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250 Years of Excellence

ENCYCLOPÆDIA
Britannica[®]

Anniversary Edition

250 Years of Excellence
(1768–2018)



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FOREWORD

There was no United States.
No American or French revolutions.
No “Australia,” Uranus, Neptune, or Pluto.
No telephones, electricity, railroads, or cars.
And Napoleon and Lincoln had yet to be born.

But one entity did exist, and it was sowing the seeds of a publishing phenomenon that continues to this day, two and a half centuries later—*Encyclopædia Britannica*, the oldest continuously published and revised work in the English language.

This year marks the 250th anniversary of Britannica’s famed reference work, and though the final print edition of the encyclopedia appeared in 2012, the publication lives on in digital form, expanded and ever expanding 24/7, at www.britannica.com. The special volume we present here—*Encyclopædia Britannica Anniversary Edition: 250 Years of Excellence (1768–2018)*—reflects on this extraordinary publishing heritage, and it does so by highlighting the three perspectives of the world long captivating to Britannica and captured in its publications, print or digital: the past, the present, and visions of the future.

Part One—Evolving Knowledge—highlights classic entries from the encyclopedia’s early years, going back to its 1st Edition, published in Edinburgh, Scotland, between 1768 and 1771. It shows in intriguing and sometimes humorous detail just how far knowledge has evolved and become more reliable over the last two and a half centuries, and it highlights as well the beauty of Britannica as a historical document and mirror of the West. As the reader will see, some of the entries are shockingly wrongheaded, reminding us how often knowledge throughout time has been colored by myth, pride, and prejudice and circumscribed by the geographical limitations of the day. Daniel Boorstin, the acclaimed writer and historian, Britannica contributor, and longtime U.S. Librarian of Congress, emphasized this very point on the occasion of Britannica’s 225th anniversary in 1993. “Additions to our knowledge require a painful adjustment,” he noted, for “the stronger the light of new knowledge, the wider and deeper the shadows on old facts and fancies.” In other words, reflections in the mirror are not always pretty, but they do serve a purpose, and in the case of *Encyclopædia Britannica*, its unparalleled mirror of our past serves as both marker and measure of our social progress, cultural change, and egress from eras of ignorance and superstition. So was California an island in the West Indies? Did unicorns and vampires actually roam the Earth? And could the corpse of a murder victim spontaneously bleed when the killer was near? This section provides the answers.

Part Two—Classic Voices—features many of the world-class contributors who have written for Britannica over the centuries and who continue to write for it today. From Nobel laureates and Pulitzer Prize winners to presidents, prime ministers, Academy Award recipients, Hall of Fame athletes, and trailblazers of business, science, and technology—the best and the brightest from every avenue of human endeavor have shared their expertise with the world through Britannica.

Part Three—Issues of Today, Visions of Tomorrow—offers insights on the present and projections of the future from prominent writers, scholars, and newsmakers from around the world. From cyberbullying to cyberwarfare, from Martin Scorsese, Garry Kasparov, and Monica Lewinsky to Henry Louis Gates, Jr., the Archbishop of Canterbury, and former U.S. secretaries of state James Baker and Madeleine Albright—just a few of the intriguing concepts and contributors who make up this engaging third feature of the book.

Lastly, the **Afterword** offers an anecdotal look at the many ways *Encyclopædia Britannica* has impacted lives, influenced scholarship, and even altered the course of history since 1768. More than a few famed writers, artists, and scientists cut their teeth on Britannica, and their experiences with the encyclopedia are highlighted here. And if you've ever wondered what possible connection there could be between Alexander Hamilton, Al Capone, Alfred Hitchcock, quiz show scandals, the Coca-Cola bottle, and even the Rolling Stones' Keith Richards, then a gander at the Afterword will be in order.

One final note: Access to information is perhaps humankind's oldest yearning. Knowledge about our environs, its flora and fauna, its potential for food, shelter, and protection, and its aptness for forging communities and finding mates; and knowledge about the larger world around us, the universe beyond our sight, which has inspired and frightened us in equal measure—this simple desire for information is perhaps ground zero of human needs. Technology, of course, has satisfied this demand once and for all, and short of a cataclysmic event of global proportions—a nuclear holocaust or an astronomical collision—it is difficult to imagine the world ever again worrying about mere access to information. But such success has spawned an equally confounding problem. Whereas once we lamented scarcity we now battle surfeit, and how to handle in prudent fashion the intoxicating spoils of our sci-tech victory remains one of the most pressing issues of our day. Which means one telling thing for a phenomenon such as Britannica: in an age of “fake news” and “information overload,” its mission to cull and to communicate sound and reliable information, and to present it in a useful and meaningful way, is more critical today than ever before. Not even a quarter of a millennium can diminish its relevance.

Theodore Pappas
Editor

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PART ONE

Evolving Knowledge



Mind, Health, & Body

ANOREXIA & BULIMIA

Smoke and Drink Brandy

Eating disorders are complex and perplexing afflictions even today, and so it is hardly shocking that the following entries from Britannica's 3rd Edition (1788–97) offer little insight into either the cause of such disorders or how best to treat them. What is surprising, however, is not only that Britannica covered the ailments in the 18th century but that the entries actually contain some accurate and progressive views: the section on anorexia correctly suggests that the condition may be symptomatic of deeper, underlying issues, and though the recommendation that people who suffer from bulimia should smoke and drink alcohol is obviously misguided, nicotine's role as an appetite suppressant was clearly understood even then.

Anorexia, a want of appetite, or a loathing of food. The disorder is either original or symptomatic. When it is original, its causes are, bad diet, too free drinking, voraciousness, etc.: In which cases, a vomit or two of ipecacuanha [roots of two South American plants used for centuries as an expectorant] may be taken; and temperance, a light but cordial nourishing diet, and daily exercise, persisted in, will generally effect a recovery. But it is more frequently a symptom of some other disorder; and then the cure depends on the removal of the original one.

Bulimia, a disease commonly owing to some fault in the stomach, by which the aliments are thrown out too soon; and unless the person be indulged in his desire for eating, he frequently falls into fainting fits. Sometimes it is attended with such a state of the stomach, that the aliment is rejected by vomit almost immediately after being swallowed; after which the appetite for food returns as violent as ever.

But there are many circumstances which seem to render it probable that it more frequently arises from a morbid condition of the secreted fluid poured into the stomach, by means of which the aliment is dissolved.

When the activity of this fluid is morbidly increased, it will both produce too sudden a solution of the solid aliment, and likewise operate as a powerful and peculiar stimulus to the stomach, giving an uneasy sensation, similar to that which takes place in natural hunger. Such things are proper for the cure as may enable the stomach to perform its office: chalybeates and other tonics will generally be proper. In some, brandy drunk in the morning has been useful; and frequently

Khayat-Nebinger-Orban-Taamallah/ABACAUSA.com/Newscom



Model Nataliya Gotsiy in 2007, when her ultra-thin physique became a topic of debate about whether the fashion industry promotes an unhealthy body image for women.

smoking tobacco has relieved others. Oil, fat, meat, pork, opiates, and in short every thing which in a sound person would be most apt to pall the appetite, may also be used as temporary expedients, but cannot be expected to perform a cure. In some, the pylorus [opening from the stomach to the intestines] has been found too large; in which case the disease must have been incurable.

BALDNESS

Fox Urine and Onions

A fresh-cut onion, a dash of wine—no, not ingredients for dinner but for the potions that cure baldness. As Britannica suggested in its entry on “Alopecia” in its 4th Edition (1801–09), these ingredients, if properly prepared and applied, can indeed regrow hair, even hair lost due to contact with that chief foe of follicles: fox urine.

Alopecia, a term used among physicians to denote a total falling off of the hair from certain parts, occasioned either by the defect of nutritious juice, or by its vicious quality corroding the roots of it, and leaving the skin rough and colourless.

The word is formed from . . . *vulpes*, “a fox,” whose urine, it is said, will occasion baldness, or because it is a disease which is common to that creature. It is directed to wash the head every night at going to bed with a ley prepared by boiling the ashes of vine branches in red wine. A powder made by reducing hermodactyls to fine flour is also recommended for the same purpose.

In cases where the baldness is total, a quantity of the finest burdock roots are to be bruised in a marble mortar, and then boiled in white wine until there remains only as much as will cover them. This liquor, carefully strained off, is said to cure baldness, by washing the head every night with some of it warm. A ley made by boiling ashes of vine branches in common water is also recommended with this intention. A fresh cut onion, rubbed on the part until it be red and itch, is likewise said to cure baldness.

BLOODLETTING

A (Painfully) Detailed Guide

After George Washington contracted a cold, strep throat, and perhaps epiglottitis after an extended wintry ride through his estate on December 12, 1799, causing a swelling of the larynx that nearly suffocated him, his aides and doctors proceeded with the prescribed treatments of the day: they gave him gargles of mo-



Breathing a Vein, an illustration on bloodletting by James Gillray, 1804.

lasses, vinegar, and butter; put his feet in warm water; emptied his bowels with a powerful enema; applied a compress of dried beetles on his throat; and, most significantly, bled him, repeatedly, four or five times, perhaps draining the former president of half his body's volume of blood. Washington went into shock and hypotension, which likely sparked the calm he experienced shortly before he died two nights after his ride. While the extensive bleedings of her 67-year-old husband terrified Martha Washington, one doctor later thought they “missed the mark” and should have been conducted closer to the throat, such as under the tongue, thereby following the then-conventional belief that bloodletting was most successful if performed closest to the inflamed organ or body part in trauma.

As one of medicine's oldest practices, bloodletting was, until only 150 years ago, the first-line treatment for nearly every ailment—from migraine to mental illness. It is hardly surprising, therefore, that Britannica's coverage of phlebotomy was extensive in the 18th century. In fact, as seen in the extended excerpt below from Britannica's “Surgery” entry in its 1st Edition (1768–71), the encyclopedia offered a kind of step-by-step manual for do-it-yourself bloodletting. These procedures, warned Britannica, were not for the faint of heart: perform them

only on a bed or near a couch, for some patients are likely to "fall into a swoon."

Of Phlebotomy.

We begin with the operation of phlebotomy: because it is of all the most general, performed in most parts of the body, and by much the most frequent in use at this present day. By phlebotomy, or bleeding, we here intend the opening of a vein, by a sharp-edged and pointed instrument of steel, for extracting a proper quantity of blood, either for the preservation or recovery of a person's health.

It is commonly enough known, that the operation of bleeding in the arm is performed on the veins that lie on the internal part of the cubit. There are several things worthy the surgeon's notice in this operation; some of which are to be done preparatory to bleeding, some in the operation itself, others immediately after the performance of it. Preparatory to bleeding you should have in readiness: (1.) A linen filler, about an ell [an arm long] in length, and two fingers in breadth. (2.) Two small square bolsters. (3.) Porringers or vessels to receive the blood. (4.) A sponge with warm water. (5.) Some vinegar, wine, or Hungary water, to raise the patient's spirits if he should be inclinable to faint. (6.) Two assistants, one to hold the porringer, the other to reach you anything that you shall want. (7.) You must place your patient upon a couch; or, if he is very fearful of the operation, lay him upon a bed, lest he should fall into a swoon. . . .

It is necessary for the surgeon to inspect his patient's arm diligently, that he may see the course of the veins: he must then take hold of the arm, and extend it towards his breast, tucking up the sleeve about a hand's breadth above the bend of the cubit, where he must make his ligature, rolling the fillet twice round, and fastening it with a knot. When you have bound up the arm in this manner, you let it go for a small time till the veins grow turgid. You are then to lay hold of the arm again in the same manner as we directed before, and extend it to your breast, having an assistant ready with the vessel in his hand, at a convenient distance for receiving the blood. . . .

When you have determined which vein to open, you are to perform the operation on that part which presents itself fairest to you. But if the vein has frequently been opened, and the part which appears largest and fairest is full of cicatrices, you are not to open above, but below the cicatrices, by which means the blood will discharge itself more freely: For the part above is generally straitened by the cicatrix.

Before you apply the lancet to the skin, when the veins are not risen, it will be proper to rub the arm below the bandage, which will drive the blood back towards the cubit, and render the veins more turgid. Whilst this is doing in the right arm, the surgeon should take hold of the patient's arm in such a manner that he may lay his thumb upon the vein he intends to open, to prevent the blood from flowing back and to keep the vein from rolling. . . . Taking the lancet with your right hand, so placed that the thumb and first finger may be fixed about the middle of the blade; the other fingers should rest gently upon the patient's arm, to prevent your hand from slipping.

Your lancet is now to be pushed lightly and carefully forward by your thumb and fore-finger, till it has penetrated through the coats of the vein; and at that instant to be raised a little upwards, in order to enlarge the orifice of the wound, which will give a freer passage to the blood. The most common and convenient size of an orifice is about twice the breadth of the back of an ordinary knife. You are to keep even between the two extremes of rashness and timidity in making the puncture. For as in one case you will only divide the common integuments, and so leave your work undone; so in the other you will run the risque of wounding the artery, nerve, or tendon. . . .

Of Bleeding in the Veins of the Forehead, Temples, and Occiput [Back of the Head].

There are many physicians and surgeons, who think that bleeding by the veins of the forehead and temples is much more serviceable and expeditious in relieving all disorders of the head, such as violent pains, vertigo, delirium, melancholy, and raving madness, etc. than the like discharge by veins more remote from the parts affected; judging that their vicinity renders them more capable of evacuating the offending matter of the disease. . . .

Of Bleeding in the Jugular Veins of the Neck.

It has been a very ancient practice to bleed in the external jugular veins of the neck, for most inflammatory disorders of the adjacent parts for a quinsy, phrenzy, madness, ophthalmia, apoplexy, inveterate head-aches, lethargy, and other disorders of the head. Nor are there wanting many among our modern surgeons and physicians to encourage the same practice, and that even from the authority of reason and experience: since the accumulated and obstructed blood and humours may be this way discharged from the parts affected, and their bad consequences prevented. . . .

Lastly, it must be acknowledged, that the patient faints away as readily after bleeding in the neck, as the jugular veins are safely and easily opened: but no danger follows from thence.

Of Phlebotomy in the Penis.

Bleeding in the *vena dorsalis penis* usually surpasses the benefit of all remedies whatever in abating inflammatory disorders of this member. This large vein, which runs along the back or upper side of the *penis*, being generally pretty much distended, and conspicuous in an inflammation of this part, may be incised about the middle or back part of the penis; and kept bleeding till the member becomes flaccid and a sufficient quantity of blood be discharged proportionable to the urgency of the symptoms. This done, you must apply a compress, and the bandage proper for the penis. But you must carefully endeavour to avoid injuring the arteries or nerves which enter the penis near this vein; as also not to make your bandage too strict: for by these means the inflammation and symptoms may turn out worse than before.

CROSSED EYES

A Contagious Disease

Some looks can kill (see the "Cockatrice Monster" and "Evil Eye" entries), while others may simply leave people . . . cross-eyed. Apparently so, as strabismus was considered a contagious

disorder in the 18th century, as seen in Britannica's 1st Edition (1768–71).

A strabismus, commonly called squinting, is an unequal contraction of the muscles of the eye, either from a spasm, an epilepsy, or a palsy, whereby the axis of the pupil is drawn towards the nose, temples, forehead, or cheeks: so that the person cannot behold an object directly. Infants readily contract this distemper, sometimes for want of care in the nurses, who place the cradles in a wrong position, with regard to the light. Children likewise, while growing up, sometimes fall into this disorder, either from ill customs contracted in playing, or by looking on others who are affected with it.

This disorder is very difficult to cure; therefore the utmost care should be taken to prevent it, and the cradle should be so placed, as not to occasion the child to look a-wry. [The ancient Greek physician Paulus] Ægineta contrived a mask, and so adapted it to the face, that nothing could be seen except through two holes straight forward; and for the same purpose what we call goggles are used.

DEAFNESS, A CURE

Ant Eggs and Onions

Few afflictions have occasioned more "miracle cures" than deafness. From swallowing pepper and drinking urine to bloodletting, tomato eating, and falling from high places, Britannica added the following in its 1st Edition (1768–71): ant eggs, onions, white wine, and (a classic folk remedy) smoke blown into the ear.

The causes of deafness are a cutting off the external ear, or an obstruction of the auditory passage from wax or other things; from a rupture of the membrane of the tympanum, or when it is corroded or ulcerated, or the auditory nerve is obstructed or compressed. External causes are, falls from high places, excessive noise, such as the explosion of cannon; likewise acute disorders near their state, which are like to terminate by a critical hæmorrhage.

As to the prognostics, those who are born deaf are rarely cured. A real deafness is hard

to remedy. A deafness in acute diseases, with crude urine, foretells a delirium; but, when the signs of coction are good, it portends a critical hæmorrhage.

With regard to the cure; if the obstruction be in the external cavity of the ear, it is discernible by the sight. If there is occasion to syringe the ear, a decoction of sage and rosemary-flowers will be proper, with equal parts of water and white-wine; but great caution should be used. Some pump the head with warm bath waters. Some say, the eggs of ants bruised and put into the ear, with the juice of an onion, cure the most inveterate deafness. . . .

[Dutch professor of medicine] Lindanus advises the gall [bile] of an eel mixed with spirit of wine; and others, the fumes of sulphur conveyed into the ear, with a pipe or funnel.

INSANE ASYLUMS

Indicting the Medical Profession

Britannica exhibited a surprisingly progressive voice on the subject of asylums in the mid-19th century, as demonstrated below in this excerpt from its 8th Edition (1852–60) entry on “Mental Diseases,” written by Scottish physician David Skae (1814–73), a brilliant specialist in the study and treatment of insanity. Britannica recounted the cruel treatment of the insane, past and present, and then castigated the medical establishment for insufficiently teaching doctors about mental illness—a complaint still heard a century and a half later.

Public asylums, indeed, existed in most of the metropolitan cities of Europe; but the insane were more generally, if at all troublesome, confined in jails, where they were chained in the lowest dungeons, or made the butts and menials of the most debased criminals. Even in the public asylums, many of which were endowed by the munificence of philanthropists, the inmates were generally confined in low and damp cellars, sometimes isolated in cages or chained to the floor or wall; if harmless, they were huddled together, without regard to their habits, in cells not fitted to contain one tithe of the num-

ber immured in them. The medical treatment consisted, perhaps, in an annual bleeding and a few emetics; while the lash was systematically used, justified, and even recommended, as it had been by such authorities as the celebrated William Cullen. These unhappy victims of disease were exhibited to the public like wild beasts, and their passions irritated to gratify a morbid and vulgar curiosity. They were often killed by the ignorance and brutality of their keepers, sometimes during rough methods of forcing meat into them, sometimes by barbarous and violent beating. . . .

In concluding this brief historical retrospect, we cannot refrain from expressing our surprise that the study of mental diseases has been deemed of so little interest or importance hitherto, as to form no part of the curriculum of medical education in this country. Although the large metropolitan asylums afford ample means of illustrating courses of instruction in psychological medicine, the study of the subject has never been required by our licensing medical or surgical boards or universities. Lectures on mental diseases, both systematic and practical, have indeed been delivered in many of the continental medical schools; and of late years, in some of the large asylums of London and in that of Edinburgh, clinical lectures have been given; but attendance upon such courses of instruction is voluntary, with the exceptional case of candidates for appointments in the East India Company's service, who have been required during the last four years to attend an asylum for the insane for three months. This neglect seems altogether unaccountable, when we reflect upon the many collateral sciences students of medicine are compelled to master, of comparatively little value to them in actual practice, and the many diseases, accidents, and operations, toxicological and analytical investigations, they are carefully and minutely schooled in, which it may never fall to their lot, in a long life, to see or practise; while insanity, which affects 1 in every 400 or 500 of the population, and which, in some of its states or forms, they can hardly pass a week in medical practice without being consulted about,—often in circumstances requiring great judgment and skill,—is made no part of their medical education at all.



Interior of London's Bethlehem Hospital, later dubbed "Bedlam," England's first asylum for the mentally ill, from an engraving by William Hogarth, 1735.

LUNATICS

On "Idiots" and the Law

Lunatics, "idiots," and those suffering the "frenzies" had legal rights to their property and their person that the state must not abridge, explained Britannica in its 3rd Edition (1788–97).

Lunatic, a person affected with that species of madness termed lunacy. The word is indeed properly applied to one that hath lucid intervals; sometimes enjoying his senses, and sometimes not; and that frequently supposed to depend on the influence of the moon.

Lunatic, in Law

Under the general term of *non compos mentis* (which Sir Edward Coke says is the most legal name) are comprized not only lunatics,

but persons under frenzies, or who lose their intellects by disease; those that grow deaf, dumb, and blind, not being born so; or such, in short, as are judged by the court of chancery incapable of conducting their own affairs. To these also, as well as idiots, the king is guardian, but to a very different purpose. For the law always imagines, that these accidental misfortunes may be removed; and therefore only constitutes the crown a trustee for the unfortunate persons, to protect their property, and to account to them for all profits received, if they recover, or after their decease to their representatives. And therefore it is declared by the statute 17 Edw. II. c. 10. that the king shall provide for the custody and sustentation of lunatics, and preserve their lands, and the profits of them, for their use when they come to their right mind; and the king shall take nothing to his own use: and if the parties die in such estate, the residue shall be distributed for their souls by the advice of

the ordinary, and of course (by the subsequent amendments of the law of administrations) shall now go to their executors or administrators.

On the first attack of lunacy, or other occasional insanity, when there may be hopes of a speedy restitution of reason, it is usual to confine the unhappy objects in private custody under the direction of their nearest friends and relations; and the legislature, to prevent all abuses incident to such private custody, hath thought proper to interpose its authority, by 14. Geo. III. c. 49. for regulating private mad-houses. But when the disorder is grown permanent, and the circumstances of the party will bear such additional expence, it is thought proper to apply to the royal authority to warrant a lasting confinement.

The method of proving a person *non compos* is very similar to that of proving him an idiot.

MADNESS & MELANCHOLY

Blame It on the Stars

Are you feeling weak, lethargic, fearful, or anxious? Do you have headaches, bloodshot eyes, and ringing in the ears? Do you see red spots? Are you unusually hungry, gassy, or constipated? Have you strangely acquired a new strength, a sexual appetite, or a sensitivity to cold? If you answered "yes" to any of these questions, according to Britannica's 1st Edition (1768–71), then you might be melancholy, or downright mad—and the calendar may be the cause.

Melancholy and madness may be very properly considered as diseases nearly allied; for we find they have both the same origin; that is, an excessive congestion of blood in the brain: they only differ in degree, and with regard to the time of invasion. Melancholy may be looked upon as the primary disease, of which madness is only the augmentation.

When persons begin to be melancholy, they are sad, dejected, and dull, without any apparent cause; they tremble for fear, are destitute of courage, subject to watching, and fond of solitude; they are fretful, fickle, cap-

tious, and inquisitive; sometimes niggardly to an excess, and sometimes foolishly profuse and prodigal. They are generally costive; and when they discharge their excrements, they are often dry, round, and covered with a black, bilious humour. Their urine is little, acrid, and bilious; they are troubled with flatulencies, putrid and fetid eructations. Sometimes they vomit an acrid humour with bile. Their countenances become pale and wan; they are lazy and weak, and yet devour their victuals with greediness.

Those who are actually mad, are in an excessive rage when provoked to anger. Some wander about; some make a hideous noise; others shun the sight of mankind; others, if permitted, would tear themselves to pieces. Some, in the highest degree of the disorder, see red images before their eyes, and fancy themselves struck with lightning. They are so salacious, that they have no sense of shame in their venereal attempts. When the disease declines, they become stupid, sedate, and mournful, and sensibly affected with their unhappy situation.

The antecedent signs are, a redness and suffusion of the eyes with blood; a tremulous and inconstant vibration of the eye lids; a change of disposition and behaviour; supercilious looks, a haughty carriage, disdainful expressions, a grinding of the teeth, unaccountable malice to particular persons; also little sleep, a violent head-ach, quickness of hearing, a singing of the ears; to these may be added incredible strength, insensibility of cold, and, in women, an accumulation of blood in the breasts, in the increase of this disorder. . . .

Both these disorders suppose a weakness of the brain, which may proceed from violent disorders of the mind, especially long-continued grief, sadness, dread, uneasiness and terror; as also close study and intense application of mind, as well as long protracted lucubrations. It may also arise from violent love in either sex, especially if attended with despair; from profuse evacuations of the semen; from an hereditary disposition; from narcotic and stupefactive medicines; from previous diseases, especially acute fevers. Violent anger will change melancholy into madness; and excessive cold, especially of the lower parts, will force the blood to the lungs, heart, and brain; whence



Illustration of facial expressions displaying various emotions from Encyclopædia Britannica's 3rd Edition (1788–97).

oppressive anxieties, sighs, and shortness of breathing, tremors and palpitations of the heart; thus vertigoes and a sensation of weight in the head, fierceness of the eyes, long watchings, various workings of the fancy intensely fixed upon a single object, are produced by these means. To these may be added a suppression of usual haemorrhages, and omitting customary bleeding: hence melancholy is a symptom very frequently attending hysteric and hypochondriac disorders. . . .

Diseases of the mind have something in them so different from other disorders, that they sometimes remit for a long time, but return at certain periods, especially about the solstices, the times at which they first appeared. It may likewise be observed, that the raving fits of mad people, which keep the lunar period, are generally accompanied with epileptic symptoms.

MIDWIFERY

Those Scandalous Drawings

When the first pages of Encyclopædia Britannica first appeared in late 1768, knowledge of the human body and its healthy functioning was quite erratic. Anatomy was understood in great detail, physiology in part, hygiene hardly, and antiseptics in medicine and surgery not at all. Definitions and classification of diseases by our standards were at the least exotic and often absurd. Marvelously, the prescribed cures sometimes worked. The early Britannicas did much to disseminate existing knowledge throughout the British Isles and the colonies. For the 1st Edition's instruction of midwives, the editor, William Smellie, relied heavily on the work of his older and distantly related namesake, the obstetrician William Smellie, the first man to teach and practice obstetrics on a scientific basis. Numerous and explicit illustrations were engraved by Britannica's copublisher, Andrew Bell. There is a tradition that either the monarch George III or his court chamberlain was so incensed by the detailed illustrations of the birth process (reproduced in this volume) that he ordered all loyal subjects to rip out and destroy the offending plates (see pages 28–30).

Midwifery is the art of assisting nature in bringing forth a perfect foetus, or child, from the womb of the mother.

The knowledge of this art depends greatly on an intimate acquaintance with the anatomy of the parts of generation in women, both internal and external. But, as those have already been fully described under the article Anatomy, we must refer to the different parts of that science upon which the knowledge of midwifery depends.

Of the increase of the Uterus after conception.

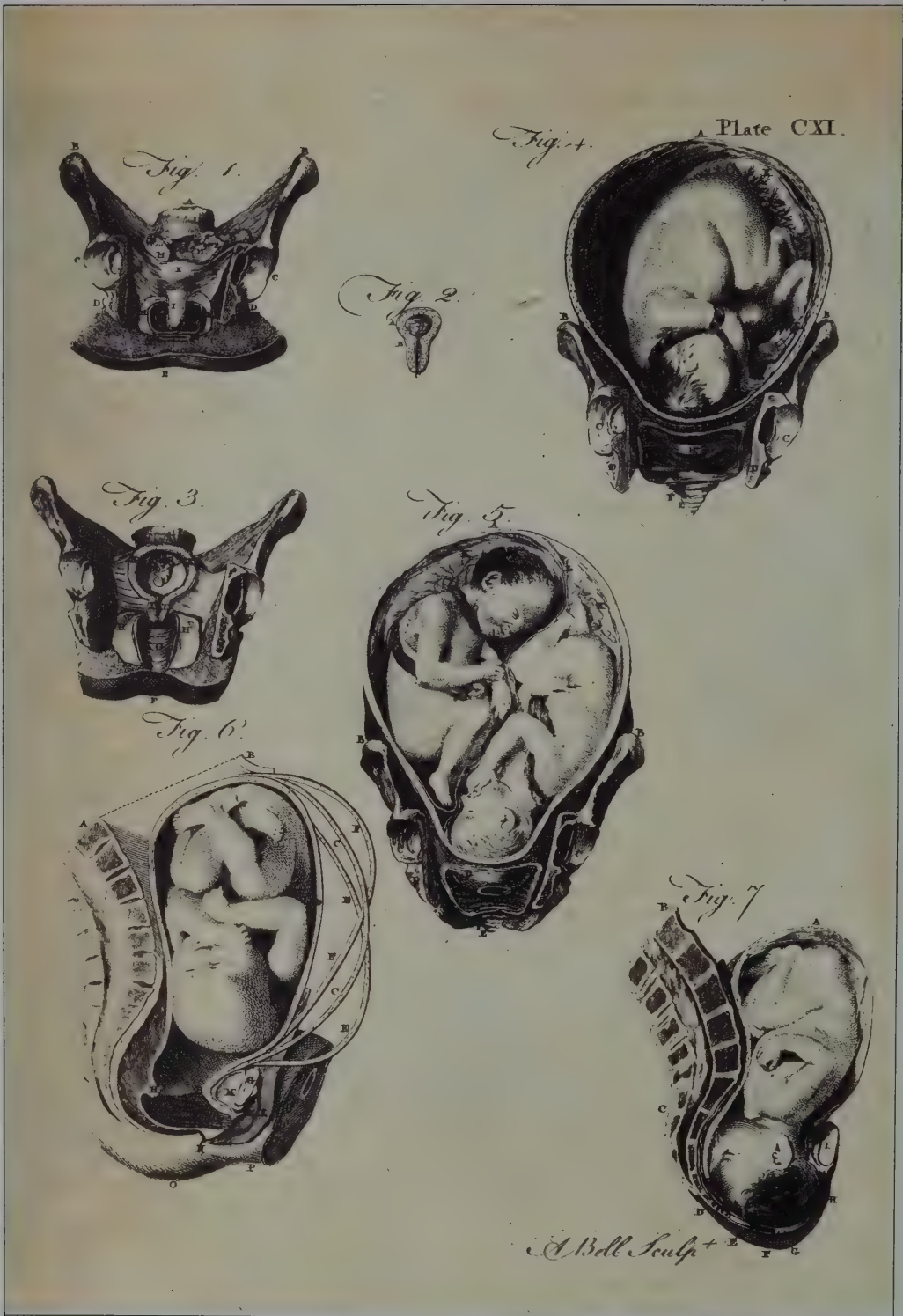
It is supposed, that the ovum swims in a fluid, which it absorbs so as to increase gradually in magnitude, till it comes in contact with all the inner surface of the fundus uteri; and this being distended in proportion to the augmentation of its contents, the upper part of the neck begins also to be stretched.

About the third month of gestation, the ovum in bigness equals a goose egg; and then nearly one fourth of the neck, at its upper part, is distended equal with the fundus. At the fifth month, the fundus is increased to a much greater magnitude, and rises upwards to the middle space betwixt the upper part of the pubes and the navel; and at that period, one half of the neck is extended. At the seventh month, the fundus reaches as high as the navel; at the eighth month, it is advanced midway between the navel and *serebicus cerdis*; and in the ninth month, is raised quite up to this last mentioned part, the neck of the womb being then altogether distended.

"MONSTROUS BIRTHS"

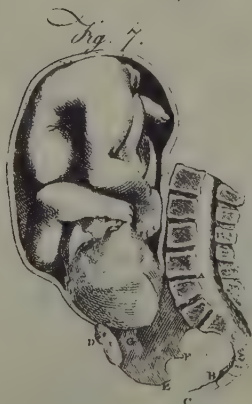
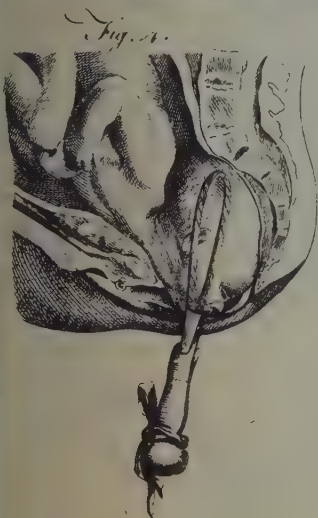
Conjoined Twins

Chang and Eng Bunker (1811–74) were the world-famous conjoined brothers whose physical abnormality and birthplace in Siam (called Thailand today) became the basis for the term "Siamese twins." The brothers can still be seen today, or at least their fused livers can: they are on display at the Mütter Museum of medical oddities in Philadelphia.

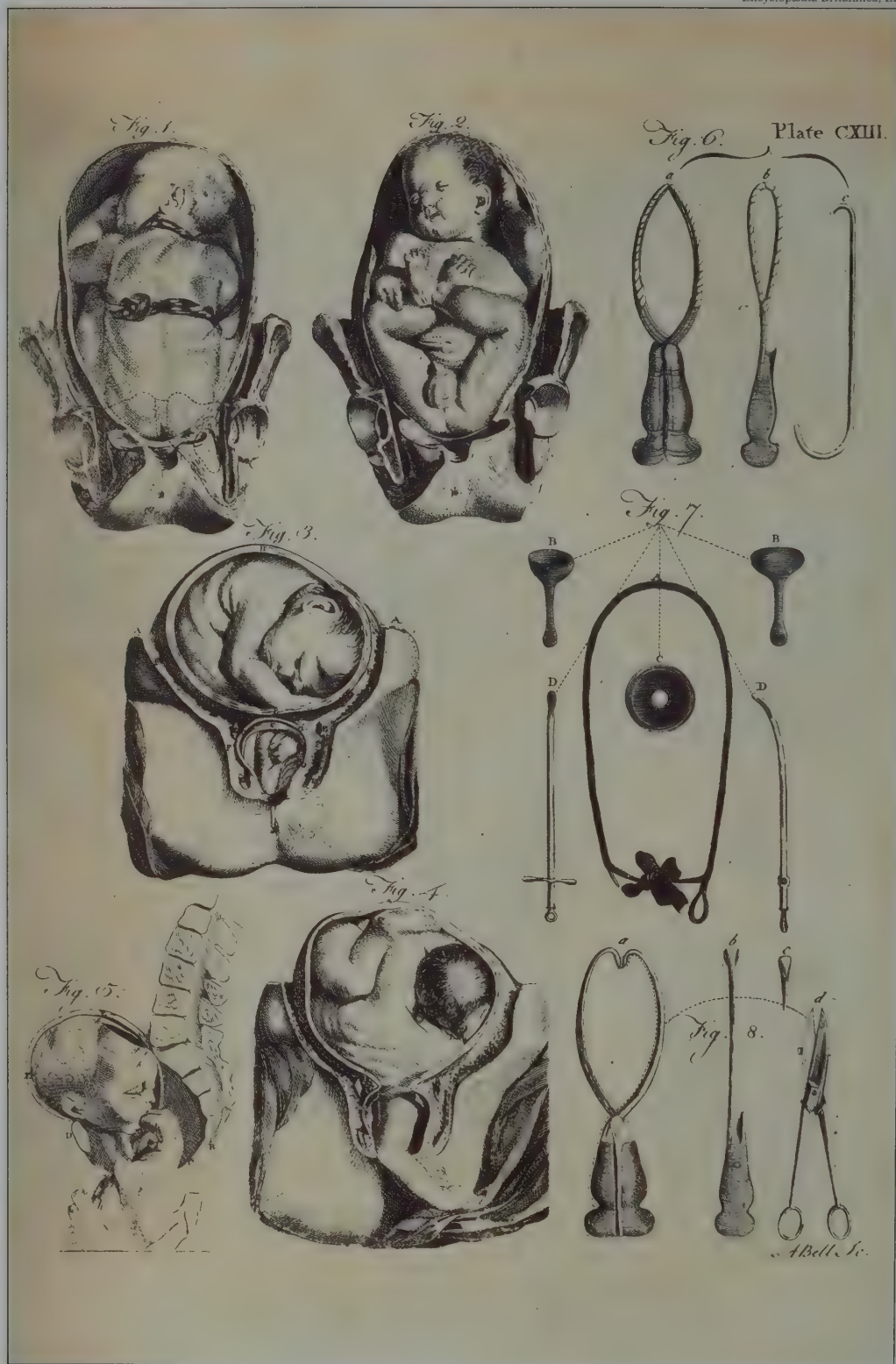


Controversial illustrations of childbirth, which accompanied the "midwifery" article in Encyclopædia Britannica's 1st Edition (1768–71).

Plate CXII.



A. Bell sculp.



Mehedi Hasan/age fotostock



Conjoined girls Rabia and Rukia, who were born in Bangladesh in 2016. As seen in the photo, the girls are conjoined only at the head.

Though the name "Siamese twins" is considered pejorative today, it pales in degree of offensiveness to the term "monster," which, as seen below in the excerpt from *Britannica's 1st Edition (1768–71)*, was a common 18th-century name for conjoined twins. The excerpt is from the section on "Monsters" in *Britannica's* long "Midwifery" article.

Of Monsters.

Two children joined together at their bellies, (which is the most common case of monstrous births,) or by the sides, or when the belly of the one adheres to the back of the other. . . .

In such a case, where the children were small, the adhesion hath been known to stretch in pulling at the feet of one, so as to be delivered; and the other hath been afterwards brought along, in the same manner, without the necessity of a separation.

When the accoucheur is called to a case of this kind, if the children are large, and

the woman come to her full time, let him first attempt to deliver them by that method: but if, after the legs and part of the body of the first are brought down, the rest will not follow, let him slide up his hand, and with his fingers examine the adhesion; then introducing the scissors between his hand and the body of the foetus, endeavour to separate them by snipping through the juncture. Should this attempt fail, he must diminish the bulk in the best manner he can think of, and bring the body of the first, in different pieces, by pulling or cutting them asunder, as he extracts with the help of the crotchet.

No certain rules can be laid down in these cases, which seldom happen; and therefore a great deal must be left to the judgment and sagacity of the operator, who must regulate his conduct according to the circumstances of the case, and according to the directions given for delivering, when the pelvis is narrow and the children extraordinary large.

NARCOLEPSY, A CURE

Vinegar Up the Nose

Ever fall asleep while urinating, eating, or yawning? Ever wake someone by shooting vinegar up their nostrils or draining some of their blood? The answer is likely no, though all such deeds were considered seriously in Britannica's 1st Edition (1768–71) as possible remedies for "sleepy diseases," the quaint 18th-century catch-all that included everything from mere drowsiness to comas to what today would be called narcolepsy, fibromyalgia, and chronic fatigue syndrome.

There are several kinds of these disorders, the principal of which are a coma vigil, a coma somnolentum, a carus, and a lethargy.

A coma vigil is known by these signs: a burning and extensive pain in the head, attended with a sense of ebullition therein; they have a strong inclination to sleep, and yet either don't sleep at all, or, if they do, awake immediately with little relief, but have no delirium. . . .

In a coma somnolentum, the patients are languid, and their chief complaint is a constant drowsiness. They often fall asleep at their meals, in conversation, and in the midst of business, and, when they are awaked, soon fall asleep again. This disorder principally seizes old men, who live luxuriously, and neglect bleeding. . . .

A carus is a profound sleep, out of which the patient cannot be roused by clamors, shaking, nor even with the pricking of a needle; or, if they are sensible of the pain they continue silent, and fall asleep again. . . .

A lethargy is a heavy and perpetual sleep, with scarce any intervals of waking. It is attended with a stupidity, and so surprising a forgetfulness, that, when the patient yawns, he forgets to close his mouth; or, if he takes the chamber-pot to make water, he forgets to do it, and falls asleep. . . .

In the cure of these diseases, three intentions should be chiefly regarded; 1. To rouse the patient from sleep. 2. To remove the difficulty of circulation, and the stagnation or extravasation of the blood or serum in the head. 3. To restore the strength of the membranes and vessels of the brain.

Those remedies are efficacious in the first case, which act on the nervous parts, by in-

ducing a tremulous and oscillatory motion through the whole nervous system: such as powerful acids, mixed with tincture of castor; volatile salts; fetid things, as galbanum, burnt partridges feathers; cold water thrown on the head; cataplasms made with vinegar, rue, bay-leaves, tops of savory, mustard-seed, castor, and camphor, applied to the head, forehead, and temples. . . .

A carus . . . requires plentiful bleeding; and the patient must be roused by clysters, rendered stimulating with the powder of squills; by blisters; by putting distilled vinegar in the nostrils; . . .

Warm baths are bad in all sleepy disorders; likewise saffron, poppies, and opiates of all kinds.

ST. VITUS DANCE

The Dangers of Early Sex

St. Vitus Dance is a neurological disorder characterized by facial grimacing and involuntary jerking of the limbs. The disease, named after a saint to whose chapels pilgrims flocked to in the Middle Ages because of his supposed curative powers, can follow scarlet fever or strep throat and typically afflicts kids, especially girls, between the ages of 5 and 15. As to the cause of the affliction, Britannica highlighted in its 1st Edition (1768–71) any action (such as too much sex or sex at too early an age) that might upset the body's precious fluids. In keeping with the ancient theory of humors (the four fluids of the body whose mixture supposedly determined one's physical and mental health, even complexion and personality), whenever these fluids were disturbed, and their equilibrium disrupted, they must then be purified and re-balanced—in this case, according to Britannica, through potions, vomiting, electric shock, and bloodletting, the last one via . . . leeches on the anus.

St Vitus's dance is a sort of a convulsion, which boys and girls are sometimes subject to, from the age of ten years, to the time of puberty. It discovers itself first by a kind of lameness, or an inability of one of the legs, which they draw after them in a ridiculous manner; nor can they hold the

arm of the same side still for a moment; for if they lay it on their breast, or any other part of their body, it is presently forced away from thence by a convulsive motion. If they are desirous of drinking, before they can bring the cup to their mouth, they use a thousand odd gesticulations like a mountebank; for they cannot bring their hand in a direct line to their mouth, but it is forced this way and that, till at length, if they have the good fortune to hit the mark, they throw the liquor down their throat as greedily as if they designed to raise laughter in the spectators.

In a convulsive paroxysm, the limbs are strangely agitated with various different postures and motions. Sometimes the hands are put behind them as if they designed to sit upon them, and soon after they seem to be beating the air; then their legs will be drawn hither and thither as if they were dancing some antic dance. Sometimes they will bend their backs like a bow, at the same time raising their breast as high as they can: then their whole body will grow stiff, and as immoveable as a stone. They generally keep on their legs without falling; yet some will grovel on the earth like epileptic persons, and will weep, laugh, gnash their teeth, gape with their mouths, put out their tongues, roll their eyes, and whirl their heads about in a strange manner.

After the fit, some are inexpressibly weak; some faint away, others fall into a deep sleep; in others, again, the fit is terminated with eructations, wind, vomiting, and throwing out plenty of water. Very often a mucus distils from the nose, or blood issues from thence, or from the uterus or hæmorrhoidal veins. . . .

To cure the St Vitus's dance, take away about 8 ounces of blood, more or less, according to the age of the patient; the next day give half, or something more of the common purging potion according to the age, and in the evening the following draught:

Take an ounce and a half of alexeterial water; 30 drops of compound spirit of lavender; a scruple of theriaca andromachi; and 8 drops of the tinctura thebaica. Mix and make them into a draught.

Let the cathartic potion be repeated thrice every other day, and the same draught in the

evening. After which, bleed again, and repeat the cathartics three or four times; and this course may be pursued to the third or fourth time. . . .

For fear of a relapse, at the same season of the next year, or a little sooner, in which the distemper appeared, bleeding should be again repeated, and purging two or three times.

Allen cured two girls of this distemper with the expression of millipedes and the Peruvian bark, after bleeding and a gentle cathartic. . . .

The patient's body, if costive [constipated], must be kept open with manna, or with oily clysters [enemas]; and if the *femes* of the disease is judged to be in the *primæ viæ* [the bowels], it will be proper, at the changes of the moon, to give a vomit with manna, that is, an ounce of manna with two or three grains of tartar emetic.

If, about the time of puberty, this disease proceeds from too early or excessive coition [sexual intercourse], or violent passions of the mind, all things which cause a commotion in the fluids must be avoided; such as, aromatics, sharp purges, emetics, spirituous liquors, inordinate motions of the body or mind, and all heating things in general. . . .

If it proceeds from worms, the cure depends on their being killed and expelled out of the body: But all anthelmintics, or worm medicines, are not to be made use of in this case; such as garlick, vitriol, copper, aloes, sharp purges, and mercurials; because, if they are given inconsiderately, they are hurtful to the nerves. It will be better to use clysters, made of milk, sweet things, and oil; as also liniments of a purging quality applied to the navel and abdomen. . . .

If it is caused by a suppression of the menses, emmenagogues and hot medicines are to be forborne; but bath-waters and bleeding will be proper. . . .

If from a stoppage of the hæmorrhoidal flux, besides bleeding and the above remedies, leeches applied to the anus will be of very great advantage.

In the observations of the medical society of London, we have an account of a deplorable convulsive case being cured by electricity.

STONE BABY

Mummies with Mummies

It seems every year, despite their extreme rareness, something about a "stone baby" or a "petrified child" makes headlines around the world. Officially called a "lithopedion," a stone baby is a fetus that has died and calcified within the mother, where it may remain undetected for years, if not decades, even causing the mother's death. The public's fascination with these highly abnormal pregnancies ("Mommies having mummies," ventured a headline in 2014) is nothing new, as evidenced by Britannica's coverage of the phenomenon in its 3rd Edition (1788–97). Britannica focused on the most famous stone baby in history, the lithopedion of Sens of 1582.

Bartholine, Paré, Licetus, and many other writers, give an account of a petrified child, which has seemed wholly incredible to some people. The child, however, which they describe, is still in being; and is kept as a great rarity in the king of Denmark's museum at Copenhagen. The woman who was big with this, lived at Sens in Champaign in the year 1582; it was cut out of her belly, and was uni-

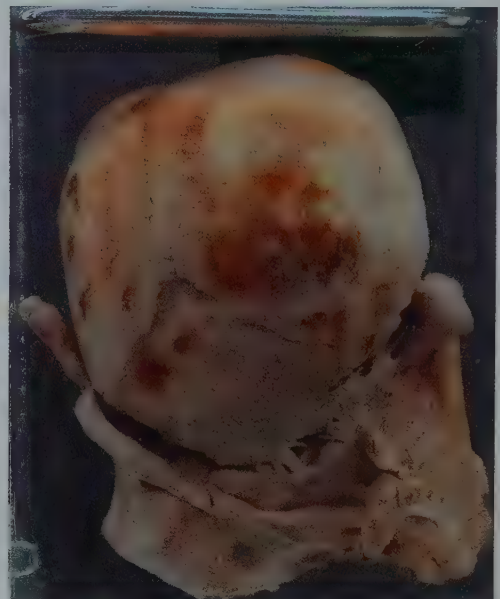
versally supposed to have lain there about 20 years. That it is a real human foetus, and not artificial, is evident to the eyes of any observer; and the upper part of it, when examined, is found to be of a substance resembling the gypsum or stone whereof they made the plaster of Paris: the lower part is much harder, the thighs and buttocks being a perfect stone of a reddish colour, and as hard as common quarry-stone: the grain and surface of this part appears exactly like that of the calculi or stones taken out of human bladders: and the whole substance, examined ever so nearly, and felt ever so carefully, appears to be absolute stone. It was carried from Sens to Paris, and there purchased by a goldsmith of Venice; and Frederic III, king of Denmark purchased it of this man at Venice for a very large sum, and added it to his collection of rarities.

STROKES, A CURE

Cut the Jugular

Conduct bloodletting of the arm or cut the jugular; rub the patient's hands, head, and feet;

Front and back views of a two-year-old lithopedion discovered in and surgically removed from a woman complaining of infertility.



have "two strong men" walk the patient from room to room; and "blow in the mouth and nostrils the smoke of tobacco from an inverted pipe." Thus were the common methods of treating stroke patients in the 18th century, as described in *Britannica's* coverage of "Apoplexy" in its 1st Edition (1768–71).

This disease is a sudden abolition of all the senses, external and internal, and of all voluntary motion, commonly attended with a strong pulse, laborious breathing, a deep sleep, and snorting.

There is no difference between a person asleep and in an apoplexy, but that the one can be awaked, and the other cannot. . . .

A slight apoplexy goes of in a profuse, equal, roscid, warm sweat; a large quantity of thick urine, by the bleeding piles [hemorrhoids], the flowing of the menses, a diarrhoea, or a fever. If it is more severe, it usually terminates in a paralytic disorder; and is seldom curable, but always leaves behind it a great defect of memory, judgment, and motion.

[Regarding treatment] bleed in the arm to 12 ounces, and then in the jugular to 7 ounces; immediately after which, give an ounce and a half, or two ounces, of emetic wine.

Apply a large strong blister [plaster] to the neck, hold the patient upright in bed, and let the spirit of sal ammoniac [ammonium chloride], highly rectified, be held to his nose.

Let there be strong frictions [rubbings] of the head, feet, and hands; and let the patient be carried upright backwards and forewords about the room, by two strong men. Strong blisters should be applied to the head, neck, back, and calves of the legs. Sharp clysters [enemas] should be thrown up into the body, which have a tendency to excite the patient, and to cause a revulsion.

Shaw advises, during the fit, to bleed largely in the arm, or rather in the jugular; to apply strong volatiles to the nose, to blow sneezing powders up the nose, as also to rub the temples with spirituous cephalic mixtures.

Likewise to blow in the mouth and nostrils the smoke of tobacco from an inverted pipe.

Those who have once had a fit of the apoplexy, are very liable to be seized with it again; and if they are plethoric [flush, supposedly from excess blood], the best preservative is bleeding once in three months, and

using themselves to a spare diet; taking medicines which strengthen gently, and abstaining from cares and all intense applications of the mind.

SWADDLING

Treating Infants Like Plants

It will doubtless seem strange to see Britannica taking a position on the hardly burning issue of swaddling, declaring "there are certainly too many pins and bandages used in the dress of infants." But the entry that follows from Britannica's 3rd Edition (1788–97) harkens back to the day when reference works were expected to provide as many answers to everyday concerns, from child care to horse care, as insights into science, society, and the world. Britannica's suggestion: dress kids as you would treat plants, and the "poor creatures" will be fine.

The absurd mode of swaddling up infants in such a manner as to confine them almost from all motion, and leave scarce a limb at liberty, which has been so often exclaimed against and represented as highly injurious to the symmetry and vigour of the human frame, is now almost entirely laid aside; and therefore we need not raise our voice against it.

Still, however, there are certainly too many pins and bandages used in the dress of infants: these are unfavourable to the circulation of the blood, impede the growth, and often occasion those tears and that peevishness which we rashly attribute to the natural ill-humour of the poor creatures. Their dress ought to be loose and cool, as to press hard on no joint, no vein nor muscle, and to leave every limb at liberty.

If too heavy and close, it may occasion too copious a perspiration, and the same time confine the matter perspired on the surface of the skin; than which nothing can be more prejudicial to the health of the child. It may also, however, be too thin and cool: for as moderate warmth is necessary to the vegetation of plants, so it is no less necessary for promoting the growth of animals: and, therefore, though the dress of infants ought to be loose and easy, yet still it should be moderately warm.

TEETHING, A CURE

Leeches and Marshmallows

"Adam and Eve had many advantages," quipped Mark Twain, "but the principal one was that they escaped teething." For youngsters not as fortunate as our "first parents," Britannica recommended three things in its 1st Edition (1768–71): leeches under the ears to reduce the swelling; a penknife to cut the gums to make way for the teeth; and opiates or a concoction of marshmallows, poppy heads, and cream to assuage the child's pain (and perhaps horror—after the youngster got a glimpse of the leeches and knife).

Among all the disorders which afflict children, there are none that generate such grievous symptoms as difficult dentition. . . .

At the time of cutting their teeth, they slaver very much, and have a diarrhoea, which is no bad sign; but when it is difficult, especially when the canine teeth begin to be in motion, and to make their out-way out through the gums, the child has startings in his sleep, tumours of the gums, gripes, inquietude, watchings, aloofness or costiveness [constipation], greenish stools, the thrush, fevers, difficult breathing, suffocating catarths, convulsions, epilepsies, which often end in death.

It shews dentition is like to be bad, if the child is perpetually crying, thrusts his fingers into his mouth, and bites the nurse's nipples; if unequal tubercles are perceived in the gums, both by the sight and touch, where the teeth are expected to appear; if there is heat in the mouth and the whole body; if they start without a cause, especially in sleep. These do not come on without great slaving, and sometimes a diarrhoea, as was mentioned above.

Harris observes, that when an inflammation appears, the physician will labour in vain, if the cure is not begun with applying a leech under each ear. When the swelling of the gums shews it is time to cut it, to make way for the tooth, he would have it done with a penknife, not with a fine lancet, lest the wound should heal, and form a cicatrix. The food he directs to be no more than luke-warm.

Heister internally advises aqueous mixtures, temperating powders; externally, oil of sweet almonds, with syrup of violets, or syrup of wild poppies, lightly acidulated with spirit of vitriol, wherewith often to rub the gums; as also with the coral or other smooth things, which will have the same effect.

Morgan affirms in this case, it will be best to abate the effervescence of the blood with diluters; to appease the pain with gentle opiates; to open the body with purges and clysters [enemas]; to draw off the fermented serum by blisters; to promote the cutting of the teeth by cooling, relaxing, and opening the gums; for this purpose diacodium is good; or a strong decoction of marsh-mallows and poppy-heads, in thick milk, cream, or neats-foot oil: These take off the heat, and assuage the pain.

TUBERCULOSIS, A CURE

Ride Horses, Take a Cruise

Tuberculosis (TB), long called "consumption," is an ancient disease, found in mummies thousands of years old. Perceptions of the disease, and how to treat it, have varied greatly through the ages, and in the 19th century, believing TB mainly "consumed" people with a fine and delicate constitution, there arose a rich romanticizing of the disease. Consumptive artists were more creative, consumptive women more beautiful (their cheeks ruddied by fever), especially in the days right before they died—or so folks believed. Britannica's first two editions reflect this strange history, as well as some of the bizarre "cures" recommended for fighting TB.

From the 1st Edition (1768–71):

This [consumptive patient] is known from a view of the tender and fine vessels, and of the slender make of the whole body, a long neck, a flat and narrow thorax, depressed scapulæ; the blood of a bright red, thin, sharp, and hot; the skin transparent, very white and fair, with a blooming red in the cheeks; the wit quick, subtle, and early ripe with regard to the age, and a merry chearful disposition. . . .



U.S. public health poster, Hempstead, New York, c. 1936-41, warning of the dangers of tuberculosis.

Spitting of blood is cured by copious bleeding every third day, to the fourth time, or till the inflammatory pellicle entirely disappears. . . . The quantity of blood to be drawn is from four to seven or eight ounces, once in eight or ten days. . . . The most sovereign remedy to restore the lungs to their pristine vigour is to get on horseback every day; and he that will put himself upon this exercise for a cure, need not be tied down to any strict rules of diet, nor be debarred from

any sort of meat or drink, since the whole stress of the matter depends wholly on the constant and continual exercise of riding. Long sea-voyages have of late been greatly recommended.

From the 2nd Edition (1778-83):

[A Dr. Solano de Luque] chose a spot of ground on which no plants had been sown, and there he made a hole large and deep enough to admit the [consumptive] patient up to the chin. The interstices of the pit were then carefully filled up with the fresh mould, so that the earth might everywhere come in contact with the patient's body. In this situation the patient was suffered to remain till he began to shiver or felt himself uneasy. . . . The patient was then taken out, and, after being wrapped in a linen cloth, was placed upon a mattress, and two hours afterwards his whole body was rubbed with an ointment, composed of the leaves of the *solanum nigrum* and hog's lard. He observes, that a new pit must be made every time the operation is repeated. . . .

[One patient given earth-baths] was evidently relieved; but having conceived a dislike to the process, refused to submit to any further trials, and died some months afterwards. In the second case he [a Dr. Fouquet] was more fortunate; the patient, a girl of 11 years of age, had been for three months troubled with a cough brought on by the measles, which was at length attended with a purulent expectoration, hectic fever, and night sweats. She began the use of the earth-bath in August, and repeated it eight times in the space of 20 days. At the end of that time the fever and disposition to sweat had entirely ceased, and by the use of the common remedies the patient was perfectly restored.

Cyberbullying

By Monica Lewinsky

In 1768, when *Encyclopædia Britannica* was first published, there was no telephone, let alone the Internet, to facilitate communication and allow for connections when people were not face-to-face. As we all know today, 250 years later, we can communicate immediately via e-mail, text, or photo and tweet, post, or snap to anyone anywhere in the world, and we can whip out our mobile phones and accomplish this in seconds.

If we could travel back in time and query people of that previous age to imagine what it would be like to have the communication system we now enjoy at our fingertips—like a global connective tissue—my hunch is, the response to this idea would be overwhelmingly positive. And while the birth of the Internet has indeed inspired extraordinarily positive things, the dark underbelly of humanity has also been amplified.

The Internet is still so young, and yet we already have new terms in our lexicon such as “cyberbullying,” “digital resilience,” and the most recent and shocking of all, “bullycide” (to describe those who have died by suicide as a result of bullying behavior). That bullycides often involve young people—sometimes as young as 9 or 10—is heartbreaking.

The grim statistics on both online and offline bullying—especially among young people—are sobering. A recent survey from the Cyberbullying Research Center found that 34 percent of students in the United States between ages 12 and 17 have been cyberbullied. (U.S. national estimates are roughly 1 in 4 students.) Moreover, 20 percent of suicides of American teens and young adults have ties to bullying-related issues. (Suicides among teenage American girls are currently at a 40-year high.)

Cyberbullying is not, of course, limited to just children and teens. Many adults, in particular vulnerable members of the LGBTQ community, women, minorities, and individuals caught in embarrassing data hacks, have all been targeted. Thirty-eight percent

of adults have already been targets of cyberbullying, usually involving either sexist or racist comments.

But how did we get here?

The gulf between how we behave online versus how we behave offline, when we’re face-to-face, is clearly too broad, vast, and deep. Anonymity—the distancing effect of a screen—and depersonalization on the Internet have contributed to an obvious coarsening of our culture. Professor Nicolaus Mills of Sarah Lawrence College coined the phrase a “culture of humiliation,” which helps define this shift in our society. Sadly, we began to place more and more value, monetary and otherwise, on humiliation and shame—both of which are core experiences of being bullied. We’ve seen this shift in the news and entertainment we consume; as a result, we have a compassion deficit that’s reflected in the vitriol we now see online. There is also ample evidence of what psychologist John Suler has identified as the Online Disinhibition Effect: we escape online into a world where we’re discon-

James Duncan Davidson/TED

Monica Lewinsky delivering a TED talk on “The Price of Shame,” March 2015.



nected from our true selves and our true compass. Our online behavior distances us from our normal personalities and encourages us to develop different personas—one only has to observe the myriad of online usernames that range from the fanciful to the outright frightening to know this is true.

I experienced this chasm and dehumanizing effect firsthand in 1998, after I became the focus of independent counsel Kenneth Starr's investigation. I instantly, overnight and worldwide, became a publicly known person and Patient Zero of Internet shaming, losing my digital reputation in the process. As I recounted in my TED talk, I was suddenly seen by many but actually known by few. It was so easy to forget that I, *“that woman,”* was also dimensional, had a soul, and was once unbroken. Surprisingly, I can't count how many times people have said hurtful and hateful things to me online in the past 20 years, but I can count—on just one or two hands—the times people have actually been cruel to my face.

Internet shaming and bullying are not just endemic in the United States. I have traveled to numerous countries around the world to speak publicly (and to learn) about this social crisis. In the United Kingdom, Childline, which is a youth hotline operated by the National Society for the Prevention of Cruelty to Children, reported that the number of young people experiencing cyberbullying rose 88 percent between 2011 and 2016; in 2015–16 alone, it conducted more than 24,000 counseling sessions with children dealing with bullying-related issues. According to a study by the National Centre for Social Research in 2011, more than 16,000 British students, ages 11–15, cited bullying as the *main* reason they were absent from school, and nearly 78,000 cited it as a reason. The National Centre Against Bullying in Australia reports that 1 in 10 school kids are cyberbullied every few weeks, and in Canada nearly 1 in 5 young Canadians have reportedly been cyberbullied or cyberstalked. I've seen sobering statistics and heard similar stories elsewhere, throughout Europe and India as well.

There is, however, light beyond this darkness. I believe we are approaching a time in

history similar to when the first mass-produced automobiles transformed the world. As I argued in a piece for *Vanity Fair* (2014), “When the horse and buggy were replaced with the Model T, there were few rules of the road. Ultimately, we devised stricter regulations on which everyone could agree. Speed limits. Stop signs. And double yellow lines that were not to be crossed.” So eventually, society caught up to this new technology and coalesced around the idea of needing safer ways to navigate daily life. I hope we are approaching that moment with the Internet.

In the interim, we can begin to shift the norms by being “Upstanders.” Instead of bystander apathy, stand up for someone online, report a bullying situation, or reach out to a target of bullying after the fact to let him or her know that someone witnessed what happened and is there for help or support. We can also continue the public discourse on this issue, which sheds a light on this crisis. We must find a way to support and heal the victims and call out the perpetrators and rehabilitate them.

We have addressed and fixed a myriad of social problems that have vexed our society in the past. Through a combination of the social values of compassion and empathy married with increasing advances in technology, we can do so again. It's time for the digerati of our online communities to step up and design tools to eradicate this social epidemic that is literally killing our young and affecting us all. Let's never forget that we can build a society where the sometimes distancing effect of technology doesn't remove our fundamental humanity.

Monica Lewinsky is a social activist, international public speaker, consultant, and a contributing editor to Vanity Fair. She advocates for a safer social media environment. In a June 2014 essay for Vanity Fair, titled “Shame and Survival,” she discussed her personal experiences, and in March 2015 she delivered the talk “The Price of Shame” at the TED Conference in Vancouver. She is also an ambassador for the Diana Award's Anti-Bullying Campaign and for the anti-bullying website Bystander Revolution and sits on the board of the Childhood Resilience Foundation.

Death, Ghosts, Monsters, & Magic

ABRACADABRA

A Magical Formula

"Abracadabra" is perhaps the most magical-sounding word in history, its supposed powers traceable to the ancient world. Particularly interesting in the following entry from Britannica's 11th Edition (1910–11) is not only the elaborate ritual necessary for tapping into the word's power but the brief parenthetical note on how the word as commonly used (to denote something that materializes with sudden and apparent ease) was popular with early opponents of Charles Darwin. "Abracadabra! Monkey becomes Man!"

Abracadabra, a word analogous to Abraxas, used as a magical formula by the Gnostics of the sect of Basilides [2nd–4th centuries] in invoking the aid of beneficent spirits against disease and misfortune. It is found on Abraxas stones which were worn as amulets. Subsequently its use spread beyond the Gnostics, and in modern times it is applied contemptuously (e.g., by the early opponents of the evolution theory) to a conception or hypothesis which purports to be a simple solution of apparently insoluble phenomena. The Gnostic physician Serenus Samonicus gave precise instructions as to its mystical use in averting or curing agues and fevers generally. The paper on which the word was written had to be folded in the form of a cross, suspended from the neck by a strip of linen so as to rest on the pit of the stomach, worn in this way for nine days, and then, before sunrise, cast behind the wearer into a stream running to the east. The letters were usually arranged as a triangle in one of the following ways:—

ABRACADABRA
BRACADABR
RACADAB
ACADA
CAD
A

ABRACADABRA
ABRACADABR
ABRACADAB
ABRACADA
ABRACAD
ABRACA
ABRAC
ABRA
ABR
AB
A

AUTOMATIC WRITING

Ghostly Twittering and Houdini

The "automatic writing" of spiritualists and mediums can reveal not only unconscious thoughts, suggested Britannica in its 11th Edition (1910–11), but even communication with extraterrestrials, such as Martians. Britannica was not alone in treating this subject with great seriousness, which was all the rage at the turn of the 20th century. By the mid-1920s, however, spiritualism, "automatic writing," and the like had come under harsh scrutiny, and Britannica reflected this shift and more critical view in its 13th Edition (1926), when it commissioned Harry Houdini, the famed magician and rabid foe of scam mediums and mind readers, to bury this topic once and for all. Excerpts from both entries follow. Houdini, the reader will note, writes about himself in the third person, which is common in reference publishing, though in this case the author seems to delight in the opportunity to discuss his subject.

From "Automatic Writing" in Britannica's 11th Edition (1910–11):

Automatic writing, the name given by students of psychical research to writing performed without the volition of the agent. The writing may also take place without any consciousness of the words written; but some automatists are aware of the word which they are actually writing, and perhaps of two or three

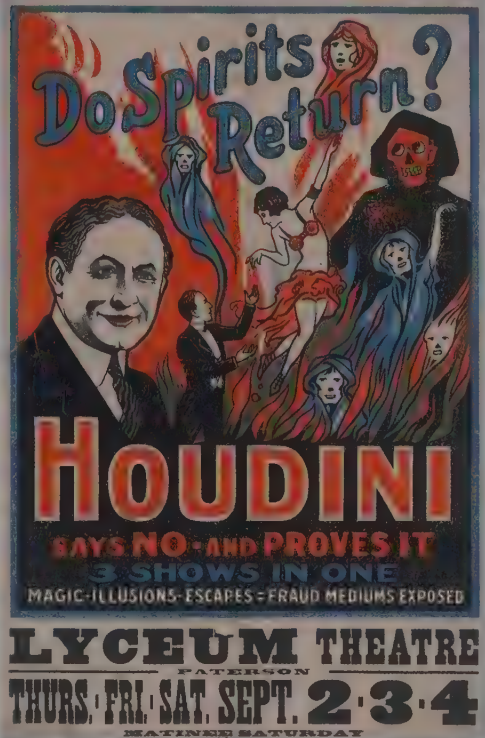
words on either side, though there is rarely any clear perception of the meaning of the whole. Automatic writing may take place when the agent is in a state of trance, spontaneous or induced, in hystero-epilepsy or other morbid states; or in a condition not distinguishable from normal wakefulness. Automatic writing has played an important part in the history of modern spiritualism. The phenomenon first appeared on a large scale in the early days (c. 1850–1860) of the movement in America. Numerous writings are reported at that period, many of considerable length, which purported for the most part to have been produced under spirit guidance. Some of these were written in “unknown tongues.” . . .

Automatic writing for the most part, no doubt, brings to the surface only the débris of lapsed memories and half-formed impressions which have never reached the focus of consciousness—the stuff that dreams are made of. But there are indications in some cases of something more than this. In some spontaneous instances the writing produces anagrams, puns, nonsense verses and occasional blasphemies or obscenities; and otherwise exhibits characteristics markedly divergent from those of the normal consciousness. In the well-known case recorded by Th. Flournoy (*Des Indes à la planète Mars*) the automatist produced writing in an unknown character, which purported to be the Martian language. . . .

Automatic writing frequently exhibits indications of telepathy. The most remarkable series of automatic writings recorded in this connexion are those executed by the American medium, Mrs Piper, in a state of trance. These writings appear to exhibit remarkable telepathic powers, and are thought by some to indicate communication with the spirits of the dead.

From “Conjuring,” by Harry Houdini, in Britannica’s 13th Edition (1926):

Houdini’s Performances.—The most radical development in conjuring in the present century is the series of sensational escapes which have been devised or developed by Houdini. His success depends partly on his great physical strength and the fact that he is slightly bow-legged. In an outdoor exhibition he allowed himself to be suspended, head down,



A poster promoting a performance by Houdini discrediting spiritualism.

some 75 ft. above the ground, in which position he freed himself from a straight jacket previously fastened upon him. The release is accomplished by first gaining slack of about two inches at the shoulder. Another remarkable act is that from the so-called “Chinese water torture cell.” The “cell” is a metal-lined mahogany tank having a front of plate glass. This tank is filled with water, into which Houdini is lowered head first, his feet being fastened in stocks, that is, a mahogany cover in two sections, brass-bound. When he is submerged, the cover is padlocked on the tank, which is enclosed in a curtained cabinet. By his unaided effort he effects an escape within the space of two minutes.

In his “overboard act” he is shackled with irons and placed in a box, which is locked, roped and weighted. The box is then submerged from a boat, to which he returns after freeing himself under water. The “milk-can escape” involves the use of a trick can. The top is locked to an outer section, which envelops the inner can containing the liquid. A

simple lifting movement puts the operator safe from harm and makes escape easy. Other sensational effects produced include the “evanishment” of an elephant from a cabinet situated in the centre of a fully-lighted stage and the so-called “Hindu needle trick,” in which upwards of 100 needles and several yards of thread are apparently swallowed, and afterwards withdrawn from the mouth with the needles threaded at intervals.

Mind Reading.—Logically classifiable under conjuring are those effects produced through natural means by many so-called spirit mediums and mind readers. The mortality of the World War quickened interest in psychic phenomena and thereby opened a frequently lucrative field for clever charlatans. A noted performer claimed a vision able to penetrate metal, reading the time through a closed watch case and deciphering messages placed in a closed metal box. It was subsequently shown that his power depended on normal vision, view of the objects being obtained by such adroit handling of the object that he was able to obtain a glimpse of the contents. A medium, “Eva” of Paris, attracted much attention by her ability, in suitable surroundings, to emit and reabsorb “ectoplasm,” the movement of which, on investigation, was shown to be obstructed when a veil was placed over her mouth.

Another notable instance was that of “Margery” (Mrs. Crandon of Boston), whose

acts of levitation, bell ringing and other phenomena, ostensibly through a spirit, “Walter,” were investigated in 1924 by a committee on which were psychologists from Harvard and other universities and shown to be reproducible by natural means. Among other effects commonly produced by mediums are slate writing, spirit photography and the revelation of information of which the medium is presumably unaware. The devices for securing these effects by natural means are very numerous, many of them requiring great adroitness of mind as well as much mechanical ingenuity.

COCKATRICE MONSTER

Why Always to Carry a Rooster

This magical, menacing creature—half-rooster, half-lizard—is likely best known to kids today as a popular monster in assorted works of fantasy fiction, such as the Harry Potter tales, and in various role-playing, digital, and online games. But the cockatrice was in fact long believed to be true, as Britannica discussed in its 11th Edition (1910–11), and only the crowing of a cock (or the monster’s reflection in a mirror, according to other sources) could save one from its deadly breath or glare. Hence the need to carry a rooster whenever traveling.

Cockatrice on Belvedere Castle in Central Park, New York City.



Charles Hoffman (www.flickr.com/photos/kitonlove/4707207285/; CC BY-SA 2.0)

Cockatrice, a fabulous monster, the existence of which was firmly believed in throughout ancient and medieval times,—descriptions and figures of it appearing in the natural history works of such writers as Pliny and Aldrovandus, those of the latter published so late as the beginning of the 17th century. Produced from a cock's egg hatched by a serpent, it was believed to possess the most deadly powers, plants withering at its touch, and men and animals dying poisoned by its look. It stood in awe, however, of the cock, the sound of whose crowing killed it, and consequently travelers were wont to take this bird with them in traveling over regions supposed to abound in cockatrices. The weasel alone among mammals was unaffected by the glance of its evil eye, and attacked it at all times successfully; for when wounded by the monster's teeth it found a ready remedy in rue—the only plant which the cockatrice could not wither. This myth reminds one of the real contests between the weasel-like mongoos of India and the deadly cobra, in which the latter is generally killed. The term "cockatrice" is employed on four occasions in the English translation of the Bible, in all of which it denotes nothing more than an exceedingly venomous reptile; it seems also to be synonymous with "basilisk," the mythical king of serpents.

DEATH-WARNINGS

"I See Dead People"

When the young character Cole utters the signature line above from the film The Sixth Sense (1999), he is referring to the dead people he sees who do not yet know they are dead. Death-warnings are similar, except that the apparition or "sixth sense" foreshadows a death. Britannica, in its 11th Edition (1910–11), was far from incredulous when it came to this subject, even citing a study that supposedly "proved" the tie between ghosts or visions of doom and the deaths that soon followed.

Death-Warning, a term used in psychical research for an intimation of the death of another person received by other than the ordinary sensory channels, i.e. by (1) a sensory

hallucination or (2) a massive sensation, both being of telepathic origin. Both among civilized and uncivilized peoples there is a widespread belief that the apparition of the living person is an omen of death; but until the Society of Psychical Research undertook the statistical examination of the question, there were no data for estimating the value of the belief. In 1885 a collection of spontaneous cases and a discussion of the evidence was published under the title *Phantasms of the Living*, and though the standard of evidence was lower than at the present time, a substantial body of testimony, including many striking cases, was there put forward. In 1889 a further inquiry was undertaken, known as the "Consensus of Hallucinations," which provided information as to the percentage of individuals in the general population who, at some period of their lives, while they were in a normal state of health, had had "a vivid impression of seeing or being touched by a living being or inanimate object, or of hearing a voice; which impression, so far as they could discover, was not due to any external cause." To the census question about 17,000 answers were received, and after making all deductions it appeared that death coincidences numbered about 30 in 1300 cases of recognized apparitions; or about 1 in 43, whereas if chance alone operated the coincidences would have been in the proportion of 1 to 19,000. As a result of the inquiry the committee held it to be proved that "between deaths and apparitions of the dying person a connexion exists which is not due to chance alone." From an evidential point of view the apparition is the most valuable class of death-warning, inasmuch as recognition is more difficult in the case of an auditory hallucination, even where it takes the form of spoken words; moreover, auditory hallucinations coinciding with deaths may be mere knocks, ringing of bells, etc.; tactile hallucinations are still more difficult of recognition; and the hallucinations of smell which are sometimes found as death-warnings rarely have anything to associate them specially with the dead person. Occasionally the death-warning is in the form of an apparition of some other person; it may also take the form of a temporary feeling of intense depression or other massive sensation.

EMBALMING

An Egyptian Art Form

When medical intervention failed, some of the skills of the apothecary and the surgeon were needed to prepare the body for burial or other disposal. Britannica's early editions dealt with these preparations in vivid detail, as seen in the "Embalming" entry below from the 1st Edition (1768–71).

Embalming is the opening a dead body, taking out the intestines, and filling the place with odoriferous and desiccative drugs and spices, to prevent its putrifying. The Egyptians excelled all other nations in the art of preserving bodies from corruption; for some that they have embalmed upwards of two thousand years ago, remain whole to this day, and are often brought into other countries as great curiosities. Their manner of embalming was thus: they scooped out the brains with an iron scoop, out at the nostrils, and threw in medicaments to fill up the vacuum: they also took out the entrails, and, having filled the body with myrrh, cassia, and other spices, except frankincense, proper to dry up the humours, they pickled it in nitre, where it lay soaking for seventy days. The body was then wrapped up in bandages of fine linen and gums, to make it stick like glue, and so was delivered to the kindred of the deceased, entire in all its features, the very hairs of the eye-lids being preserved. They used to keep the bodies of their ancestors, thus embalmed, in little houses magnificently adorned, and took great pleasure in beholding them, alive as it were, without any change in their size, features, or complexion.

HEART-BURIAL

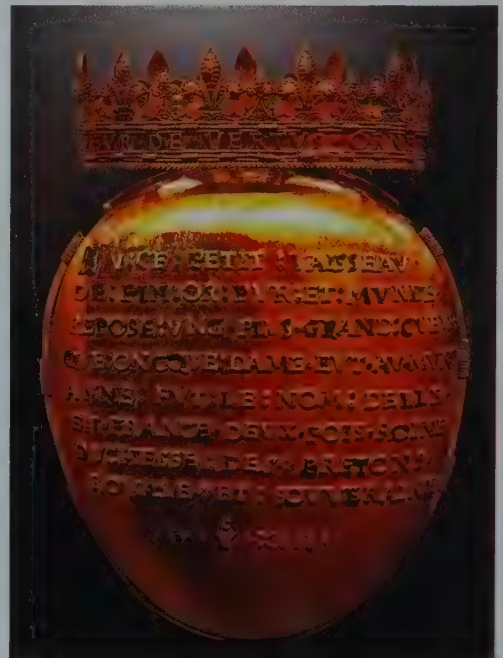
A Grave and Grisly Practice

What do Richard I, Robert the Bruce, Anne Boleyn, Frédéric Chopin, Thomas Hardy, and Percy Bysshe Shelley all have in common? They all posthumously experienced that ancient custom, very popular in medieval Europe and which lingered for centuries thereafter, of being buried without that chief organ of reverence—

their hearts—which were saved for special burial or safekeeping elsewhere. Chopin, for example, died in Paris and was buried there in 1849, but his heart was removed and secreted past Russian border guards and returned to his beloved homeland of Poland, where the organ was sealed in a pillar of Warsaw's Holy Cross Church. The heart was exhumed and examined by a special team of scientists and city officials in 2014, when hot wax was added to the jar containing the organ in the hope of better preserving it. The following entry on "Heart-Burial" is from Britannica's 11th Edition (1910–11).

Heart-Burial, the burial of the heart apart from the body. This is a very ancient practice, the special reverence shown towards the heart being doubtless due to its early association with the soul of man, his affections, courage and conscience. In medieval Europe heart-burial was fairly common. Some of the more notable cases are those of Richard I., whose heart, preserved in a casket, was placed in Rouen cathedral; Henry III., buried in Normandy; Eleanor, queen of

Raised enamel gold reliquary containing the heart of Anne of Brittany (1477–1514), queen consort of France.



Dennis G. Jarvis

Edward I., at Lincoln; Edward I., at Jerusalem; Louis IX., Philip III., Louis XIII. And Louis XIV., in Paris. Since the 17th century the hearts of deceased members of the house of Habsburg have been buried apart from the body in the Loretto chapel in the Augustiner Kirche, Vienna. The most romantic story of heart-burial is that of Robert Bruce. He wished his heart to rest at Jerusalem in the church of the Holy Sepulchre, and on his deathbed entrusted the fulfilment of his wish to Douglas. The latter broke his journey to join the Spaniards in their war with the Moorish king of Granada, and was killed in battle, the heart of Bruce enclosed in a silver casket hanging round his neck. Subsequently the heart was buried at Melrose Abbey. The heart of James, marquess of Montrose, executed by the Scottish Covenanters in 1650, was recovered from his body, which had been buried by the roadside outside Edinburgh, and, enclosed in a steel box, was sent to the duke of Montrose, then in exile. It was lost on its journey, and years afterwards was discovered in a curiosity shop in Flanders. Taken by a member of the Montrose family to India, it was stolen as an amulet by a native chief, was once more regained, and finally lost in France during the Revolution. Of notable 17th-century cases there is that of James II., whose heart was buried in the church of the convent of the Visitation at Chaillot near Paris, and that of Sir William Temple, at Moor Park, Farnham. The last ceremonial burial of a heart in England was that of Paul Whitehead, secretary to the Monks of Medmenham club, in 1775, the interment taking place in the Le Despenser mausoleum at High Wycombe, Bucks. Of later cases the most notable are those of Daniel O'Connell, whose heart is at Rome, Shelley at Bournemouth, Louis XVII. at Venice, Kosciusko at the Polish museum at Rapperschwyll, Lake Zurich, and the marquess of Bute, taken by his widow to Jerusalem for burial in 1900. Sometimes other parts of the body, removed in the process of embalming, are given separate and solemn burial. Thus the viscera of the popes from Sixtus V. (1590) onward have been preserved in the parish church of the Quirinal. The custom of heart-burial was forbidden by Pope Boniface VIII.

SIN-EATERS

Bon appetit!

Sin-eating was not a profession held in high esteem. True, the sin-eater got a meal and a tad to drink for his services, but in exchange for cleansing others of their sins, paving their way to heaven, and ensuring they will not have to wander earth as a ghost, he got pelted with "missiles," rocks, and sticks and had to carry the burden of everyone else's ill deeds, which might likely condemn him to the very hell he supposedly saved others from experiencing—a heavy trade-off for a snack. Here is Britannica's coverage of sin-eating in its 11th Edition (1910–11).

Sin-Eater, a man who for trifling payment was believed to take upon himself, by means of food and drink, the sins of a deceased person. The custom was once common in many parts of England and in the highlands of Scotland, and survived until recent years in Wales and the counties of Shropshire and Herefordshire. Usually each village had its official sin-eater to whom notice was given as soon as a death occurred. He at once went to the house, and there, a stool being brought, he sat down in front of the door. A groat, a crust of bread and a bowl of ale were handed him, and after he had eaten and drunk he rose and pronounced the ease and rest of the dead person, for whom he thus pawned his own soul. The earlier form seems to have been more realistic, the sin-eater being taken into the death-chamber, and a piece of bread and possibly cheese having been placed on the breast of the corpse by a relative, usually a woman, it was afterwards handed to the sin-eater, who ate it in the presence of the dead. He was then handed his fee, and at once hustled and thrust out of the house amid execrations, a shower of sticks, cinders or whatever other missiles were handy. The custom of sin-eating is generally supposed to be derived from the scapegoat in Leviticus xvi. 21, 22. A symbolic survival of it was witnessed as recently as 1893 at Market Drayton, Shropshire. After a preliminary service had been held over the coffin in the house, a woman poured out a glass of wine for each bearer and handed it to him across the coffin with a "funeral biscuit." In Upper Bavaria sin-eating still survives: a

corpse cake is placed on the breast of the dead and then eaten by the nearest relative, while in the Balkan peninsula a small bread image of the deceased is made and eaten by the survivors of the family. The Dutch *doed-koecks* or “dead-cakes,” marked with the initials of the deceased, introduced into America in the 17th century, were long given to the attendants at funerals in old New York. The “burial cakes” which are still made in parts of rural England, for example in Lincolnshire and Cumberland, are almost certainly a relic of sin-eating.

SPONTANEOUS HUMAN COMBUSTION

But Stockings Just Fine

Spontaneous human combustion—SHC—is a long-held belief, as seen below in the excerpt from Britannica’s 3rd Edition (1788–97). Though most forensic experts believe these stories of persons mysteriously consumed by flames can be explained by natural causes, such as lightning or a dropped cigarette, there are legions of SHC believers who attribute the conflagrations to everything from divine retribution for bad behavior to an internal nuclear reaction, a build up of static electricity, or an excessive amount of internal gas (such as methane in our intestines). Heavy drinking, too, was long believed to be a cause. In fact, when Charles Dickens attributed the death of an alcoholic character in his novel Bleak House (1852–53) to SHC, critics lambasted him, leading Dickens in turn to defend his belief in SHC in the preface to a later edition of his work. Britannica, as seen in the final line below, was horrified by the prospect that SHC might be true, and what it would mean for humanity. Concerning the nature of the “gross stinking moisture” described below, now that is anyone’s guess.

We have instances of persons burnt by fire kindled within their own bodies. A woman at Paris, who used to drink brandy to excess, was one night reduced to ashes by a fire from within, all but her head and the ends of her fingers. Signora Conr. Zangari, or, as others call her, *Corn. Bandi*, an aged lady, of an un-

blemished life, near Celena in Romagna, underwent the same fate in March 1731. She had retired in the evening into her chamber somewhat indisposed; and in the morning she was found in the middle of the room reduced to ashes, all except her face, legs, skull, and three fingers. The stockings and shoes she had on were not burnt in the least. The ashes were light; and, on pressing between the fingers, vanished, leaving behind a gross stinking moisture with which the floor was smeared; the walls and furniture of the room being covered with a most cineritious soot, which had not only stained the linen in the chests, but had penetrated into the closet, as well as into the room overhead, the walls of which were moistened with the same viscous humour.—We have various other relations of persons burnt to death in this unaccountable manner.

Sig. Mondini, Bianchini, and Maffei, have written treatises express to account for the cause of so extraordinary an event: common fire it could not be, since this would likewise have burnt the bed and the room; besides that it would have required many hours, and a vast quantity of fuel, to reduce a human body to ashes; and, after all, a considerable part of the bones would have remained entire, as they were anciently found after the fiercest funeral fires. Some attribute the effect to a mine of sulphur under the house; others, to a miracle; while others suspect that art or villainy had a hand in it. A philosopher of Verona maintains, that such a conflagration might have arisen from the inflammable matters wherewith the human body naturally abounds. Sig. Bianchini accounts for the conflagration of the lady above-mentioned, from her using a bath or lotion of camphorated spirit of wine when she found herself out of order. Maffei supposes it owing to lightning, but to lightning generated in her own body, agreeable to his doctrine, which is, That lightning does not proceed from the clouds, but is always produced in the place where it is seen and its effects perceived. We have had a late attempt to establish the opinion, that these destroying internal fires are caused in the entrails of the body by the inflamed effluvia of the blood; by juices and fermentation in the stomach; by the many combustible matters which abound in living bodies for the purposes of life; and, finally, by the fiery evaporations which exhale from the settlings of spirit of wine, brandies,

Mary Evans Picture Library/age fotostock

and other hot liquors, in the tunica villosa of the stomach and other adipose or fat membranes; within which those spirits engender a kind of camphor, which in the night-time, in sleep, by a full respiration, are put in a stronger motion, and are more apt to be set on fire. Others ascribe the cause of such persons being set on fire to lightning; and their burning so entirely, to the greater quantity of phosphorus and other combustible matter they contained.—For our own part, we can by no means pretend to explain the cause of such a phenomenon: but for the interests of humanity we wish it could be derived from something external to the human body; for if, to the calamities of human life already known, we superadd a suspicion that we may unexpectedly, and without the least warning, be consumed by an internal fire, the thought is too dreadful to be borne.

VAMPIRES

How to Become One

Vlad III Dracula (also called Vlad the Impaler or Vlad Țepeș) was a real-life prince who ruled in Transylvania (Romania) in the mid-15th century. “Dracula” (meaning “son of Dracul”) stemmed from the Latin draco (“dragon”) after his father joined the Order of the Dragon, which was created by the Holy Roman Empire for the defense of Christian Europe against the Ottoman Turks. Vlad was notorious for his cruelty, especially his penchant for impaling victims upright in the ground as a warning to others, and it has long been suspected that Bram Stoker’s novel *Dracula* (1897) was based on Vlad and his bloody exploits. *Britannica*, in its 9th Edition (1875–89), did not delve into this historic detail but did relate rare tidbits of folklore about vampires, such as how to become one and how the undead could even appear as a single strand of straw or fluff of down to better suck the blood of sleepers in the night.

Vampire, a term, apparently of Servian origin (*wampir*), originally applied in eastern Europe to blood-sucking ghosts, but in modern usage transferred to one or more species of blood-sucking bats inhabiting South America.



A 1499 German woodblock print showing Vlad Țepeș (“Dracula”), also known as “Vlad the Impaler” for his gruesome method of killing, casually dining while murders occur around him.

In the first-mentioned meaning a vampire is usually supposed to be the soul of a dead man which quits the buried body by night to suck the blood of living persons. Hence, when the vampire’s grave is opened, his corpse is found to be fresh and rosy from the blood which he has thus absorbed. To put a stop to his ravages, a stake is driven through the corpse, or the head cut off, or the heart torn out and the body burned, or boiling water and vinegar are poured on the grave. The persons who turn vampires are generally wizards, witches, suicides and those who have come to a violent end or have been cursed by their parents or by the church. But any one may become a vampire if an animal (especially a cat) leaps over his corpse or a bird flies over it. Sometimes the vampire is thought to be the soul of a living man which leaves his body in sleep, to go in the form of a straw or fluff of down and suck the blood of other sleepers. The belief in vampires chiefly prevails in Slavonic lands, as in Russia (especially

White Russia and the Ukraine), Poland and Servia, and among the Czechs of Bohemia and the other Slavonic races of Austria. It became specially prevalent in Hungary between the years 1730 and 1735, whence all Europe was filled with reports of the exploits of vampires. . . . It is probable that this superstition gained much ground from the reports of those who had examined the bodies of persons buried alive though believed to be dead, and was based on the twisted position of the corpse, the marks of blood on the shroud and on the face and hands—results of the frenzied struggle in the coffin before life became extinct. The belief in vampirism has also taken root among the Albanians and modern Greeks, but here it may be due to Slavonic influence.

WEREWOLVES

Where to Find Them

The condemned and damned transforming into beasts; wizards reviving the dead, burning holes in their skulls, and extracting their tongues; zombie-like victims at the mercy of their master's every whim—just part of Britannica's discussion of werewolves in its 11th Edition (1910–11).

Although the term lycanthropy properly speaking refers to metamorphosis into a wolf, it is in practice used of transformation into any animal. The Greeks also spoke of kynianthropy; in India and the Asiatic islands the tiger is the commonest form, in North Europe the bear, in Japan the fox, in Africa the leopard or hyena, sometimes also the lion, in South America the jaguar; but though there is a tendency for the most important carnivorous animal of the area to take the first place in stories and beliefs as to transformation, the less important beasts of prey and even harmless animals like the deer also figure among the wer-animals. . . .

The vampire is sometimes regarded as an example of lycanthropy; but it is in human form, sometimes only a head, sometimes a whole body, sometimes that . . . of a dead man who issues nightly from the grave to prey upon the living.

The people of Banana [Congo] are said to change themselves by magical means, composed of human embryos and other ingredients, but in their leopard form they may do no hurt to mankind under pain of retaining forever the beast shape. In other cases the change is supposed to be made for the purposes of evil magic and human victims are not prohibited. . . . A further link is supplied by the Zulu belief that the magician's familiar is really a transformed human being; when he finds a dead body on which he can work his spells without fear of discovery, the wizard breathes a sort of life into it, which enables it to move and speak, it being thought that some dead wizard has taken possession of it. He then burns a hole in the head and through the aperture extracts the tongue. Further spells have the effect of changing the revived body into the form of some animal, hyena, owl or wild cat, the latter being most in favour. This creature then becomes the wizard's servant and obeys him in all things; its chief use is, however, to inflict sickness and death upon persons who are disliked by its master.

WITCHCRAFT

Murderous Nonsense

Britannica, as it made clear in its short 1st Edition (1768–71) entry on the subject, had little use for witchcraft. Belief in such sorcery was not only ridiculous, said Britannica, but it had tragically led to the persecution and killing of many innocent people.

Witchcraft, a kind of sorcery, especially in women, in which it is ridiculously supposed that an old woman, by entering into a contract with the devil, is enabled, in many instances, to change the course of nature; to raise winds; perform actions that require more than human strength; and to afflict those who offend them with the sharpest pains, etc. In the times of ignorance and superstition, many severe laws were made against witches, by which great numbers of innocent persons, distressed with poverty and age, were brought to a violent death; but these are now happily repealed.

Mass Extinction

By Edward O. Wilson

A realistic prediction of the future depends upon recognition that humanity originated in Africa by a series of accidents bordering on the bizarre. The unique winning combination was, first, a relatively immense body size, roughly over 10 kilograms, attained by fewer than 1 in 10,000 species in the history of the animal kingdom. Large bodies make possible the evolution of large brains. Add to this our fast, very precise audiovisual communication, where the vast majority of animal species, along with plants and microorganisms, depend on taste and smell.

We alone can think back and forth through time. Language refined into written literacy has allowed us to envelope and dominate the planet. Tragically, *Homo sapiens* is not prone to be benevolent to the rest of life. We have proceeded to extirpate all those species of organisms that do not provide us with food, shelter, energy, or entertainment. Meanwhile, we are deeply conflicted in our moral reasoning toward nature and among ourselves. The cause for this condition appears to be the multiple-layered nature of the natural selection that shaped our progenitors' emotional apparatus. Our responses were crafted by a mix of individual selection, defined as competition among members of the same group for status and resources ("selfish" behavior) versus competition between groups

that requires cooperation within groups ("altruistic" behavior). Therein lies the curse visited upon humanity. Its most dangerous and seemingly ineradicable consequence is conflict among competing religious faiths as well as among competing religion-like ideologies.

The consequence that causes me greatest personal concern for Earth's ultimate future is the ongoing mass extinction of the rest of life. We share the planet with a roughly estimated 10 million other species. They are being extinguished at a rate between 100 and 1,000 times faster than before the arrival of our own species. The effect could be the reduction of Earth's biodiversity to half its present amount by the end of the century. I prayerfully hope that somehow we can slow the extinction rate and avoid a permanent horrific catastrophe for Earth and ourselves, but, as a career-long student of the subject, I am not optimistic. Yet, we must, and soon. To fail will be the folly our descendants are least likely to forgive.

Edward O. Wilson, one of the world's most distinguished biologists and naturalists and the foremost expert on ants, is professor emeritus and honorary curator in entomology at Harvard University. His seminal works include Sociobiology: The New Synthesis (1975); On Human Nature (1978), for which he was awarded a Pulitzer Prize in 1979; The Ants (1990; with Bert Hölldobler), which also won a Pulitzer; Consilience: The Unity of Knowledge (1998); and Half-Earth: Our Planet's Fight for Life (2016), about our plummeting biodiversity. In 1990 Wilson and American biologist Paul Ehrlich shared the Crafoord Prize, awarded by the Royal Swedish Academy of Sciences to support areas of science not covered by the Nobel Prizes.

Peter Maltz/dieKleinert/Alamy



Crime & Punishment

BLEEDING CORPSES

How to Catch a Murderer

Forget DNA analysis and the fancy gadgetry of crime scene investigators—the corpse itself can reveal the murderer, as Britannica explained in its 4th Edition (1801–09).

Bleeding of a corpse is a phenomenon said to have frequently happened in the bodies of persons murdered, which, on the touch, or even the approach, of the murderer, began to bleed at the nose, ears, and other parts; so as formerly to be admitted in England, and still allowed in some other parts, as a sort of detection of the criminal and proof of the fact. Numerous instances of these posthumous haemorrhages are given by writers. But this kind of evidence ought to be of small weight.

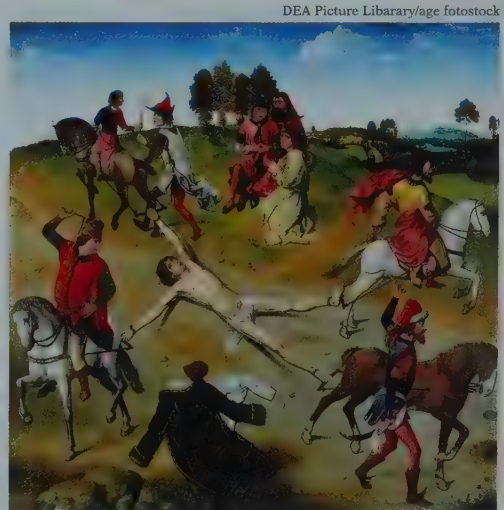
DRAWING & QUARTERING

A Traitor's Just Rewards?

A symbolic funeral and memorial service was held in London for Scottish warrior and hero William Wallace in 2005. He had died 700 years earlier, in 1305, when there was little left of his body to bury or memorialize. For upon his capture by the English and conviction of treason, Wallace was hanged, drawn, and quartered, which entailed dragging him naked through the streets by a horse, hanging him nearly to death, and emasculating him, followed by disembowling, beheading, and cutting his body into fourths. Britannica recounted the history of this grisly punishment in its 11th Edition (1910–11).

Drawing and Quartering, part of the penalty anciently ordained in England for treason. Until 1870 the full punishment for the crime was that the culprit be dragged on a hurdle to the place of execution; that he be hanged by the neck but not till he was dead; that he

should be disembowelled or drawn and his entrails burned before his eyes; that his head be cut off and his body divided into four parts or quartered. This brutal penalty was first inflicted in 1284 on the Welsh prince David, and on Sir William Wallace a few years later. In Richard III's reign one Collingbourne, for writing the famous couplet "The Cat, the Rat and Lovel the Dog, Rule all England under the Hog," was executed on Tower Hill. Stow says, "After having been hanged, he was cut down immediately and his entrails were then extracted and thrown into the fire, and all this was so



The central panel of the St. Hippolytus Triptych (1470–75) by Dieric Bouts, depicting the brutal murder of the Christian martyr c. 235 CE.

speedily done that when the executioners pulled out his heart he spoke and said 'Jesus, Jesus.'" Edward Marcus Despard and his six accomplices were in 1803 hanged, drawn and quartered for conspiring to assassinate George III. The sentence was last passed (though not carried out) upon the Fenians Burke and O'Brien in 1867. There is a tradition that Harrison the regicide, after being disemboweled, rose and boxed the ears of the executioner.

DUCKING

Caged and Plunged

In describing ducking as a punishment, Britannica's 1st Edition (1768–71) had not yet taken note of the colonial American use of the ducking stool.

Ducking, plunging in water, a diversion anciently practiced among the Goths, by way of exercise; but among the Celtae, Franks, and ancient Germans, it was a sort of punishment for persons of scandalous lives.

They were shut up, naked to the shift, in an iron cage, fastened to the yard of a shaloo, and ducked several times.

Ducking at the main-yard, among seamen, is a way of punishing offenders on board a ship; and is performed by binding the malefactor, by a rope, to the end of the yard, from whence he is violently let down into the sea, once, twice, or three times, according to his offence: and if the offence be very great, he is drawn underneath the keel of the ship, which they call keel-hauling.

EVIL EYE

Looks that Kill

Medusa turned her enemies to stone with a single look; Dracula's hypnotic stare left his victims in a trance; and the powers of the "evil eye," as Britannica detailed in its 11th Edition (1910–11), seemingly knew no bounds.

The terror of the arts of "fascination," i.e., that certain persons can bewitch, injure and even kill with a glance, has been and is still very widely spread. The power was not thought to be always maliciously cultivated. It was so often supposed to be involuntary (cf. Deuteronomy xxviii. 54); and a story is told of a Slav who, afflicted with the evil eye, at last blinded himself in order that he might not be the means of injuring his children. Few of the old classic writers fail to refer to the dread power. In Rome the "evil eye" was so well recognized that Pliny states that special laws were enacted against injury to crops by incantation, excantation or fascination. . . .

Children and young animals of all kinds were thought to be specially susceptible. Charms were worn against the evil eye both by man and beast, and in Judges viii, 21 it is thought there is a reference to this custom in the allusion to the "ornaments" on the necks of camels. In classic times the wearing of amulets was universal. . . .

But the ancients did not wholly rely on amulets. Spitting was among the Greeks and Romans a most common antidote to the poison of the evil eye. According to Theocritus it is necessary to spit three times into the breast of the person who fears fascination. Gestures, too, often intentionally obscene, were regarded as prophylactics on meeting the dreaded individual. The evil eye was believed to have its impulse in envy, and thus it came to be regarded as unlucky to have any of your possessions praised. Among the Romans, therefore, it was customary when praising anything to add *Praefiscini dixerim* (Fain Evil! I should say). This custom survives in modern Italy, where in like circumstances is said *Si mal occhio non ci fosse* (May the evil eye not strike it). . . . So in Ireland, to avoid being suspected of having the evil eye, it is advisable when looking at a child to say "God bless it"; and when passing a farm-yard where cows are collected at milking time it is usual for the peasant to say, "The blessing of God be on you and all your labour."

The powers of the evil eye seem indeed to have been most feared by the prosperous. Its powers are often quoted as almost limitless. Thus one record solemnly declares that in a town of Africa a fascinators called Elzanar killed by his evil art no less than 80 people in two years. The belief as affecting cattle was universal in the Scottish Highlands as late as the 18th century and still lingers. . . . If a stranger looks admiringly on a cow the peasants still think she will waste away, and they offer the visitor some of her milk to drink in the belief that in this manner the spell is broken. The modern Turks and Arabs also think that their horses and camels are subject to the evil eye. But the people of Italy . . . are the best modern instances of implicit believers. The *jettatore*, as the owner of the evil eye is called, is so feared that at his approach. . . . a street will clear: everybody will rush into doorways or up alleys to avoid the dreaded glance. The *jettatore di bambini* (fascinators of

children) is the most dreaded of all. The evil eye is still much feared for horses in India, China, Turkey, Greece and almost everywhere where horses are found. In rural England the pig is of all animals oftenest "overlooked." While the Italians are perhaps the greatest believers in the evil eye as affecting persons, the superstition is rife in the East. . . . Modern Egyptian mothers thus account for the sickly appearance of their babies. In Turkey passages from the Koran are painted on the outside of houses to save the inmates, and texts as amulets are worn upon the person, or hung upon camels and horses by Arabs, Abyssinians and other peoples.

EXPOSING CHILDREN

The Art of Infanticide

"Know that I am still in Alexandria," wrote a Greek husband to his pregnant wife in the year 1 BC. "If you are delivered of child [before I come home], if it is a boy keep it, if a girl, discard it." The excerpt below from Britannica's 3rd Edition (1788–97) makes plain that infanticide was common throughout the ancient world. In ancient Greece, Rome, India, and China, children who were unwanted or deemed

weakly or deformed were killed by their parents or "exposed" to the elements and left to die. Girls were often the most common victims.

Exposing of children, a barbarous custom practiced by most of the ancients excepting the Thebans. . . .

When a child was born, it was laid on the ground; if the father designed to educate his child, he immediately took it up; but if he forbore to do this, the child was carried away and exposed. The Lacedemonians indeed had a different custom: for with them all new-born children were brought before certain triers, who were some of the gravest men in their own tribe, by whom the infants were carefully viewed; and if they were found lusty and well-favoured, they gave orders for their education, and allotted a certain proportion of land for their maintenance; but if weakly or deformed, they ordered them to be cast into a deep cavern in the earth, near the mountain Taygetus, as thinking it neither for the good of the children themselves nor for the public interest, that defective children should be brought up. Many persons exposed their children only because they were not in a condition to educate them, having no intention that they should perish. It was the unhappy fate of daughters especially to be thus treated, as re-

"Infant Exposure to Vultures," an 1884 book illustration depicting this historically common method of child abandonment and infanticide.



"Infant Exposure to Vultures" image, courtesy Center for Study of the Life and Work of William Carey, D.D. (1761-1834), William Carey University, Hattiesburg, Mississippi, USA

quiring more charges to educate and settle them in the world than sons.

The parents frequently tied jewels and rings to the children they exposed, or any other thing whereby they might afterwards discover them, if Providence took care for their safety. Another design in adorning these infants was either to encourage such as found them to nourish and educate them, if alive; or to give them human burial if dead. The places where it was usual to expose children were such as people frequented most. This was done in order that they might be found, and taken up by compassionate persons who were in circumstances to be at the expence of their education. With this intention the Egyptians and Romans chose the banks of rivers, and the Greeks the highway.

GUILLOTINE

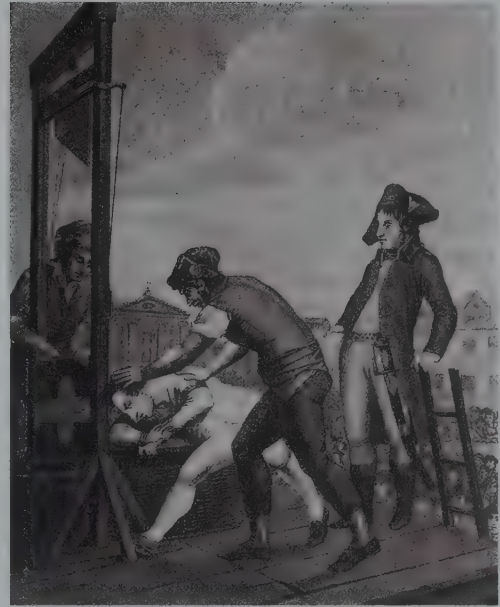
Ol' Dr. Guillotin

Britannica's early coverage of the infamous French agent of death, the guillotine, offered not only an opportunity to describe a bloody punishment but another occasion for desecrating the morality of the despised French. This excerpt hails from Britannica's Supplement (1801) to its 3rd Edition.

Guillotine, a new term introduced into the languages of Europe by the mournful effects of fanaticism in the holy cause of liberty. Our readers are not ignorant that this is the name given by the National Assembly of France to the engine of decapitation, which those usurpers of the legislative authority decreed to be the sole punishment of those condemned to death for their crimes. . . .

Dr Guillotin, physician at Lyons, and member of the self-named National Assembly of France, thought himself honoured by the decree which associated his name with this instrument of popular vengeance. It was indeed proposed by him as an instrument of mercy, in a studied harangue, filled with that sentimental slang of philanthropy, which costs so little, promises so much, and has now corrupted all the languages of Europe. His invention is indeed one of the most expressive specimens of Gallic philanthropy, whose ten-

Classic Vision/age fotostock



The death of Maximilien Robespierre, a leader of the French Revolution, by guillotine in Paris, July 28, 1794.

der mercies are cruel; and was accordingly received with loud applauses, both from the house and from the galleries. . . .

We acknowledge, that in as far as this instrument lessens the duration of the horrid conflict with the king of terrors, and probably diminishes the corporeal sufferance, it may be called merciful (alas! the day!); but we question much, whether the dreadful agitation of soul is not rather increased by the long train of preparatory operations. The hands of the convict are tied behind his back: he is then stretched along on his face on a strong plank, and his precise position adjusted to the instrument. When fastened to the plank, it is pushed forward into its place under the fatal edge, his neck adjusted to the block, and a basket placed just before his eyes (for the face of Louis XVI. was not covered) to receive his head. This must employ a good deal of time, and every moment is terrible.

The construction has received many alterations and refinements; and has at last been made so compendious and portable, as to become part of the travelling equipage of a commissioner from the National Assembly, sent on a provincial or special visitation. Thus did the sovereign people become terrible in majesty.

HUE & CRY

It Takes a Village

Whether the English "hue and cry" or the American posse comitatus (a staple of the cowboy film and Western novel), the concept of citizen participation in the capture of criminals is one ingrained in Anglo-American custom. Contrary to the rights that the accused enjoy today, parties apprehended by "hue and cry" were not allowed to speak in their own defense, and "proof was not required of a culprit's guilt." In fact, as Britannica explained in its 11th Edition (1910–11), citizens refusing to answer the "hue and cry" could themselves be punished.

Hue and cry, a phrase employed in English law to signify the old common law process of pursuing a criminal with horn and voice. It was the duty of any person aggrieved, or discovering a felony, to raise the hue and cry, and his neighbours were bound to turn out with him and assist in the discovery of the offender.

In the case of a hue and cry, all those joining in the pursuit were justified in arresting the person pursued, even though it turned out that he was innocent. A swift fate awaited any one overtaken by hue and cry, if he still had about him the signs of his guilt. If he resisted

he could be cut down, while, if he submitted to capture, his fate was decided. Although brought before a court, he was not allowed to say anything in self-defence, nor was there any need for accusation, indictment or appeal. Although regulated from time to time by writs and statutes, the process of hue and cry continued to retain its summary method of procedure, and proof was not required of a culprit's guilt, but merely that he had been taken red-handed by hue and cry. The various statutes relating to hue and cry were repealed in 1827. The Sheriffs Act 1887 provides that every person in a county must be ready and appareled at the command of the sheriff and at the cry of the county to arrest a felon, and in default shall on conviction be liable to fine.

KEEL-HAULING

Naval Naughtiness

This method of punishing sailors at sea, by pulling them beneath the keel of the boat, was prevalent in ancient Greece but is mostly associated with the Dutch navy. It was a brutal and potentially lethal punishment. If the sailor did not drown or die from hypothermia, then he often was badly bruised and banded by hitting the

An illustration of keel-hauling, from Olaus Magnus's History of the Northern Nations (1555).



Mary Evans Picture Library/age fotostock

underside of the ship, cut horribly by the barnacle-encrusted shell, or suffered severed limbs if not outright decapitation. Here is Britannica's description of the act from its 2nd Edition (1778–83).

Keel-Hauling, a punishment inflicted for various offences in the Dutch navy. It is performed by plunging the delinquent repeatedly under the ship's bottom on one side, and hoisting him up on the other, after having passed under the keel. The blocks, or pullies, by which he is suspended, are fastened to the opposite extremities of the main-yard, and a weight of lead or iron is hung upon his legs, to sink him to a competent depth. By this apparatus he is drawn close up to the yardarm, and thence let fall suddenly into the sea, where, passing under the ship's bottom, he is hoisted up on the opposite side of the vessel. As this extraordinary sentence is executed with a serenity of temper peculiar to the Dutch, the culprit is allowed sufficient intervals to recover the sense of pain, of which indeed he is frequently deprived during the operation. In truth, a temporary insensibility to his sufferings ought by no means to be construed into a disrespect of his judges, when

we consider that this punishment is supposed to have peculiar propriety in the depth of winter, whilst the flakes of ice are floating on the stream; and that it is continued till the culprit is almost suffocated for want of air, benumbed with the cold of the water, or stunned with the blows his head receives by striking the ship's bottom.

RUNNING AMUCK

Going Postal

Merriam-Webster defines amok, colloquially known as "running amok," as "an episode of sudden mass assault against people or objects usually by a single individual following a period of brooding that has traditionally been regarded as occurring especially in Malaysian culture but is now increasingly viewed as psychopathological behavior occurring worldwide in numerous countries and cultures." Britannica, in its 11th Edition (1910–11), offered a rather detailed account of the mania, which in colloquial terms means something done in "a violently raging, wild, or uncontrolled manner."

Illustration of a young man "running amok" in eastern Russia, killing indiscriminately.



Mary Evans Picture Library/age fotostock

Running Amuck (or more properly Amok), the native term for the homicidal mania which attacks Malays. A Malay will suddenly and apparently without reason rush into the street armed with a kris or other weapon, and slash and cut at everybody he meets till he is killed. These frenzies were formerly regarded as due to sudden insanity. It is now, however, certain that the typical *amok* is the result of circumstances, such as domestic jealousy or gambling losses, which render a Malay desperate and weary of his life. It is, in fact, the Malay equivalent of suicide. "The act of running *amuck* is probably due to causes over which the culprit has some amount of control, as the custom has now died out in the British possessions in the peninsula, the offenders probably objecting to being caught and tried in cold blood" (W.W. Skeat).

Though so intimately associated with the Malay there is some ground for believing the word to have an Indian origin, and the act is certainly far from unknown in Indian history. Some notable cases have occurred among the Rajputs. This, in 1634, the eldest son of the raja of Jodhpur ran amuck at the court of Shah Jahan, failing in his attack on the emperor, but killing five of his officials. During the 18th century, again, at Hyderabad (Sind), two envoys, sent by the Jodhpur chief in regard to a quarrel between the two states, stabbed the prince and twenty-six of his suite before they themselves fell.

In Malabar there were certain professional assassins known to old travellers as *Amouchi* or *Amuco*. The nearest modern equivalent to these words would seem to be the Malayalam *Amar-khan*, "a warrior" (from *amar*, "fight"). The Malayalam term *chaver* applied to these ruffians meant literally those "who devote themselves to death." In Malabar was a custom by which the zamorin or king of Calicut had to cut his throat in public when he had reigned twelve years. In the 17th century a variation in his fate was made. He had to take his seat, after a great feast lasting twelve days, at a national assembly, surrounded by his armed suite, and it was lawful for anyone to attack him, and if he succeeded in killing him the murderer himself became zamorin (see Alex. Hamilton, "A new Account of the East Indies," in Pinkerton's *Voyages and Travels*, viii 374). In 1600 thirty would-be assassins were killed in their attempts. These men were

called *Amar-khan*, and it has been suggested that their action was "running amuck" in the true Malay sense. Another proposed derivation for *amouchi* is Sanskrit *amokshya*, "that cannot be loosed," suggesting that the murderer was bound by a vow, an explanation more than once advanced for the Malay *amuck*; but *amokshya* in such a sense is unknown in Malayalam.

STEAMING CORPSES

Chinese Crime Detection

Britannica's 3rd Edition (1788–97), as evidenced by the excerpt below, well reflected the West's historic animus against traditional Chinese practices. Although treatments such as acupuncture and the use of herbal medicine have gained popularity in the West over the last century, few crime scene experts are likely to adopt the following method of investigating murders and suicides that Britannica attributed to the Chinese in the 18th century.

Most of the Chinese medicine is absolute quackery; their skill in anatomy is not only very limited, but mixed with such a number of falsehoods, as render it in a manner absolutely useless. Their materia medica consists mostly of herbs, of which tea is one. To this they ascribe great and wonderful virtues, especially if it has been gathered on any of the summits of a mountain called *Mong-chan*. The only thing regarding this science, which merits any attention, is the method they are said to possess of discovering whether a man has hanged or drowned himself, or had that violence committed upon him by others.

In order to discover this, the body is first taken from the earth, and washed in vinegar. After this a large fire is kindled in a pit dug on purpose, six feet long, three wide, and the same in depth. This fire is continually augmented, until the surrounding earth becomes as hot as an oven; the remaining fire is then taken out, a large quantity of wine is poured into it, and it is covered with a hurdle made of osier twigs, upon which the body is stretched out at full length. A cloth is thrown over both in the form of an arch, in order that the steam of the wine may act upon it in every

The Metropolitan Museum of Art, New York; bequest of Charles Allen Munn, 1924 (accession no. 24.90.32); www.metmuseum.org

direction. At the end of two hours the cloth is taken off; and if any blows have been given, they then appear upon the body in whatever state it may be.

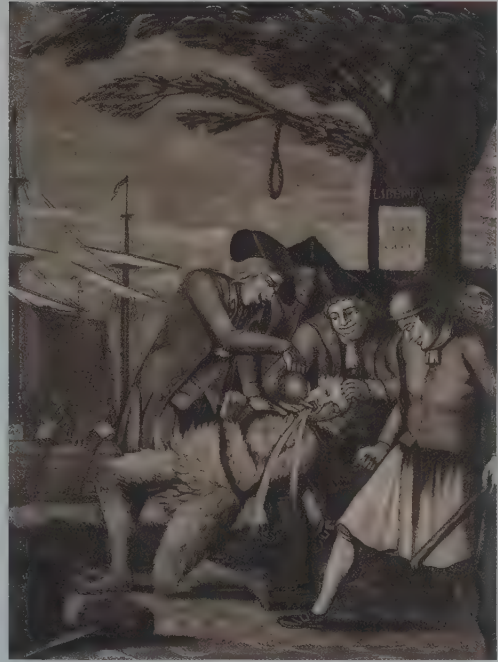
The Chinese likewise assert, that if the blows given have been so severe as to occasion death, this trial makes the marks appear upon the bones, though none of them should be broken or apparently injured. The wine used in these trials is only a kind of beer made from rice and honey.

TARRING & FEATHERING

A Forgotten Gift of the Crusades

Tarring and feathering has long been an extra-legal way of intimidating, punishing, and humiliating those accused of an offense, as Britannica explained in its 11th Edition (1910–11).

Tarring and Feathering, a method of punishment at least as old as the Crusades. The head of the culprit was shaved and hot tar poured over it, a bag of feathers being afterwards shaken over him. The earliest mention of the punishment occurs in the orders of Richard Cœur de Lion, issued to his navy on starting for the Holy Land in 1191. "Concerning the lawes and ordinances appointed by King Richard for his navie the forme thereof was this . . . item, a thiefe or felon that hath stolen, being lawfully convicted, shal have his head shorne, and boyling pitch poured upon his head, and feathers or downe strawed upon the same whereby he may be knowen, and so at the first landing-place they shall come to, there to be cast up." A later instance of this penalty being inflicted is given in *Notes and Queries*, which quotes one James Howell writing from Madrid, in 1623, of the "boisterous Bishop of Halverstadt," who, "having taken a place where there were two monasteries of nuns and friars, he caused divers feather beds to be ripped, and all the feathers thrown into a great hall, wither the nuns and friars were thrust naked and their bodies oiled and pitched and to tumble among these feathers, which makes them here (Madrid) presage him an ill-death." In 1696 a London bailiff, who attempted to serve process on a debtor who had taken refuge within the precincts of the



Tarring and feathering, illustration by English artist Philip Dawe, 1774.

Savoy, was tarred and feathered and taken in a wheelbarrow to the Strand, where he was tied to the Maypole which stood by what is now Somerset House. It is probable that the punishment was never regarded as legalized, but was always a type of mob vengeance.

WHIPPING

Flogging Through the Ages

"It is Christmas: a cold time for madam to strip. See that you warm her shoulders"—with a whip, that is. This "cheerful" holiday sentiment, discussed in this excerpt on "Whipping" from Britannica's 11th Edition (1910–11), reflects the glee with which society once exacted revenge not only on miscreants and criminal types but on the sick, the poor, the homeless and mentally ill, on out-of-wedlock mothers, and peddlers alike.

Whipping, or Flogging, a method of corporal punishment which in one form or another has been used in all ages and all lands. In an-

cient Rome a citizen could not be scourged, it being considered an infamous punishment. Slaves were beaten with rods. Similarly in early medieval England the whip could not be used on the freeman, but was reserved for the villain.

The Anglo-Saxons whipped prisoners with a three-corded knotted lash. It was not uncommon for mistresses to whip or have their servants whipped to death. William of Malmesbury relates that as a child King Aethelred was flogged with candles by his mother, who had no handier weapon, until he was insensible with pain. During the Saxon period whipping was the ordinary punishment for offences, great or small. Payments for whipping figure largely in municipal and parish accounts from an early date. The abolition of the monasteries, where the poor had been sure of free meals, led during the 16th century to an increase of vagrancy, at which the Statute of Labourers (1350) and its provisions as to whipping had been early aimed. In the reign of Henry VIII. was passed (1530) the famous Whipping Act, directing vagrants to be carried to some market town or other place "and there tied to the end of a cart naked and beaten with whips throughout such market town till the body shall be bloody."

In the 39th year of Elizabeth a new act was passed by which the offender was to be stripped to the waist, not quite naked. It was under this statute that whipping-posts were substituted for the cart. Many of these posts were combined with stocks, as that at Waltham Abbey, which bears date "1598." It is of oak, 5 ft. 9 in. high, with iron clasps

for the hands when used for whipping, and for the feet when used as stocks. Fourpence was the old charge for whipping male and female rogues.

At quarter-sessions in Devonshire at Easter 1598 it was ordered that the mothers of bastard children should be whipped; the reputed fathers suffering a like punishment. In the west of England in 1684, "certain Scotch pedlars and petty chapmen being in the habit of selling their goods to the greates damage and hindrance of shoppe-keepers," the court ordered them to be stripped naked and whipped.

The flogging of women was common. Judge Jeffreys, in so sentencing a female prisoner, is reported to have exclaimed, "Hangman, I charge you to pay particular attention to this lady. Scourge her soundly, man: scourge her till her blood runs down! It is Christmas: a cold time for madam to strip. See that you warm her shoulders."

Lunatics, too, were whipped, for in the Constable's Accounts of Great Staughton, Hunts, occurs the entry, "1690-I, Paid in charges taking up a distracted woman, watching her and whipping her next day—8/6d."

A still more remarkable entry is "1710-I, Pd. Thomas Hawkins for whipping two people who [had] smallpox—8d." In 1764 the *Public Ledger* states that a woman who is described as "an old offender" was taken from the Clerkenwell Bridewell to Enfield and there publicly whipped at the cart's tail by the common hangman for cutting wood in Enfield Chase. A statute of 1791 abolished the whipping of females.

The EdTech Challenge

By Betsy Corcoran

No one marvels at the ballpoint pen or overhead projector as a powerful “learning technology.” In short order, most of today’s educational technology apps and Chromebooks may cease to be cool gadgets, too, settling into the background of established tools that help students learn.

But the greatest challenge for “edtech” in the future will simply be this: Will the search for fresh generations of tools be led by teachers, students, and human communities—or by advanced technology that sets its own agenda?

Education is all about preparing students to survive in society. That means the knowledge we share, the way we share it, and the tools we use reflect both what we love and fear about our world.

In the coming years, we will alternately love and fear machine intelligence (or AI) with screaming intensity. Some of us will declare machine intelligence the quintessential learning tool—the societal lever that will erase differences in class or race by putting any goal within anyone’s reach.

Others will condemn machine learning, contending that it’s eliminating our humanity and individuality and enslaving us to the ruthless and unforgiving god of efficiency.

Machines are great at tasks. They may even prove to be great at training people to do specific tasks—from algebra to interpreting an EKG signal. But embedded in the word “education” are the Latin roots and ideas of *educare*, or “bringing up,” and *educere*, which means to bring forth. That makes “education” (in contrast to training) profoundly social.

So how will we build tools for learning that are designed around people—and designed to keep people in charge? If we keep teachers and students in charge of the tools that we use to raise future generations—to *educate* them—we will yet save humanity.

Betsy Corcoran is a cofounder and the CEO of EdSurge, previously executive editor for technology coverage at Forbes Media, and an award-winning staff writer for the Washington Post and Scientific American.

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Grade school student conducting a project through a virtual reality headset.



Gender, Love, & Sex

APHRODISIACS

Stimulants or Mere Suggestions?

Not even sexual stimulants escaped *Britannica's* early editorial eye. In its 11th Edition (1910–11) *Britannica* devoted a half-page of coverage to the topic of aphrodisiacs, and the entry remained in the encyclopedia for more than a generation. It was augmented by half in *Britannica's* 14th Edition (1929), from which the following extract has been taken.

Aphrodisiac, any of various forms of stimulation used chiefly to arouse sexual excitement. Aphrodisiacs may be classified in two principal groups: (1) psychophysiological (visual, tactile, olfactory, aural); and (2) internal (foods, alcoholic drinks, drugs, love potions, medical preparations).

By far the more important is the second group, as the preparation of erotic dishes has played a tremendous role in the sexual history of man. In spite of their vast popularity, almost no scientific studies have been written about them; most writings on the subject are little more than unscientific compilations of traditional material. . . .

With the exception of alcoholic drinks and certain narcotics such as marijuana, which may lead to sexual excitation through depression of inhibitory centres, modern medical science recognizes a very limited number of aphrodisiacs. These are, principally, cantharides and yohimbine. Yohimbine is a crystalline alkaloid substance derived from the bark of the yohimbé tree (*Corynanthe yohimbe*) found in central Africa, where it has been used for centuries by Africans to increase sexual powers. Although it has been promoted as an aphrodisiac, most investigators feel that any clinical change in sexual powers after its use is probably due to suggestion, since stimulatory effects are elicited only with toxic doses.

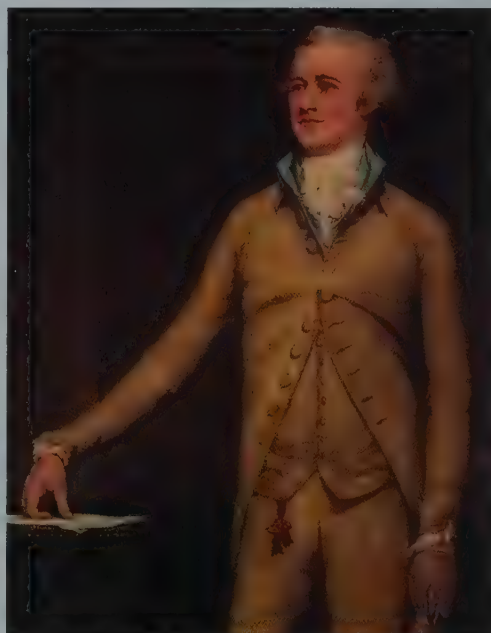
BASTARDS

"Defects of Birth"

William the Conqueror, Leonardo da Vinci, Alexander Hamilton, Frederick Douglass, Lawrence of Arabia, Billie Holiday, Eva Perón—just a few of history's magnificent "bastards." With some 40–70 percent of children now born out of wedlock in many of the major industrialized countries of the world, the negative connotations long associated with "illegitimacy" have greatly lessened. But the mark of shame that historically accompanied these "defects of birth," both socially and legally, is clear in the excerpt below from *Britannica's* 3rd Edition (1788–97).

Bastardy is a defect of birth objected to one born out of wedlock. Eustathius [says] bastards among the Greeks [were] in equal favour with legitimate children, [down] to the Trojan war; but the course of antiquity seems

Alexander Hamilton, color mezzotint.



Frost & Reed, Ltd./Library of Congress, Washington, D.C. (LC-DIG-pga-03160)

against him. Potter and others show, that there never was a time when bastardy was not in disgrace.

In the time of William the Conqueror, however, bastardy seems not to have implied any reproach, if we may judge from the circumstance of that monarch himself not scrupling to assume the appellation of bastard. His epistle to Alan count of Bretagne begins, *Ego Willielmus cognomento bastardus*.

Bastardy, in relation to its trial in law, is distinguished into general and special. *General* bastardy is a certificate from the bishop of the diocese, to the king's justices, after inquiry made, whether the party is a bastard or not, upon some question of inheritance. *Bastardy special* is a suit commenced in the king's courts against a person that calls another bastard.

Arms of Bastardy should be crossed with a bar, fillet, or traverse, from the left to the right. They were not formerly allowed to carry the arms of their father, and therefore they invented arms for themselves; and this is still done by the natural sons of a king.

Right of Bastardy, Droit de batardise, in the French laws, is a right, in virtue whereof the effects of bastards dying intestate devolve to the king or the lord.

BURNING

A Gift from the "Stews"

The words "burning" and "stew," as Britannica's 1st Edition (1768–71) made plain, once had nothing to do with fire and food.

Burning, or *Brenning*, in our old customs, denotes an infectious disease, got in the stews by conversing with lewd women, and supposed to be the same with what we now call the *venereal disease*.

In a manuscript of the vocation of John Bale to the bishopric of Osiory, written by himself, he speaks of Dr Hugh Weston, who was dean of Windsor in 1556, but deprived by cardinal Pole for adultery, thus: "At this day is lecherous Weston, who is more practiced in the arts of breech-burning, than all the whores of the stews. He not long ago brent a beggar of St Botolph's parish."

CHILDREN & PARENTS

Our Mutual Duties

Parents care for their children when the children are young, and the children care for their parents when the parents are old—such were the duties of families as explained by Britannica in its 3rd Edition (1788–97). And concerning that nobleman from Sienna mentioned below, there should be no shortage of care for him during his dotage.

Children, the plural of Child.

Mr Derham computes, that marriages, one with another, produce four children not only in England but in other parts also.

In the genealogical history of Tuscany, wrote by Gamarini, mention is made of a nobleman of Sienna, named Pichi, who of three wives had 150 *children*; and that, being sent ambassador to the pope and the emperor, he had 48 of his sons in his retinue. . . .

As to the duties of children to their parents, they arise from a principle of natural justice and retribution. For those who gave us existence, we naturally owe subjection and obedience during our minority, and honour and reverence ever after; they who protected the weakness of our infancy, are entitled to our protection in the infirmity of their age; they who by sustenance and education have enabled their offspring to prosper, ought, in return, to be supported by that offspring, in case they stand in need of assistance. Upon this principle proceed all the duties of children to their parents, which are enjoined by positive laws.

JACTITATION

Hey, She's My Wife!

The need for laws against slander and defamation is easily understood today, but the idea that a law is also needed to protect against someone boasting to be your husband or wife, this doubtless will shock many readers. Britannica explained this malfeasance in its 11th Edition (1910–11).

Jactitation (from Lat. *jactitare*, to throw out publicly), in English law, the maliciously

boasting or giving out by one party that he or she is married to the other. In such a case, in order to prevent the common reputation of their marriage that might ensue, the procedure is by suit of jactitation of marriage, in which the petitioner alleges that the respondent boasts that he or she is married to the petitioner, and prays a declaration of nullity and a decree putting the respondent to perpetual silence thereafter. Previously to 1857 such a proceeding took place only in the ecclesiastical courts, but by express terms of the Matrimonial Causes Act of that year it can now be brought in the probate, divorce and admiralty division of the High Court. To the suit there are three defences: (1) denial of the boasting; (2) the truth of the representations; (3) allegation (by way of estoppel) that the petitioner acquiesced in the boasting of the respondent. In *Thompson v. Rourke*, 1893, Prob. 70, the court of appeal laid down that the court will not make a decree in a jactitation suit in favour of a petitioner who has at any time acquiesced in the assertion of the respondent that they were actually married. Jactitation of marriage is a suit that is very rare.

LOVE

That Deadly Twinkle

"Love is merely a madness, and, I tell you, deserves as well a dark house and a whip as madmen do." Britannica echoed Shakespeare's sentiments 200 years later, in the following passage on love from its 3rd Edition. Though the passage is clearly overwrought, it endears nonetheless by capturing and mirroring in pulsating prose the suddenness, the breathlessness, of that heady passion we call love. Britannica took a far more analytical approach to the topic some 150 years later, when the polymath Mortimer Adler, longtime chairman of Britannica's Board of Editors, wrote the chapter on love for the Syntopicon, the two-volume index to the Great Books of the Western World. An excerpt from Adler's essay follows as well.

From Britannica's 3rd Edition (1788–97):

The symptoms produced by this passion . . . are as follow: The eye-lids often twinkle; the

eyes are hollow, and yet appear as if full with pleasure: the pulse is not peculiar to the passion, but the same with that which attends solicitude and care. When the object of this affection is thought of, particularly if the idea is sudden, the spirits are confused, the pulse changes, and its force and time are very variable: in some instances, the person is sad and watchful; in others, the person, not being conscious of his state, pines away, is slothful, and regardless of food; though the wiser, when they find themselves in love, seek pleasant company and active entertainments. As the force of love prevails, sighs grow deeper; a tremor affects the heart and pulse; the countenance is alternately pale and red; the voice is suppressed in the senses; the eyes grow dim; cold sweats break out; sleep absents itself, at least until the morning; the secretions become disturbed; and a loss of appetite, a hectic fever, melancholy, or perhaps madness, if not death, constitutes the sad catastrophe.

From "Love," by Mortimer Adler, in Britannica's Syntopicon (1952):

There is a sense in which each great love affair is unique—a world in itself, incomparable, unconditioned by space and time. That, at least, is the way it feels to the romantic lovers, but to the dispassionate observer there seems to be a world of difference between the relationship of Paris and Helen in *The Iliad* and that of Prince Andrew and Natasha in *War and Peace*, or Swann and Odette, Troilus and Criseyde, Gatsby and Daisy, Don Quixote and Dulcinea, Jason and Medea, Aeneas and Dido, Othello and Desdemona, Dante and Beatrice, Hippolytus and Phaedra, Faust and Margaret, Henry V and Catherine, Paolo and Francesca, Samson and Delilah, Antony and Cleopatra, Admetus and Alcestis, Orlando and Rosalind, Haemon and Antigone, Ulysses and Penelope, and Adam and Eve.

The analyst can make distinctions here. He can classify these loves as the conjugal and the illicit, the normal and the perverse, the sexual and the idyllic, the infantile and the adult, the romantic and the Christian. He can, in addition, group all these loves together despite their apparent variety and set them apart from still other categories of love: the friendships between human beings without regard to gender; the familial ties—parental, filial,

fraternal; the love of a man for himself, for his fellowmen, for his country, for God. All these other loves are, no less than the love between man and woman, the materials of great poetry even as they are omnipresent in every human life. . . .

In contrast to the love of desire, the love of friendship makes few demands. "In true friendship, in which I am expert," Montaigne declares, "I give myself to my friend more than I draw him to me. I not only like doing him good better than having him do me good, but also would rather have him do good to himself than to me; he does me most good when he does himself good. And if absence is pleasant or useful to him, it is much sweeter to me than his presence."

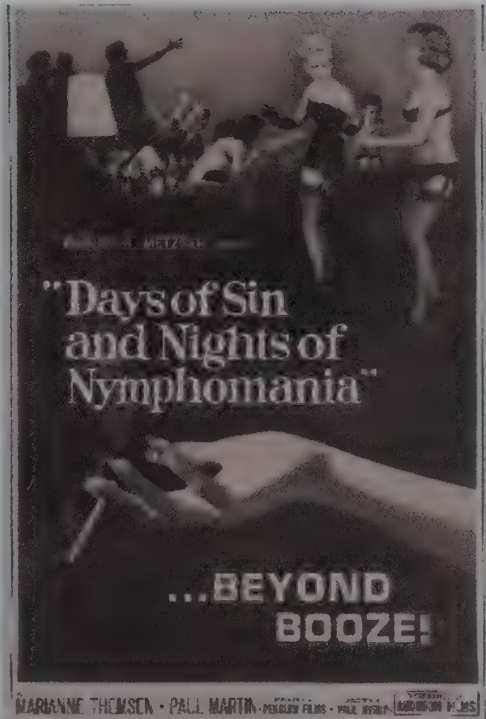
These two loves appear in most of the great analyses of love, though under different names: concupiscent love and fraternal love; the friendship based on pleasure or utility and the friendship based on virtue; animal and human love; sexuality and tenderness. Sometimes they are assigned to different faculties: the love of desire to the sensitive appetite or the sphere of instinct and emotion; the love of friendship to the will or faculty of intellectual desire, capable of what Spinoza calls the *amor intellectualis Dei*—"the intellectual love of God." Sometimes the two kinds of love are thought able to exist in complete separation from one another as well as in varying degrees of mixture, as in romantic and conjugal love; and sometimes the erotic or sexual component is thought to be present to some degree in all love. Though he asserts this, Freud does not hold the converse, that sexuality is always accomplished by the tenderness which characterizes human love.

NYPHOMANIA

Female Sex Addiction

There are clinics today for treating sexual addiction, and that's doubtless a good thing, especially for women, considering the treatment suggested by Britannica in its coverage of nymphomania in its 3rd Edition (1788-97): bloodletting, taking opiates, and shooting barley water and hemlock juice up the uterus. And if these fail to lesson the lust, then there is al-

Everett Collection



Movie poster advertising *Days of Sin and Nights of Nymphomania* (1963), a film written and directed by Poul Nyrup.

ways, claimed Britannica, that act of last resort: marriage! That, said Britannica, should curb the sex drive.

The *furor uterinus* is in most instances either a species of madness or an high degree of hysterics. Its immediate cause is a preternatural irritability of the uterus and pudenda of women (to whom the disorder is proper), or an unusual acrimony of the fluids in these parts.—Its presence is known by the wanton behaviour of the patient: she speaks and acts with unrestrained obscenity; and as the disorder increases, she scolds, cries, and laughs, by turns. While reason is retained, she is silent, and seems melancholy, but her eyes discover an unusual wantonness. The symptoms are better and worse untill the greatest degree of the disorder approaches, and then by every word and action her condition is too manifest.—In the beginning a cure may be hoped for; but if it continue, it degenerates into a mania.—In order to the cure, bloodletting is commonly had recourse to in pro-

portion to the patient's strength. Camphor in doses of 15 or 20 grains, with nitre, and small doses of the tincture of opium, should be repeated at proper intervals. Some venture to give cerusa acetata in doses from three to five grains. Besides bleeding, cooling purges should also be repeated in proportion to the violence of symptoms, etc. What is useful in maniacal and hypochondriac disorders, is also useful here, regard being had to sanguine or phlegmatic habits, etc. When the delirium is at the height, give opiates to compose; and use the same method as in a phrenitis or a mania. Injections of barley-water, with a small quantity of hemlock-juice, according to Riverius, may be frequently thrown up into the uterus: this is called *specific*; but matrimony, if possible, should be preferred. For although this cannot be represented as a cure for the disease when in an advanced state, yet there is reason to believe that it has not unfrequently prevented it where it would otherwise have taken place.

SATYRIASIS

Male Sex Addiction

In recent years two trailblazers and champions of American sports—basketball legend Wilt Chamberlain and golf great Tiger Woods—admitted to suffering from sex addiction. Both also suffered another affliction in common, insomnia—one of the very manifestations of sex addiction (“satyriasis”) highlighted by Britannica more than two centuries ago in its 3rd Edition (1788–97).

Satyriasis is a violent desire of venery in men, even so that reason is depraved by it. The pulse is quick, and the breathing short; the patient is sleepless, thirsty, and loathes his food; the urine is evacuated with difficulty, and a fever soon comes on. These symptoms, however, are probably not so much the consequence of satyriasis, as merely concomitant effects resulting from the same cause. And indeed this affection is most frequently the concomitant of a certain modification of insanity. The nature and cause of this affection are in most instances very little ascertained; but as far as we are ac-

quainted with the treatment, it agrees very much with the affection next to be mentioned [“Nymphomania”], which, of the two, is the most common occurrence.

SEX

What's Love Got to Do with It?

Silly, utter nonsense combined with insight—both are intertwined in Britannica's coverage of sex and relationships in its 3rd Edition (1788–97). It sagely poses, on the one hand, that love without sex and sex without love can be equally unfulfilling, and it even echoes, for good measure, something mothers the world over have long told their daughters: Don't waste your time on a cheatin' man. But in the next breath Britannica announces to women ugly and old: Don't expect men to love you—if you're lucky to get respect, you're doing well! (And yes: 18th-century reference works were nearly always written by men.)

Animal desire is the actual energy of the sensual appetite: and that it is an essential part of the complex affection, which is properly called *love*, is apparent from this consideration, that though a man may have sentiments of esteem and benevolence towards women who are both old and ugly, he never supposes himself to be in love of any woman, to whom he feels not the sensual appetite to have a stronger tendency than to other individuals of her sex. On the other hand, that animal desire *alone* cannot be called the affection of love is evident; because he who gratifies such a desire without esteeming its object, and wishing to communicate at the same time that he receives enjoyment, loves not the woman, but himself. Mere animal desire has nothing in view but the species and the sex of its object. . . .

From the whole of this investigation, we think it appears, that the affection between the sexes which deserves the name of *love*, is inseparably connected with virtue and delicacy; that a man of loose morals cannot be a faithful or a generous lover: that in the breast of him who has ranged from woman to woman for the mere gratification of his

sensual appetite, desire must have effaced all esteem for the female character; and that, therefore, the maxim too generally received, "that a reformed rake makes the best husband," has very seldom a *chance* to be true.

STEWES & SERAGLIOS

Pleasure Palaces

As this volume makes plain, Britannica's early editions covered the many sectors of not just science and society but also sex, including relations of the out-of-wedlock type. Two such entries from Britannica's 1st Edition (1768–71) are "Stews" (English whorehouses) and "Seraglios" (Turkish harems).

Stews were . . . places anciently permitted in England to women of professed incontinency, for the proffer of their bodies to all comers. These were under particular rules and laws of

discipline, appointed by the lord of the manor.

Seraglio, a Persian word, which signifies the palace of a prince or lord; in which sense the houses of the ambassadors of England, France, etc., are, at Constantinople, called their seraglios. But the term seraglio is used by way of eminence, for the palace of the grand seignor at Constantinople, where he keeps his court, in which his concubines are lodged, and where the youth are trained up for the principal posts of the empire. It is in form of a triangle, about two miles round, at the end of the promontory Chrysopolis, now called the Seraglio-point: the buildings extend to the top of the hill, and from thence there are gardens that reach to the sea. The outward appearance is not very beautiful, the architecture being irregular, consisting of separate edifices, in the manner of pavilions and domes. The old seraglio is the palace where the grand seignor's old mistresses are kept.

The ladies of the haram, which is the part allotted to the women, is a collection of young

A brothel in Flanders, painting by Joachim Beuckelaer, 1562.



Walters Art Museum, Baltimore; acquired by Henry Walters with the Massarenti Collection, 1902 (accession no. 37.1784)

beautiful girls, who, on their admission, are committed to the charge of some old lady, and taught musick, dancing, and other accomplishments. These frequently play and dance before the grand seignor, while others entertain him with their conversation. Besides these ladies, there are a great many black eunuchs, and female slaves, in the seraglio, whose business it is to guard and wait upon them.

WOMEN

One-Half of a Delicious Harmony

Britannica's early coverage of the distaff sex reflected the prevailing prejudices of its day. This is hardly surprising. In fact, in its earliest editions, women barely warranted discussion. As the reader will see, Britannica's first coverage of women could not have been briefer, comprising but a single line, with a cross-reference to Britannica's entry on man. Later coverage was expanded to include the ways in which men and women are different but complementary, forming a "delicious harmony." Above all, noted Britannica, by making women intellectually inferior to men, and sexually modest to boot, Nature minimized the possibility of any rivalry between the sexes and any pre- or extramarital sex. Right.

*Complete entry on women in
Britannica's 1st Edition (1768–71):*

Woman, the female of man. See Homo.

From Britannica's 4th Edition (1801–09):

With regard to outlines, indeed, whether of internal disposition or of external form, men and women are the same; but nature, intending them for mates, has given them dispositions which, though concordant, are however different, so as to produce together delicious harmony.

The man, more robust, is fitted for severe labour, and for field exercise; the woman; more delicate, is fitted for sedentary occupations, and particularly for nursing children. The man, bold and vigorous, is qualified for being a protector; the women, delicate, and

timid, requires protection. Hence it is that a man never admires a woman for possessing bodily strength or personal courage; and women always despise men who are totally destitute of these qualities. The man, as a protector, is directed by nature to govern; the woman, conscious of inferiority, is disposed to obey.

Their intellectual powers correspond to the destination of nature. Men have penetration and solid judgment to fit them for governing, women have sufficient understanding to make a decent figure under a good government; a greater portion would excite dangerous rivalry between the sexes, which nature has avoided by giving them different talents. Women have more imagination and sensibility than men, which make all their enjoyments more exquisite; at the same time that they are better qualified to communicate enjoyment. Add another capital difference of disposition: The gentle and insinuating manners of the female sex tend to soften the roughness of the other sex; and wherever women are indulged with any freedom, they polish sooner than men.

These are not the only particulars that distinguish the sexes. With respect to the ultimate end of love, it is the privilege of the male, as superior and protector, to make a choice; the female preferred has no privilege but barely to consent or to refuse. Whether this distinction be the immediate result of the originally different dispositions of the sexes, or only the effect of associations inevitably formed, may be questioned; but among all nations it is the practice for men to court, and for women to be courted; and were the most beautiful woman on earth to invert this practice, she would forfeit the esteem, however by her external grace she might excite the animal desire, of the man whom she addresses. The great moral virtues which may be comprehended under the general term integrity are all absolutely necessary to make either men or women estimable; but to procure esteem to the female character, the modesty peculiar to their sex is a very essential circumstance. Nature hath provided them with it as a defence against the artful solicitations of the other sex before marriage, and also as a support of conjugal fidelity.

The “Robotic Moment”

By Sherry Turkle

In the early 1980s I interviewed one of Marvin Minsky’s young students, who told me that, as he saw it, his hero, Minsky, one of the founders of artificial intelligence (AI), was “trying to create a computer beautiful enough that a soul would want to live in it.”

In the AI world, things have gone from mythic to prosaic. Today, children grow up with robotic pets and digital dolls. They think it natural to chat with their phones. New appliances are released that offer information about movies and music but promise much more. We are at what I call a “robotic moment,” not because we have built intelligent machines worthy of our company but because we declare ourselves ready for theirs. We are tempted by the prospect of artificial intelligences as our companions. That taking care of us will be their jobs. That we will take comfort in their company and conversation. This is where we are, and this is where we are pointing.

This is a station on our voyage of forgetting. The forgetting begins long before we have an artificial companion in place. It begins now, as we consider putting it in place. Even before we make the robots, we remake ourselves as people ready to be their companions.

We change our expectations of what we commit to each other and what can be delegated.

But what do we forget when we talk to machines? We forget what is special about being human. We forget what it means to have authentic conversation. Machines are programmed to have conversations “as if” they understood what the conversation is about. So when we talk to them, we, too, are reduced and confined to the “as if.”

That we seem to be going down this path is an issue for my *field* and an issue for all of us.

Sherry Turkle is the founder (2001) and current director of MIT’s Initiative on Technology and Self. Turkle received a joint doctorate in sociology and personality psychology from Harvard University and is a licensed clinical psychologist. She writes on the “subjective side” of people’s relationships with technology, especially computers. Her newest book is the New York Times best seller Reclaiming Conversation: The Power of Talk in a Digital Age (2015), which investigates how a flight from conversation undermines our relationships, creativity, and productivity.

Sarah Holmlund/Fotolia

Robot positioned like Auguste Rodin’s famed statue The Thinker.



Sports & Pastimes

ANGLING

Fly-Fishing Elegance

Britannica's article on angling in its 7th Edition (1830–42) took the form of the familiar essay. The writer seems less interested in conveying facts than in charming the reader, and in pursuit of the latter he certainly succeeds.

Angling, or the art of fishing with rod and line, includes those branches of the piscatorial trade which are usually followed, not so much for profit, as for pleasant recreation. That the practice of “casting angles into the brook” had its origin in necessity, the mother of so many inventions, can hardly be doubted; but it is equally clear that the refined skill exhibited in this pursuit at the present day has been derived from leisure and the love of sport, aided by the more delicate gear which modern ingenuity has invented for the deception of the finny race.

The comparative merits of angling, and of the kindred occupations of the fowler and the huntsman, are not likely to be determined by any portraiture which a lover of these exciting amusements might draw of their various excellencies, but must depend on the tone and temper of mind possessed by different persons, and their greater or less accordance with individual tastes. This much, however, may be safely stated as a general and admitted truth, that the value of a pursuit increases in proportion as it becomes attainable by the mass of our fellow-creatures; and as angling is a much cheaper and more convenient pleasure than either hunting or shooting, it may, in so far as regards those advantages, claim a decided preference. Be it remembered that Dr Johnson's description of a rod with a fly at one end and a fool at the other is not admitted among the memorabilia of old Izaak Walton. . . .

As expert angling never was and never will be successfully taught by rule, but is almost entirely the result of assiduous and long-continued practice, we purpose being very brief in our disquisition on the subject. We shall

commence by stating our belief that fly-fishing, by far the most elegant and interesting branch of the art, ought not to be regarded exclusively as an art of imitation. It no doubt depends on deception, which usually proceeds on the principle of one thing being successfully substituted in the likeness of another; but Bacon's distinctive definitions of simulation and dissimulation place the subject in a truer light. As simulation consists in the adoption or affectation of what is not, while dissimulation consists in the careful concealment of what really is—the one being a positive, the other rather a negative act—so the great object of the fly-fisher is to dissimulate in such a manner as to prevent his expected prey from detecting the artificial nature of his lure, without troubling himself by a vain effort to simulate or assume, with his fly, the appearance of any individual or specific form of insect life. There is, in truth, little or no connection between the art of angling and the science of entomology; and therefore the success of the angler, in by far the greater proportion of cases, does not depend on the resemblance which subsists between his artificial fly and the natural insect. This statement is no doubt greatly at variance, as well with the principles as the practice of all who have deemed fishing worthy of consideration, from the days of Isaiah and Theocritus, to those of Carrol and Bainbridge. But we are not the less decidedly of opinion, that in nine instances out of ten a fish seizes upon an artificial fly as upon an insect or moving creature *sui generis*, and not on account of its exact and successful resemblance to any accustomed and familiar object.

ANIMAL-BAITING

Cruelty Fit for the Sabbath'

Many modern readers will find it hard to understand how the deliberate torture of animals can be considered a sport and acceptable pastime, let alone an activity worthy of celebrating



Bear-baiting at Charley's Theatre, Westminster, London, 1821.

on the Sabbath. *Britannica* offered a detailed history of animal-baiting in its 11th Edition (1910–11), working in the famed quip by Lord Thomas Babington Macaulay (also a *Britannica* contributor): “The Puritan hated bear-baiting not because it gave pain to the bear, but because it gave pleasure to the spectators.”

Bear-baiting and bull-baiting, sports formerly very popular in England but now suppressed on account of their cruelty. They took place in arenas built in the form of theatres which were the common resort even of cultivated people. In the bear-gardens, which are known to have existed since the time of Henry II., the bear was chained to a stake by one hind leg or by the neck and worried by dogs. Erasmus, writing (about 1500) from the house of Sir Thomas More, spoke of “many herds of bears maintained in the country for the purpose of baiting.” Sunday was the favourite day for these sports. Hentzner, writing in 1598, describes . . . the whipping of a blinded bear, a favourite variation of bear-baiting. For a famous baiting which took place before Queen Elizabeth in 1575 thirteen bears were provided. Of it Robert Laneham (1575) wrote,

it was a sport very pleasant to see, to see the bear, with his pink eyes, tear-

ing after his enemies' approach; the nimbleness and wait of the dog to take his advantage and the force and experience of the bear again to avoid his assaults: if he were bitten in one place how he would pinch in another to get free . . . with biting, with clawing, with roaring, with tossing and tumbling he would work and wind himself from them; and when he was loose to shake his ears twice or thrice with the blood and the slaver hanging about his physiognomy.

The famous “Paris Garden” in Southwark was the chief bear-garden in London. A Spanish nobleman of the time, who was taken to see a pony baited that had an ape tied to its back, expressed himself to the effect that “to see the animal kicking amongst the dogs, with the screaming of the ape, beholding the curs hanging from the ears and neck of the pony, is very laughable.” . . .

The Puritans endeavoured to put an end to animal-baiting, although Macaulay sarcastically suggested that this was “not because it gave pain to the bear, but because it gave pleasure to the spectators.” The efforts of the Puritans seem, however, to have had little effect, for we find the sport flourishing at the

Restoration; but the conscience of cultivated people seems to have been touched, for Evelyn wrote in his *Diary*, under the date of June 16th, 1670:

I went with some friends to the bear-garden, where was cock-fighting, dog-fighting, bear and bull baiting, it being a famous day for all these butcherly sports, or rather barbarous cruelties. The bulls did exceedingly well, but the Irish wolf-dog exceeded, which was a tall greyhound, a stately creature indeed, who beat a cruel mastiff. One of the bulls tossed a dog full in to a lady's lap, as she sat in one of the boxes at a considerable height from the arena. Two poor dogs were killed, and so all ended with the ape on horseback, and I most heartily weary of the rude and dirty pastime, which I had not seen, I think, in twenty years before.

Steele also attacked these cruel sports in the *Tatler*. Nevertheless, when the tsar Nicholas I visited England as cesarevich, he was taken to see a prize-fight and a bull-baiting. In this latter form of the sport the bull's nose was usually blown full of pepper to render him the more furious. The bull was often allowed a hole in the ground, into which to thrust his nose and lips, his most vulnerable parts. Sometimes the bull was tethered, and dogs, trained for the purpose, set upon him one by one, a successful attack resulting in the dog fastening his teeth firmly in the bull's snout. This was called "pinning the bull."

"BASE-BALL"

Popular but Unsavory

Britannica's 11th Edition (1910-11) recounted the sport's origins and evolution and the rather unsavory early reputation it had in the United States due to betting and the "throwing" of games by players "on the take," malfeasance that would draw national attention eight years later with the notorious Black Sox Scandal of 1919. The sport's extraordinary popularity, however, even in its early days, is seen by the fact noted by Britannica that at a 1867 con-

vention held in Philadelphia to discuss a "reformation" of the sport, some 500 organizations attended.

Base-Ball (so-called from the bases and ball used), the national summer sport of the United States, popular also throughout Canada and in Japan. Its origin is obscure. According to some authorities it is derived from the old English game of rounders, several variations of which were played in America during the colonial period; according to other authorities, its resemblance to rounders is merely a coincidence, and it had its origin in the United States, probably at Cooperstown, New York, in 1839, when it is said, Abner Doubleday (later a general in the U.S. army) devised a scheme for playing it. About the beginning of the 19th century a game generally known as "One Old Cat" became popular with schoolboys in the North Atlantic states; this game was played by three boys, each fielding and batting in turn, a run being scored by the batsman running to a single base and back without being put out. Two Old Cat, Three Old Cat, and Four Old Cat were modifications of this game, having respectively four, six and eight players. A development of this game bore the name of town-ball, and the Olympic Town-Ball Club of Philadelphia was organized in 1833. Matches between organized baseball clubs were first played in the neighbourhood of New York, where the Washington Baseball Club was founded in 1843. The first regular code of rules was drawn up in 1845 by the Knickerbocker Baseball Club and used in its matches with the Gotham, Eagle and Empire clubs of New York, and the Excelsior, Putnam, Atlantic and Eckford clubs of Brooklyn. In 1858 the first National Association was organized, and, while its few simple laws were generally similar to the corresponding rules of the present code, the ball was larger and "livelier," and the pitcher was compelled to deliver it with a full toss, no approach to a throw being allowed. The popularity of the game spread rapidly, resulting in the organization of many famous clubs, such as the Beacon and Lowell of Boston, the Red Stockings of Cincinnati, the Forest City of Cleveland and the Maple Leaf of Guelph, but, owing to the sharp rivalry between the foremost teams, semi-professionalism soon crept in, although in those days a man who played for a finan-



Cigarette baseball cards from the American Tobacco Company, 1909–11.

cial consideration always had some other means of livelihood, as the income to be derived from playing ball in the summer time was not enough to support him throughout the year. In spite of its popularity, the game acquired certain undesirable adjuncts. The betting and pool selling evils became prominent, and before long the game was in thorough disrepute. It was not only generally believed that the matches were not played on their merits, but it was known that players themselves were not above selling contests. At that time many of the journals of the day foretold the speedy downfall of the sport. A convention of those interested financially and otherwise in the game, was held in 1867 in Philadelphia, and an effort was made to effect a reformation. That the sport even then was by no means insignificant can be seen from the fact that in that convention some 500 organizations were represented. While the work done at the convention did not accomplish all that was expected, it did produce certain reforms, and the sport grew rapidly thereafter both in the eastern and in the middle western part of the United States.

CHEERING

Sis-Boom-Bah!

The making of love, which creates, and the making of war, which destroys, are perhaps the two most consequential forms of human behavior, if we exclude eating. But Britannica has also devoted much attention to our conduct in less fateful areas, as seen by the rousing article on college yells in its 11th Edition (1910–11).

Rhythmical cheering has been developed to its greatest extent in America in the college yells, which may be regarded as a development of the primitive war-cry; this custom has no real analogue at English schools and universities, but the New Zealand football team in 1907 familiarized English crowds at their matches with a similar sort of war-cry adopted from the Maoris. In American schools and colleges there is usually one cheer for the institution as a whole and others for the different classes. The oldest and simplest are those of the New England colleges. The original yells of Harvard and Yale are identical in form, being composed of *rah* (abbreviation of *hurrah*) nine times repeated, shouted in unison with the name of the university at the end. The Yale cheer is given faster than that of Harvard. Many institutions have several different yells, a favourite variation being the name of the college shouted nine times in a slow and prolonged manner. The best known of these variants is the Yale cheer, partly taken from the *Frogs* of Aristophanes, which runs thus:

"Brekekekéx, ko-áx, ko-áx,
Brekekekéx, ko-áx, ko-áx,
O-óp, O-óp, parabalóū,
Yale, Yale, Yale,
Rah, rah, rah, rah, rah, rah, rah, rah,
Yale! Yale! Yale!"

The regular cheer of Princeton is:

"H'ray, h'ray, h'ray, tiger,
Siss, boom, ah; Princeton!"

(continued on page 74)

Rescuing Muhammad Ali's Lost Legacy

By Thomas Hauser

People today understand that Muhammad Ali defied the United States government and alienated mainstream America in the 1960s because he stood up for his principles. But they don't know what those principles were. In recent years, economic motives have dictated a deliberate distortion of what Ali once believed, said, and stood for. His adherence to Nation of Islam doctrine (which Arthur Ashe called "a sort of American apartheid") has been largely ignored. To younger generations, Ali today is famous primarily for being famous.

Ali in the 1960s stood for the proposition that principles matter; that equality among people is just and proper; and that the war in Vietnam was wrong. Every time he looked in the mirror and preened, "I'm so pretty," he was saying "black is beautiful"

before it became fashionable to do so. But one of the reasons Ali had the impact he did was because there was an ugly edge to what he said. Many of his views changed later on, but he was unrepentant regarding what he once believed. And by covering up the true nature of Ali's earlier beliefs, the current keepers of his legacy are losing sight of why he so enthralled and enraged segments of American society.

Ali's love affair with the world reached its zenith in 1996, when he was chosen to light the Olympic flame in Atlanta. It was a glorious moment. More than three billion people watched on television and were united by love and caring for one man. But the 1996 Olympics carried negatives as well, for it was in Atlanta that corporate America "rediscovered" Ali. Since then, there has

been a determined effort to rewrite history. In order to take advantage of Ali's economic potential, it was deemed desirable to "sanitize" him. As a result, all of the rough edges have been filed away from his life story.

No event crystallized the commercialization of Ali more clearly than his appearance at the New York Stock Exchange on December 31, 1999. That was an important day. By most reckonings, it marked the end of a millennium. The Ali who won hearts in the 1960s could have been expected to celebrate the occasion at a soup kitchen or homeless shelter to draw attention to the plight of the disadvantaged. Many

Everett Collection/age fotostock

Boxer Muhammad Ali (far left) listens as Elijah Muhammad, leader of the Nation of Islam (also known as the Black Muslims) addresses a convention in Chicago, 1967.



hoped to see Ali spend December 31, 1999, in a spiritual setting. Instead, the man who decades earlier was a beacon of hope for oppressed people around the globe and who refused to become a symbol for the United States Army became a symbol for the New York Stock Exchange. As the clock struck midnight, Ali was in Washington, D.C., dining on beluga caviar, lobster, and foie gras. That saddened a lot of people.

The commercialization of Ali is also typified by the 2001 feature film that bore his name. The movie *Ali* represented a unique opportunity to depict its subject for current and future generations that didn't experience his magic. It cost more than a hundred million dollars to make and was backed by a multinational promotional campaign that cost tens of millions of additional dollars. But instead of being faithful to the legacy of its subject, *Ali* turned its hero into a virtual Disney character.

The ultimate payoff came in 2006, when the licensing firm CKX Inc. announced that it had acquired an 80 percent interest in Ali's name, image, likeness, and other publicity rights for \$50 million. CKX also owns rights to the name, image, and likeness of Elvis Presley.

The young Ali, who much of the world fell in love with, would have been in the Superdome after Hurricane Katrina. Quite

possibly, he would have refused the Presidential Medal of Freedom as a protest against the war in Iraq and the torture of Islamic prisoners instead of going to the White House to accept it in November 2005.

It should also be noted that there's a particularly compelling reason to mourn the lost legacy of Muhammad Ali today. We live in an age marked by horrific divisions among the world's cultures and religions. If we are to avoid increasingly violent assaults and possibly a nuclear holocaust, the people of the world must learn to understand others with alien beliefs, find the humanity in their enemies, and embrace that which is good in those they abhor. A full understanding and honest appraisal of the life and times of Muhammad Ali would advance that cause.

Thomas Hauser graduated from law school in 1970 and began writing in 1977. Since then, he has authored some 50 books on subjects ranging from professional boxing to Beethoven. His first book—The Execution of Charles Horman: An American Sacrifice—was nominated for the Pulitzer Prize, Bancroft Prize, and National Book Award and served as the basis for the Academy Award-winning film Missing (1982), starring Jack Lemmon and Sissy Spacek.

(continued from page 71)

This is expanded into the "triple cheer":

"H'ray, h'ray, h'ray,
Tiger, tiger, tiger,
Siss, siss, siss,
Boom, boom, boom,
Ah, ah, ah,
Princetón, Princetón, Princetón!"

The "railroad cheer" is like the foregoing, but begun very slowly and broadly, and gradually accelerated to the end, which is enunciated as fast as possible. Many cheers are formed like that of Toronto University:

"Varsítý, varsítý,
V-a-r-s-í-t-y (spelled)
VARSITY (spelled *staccato*)
Vár-sí-tý,
Rah, rah, rah!"

Another variety of yell is illustrated by that of the School of Practical Science of Toronto University:

"Who are we? Can't you guess?
We are from the S. P. S.!"

The cheer of the United States Naval Academy is an imitation of a nautical syren. The Amherst cheer is:

"Amherst! Amherst! Amherst! Rah! Rah!
Amherst! Rah! Rah!
Rah! Rah! Rah! Rah! Rah! Rah! Amherst!"

Besides the cheers of individual institutions there are some common to all, generally used to compliment some successful athlete or popular professor. One of the oldest examples of these personal cheers is:

"Who was George Washington?
First in war,
First in peace,
First in the hearts of his countrymén,"

followed by a stamping on the floor in the same rhythm.

College yells are used particularly at athletic contests. In any large college there are several leaders, chosen by the students, who stand in front and call for the different songs

and cheers, directing with their arms in the fashion of an orchestral conductor. This cheering and singing form one of the distinctive features of inter-collegiate and scholastic athletic contests in America.

COCKFIGHTS

Bloodsucking in the Churchyard

They were hosted by churches, even sponsored by schools, which considered them at one point such an integral part of a child's education that parents were required to fund them with an annual fee. They are cockfights, a controversial "pastime" to say the least but one popular for centuries, especially with gamblers big and small. Though this "blood sport" is now illegal in Europe and the United States, it still thrives in Mexico and Central America, South America, throughout South and Southeast Asia, and in the Philippines and various Pacific islands. Britannica traced the history of cockfights in its 11th Edition (1910-11).

The sport was popular in ancient times in India, China, Persia and other eastern countries, and was introduced into Greece in the time of Themistocles. The latter, while moving with his army against the Persians, observed two cocks fighting desperately, and, stopping his troops, inspired them by calling their attention to the valour and obstinacy of the feathered warriors. In honour of the ensuing victory of the Greeks cock-fights were thenceforth held annually at Athens, at first in a patriotic and religious spirit, but afterwards purely for the love of the sport. . . .

From Athens the sport spread throughout Greece, Asia Minor and Sicily, the best cocks being bred in Alexandria, Delos, Rhodes and Tanagra. For a long time the Romans affected to despise this "Greek diversion," but ended by adopting it so enthusiastically that Columella (1st century A.D.) complained that its devotees often spent their whole patrimony in betting at the pit-side. The cocks were provided with iron spurs (*tela*), as in the East, and were often dosed with stimulants to make them fight more savagely. . . .

It was probably introduced into England by the Romans before Caesar's time. William

Fitz-Stephen first speaks of it in the time of Henry II. as a sport for school-boys on holidays, and particularly on Shrove Tuesday, the masters themselves directing the fights, or mains, from which they derived a material advantage, as the dead birds fell to them. It became very popular throughout England and Wales, as well as in Scotland, where it was introduced in 1681. Occasionally the authorities tried to repress it, especially Cromwell, who put an almost complete stop to it for a brief period, but the Restoration re-established it among the national pastimes. Contemporary apologists do not, in the 17th century, consider its cruelty at all, but concern themselves solely with its justification as a source of pleasure. "If Leviathan took his sport in the waters, how much more may Man take his sport upon the land?" From the time of Henry VIII., who added the famous Royal Cock-pit to his palace of Whitehall, cocking was called the "royal diversion," and the Stuarts, particularly James I. and Charles II., were among its most enthusiastic devotees, their example being followed by the gentry down to the 19th century. Gervase Markham in his *Pleasures of Princes* (1614) wrote "Of the Choyce, Ordring, Breeding and Dyeting of the fighting-Cocke for Battell," his quaint directions being of the most explicit nature. When a cock is to be trained for the pit he must be fed "three or foure daies only with old Maunchet (fine white bread) and spring water." He is then set to spar with another cock, "putting a payre of hots upon each of their heeles, which Hots are soft, bumbasted rouples of Leather, covering their spurs, so that they cannot hurt each other. . . . Let them fight and buffet one another a good space." After exercise the bird must be put into a basket, covered with hay and set near the fire. "Then let him sweate, for the nature of this scowring is to bring away his grease, and to breed breath, and strength." If not killed in the fight, "the first thing you doe, you shall search his wounds, and as many as you can find you shall with your mouth sucke the blood out of them, then wash them with the warm salt water; . . . give him a roule or two, and so stove him up as hot as you can."

Cocking-mains usually consisted of fights between an agreed number of pair of birds, the majority of victories deciding the main;

but there were two other varieties that aroused the particular ire of moralists. These were the "battle royal," in which a number of birds were "set," i.e. placed in the pit, at the same time, and allowed to remain until all but one, the victor, were killed or disabled; and the "Welsh main," in which eight pairs were matched, the eight victors being again paired, then four, and finally the last surviving pair. Among London cock-pits were those at Westminster, in Drury Lane, Jewin Street and Birdcage Walk (depicted by Hogarth). Over the royal pit at Whitehall presided the king's cockmaster. The pits were circular in shape with a matted stage about 20 ft. in diameter and surrounded by a barrier to keep the birds from falling off. Upon this barrier the first row of the audience leaned. Hardly a town in the kingdom was without its cockpit, which offered the sporting classes opportunities for betting not as yet sufficiently supplied by horse-racing. . . .

In Wales, as well as some parts of England, cocking-mains took place regularly in churchyards, and in many instances even inside the churches themselves. Sundays, wakes and church festivals were favourite occasions for them. The habit of holding mains in schools was common from the 12th to about the middle of the 19th century. When cocking was at its height, the pupils of many schools were made a special allowance for purchasing fighting-cocks, and parents were expected to contribute to the expenses of the annual main on Shrove Tuesday, this money being called "cockpence." Cock-fighting was prohibited by law in Great Britain in 1849.

GOLF

Ban It!

A Scottish act of Parliament in 1491 banned football, golf, and similar games ("fut bawis gouff or uthir sic unprofitable sports") because they interfered with more important pastimes and duties, such as attending church and practicing archery (the latter critical to the country's defense). In fact, it is these 15th-century injunctions against golf that led to the belief in the Scottish origins of the game, which likely started in the Netherlands instead. (The Scots



The Golfers, an 1825 painting by Charles Lees depicting a match at the famed Old Course at the Royal and Ancient Golf Club of St. Andrews, Scotland.

are certainly responsible for developing the game into the sport we know today.) Here is *Britannica's* coverage of golf from its 3rd Edition (1788–97).

Golf, the name of a certain game among the Scots, and said to be peculiar to their country.—Among them it has been very ancient; for there are statutes prohibiting it as early as the year 1457, lest it should interfere with the sport of archery. It is commonly played on rugged broken ground, covered with short grass, in the neighbourhood of the seashore. A field of this sort is in Scotland called *links*. The game is generally played in parties of one or two on each side. Each party has an exceeding hard ball, somewhat larger than a hen's egg. This they strike with a slender and elastic club, of about four feet long, crooked in the head, and having lead run into it, to make it heavy. The ball being struck with this club, will fly to the distance of 200 yards, and the game is gained by the party who puts his ball in the hole with the fewest strokes. But the game does not depend solely upon the striking of the longest ball, but also upon measuring the strength of the stroke, and applying it in such direction as to lay the ball in smooth ground, whence it may be easily moved at the next stroke. To encourage this amusement, the city of Edinburgh, A.D 1744,

gave to the company of golfers a silver club, to be played for annually by the company, the victor to append a gold or silver piece to the prize. It has been played for every year since, except the years 1746, 1747. For their better accommodation, 22 members of the company subscribed L. 30 each in the year 1768, for building a house, where their meetings might be held. The spot chosen for this purpose was the southwest corner of Leith Links, where an area was taken in leu from the magistrates of Edinburgh, and a commodious house and tavern built upon it.

HUNTING

The Only Manly Sport

Ready, Aim . . . Grill—a former cooking show on one of television's many "outdoor channels"—was just another of the many infotainment diversions that have contributed to our fondness for not doing but watching in our virtual times and to the decline of such pastimes as hunting in the Western world. Animal rights activists cheer the development, while hunting enthusiasts, channeling the grit of Teddy Roosevelt, bemoan it as another sign of civilization's growing "softness." There was no ques-

tion where Britannica stood on the issue of hunting in the mid-19th century, as evidenced by its coverage in its 7th Edition (1830–42).

Nature has prepared many advantages and pleasures for the use of mankind, and given them the taste to enjoy them, and the sagacity to improve them; but of all the out-of-door amusements that have occupied the modern world, at least the male part of it, nothing has better stood the test of time than the noble diversion of hunting.

“Of all our fond diversions,
A hunter’s is the best:
In spite of wars and petty jars,
That sport has stood the test.”

And why has it stood the test? Not merely because the passion for the chase is interwoven closely with our nature; not because it originated in necessity, therefore originated

in nature; but because it has been encouraged and approved of by the very best authorities, and practiced by the greatest men. It cannot now, then, be supposed to dread criticism, or require support; neither can any solid objections be raised against a reasonable enjoyment of the sports of the field in general, provided what ought to be the pleasing relaxation of a man’s leisure hours be not converted into the whole business of his life. But hunting, above all others, is a taste characteristically manly and appropriate to the gentlemen of Great Britain; and it has likewise another advantage over all other sports of the field, which adds much to its value in this land of liberty, and especially in the present age: it is a kind of Saturnalian amusement, in which the privileges of rank and fortune are laid aside, the best man in the chase being he who rides the best horse, and is best skilled in the use he should make of his superiority.

Going It Alone Is Not an Option

By James A. Baker, III

It's sometimes easy to despair about the future of mankind. Global climate change may make large portions of the planet uninhabitable. There are enough nuclear weapons to kill the world's population several times over. Artificial intelligence is a potential threat to human control over our own creations.

From the risk of worldwide pandemic to a cataclysmic collision with a meteor, the list of potential planetary calamities goes on and on. In fact, renowned astrophysicist Stephen Hawking has predicted our species' extinction if we don't begin colonizing another planet within 100 years.

Although I am not a futurist, I understand the grave consequences of those challenges, as mind-numbing as they sometimes may seem. And I have great concern about each because I want my great grandchildren and their great grandchildren to inherit a world even better than the one I have enjoyed.

Isolating the foremost issue facing the world and placing it atop the list of all others is no easy task because there are so many daunting challenges confronting us. But here is my answer. Mankind must learn how to focus on its ability to work with one another in search of common solutions rather than fight one another over scarce resources, power, or prestige. To put it even more simplistically, we must abide by the mantra of Alexandre Dumas' *Three Musketeers* — "All for one and one for all."

All of these challenges are global in nature, and as a result, each will require global solutions. Going it alone is not an option. No single country, for example, can resolve the threat of climate change by itself. To do that will require cooperation from the major carbon-emitting economies and, just as importantly, a consensus for action within countries.

The same is true for the proliferation of nuclear, chemical, and biological weapons. The threat of mutually-assured destruction kept the world safe during the Cold War and

its immediate aftermath. Today, however, more rogue nations are attempting to acquire these weapons, as are deadly terrorist organizations. Such efforts should be confronted—firmly and consistently—by the global community. In the meantime, the leaders of the nuclear-armed countries should work together to devise cooperative ways that drastically reduce their own arsenals, as we have in the past.

I recognize that achieving such a cooperative spirit is much easier said than done. After all, mankind has a history of conflict.

But there have also been periods of relative global peace and cooperation. Even during the height of the Cold War, the United States and Soviet Union recognized the need for cooperation, which led to agreements regarding space exploration starting in 1962, the Limited Test-Ban Treaty in 1963, and the Strategic Arms Reduction Treaty of 1991, among others. To generate such global cooperation, the United States and other world leaders should accentuate areas where they share similar goals, such as curbing global terrorism or coordinating scientific research that benefits the world. At the same time, major powers must manage their differences, such as human rights issues and territorial claims. In other words, we must seek pragmatic solutions to the most profound challenges that affect us all.

Additionally, we should continue to promote democracy. Since the end of the Cold War, the number of countries with some form of democratic rule has roughly doubled. In 1795 philosopher Immanuel Kant first suggested that democratic republics were less likely to make wars. He was right then. He is right now.

Finally, we should promote free trade and investment. In general, countries that trade with one another have fewer disputes than those that erect trade barriers. Such barriers often exacerbate differences between countries, as they did during the lead up to

World War II. Today, with communication and transportation systems rapidly shrinking the distances between us, integration into the global economy is a powerful engine for economic well-being and geopolitical stability.

In my 88th year, I don't anticipate boarding a spaceship that will colonize another planet, should that indeed happen. I doubt that many of us will.

So it behooves us to work together to find solutions that benefit us all. We can do it, but only if we look beyond transitory self-

advantage to enduring and existential common interests.

James A. Baker, III, was the 61st U.S. secretary of state, its 67th secretary of the treasury, and White House chief of staff for Presidents Ronald Reagan and George H.W. Bush. A senior partner with the law firm Baker Botts L.L.P., he is the author of The Politics of Diplomacy (1995) and Work Hard, Study . . . and Keep Out of Politics! Adventures and Lessons from an Unexpected Public Life (2006).

Hendrik Schmidt/picture-alliance/dpa/AP Images



Statesmen and political leaders from around the world, including former U.S. Secretary of State James Baker (second from left), placing candles in Augustusplatz in Leipzig, Germany, on October 9, 2014, to celebrate the 25th anniversary of the Peaceful Revolution, which began with the fall of the Berlin Wall in 1989 and ended with the reunification of Germany in 1990.

Living Things

AMERICAN SERPENTS

Beasts with Killer Breaths

Ignorance breeds fear—and wild stories to boot. Such certainly has been the case whenever accurate knowledge of geography was limited, as seen in Britannica's entry on America in its 3rd Edition (1788–97).

With respect to the size of the insects, reptiles, and such animals, M. de Paw makes use of the testimony of [French colonial adventurer] Mr [Jean-François-Benjamin] Dumont [de Montigny], who, in his *Memoirs on Louisiana* [1753], says, that the frogs are so large there that they weigh 37 French pounds, and their horrid croaking imitates the bellowing of cows. But M. de Paw himself says . . . that all those who have written about Louisiana from Henepin, Le Clerc, and Cav. Tonti, to Dumont, have contradicted each other, sometimes on one and sometimes on another subject. In fact, neither in the old or the new continent are there frogs of 37 pounds in weight; but there are in Asia and Africa serpents, butterflies, ants, and other animals, of such monstrous size, that they exceed all those which have been discovered in the new world. We

Boa constrictor, an illustration from Encyclopædia Britannica's 1st Edition (1768–71).



Encyclopædia Britannica, Inc.

know very well, that some American historian says, that a certain gigantic species of serpents is to be found in the woods, which attract men with their breath, and swallow them up; but we know also, that several historians, both ancient and modern, report the same thing of the serpents of Asia, and even something more. Megasthenes, cited by Pliny, said, that there were serpents found in Asia, so large, that they swallowed entire stags and bulls. Metrodorus cited by the same author, affirms, that in Asia there were serpents which, by their breath, attracted birds, however high they were, or quick their flight. Among the moderns, Gemelli, in Vol. V. of his *Tour of the World* [1719], when he treats of the animals of the Philippine isles, speaks thus: "There are serpents in these islands of immoderate size; there is one called *Ibitin*, very long, which suspending itself by the tail from the trunk of a tree, waits till stags, bears, and also men pass by, in order to attract them with its breath, and devour them at once entirely;" from whence it is evident, that this very ancient fable has been common to both continents.

"BEDBUGGS"

How to Rid Them

Britannica's earliest editions offered both academic knowledge and practical information. Among the latter, Britannica explained how to prepare "Brawn," the pickled flesh of a boar; under "Bread," one found a lengthy paragraph on how to make six large loaves in the style followed in Debrecen, Hungary; and under "Bug," in Britannica's 3rd Edition (1788–97), readers learned how best to rid themselves of that all-too-common pest of their times (and ours)—"bedbugs."

Cheap, easy, and clean mixture for effectually destroying Bugs. Take of the highest rectified spirit of wine, (viz. lamp-spirits) that will burn all away dry, and leave not the least moisture behind it, half a pint; new distilled oil, or spirit,

of turpentine, half a pint: mix them together; and break into it, in small bits, half an ounce of camphire, which will dissolve it in a few minutes; shake them well together; and with a piece of sponge, or a brush dipt in some of it, wet very well the bed or furniture wherein those vermin harbour and breed, and it will infallibly kill and destroy both them and their nits, although they swarm ever so much. But then the bed and furniture must be well and thoroughly wet with it (the dust upon them being first brushed and shook off), by which means it will neither soil, stain, nor in the least hurt, the finest silk or damask bed that is. The quantity here ordered of this mixture (that costs but about a shilling) will rid any one bed whatever, tho' it swarms with bugs.

BOTANY

Saviour of Sailors

Likely the field of expertise most critical to good sailors is navigation. Britannica, in its 3rd Edition (1788–97), suggested another candidate: botany. After all, with so much of the world still left to be explored in the late 18th century, how would sailors, either those stranded or merely pioneering, know what to eat and what not to touch, without at least a rudimentary knowledge of the plant world?

In the utmost extent of the word, [Botany] signifies a knowledge of plants, and of the uses to which they may be applied, either in medicine, chemistry, or in the different arts. But as the medical virtues of plants fall properly under the province of the physician, their chemical properties belong to the chemist, etc.; hence the science of botany is commonly restricted to a bare knowledge of the different plants themselves, and of the distinguishing marks whereby each individual species may be known from each other. . . .

The utility of botanical classifications may be further illustrated from the following considerations.

1. With regard to *Food*. Many animals are endowed with an instinctive faculty of distinguishing with certainty whether the food presented to them be salutary or noxious. Mankind have no such instinct. They

must have recourse to experience and observation. But they are not sufficient to guide us in every case. The traveller is often allured by the agreeableness of smell and taste to eat poisonous fruits. Neither will a general caution, not to eat any thing but what we know from experience to be salutary, answer in every emergency. A ship's company, in want of provisions, may be thrown upon an uninhabited coast or a desert island. Totally ignorant of the nature of the plants they meet with, diseases, or scarcity of animals, may make it absolutely necessary to use vegetable food. The consequence is dreadful: they must first eat before any certain conclusion can be formed. This is not the description of danger arising from an imaginary situation. Before the vegetables that grow in America, the East and West Indies, etc. became familiar to our sailors, many lives were lost by trials of this kind: neither has all the information received from experience been sufficient to prevent individual from still falling a prey to ignorance or rashness.—If the whole science of botany were as complete as some of its branches, very little skill in it would be sufficient to guard us infallibly from committing such fatal mistakes. There are certain orders and classes which are called *natural*, because every genus and species comprehended under them are not only distinguished by the same characteristic marks, but likewise possess the same qualities, though not in an equal degree. For example: Show a botanist the flower of a plant whose calyx is a double-valved glume, with three stamina, two pistils, and one naked seed; he can pronounce with absolute certainty, that the plant from which the flower was taken, bears seeds of a farinaceous quality, and that they may be safely used as food. In like manner, show him a flower with 12 or more stamina all inserted into the internal side of the calyx, tho' it belonged to a plant growing in Japan, he can pronounce without hesitation, that the fruit of it may be eat with safety. On the other hand, show him a plant whose flower has five stamina, one pistil, one petal, or flower-leaf, and whose fruit is of the berry kind, he will tell you to abstain from it, because it is poisonous. Facts of this kind render botany not only a respectable, but a most interesting, science.

2. With respect to *Medicine*, the same thing holds good. It is found by experience, that plants which are distinguished by the same characters in the flower and fruit have the same qualities, though not always in an equal degree as to strength or weakness; so that, upon inspection of the flower and fruit, a botanist can determine *à priori* the effects that will result when taken into the stomach.

BRUTES

God and the Souls of Nonhuman Mutes

To get a quick sense of the mental world of scholars of two to three centuries ago, one need simply compare the titles of their encyclopedia articles with ours. We would never think of including an article labeled "Brute" today, but they did. Here, in part, is how Britannica's 4th Edition (1801–09) dealt with the "souls" and physiology of nonhuman animals.

Brute, a general name for all animals except mankind.

Among brutes, the monkey kind bear the nearest resemblance to man, both in the external shape and internal structure, but more in the former than in the latter. In the monkey kind, the highest and the nearest approach to the likeness of man is the ouran outang, or *Homo Sylvestris*.—The structure and economy of brutes make the objects of what is called *Comparative Anatomy*.

Philosophers have been much puzzled about the essential characteristics of brutes, by which they may be distinguished from man. Some define a brute to be an *animal not risible*, or a *living creature incapable of laughter*; others call them *mute animals*. The peripatetics allowed them a sensitive power, but denied them a rational one. The Platonists allowed them reason and understanding, though in a degree less pure and refined than that of men. Lactantius allows every thing to brutes which men have, except a sense of religion; and even this has been ascribed to them by some sceptics. Descartes maintained, that brutes are mere inanimate machines, absolutely destitute not only of reason but of all thought and perception, and that all their actions are only conse-

quences of the exquisite mechanism of their bodies. . . .

The opinion of Descartes was probably invented, or at least adopted by him, to defeat two great objections: one against the immortality of the souls of brutes, if they were allowed to have any; the other against the goodness of God, in suffering creatures who had never sinned to be subjected to so many miseries.

CATS

Unlovable Floozies

They are malicious, dishonest, and unlovable—"totally destitute of friendship"—and the male is no match for the wily female who will lure and sexually assault him, all to "satisfy the fury of her desires." Such is the way early science writers characterized—and humorously anthropomorphized—the simple household cat, as seen in Britannica's 1st Edition (1768–71).

Of all domestic animals, the character of the cat is the most equivocal and suspicious. He is kept, not for any amiable qualities, but purely with a view to banish rats, mice, and other noxious animals from our houses, granaries, etc. Although cats, when young, are

Illustration of an Angora cat from Encyclopædia Britannica's 1st Edition (1768–71).



Encyclopædia Britannica, Inc.

playful and gay, they possess at the same time an innate malice and perverse disposition, which increases as they grow up, and which education learns them to conceal, but never to subdue. Constantly bent upon theft and rapine, though in a domestic state, they are full of cunning and dissimulation; they conceal all their designs; seize every opportunity of doing mischief, and then fly from punishment. They easily take on the habits of society, but never its manners: for they have only the appearance of friendship and attachment. This disingenuity of character is betrayed by the obliquity of their movements, and the ambiguity of their looks. In a word, the cat is totally destitute of friendship; he thinks and acts for himself alone. He loves ease, searches for the softest and warmest places to repose himself. The cat is likewise extremely amorous; and, which is very singular, the female is more ardent than the male; she not only invites, but searches after and calls upon him to satisfy the fury of her desires; and, if the male disdains or flies from her, she pursues, bites, and in a manner compels him.

GIANTS

They Exist!

Early Britannica editors were more credulous than their counterparts today, a circumstance that often produced interesting results. This sample, from the entry titled "Giant," derives from Britannica's 2nd edition (1778–83).

January 11, 1613, some masons digging near the ruins of a castle in Dauphine, France, in a field which (by tradition) had long been called *the giant's field*, at the depth of 18 feet discovered a brick-tomb 30 feet long, 12 feet wide, and 8 feet high; on which was a grey stone, with the words *Theutobochus Rex* cut thereon. When the tomb was opened, they found a human skeleton entire, 25 feet and a half long, 10 feet wide across the shoulders, and five feet deep from the breast-bone to the back. His teeth were about the size each of an ox's foot, and his shin bone measured four feet.—Near Mazarino, in Sicily, in 1516, was found a giant 30 feet high; his head was the

size of an hog-head, and each of his teeth weighed five ounces. Near Palermo, in the valley of Mazara, in Sicily, a skeleton of a giant 30 feet long was found, in the year 1548; and another of 33 feet high, in 1550; and many curious persons have preserved several of these gigantic bones.

The Athenians found near their city two famous skeletons, one of 34 and the other of 36 feet high.

At Totu, in Bohemia, in 758, was found a skeleton, the head of which could scarce be encompassed by the arms of two men together, and whose legs, which they still keep in the castle of that city, were 26 feet long. The skull of the giant found in Macedonia, September 1691, held 210 pounds of corn.

The celebrated Sir Hans Sloane, who treated this matter very learnedly, does not doubt these facts; but thinks the bones were those of elephants, whales, or other enormous animals.

Elephants' bones may be shown for those of giants; but they can never impose on connoisseurs. Whales, which, by their immense bulk, are more proper to be substituted for the largest giants, have neither arms nor legs, and the head of that animal hath not the least resemblance to that of a man. If it be true, therefore, that a great number of the gigantic bones which we have mentioned have been seen by anatomists, and by them have been reputed real human bones, the existence of giants is proved.

"GRE-HOUNDS"

Reward Them with Blood

Hundreds of what seem to us quaint entries from Britannica's earlier editions throw clear light on the minds and daily interests of the Englishman (and, perhaps, the Englishwoman) of the late 18th century. Here, for example, from Britannica's 3rd Edition (1788–97), is "Gre-hound."

Among a litter of gre-hound puppies, the best are always those which are lightest. These will make the nimblest dogs as they grow up. The gre-hound is best for open countries where there is little covert. In these places



Greyhound, an illustration from Encyclopædia Britannica's 1st Edition (1768–71).

there will sometimes be a course after a hare of two or three miles or more, and both the dogs and the game in sight all the while. It is generally supposed that the gre-hound bitch will beat the dog in running; but this seems to be an error; for the dog is both longer made, and considerably stronger, than the bitch of the same kind. In the breeding these dogs the bitch is principally to be regarded; for it is found by experience, that the best dog and a bad bitch will not get so good puppies as an indifferent dog with a good bitch. The dog and bitch should be as nearly as may be of the same age; and for the breeding of fine and perfect dogs, they should not be more than four years old. An old bitch may be used with a young dog, but the puppies of a young bitch and an old dog will never be good for any thing.

The general food for a gre-hound ought to be chippings or raspings of bread, with soft bones and gristles; and those chippings ought always to be soaked in beef or mutton broth.

The proper exercise for a gre-hound is coursing him three times a-week, and rewarding him with blood; which will animate him in the highest degree, and encourage him to prosecute his game. But the hare also should ever have fair play. She should have the law, as it is called; that is, have leave to run about twelve score yards before the dog is slipped at her, that he may have some difficulty in the course, and not pick up the game too easily. If he kills the hare, he must never be suffered to tear her; but she must be taken from him, his mouth cleaned of the

wool, and the liver and lights given him by way of encouragement. Then he is to be led home, and his feet washed with butter and beer, and about an hour after he is to be fed.

When the dog is to be taken out to course, he should have nothing in the morning but a toast and butter, and then he is to be kennelled till taken out to the field. The kennelling these dogs is of great use, always giving them spirit and nimbleness when they are let loose: and the best way of managing a fine gre-hound is, never to let him stir out of the kennel, except at the times of feeding, walking, or coursing.

HERRINGS

"As Dead As . . ."

"As dead as a herring" was an 18th-century Britishism approximating the Americanism "dead as a mackerel." From Britannica's 1st Edition (1768–71) modern readers may, at last, discover why these fish have been so distinguished for their mortality.

Clupea, or herring, in ichthyology, a genus belonging to the order of abdominales. The upper jaw is furnished with a serrated mystache; the branchioflege membrane has eight rays; a scaly serrated line runs along the belly from the head to the tail; and the belly-fins have frequently nine rays. There are 11 species, viz.

1. The harengus, or common herring, has no spots, and the under jaw is longer than the upper one. A herring dies immediately after it is taken out of the water, whence the proverb arises, *As dead as a herring*. The flesh is every where in great esteem, being fat, soft, and delicate, especially if it is drest as soon as caught; for then it is incomparably better than on the next day.

NIGHTJARS

Goat-Sucking Birds

Nightjars are medium-sized nocturnal birds that prey on insects, such as those found on farms around large animals. As a result, a

strange legend arose, further propagated in the pages of Britannica's 1st Edition (1768–71), that the bird sucked the milk of goats (from their teats) at night.

Caprimulgus, Goat-sucker, or Fern-owl, in ornithology, a genus of birds belonging to the order of passerines. The beak is incurved, small, tapering, and depressed at the base; the hairs at the mouth, which it opens very wide, are placed in a row. There are two species, viz. the *Europæus*, with the tubes of the nostrils hardly visible. It is a native of Europe, and feeds upon moths and nocturnal insects. This bird is said to suck goats in the night. . . . The *Americanus*, has the tubes of the nostrils very conspicuous. This is a night-bird, and is found in America.

REVIVIFICATION

Restoring the Dead to Life

In 2012 Russian scientists restored a flower to life from seeds stored in permafrost by squirrels more than 30,000 years ago. In 2014 French scientists restored to life a 30,000-year-old virus also frozen in permafrost; the virus then went on the attack, killing amoebas but (fortunately) not animals or humans. In 2016, however, a mysterious outbreak of anthrax in Siberia was believed to stem from thawing reindeer carcasses infected by the disease and then frozen in the ice some 75 years ago. These developments, in conjunction with recent advances in genetic engineering, have animated an assortment of Frankenstein-like debates and ethical concerns and underscored the potential dangers of global warming. Could melting glaciers release long-dormant ancient viruses now lethal to us? Should extinct species like the woolly mammoth and sabre-toothed tiger be intentionally restored to life? And, if so, what are the risks?

Although it is highly doubtful that Benjamin Franklin restored dead flies to life after once finding the pesky critters floating in his wine, as Britannica said he did in the 1801 Supplement to its 3rd Edition, what is not in question is that revivification-like issues are now clearly in the crosshairs of modern science.

Revivification, in physiology, the recalling to life of animals apparently dead. There are

many kinds of insects which may be revived, after all the powers of animation have been suspended for a considerable time. Common flies, small beetles, spiders, moths, bugs, etc., after being drowned in spirit of wine, and continuing apparently dead for more than a quarter of an hour, have been restored to life merely by being thrown among wood-ashes slightly warm.

While Dr Franklin resided in France, he received from America a quantity of Madeira wine which had been bottled in Virginia. In some of the bottles he found a few dead flies, which he exposed to the warm sun, it being then the month of July; and in less than three hours these apparently dead animals recovered life which had been so long suspended. At first they appeared as if convulsed; they then raised themselves on their legs, washed their eyes with their fore feet, dressed their wings with those behind, and began in a little time to fly about.

But the most extraordinary instance of revivification that we ever heard of, is the following: In the warmer parts of France there is an insect very destructive to rye, which seems to begin its operations at the root of the plant, and gradually to proceed upwards to the ear. If the plant be completely dried while the insect is in the root or stem, the animal is irrecoverably killed; but after it has reached the grain, the case is very different. There have been instances, which are noticed in the Academy of Sciences, of these insects being brought to life in a quarter of an hour, by a little warm water; after the grains, in which they were lodged, had been kept dry for 30 years.

What is the metaphysician to think of these phenomena, or what conclusion is he to draw from them with respect to the mind or sentient principle? If he be a sober man, he will draw no conclusion; and for this very good reason, that of the sentient principle of insects, and indeed of every animal but man, he knows nothing.

SLEEPY PLANTS

Vegetative Exhaustion

Daniel Ellis was a respected botanist of Edinburgh and a fellow of the Royal Society. In his

article "Vegetable Physiology," in the *Britannica Supplement* (1815–24) to its 4th, 5th, and 6th editions, he took note, rather cautiously, of an early 19th-century notion that plants, like animals, needed sleep.

Some writers, deeming plants to possess voluntary power, have from thence inferred that they require sleep. We have no proof, however, that they possess any such power; nor that, in the exercise of their ordinary functions, they experience that fatigue and exhaustion which renders sleep necessary to their restoration. All the spontaneous movements of vegetables previously described, seem to arise from the operation of physical agents, conjoined with those inherent properties which belong to them as living beings. These agents act variously on different plants; and hence some close their leaves and flowers from the abstraction of heat or moisture, and others from the exclusion of light; and this at various periods of the day, as well as through the night. Other plants exhibit spontaneous movements only in the flower, and at the season of fecundation, when suitable conditions of the atmosphere prevail: and though, in some instances, these motions continue for a time after the conditions required for their display may have been withdrawn, yet we must ascribe such motions rather to habit than to any thing that partakes of the nature of volition.

The diminution or suspension of action that occurs, through the night, to plants that inhabit temperate climes, cannot be received as a proof of sleep, induced by exhaustion of the vegetative powers; for even in such climes, vegetation, in favourable seasons, proceeds often by night as well as by day. In climates still more favourable, the same plants which produce fruits only once a-year with us, yield two or more crops; and in Norway and Lapland, where the sun, at certain periods, continues almost constantly above the horizon, the whole period between seed-time and harvest sometimes occupies only about fifty days. In such cases, little or no suspension of the vegetative functions can have taken place; nor have we the smallest reason to believe that the continued exercise of them is followed by fatigue or exhaustion sufficient to require sleep. What, therefore, has commonly been denominated the "sleep of plants," we can regard only as a diminution or suspension of the

vegetative functions, arising from the abstraction, more or less complete, of those external agents, whose presence is essential to their full operation and display.

SPONTANEOUS GENERATION

Mice and Sweaty Underwear

Want to whip up a batch of mice? Start with some unwanted clothes, say a pair of sweaty underwear, and put them in a barrel with some husks of wheat. Leave them together for 21 days: the sweat from the underwear will penetrate the wheat, transforming the moldy grain into both male and female mice, which can then mate and reproduce the more traditional way.

Absurd? Not to believers of spontaneous generation ("abiogenesis"), including Aristotle, who thought living organisms could develop from nonliving matter. After all, this notion, for thousands of years, was a convenient way of explaining the origin of life and why certain things just seemed to be always together, such as aphids on flowers, frogs in mud, mice in grain, and maggots on rotting meat. Though it became obvious in the 18th century that organisms did not develop this way, it was not until Louis Pasteur and his work on the origin of microorganisms in the 19th century that this theory was largely laid to rest. Here's *Britannica's* coverage of the topic in its entry on "Abiogenesis" from its 11th Edition (1910–11).

Abiogenesis, in biology, the term, equivalent to the older term "spontaneous generation," . . . and of more recent terms such as archegogenesis and archebiosis, for the theory according to which fully formed living organisms sometimes arise from not-living matter. Aristotle explicitly taught abiogenesis, and laid it down as an observed fact that some animals spring from putrid matter, that plant-lice arise from the dew which falls on plants, that fleas are developed from putrid matter, and so forth. T. J. Parker (*Elementary Biology*) cites a passage from Alexander Ross, who, commenting on Sir Thomas Browne's doubt as to "whether mice may be bred by putrefaction," gives a clear statement of the common opinion on abiogenesis held until about two centuries ago. Ross wrote: "So may he (Sir Thomas

Browne) doubt whether in cheese and timber worms are generated; or if beetles and wasps in cows' dung; or if butterflies, locusts, grasshoppers, shell-fish, snails, eels, and such like, be procreated of putrefied matter, which is apt to receive the form of that creature to which it is by formative power disposed. To question this is to question reason, sense and experience. If he doubts of this let him go to Egypt, and there he will find the fields swarming with mice, begot of the mud of Nylus, to the great calamity of the inhabitants."

The first step in the scientific refutation of the theory of abiogenesis was taken by the Italian Redi, who, in 1668, proved that no maggots were "bred" in meat on which flies were prevented by wire screens from laying their eggs. From the 17th century onwards it was gradually shown that, at least in the case of all the higher and readily visible organisms, abiogenesis did not occur, but that *omne vivum e vivo*, every living thing came from a pre-existing living thing.

The discovery of the microscope carried the refutation further. . . . It was due chiefly to L. Pasteur that the occurrence of abiogenesis in the microscopic world was disproved as much as its occurrence in the macroscopic world. If organic matter were first sterilized and then prevented from contamination from without, putrefaction did not occur; and the matter remained free from microbes.

TARANTULAS

Dancing Away Death

On the list of things that have inspired great artists, animal venom seldom makes the cut. Yet the bite of a spider has done just that. The lively folk dance called the "tarantella," which composers such as Chopin, Liszt, and Tchaikovsky replicated in frenetically paced piano pieces, derives directly from the long-held belief that only frenzied dancing could save one from the poisonous bite of a tarantula.

The spider's name stems from the southern Italian town of Taranto, where large spiders were commonly encountered and where the belief was strong that only by distributing the spider's poison throughout the victim's body via long and lively dance, thereby "sweating out"

Fig 10
ARANEA TARANTULA



Spider, an illustration from Encyclopædia Britannica's 1st Edition (1768–71).

the venom in a kind of exorcism by rhythm, could one survive the spider's bite and the resulting convulsions of "tarantism." This belief was reflected in Britannica's brief but telling coverage of tarantulas in its 1st Edition (1768–71).

The bite of the tarantula is said to occasion an inflammation in the part, which in a few hours brings on sickness, fainting, and difficulty of breathing: The person afterwards is affected with a delirium, putting himself into the most extravagant postures. However, this is not always the case; for they are sometimes seized with a deep melancholy. The same symptoms return annually, in some cases, for several years, and at last terminate in death. Music is said to be the only cure. It induces the patient to dance, and sweat out the poison.

TOBACCO

Noble but Stupid

Due to its continual publishing since the 18th century, Britannica provides a wonderful record of just how confused and conflicted society and the medical community have viewed tobacco and the consequences of smoking. Not until the

20th century do we find overwhelmingly negative discussions of "the weed." Prior to then, as the following series of excerpts demonstrate, it was commonly believed that a moderate use of tobacco was not only not harmful but perhaps helpful in many ways. What seemed never in doubt: tobacco's extraordinary addictiveness.

*From Britannica's 1st Edition (1768–71):
Kills Cats, Cures Toothaches, but Shrivels
the Brain*

Tobacco is either taken by way of snuff; . . . by chewing it in the mouth; or by smoking it in a pipe. It is sometimes also taken in little longish pellets put up the nose, where it is found to produce very good effects, to attract a deal of water or pituita, unload the head, resolve catarrhs, and make a free respiration. . . . Some have left this tobacco in their noses all night, but this is found to occasion vomiting the next morning. Another thing charged on this way of application is that it weakens the sight. When taken in great quantities in the way of snuff, it is found to prejudice the smelling, greatly diminishes the appetite, and in time gives rise to a phthisis [tuberculosis]. That taken in the way of smoke dries and damages the brain. Borghi, in a letter to Bartholine, mentions a person who through excess of smoking had dried his brain to that degree, that after his death there was nothing found in his skull but a little black lump, consisting of mere membranes.

Some people use the infusion of tobacco as an emetic, but it is a very dangerous and unjustifiable practice, and often produces violent vomiting, sickness, and stupidity. . . .

A drop or two of the chymical oil of tobacco, being put on the tongue of a cat, produces violent convulsions, and death itself in the space of a minute; yet the same oil used in lint, and applied to the teeth, has been of service in the tooth-ach: though it must be used by those used to the taking of tobacco, otherwise great sickness, retchings, vomitings, etc., happen.

*From Britannica's 2nd Edition (1778–83):
Not an Unhealthy Amusement*

The most common uses of [tobacco] are . . . by way of snuff . . . by chewing it in the mouth, or . . . by smoking it; and when taken

in moderation, it is not an unhealthy amusement. Before pipes were invented, it was usually smoked in segars, and they are still in use among some of the southern nations. The method of preparing these is at once simple and expeditious: A leaf of tobacco being formed into a small twisted roll, somewhat larger than the stem of a pipe, and about eight inches long, the smoke is conveyed through the winding folds which prevent it from expanding, as through a tube; so that one end of it being lighted, and the other applied to the mouth, it is in this form used without much inconvenience. But, in process of time, pipes being invented, they were found more commodious vehicles for the smoke, and are now in general use.

Among all the productions of foreign climes introduced into these kingdoms, scarce any has been held in higher estimation by persons of every rank than tobacco. In the countries of which it is a native, it is considered by the Indians as the most valuable offering that can be made to the beings they worship. They use it in all their civil and religious ceremonies. When once the spiral wreaths of its smoke ascend from the feathered pipe of peace, the compact that has been just made is considered as sacred and inviolable. Likewise, when they address their great Father, or his guardian spirits, residing as they believe in every extraordinary production of nature, they make liberal offerings to them of this valuable plant, not doubting but that they are thus secured of protection.

*From Britannica's 8th Edition (1852–60):
Poisonous, Paralyzing, but Refreshing*

Nicotine, the active principle of tobacco, is poisonous in an isolated form; hence it has been argued that the use of tobacco must be generally injurious. This has not been confirmed, however, by the usage of mankind, among whom the practice of smoking tobacco is widely and increasingly prevalent; and it appears that the excess only of its use is dangerous to health, causing a tendency to paralysis. . . .

A great deal has been written as to the effect of tobacco on the human frame, and although medical opinion has frequently been expressed against its use, and we have seen that nicotine is a powerful poison; yet there is

the strong fact, that wherever tobacco has been introduced it has been consumed with avidity, and its use among whole nations has amounted to a passion. Nor do we find that advancing civilisation checks the use of this poisonous weed; but, on the contrary, the demand for it seems to increase as society advances. . . . Doubtless, there are persons of weak digestion to whom tobacco in any form must be injurious; but there are others to whom its moderate use may be as agreeable and refreshing as tea and coffee are to most persons. In cases of this kind one's own experience is better than dogmatic rules, especially when we find so many contradictory opinions on the subject among medical men. One thing, however, is certain, that moderation must be useful, and total abstinence can do no harm.

*From Britannica's 9th Edition (1875–89):
Exhilarating, but Causes Blindness*

The influence of tobacco on health and morals has, ever since its introduction into Europe, been a fruitful subject of controversy. On all grounds, except as a medicine, it met the most uncompromising opposition when it first became known; but it was precisely the expectations entertained regarding its medicinal virtues which were completely disappointed. Burton, in the *Anatomy of Melancholy*, gives strong expression to the two views: "Tobacco, divine, rare, superexcellent tobacco, which goes far beyond all the panaceas, potable gold, and philosopher's stones, is a sovereign remedy in all diseases. A good vomit, I confess, a virtuous herb if it be well qualified, opportunely taken, and medicinally used; but, as it is commonly abused by most men, which take it as tinkers do ale, 'tis a plague, a mischief, a violent purge of goods, lands, health,—hellish, devilish, and damned tobacco, the ruin and overthrow of body and soul." Burton's meaning—that tobacco in moderation is a good thing, while its excessive use causes many physical and other evils—has many sympathizers; but the difficulty is to define moderation and excess. Among modern authorities . . . Sir Robert Christison concludes, "In many individuals who use it habitually, the smoke has an extraordinary power in removing exhaustion, listlessness, and restlessness, especially when brought on by bodily or mental fatigue, and

this property is the basis of its general use as an article of luxury." . . . On the other hand, it is asserted by the opponents of tobacco, and by the anti-tobacco societies, that the habitual use of this narcotic leads, especially in the young, to decrease of bodily and mental vigour, and specially produces symptoms of anæmia, palpitation, intermittent pulse, and other affections of the heart and circulation. It is an admitted fact that a disease of the vision—tobacco amblyopia—is contracted by smokers, and is not uncommon among those using strong heavy preparations, such as black twist. Allowing that such incidental evils may arise from even comparatively moderate indulgence in tobacco, they are after all as nothing compared to the vast aggregate of gentle exhilaration, soothing, and social comfort, extracted from the Virginian weed.

UNICORNS

Where to Find Them

One of the results of the recent Census of Marine Life (2000–10) was the discovery of some 1,200 new species and some 5,000 others awaiting description, confirming, once again, that the Age of Discovery is far from over. It was certainly very far from over when the following entry on "Mammalia" appeared in Britannica's 4th Edition (1801–09). The scientific consensus of the day was that assorted land animals, including the elusive unicorn, had yet to be discovered or fully understood. A belief in the reality of unicorns goes back some 2,000 years, and it was especially strong in the mid-18th century, due to the sketching of what reportedly was a unicorn skeleton by the great philosopher Gottfried Wilhelm Leibniz. (It was an honest mistake, the field of paleontology then very much in its infancy.) So while the unicorn is clearly a creature of legend, what continues to resonate is that humbling belief, resonant throughout Britannica, in the many mysteries of nature that still await our discovery.

Quadrupeds have . . . engaged the particular attention of naturalists in every country and in every age, and as our acquaintance with them is less difficult than with most other classes of animated nature, it is not surpris-



Unicorn, detail from "The Lady and the Unicorn" tapestry, late 15th century; in the Musée de Cluny, Paris.

ing that their form, habits, and manners are most familiar to us. Still, indeed, much remains in doubt respecting some of the foreign and rarer quadrupeds, and of some we know little more than the name. Even with regard to those which have been longest known and described, as the *lion*, the *elephant*, the *porcupine*, etc., the observations of modern naturalists and travelers have corrected several erroneous notions that had been generally received as certain. Long as this part of natural history has occupied the attention of mankind, there yet probably remain many gleanings to repay the industry of future inquirers. It is probable that the unexplored regions of Africa, America, and New Holland, may contain many quadrupeds either entirely unknown to us at present, or known only by the fossil remains that have been discovered in the bowels of the earth. There can, we think, be little doubt that the unicorn exists in Africa not far north of the Cape of Good Hope, and perhaps, at some distant period it may be as well known as the elephant or the hippopotamus is at present.

Let Science Be Our Guidepost

By Elizabeth H. Blackburn

Our planet today faces tremendous pressures: a burgeoning and aging population, accelerating climate change, polluted waters, threatened food crops, and drug-resistant diseases. Without intervention, these pressures promise to inflate to catastrophes.

Scientists stand ready to help provide solutions. For centuries we've been some of the world's great problem-solvers. We tackle all the critical issues of humanity with generations of accumulated knowledge behind us. Aided further by technological advances and groundbreaking insights, we produce reams of valuable knowledge. Unfortunately, we sometimes see this wealth go to waste. Personal prejudices or political agendas ignore scientific fact, which further endangers our world.

I propose we take a different tack. Let's initiate a unified and universal reliance on science to better protect our world and the people living in it.

We should begin by emphasizing scientific education in our children and elevating scien-

tific proficiency among our citizens. I believe we must grow knowledgeable voters, those who will continue to implement good science policy.

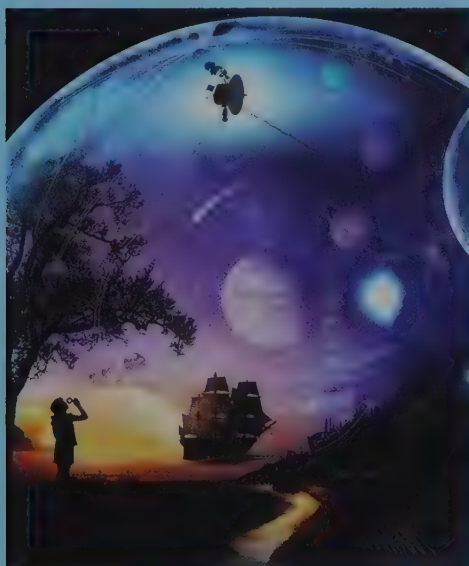
As scientists, we must strive to better explain the arduous and meticulous path that sound scientific research must follow. Few people realize how many thousands of assays must be performed, how many years of animal studies and clinical trials must be successfully completed, and how many objective reviews must be passed before a new drug can be responsibly introduced to the world. Shared information will nurture confident partnership.

In addition to the essential human benefits of scientific research, we must work to convey the material value of funding such research. We must strive to show how scientific discovery drives advancements in prosperity: spurring private investment, adding jobs and industries, and introducing commercialized products—all while reducing the socioeconomic burden of illness and disability and further supporting the planet that nourishes and sustains us.

Thus, I urge government leaders and influencers around the world to join us. Unite in a commitment to support, with our combined hearts and prosperity, the broad scientific research that can and will create a better world—one in which the planet's environment is thriving, every person has a reliable supply of nutritious food, and people live long, productive lives without fear of lingering illness or mental decline and social calamities. I believe that a universal and far-sighted agenda combined with a globally directed investment plan—one that strategically utilizes fundamental scientific discovery—will safeguard humanity's future for millennia to come.

Elizabeth H. Blackburn is the president of the Salk Institute in La Jolla, California. She won the Nobel Prize in Physiology or Medicine in 2009.

NASA



The Physical World

ASTRONOMY

On Heavenly Bodies

The scientific revolution was set in motion by the 16th-century work of Copernicus and that of his successors Tycho Brahe, Kepler, and Galileo, which extended well into the next century. Newton, in the late 17th and early 18th centuries, provided a mathematical and theoretical explanation for their discoveries. Then began what we may call the classical age of science. The word "science" at that time meant knowledge; what we call science was understood as "natural philosophy."

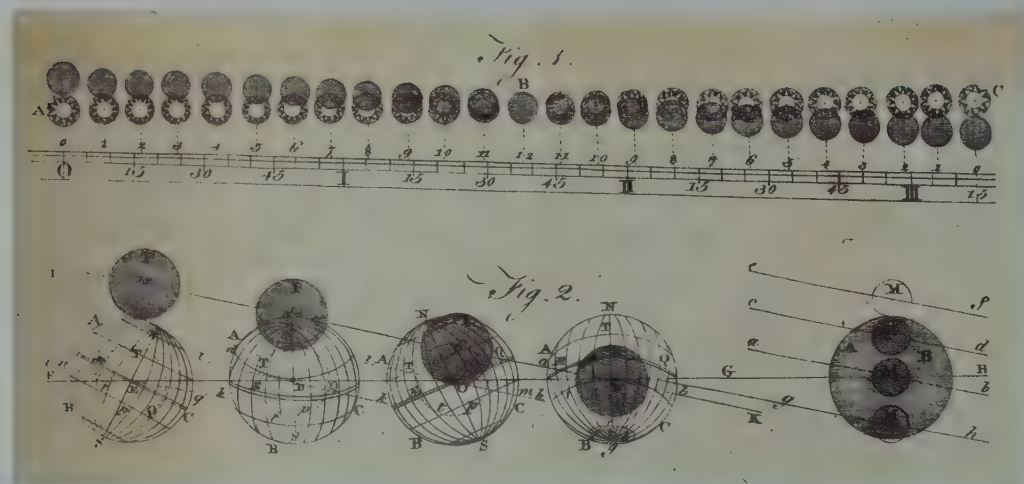
Natural philosophy was the province of all educated men, and the intellectuals of Europe were beginning to consolidate the exhilarating and unsettling revolution that had been upending European knowledge for a generation. It was a time when the educated and curious were conducting their own experiments in natural philosophy, so as to understand the astonishing inventions and discoveries of the new pioneers, whose exploits they followed assiduously through personal correspondence, in such journals as the *Philosophical Transactions of the Royal Society*, and in books.

This era of widespread intellectual ferment lasted for a century, a time never really paralleled before or since. It was amid this palpable frenzy of curiosity, in December 1768, that a series of fascicles began rolling off a press in Edinburgh, Scotland—that "hotbed of genius" and capital of the so-called Scottish Enlightenment—marking the debut of *Encyclopædia Britannica*.

A grasp of what the cosmos looked like from the perspective of this time and place is possible by reading an excerpt of the lengthy article on "Astronomy" in *Britannica's 1st Edition* (1768–71). Two points are telling; *Britannica* reflects the astounding impact of new technology on our knowledge of the universe—praising the power of new "glasses," i.e., telescopes—and positions the cosmos firmly within, not outside, the purview of the Almighty, our "beneficent Creator" of all heavenly bodies.

By astronomy we discover that the earth is at so great a distance from the sun, that if seen from thence it would appear no bigger than a point, although its circumference is known to be 25,020 miles. Yet that distance is so small, compared with the earth's distance from the fixed stars, that if the orbit in which the earth

Astronomical illustrations from Encyclopædia Britannica's 1st Edition (1768–71).



Encyclopædia Britannica, Inc.

moves round the sun were solid, and seen from the nearest star, it would likewise appear no bigger than a point, although it is at least 162 millions of miles in diameter. For the earth, in going round the sun, is 162 millions of miles nearer to some of the stars at one time of the year than at another; and yet their apparent magnitudes, situations, and distances from one another still remain the same; and a telescope which magnifies above 200 times does not sensibly magnify them; which proves them to be at least 400 thousands times farther from us than we are from the sun.

It is not to be imagined that all the stars are placed in one concave surface, so as to be equally distant from us; but that they are scattered at immense distances from one another through unlimited space. So that there may be as great a distance between any two neighbouring stars, as between our sun and those which are nearest to him. Therefore an observer, who is nearest any fixed star, will look upon it alone as a real sun; and consider the rest as so many shining points, placed at equal distances from him in the firmament.

By the help of telescopes we discover thousands of stars which are invisible to the naked eye; and the better our glasses are, still the more become visible; so that no limits can be set either to their number or their distances.

The sun appears very bright and large in comparison of the fixed stars, because we keep constantly near the sun, in comparison of our immense distance from the stars. For a spectator, placed as near to any star as we are to the sun, would see that star a body as large and bright as the sun appears to us; and a spectator, as far distant from the sun as we are from the stars, would see the sun as small as we see a star, divested of all its circumvolving planets; and would reckon it one of the stars in numbring them.

The stars, being at such immense distances from the sun, cannot possibly receive from him so strong a light as they seem to have; nor any brightness sufficient to make them visible to us. For the sun's rays must be so scattered and dissipated before they reach such remote objects, that they can never be transmitted back to our eyes, so as to render these objects visible by reflexion. The stars therefore shine with their own native and un-

borrowed lustre, as the sun does; and since each particular star, as well as the sun, is confined to a particular portion of space, it is plain that the stars are of the same nature with the sun.

It is noways probable that the Almighty, who always acts with infinite wisdom, and does nothing in vain, should create so many glorious suns, fit for so many important purposes, and place them at such distances from one another, without proper objects near enough to be benefited by their influences. Whoever imagines they were created only to give a faint glimmering light to the inhabitants of this globe, must have a very superficial knowledge of astronomy, and a mean opinion of the Divine Wisdom; since, by an infinitely less exertion of creating power, the Deity could have given our earth much more light by one single additional moon.

Instead then of one sun and one world only in the universe, astronomy discovers to us such an inconceivable number of suns, systems, and worlds, dispersed through boundless space, that if our sun, with all the planets, moons, and comets belonging to it, were annihilated, they would be no more missed, by an eye that could take in the whole creation, than a grain of sand from the seashore: The space they possess being comparatively so small, that it would scarce be a sensible blank in the universe, although Saturn, the outermost of our planets, revolves about the sun in an orbit of 4884 millions of miles in circumference, and some of our comets make excursions upwards of ten thousand millions of miles beyond Saturn's orbit; and yet, at that amazing distance, they are incomparably nearer to the sun than to any of the stars; as is evident from their keeping clear of the attractive power of all the stars, and returning periodically by virtue of the sun's attraction.

From what we know of our own system, it may be reasonably concluded, that all the rest are with equal wisdom contrived, situated, and provided with accommodations for rational inhabitants. Let us therefore take a survey of the system to which we belong; the only one accessible to us; and from thence we shall be the better enabled to judge of the nature and end of the other systems of the universe. For although there is almost an infinite variety in the parts of the creation which we

have opportunities of examining; yet there is a general analogy running through, and connecting all the parts into one great and universal system.

To an attentive considerer, it will appear highly probable, that the planets of our system, together with their attendants called *satellites* or *moons*, are much of the same nature with our earth, and destined for the like purposes. For they are solid opaque globes, capable of supporting animals and vegetable. Some of them are larger, some less, and some much about the size of our earth. They all circulate round the sun, as the earth does, in a shorter or longer time, according to their respective distances from him; and have, where it would not be inconvenient, regular returns of summer and winter, spring and autumn. They have warmer and colder climates, as the various productions of our earth require: And, in such as afford a possibility of discovering it, we observe a regular motion round their axes like that of our earth, causing an alternate return of day and night; which is necessary for labour, rest, and vegetation, and that all parts of their surfaces may be exposed to the rays of the sun.

Such of the planets as are farthest from the sun, and therefore enjoy least of his light, have that deficiency made up by several moons, which constantly accompany and revolve about them, as our moon revolves about the earth. The remotest planet has, over and above, a broad ring encompassing it; which like a lucid zone in the heavens reflects the sun's light very copiously on that planet; so that if the remoter planets have the sun's light fainter by day than we, they have an addition made to it morning and evening by one or more of their moons, and a greater quantity of light in the night-time.

On the surface of the moon, because it is nearer us than any other of the celestial bodies are, we discover a nearer resemblance of our earth. For, by the assistance of telescopes we observe the moon to be full of high mountains, large valleys, and deep cavities. These similarities leave us no room to doubt, but that all the planets and moons in the system are designed as commodious habitations for creatures endued with capacities of knowing and adoring their beneficent Creator.

Since the fixed stars are prodigious spheres of fire like our sun, and at inconceiv-

able distances from one another as well as from us, it is reasonable to conclude they are made for the same purposes that the sun is; each to bestow light, heat, and vegetation, on a certain number of inhabited planets, kept by gravitation within the sphere of its activity.

ATOMIC ENERGY

Of Concern to Philosophers

Francis William Aston (1877–1945) was an English chemist and physicist who developed the mass spectrograph to measure (with unprecedented accuracy) the mass of atoms and other fragments of molecules. For this accomplishment he won the Nobel Prize in 1922. Writing in 1924–25, he saw with absolute clarity the future—ambiguities and all—of atomic energy. The following extract is from Britannica's 13th Edition (a supplement to the 11th and 12th editions, 1926). Note the Cassandra-like echo in Aston's final words, as he posits from our staggering work in atomic research that we may "one day discover supreme material power, or cataclysmic annihilation." He sagely concludes that "how long it will be before man can release and control this energy, and to what uses he will put such vast potentialities," should be of concern to not just the scientist but also "the philosopher."

With the coming of Relativity and the discovery of Isotopes the matter took a new aspect. The whole number rule removed the last obstacle in the way of the electrical theory of matter, that all atoms are composed of protons and electrons, the atoms of positive and negative electricity. According to Rutherford's nucleus atom theory, in the atom of a normal element all the protons and about half the electrons are packed together to form a central positively charged nucleus, which is surrounded by the remaining electrons. It can be shown that if we bring two charges of opposite sign as close together as they are in the nucleus, their fields will affect each other in such a way that the mass of the system will be reduced. This reduction is called the packing effect. In the atom of hydrogen with a nucleus of a single proton there can be no packing effect, so that it will be abnormally

heavy. Measurements by means of the mass-spectrograph demonstrate conclusively that the mass of a hydrogen atom, consisting of one proton and one electron, is that accepted by chemists, namely 1.0077, whereas that of the helium atom, consisting of a nucleus of four protons and two electrons and two exterior electrons, is 4.00. Hence, whatever the explanation, it is certain that if it were possible to transmute hydrogen into helium, mass would be lost, and therefore, by the theory of relativity, energy liberated. On the latter theory, mass and energy are interchangeable, and the energy associated with a mass m is mc^2 where c is the velocity of light. For quantities of matter in ordinary experience this quantity of energy is prodigious. Take the case of one gramme atom of hydrogen, that is to say, the quantity of hydrogen in 9 cu.-cm. of water. If this is entirely transformed into helium the energy liberated will be $.0077 \times 9 \times 10^{20} = 6.93 \times 10^{18}$ ergs. Expressed in terms of heat this is 1.66×10^{11} calories or in terms of work 200,000 kilowatt hours. Within a tumbler of water lies sufficient energy to propel the "Mauretania" [one of the largest ocean liners of the day] across the Atlantic and back at full speed. Here we have a supply equal even to the demands of astronomers. Eddington remarks that if only ten per cent of the hydrogen in the sun were transformed into helium, enough energy would be liberated to maintain its present radiation for a thousand million years. There can be little doubt that the vast energy of the stars is kept up by the loss of an insignificant fraction of their mass. Whether this process is a degradation of hydrogen, or simple annihilation of matter by the coalescence of protons and electrons, is unknown. How long it will be before man can release and control this energy, and to what uses he will put such vast potentialities, are subjects for the philosopher. The first step has already been taken, for Sir Ernest Rutherford has succeeded in causing transmutation in several elements, only, of course, in inconceivably small quantities, by bombardment with swift alpha rays. If scientific knowledge maintains its present rate of progress, the balance of probability is in favour of ultimate success, but this appears so far off that almost any speculation is permissible. It may be that the operation, once started, is uncontrollable and

that the new stars which flare out from time to time are but the notification of successful large-scale experiments on far distant worlds. It may be that the highest form of life on our planet will one day discover supreme material power, or cataclysmic annihilation, in the same ocean wherein, we are told, its lowest forms originally evolved.

DEW

A Great Detergent and Diet

Dew was long considered a miracle drug of sorts. It was the "celestial wash" of antiquity, offering beauty, clear skin, a long life, and robust health. It was even, reported Britannica in the Supplement (1815-24) to its 4th, 5th, and 6th editions, a fine detergent and dietetic, proof of the latter being why few dew-drinking grasshoppers ever struggle with their weight.

The dew of heaven has always been regarded as a fluid of the purest and most translucid nature. Hence it was celebrated for that abstergent property which, according to the vulgar persuasion, enables it to remove all spots and stains, and to impart to the skin the bloom and freshness of virgin beauty. Like the elixir of later times, it was conceived to possess the power of extending the duration of human life; and Ammianus Marcellinus ascribes the longevity and robust health of mountaineers, in comparison with the inhabitants of the plains, chiefly to the frequent aspersion of dew on their gelid bodies. Dew was also employed as a most powerful agent, in all their operations, by the alchemists; some of whom pretended that it possessed such a subtle and penetrating efficacy, as to be capable of dissolving gold itself. Following out the same idea, the people of remote antiquity fancied that the external application of dew had some virtue in correcting any disposition to corpulence. The ladies of those days, anxious to preserve their fine forms, procured this celestial wash, by exposing clothes or fleeces of wool to the humifaction of the night. It was likewise imagined, that grasshoppers feed wholly on dew, and owe their lean features perhaps to such spare diet.

EMERALDS

How to Make Counterfeit Ones

In the early days Britannica articles on geological subjects ranged from giving practical advice to debunking the downright fanciful. In fact, as the reader will see in the "Emeralds" entry below from Britannica's 1st Edition (1768–71), early editors even provided instructions for counterfeiting gems, reflecting the persistence of alchemical practices.

Emerald, in natural history, a genus of precious stones, of a green colour, and next in hardness to the ruby.

Our jewelers distinguish emeralds into two kinds, the oriental and occidental: the emeralds of the East-Indies are evidently finer than those of any other part of the world; but our jewellers, seldom meeting with these, call the American emeralds the oriental, and usually sell crystal accidentally tinged with green, under the name of the occidental emerald. . . .

To Counterfeit Emeralds

Take of natural crystal, four ounces; of red-lead, four ounces; verdegrease, forty-eight grains; crocus martis, prepared with vinegar, eight grains; let the whole be finely pulverized and sifted; put this into a crucible, leaving one inch empty: lute it well, and put it into a potter's furnace, and let it stand there as long as they do their pots. When cold, break the crucible, and you will find a matter of a fine emerald colour, which, after it is cut and set in gold, will surpass in beauty an oriental emerald.

GLACIER

Nature Clad in Terror

As in the rest of the Earth sciences, Britannica's treatment of hydrology owed much to the journals of travelers who were meticulous observers. However well or badly their scientific conclusions meet the test of time, their reports often hold up beautifully as travel writing. Here is an excerpt from Britannica's 3rd Edition (1788–97).

Mr Coxe, who visited the glacier des Bois, informs us, that the appearance of it at a distance was so tremendous, that it seemed impracticable to cross it. Numerous and broad chasms intersected it in every direction; but entering upon it, the company found that courage and activity were only required to accomplish the task. They had large nails in their shoes and spiked sticks; which on this occasion were found to be particularly serviceable. . . . As our traveller proceeded on his journey, he was surprised by the noise of a large fragment of rock which had detached itself from one of the highest needles, and bounded from one precipice to another with great rapidity; but before it reached the plain, it was almost reduced to dust. "Having proceeded about an hour (says he) we were astonished with a view more magnificent than imagination can conceive: hitherto the glaciers had scarcely answered my expectations, but now they far surpassed them. Nature had clad herself in all her terrors. Before us was a valley of ice 20 miles in extent, bounded by a circular glacier of pure unbroken snow, named Takul, which leads directly to the foot of Mount Blanc, and is surrounded by large conical rocks, terminating in sharp points like the towers of an ancient fortification; to the right rose a range of magnificent peaks, their intervals filled with glaciers; and far above the rest, the magnificent summit of Mount Blanc, his highest point obscured with clouds. He appeared of such immense magnitude, that, at his presence, the circumjacent mountains, however gigantic, seemed to shrink before him, and *hide their diminished heads*. . . ."

They continued to ascend the valley of ice, the scene constantly increasing in magnificence and horror; and having walked about five miles on the ice, they arrived at last at the foot of the eminence named *Couvercle*, where they were obliged to quit the ice. The doing this was extremely dangerous, and at one place very tremendous. It was a bulging smooth rock, with a precipice of considerable depth terminated by a vast crevice in the ice, which seemed to stop all further progress: a small hollow in the middle, however, afforded room for one foot; and having fixed this, they sprung over to the other side, being helped and directed by the guides who went over first. Having gained the top of the *Couvercle*, they had a view of three of the glaciers, viz.

U.S. National Park Service



Johns Hopkins Glacier in Glacier Bay National Park and Preserve, Alaska.

that of *Talefre* to the left, *l'Echant* in front, and *Takul* on the right; all uniting that great one called the *Glacier ae Bois*. The *Couvercle* itself is a most extraordinary rock, having the appearance of a large irregular building with many sides; the substance of which is granite. Having reached the top, they were surprised with a thunder-storm, from whence they took shelter under an impending rock. The view was exceedingly magnificent; the glaciers appearing like a rugged expanse of frozen sea bounded by gigantic rocks, and terminated by Mount Blanc. A single rock appeared of a triangular figure covered with Alpine plants; and which by reason of its contrast with the rugged and snowy mountains in the neighbourhood, has obtained the name of the *Garden*.—During this, as well as other excursions among the Alps, Mr Coxe had occasion to observe that the colour of the sky was of a much deeper blue than in the lower regions.

MANURE

The Power of the Privies

In the physical world, manure remains of perennial interest. The 1801 Supplement to Britannica's 3rd Edition devoted 12 columns to it, calling continually upon the authority of a certain Mr. Middleton, who seems to have been the last word on the subject.

Manure is so essential to agriculture, that the want of it, or an improper manner of using it, is the principal cause of the sterility of a country. We have therefore treated of manures and their action at some length in the article *Agriculture* in the *Encyclopædia*; but as the theoretical part of that disquisition rests in a great measure on the doctrine of phlogiston, which is now exploded, it may not be improper to resume the subject here. . . .

What is a vegetable, considered chemically, according to the present state of our knowledge? It is, say the chemists, a compound of hydrogen, oxygen, and carbon, the proportions of which vary according to the agents which have concurred to its development, and according to the matrix which received and assimilated them, in order to create those combinations which are varied to infinity, by their forms and properties, and known by the generic terms of salt, oil, and mucilage. . . .

Perhaps it would not be proper to dismiss this subject without noticing Mr Middleton's observations on various kinds of manure, which were published in the *Transactions of the Society of Arts* for the year 1799. This gentleman agrees with Mr Parmentier in recommending the *excrementitious matter of privies* as the most powerful of all manures on some kinds of soil; but he differs from him, and we believe from most writers on agriculture, when he affirms, that *wood ashes*, when spread on the grass in February or March, are

of very little service, and that the ashes of *coal* and even of *peat* are of none upon any kind of land. He likewise affirms *soot* to be of very little value as a manure, *soapmakers waste* to be of none, or rather to be hurtful; and he seems to consider *malt-dust*, including the dust from the malt kilns, to be, after the soil of privies, one of the most powerful manures. He affirms, from his own experience, that, with respect to fertilising power, the soil of privies, compared with farm-yard dung, is in the proportion of five to one.

PHLOGISTON

Killing a Myth

Surely no scientific development of the waning 18th century was more dramatic than the dawning comprehension of the process of combustion. Almost in a stroke, the alchemists' notion of the elements of air, earth, fire, and water fell away, and the idea of the invisible fluid phlogiston as the "principle of inflammability" went up in its own smoke. This mystical theory was finally exploded by Lavoisier (1743–94). Britannica's 2nd Edition (1778–83) did its rather uncertain best to explain the moribund notion.

Phlogiston, a term used by chemists to express that invisible and very much unknown substance, which, in conjunction with heat or elementary fire, produces the phenomena of flame or ignition, and gives to metals their splendor; which, in other circumstances, contaminates the white colour of some earths and metallic calces, with black, brown, or other shades; and which in some cases renders the air noxious, and incapable of sustaining the life of animals, or supporting flame, etc., etc.

To give a definition of this *principle of inflammability*, as the phlogiston is frequently called, has hitherto been found impossible; because, it is so far from being the subject of investigation by itself, that no person has yet been able to procure it by itself; neither is it possible to expel it from any one body, without suffering it, in the very same moment, to combine with another. In the act of burning, for instance, phlogiston is discharged very co-

piously by any inflammable body; but some part, and that a very considerable one, goes to the composition of the flame. Part of the remainder is carried off by the air, and goes to the formation of soot; another part contaminates the air, and either converts part of the atmospherical air into what is called *fixable air*, or, according to others, *phlogisticates* it, while the fixable air is separated from the atmosphere itself, of which it is originally a component part: but in all this process, no part of the phlogiston is to be discovered by itself. In like manner, when iron is dissolved in the vitriolic acid, a great quantity of phlogiston is discharged: but in this case also it is altogether invisible, and incapable of being subjected to examination; the only result of this process being a kind of aerial vapour, by Dr Priestley and others called *inflammable air*: and so, in all other phlogistic processes, though we are assured that the principle is discharged in great quantity, yet it constantly eludes our most diligent search.

From this invisibility of the phlogiston, it has been concluded, either that phlogiston is the matter of fire, heat, and light, or that these elements contain it in great quantity. The arguments for this opinion seem reducible to the following. 1. Phlogiston is in some cases capable of penetrating the substance of the closest bodies, in such a manner as to be capable of reducing calcined metals to their proper state. 2. The light of the sun appears to contain phlogiston; as it will turn the calx of silver black when exposed to it, even tho' the calx is included within a glass vessel stopped in the most careful manner. In like manner, the green colour which the leaves of plants acquire from the solar light is thought to be owing to a communication of phlogiston from it. 3. Dr Priestley has determined, that the electric fluid either is the phlogiston itself, or contains it; because an electric shock will either reduce metals to a calx, or restore them from a calcined to a metallic state.

By the time the fascicles that constituted Britannica's 3rd Edition (1788–97) reached the letter P, phlogiston was no more. This brief extract lets us listen in on its last gasp and see how an encyclopedia buries a theory.

Phlogiston, a term used by chemists to express a principle which was supposed to en-

ter the composition of various bodies. Since the existence of phlogiston, as a chemical principle in the composition of certain bodies, is now fully proved to be false, we shall not trouble our readers with any farther observations on it, except adding, that although the chemists were satisfied with the proofs they gave of its reality, they were never able to exhibit it in a separate state, or show it in a pure form, unmixed with other matter.

RIVERS

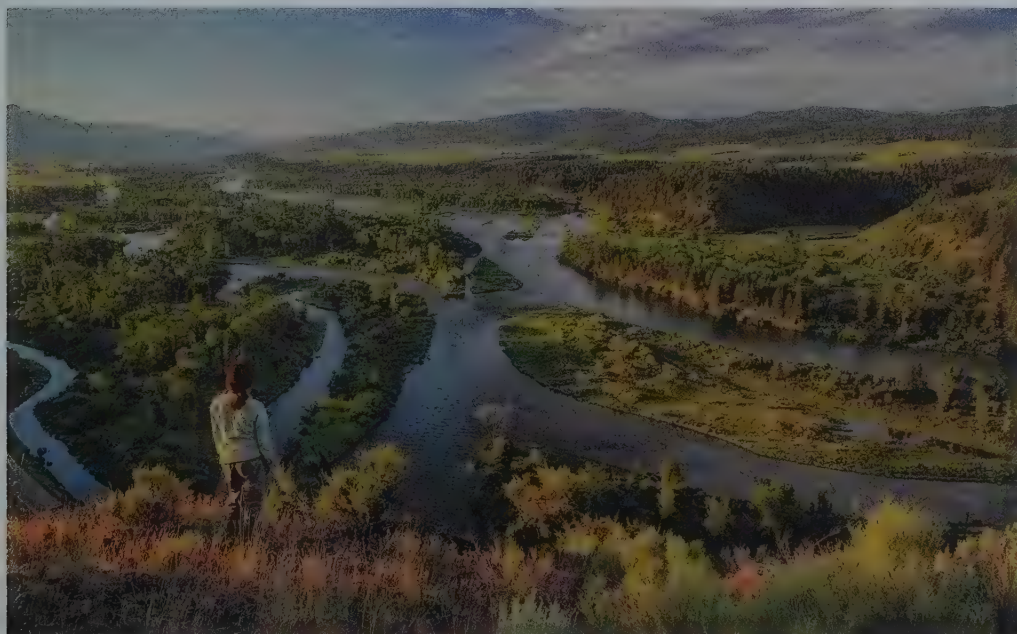
Precious Mirrors of Life

"River, (ultimately from Latin ripa, "bank"), any natural stream of water that flows in a channel with defined banks. Modern usage includes rivers that are multichanneled, intermittent, or ephemeral in flow and channels that are practically bankless."

"The river springs from the earth; but its origin is in heaven. . . . It passes through the populous cities and all the busy haunts of man, tendering its services on every side."

Both descriptions above hail from Britannica: the former from Britannica.com today, the latter from Britannica's 3rd Edition (1788–97), excerpted below. We have come to expect our science writers and reference works to be exacting and sober, dispassionate to a fault, all for the communication of accurate, unbiased information. This is all well and good. But an earlier culture of reference writers, unembarrassed by their use of allusion and metaphor, often captured in their shockingly unscientific prose insights and basic truths about the wonders of the world frequently missed in our more clinical, fact-laden treatments today. The science article below, in fact, is replete with references to Lucretius, the Old Testament, Virgil, and other classical loci, with more than one casual Latin quotation. In those happy days C.P. Snow's notorious distinction between the two cultures did not exist; the sciences had not yet been divorced from the humanities. For despite the following extract's abject floridity, Britannica's Wordsworth-like description of a river's "life" does tell us something about waterways that is absent from today's Spartan, objective treatment. Or, as Shakespeare might have put it, all the world's a stage, and one river in its time plays many parts.

South fork of the Snake River, southeastern Idaho.



Bob Wick/U.S. Bureau of Land Management

River is a current of fresh water, flowing in a bed or channel from its source to the sea.

The term is appropriated to a *considerable* collection of waters, formed by the conflux of two or more brooks, which deliver into its channel the united streams of several rivulets, which have collected the supplies of many rills trickling down from numberless springs, and the torrents which carry off from the sloping grounds the surplus of every shower.

Rivers form one of the chief features of the surface of this globe, serving as voiders of all that is immediately redundant in our rains and springs, and also as boundaries and barriers, and even as highways, and in many countries as plentiful storehouses. They also fertilise our soil by laying upon our warm fields the richest mould, brought from the high mountains, where it would have remained useless for want of genial heat.

Being such interesting objects of attention, every branch acquires a proper name, and the whole acquires a sort of personal identity, of which it is frequently difficult to find the principle; for the name of the great body of waters which discharges itself into the sea is traced backwards to one of the sources, while all the contributing streams are lost, although their waters form the chief part of the collection.

But in general their origin and progress, and even the features of their character, bear some resemblance (as has been prettily observed by Pliny) to the life of man. The river springs from the earth; but its origin is in heaven. Its beginnings are insignificant, and its infancy is frivolous; it plays among the flowers of a meadow; it waters a garden, or turns a little mill. Gathering strength in its youth, it becomes wild and impetuous. Impatient of the restraints which it still meets with in the hollows among the mountains, it is restless and fretful; quick in its turnings, and unsteady in its course. Now it is a roaring cataract, tearing up and overturning whatever opposes its progress, and it shoots headlong down from a rock; then it becomes a sullen and gloomy pool, buried in the bottom of a glin. Recovering breath by repose, it again dashes along, till tired of the uproar and mischief, it quits all that it has swept along, and leaves the opening of the valley strewn with the rejected waste. Now, quitting its retire-

ment, it comes abroad into the world, journeying with more prudence and discretion through cultivated fields, yielding to circumstances, and winding round what would trouble it to overwhelm or remove. It passes through the populous cities and all the busy haunts of man, tendering its services on every side, and becomes the support and ornament of the country. Now increased by numerous alliances, and advanced in its course of existence, it becomes grave and stately in its motions, loves peace and quiet; and in majestic silence rolls on its mighty waters, till it is laid to rest in the vast abyss.

SNOW

"A Well-Known Meteor"

Calling snow a "meteor," as Britannica did in its 2nd Edition (1778–83), will seem downright wrong to contemporary readers, until we remember that "meteor" derives from the Greek meteoron, meaning any "phenomenon in the air" and not just that streak of light that results from space debris blazing through our atmosphere; the latter is what we know as a "meteor" today and colloquially call a "shooting star." Once the original meaning of the word "meteor" is understood, the field of meteorology—meaning what weather reporters do, not the study of meteors—suddenly makes sense.

Snow, a well-known meteor, formed by the freezing of the vapours in the atmosphere. It differs from hail and hoar-frost in being as it were crystallized, which they are not. This appears on examining a flake of snow by a magnifying glass; when the whole of it will appear to be composed of fine shining spicula diverging like rays from a centre. As the flakes fall down through the atmosphere, they are continually joined by more of these radiated spicula, and thus increase in bulk like the drops of rain or hailstones. Dr Grew, in a discourse of the nature of snow, observes, that many parts thereof are of a regular figure, for the most part so many little rowels or stars of six points, and are as perfect and transparent ice as any we see on a pond, etc.

STONES

They Grow Like Vegetables?

No, said Britannica in its 3rd Edition (1788–97), excerpted below. Stones do not grow like vegetables but are simply what they are: “stones are stones” like “plants are plants,” and with this simple analysis “we content ourselves.”

As philosophers have perplexed themselves much about the origin and formation of the earth (a subject certainly far beyond the ken of the human intellect, at least if we believe that it was made by the Almighty power of God), so they have also proposed theories to explain the origin of stones. When philosophers limit their inquiries within the bound-

aries of science, where they are led by the sober and safe conduct of observation and experiment, their conclusions may be solid and may be useful; but when, throwing experiment and observation aside, they rear a theory upon an airy nothing, or upon a single detached fact, their theories will vanish before the touch of true philosophy as a romantic palace before the rod of the enchanter. . . . We content ourselves with the old opinion, that the soul is a spiritual substance; that plants are plants, and that stones are stones.

We have been led into these remarks by finding that some philosophers say that stones are vegetables; that they grow and increase in size like a plant. This theory, we believe, was first offered to the world by M. Tournefort, in the year 1702, after returning from his travels in the east.

The War on Democracy

By Madeleine K. Albright

The most important development of the 20th century was the spread of democracy. The most important lesson was that the tides of freedom will always be opposed. Now and in the future, this warning should be on our minds because democracy is undergoing a new and rigorous round of tests.

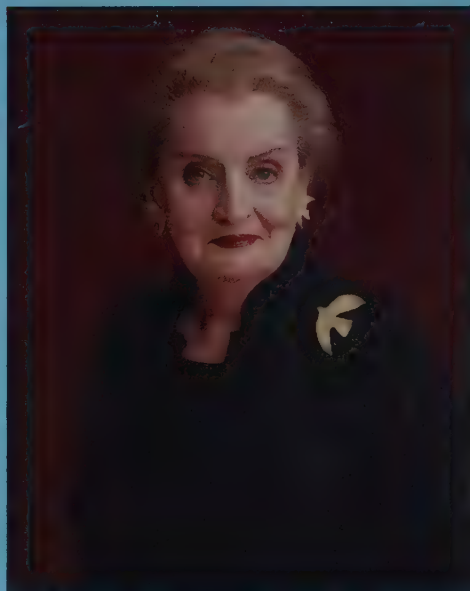
The honor roll of free countries stopped growing some time ago and has begun to shrink. Doubts about the capacity of democracy to deliver on its promises have deepened as technology has enabled people everywhere to see what others have and they do not, feeding dissatisfaction and fueling anger. Gaps have widened between rich and poor, urban and rural, the well-educated and those lacking 21st-century skills. The unprecedented mobility of people and ideas has rubbed raw feelings of economic and social insecurity, threatening cultural identity and prompting a backlash against immigrants, refugees, and religious minorities.

All this has consequences. Democratically elected leaders swept into power on the promise of change find themselves unable to meet expectations and so begin losing popularity the day they take office. Globalization—a fact of life—has become for many an evil to be resisted at all costs. In a rising number of countries, citizens profess a lack of faith in parliaments, the media, police, courts, and governing and opposition parties alike.

The lack of trust is exacerbated by the sustained propaganda campaign orchestrated by Russian Pres. Vladimir Putin, who has emerged as the leading opponent of liberal democracy in our time. He has openly mourned the demise of the Soviet Union while seeking to extend his influence over Russia's near border, to weaken NATO and the European Union, and to create a wedge between the United States and its allies.

Seventy years ago, the United States developed a containment strategy to push back against Soviet expansionism and counter the spread of communist ideology,

Portrait of Madeleine Albright, courtesy of Timothy Greenfield-Sanders (www.greenfield-sanders.com); collection of the National Portrait Gallery



confident that if we put up enough economic, military, and political pressure the Soviet system would ultimately collapse. Today, Russia is pursuing its own containment strategy against liberal democracy—using high-tech tools, such as computational propaganda and disinformation campaigns, to penetrate and undermine Western institutions, while destabilizing fragile democracies on their periphery, such as Georgia and Ukraine.

President Putin appears to think that if he applies enough pressure, liberal democratic institutions will collapse and the spread of democratic ideals will stop. But those who wish to tear democracy down can succeed only if democracy's guardians are too complacent, too divided, too timid, or too stuck in the past to stop them.

To secure the promise of liberty, small “d” democrats must band together in opposition to the repression of free institutions and in support for critical thinking, education, and truth. But above all, we must rec-

ognize that democracy's unique virtue is its ability—through reason and open debate—to find remedies for its own shortcomings. In a free country the solution to setbacks can be found—not by bowing to the false gods of nationalism and tyranny but by building better, more flexible, and responsive societies. That job is within our power to do, and we had better get on with it before it is too late.

Madeleine K. Albright is chair of the Albright Stonebridge Group, a global strategy firm, and chair of Albright Capital Management LLC, an investment advisory firm focused on emerging markets. In 1997 Dr. Albright was named the first female U.S. secretary of state

and became, at that time, the highest ranking woman in American history. From 1993 to 1997 she served as the U.S. permanent representative to the United Nations and was a member of the president's cabinet. She is a professor of diplomacy at the Georgetown University School of Foreign Service; the chair of the National Democratic Institute for International Affairs; the president of the Truman Scholarship Foundation; and a member of an advisory body, the U.S. Defense Department's Defense Policy Board. In 2012 she was chosen by President Obama to receive the nation's highest civilian honor, the Presidential Medal of Freedom, in recognition of her contributions to international peace and democracy.

William J. Clinton Presidential Library

U.S. Secretary of State Madeleine Albright and others briefing Pres. Bill Clinton on the situation in Kosovo, March 31, 1999.



People & Places

AMERICA & RUSSIA

Destined to Lead

"There are now two great nations in the world which, starting from different points, seem to be advancing toward the same goal: the Russians and the Anglo-Americans." Alexis de Tocqueville issued his famously prescient statement, seemingly predicting the Cold War to come in the next century, in *Democracy in America* (1835–40). But at least one writer had beaten Tocqueville to the punch, singling out these two countries some two decades earlier, in *Britannica* no less, in the Supplement (1815–24) to its 4th, 5th, and 6th editions. The author was Charles Maclaren, a prominent member of Edinburgh's literati, founder of The

Scotsman newspaper (1817), and editor of *Britannica*'s 6th Edition (1820–23). He delineated beautifully, in prose unparalleled in most scholarship today, what made America special (historically, culturally, and geographically) and what set it on a course to global greatness. Just as striking as his prose and prophecy was his unbridled hatred for Catholic Spain and for the old aristocracies of Europe in general.

No single event in modern history has been of so much importance to mankind as the discovery of America. That great continent, which had been hid from the eyes of civilized nations for so many ages, comprises nearly one-third of the habitable globe. In soil and climate, it rivals the best parts of the old continent. It is not, like Asia and Africa, infested

A map of Europe from the 1st Edition of the *Encyclopædia Britannica*, 1768–71.



by the larger and more dangerous species of wild animals, nor deformed by vast deserts, which present insuperable obstacles to civilization. But its great and peculiar advantage lies in the unrivalled magnitude and number of its navigable rivers, which enable its most remote inland parts to hold commercial intercourse with each other, and with foreign states, with unparalleled ease and rapidity. The position of these great rivers, whose estuaries all open to the east, points out the western side of the old continent as the region with which it is destined by nature to be most closely connected.

Two great classes of colonists, widely dissimilar in character and circumstances, came from Europe to occupy this new world. The Spaniards, who were first in order of time, took possession of the most populous and fertile regions; but their natural advantages were rendered abortive by political and moral evils,—a rapacious spirit, a corrupt religion, and a vicious system of government.

The English, the other great class of colonists, owed their better fortunes in some measure to their apparent disadvantages. Having neither gold mines to work, nor wealthy Indians to rob, they cultivated with greater diligence the natural riches of the soil, and laid the foundation of future prosperity in habits of order and industry. Neglected by the government as a band of destitute refugees, they enjoyed what was then an unusual degree of civil and religious liberty. Their industry flourished, because it was unfettered and unburdened. They were well governed, because they were left to govern themselves. And if they wanted the aid of the mother country when that aid might sometimes have been useful, they were, on the other hand, exempted from those incessant exactions and vexations to which the Spanish colonists were exposed, from the ignorant, meddling, grasping, bigoted spirit of their European rulers. The troubles they experienced from the hostility of the Indians diminished as their own numbers increased, and, except at first, were never extremely detrimental. . . . Had the Dutch, French, Danish, and Swedish colonies planted in North America spread as fast and as far as those of England, and continued separate and independent, we should have seen, in the space between the Mississippi and the Atlantic, the same medley of na-

tions and languages, with the same diversity of manners, religion, institutions, and clashing interests, which foster everlasting feuds and jealousies in Europe, engender desolating wars, load the people with oppressive taxes and military tyrannies, and present a formidable barrier to the circulation of knowledge and the progress of society. The conquests of England, which blended all these colonies into one nation, have secured to the United States an exemption from half the evils which afflict civil society in Europe, and prepared for them a career of peaceful grandeur and growing prosperity, which divided Europe cannot hope to enjoy, and which has had no parallel in the history of mankind.

The people of the United States find themselves in a condition to devote their whole energies to the cultivation of their vast natural resources, undistracted by wars, unburdened by oppressive taxes, unfettered by old prejudices and corruptions. Enjoying the united advantages of an infant and a mature society, they are able to apply the highly refined science and art of Europe to the improvement of the virgin soil and unoccupied natural riches of America. They start unencumbered by a thousand evils, political and moral, which weigh down the energies of the old world.

The volume of our history lies before them: they may adopt our improvements, avoid our errors, take warning from our sufferings, and with the combined lights of our experience and their own, build up a more perfect form of society. Even already, they have given some momentous and some salutary truths to the world. It is their rapid growth which has first developed the astonishing results of the productive powers of population. We can now calculate with considerable certainty, that America, which yet presents to the eye, generally, the aspect of an untrodden forest, will, in the short space of one century, surpass Europe in the number of its inhabitants. We even hazard little in predicting, that, before the tide of civilization has rolled back to its original seats, Assyria, Persia, and Palestine, an intelligent population of two or three hundred millions will have overspread the new world, and extended the empire of knowledge and the arts from Cape Horn to Alaska. Among this vast mass of civilized men, there will be but two languages spoken.

The effect of this single circumstance in accelerating the progress of society can scarcely be calculated. What a field will then be opened to the man of science, the artist, the popular writer, who addresses a hundred millions of educated persons?—what a stimulus given to mental energy and social improvement, when every new idea, and every useful discovery, 'will be communicated instantaneously to so great a mass of intelligent beings, by the electric agency of the post and the press? With the united intellect and resources of a society framed on such a gigantic scale, what mighty designs will then be practicable? Imagination is lost in attempting to estimate the effects of such accumulated means and powers. One result, however, may be anticipated. America must then become the centre of knowledge, civilization, and power; and the present leading states of Europe (Russia perhaps excepted), placed on the arena amidst such colossal associates as the American Republics, will sink to a subordinate rank, and cease to exert any greater influence on the fate of the world than the Swiss Cantons do at the present day.

AMERICANS

Ambitious, Litigious, and Liquored Up

American confidence and ambition, occasional cockiness and garishness—this appalled the powdered heads of 18th-century Europe. But that which disgusted the literati in Paris impressed the editors of Britannica in Edinburgh. From the latter's perspective, as seen in the excerpt below from Britannica's 4th Edition (1801–09), it was exactly this "boundless" American "thirst after gain" that held the key to understanding this new country and its people. In fact, rather than sneering at the young upstarts from "across the pond," Britannica praised this unmistakable ambition and contrasted it quite favorably with the more timid British appetite for advancement. Britannica also lauded American women, for their beauty and cleanliness, and American youth, whose great independence and adaptability on the frontier was seen as presaging a strong and promising future for their country.

Britannica was not, however, totally uncritical of Americans: the latter's rabid litigiousness had already, by 1800, become a common trait and criticism, and Britannica noted with disdain an over-affection for liquor among America's lower classes. But on the whole, the United States was portrayed as the most exciting country in the world at the start of the 19th century.

In the United States, the British character is modified by the situation in which the inhabitants of this new empire find themselves. The most general qualities common to all Americans, are understood to be, intrepidity, an ardour for enterprise, a high opinion of themselves, humanity, and a boundless love of gain. These qualities, some of which are so apparently discordant, are nevertheless found to unite in the American character. . . .

But the most remarkable feature in the American character, and indeed their ruling passion, is a boundless thirst after gain. This passion however, is in them altogether different from that timid and hoarding appetite which with us is sometimes seen to quench all the energies of the human mind, and to extinguish every generous and liberal sentiment. In truth, the avarice of an American is nothing more than the passion of ambition directed to the acquisition of wealth as the only means of attaining distinction in the state of society in which he is placed. Accordingly, he endeavours to gratify his love of riches, not so much by the slow and sure mode of saving what he already possesses, and of suffering it to accumulate, as by entering into bold and hazardous speculations, with a view to the sudden acquisition of fortune. If his speculation is unsuccessful, he thinks not the worse of himself on that account, nor is discouraged from repeatedly encountering similar hazards. If he is at last successful, his wealth is used in such a manner as evidently demonstrates, that the love of riches has not fully engrossed his mind. He is luxurious, ostentatious, generous to the unfortunate, and ready to contribute to every scheme of public benevolence or utility. Still, this ardent passion for the acquisition of money which occupies so much of the thoughts of every American, never fails to appear disgusting to men of letters, or to men of rank who have at any time gone from Europe to America. They are

astonished to find physicians, lawyers, and priests, deeply engaged in stock-jobbing and commercial speculations, and that every part of society is composed of men whose ruling passion and great subject of meditation is, the sudden acquisition in some way or other of great pecuniary gain. . . .

The manners of the Americans in their conduct towards the other sex are represented as very pure. Young women of uncommon beauty travel alone from 15 to 25 miles to Philadelphia to market with eggs, fowls, butter, and other commodities, beginning their journeys at the commencement of the night, without finding that their youth and beauty expose them to any hazard or inconvenience. . . .

One quality ascribed in a remarkable degree to the American women ought not to pass unnoticed, which is, a remarkable attention to cleanness, both in their persons and their houses. The French who took refuge in the United States during the revolution, though attentive enough in this respect to the appearance of their persons, were regarded as so slovenly and dirty in the management of their houses and furniture, that they soon rendered themselves altogether odious to the Americans. . . .

There are few American children who cannot swim boldly, and at ten years of age, manage a gun and hunt without danger; and not one who does not ride with great courage, or who fears fatigue. This liberty given to children teaches them to take care of themselves, and, bold as they are, they avoid dangers better than children brought up with much greater care. They become strong and enterprising men, whom no difficulties dishearten; and produce a growing generation, which will be as invincible in its territory, as that which preceded it was found to be. . . .

The most common vices of the American people are, an ostentatious luxury, on the part of the rich in great towns; and of the inferior class, a too free use of spirituous liquors. This they are led to by their easy circumstances, and by a great fondness for society. These vices are greater and more remarkable in the southern states than in the northern. In the south, also, men are more fond of gaming than in the north, and the energetic qualities of the American character are less conspicuous; a circumstance which is supposed to arise

from the existence of slavery, which in these states renders labour and personal industry less respectable. . . . One of the most troublesome of their faults, however, ought not to pass unnoticed: They are, upon the whole, a very litigious people, and lawyers abound and flourish among them to a great degree. . . .

Upon the whole, though men exclusively attached to the pursuits of literature, and to the enjoyment of idle but polished society, would find themselves ill situated in America, yet we must undoubtedly regard the United States as forming at this moment the most prosperous empire upon the globe. It contains an active people, easy in their circumstances and happy; and every day gives an accession of population and of strength to this new country.

AUSTRALIA

Astounding Beauty (and One-Eyed Women?)

Early editors mined their geography articles from the accounts of adventurers and travelers. Britannica's Supplement (1815–24) to its 4th, 5th, and 6th editions was the first time Britannica had assigned most of its articles to outside authorities and identified them as contributors. Since that day, it is the travelers themselves who have recounted their own observations. At first these experts were given carte blanche. Many British travelers to the Far East saw its exotic cultures through a strange mix of xenophobia and absolute cultural and moral superiority. One of these was a famous geographer and travel writer Sir John Barrow (1764–1848), later a baronet, and the man for whom Point Barrow, Alaska (among others), was named. He was second secretary of the Admiralty, a founder of the Royal Geographic Society, and had been secretary to the British ambassador to China. Out of that background came his articles "Australasia" and "China" for the aforementioned Supplement; an excerpt from the former is highlighted below.

Not for 25 years after the first settlement at Port Jackson did a British explorer penetrate farther than 30 leagues (90 miles) into the interior of Australia. Barrow related that first inland exploration, describing the pristine beauty of "this large Island, or, more properly, Continent" and noting in particular

the abundance of emu, kangaroo, and that sugary manna from Australia's "gum trees." About those one-eyed women he referenced, not much is known.

Of these journeys we are enabled to give a brief abstract. On the 19th November 1813, Mr Evans left Emu Island in the Nepean, and returned on the 8th January 1814, having performed a journey of 154 miles nearly west. At the end of 48 miles, he had cleared the ranges of mountains, which he says are granite, with loose flints and quartz pebbles strewed on the surface; and here, for the first time, he fell in with a small stream running to the westward. The farther he advanced the more beautiful the country became; both hill and dale were clothed with fine grass, the whole appearing at a little distance as if laid out into fields divided by hedge-rows; through every valley meandered trickling streams of fine water, all falling down towards the *Fish River*, so called by him from the vast abundance of fine fish resembling trout, which his party caught with ease whenever they had occasion for them. Many of the hills were capped with forest trees, chiefly of the *Eucalyptus*, and clumps of these mixed with *Mimosas* and the *Casua-*

rina, were interspersed along the feet of the hills and in the valleys, so as to wear the appearance of a succession of gentlemen's parks. The river, which at first consisted of a chain of pools, connected by small streamlets, had assumed in the neighbourhood of *Macquarrie's Plains*, the character of a considerable stream, and had become unfordable, which made it necessary to construct a bridge of large trees to transport the people, the horses, and baggage. Evans says, the country was now more beautiful than he had ever seen. A fine river, running in a deep channel over a gravelly bottom, and its banks skirted with trees, excepting at the sloping points of hills round which it winded, and which were covered with a fine green sod down to the margin, intermixed with the white daisy;—all this, added to the temperate climate, put him in mind of England. Farther on, and before they reached *Bathurst's Plains*, the river was increased considerably in size by the junction of another stream, which he called *Campbell's River*; and to the united streams, he gave the name of *Macquarrie's River*, the general direction of which appeared to be to the northward of west. Fish continued to abound of the same kind as those first caught, but of a size from 11 to 15 pounds each. Governor Macquarrie says, these fish resemble perch, are not unlike that usually called rock-cod, and have been caught from 17 to 25 pounds weight each. Large herds of emus were seen crossing the plains, and kangaroos in great abundance; but not a native human being appeared until on his return, when, near *Bathurst's Plains*, two women and four children were come upon by surprise, and were so terrified, that they fell down with fright. It was observed, that both the women had lost the right eye. . . .

From hence Mr Evans was a second time dispatched, in May 1815, to follow the course of *Macquarrie's River*. . . .

The country beyond *Bathurst* was even superior to that first explored. The vast herds of emus and kangaroos were truly astonishing. These animals, and the fish of the river, appeared to be the principal articles of subsistence for the natives. In one large plain, covered with kangaroos and emus, Evans discovered an immense quantity of a white substance, resembling comfits or sugar-plums, which he took to be manna, but which

The Founding of Australia. By Capt. Arthur Phillip R.N. Sydney Cove, Jan. 26th 1788, oil sketch by Algernon Talmage, 1937, from the State Library of New South Wales, Australia.



Mitchell Library, State Library of New South Wales (a128112)



Map of North America from Encyclopædia Britannica's 1st Edition (1768-71).

appears to be a pure saccharine substance,—an exudation probably from some particular plant. He passed whole mountains of fine blue limestone, and picked up topazes, crystals, and other pebbles, such as are met with on the coast of Bass's Strait. He also mentions forests of pines, the trees 40 feet high without a branch. . . .

If, however, but little is yet known of the interior of New Holland, and the detail of the western coast still requires to be filled up, the grand outline of this large Island, or, more properly, Continent, has been completed, and its limits correctly ascertained.

"CALLIFORNIA"

A Mysterious (but Promising) Island

"There is science, logic, reason; there is thought verified by experience. And then there is California." That sense of peculiarity—that Califor-

nia is inherently different or strangely unique—lies at the heart of the comment above (attributed to Edward Abbey) and to Britannica's early coverage of the region excerpted below. Though Britannica in the 18th century, from its offices in Edinburgh, thought this land called "Callifornia" might even be an island—in the West Indies no less—it proved prescient in its commentary a hundred years later. As it announced on the eve of the American Civil War, California "promises at no distant day" to be "great, wealthy, and powerful," "one of the first [i.e., foremost] states in the Union."

Note, in particular, two lines below: Britannica's matter-of-fact statement that its history of California will naturally begin with the territory's annexation by the United States, since anything earlier—say, the history of Mexico or of Native Americans—"presents little of interest to the general reader"; and second, Britannica's highlighting of the discrimination of the "unfortunate yellow men" of California, meaning Chinese immigrants. Britannica's comment on the latter—on the controversy that

then existed over immigrants competing for native jobs—sounds surprisingly current. Plus ça change . . .

Complete entry on "Callifornia" from Britannica's 1st Edition (1768–71):

Callifornia, a large country of the West Indies, lying between 116° and 138° W. long. [longitude] and between 23° and 46° N. lat. [latitude]. It is uncertain whether it be a peninsula or an island.

From Britannica's 2nd Edition (1778–83):

California, the most northerly of all the Spanish dominions on the continent of America, is sometimes distinguished by the name of *New Albion*, and the *Islas Carabiras*: but the most ancient appellation is *Californi*; a word probably owing to some accident, or to some words spoken by the Indians and misunderstood by the Spaniards. For a long time California was thought to be an island; but Father Caino, a German Jesuit, discovered it to be a peninsula joining to the coast of New Mexico and the southern parts of America. . . .

In a country stretching about 800 miles in length, there must be considerable variations of soil and climate; and indeed we find, from good authority, that California produces some of the most beautiful lawns, as well as many of the most inhospitable deserts, in the universe. Upon the whole, although California is rather rough and craggy, we are assured by the Jesuit Vinegas, and other good writers, that with due culture it furnishes every necessary and conveniency of life; and that, even where the atmosphere is hottest, vapours rising from the sea, and dispersed by pleasant breezes, render it of a moderate temperature. . . .

In all California there are only two garisons, each consisting of 30 men, and a soldier with every missionary. These troops were chosen by the legislators, though they are paid by the government. Were the court of Madrid to push their interest with half the zeal of the Jesuits, California might become one of the most valuable of their acquisitions, on account of the pearls and other valuable articles of commerce which the country contains.

From Britannica's 7th Edition (1830–42):

California, New, a province of Mexico, or New Spain, which extends from the isthmus of Old California, or the bay of Todos Santos, to Cape Mendocino in north lat. 40.19. . . .

The aspect of the country is exceedingly picturesque and beautiful, and the inhabitants enjoy almost a perpetual spring. On every side are presented views of magnificent forests and verdant savannahs, whose numerous herds of deer, or elks of gigantic size, graze undisturbed in their sylvan retreats. . . . The population of New California is estimated at about 15,000 souls, and its surface at 2125 square leagues.

From Britannica's 8th Edition (1852–60):

California, *Upper*, as ceded to the United States by the treaty of 1848, comprises the region between 32. 30. and 42. N. Lat. and 106. and 124. W. Long. . . .

The history of California, previous to its annexation to the United States, presents little of interest to the general reader. . . .

In [January 1848], a mechanic named Marshall, employed in building a saw-mill for Captain Sutter, on the south branch of a river known as the American Fork, while cutting a mill-lead, discovered scales of gold in the soil. Pieces of considerable size were taken out, and in a few days gold to the amount of \$150 was gathered. The news spread rapidly through the country, and examinations were prosecuted at other points along the stream, and almost everywhere with success. The towns were forthwith deserted by their male population, and a complete cessation of the whole industrial pursuits of the country was the consequence. Commerce, agriculture, mechanical pursuits, professions—all were abandoned for the purpose of gathering the glittering treasure which lay buried in the ravines, gorges, and rivers of the Sierra Nevada. In the mean time, news of the discovered *El Dorado* crossed the continent; and although its marvels were regarded by many as fabulous, there were others who either abandoned their homes for the wilderness, or sent hither valuable cargoes, from the sale of which they drew enormous profits. Under the temptations of trade and discovery, an immense em-

igration, chiefly of males, poured into California, not only from the United States, but also from Mexico, Chili, Peru, China, the Sandwich Islands, and other parts. . . . Intelligent and industrious men thronged the towns that sprang up as if by enchantment at every advantageous point. . . .

California promises at no distant day to be one of the first states in the Union. The bold and enterprising character of her present inhabitants cannot fail of rendering it a great, wealthy, and powerful state. In the ordinary elements of wealth and power, it is not behind the older states, while it far surpasses the most favoured in her inexhaustible supplies of the precious metals.

From Britannica's 9th Edition (1875–89):

California, the name originally given to a portion of the region of western North America bordering on the Pacific Ocean, and apparently taken from a Spanish romance (*Las Sergas de Esplandian*), in which the author speaks of "the great island of California, where a great abundance of gold and precious stones is found." This romance was published in 1510, and, becoming quite popular, the name of California probably struck the fancy of some one of the officers or companions of Cortez, and was applied by them to the newly-discovered country, perhaps on account of its association with a region fabulously rich in gold, the early Spanish discoverers in America always expecting to find an El Dorado in every new region they entered. . . .

The Chinese element in California is a peculiar and interesting feature. By the last census there were 49,310 of that race in the State. They are settled in great numbers in San Francisco, where they are house-servants, and operatives in the manufacturing establishments, which could not be successfully carried on with white labour. They also work the abandoned placers, although the amount of their gains in this operation must usually be very small, as they are only allowed to occupy spots supposed by the white men to have been quite worked out. [As Hittell cites in *Resources of California*,] "The white miners have a great dislike to Chinamen, who are frequently driven away from their claims, and expelled from districts by mobs. In such cases the officers of the law

do not ordinarily interfere; and, no matter how much the unfortunate yellow men may be beaten or despoiled, the law does not attempt to restore them to their rights or avenge their wrongs."

CANADA

Carioles, Sledges, and "Skaits"

Britannica maintained a high degree of interest in what remained of British North America after Britain's defeat in the American Revolution. David Buchanan, a journalist and editor of the Edinburgh Courant, lyrically recalled his observations of the extremes of climate in that vast country. The excerpt below from his article "Canada," from the Supplement (1815–24) to Britannica's 4th, 5th, and 6th editions, highlights that frigid expanse of northern whiteness called winter.

In Canada, the spring, summer, and autumn are comprehended in five months, from May to September. The rest of the year may be said to consist wholly of winter. . . . In October, frost begins to be felt, although during the day, the rays of the sun still keep the weather tolerably warm. In the succeeding month of November, the frost increases in rigour, and one snow storm succeeds another, until the whole face of the country is covered, and the eye looks in vain for one solitary spot of verdure whereon to rest. These storms are generally accompanied by a violent tempest of wind, which, driving along the snow with immense velocity, renders them tenfold more gloomy and terrific. The most severe snow storms occur in November. They generally come from the north-east, from the frozen regions of Hudson's Bay and Labrador. This gloomy and disagreeable weather frequently continues to the middle or latter end of December, when the atmosphere clears; an intense frost succeeds—the sky becomes serene, pure, and frosty, and of a bright azure hue, and this cold and clear weather generally lasts till the month of May. The snow covers the ground to the depth of several feet, so that wheel-carriages can no longer be used. Their place is supplied by *carioles*, a sort of sledges, which, being

placed on iron-runners, resembling in their form the irons of a pair of skais, pass over the hardened snow without sinking deep. Those carriages are generally light open vehicles, drawn by one horse, to which the snow, after it is trodden for some time, and hardened by the frost, offers very little resistance. In these vehicles, the Canadians travel in the most agreeable manner, and with inconceivable rapidity. So light is the draught, that the same horse will go in one day 80, and sometimes 90 miles, and the inhabitants of this cold climate always take advantage of the winter season, when they can travel so easily and expeditiously, to visit their friends who live at a distance. Covered *carioles* are sometimes used to protect the travellers from the weather. But, in general, open carriages are preferred.

About the beginning of December, all the small rivers are completely frozen over and covered with snow. Even the great river St Lawrence is arrested in its course, and from the beginning of December till the middle of April, the navigable communication is interrupted by the frost. During this period, the river from Quebec to Kingston, and between the great lakes, except the Niagara and the rapids, is wholly frozen over. . . . When the river is frozen over, it is of great advantage, . . . as it affords an easy mode of transporting into the town all sorts of bulky commodities, such as fire-wood, and other produce. It thus reduces the price of those necessary articles, . . . while by diminishing the price of carriage, it opens to the produce of the most distant parts of the country, a quick and easy access to all the most eligible markets.

The snow begins to melt in April, and the thaw is so rapid that it is generally gone by the second or third week. Vegetation then resumes its suspended powers; the fields are clothed with verdure, and spring can scarcely be said to exist before summer is at hand. In Upper Canada, the winters are much shorter than in Lower Canada, nor is the cold so intense. The spring opens, and the labours of the farmer commence six weeks or two months earlier than in the neighbourhood of Quebec. The climate is not liable to the same extremes either of heat or cold, and the weather in autumn is usually favourable for securing all the late crops.

EUROPE

Pride and Prejudices

Evident in Britannica's Supplement (1815–24) to its 4th, 5th, and 6th editions are two complementary mind-sets hardly unique to its time and place: a pride bordering on zealotry for one's own culture and a simultaneous disdain for others. The article "Europe" was written by Charles Maclaren. His introduction, printed below, opened on a note both graceful and boosterish. It then proceeded to denigrate much of the rest of the world, save for those areas populated with European transplants.

On a first view, Europe appears to be less favoured by nature than the other quarters of the globe over which it has obtained so great an ascendancy. It is much smaller in extent; its rocky and mountainous surface does not admit of those noble rivers, like inland seas, which lay open the remotest regions of Asia and America to the commerce of the world. Its vegetable productions are neither so various nor so exuberant; and it is poorly supplied with the precious metals, and with many of those commodities on which mankind set the greatest value. On the other hand, the climate of Europe, if it nourishes a less luxuriant vegetation, is of an equal and temperate kind, well adapted to preserve the human frame in that state of health and vigour which fits it for labour, and promotes the development of the intellectual and moral powers. The mountains that intersect its surface were barriers which enabled infant communities to protect themselves from violence, and to lay the foundation of arts, knowledge, and civilization. If it has few large navigable rivers, its inland seas and bays are the finest in the world, and were the means of creating and nourishing that commercial spirit which has been one great source of its improvement. Though comparatively deficient in gold and silver, it is abundantly supplied with those useful metals and minerals which minister still more essentially to the wants of civilized life.

Its apparent defects have become the source of real benefits, and the foundation of its grandeur. The disadvantages of its soil and climate have excited the industry of its inhabitants, given them clearer ideas of prop-

erty, kindled a resolute spirit to defend their rights, and called into existence that skill and enterprise, and those innumerable arts and inventions, which have enabled the inhabitants of this apparently barren and rocky promontory to command the riches and luxuries of all the most favoured regions of the globe. . . .

It is only in Europe that knowledge and the arts seem to be indigenous. Though they have appeared at times among some of the nations of Asia, they have either stopt short after advancing a few steps, or they have speedily retrograded and perished, like something foreign to the genius of the people. In Europe, on the contrary, they have sprung up at distant periods, and in a variety of situations; they have risen spontaneously and rapidly, and declined slowly; and when they disappeared, it was evident, they were but crushed for the time by external violence, to rise again when the pressure had subsided.

It is only in Europe, and among colonies of Europeans, that the powers of the human mind, breaking through the slavish attachment to ancient usages and institutions, have developed that principle of progressive improvement of which it is impossible to calculate the final results. The rudest tribe in Europe, in which this principle has taken root, has a certain source of superiority over the most improved nations of Asia and Africa, where society remains perfectly stationary. If these nations are ever destined to advance in civilization, they must borrow from Europe those arts which she has invented, and which belong to civilized life in every climate. But the tenacious adherence of rude nations to the customs and superstitions of their ancestors will not allow us to hope that the benefits of civilization will be rapidly diffused in this way. It is more probable, that colonies from the older states of Europe will multiply, as the population becomes more and more redundant; and that these colonies will carry the arts and knowledge, the language and manners of Europe with them, to the other quarters of the world.

From prejudices on both sides, it is found that two races in very different stages of civilization do not readily amalgamate; and it is therefore probable, that the feebler inhabitants of these countries, like the American Indians, will be gradually displaced by the con-

tinued encroachments of the more energetic race of Europe. Such a change, however, must take place slowly, and there is nothing in it to alarm humanity. The vast number of tribes that people Asia and Africa seem born only to be the victims of savage superstition and ferocious tyranny. . . .

Should the state of things we have been contemplating, and which seems to arise naturally out of the circumstances of Europe, and the other quarters of the globe, be realized, it will be curious to reflect on the circle of changes which will then be completed. The ancient inhabitants of Europe, as well as the modern, were originally colonies sent off from the surplus population of Asia. Here they have thrown off their barbarism, invented and improved arts and sciences, and carried their social institutions to a high degree of perfection; and now, in the maturity of their strength, they are throwing back their surplus numbers upon Asia, to conquer and supplant the remains of those tribes from whom they originally sprung.

MOORS

Their Busy Ladies

Egypt and the Barbary States lying west of it were where the Near East merged into Africa proper. To many Westerners, it was a land of enchantment, unknown perils, and mystery. Britannica described its people, the Moors of North Africa (especially the daily life of its upperclass women), in great detail in the article "Barbary States" from the Supplement (1815–24) to its 4th, 5th, and 6th editions.

The toilet of a Moorish lady is said to be formed entirely after the ancient model. No dressing-table is used; but a number of slaves attend, to each of whom a different office is assigned. One plaits and perfumes the hair, another arranges the eyebrows, a third paints them, and so on. A profusion of the richest Arabian perfumes and scented waters is used, and powdered cloves, in vast quantity, are stuffed into the hair. The eyelashes are, by a very tedious process, painted black, and, by pulling out a number of the hairs, are formed into a particular shape.

This operation, though attended with very acute pain, is cheerfully submitted to. In short, a Moorish lady cannot be fully dressed under several hours; and her appearance is then so completely altered, that her nearest relations could scarcely be able to recognize her.

These ladies [are] by no means spending their time, as usually supposed, in listless indolence. It is their task to overlook the numerous slaves who grind, spin, and perform all the necessary domestic offices. They are particularly expected to superintend the culinary operations, in order to guard against poison, the administering of which at meals is not unusual in these countries. These cares, with those of their family, fill up the time of the more amiable and domestic members of the harem; while those of a lighter turn find full occupation in the difficult and dangerous intrigues to which their disposition prompts them. With a few exceptions, however, they seem tolerably cheerful; and the view which these letters give of their character is, on the whole, favourable.

SCOTS

Not a Term of Endearment

Whether from modesty or forgetfulness, Britannica's 1st Edition (1768–71) had little to say about its homeland, Scotland: only a scant paragraph. Its 2nd Edition (1778–83) made up for this deficiency and more so, devoting some 180 pages to the country. The great bulk of this mammoth coverage was given to the colorful and frequently bloody history of Scotland, told in a lusty and vigorously partisan fashion that makes much later historiography in and out of encyclopedias seem pale and lifeless by comparison. The article also, as the reader will see below, went to great lengths to explain the origin of the Scots' name.

It is extremely difficult to give any satisfactory account of the origin of the appellation of *Scots*, from which the country has derived its name. It has puzzled the most eminent antiquaries, whose conjectures serve rather to

perplex than to clear up the difficulty. Nor is this to be wondered at, when Varro and Dionysius could not agree about the etymon of *Italia*, nor Plutarch and Solinus about that of *Rome*. All that we know with any degree of certainty, concerning the appellation of *Scot*, amounts to this—That it was at first a term of reproach, and consequently framed by enemies, rather than assumed by the nation distinguished by that name. The Highlanders, who were the genuine descendants of the ancient Scots, are absolutely strangers to the name, and have been so from the beginning of time. All those who speak the Gaelic language call themselves *Albanich* or *Gael*, and their country *Alba* or *Gaeldochd*.

The Picts, who possessed originally the northern and eastern, and in a latter period also the more southern, division of North Britain, were at first more powerful than the Caledonians of the west. It is therefore probable, that the Picts, from a principle of malevolence and pride, were ready to traduce and ridicule their weaker neighbours of Argyle. These two nations spoke the same language, the Gaelic. In that language *Scot*, or *Scode*, signifies a corner or small division of a country. Accordingly, a corner of north Britain is the very name which Giraldus Cambrensis gives the little kingdom of Argyle, which the six sons of Muredus king of Ulster were said, according to his information, to have erected in Scotland. *Scot* in Gaelic is much the same with *little* or *contemptible* in English; and *Scotlan*, literally speaking, signifies a *small flock*; metaphorically, it stands for a small body of men. (*Dr Macpherson's Dissert.*)

Others observe, that in the same language the word *Scuit* signifies a *wanderer*, and suppose that this may have been the origin of the name of *Scot*; a conjecture which they think is countenanced by a passage in Ammianus Marcellinus (1. xxvii.), who characterizes the men by the epithet of *roaming*; “*per diversa vagantes.*” (*Mr Macpherson, and Mr Whitaker.*)

All that we can say is, that for some one of the reasons couched under the above disparaging epithets, their malicious or sneering neighbours, the Picts or the Britons, may have given the appellation of *Scots* to the ancestors of the Scottish nation.

Humility: How to Save the Planet

By Bill McKibben

Human civilization faces, for the first time, questions about whether it can and will continue. Those were raised for the first time in the mid-20th century, as the first nuclear bombs exploded, making it possible to imagine an apocalypse. As J. Robert Oppenheimer, quoting from the *Gita*, said as he watched the mushroom cloud at Alamogordo: “Now, I am become Death, the destroyer of worlds.” Those titanic explosions were enough to enter the imaginations of people around the world, and so we have devoted enormous effort to stuffing that genie back inside its lantern—where, despite the best efforts of Donald Trump and Kim Jong Un, it remains.

But it was much harder for humans to imagine that the explosion of a billion cylinders in a billion pistons every minute of every day could produce damage on a similar scale—and indeed, as we now know, the fossil fuel industry devoted huge resources to making sure that we would stay in a state of confusion about global warming. That state is finally ending—most human beings, again with the notable exception of Mr. Trump, now understand the danger posed by climate change. But so far our efforts have been too small, and the damage much greater than even pessimistic scientists predicted. Even with just a degree Celsius of global temperature rise, we see wholesale destruction of ice and coral; greater rainfall; rising sea levels; spreading epidemics. As we are currently on a path for a three- or four-degree Celsius rise in global temperature (even if we meet the targets of the Paris Agreement), that damage will get exponentially worse, challenging our ability to inhabit many of the places we now live.

One way of saying this is, humans allowed themselves to get too big: our ability to blow up the world and then to overheat it turned us from relatively small parts of creation to colossi. And now we seem poised to continue that growth: the possibilities for advances in human genetic engineering, arti-

cial intelligence, and robotics seem poised to make us much larger still—perhaps so large that we are not precisely human at all any more.

None of this is set in stone, of course; it is possible that we could choose to get smaller, embracing the opportunities of renewable energy and allied technologies to reduce our impact on the planet, and summoning the same will that has reined in nuclear technology to meet the threat—increasingly perceived by the technology intelligentsia—of advances like artificial intelligence. But all depends, I think, on understanding how we have changed in relation to the size of the planet. If the result of that understanding was even a small dose of humility, we would be better positioned to take on the challenges of our time.

*Bill McKibben is a founder of the grassroots climate campaign 350.org and the Schumann Distinguished Scholar in Residence at Middlebury College in Vermont. He is a 2014 recipient of the Right Livelihood Prize, sometimes called the “alternative Nobel,” and is a founding fellow of the Sanders Institute. He has written a dozen books about the environment, including his first, *The End of Nature* (1989), and his most recent, *Radio Free Vermont* (2017).*

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Society & Culture

BACHELORS

Fine Them! Tax Them!

Beards, hats, boots, basements, windows, chimneys, wig powder, horse collars, birth, marriage, burial, bachelorhood, even urine—what do these disparate things have in common? All have been taxed at one time or another in history. Why urine? Urine contains ammonia, a precious commodity to leather tanners and launderers of ancient Rome. When Titus, Emperor Vespasian's son, suggested the urine tax was offensive, the ruler reportedly held up a coin and set his impudent son straight: "This doesn't stink!" Here's Britannica's coverage of England's bachelor tax from its 3rd Edition (1788–97).

Bachelor, . . . a common term for a man not married, or who is yet in a state of celibacy.—The Roman censors frequently imposed fines on old bachelors. . . . In England, there was a tax on bachelors, after 25 years of age, 12l. [pound] 10s. [shillings] for a duke, a common person 1s. [shilling] by [an act of William III in] 1695. In Britain, at present, they are taxed by an extra-duty on their servants. Every man of the age of 21 years and upwards, never having been married, who shall keep one male servant or more, shall pay 1l. [pound] 5s. [shillings] for each above or in addition to the ordinary duties leviable for servants. Every man of the age of 21 years and upwards, never having been married, keeping one female servant, shall pay 2s. [shillings] 6d. [pence]; 5s. [shillings] in addition for each, if he has two female servants; and 10s. [shillings] in addition for each for three or more female servants.

BOUNDS BEATING

Who Needs GPS?

Gang fights, riots, boys standing on their heads—all done in the name of community awareness? Such is the history of "beating the

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Choirboys whacking the boundaries of the Tower of London with sticks, during the "beating the bounds" custom, May 5, 1963.

bounds," an Anglo-Saxon custom more than a thousand years old that continues in some English (and even a few New England) towns today. The custom, originating at a time when maps were rare, was a celebration of community, a reinforcement of a sense of place, and a way of instilling in the younger generation an appreciation for and knowledge of the local environment.

Historically, residents would walk and retrace the physical boundaries of their community or parish district, pausing along the way to honor the rivers, hedges, fences, or walls that marked the boundaries of their area. As Britannica explained in its 11th Edition (1910–11), food might be consumed at designated spots along the way, in homage to the community, and strange traditions performed on young boys as a kind of rite of passage. These celebrations were often rowdy, at times even violent, when gangs of neighboring communities converged at the borders.

Beating the bounds, an ancient custom still observed in many English parishes. In former times when maps were rare it was usual to make a formal perambulation of the parish boundaries on Ascension day or during Rogation week. The latter is in the north of England still called "Gang Week" or "Ganging Days" from this "ganging" or procession.

The priest of the parish with the churchwardens and the parochial officials headed a crowd of boys who, armed with green boughs, beat with them the parish border-stones. Sometimes the boys were themselves whipped or even violently bumped on the boundary-stones to make them remember. The object of taking boys was obviously to ensure that witnesses to the boundaries should survive as long as possible. In England the custom is as old as Anglo-Saxon days. . . . It is thought that it may have been derived from the Roman Terminalia, a festival celebrated on the 22nd of February in honour of Terminus, the god of landmarks, to whom cakes and wine were offered, sports and dancing taking place at the boundaries.

In England a parish-ale or feast was always held after the perambulation, which assured its popularity, and in Henry VIII.'s reign the occasion had become an excuse for so much revelry that it attracted the condemnation of a preacher who declared "these solemn and accustomable processions and supplications be nowe grown into a right foule and detestable abuse."

Beating the bounds had a religious side in the practice which originated the term Rogation, the accompanying clergy being supposed to beseech (*rogare*) the divine blessing upon the parish lands for the ensuing harvest. This feature originated in the 5th century, when Mamercus, bishop of Vienne, instituted special prayers and fasting and processions on these days. This clerical side of the parish bounds-beating was one of the religious functions prohibited by the Injunctions of Queen Elizabeth; but it was then ordered that the perambulation should continue to be performed as a quasi-secular function, so that evidence of the boundaries of parishes, etc., might be preserved. . . .

Bequests were sometimes made in connexion with bounds-beating. Thus at Leighton Buzzard on Rogation Monday, in accordance with the will of one Edward Wilkes, a London

merchant who died in 1646, the trustees of his almshouses accompanied the boys. The will was read and beer and plum rolls distributed. A remarkable feature of the bequest was that while the will is read one of the boys has to stand on his head.

EDUCATING WOMEN

Teaching Them to Please

Teach them to read and write, give them a sampling of great literature, but train them, most importantly, "how to please." Ban them from a "learned education" of any depth, for which they have no need, and by all means keep them away from those "panders of vice" and corrupter of morals, meaning those damnable novelists, in whose work, like rock music in the 1950s, the "young people of the present age take delight." Such was a prominent view of educating women in the 18th century, as seen below in an excerpt from Britannica's 3rd Edition (1788-97).

Ladies have sometimes distinguished themselves as prodigies of learning. Many of the most eminent geniuses of the French nation have been of the female sex. Several of our countrywomen have also made a respectable figure in the republic of letters. Yet we cannot approve of giving girls a learned education. To acquire the accomplishments which are more proper for their sex will afford sufficient employment for their earlier years. If they be instructed in the grammar of their mother-tongue, and taught to read and speak it with propriety; be taught to write a fair hand, and to perform with readiness the most useful operations of arithmetic; if they be instructed in the nature of the duties which they owe to God, to themselves, and to society; this will be almost all the literary instruction necessary for them. Yet we do not mean to forbid them an acquaintance with the literature of their country. The periodical writers, who have taught all the duties of morality, the decencies of life, and the principles of taste, in so elegant and pleasing a manner, may with great propriety be put into the hands of our female pupil. Neither will we deny her the historians, the most popu-

lar voyages and travels, and such of our British poets as may be put into her hands without corrupting her heart or inflaming her passions. But could our opinion or advice have so much influence, we would endeavour to persuade our countrymen and countrywomen to banish from among them the novelists, those panders of vice, with no less determined severity than that with which Plato excludes the poets from his republic, or that with which the converts to Christianity, mentioned in the Acts, condemned their magical volumes to the flames. Unhappily, novels and plays are almost the only species of reading in which the young people of the present age take delight; and nothing has contributed more effectually to bring on that dissoluteness of manners which prevails among all ranks.

But we will not discover so much austerity as to express a wish that the education of the female sex should be confined solely to such things as plain and useful. We forbid not those accomplishments which are merely ornamental, and the design of which is to render them amiable in the eyes of the other sex. When we consider the duties for which they are destined by nature, we find that the art of pleasing constitutes no inconsiderable part of these; and it would be wrong, therefore, to deny them those arts, the end of which is to enable them to please. Let them endeavour to acquire taste in dress: to dress in a neat graceful manner, to suit colours to her complexion, and the figure of her clothes to her shape, is no small accomplishment for a young woman. She who is rigged out by the taste and dexterity of her maid and her milliner, is nothing better than a doll sent abroad to public places as a sample of their handy-work. Dancing is a favourite exercise: nay, we might almost call it the favourite study of their fair sex. . . .

Music, also, is an art in which the youth of the female sex are pretty generally instructed; and if their voice and ear be such as to enable them to attain any excellence in vocal music, it may conduce greatly to increase their influence over our sex, and may afford a pleasing and elegant amusement to her leisure-hours. . . .

Drawing is another accomplishment which generally enters into the plan of female education. . . .

Such are the hints which have occurred to us on the education proper for the female sex, as far as it ought to be conducted in a manner different from that of the male.

ENGLISH

Fencing Off the Perfect Language

"If the French were really intelligent, they'd speak English." Wilfrid Sheed's tongue-in-cheek chauvinism is entertaining, but linguistic hubris of the real sort has a very long history, as evidenced below in the "Language" entry from Britannica's 1st Edition (1768–71). Contrary to the popular notion today—that languages are enriched by contact with other languages—Britannica suggested a virtual fence around the language as the perfect medium for cultivating English to its purist glory.

As the people of great Britain are a bold, daring, and impetuous race of men; subject to strong passions, and, from the absolute freedom and independence which reigns among all ranks of people throughout this happy isle, little solicituous about controlling these passions;—our language takes its strongest characteristic distinction from the genius of the people; and, being bold, daring, and abrupt, is admirably well adapted to express those great emotions which spring up in an intrepid mind at the prospect of interesting events. . . . Hence it is more peculiarly adapted for the great and interesting scenes of the *Drama* than any language that has yet appeared in the globe.—Nor has any other nation ever arrived at that perfection which the English may justly claim in that respect; for however faulty our dramatic compositions may be in some of the critical niceties which relate to this art,—in nervous force of diction, and in the natural expression of those great emotions which constitute its soul and energy, we claim, without dispute, an unrivalled superiority. . . .

[English] is the language of a great and powerful nation, whose fleets surround the globe, and whose merchants are in every port; a people admired, or revered by all the world;—and yet it is less known in every foreign country, than any other language in Europe. . . . Its superior powers for every pur-

pose of language are sufficiently obvious from the models of perfection, in almost every particular; which can be produced in it;—yet it is neglected, despised, and vilified by the people who use it; and many of those authors who owe almost the whole of their fame to the excellence of the language in which they wrote, look upon that very language with the highest contempt. . . .

Like a healthy oak planted in a rich and fertile soil, [English] has sprung up with vigour: and although neglected, and suffered to be over run with weeds; although exposed to every blast, and unprotected from every violence; it still beareth up under all these inconveniences, and shoots up with a robust healthiness and wild luxuriance of growth. Should this plant, so sound and vigorous, be now cleared from those weeds with which it has been so much encumbered;—should every obstacle which now buries it under thick shades, and hides it from the view of every passenger, be cleared away;—should the soil be cultivated with care, and a strong fence be placed around it, to prevent the idle or the wicked from breaking or distorting its branches;—who can tell with what additional vigour it would flourish, or what amazing magnitude and perfection it might at last attain!—How would the astonished world behold, with reverential awe, the majestic gracefulness of that object which they so lately despised!

FAKE NEWS

American Style

James Browne (1793–1841), a distinguished Scottish journalist and editor, praised British magazines and newspapers but took a harsh view of the press in America. Lambasting American journalism and its trade in what today would be called “fake news,” his article ends on a humorously optimistic note, suggesting that no free and wise populace would ever tolerate such calumny for long. Well, the excerpt below is from Britannica’s 7th Edition (1830–42)—you do the math.

One of the most remarkable characteristics of modern, as compared with ancient times,

is the periodical press, an engine affecting society in all its relations, and forming one of the most important safeguards of public liberty. Under this head are usually included reviews, magazines, and other publications of a similar kind, as well as newspapers. But although, upon certain grave and important questions, the former sort of periodicals may contribute more to enlighten the public mind, and to guide public opinion into safe and proper channels; yet the wide diffusion of newspapers, their rapid communication of intelligence on subjects of immediate interest, their hasty and rough but often vigorous comments on the leading events of the day, and the means which they thus afford of acting immediately and constantly upon the public mind, in all its varied states, render them much more powerful as instruments of political influence, and thus secure to them a prominence to which, intrinsically, they are by no means entitled. They circulate every kind of information with equal celerity and regularity; they bring to every man’s home and fireside intelligence of all that is passing in the great world, whether at home or abroad, in war, in politics, in government, in commerce, and in the common affairs of life; they are registers of extraordinary events, as well as of ordinary occurrences, of discoveries and inventions, as well as accidents, offences, calamities, or crimes; they often diversify their contents with scientific and literary notices; and from the variety of facts and information which they contain, they are indispensable to many classes of society, and more or less agreeable or instructive to all

The increase of newspapers in the United States has been much more rapid than in England. The total number of newspapers annually issued in the Union has been estimated at from 55,000,000 to 60,000,000, whereas the total number issued in Great Britain and Ireland during the year 1833 was only 34,515,221. It follows that, making allowance for the difference of population, every individual in America has, at an average, more than twice the supply of newspapers enjoyed by each person in England. From the low price of the American, as compared with the English and even the French newspapers, they are liberally patronised by all classes, and are to be seen in almost every dwelling



geration, and which, besides the outrages it commits against individuals, opposes a serious obstacle to wise government and well-considered improvement.

No Free People Would Accept Them

No free people would ever tolerate a tax on their labor, would they? For the "inquisitorial proceedings" and bureaucracy necessary to enact such a system would constitute a kind of slavery that would undercut a nation's honor, virtue, and probity. Moreover, the entire system would have to rely on the honor system to work, constituting a tax on honesty and a bounty on fraud. This delightfully naive argument comes courtesy of John R. McCulloch, London University's first professor of political economy, who wrote the following for Britannica's 7th Edition (1830–42). McCulloch obviously never envisioned a day when technology and modern accounting would make a national income tax not only feasible but a government's chief source of revenue.

Incomes arising from the rent of land and houses, mortgages, funded property, and such like sources, may be learned with tolerable precision; but it neither has been, and, we are bold to say, never will be, possible to determine the incomes of farmers, manufacturers, dealers of all sorts, and professional men, with any thing like even the rudest approximation to accuracy. It is in vain to attempt to overcome this insuperable difficulty by instituting an odious inquiry into the affairs of individuals. It is not, indeed, very likely that any people, not altogether enslaved, would tolerate, in ordinary circumstances, such inquisitorial proceedings; but whether they did or did not, the result would be the same. The investigations would be worthless; and the commissioners of an income-tax would in the end have nothing to trust to but the declarations of the parties. Hence it is that the tax would fall with its full weight upon men of integrity, while the *millionaire* of “easy virtue” would well nigh escape it altogether. It would, in fact, be a tax on honesty, and a bounty on perjury and fraud; and, if carried to any considerable height—to such a height as to render it a prominent source of income—it would undoubtedly generate the most barefaced prostitution of principle, and would do much to obliterate that nice sense of honour which is the only sure foundation of national probity and virtue.

LUXURIES

Greed Is Good

“Greed, for lack of a better word, is good. Greed is right, greed works. Greed clarifies, cuts through, and captures the essence of the evolutionary spirit.” In fact, anyone not covetous of the creature comforts that such “greed” can provide is “savage and uncivilized,” part of the “uncivilized hordes” who are vulnerable to an “attendant train of evils” that others are immune to due to their insatiable appetites that mark success.

The first line quoted above is from Gordon Gekko’s famous speech in Oliver Stone’s hit film *Wall Street* (1987); the phrases quoted in the second line are by John R. McCulloch, London University’s first professor of

political economy, who wrote the following passage for the Supplement (1815–24) to Britannica’s 4th, 5th, and 6th editions. That the conspicuous consumption of luxuries and consumer goods just might breed some less savory attributes—such as moral laxity and cultural decadence—seemed impossible to Professor McCulloch and the Gordon Gekkos of his day, living as they did during the height of the Industrial Revolution.

It was long a prevalent opinion among moralists, that the labour bestowed on the production of luxuries, and consequently their consumption, was unproductive. But this opinion is now almost universally abandoned. . . . Every thing that stimulates exertion is advantageous. The mere necessities of life may be obtained with comparatively little labour; and those savage and uncivilized hordes, who have no desire to possess its comforts, are proverbially and notoriously indolent and dissipated. To make men industrious—to make them shake off that lethargy which is natural to them, they must be inspired with a taste for the luxuries and enjoyments of civilized life. When this is done, their artificial wants will become equally clamorous with those that are strictly necessary, and they will increase exactly as the means of gratifying them increase. Wherever a taste for comforts and conveniences has been generally diffused, the wants and desires of man become altogether unlimited. The gratification of one leads directly to the formation of another. In highly civilized societies, new products and new modes of enjoyment are constantly presenting themselves as motives to exertion, and as means of rewarding it. Perseverance is, in consequence, given to all the operations of industry; and idleness, and its attendant train of evils, almost entirely disappear.

ROCK MUSIC

A Rocky Start

Britannica’s first yearbook appeared in 1913, and then an annual Britannica Book of the Year was published continually from 1938 to 2017. This regularity of publishing offers a

wonderful way of tracing the evolution of an idea or the acceptance of a new art form, and the latter is beautifully exemplified in Britannica's running, annual commentary on the vulgarity, illiteracy, nonsense, menace, curse, and debauchery of that new form of popular music called "rock." As the reader will see in the chronological excerpts below, Britannica forms a wonderful window through which to trace rock music from its shaky beginnings in the 1950s and its gradual acceptance in the early 1960s to its solid standing as a subject worthy of academic analysis in the 21st century.

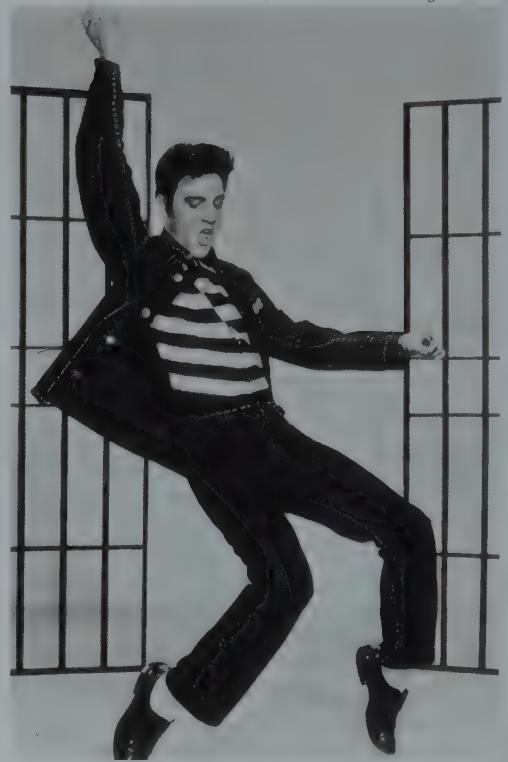
From Britannica Book of the Year 1957:

Most of the popular songs of 1956 had little to recommend them artistically, and the best of them were either revivals from the past or imitations of tried and true materials. The Elvis Presley hysteria began with a rhythmic monstrosity called "Blue Suede Shoes" and continued through "Heartbreak Hotel" to the primitive "Hound Dog." Eventually "the Pelvis" arrived at a straightforward ballad, "Love Me Tender," which served as the title of his first motion picture and was copied note for note from the old "Aura Lee," also known as "Army Blue" and "The Violet."

From Britannica Book of the Year 1958:

The year 1957 was a bad one for popular music in many ways. Not only were most of the hit tunes incredibly trashy, but serious charges were directed against many of their publishers, including accusations of bribery, monopoly and conspiracy. The low quality of much of the material heard on the air and on records . . . lent credibility to the wide-spread belief that such music did not actually represent the taste of the public.

The few good songs of the year were mostly revivals or deliberate imitations of past successes, with "Love Me Tender" (actually the "Aura Lee" of 1861) still leading the way on that barometer of popularity, the "Hit Parade." The Elvis Presley hysteria was maintained through a particularly nasty ditty called "All Shook Up," literally demonstrated by its quivering interpreter, who began to appear on the motion picture screen as well as television and records.



Elvis Presley dancing in Jailhouse Rock (1957).

From Britannica Book of the Year 1959:

The incubus of "rock 'n' roll" continued to weigh down the popular music of 1958. . . . Elvis Presley, temporarily subdued by his induction into the army, managed to hold the attention of his admirers by way of several records, including the title songs of two of his films, *Jailhouse Rock* and *King Creole*, plus "Hard Headed Woman" and "Wear My Ring Around Your Neck."

From Britannica Book of the Year 1960:

In 1959 popular music in the United States reached a new low of illiteracy, vulgarity and dullness. An index to its utter worthlessness may be found in the death of the once popular television program, "The Hit Parade," which had been for years a fairly reliable guide to honestly successful music in the lighter forms. "The Hit Parade" died because it represented only the taste of teen-agers, the largest consumer market for popular music, and gradually lost its adult audience as a re-

sult. As indicated by the weekly listings of *Variety* magazine, "the Bible of show business," hits were created through records rather than the sale of sheet music, and the success of these records depended upon the juvenile ratings of the "singers" concerned, many of whom offered little or nothing to suggest either voice or talent. . . .

The menace of "rock 'n' roll" continued through 1959, although it showed some signs of weakening. Elvis Presley's military service did not interfere noticeably with his standing as high priest of the cult, and his popularity with teen-agers accounted for at least three hits, "A Fool Such as I," "I Need Your Love Tonight," and "A Big Hunk o' Love." Ricky Nelson added to his growing reputation as a singer with "It's Late," "There'll Never Be Anyone Else But You," "Sweeter Than You" and "Just a Little Too Much." Edd Byrnes, an actor rather than a vocalist, capitalized on his television reputation in the autobiographical song "Kookie, Kookie," and the highly synthetic Fabian (generally billed as "fabulous") made some sort of record with "Turn Me Loose" and "Tiger." A song called "Lonely Boy" was Paul Anka's chief claim to fame, with "Put Your Head on My Shoulder" as a sequel.

From Britannica Book of the Year 1961:

U.S. popular music of 1960 was hardly worth discussing seriously. The curse of "rock 'n' roll" still hung heavily over most of the widely heard songs, and more than 90% of this material could be dismissed as unadulterated trash. The chief reason for this complete lack of ideals or standards in the lighter field of music may be found in the system known as "payola," by which disc jockeys were given inducements to play certain records, regardless of merit or general appeal. Their constant promotion of worthless music on the air created an utterly spurious popularity, particularly with the impressionable and musically naïve younger generation. . . .

There was a continuation of the tendency to judge a song by the sale of records rather than by the music itself, and these sales resulted from the reputations of the singers, not the composers. Actually this emphasis on records and recording stars made it possible for unknown and largely untalented writers of

words and music to get a hearing, even though their names often remained a secret with credit bestowed upon the interpreters as creators. In many cases popular young singers were hired by the recording companies to write their own material, with no questions asked as to the actual source.

Thus the public was presented with the suggestive "Handy Man," sung and supposedly written by Jimmy Jones; the deadpan Paul Anka continued the success of his "Put Your Head on My Shoulder"; Marty Robbins' "El Paso"; the Everly Brothers' "Kathy's Clown"; Sam Cooke's "Chain Gang"; and Elvis Presley's "It's Now or Never," which simply rewrote the familiar Neapolitan "O Sole Mio." Other borrowings included the aria "My Heart at Thy Sweet Voice" from Saint-Saëns' *Samson and Delilah*, recorded as "Night" by Jackie Wilson who later added the 17th "pop" version of Tchaikovsky's famous Piano Concerto theme under the title of "Alone at Last."

From Britannica Book of the Year 1962:

Once more it was difficult if not impossible to express any enthusiasm for the popular music being produced in the U.S. As of 1961 there was very little material that could be credited with either musical value or novelty. There was the same emphasis on the "big beat" characteristic of the nauseous "rock 'n' roll," although this particular type of musical illiteracy seemed gradually to be losing its hold on even the most indiscriminating teen-agers.

In the weekly "Honor Roll of Hits," published as a logical successor to the old "Hit Parade" by that authoritative magazine of show business, *Billboard*, even the titles appearing most frequently were singularly unattractive. Often they consisted of a single word—"Twist," "Kiddio," "Yogi," "Stay," "Sleep," "Hucklebuck," "Ruby," "Calcutta," "Wheels," "Runaway," "Apache" and "Cryin'."

Again the success of a popular song depended largely on phonograph records rather than sheet music, and the sale of records could be traced to the drawing power of the interpreters, not the merit or appeal of the song. The form of bribery known as "payola" reportedly continued to play an important role in such spurious promotion of commercial trash.

Elvis Presley, back in harness after completing his military service, had a hand in the creation of several hits, including "Don't Be Cruel," "It's Now or Never," "I Gotta Know," "Surrender," "Flaming Star," "Little Sister," "His Latest Flame" and "Wild in the Country" (from the motion picture of the same title). Connie Francis, the feminine idol of the teenagers, recorded "My Heart Has a Mind of Its Own," "Many Tears Ago," "Where the Boys Are," "Breakin' in a Brand New Broken Heart" and other commercially successful songs. The youthful Brenda Lee included "I Want to Be Wanted" and "Dum Dum" among her hits. Paul Anka contributed to the juvenile popularity of "Summer's Gone," "Dance On, Little Girl" and "Tonight, My Love, Tonight," with a composer's credit for the last named song.

To balance such a consistent array of nonsense, there were at least two songs published in 1961 that could command respect. The first was the theme from the motion picture *Exodus*, by Ernest Gold, whose background music for that film won an Academy award.

From Britannica Book of the Year 1963:

If no song was universally popular in the U.S. in 1962 it was because popular music remained sharply divided into separate

schools for juveniles and adults. Except in limited instances, as when café society adopted the teen-age twist for a brief period, there was very little overlapping of the two musical cultures.

The sale of 45-r.p.m. single records continued to measure the success of songs addressed to the teen-age market, and such ditties were performed mainly on radio stations that programmed their music from record charts published in trade journals. Thousands of new songs were issued, and of the small percentage that achieved hit status all were relatively short-lived in their popularity. . . .

The Tin Pan Alley hacks creating songs for a fast turnover on the singles market often gave them titles that left no doubt as to the age group they were intended for; viz., "Teenage Idol," "Venus in Blue Jeans," "Teenage Monster" and "I'm Going Back to School." Included in the year's hits was a rash of tunes titled only by a first name: "Gina," "Sherry," "Norman," "James," "Leah," "Anna" and "Sheila." There was also a plethora of absurdities, for instance, "Monster Mash," "Wiggle Wobble," "Don't Go Near the Indians," "If You Were a Rock 'n' Roll Record," "Monsters' Holiday," "Ahab the Arab" and "Hully Gully Baby." . . .

There was some improvement in the general quality of rock 'n' roll records over pre-

The Beatles at rehearsal with Ed Sullivan, February 8, 1964, the day before the band's historic TV appearance on The Ed Sullivan Show.



AP Images

vious years, mainly because the smaller recording firms that had championed the idiom in the beginning had acquired enough wealth to dignify the songs with thoughtful arrangements using brasses and strings. Rock 'n' roll was essentially the same musical ragamuffin it had been in the mid-1950s but was somewhat more attractively outfitted.

From Britannica Book of the Year 1965:

In a year that was otherwise ruled by rock 'n' roll, "Hello, Dolly," a simple, old-fashioned ditty, was without contest the top hit. Widely performed by every kind of ensemble from symphony orchestra to hillbilly band, it was one of few songs in the postwar era to enjoy popularity in all strata of U.S. society. Its best-known performances, however, were those of Carol Channing, who introduced it in the Broadway musical *Hello, Dolly!*, and Louis Armstrong, whose recording for Kapp Records made it the nation's no. 1 song during the spring. . . .

So popular was the song that both political parties wanted to parody it for the presidential campaign [of 1964]. David Merrick, who as producer of the play controlled the rights for the duration of the Broadway run, denied its use to the Republican candidate, Barry Goldwater, with the threat of a \$10 million lawsuit. Merrick advertised his partisanship by approving a "Hello, Lyndon" adaptation and loaning Miss Channing to the Democratic national convention in Atlanta City, N.J., to introduce it there. . . .

If 1964 introduced few other songs of lasting value, it was chiefly because the dominating rock 'n' roll was given to producing ephemera. After weakening in 1963 to the extent that Tin Pan Alley had almost pronounced them dead, rock music and other variations of the big beat were spurred to a comeback in the U.S. by the Beatles and such other frenetic, mop-haired groups as the Dave Clark Five, the Rolling Stones, and the Animals. . . .

* * *

Periodically, there occurs in show business a phenomenon that stirs a worldwide paroxysm of adulation, usually among the young. In the last half century, Rudolph Valentino caused such a furor through his motion pic-

tures in the early 1920s. Teen-agers responded to singer Frank Sinatra by swooning in the early 1940s and roared their approval of country and western singer Elvis Presley by screaming during his performances in the mid-'50s.

In 1964 the term "Beatlemania" was coined to describe the hysterical response of early adolescents to the music of four young instrumentalist-singers from Liverpool, Eng. The quartet called themselves the Beatles because they played "beat," or heavily rhythmized music. . . .

The Beatles made their first trip to the United States in February 1964 to appear on the Ed Sullivan network television show and to make a few personal appearances. Their first U.S. public performance on Feb. 12 at Carnegie Hall in New York City was completely sold out for two performances. Also, in a foretaste of what was to come, the predominantly teen-age audience all but drowned out the entire concert with its squealing. The Beatles were described by one critic as "an energetic, good-humored group of youngsters who have combined an unusual appearance with a mixture of some familiar rhythms and harmonies." The unique appearance referred to was the quartet's long hair style, which another commentator said looked like "the thatch on an unkempt cottage."

From the entry "Rock" at Britannica.com, written by Simon Frith, a sociomusicologist at the University of Edinburgh:

How, then, should rock's contribution to music history be judged? One way to answer this is to trace rock's influences on other musics. Another is to attempt a kind of cultural audit. (What is the ratio of rock masterworks to rock dross?) But such approaches come up against the problem of definition. Rock does not so much influence other musics as colonize them, blurring musical boundaries. Any attempt to establish an objective rock canon is equally doomed to failure; rock is not this sort of autonomous, rule-bound aesthetic form.

Its cultural value must be approached from a different perspective. The question is not How has rock influenced society? but rather How has it reflected society? From the musician's point of view, for example, the most important change since the 1950s has been in the division of music-making labour.

When Elvis Presley became a star, there were clear distinctions between the work of the performer, the writer, the arranger, the session musician, the record producer, and the sound engineer. By the time Public Enemy was recording, such distinctions had broken down from both ends: performers wrote, arranged, and produced their own material; engineers made as significant a musical contribution as anyone else to the creation of a recorded sound. Technological developments—multi-track tape recorders, amplifiers, synthesizers, and digital equipment—had changed the meaning of musical instruments; there was no longer a clear distinction between producing a sound and reproducing it.

From a listener's point of view too, the distinction between music and noise changed dramatically in the second half of the 20th century. Music became ubiquitous, whether in public places (an accompaniment to every sort of activity), in the home (with a radio, CD player, or cassette player in every room), or in blurring the distinction between public and private use of music (a Walkman, boom box, or karaoke machine). The development of the compact disc only accelerated the process that makes music from any place and any time permanently available. Listening to music no longer refers to a special place or occasion but, rather, a special attention—a decision to focus on a given sound at a given moment.

Rock is the music that has directly addressed these new conditions and kept faith with the belief that music is a form of human conversation, even as it is mediated by television and radio and by filmmakers and advertisers. The rock commitment to access—to doing mass music for oneself—has survived despite the centralization of production and the ever-increasing costs of manufacture, promotion, and distribution. Rock remains the most democratic of mass media—the only one in which voices from the margins of society can still be heard out loud. Yet, at the beginning of the 21st century, rock and the music industry faced a new crisis. The development of digital technology meant that music could now be stored on easy-to-use digital files, which could in turn be transferred from personal computer to personal computer via the Internet. The resulting legal and corporate disputes about new digital formats such as MP3 and services such as Napster reflected

both new commercial opportunities (musical rights holders had visions of making money every time a song was downloaded) and fears (that their songs would be exchanged without any money changing hands at all).

Beginning in late 1999, the Recording Industry Association of America, Bertelsmann AG, and some artists sued Napster, an Internet company whose “peer-to-peer” file-sharing program allowed users to download music for free. Artists lined up on either side of the issue. In the end Bertelsmann became the majority owner of Napster, anxious to provide a fee-based service. But this was only the beginning of what became an ongoing process of both trying to prevent the free exchange of digital music (by extending copyright protection and pursuing both “illegal” Internet services and their users through the courts and by the use of different technologies of “digital rights management”) and developing new paid downloading systems (such as Napster and iTunes). So far, and despite iTunes' commercial success, the record industry's attempt to halt the development of the Internet as the source of free music has been unsuccessful, and more farsighted entrepreneurs focused instead on the development of new ways to make money out of music rights.

While the issues here are new, the story line is not. Again, an emergent technology has meant new commercial opportunities being explored and developed by fledgling entrepreneurs before being absorbed and reordered by larger corporations, though these are now as likely to be telecommunications or computer companies as they are music companies. Even more striking is how much the new ways of using the Web have drawn on rock practices. The many file-sharing services that followed Napster have similarly involved a global network of home “tapers” and have drawn on the rock ideology of DIY, community, and anti-commerce. Networking sites such as MySpace and YouTube were quickly adopted by rock groups and rock fans whose use of the new promotional possibilities became a model for other entertainment sectors.⁹ However the various legal and economic issues are resolved, rock music will certainly be central to 21st-century ways of doing things. Rock, in short, not only reflects (and reflects on) social and cultural change; it is also a social force in its own right.

SCHOOLTEACHERS

Underpaid, Unappreciated Even Then!

Schoolteachers are routinely underpaid and unappreciated—this is hardly shocking news. But what may be surprising is that Britannica conveyed these very sentiments as early as its 4th Edition (1801–09), as seen below.

We will venture to say, that there is no class of men to whom a nation is so much indebted as to those employed in instructing the young: For if it be education that forms the only distinction between the civilized and the savage, much certainly is due to those who devote themselves to the office of instruction. It must be the duty therefore of every state to take care that proper encouragement be given to those who undertake this office. There ought to be such a salary as would render it an object of ambition to men of abilities and learning, or at least as would keep the teacher respectable. In Scotland, the office of a schoolmaster was formerly much

more lucrative than at present, and most of that class had received liberal education; and this is the reason why the common people in Scotland have been famous even to a proverb, for their learning. But at present the salary of a country schoolmaster, independent of fees for scholars, is not greater than a ploughman can earn, being seldom more than 8l. 6s. 8d. the consequence of which is that this, which is in fact an honourable, because an useful profession, is now sinking into contempt. It is no longer an object to a man of learning; and we must soon be satisfied with schoolmasters that can read, write, and cast accounts, a little better than the lowest of the people, or who from some natural deformity are unable to exercise a trade. And what in this case must become of the minds of the common people? They must be totally uncultivated. . . .

We are willing to hope, then, that the government and the moneyed men of the nation, who alone have property to lose and money to bestow, will at length find it to be their interest to patronize schoolmasters.

Typographic Man, R.I.P.

By Lewis Lapham

*"I speak Spanish to God, Italian
to women, French to men, and
German to my horse."*

—Charles V

But in which language does one speak to a machine, and what can be expected by way of a response? And if our languages these days are for the most part being made by and for machines, how and where do we find the words with which to conceive a politics or a future fit for human beings? Increasingly over the last 50 years, we have learned to live in a world in which it is the thing that thinks and the man who is reduced to the state of a thing.

America's democratic republic is founded on the meaning and value of words; so is the structure of what goes by the name of civilization. The Internet assigns no meaning to the value of words; neither does Pres. Donald J. Trump, figurehead for the spirit of an age convinced that money is the hero with a thousand faces, technology the salvation of the human race.

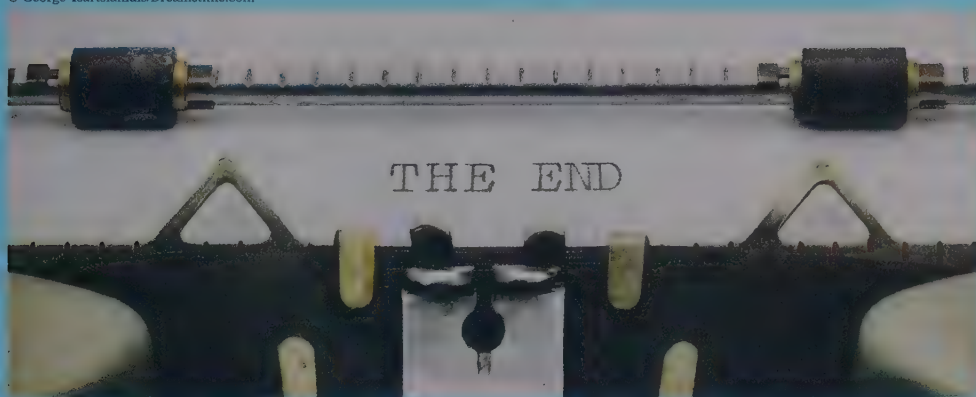
Machines can scan the flesh and track the heartbeat, cue the GPS and ATM, arrange the trades for Goldman Sachs and Tinder, manufacture the content of our news and social media. They collect and store the dots but connect them to nobody but themselves. Technology neither knows nor cares to know who or what or where is the human race, why or if it is something to be deleted, sodomized, or saved. Siri, Watson, and Alexa can access the Library of Congress, but not knowing what words mean, the bots don't read the books, can't hack into the vast store of human consciousness and emotion (history, art, literature, religion, philosophy, poetry, and myth) that is the making of ourselves as once and future human beings.

Our machine-made consciousness (the Internet's and President Donald Trump's) is the consequence of what Marshall McLuhan recognized in 1964 as a new age of infor-

mation in which "the medium is the message." His *Understanding Media* understood media as "make happen agents," not as "make aware agents," not as art or philosophy but as systems comparable to roads and sewers. "We become what we behold"; we shape our tools and thereafter they shape us. Shift the means of communication from the printed page to the electronic screen, and they establish new rules for what counts as knowledge. The visual order of print sustains a sequence of cause and effect, tells a story with beginning, middle, and end. The electronic media favor a sensibility that runs around in circles, eliminate the dimensions of space and time, construct a world in which nothing follows from anything else. Sequence becomes additive instead of causative. "Graphic Man" replaces "Typographic Man," and the time is always now, the images of wealth and power signifying nothing other than their own momentary magnificence.

Machines promote the sale of a product, discount the expression of a thought. The constant viewer's participation in the ever-present promise of a paradise regained underwrites what McLuhan identified as "the huge educational enterprise that we call advertising." Not the teaching of man's humanity to man; the gathering and processing of exploitable social data by "the Madison Avenue frogmen-of-the-mind" intent upon retrieving sunken subconscious treasure of human credulity and desire, ignorance, and fear. Madison Avenue frogmen have evolved over the last 50 years into Silicon Valley data-mining dwarves equipped with ever more efficient tools to dig for gold. Advertising is the voice of money talking to money, a dialect defined by Toni Morrison in her 1993 Nobel Prize acceptance speech as "language that drinks blood," dumb, predatory, and sentimental, prioritized to sanction ignorance and preserve privilege.

Which is the language in which we do our shopping, our higher education, and



our politics. Typographic Man wrote the Constitution and the Gettysburg Address. Graphic Man elects the president of the United States. The media on the campaign trail with Donald Trump weren't following a train of thought. Like flies to death and honey, they were drawn to the splendor and flash of money, to the romance of crime and the sweet decaying smell of divine celebrity. The camera sees but doesn't think, makes no meaningful distinction between a bubble bath in Las Vegas staffed by pretty girls and a blood bath in Palmyra staffed by headless corpses. It didn't matter what Trump said or didn't say, whether he was cute and pink or headless. He was maybe short on sense and sensibility, but he was long on market share. He stands and serves as product placement in and for and from a world in which it is the thing that thinks, the man who is reduced to the state of a thing.

The finite resources of the planet cannot accommodate the huckster capitalism sales promotion of unlimited economic growth and greatness. Too many people coming into the world, no miracle of loaves and fishes to feed the multitude. The collateral damage—overpopulation, environmental degradation and climate change, unredeemable debt, extinction of species, pandemic disease, never-ending war—suggests that if left to its own devices the voracious

global consumer market must devour and destroy the earth. Not with malice aforethought but because it is a machine, and like all machines (among them President Trump, the atomic bomb, and Google) knows not what else to do.

Our technologies produce wonder-working weapons and information systems, but they don't know at whom or at what they point the digital enhancements. Unless we find words with which to place them in the protective custody of the humanities—languages that hold a common store of human value and therefore the hope of a future fit for human beings—we surely will succeed in murdering ourselves with our shiny new windup toys.

The founder and editor of Lapham's Quarterly (2007–), Lewis Lapham was for 30 years (1976–2006) editor of Harper's Magazine. He is the author of 14 books of essays, among them Money and Class in America, Theater of War, The Wish for Kings, and, most recently, Age of Folly. Lapham's writing over the years has prompted the New York Times to liken him to H.L. Mencken, Vanity Fair to suggest a resemblance to Mark Twain, and Tom Wolfe to compare him to Montaigne. He was inducted into the American Society of Magazine Editor's Hall of Fame in 2007. A member of the Council on Foreign Relations, Lapham lives in New York City.

Technology

FLYING

Where's My Wings?

Although modest mechanical improvements in the means of highway travel were made throughout Britannica's first century, the revolution set off by the internal combustion engine did not occur until after the time of the 9th Edition (1875–89). Curiously enough, however, the invention of the railway and the revolutions in sea and air travel began virtually with Britannica's 1st Edition (1768–71). The pages of every edition are filled with reports of the newest developments in these modes of transportation.

While it was occurring to Andrew Bell, one of Britannica's two founders, to publish an encyclopedia in Edinburgh, Henry Cavendish was determining that hydrogen was lighter than air, a discovery that led Joseph Black and others to conclude that a lightweight sac of hydrogen ought to float in air. James Tytler, an Edinburgh chemist and contemporary of these men, was editor of Britannica's 2nd Edition (1778–83) and a portion of the 3rd (1788–97). Interested in the possibility of flight, he wrote the article "Flying" in the 3rd, describing the flight of birds, then recounting various speculations in human flight, including those of Britain's famous scientific pioneer Roger Bacon. Now, what exactly Tytler meant by his interjection of "Fa," after Friar Bacon's famous and fanciful claim that man had already succeeded in flying, is anyone's guess, but it hardly seems a credulous endorsement, an attitude sometimes attributed to Tytler.

The excerpt below is from the 2nd Edition. If Tytler, a trained scientist, was no naif, he nonetheless grew wholly absorbed with the possibilities of human flight, and when the 2nd Edition was complete he became a passionate experimenter with balloons. In fact, he is often cited as the first Briton to ascend in one—i.e., "the first Briton to fly"—albeit briefly and almost disastrously. As a consequence, he came to be called "Balloon Tytler."

Excerpts from Britannica's 9th Edition (1875–89) and 11th (1910–11) follow as well, to continue our look at the evolution of flight.

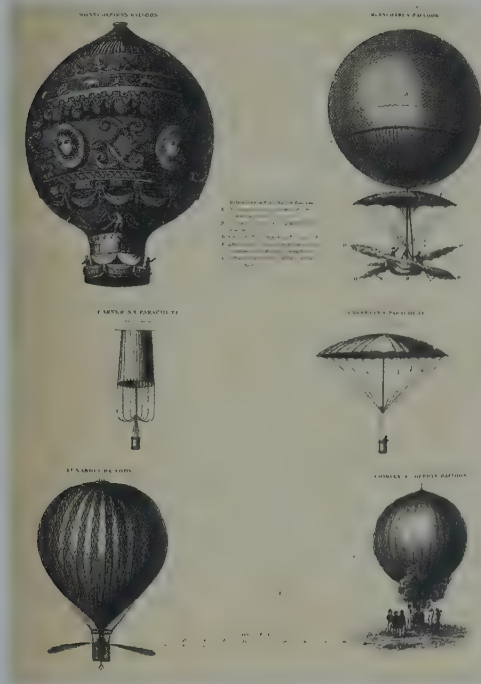
Friar Bacon, who lived near 500 years ago, not only affirms the art of flying possible, but assures us, that he himself knew how to make an engine wherein a man sitting might be able to convey himself through the air like a bird; and further adds, that there was then one who had tried it with success. The secret consisted in a couple of large thin hollow copper-globes exhausted of air; which being much lighter than air, would sustain a chair, whereon a person might sit. Fa. Francisco Lana, in his *Prodromo*, proposes the same thing, as his own thought. He computes, that a round vessel of plate-brass, 14 foot in diameter, weighing three ounces the square foot, will only weigh 1848 ounces; whereas a quantity of air of the same bulk, will weigh $2155\frac{2}{3}$ ounces; so that the globe will not only be sustained in the air, but will carry with it a weight of $373\frac{2}{3}$ ounces; and by increasing the bulk of the globe, without increasing the thickness of the metal, he adds, a vessel might be made to carry a much greater weight.—But the fallacy is obvious: a globe of the dimensions he describes, Dr Hook shews, would not sustain the pressure of the air, but be crushed inwards. Beside, in whatever ratio the bulk of the globe were increased, in the same must the thickness of the metal, and consequently the weight, be increased: so that there would be no advantage in such augmentation.

The same author describes an engine for flying invented by the Sieur Besnier, a smith of Sable, in the county of Maine.

The philosophers of king Charles the second's reign were mightily busied about this art. The famous bishop Wilkins was so confident of success in it, that he says, he does not question but, in future ages, it will be as usual to hear a man call for his wings, when he is going a journey, as it is now to call for his boots.

Here is more from Tytler's "Aërostation" article (3rd Edition, 1788–97), recreating the sensation of ballooning in 1785.

On the 8th of September 1785, at forty minutes past one P.M. Mr Baldwin ascended from Chester in Mr Lunardi's balloon. After tra-



Early hot-air balloons, an illustration from Encyclopædia Britannica's 3rd Edition (1788-97).

versing in a variety of different directions, he first alighted, at 28 minutes after three, about twelve miles from Chester, in the neighbourhood of Frodsham; then reascending and pursuing his excursion, he finally landed at Rixtonmoss, five miles N.N.E. of Warrington, and 25 miles from Chester. Our limits will not admit of relating many of his observations; but the few following are some of the most important and curious. The sensation of ascending is compared to that of a strong pressure from the bottom of the car upwards against the soles of his feet. At the distance of what appeared to him seven miles from the earth, though by the barometer scarcely a mile and a half, he had a grand and most enchanting view of the city of Chester and its adjacent places below. The river Dee appeared of a red colour; the city very diminutive; and the town entirely blue. The whole appeared a perfect plain, the highest building having no apparent height, but reduced all to the same level, and the whole terrestrial prospect appeared like a coloured map. Just after his first ascent, being in a well-watered and maritime

part of the country, he observed a remarkable and regular tendency of the balloon towards the sea; but shortly after rising into another current of air, he escaped the danger: this upper current, he says, was visible to him at the time of his ascent, by a lofty sound stratum of clouds flying in a safe direction. The perspective appearance of things to him was very remarkable. The lowest bed of vapour that first appeared as cloud was pure white, in detached fleeces, increasing as they rose: they presently coalesced, and formed, as he expresses it, a sea of cotton, tufting here and there by the action of the air in the undisturbed part of the clouds. The whole became an extended white floor of cloud, the upper surface being smooth and even. Above this white floor he observed, at great and unequal distances, a vast assemblage of thunder-clouds, each parcel consisting of whole acres in the densest form: he compares their form and appearance to the smoke of pieces of ordnance, which had consolidated as it were into masses of snow, and penetrated through the upper surface or white floor of common clouds, there remaining visible and at rest. Some clouds had motions in slow and various directions, forming an appearance truly stupendous and majestic. Mr Baldwin truly gives a curious description of his tracing the shadow of the balloon over tops of volumes of clouds. At first it was small, in size and shape like an egg; but soon increased to the magnitude of the sun's disc, still growing larger, and attended with a most captivating appearance of an iris encircling the whole shadow at some distance round it, the colours of which were remarkably brilliant. The regions did not feel colder, but rather warmer, than below. The sun was hottest to him when the balloon was stationary. The discharge of a cannon when the balloon was at considerable height, was distinctly heard by the aeronaut; and a discharge from the same piece, when at the height of 30 yards, so disturbed him as to oblige him for safety to lay hold firmly of the cords of the balloon. At a considerable height he poured down a pint-bottle full of water; and as the air did not oppose a resistance sufficient to break the steam into small drops, it mostly fell down in large drops. In the course of the balloon's tract it was found much affected by the water (a circumstance observed in former aerial voyages).

At one time the direction of the balloon kept continually over the water, going directly towards the sea, so much as to endanger the aeronaut; the mouth of the balloon was opened and he in two minutes descended into an under current blowing from the sea: he kept descending, and landed at Bellair farm in Rinsley, 12 miles from Chester. Here he lightened his car by 31 pounds, and instantly reascending, was carried into the interior part of the country, performing a number of different manoeuvres. At his greatest altitude he found his respiration free and easy. Several bladders which he had along with him crackled and expanded very considerably. Clouds and land, as before, appeared on the same level. By way of experiment, he tried the upper valve two or three times, the neck of the balloon being close; and remarked, that the escape of the gas was attended with a growling noise like millstones, but not near so loud. Again, round the shadow of the balloon, on the clouds he observed the iris. A variety of other circumstances and appearances he met with, is fancifully described; and at 53 minutes past three he finally landed.

When Britannica's 9th Edition (1875–89) began to appear, its first volume featured a new "Aeronautics" article by one of the most distinguished balloon pilots of the day, James Glaisher, a fellow of the Royal Society, first president of the Royal Meteorological Society, and a founder of the Aeronautical Society of Great Britain. Glaisher, who had himself ascended in a balloon to the remarkable altitude of 37,000 feet in 1862, touched on the development and use of the parachute. Early experiments with flight were fraught with danger, as will be seen below.

Jordaki Kuparento, a Polish aeronaut, is the only person who ever made any real use of a parachute. He ascended from Warsaw on July 24, 1808, in a fire-balloon, which, at a considerable elevation, took fire; but being provided with a parachute, he was enabled to effect his descent in safety.

The next experiment made with a parachute was that which resulted in the unfortunate death of Mr Robert Cocking. . . . The great defect of Garnerin's umbrella-shaped parachute was its violent oscillation during descent, and Mr Cocking considered that if

the parachute were made of a conical form (vertex downwards), the whole of this oscillation would be avoided; and if it were made of sufficient size, there would be resistance enough to check too rapid a descent. He therefore constructed a parachute on this principle, the radius of which at its widest part was about 17 feet. It was stated in the public announcements previous to the experiment that the whole weighed 223 lb; but from the evidence at the inquest it appeared that the weight must have been over 400 lb. Mr Cocking's weight was 177 lb, which was so much additional. On July 24, 1837, the trial took place; and the Nassau balloon, with Mr Green and Mr Spencer, a solicitor, in the car, and having suspended below it the parachute, in the car of which was Mr Cocking, rose from the ground at twenty-five minutes to eight in the evening. A good deal of difficulty was experienced in rising to a suitable height, partly in consequence of the resistance to the air offered by the expanded parachute, and partly owing to its weight. Mr Cocking wished the height to be 8000 feet; but when the balloon reached the height of 5000 feet, it being then nearly over Greenwich, Mr Green called out to Mr Cocking that he should be unable to ascend to the requisite height if the parachute was to descend in daylight. Mr Cocking accordingly let slip the catch which was to liberate him from the balloon. The parachute for a few seconds descended very rapidly but still evenly, until suddenly the upper rim seemed to give way, and the whole apparatus collapsed (taking a form resembling an umbrella turned inside out, and nearly closed), and the machine descended with great rapidity, oscillating very much. When about two or three hundred feet from the ground, the basket became disengaged from the remnant of the parachute, and Mr Cocking was found in a field at Lee, literally dashed to pieces. . . .

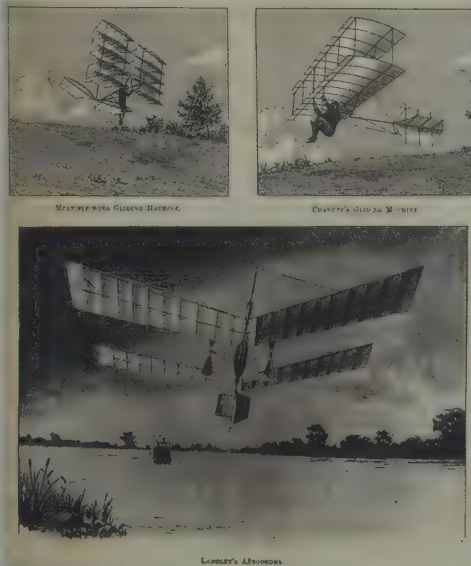
We may remark that a descending balloon half-full of gas either does rise, or can with a little management be made to rise, to the top of the netting and take the form of a parachute, thus materially lessening the rapidity of descent. Mr Wise, in fact, having noticed this, once purposely exploded his balloon when at a considerable altitude, and the resistance offered to the air by the envelope of the balloon was sufficient to enable him to reach the ground without injury. And a

similar thing took place in one of Mr Glaisher's high scientific ascents (April 18, 1863), when, at a height of about 2 miles, the sea appeared directly underneath; the gas was let out of the balloon as quickly as possible, and the velocity of descent was so great, that the 2 miles of vertical height were passed through in four minutes. On the balloon reaching the ground at Newhaven, close to the shore, it was found to be nearly empty. The balloon had, in fact, for the last mile or more, merely acted as a parachute; the shock was a severe one, and all the instruments were broken, but nothing serious resulted to the occupants of the car.

Numerous attempts have been made both to direct balloons and contrive independent flying machines. After the invention of the balloon by the brothers Montgolfier, it was at once thought that no very great difficulty would be found in devising a suitable steering apparatus; in fact, it was supposed that to rise into the air and remain there was the chief difficulty, and that, this being accomplished, the power of directing the aerostat would be a secondary achievement that must follow before long. Accordingly, in most of the early balloons the voyagers took up oars, sails, or paddles, which they diligently worked while in the air; sometimes they thought an effect was produced, and sometimes not. If we consider the number of different currents in the atmosphere, it is no wonder that some should have announced with confidence that their course was changed from that of the wind by means of the sails or oars that they used; in fact, it is not very often that the whole atmosphere up to a considerable height is moving *en masse* in the same direction, so that generally the course taken by the balloon, as determined merely by joining the places of ascent and descent, is not identical with the direction of the wind, even when it is the same at both places. Although there is no reason why balloons should not be so guided by means of mechanical appliances attached to them as to move in a direction making a small angle with that of the wind, still it must have been evident to any one who has observed a balloon during inflation on a windy day, that any motion in which it would be exposed to the action of a strong current of air must result in its destruction. It has therefore gradually become recognised that the balloon is

scarcely a step at all towards a system of aerial navigation; and many have thought that the principles involved in the construction of a flying machine must be very different from the simple statical equilibrium that subsists when a balloon is floating in the air. "To navigate the air the machine must be heavier than the air," has frequently been regarded as an axiom; and there can be no doubt that an apparatus constructed of such light material as is necessary for a balloon must either be destroyed or become ungovernable in a high wind. Recently, however, M. Dupuy de Lôme, an eminent French engineer, has constructed and made experiments with a balloon which he considers satisfies some of the conditions. The balloon is spindle-shaped, the longer axis being horizontal, and it contains about 120,000 cubic feet. The car is suspended below the middle of the balloon, and there are provided a rudder and a screw. The rudder consists of a triangular sail placed beneath the balloon and near the rear, and is kept in position by a horizontal yard, about 20 feet long, turning round a pivot in its forward extremity; the height of the sail is 16 feet, and its surface 160 square feet. Two ropes for working the rudder extend forward to the seat of

Early gliding machines, an illustration from Encyclopædia Britannica's 11th Edition (1910-11).



Encyclopædia Britannica, Inc.

the steerer, who has before him a compass fixed to the car, the central part of which will contain fourteen men. The screw is carried by the car, and is driven by four or eight men working at a capstan. A trial was made with the machine on February 2, 1872, on a windy day, and M. de Lôme considered that he had been enabled by his screw and rudder to alter his course about 12°. (See *Report of the Aeronautical Society, 1872*).

Whatever difficulties may present themselves in regulating the horizontal movement of the balloon, there can be no doubt that the vertical motion could be obtained by means of a screw or other mechanical means; and the power of being able to ascend or descend without loss of ballast would be a considerable gain. In the opinion of many, however, the balloon is not worth improvement; and as ballooning is now generally practised merely as a spectacle by which the aeronaut or showman gains his living, it is not likely that any advancement will be made.

Of flying machines, in which both bouyancy and motion were proposed to be obtained by purely mechanical means, the number has been very great. Most of the projects have been chimerical, and were due to persons possessed of an insufficient knowledge of the principles of natural philosophy, both theoretically and practically. They serve, however, to show how great a number of individuals must have paid attention to the matter, and even at the present time several patents are taken out annually on the subject.

Finally, Britannica's 11th Edition (1910–11), in its article "Flight and Flying," could report success with the flying machine, thanks to Wilbur and Orville Wright.

To Lilienthal in Germany belongs the double credit of demonstrating the superiority of arched over flat surfaces, and of reducing gliding flight to regular practice. He made over 2000 glides safely, using gravity as his motive power, with concave, batlike wings, in some cases with superposed surfaces. . . .

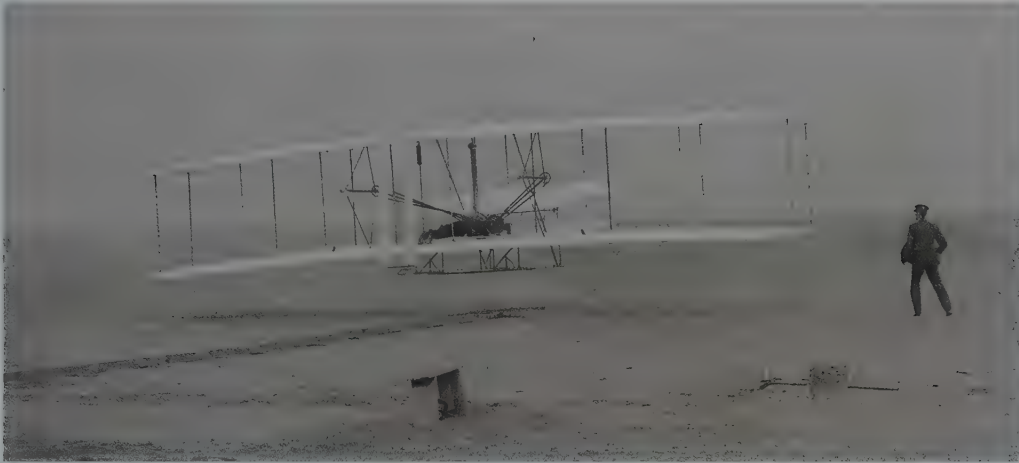
It was with a machine of the latter type that he was upset by a sudden gust of wind and killed in 1896. . . .

Similar experiments were meanwhile conducted by Wilbur and Orville Wright of Dayton, Ohio, in whose hands the glider devel-

oped into a successful flying machine. These investigators began their work in 1900, and at an early stage introduced two characteristic features—a horizontal rudder in front for steering in the vertical plane, and the flexing or bending of the ends of the main supporting aeroplanes as a means of maintaining the structure in proper balance. Their machines to begin with were merely gliders, the operator lying upon them in a horizontal position, but in 1903 a petrol motor was added, and a flight lasting 59 seconds was performed. In 1905 they made forty-five flights, in the longest of which they remained in the air for half an hour and covered a distance of 24½ m. The utmost secrecy, however, was maintained concerning their experiments, and in consequence their achievements were regarded at the time with doubt and suspicion, and it was hardly realized that their success would reach the point later achieved. . . .

But the best results were obtained by the Wright brothers—Orville Wright in America and Wilbur Wright in France. On the 9th of September 1908 the former, at Fort Myer, Virginia, made three notable flights; in the first he remained in the air 57½ minutes and in the second 1 hour 3 minutes, while in the third he took with him a passenger and covered nearly 4 m. in 6 minutes. Three days later he made a flight of 45 m. in 1 hour 14½ minutes, but on the 17th he had an accident, explained as being due to one of his propellers coming into contact with a stay, by which his machine was wrecked, he himself seriously injured, and Lieutenant Selfridge, who was with him, killed. Four days afterwards Wilbur Wright at Le Mans in France beat all previous records with a flight lasting 1 hour 31 minutes 25⅘ seconds, in which he covered about 56 m.; and subsequently, on the 11th of October, he made a flight of 1 hour 9 minutes accompanied by a passenger. On the 31st of December he succeeded in remaining in the air for 2 hours 20 minutes 23 seconds.

Wilbur Wright's machine, that used by his brother being essentially the same, consisted of two slightly arched supporting surfaces, each 12½ metres long, arranged parallel one above the other at a distance of 1½ metres apart. As they were each about 2 metres wide their total area was about 50 sq. metres. About 3 metres in front of them was arranged a pair of smaller horizontal aeroplanes, shaped like



Orville Wright making the first powered flight, December 17, 1903, near Kitty Hawk, North Carolina, with his brother Wilbur running alongside.

a long narrow ellipse, which formed the rudder that effected changes of elevation, the driver being able by means of a lever to incline them up or down according as he desired to ascend or descend. The rudder for lateral steering was placed about $2\frac{1}{2}$ metres behind the main surfaces and was formed of two vertical pivoted aeroplanes. The lever by which they were turned was connected with the device by which the ends of the main aeroplanes could be flexed simultaneously though in opposite directions; *i.e.* if the ends of the aeroplanes on one side were bent downwards, those on the other were bent upwards. By the aid of this arrangement the natural cant of the machine when making a turn could be checked, if it became excessive. The four-cylinder petrol engine was placed on the lower aeroplane a little to the right of the central line, being counterbalanced by the driver (and passenger if one was carried), who sat a little to the left of the same line. Making about 1200 revolutions a minute, it developed about 24 horse-power, and was connected by chain gearing to two wooden propellers, $2\frac{1}{2}$ metres in diameter and $3\frac{1}{2}$ metres apart; the speed of which was about 450 revolutions a minute. The whole machine, with aeronaut, weighed about 1100 lb, the weight of the motor being reputed to be 200 lb.

A feature of the year 1909 was the success obtained with monoplanes having only a single supporting surface, and it was on a machine of this type that the Frenchman Blériot

on July 25th flew across the English Channel from Calais to Dover in 31 minutes. Hubert Latham all but performed the same feat on an Antoinette monoplane. The year saw considerable increases in the periods for which aviators were able to remain in the air; and Roger Sommer's flight of nearly $2\frac{1}{2}$ hours on August 7th was surpassed by Henry Farman on November 3rd, when he covered a distance estimated at $137\frac{1}{4}$ m. in 4 hr. 17 min. 53 sec. In both these cases biplanes were employed. Successful aviation meetings were held, among other places, at Reims, Juvisy, Doncaster and Blackpool; and at Blackpool a daring flight was made in a wind of 40 m. an hour by Latham. This aviator also proved the possibility of flying at considerable altitudes by attaining on December 1st a height of over 1500 ft. but this record was far surpassed in the following January by L. Paulhan, who on a biplane rose to a height of 1383 yds. at Los Angeles. In the course of the year three aviators were killed—Defèvre and Ferber in September and Fernandez in December; and four men perished in September by the destruction of the French airship "République," the gas-bag of which was ripped open by a broken propeller. In January 1910 Delagrangé was killed by the fracture of one of the wings of a monoplane on which he was flying. On April 27th–28th, 1910, Paulhan successfully flew from London to Manchester, with only one stop, within 24 hours, for the *Daily Mail's* £10,000 prize.

GUNPOWDER

As Old as Moses?

John Macculloch, M.D., "late Chemist to the Board of Ordnance," brought authoritative knowledge to his Britannica treatise on "Gunpowder," which, after setting forth the history of the substance as was then known, supplied the formulas in current use by various nations. This excerpt is from the Supplement (1815–24) to Britannica's 4th, 5th, and 6th editions.

The invention of gunpowder is popularly ascribed to Barthold Schwartz, a German monk and alchemist, and the date of the discovery is further supposed to have been in 1320. The prior claims of our countryman, Roger Bacon, such as they are, are however unquestionable; as this substance is described in his writings about the year 1270; or eighty years before the time of the supposed discovery of Schwartz. But even Bacon has as little title to this invention as his supposed rival; nor, indeed, when we examine his own description of this then wonderful compound, do we perceive that he makes any claim to have been the discoverer. On the contrary, he quotes it as a well known substance, in common use all over the world for making squibs to amuse children. So pertinacious are vulgar errors. . . .

The earliest date to which we can refer the knowledge of gunpowder, in defect of a sufficiently remote acquaintance with Oriental History, is 355 A.C.; although, from the very nature of this evidence, it follows that it was then not only known to the eastern nations, but that it must have long been so; since, even at that early period, it was applied to warlike purposes. In the code of Hindoo laws, indeed, where it is mentioned, it is referred to a period which Oriental antiquaries have considered as coincident with the time of Moses.

SPINNING JENNY

Mob Violence and Technological Change

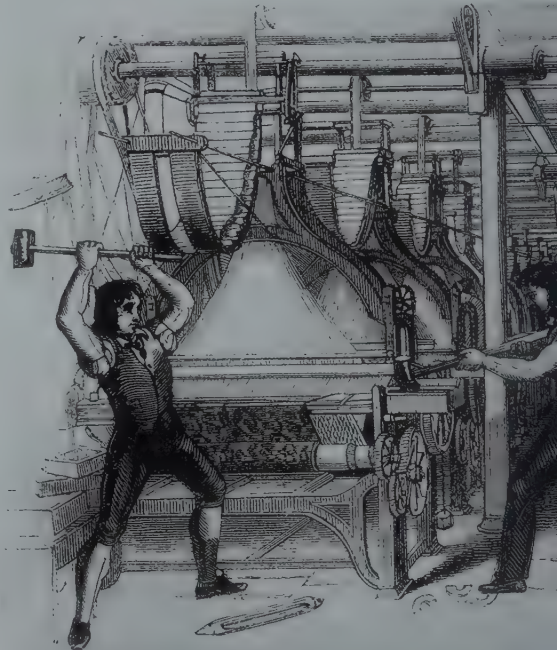
Machine-breaking in the wake of technological change has a long history in England. In fact, the phenomenon is present a good hundred

years before the world learned the word "Luddite" in the 19th century. The invention of the spinning jenny, and the socioeconomic ramifications it spawned, is a prime case in point. Britannica covered both the technology and the turmoil in "Cotton Manufacture," an entry from its 7th Edition (1830–42).

James Hargreaves, a weaver at Stanhill, near Church, in Lancashire, an illiterate man, possessed of no great mechanical knowledge, had adapted the stock cards used in the woollen manufacture, to the carding of cotton, and had besides greatly improved them. By his invention a person was able to do double the work, and with more ease than by hands carding. In the stock cards, one of the cards is fixed, whilst the other, being suspended by a cord over a pulley, is worked by the carder; and in this way two or three cards can be applied to the same stock. . . .

There had been several unsuccessful attempts to improve the mode of spinning before the year 1767, when James Hargreaves, whom we have already mentioned, invented the "Spinning Jenny." The idea of this ma-

Luddites destroying machines, mid-19th-century illustration.



Mary Evans Picture Library/age fotostock

chine is said to have been suggested to him by seeing a common spinning wheel which had been accidentally overturned, continue its motion while it lay on the ground. If such was the cause, it marks a mind of no common description, which from so casual an occurrence could elicit an invention of so much importance.

After several unsuccessful attempts to carry into execution the conception he had formed, he succeeded in producing a rudely constructed *jenny* of eight spindles, turned by bands from a horizontal wheel. In it the eight rovings were passed between two pieces of wood laid horizontally the breadth of the machine; and these being grasped in the spinner's hand, and drawn out by him, formed the rovings into threads. The structure of this "*jenny*" was soon afterwards greatly improved, and it was at last brought to work as many as eighty spindles. This machine, although of limited powers when compared with the beautiful inventions which succeeded it, must be considered as the first and leading step in that progress of discovery which carried improvement into every branch of the manufacture—which, as it proceeded, changed the nature and character of the means of production, by substituting mechanical operations for human labour—which caused the manufactured article to become more and more a product of capital. The progress of invention after this was rapid; for when it was seen that, with the aid of the few mechanical combinations we have mentioned, the spinner had been enabled to increase his power of production nearly eighty fold, the attention of those engaged in other branches of manufacture was awakened to the possibility of introducing changes equally beneficial into their peculiar employments.

Hargreaves' invention occasioned great alarm among those who earned their subsistence by the old mode of spinning, and even produced popular commotion. A mob broke into his house and destroyed his machine; and sometime after, when a better knowledge of the advantage of his invention had begun to bring his "*spinning jenny*" into general use, the people rose a second time, and scouring the country, broke to pieces every carding and spinning machine they could find. Hargreaves himself had by this time removed to Nottingham, where he was engaged in erecting a

small spinning work, about the same period that Mr Arkwright came to settle there, being also driven from Lancashire by the fear of similar violence.

The "*jenny*" in a short time put an end to the spinning of cotton by the common wheel, and the whole wefts used in the manufacture continued to be spun upon that machine, until the invention of the "*mule jenny*," by which it was in its turn superseded. Hargreaves died in great poverty a few years after his removal to Nottingham.

While Hargreaves was producing the common *jenny*, Mr Arkwright (afterwards Sir Richard Arkwright) was employed in contriving that wonderful piece of mechanism, the spinning frame, which, when put in motion, performs of itself the whole process of spinning, leaving to the workman only the office of supplying the material, and of joining or piecing the thread when it happens to break.

The extraordinary person to whom we owe this invention was born in the year 1732, at Preston, in Lancashire, of parents in poor circumstances, and was the youngest of thirteen children. He was brought up to the humble occupation of a barber, and up to the time when he made his discovery he continued to derive his subsistence from the exercise of this employment. Living in a manufacturing district, it is probable that his attention was drawn to the mechanical contrivances around him; and that hearing from every one complaints of the deficient supply of cotton yarn, he was stimulated to contrive a plan for increasing the production, by changing the mode of spinning. . . .

The originality of Mr Arkwright's mind, as well as the merit of his invention of the spinning frame, appear most striking when we consider the little resemblance between this machine and the common spinning wheel. His discovery did not consist in improving an instrument which already existed, but in the invention of an entirely new means for performing the same process in a better manner. When this is kept in view, it seems extraordinary that such a contrivance should have been the production of a person in his circumstances. His after inventions for preparing the cotton, which are sometimes spoken of as the most wonderful parts of the process of cotton spinning, do not appear to us so striking as this first effort of his genius.

STREET LAMPS

The Rise of Public Lighting

Just shortly after the first gaslit public street-lights glowed in London—on Pall Mall in 1807—came Britannica's detailed coverage of "Lamps" in the Supplement to its 4th, 5th, and 6th editions (1815–24). The architecture of the lamps and the various fuels each lamp ran on were covered in illuminating detail, as the reader will see.

Till within the last six years, the street lamps, used in London and in other parts of Britain, consisted almost uniformly of a deep inverted bell-shaped glass lantern blown of one piece, and suspended by the edge in an iron ring; with a tin conical cover perforated to give issue to the smoke, and within the lantern, a flat oil vessel with two or more wick holders or beaks, projecting from its circumference. Many districts of London are lighted with lamps of this form; other districts employ several kinds of street lamps of a different form. The first of these new kinds were made under the direction of Lord Cochrane, and employed to light the streets in the parish of Saint Anne, Soho, London.

The lanterns which serve to protect the light from wind and weather in the new lamps in one district of London, are composed of four lateral panes and a bottom of glass, joined together by sheet iron, so that the lantern is in form of a truncated pyramid, inverted like the lanterns of the street lamps in Paris. In lanterns of this form some light is intercepted, and a shadow is thrown on the street by the metal that unites the panes. This defect does not occur in the lanterns of street lamps most commonly used in England, and made of one piece of glass blown into the form of a spheroid. The spheroidal lanterns deflect the light more, because they are more unequal in thickness, but this is a smaller inconvenience: the lanterns blown of one piece of glass are more easily cleaned. Many of the lanterns for gas lights are also made of panes in the above mentioned form; some are cylinders blown of one piece with a hole in the bottom to admit air. In some of the new lamps, in London, which have lanterns of one piece of glass, the form of the lantern is nearly cylindrical; in others, the lantern is not so deep as the lanterns of the old form. The new lamps have reflectors placed above the light, for the purpose of reflecting the light downwards on the foot pavement. These reflectors

Crowds admiring the electric lights on Victoria Docks, London, England, 1887.



Classic Vision/age fotostock

are of various forms, in some of the lamps, the four plane surfaces of the inside of the pyramidal cover of the lantern are made bright, and serve to reflect the light downwards. In other lamps the ceiling of the lantern is a reflector in form, having a small portion of a large curved surface with a chimney in the middle to give issue to the smoke. Others have two, and sometimes three, concave conoidal reflectors, whose vertices meet over the light, the axes of two of the reflectors being parallel to the direction of the street: at the point where the reflectors meet there is a chimney through which the smoke ascends. The reflectors require to be frequently wiped in order to keep them bright. . . .

In England whale oil is used as the combustible material in the streetlamps; of late naptha, obtained from the distillation of pit coal, has been used in a district of London which is lighted with Major Cochrane's lamps. This naptha is a clear and colourless liquid, and is found to give a good light; it requires to be prepared with particular attention; that made at the gas light work is said to be too easily inflammable. In Paris rape seed oil, and poppy seed oil, are used: these expressed oils are made in the northeastern part of France and in Flanders. In the south of Europe olive oil of inferior quality and walnut oil are used. Street lamps lighted with the gas distilled from pit coal are now (1821) employed in the principal streets of London, Edinburgh, Glasgow, Liverpool, Manchester, Birmingham, Sheffield, and other cities in Britain. The use of coal gas for giving light had made very little progress in France in 1818, being scarcely employed even in Paris, and we believe not at all at Lyons, although pit coal is abundant and commonly used as fuel there.

TELEGRAPHS TO TELEVISION

"Conveying Intelligence"

Long-distance communications, and how best to facilitate them, have likely been a concern of humankind since our earliest existence. It certainly has been a concern of Britannica's since its earliest editions. Here follows an excerpt from "Telegraph" in Britannica's 3rd Edition (1788–97).

'Telegraph is . . . the name very properly given to an instrument, by means of which information may be almost instantaneously conveyed to a considerable distance.

The telegraph, though it has been generally known and used by the moderns only for a few years, is by no means a modern invention. There is reason to believe that amongst the Greeks there was some sort of telegraph in use. The burning of Troy was certainly known in Greece very soon after it happened, and before any person had returned from thence. . . .

About 40 years afterwards M. Amontons proposed a new telegraph. His method was this: Let there be people placed in several stations, at such a distance from one another, that by the help of a telescope a man in one station may see a signal made in the next before him; he must immediately make the same signal, that it may be seen by persons in the station next after him, who are to communicate it to those in the following station, and so on. These signals may be as letters of the alphabet, or as a cipher, understood only by the two persons who are in the distant places, and not by those who make the signals. . . .

It was not, however, till the French revolution that the telegraph was applied to useful purposes. Whether M. Chappe, who is said to have invented the telegraph first used by the French about the end of 1793, knew anything of Amontons's invention or not, it is impossible to say; but his telegraph was constructed on principles nearly similar. The manner of using this telegraph was as follows: At the first station, which was on the roof of the palace of the Louvre at Paris, M. Chappe, the inventor, received in writing, from the committee of public welfare, the words to be sent to Lisle, near which the French army at that time was. An upright post was erected on the Louvre, at the top of which were two transverse arms, moveable in all directions by a single piece of mechanism, and with inconceivable rapidity. He invented a number of positions for these arms, which stood as signs for the letters of the alphabet; and these, for the greater celerity and simplicity, he reduced in number as much as possible. The grammarian will easily conceive that sixteen signs may amply supply all the letters of the alphabet, since some letters may be omitted not only without detriment but with advantage.

These signs, as they were arbitrary, could be changed every week; so that the sign of B for one day might be the sign of M the next; and it was only necessary that the persons at the extremities should know the key. . . .

Were telegraphs brought to so great a degree of perfection, that they could convey information speedily and distinctly; were they so much simplified, that they could be constructed and maintained at little expence—the advantages which would result from their use are almost inconceivable.

The subjoined paragraph was inserted into the article "Telegraph" at the last moment before the article was set in type. The Wheatstone experiment it described was performed in 1837, and its actual, and successful, application to rail-road signaling was only being completed as the final volume of the 7th Edition (1830–42) went to press.

It has been supposed that electricity might be the means of conveying intelligence, by passing given numbers of sparks through an insulated wire in given spaces of time. A gentleman of the name of Ronalds has written a small treatise on the subject; and several persons on the Continent and in England have made experiments on Galvanic or Voltaic telegraphs, by passing the stream through wires in metal pipes to the two extremities or stations, into phials of water; but there is reason to think that, ingenious as the experiments are, they are not likely ever to become practically useful. Since this was written, Professor Wheatstone has succeeded in contriving a Galvanic telegraph that works admirably, and will no doubt be applied to all the great lines of rail-road in the kingdom. It is simple in its construction, not liable to error, very portable, and carries round the margin of a circle the letters of the whole alphabet in rapid succession, so that each word is speedily conveyed to any distance.

By the time of Britannica's 11th Edition (1910–11), Guglielmo Marconi had astonished the world by sending a wireless telegraph signal across the Atlantic. For the 13th Edition he himself, by then a Nobel laureate in physics (1909), explained not only wireless telegraphy but also the newer and more remarkable phenomenon of wireless telephony. The article con-

cludes with an exciting and, to us, amusing look at the near future—television. These excerpts are from the article "Wireless Telegraphy and Telephony," by Guglielmo Marconi and Henry M. Dowsett, in Britannica's 13th Edition (1926).

The employment of the Poulson arc generator from 1906 onwards gave an impetus to the development of wireless telephony, and an appreciable advance was made by the invention by Majorana in 1908 of a heavy current liquid microphone which enabled speech to be transmitted from Rome to Sicily, a distance of 300 miles. In 1909 the Colin-Jeance arc apparatus was in use from Toulon to a French cruiser 100 m. away; in 1910 successful tests were carried out in the United States over a distance of 490 m., and in 1912 the Vanni liquid microphone used with an arc transmitter enabled speech to be carried on from Rome to Tripoli—600 miles.

Development along new and more practical lines followed the invention by Meissner in 1913 of the valve oscillator and its use as a carrier wave generator for communicating between Berlin and Nauen, and the necessity for a heavy current microphone also disappeared with the arrival of the valve amplifier. In 1914 Marconi carried out a number of tests with valve transmitters and receivers on Italian war vessels up to a range of 45 miles.

The outbreak of war brought European long range telephone tests to a temporary standstill, but the American tests were continued, and in Oct. 1915, by employing 300 valves in the oscillator and modulator circuits, speech communication was effected when transmission conditions were favourable from Arlington to Eiffel Tower, Paris, a distance by great circle of 3,080 m.; also during the same series of tests long distance telephony from New York to Arlington by land line and Arlington to Hawaii by wireless was achieved, the total distance being over 5,000 miles. . . .

Future Progress

An enormous field of development lies ahead. Navigation by sea and air will be aided by the installation of rotating wireless beams which signal a different code for each point of the compass; by special beacon stations automatically transmitting known code signals on re-

served wavelengths for direction-finding purposes; and by the use on board ship of automatic call devices for S.O.S. signals.

Point to point wireless telegraph communications for economic and interference reasons are likely to be established to a rapidly increasing extent by short wave beams, transmission on alternative wavelengths being provided if propagation absorption conditions make this necessary.

Automatic operating speeds up to 2,000 words per min. if called for can be achieved, and if traffic becomes heavy enough multiplex transmission by applying different modulating frequencies to the same carrier wave may be employed.

It is expected that the British Post Office trans-Atlantic wireless telephone service will be operating commercially within a year or so.

Transmission of line drawings and photographs and whole pages of messages by wireless is already an accomplished fact, and is being adapted for commercial use to trans-Atlantic circuits by the Radio Corporation of America working in conjunction with the Marconi Company.

The invaluable aid that a popular broadcast service, comprising distributed transmitting stations under a centralised control, can render a Government at a time of national emergency, was effectively demonstrated in Great Britain during the General Strike of 1926, and the experience then gained is likely to influence future broadcast regulations.

Finally reference may be made to wireless television, which is still (in 1926) in the laboratory stage, and must take several years to develop; but when mature will prove to be a very useful and popular extension of the art of broadcasting and radio transmission in general.

TRAVEL

Early Rails and Steam

George Buchanan (1790–1852), a distinguished civil engineer and fellow of the Royal Society of Edinburgh, writing on "Railway" for Britannica's Supplement to the 4th, 5th, and 6th editions (1815–24), gives us a sense of the early

days of rail travel, when "steam engines" pulled "wagons," before "trains" pulled "cars."

A railway is a species of road or carriage-way, in which the track of the carriage-wheels being laid with bars, or rails, of wood, stone, or metal, the carriage is more easily drawn along this smooth surface than over an ordinary road. . . .

The railways in Britain are so numerous, that it would exceed our limits to specify the particular lines. In the Newcastle coal district, on the river Wear, in the coal and mining districts of Yorkshire and Lancashire, as well as of Derbyshire and Staffordshire, there are numerous railways branching off from the navigable rivers and canals to the different mines. . . .

On some of the railways near Newcastle, the waggons are drawn by means of a steam-engine working in a waggon by itself, the wheels of which are driven by the engine, and acting on a rack laid along the railway, impel forward both the engine and the attached waggons: in some cases the wheels of the waggon operate without rail work, by the mere friction between them and the railway. The steam-engines employed for this purpose are of the high pressure kind; these requiring no condensing apparatus. But this application of steam has not yet arrived at such perfection as to have brought it into general use.

From the same Supplement comes the following account of the early days of steamboats and the locus of their refinement: America.

Considering the importance to America of navigating her mighty rivers, it is not surprising that the application of the power of steam to the propulsion of boats should, by persevering efforts, have been first carried into successful practice in that continent. This was achieved by the activity and zeal of Mr Fulton, who appears evidently, however, to have derived all his primary knowledge of the subject from Scotland.

Mr Symington's *Memorial on Steam Navigation* . . . gives the following remarkable statement:

"When engaged in these last experiments in 1802, I was called upon by Mr Fulton, who very politely made himself known, and candidly told me that he was lately from North



A 1909 reproduction of Robert Fulton's famed 1807 steamboat (North River Steamboat of Clermont, or the Clermont).

America, and intended to return thither in a few months, but having heard of our steamboat operations, could not think of leaving this country without first waiting upon me in expectation of seeing the boat, and procuring such information regarding it as I might be pleased to communicate; he at same time mentioned, however advantageous such invention might be to Great Britain, it would certainly become more so in North America, on account of the many extensive navigable rivers in that country; and as timber of the first quality, both for building the vessels, and also for fuel to the engine, could be purchased there for a small expence, he was decidedly of opinion it could hardly fail, in a few years, to become very beneficial to trade in that part of the world; and that his carrying the plan to North America could not turn out otherwise than to my advantage; as, if I inclined it, both the making and superintendence of such vessels would naturally fall upon me, provided my engagements with steam-boats at home did not occupy so much of my time as to prevent me from paying any attention to those which might afterwards be constructed abroad.

"Mr Fulton having thus spoken, in compliance with his most earnest request, I caused the engine fire to be lighted up, and in a short time thereafter, put the steam-boat in motion, and carried him from Lock No. 16,

where the boat then lay, four miles west the canal, and returned to the place of starting, in one hour and twenty minutes, to the great astonishment of Mr Fulton, and several gentlemen, who, at our outset, chanced to come on board.

"During the above trip, Mr Fulton asked if I had any objections to his taking notes respecting the steam-boat, to which question I said, none; as I considered the more publicity that was given to any discovery intended for general good, so much the better; and having the privilege secured by letters-patent, I was not afraid of his making any encroachment upon my right in the British dominions; though in the United States, I was well aware, I had no power of control. In consequence, he pulled out a memorandum-book, and, after putting several pointed questions respecting the general construction and effect of the machine, which I answered in a most explicit manner, he jotted down particularly every thing then described, with his own remarks upon the boat, while moving with him on board, along the canal; but he seems to have been altogether forgetful of this, as, notwithstanding his fair promises, I never heard any thing more of him, till reading in a newspaper an account of his death.

"From the above incontrovertible facts, which can be corroborated by a number of people of respectability living at this day, it is

very evident that commerce is not indebted to North America for the invention of steam-packets, it being hereby established beyond the possibility of doubt, to be truly British, both in idea and practice, and that Mr Fulton's steam-vessel did not make its first appearance in the Hudson River earlier than 1806 or 1807, four years at least posterior to his having been on board the Charlotte Dundas steam-boat, and minutely examined it, when at work upon the Forth and Clyde Canal, and 18 years later than the date of the first experiments made by me upon steam-boats, on the lake at Dalswinton, Dumfriesshire, in Great Britain. . . ."

TYPEWRITERS

"Writing Machines"

There will doubtless be readers of this volume, in our age of personal computers and smart technology, who have never seen, let alone used, a typewriter (especially a manual one). But this mastodon of technology was once a revolutionary invention, and its import and impact were covered by Britannica in the "Writing Machines" entry from its 9th Edition (1875–89).

The principal substitute for the pen, however, is the machine now generally known as the type-writer, which in its present form dates only from 1873, but it has within that time come into extensive use, especially in America, the country of its origin. Numerous attempts to produce type-writing machines had been previously made both in England and America. So long ago as 1714 one Henry Mill took out a patent for a machine which he described as "an artificial machine or method for the impressing or transcribing of letters, singly or progressively, one after another as in writing, whereby all writings whatsoever may be engrossed in paper or parchment so neat and exact as not to be distinguished from print"; but his instrument is said to have been clumsy and useless, and led to no practical result. In 1867 the idea was taken up by Messrs

C. Latham Sholes and Samuel W. Soulé, printers in Milwaukee, and Mr Carlos Glidden, and, after many experiments and failures, a practical working machine was elaborated in 1873, which, being originally made by Messrs E. Remington and Sons, of Ilion, N.Y., is known as the Remington standard type-writer. The success of this machine has induced many inventors to enter the field, and now three principal classes of type-writers are more or less in use. These are (1) type-bar machines, (2) cylinder machines, and (3) wheel machines. The Remington is the type and original of all type-bar machines, which are so called because the steel types are fixed at the extremity of a bar or rod of iron. These bars are in the Remington arranged in a circle around a common centre, and by striking the key of any particular letter, a lever is moved which raises the type-bar, and causes the type at its point to strike on an inked ribbon, and impresses the letter on the paper, which lies against an india-rubber roller. The type-bars are so hinged that all the types as they are struck hit precisely the same spot, so that were the paper to remain stationary the impressions of all the types struck would be superimposed on each other; but, by an automatic mechanism, the cylinder with the paper moves a space to the left after the impression of each type, and the depression of a wooden bar similarly moves the cylinder a space after each word without impressing any sign. In the recent forms of the Remington machine, each type bar carries two types, capital and lower case, or other duplicate signs, the one a little behind the other, and when a capital letter is to be printed the depression of a key shifts the position of the cylinder so as to bring the second type in contact with the ink ribbon. In this way from one set of keys two sets of type can be with facility acted upon. With practice, an average writing speed of forty words per minute can easily be attained on the Remington type-writer, and very expert writers have been able to keep up a speed of from sixty to seventy words for a short time. It is safe to say that type-writing can be ordinarily done at about three times the speed of ordinary handwriting.

Worry About Human (Not Machine) Intelligence

By Garry Kasparov

I became the proverbial man in “man versus machine” when I faced the IBM supercomputer Deep Blue across the chessboard in the 1990s. In fact, *The Man vs. the Machine* was the very name of ESPN’s 2014 documentary about our two contests.

I defeated Deep Blue (4–2) in our first face-off in 1996. When the computer defeated me in the first of our six games, it marked the first time a machine had won a game against a world champion under classical tournament conditions. When the computer beat me in the decisive sixth game of our 1997 rematch, its 3.5–2.5 victory (winning two games, with three draws) marked the first time a computer had ever won a classical *match* against a world champion.

When I lost the rematch, it was hailed by many as a momentous occasion for human progress on par with the Moon landing. I didn’t feel so enthusiastic about it myself, but I realized that while the era of intelligent machines was ending in chess, it was only getting started in every other aspect of our lives.

Real life—language, business, education, health—doesn’t have a tidy framework like chess. Artificial intelligence (AI) today begins with a huge amount of data and clever algorithms to analyze it, without strict pre-existing rules. Machine learning is pushing the frontier of what machines can do better than humans—medical diagnosis, legal research—and how it does it has limitless potential.

This type of AI doesn’t care *why* something works, *as long as* it works. These machines even teach themselves better ways to learn, effectively coding themselves iteratively. Chess, still an AI bellwether, demonstrated this principle in astonishing fashion in late 2017, when the machine learning algorithm *AlphaZero* taught itself to play better than any existing program or human after four hours of playing against itself.

Think about all the new ways of solving problems based on objective results instead of centuries of accumulated human dogma. This is a brave new world, one in which machines are doing things humans do not know how to teach them to do, one in which machines figure out the rules—and, if we are lucky, explain them to us.

If this sounds threatening instead of amazing, you’ve been watching too many dystopian Hollywood movies. Humans will still set the goals and establish the priorities. We must ensure that our agnostic machines represent the best of our human morality. If we succeed, our new tools will make us smarter, enabling us to better understand our world and ourselves. Our real challenge is to avoid complacency, to keep thinking up new directions for AI to explore. And that’s one job that can never be done by a machine.

One very real area of concern, however, is the political polarization of the world.

Since I retired from professional chess, much of my life has been divided between human rights activism and investigations into human and machine cognition, and we are at a critical inflection point in both areas.

The global rise of authoritarianism threatens to roll back a half-century of democratic proliferation that was capped by the fall of the Berlin Wall in 1989 and the collapse of the Soviet Union two years later. Today, freedom is under assault from all sides—geographically from the Americas to Europe to Asia, politically from both right and left, in regimes that have relatively little experience with democracy and in several of the world’s freest states. The political center is being hollowed out, with extremist positions leading to backlash and whiplash.

Over half the world’s population lives under nondemocratic regimes today. Even more troubling, that percentage has been rising. Autocratic regimes like my native Russia

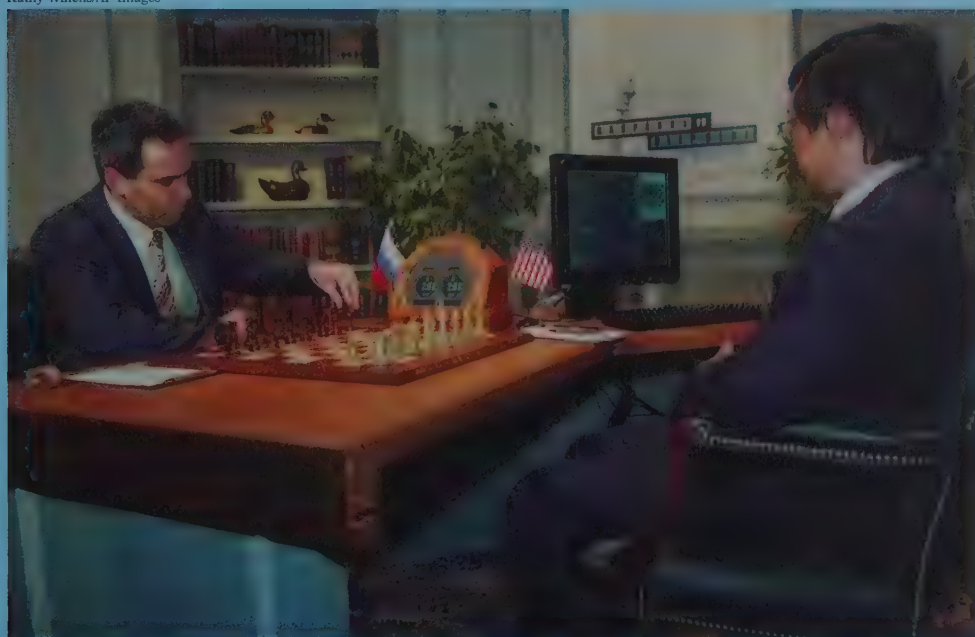
have become full-blown dictatorships. A tide of illiberal nationalism is rising in eastern Europe, just one generation removed from life behind the Iron Curtain. Traditional defenders of the values of openness and liberty, the United Kingdom and the United States, were dealt shocking election results by the forces of isolation and nativism.

If this trend against freedom is not combated and reversed, the world is headed into a new era of conflict between great powers, with all the human suffering that would entail. The free world is still ascendant—eco-

nomically, politically, militarily—but if there is no will to leverage that power to make the world freer and safer for all, that advantage will continue to wane.

*Garry Kasparov is a former world chess champion, the chairman of the Human Rights Foundation, and the author of *Winter Is Coming: Why Vladimir Putin and the Enemies of the Free World Must Be Stopped* (2015) and *Deep Thinking: Where Machine Intelligence Ends and Human Creativity Begins* (2017).*

Kathy Willens/AP Images



Garry Kasparov, left, playing against Deep Blue, the chess-playing computer built by IBM, during game four of their six-game rematch, May 7, 1997. The principal designer of Deep Blue, Feng-hsiung Hsu, sits to the right.

The Arts

ACTRESSES

On Prostitutes and Profits

Sleaziness sells, or at least it can be economically good for actresses. So argued Britannica in its 4th Edition (1801–09). The history of acting, to a large degree, is one long struggle for legitimacy, and this was especially true for actresses, who were either ostracized as harlots or outright banned from the profession, leaving female roles to boys and men. So what would happen, asked Britannica, should this social stigma attached to them and their trade ever cease? Well, more women (and talented women) would enter the profession, increasing supply and driving down their wages. Basic economics.

*The “Prynne” mentioned below is the Puritan pamphleteer William Prynne (1600–69), whose *Histrio Mastix: The Players Scourge, or, Actor’s Tragoedie* (1633) was the classic Puri-*

tan denunciation of the English theater as a plague on public morality. Unfortunately for Prynne, his polemic was deemed a personal attack on the theater-loving wife of Charles I, the king of England, leading to Prynne’s imprisonment and subsequent torture: his ears were cut off, and his cheeks were branded with the letters “SL” (for “seditious libeler”).

Actress, in a general sense, a female who acts or performs something.

Actress, in the Drama, a female performer. Women actors were unknown to the ancients, among whom men always performed the female character; and hence one reason for the use of masks among them.

Actresses are said not to have been introduced on the English stage till after the restoration of King Charles II. who has been charged with contributing to the corrupting of our manners by importing this usage from

Strolling Actresses Dressing in a Barn, a 1738 engraving by William Hogarth showing the shabby and chaotic reality of an actress’s life.



The Metropolitan Museum of Art, New York; gift of Mrs. Carl Joseph Ulmann, 1929 (accession no. 29.38.3); www.metmuseum.org

abroad. But this can be but partly true: the queen of James I. acted a part in a pastoral; and Prynne, in his *Histriomastix*, speaks of women actors in his time as prostitutes; which was one occasion of the severe prosecution brought against him for that book.

There are some very agreeable and beautiful talents, of which the possession commands a certain sort of admiration; but of which the exercise for the sake of gain is considered, whether from reason or prejudice, as a sort of public prostitution. The pecuniary recompense, therefore, of those who exercise them in this manner, must be sufficient, not only to pay for the time, labour, and expence of acquiring the talents, but for the discredit which attends the employment of them as the means of subsistence. The exorbitant rewards of players, opera-singers, opera-dancers, etc., are founded upon these two principles; the rarity and beauty of the talents, and the discredit of employing them in this manner. It seems absurd at first sight, that we should despise their persons, and yet reward their talents with the most profuse liberality. While we do the one, however, we must of necessity do the other. Should the public opinion or prejudice ever alter with regard to such occupations, their pecuniary recompense would quickly diminish. More people would apply to them, and the competition would quickly reduce the price of their labour. Such talents, though far from being common, are by no means so rare as is imagined. Many people possess them in great perfection, who disdain to make this use of them; and many more are capable of acquiring them, if any thing could be made honourably by them.

ADAGIO

Music and the Grave

In Britannica's 1st Edition (1768–71), the term "adagio" is defined thusly, as seen below. The final three words comprise a fine example of what is often termed the Scots' blunt sense of humor.

... in music, an Italian adverb, signifying softly, leisurely; and is used to denote the slowest of all times, except the grave.

ART

A System of Rules

Art, in the late 18th century, was nothing like that expansive affective power and entity we associate with the term today. Instead, it was something capturable in a mere 12 words, as seen in the definition of the term in Britannica's 1st Edition (1768–71). Note the emphasis on "system" and "rules."

Art, a system of rules serving to facilitate the performance of certain actions.

DANCE

No Bodily Defects Allowed

Britannica, in its early coverage of the world of Terpsichore, dealt with the art form at both the personal and physical levels, detailing both the uncontrollable urge in all of us to move to music that "moves us" and the physical requirements and body conditions required for good dance—body shaming be damned! Here is Britannica's coverage of dancing from its 4th Edition (1801–09).

Dance, or Dancing, as at present practised, may be defined "an agreeable motion of the body, adjusted by art to the measures or tone of instruments, or of the voice."—But, according to what some reckon more agreeable to the true genius of the art, dancing is "the art of expressing the sentiments of the mind, or the passions, by measured steps or bounds that are made in cadence, by regulated motions of the body, and by graceful gestures; all performed to the sound of musical instruments or of the voice."

There is no account of the origin of the practice of dancing among mankind. It is found to exist among all nations whatever, even the most rude and barbarous; and, indeed, however much the assistance of art may be necessary to make any one perfect in the practice, the foundation must certainly lie in the mechanism of the human body itself.

The connexion that there is between certain sounds and those motions of the human body called *dancing*, hath seldom or never



Gentlemen receiving lessons in dancing and posture, a mezzotint of a painting, c. 1760, by John Collet.

been inquired into by philosophers, though it is certainly a very curious speculation. The power of certain sounds not only over the human species, but even over the inanimate creation, is indeed very surprising. It is well known, that the most solid walls, nay the ground itself, will be found to shake at some particular notes in music. This strongly indicates the presence of some universally diffused and exceedingly elastic fluid, which is thrown into vibrations by the concussions of the atmosphere upon it, produced by the motion of the sounding body.—If these concussions are so strong as to make the large quantity of elastic fluid vibrate that is dispersed through a stone wall or a considerable portion of earth, it is no wonder they should have the same effect upon that invisible and exceedingly subtle matter that pervades and seems to reside in our nerves.

Some there are that have their nerves constructed in such a manner, that they cannot be affected by the sounds which affect others, and some scarce with any; while others have

such an irritability of the nerves in this case, that they cannot, without the greatest difficulty, sit or stand still when they hear a favourite piece of music played. . . .

As to performers and their personal qualifications: The first point to which it is directed to pay attention when one takes up the profession of a dancer (at least so soon as he becomes capable of reflection), is his bodily formation: If one is conscious of any natural defect which seems irremediable by art, it will be best immediately to renounce every idea that may have been formed of the advantage arising from popular approbation. But where personal defects can be reformed by application, study, or the advice and assistance of judicious masters, then it becomes an essential concern quickly to exert every effort, before the parts to be corrected have acquired strength and consistency, before nature has unalterably taken her bent, and the error becomes too habitual and inveterate.

Among other personal defects, there are two which deserve particular notice: The first

is that of being *jarreté*, “knock-knee’d”; the other of being *arqué*, or “bowlegged.”

DANCING GIRLS

On Bosoms and Beauties

In Britannica’s coverage of dance in its 4th Edition (1801–09), the editor was especially taken by the beautiful dancing girls of “Goa,” “Indostan,” and the “Gentoo temples,” meaning India. He was especially impressed with India’s ability to prevent the bosoms of its dancers from growing “to any disgustfully exuberant size,” as they apparently did in the West. These girls are gratefully free of that “nauseous boldness which characterizes the European prostitutes.”

Dancing-girls are employed all over the east, as affording great diversion at all public entertainments. They are all prostitutes; and by the laws of their society, are bound to refuse no one for their price, which is rated according to their beauty and other accomplishments. There are even particular sets of them appropriated to the service of the Gentoo temples, and the use of the Bramin priests who attend them. These poor creatures say that they were first debauched by their *god*, and afterwards by him consigned over to the use of the priests who belong to his temples.

These dancing-girls, whether in a settled or unsettled condition, live in a band or community under the direction of some superannuated female of the same profession, under whom they receive a regular education, and are trained up in all the arts of love and pleasing, like scholars in an academy. Thus they acquire the art of captivating the affections of the other sex to such a degree, that nothing is more common than for one of the princes or chief people of the country to take a liking to one of these girls, and waste immense sums on her, though at the same time their own haram is stocked with beauties far superior, and who are besides possessed of the natural modesty of the sex, to which the others have not the smallest pretensions. Thus some of these girls acquire immense wealth. In the neighbourhood of Goa, for instance, on a part of the continent bordering on the dis-

trict of that island, the dancing-girls founded a village, after being driven from Goa by the zeal of the archbishop. Here they reside in a body corporate, and attend the parties of pleasure of the noblemen and principal inhabitants, for it is not every one’s purse that can afford them. Here many of them acquire considerable fortunes by this scandalous traffic, and throw it into a common stock for the sake of carrying on merchandise; being concerned in shipping and the most profitable voyages, for which they have regular factors and brokers.

The dress of these women varies according to the country they live in; but in all it is the most gorgeous imaginable. They are loaded with jewels, literally from top to toe, since even on their toes they wear rings. Their necks are adorned with carcanets, their arms with bracelets, and their ancles with chains of gold and silver, often enriched with precious stones. They also wear nose-jewels, which at first have an odd appearance, but to which the eye is soon reconciled. In Indostan, these dancing-girls, as well as the other women of the country, have a peculiar method of preserving and managing their breasts, which at the same time makes no inconsiderable part of their finery. They inclose them in a pair of hollow cases, exactly fitted to them; made of very light wood, linked together and buckled at the back. These at once confine their breasts so that they cannot grow to any disgustfully exuberant size; though, from their smoothness and pliancy, they play so freely with every motion of the body, that they do not crush the tender texture of the flesh in that part, like the stiff whalebone stays in use among the Europeans. The outside of them is spread over with a thin plate of gold or silver, or set with gems, if they can afford it. Another occasional ornament the dancing-girls put on, particularly when they resort to their gallants, viz. a necklace of many loose turns, composed of flowers strung together, which they call *mogrees*, somewhat resembling Spanish double jessamy, but of a much stronger and more agreeable fragrant odour, and far preferable to any perfumes. “They have nothing,” says Mr Grose, “of that nauseous boldness which characterizes the European prostitutes, their style of seduction being all softness and gentleness.”

FICTION

A Poison or a Virtue?

Literature was not a title in Britannica's 1st Edition (1768–71), although its several elements were treated, as seen briefly below.

Novel, in matters of literature, a fictitious history of a series of entertaining events in common life, wherein the rules of probability are or ought to be strictly preserved.

Romance, in matters of literature, a fabulous relation of certain adventures designed for the entertainment and instruction of the readers.

With succeeding editions, and somewhat more space as the editions grew slowly in size, more attention was paid to literature. At first, pre-eminent authorities were identified and quoted, often extensively, sometimes without soliciting permission. This was the case with the article "Romance" in the 4th Edition (1801–09). The author, Isaac D'Israeli (1766–1848), was the father of Benjamin. Britannica's editor, after a florid compliment to D'Israeli's delightful Curiosities of Literature (1791), then proceeded to quote from it at length, presumably without either permission or pay. An extract follows.

Romance has been elegantly defined the offspring of fiction and love. Men of learning have amused themselves with tracing the epocha of romances. In this research they have displayed more ingenuity than judgement; and some have fancied that it may have existed as far back as the time of Aristotle; Dearchus, one of his disciples, having written several works of this amusing species. . . .

From romances, which had now exhausted the patience of the public, sprung novels. They attempted to allure attention by this inviting title, and reducing their works from ten to two volumes. The name of romance disgusted; and they substituted those of histories, lives, memoirs, and adventures. In these works they quitted the unnatural incidents, the heroic projects, the complicated and endless intrigues, and the exertion of noble passions; heroes were not now taken from the throne, they were sought for even amongst the lowest ranks of the people. On

this subject, I shall just observe, that a novel is a very dangerous poison in the hand of a libertine; it may be a salutary medicine in that of a virtuous writer.

MUSICAL GLASSES

Benjamin Franklin's Sweet Tones

Benjamin Franklin (1706–90) never wrote directly for Britannica (like Samuel Johnson, he would have been a great editor), but he is so generously quoted in the article "Harmonica" from Britannica's 3rd Edition (1788–97) that we may call him an honorary contributor. The editor tells us that "in a letter to Father Beccaria" Franklin gives "a minute and elegant account of the Harmonica" (a contemporary invention) and then goes on to describe a "new instrument," quite different, of course, from our modern mouth harmonica. The excerpt below leaps the centuries to give us the flavor of one aspect of the ever-versatile Doctor Franklin.

You have doubtless heard the sweet tone that is drawn from a drinking-glass, by pressing a wet finger round its brim. One Mr Puckeridge, a gentleman from Ireland, was the first who thought of playing tunes formed of these tones. . . .

Mr E. Delaval, a most ingenious member of our Royal Society, made one in imitation of it with a better choice and form of glasses, which was the first I saw or heard. Being charmed with the sweetness of its tones, and the music he produced from it, I wished to see the glasses disposed in a more convenient form, and brought together in a narrower compass, so as to admit of a greater number of tones, and all within reach of hand to a person sitting before the instrument; which I accomplished, after various intermediate trials, and less commodious forms, both of glasses and construction, in the following manner.

The glasses are blown as near as possible in the form of hemispheres, having each an open neck or socket in the middle. The thickness of the glass near the brim is about the tenth of an inch, or hardly quite so much, but thicker as it comes nearer the neck; which in the largest glasses is about an inch deep, and an inch and a half wide within. . . . The largest

glass is nine inches diameter, and the smallest three inches. Between these there are 23 different sizes, differing from each other a quarter of an inch in diameter. To make a single instrument there should be at least six glasses blown of each size; and out of this number one may probably pick 37 glasses (which are sufficient for three octaves with all the semitones) that will be each either the note one wants, or a little sharper than that note, and all fitting so well into each other as to taper pretty regularly from the largest to the smallest. . . .

The glasses being chosen, and every one marked with a diamond the note you intend it for, they are to be tuned by diminishing the thickness of those that are too sharp. This is done by grinding them round from the neck towards the brim, the breadth of one or two inches as may be required; often trying the glass by a well tuned harpsichord, comparing the note drawn from the glass by your finger with the note you want, as founded by that string of the harpsichord. . . .

The glasses being thus tuned, you are to be provided with a case for them, and a spindle on which they are to be fixed. My case is about three feet long, eleven inches every way wide within at the biggest end, and five inches

at the smallest end; for it tapers all the way, to adapt it better to the conical figure of the set of glasses. This case opens in the middle of its height, and the upper part turns up by hinges fixed behind. The spindle is of hard iron, lies horizontally from end to end of the box within, exactly in the middle, and is made to turn on brass gudgeons at each end. It is round, an inch diameter at the thickest end, and tapering to a quarter of an inch at the smallest.—A square shank comes from its thickest end through the box, on which shank a wheel is fixed by a screw. This wheel serves as a fly to make the motion equable, when the spindle, with the glasses, is turned by the foot like a spinning wheel. My wheel is of mahogany, 18 inches diameter, and pretty thick, so as to conceal near its circumference about 25 lb. of lead.—An ivory pin is fixed in the face of this wheel, about four inches from the axis. Over the neck of this pin is put the loop of the string that comes up from the moveable step to give it motion. The case stands on a neat frame with four legs.

To fix the glasses on the spindle, a cork is first to be fitted in each neck pretty tight, and projecting a little without the neck, that the neck of one may not touch the inside of another when put together, for that would make a jarring. These corks are to be perforated with holes of different diameters, so as to suit that part of the spindle on which they are to be fixed. When a glass is put on, by holding it stiffly between both hands, while another turns the spindle, it may be gradually brought to its place. . . . The glasses thus are placed one in another; the largest on the biggest end of the spindle, which is to the left hand: the neck of this glass is towards the wheel; and the next goes into it in the same position, only about an inch of its brim appearing beyond the brim of the first; thus proceeding, every glass when fixed shows about an inch of its brim (or three quarters of an inch, or half an inch, as they grow smaller) beyond the brim of the glass that contains it; and it is from these exposed parts of each glass that the tone is drawn, by laying a finger on one of them as the spindle and glasses turn round.

My largest glass is G a little below the reach of a common voice, and my highest G, including three complete octaves. . . .

This instrument is played upon by sitting before the middle of the set of glasses, as be-

Benjamin Franklin playing the glass harmonica, 1927 illustration.



Sueddeutsche Zeitung Photo/Alamy

fore the keys of a harpsichord, turning them with the foot, and wetting them now and then with a sponge and clean water. The fingers should be first a little soaked in water, and quite free from all greasiness; a little fine chalk upon them is sometimes useful, to make them catch the glass and bring out the tone more readily. Both hands are used, by which means different parts are played together. Observe, that the tones are best drawn out when the glasses turn from the ends of the fingers, not when they turn to them.

The advantages of this instrument are, that its tones are incomparably sweet beyond those of any other; that they may be swelled and softened at pleasure by stronger or weaker pressures of the finger, and continued to any length; and that the instrument, being once well tuned, never again wants tuning.

PAINTING BY THE RULES

Why Pollock Isn't Art

It is hardly surprising that the drips and splatters of a painting by Jackson Pollock would never have been considered art in the 18th century. For there were rules of painting back then that were rigid and unforgiving, as art and an artist's worth were governed by a rhetoric of uplift and decorum ("goodness," "proper," "just," "judicious," "beautiful," "clean," "grace and greatness") that seems quaint if not oppressive to our modern ear bent so fervently toward subjectivity and self-expression. So here are the rules of painting as set forth by Britannica in its 1st Edition (1768–71).

To judge of the goodness of a painting, it is necessary to establish to ourselves a system of rules to be applied occasionally; and to assist the judgment herein, the following rules have been laid down: 1. The subject must be finely imagined, and, if possible, improved in the painter's hands; he must think well as an historian, poet, philosopher, or divine, and more especially as a painter, in making a wise use of all the advantages of his art, and in finding expedients to supply its defects. 2. The expression must be proper to the subject, and the characters of the persons: it must be strong, so that the dumb shew may be per-



Reflection of the Big Dipper, oil painting on canvas by Jackson Pollock, 1947.

fectly and readily understood: every part of the picture must contribute to this end; colours, animals, draperies, and especially the actions of the figures, and above all the airs of the heads. 3. There must be one principal light; and this, and all the subordinate ones, with the shadows and reposes, must make one entire and harmonious mass; the several parts must be well connected and contrasted, so as to render the whole as grateful to the eye, as a good piece of musick to the ear. By this means the picture is not only more delightful, but better seen and comprehended. 4. The drawing must be just; nothing must be flat, lame, or ill-proportioned; and these proportions should vary according to the characters of the persons drawn. 5. The colouring, whether gay or solid, must be natural, beautiful, and clean, and what the eye is delighted with, in shadows, as well as lights and middle tints; and whether the colours are laid on thick, or finely wrought, they must appear to be done by a light and accurate hand. Lastly, Nature must be the foundation that must be seen at the bottom; but nature must be raised and improved, not only from what is commonly seen, to what is but rarely met with, but even yet higher, from a judicious and beautiful

idea in the painter's mind, so that grace and greatness may shine throughout more or less according to the subject.

THEATER

A Mirror of Society

The theater was given only a few lines in Britannica's 1st Edition (1768–71), but by the 3rd (1788–97) it was treated at considerable length. Under that title appeared an excellent review of theatrical history, surely written by the edition's editor, George Gleig, who tackled the morality of acting and the theater in a simple way: they comprise but a mirror of the morals of the society that tolerates, accommodates, and perpetuates their existence. When it came to culture and the arts, virtue begets virtue was Britannica's final word.

Theatre, a place in which shows or dramatic representations are exhibited.

For the origin of the dramatic art we always turn our eyes to Greece, the nursery of the arts and sciences. It may indeed have been known among more ancient nations, but no records remain sufficient to support this opinion. The different states of Greece asserted their claim to the honour of having given it birth, but the account of the Athenians is most generally received. It derived its origin from the hymns which were sung in the festivals of Bacchus in honour of that deity. While these resounded in the ears of the multitude, choruses of Bacchantes and Fauns, ranged round certain obscene images which they carried in triumphal procession, chanted lascivious songs, and sometimes sacrificed individuals to public ridicule.

This was the practice in the cities; but a still greater licentiousness reigned in the worship paid to the same divinity by the inhabitants of the country, and especially at the season when they gathered the fruits of his beneficence. Vintagers, besmeared with wine-lees, and intoxicated with joy and the juice of the grape, rode forth in their carts, and attacked each other on the road with gross sarcasms, revenging themselves on their neighbours with ridicule, and on the rich by publishing their injustice. . . .

The origin of the English stage is hid in obscurity. It was not, however, copied from the Grecian or Roman; for it was evidently different in form as well as in matter, and may with more propriety be deduced from a Gothic original. It appears that there were theatrical entertainments in England almost as early as the conquest; for we are told by William Stephanides or Fitz-Stephen, a monk, who in the reign of Henry II. wrote his *Descriptio Nobilissima Civitatis Londonie*, that "London, instead of the common interludes of the theatre, had plays of a more holy kind; representations of the miracles of confessors, and the sufferings of martyrs. At this time there were also certain sets of idle people, who travelled the countries and were called *Mummers*, a kind of vagrant comedians, whose excellence consisted altogether in mimicry and humour.

It is probable that, soon after this time, the dramatic representations called *Mysteries* were exhibited: These mysteries were taken from scripture-history: some represented the creation of the world, with the fall of Adam and Eve; some the story of Joseph; and others even the incarnation and sufferings of the Son of God. These pieces were exhibited in a manner so ridiculous as to favour libertinism and infidelity, as appears by a petition of the chaunters of St Paul's cathedral to Richard II. in 1378 praying, that "some unexpert people might be prohibited from representing the history of the Old Testament to the prejudice of the said clergy, who had been at great expence to represent it publicly at Christmas." . . .

During the whole reign of James I. the theatre was in great prosperity and reputation: dramatic authors abounded, and every year produced a number of new plays; it became a fashion for the nobility to celebrate their weddings, birth-days, and other occasions of rejoicing, with masques and interludes, which were exhibited with surprising expence; our great architect, Inigo Jones, being frequently employed to furnish decorations, with all the luxuriance of his invention and magnificence of his art. The king and his lords, and the queen and her ladies, frequently performed in these masques at court, and the nobility at their private houses; nor was any public entertainment thought complete without them. This taste for theatrical entertainments continued during great part of the reign

of king Charles the first; but, in the year 1633, it began to be opposed by the Puritans from the press; and the troubles that soon after followed entirely suspended them till the restoration of king Charles the second in 1660.

The king, at his restoration, granted two patents, one to Henry Killigrew, Esq; and the other to Sir William Davenant, and their heirs and assigns, for forming two distinct companies of comedians. Killigrew's were called the *King's Servants*, and Davenant's the *Duke's Company*. About ten of the company called the *King's Servants* were on the royal household establishment, having each ten yards of scarlet cloth, with a proper quantity of lace allowed them for liveries; and in their warrants from the lord chamberlain they were styled *gentleman of the great chamber*.

Till this time no woman had been seen upon the English stage, the characters of women having always been performed by boys, or young men of an effeminate aspect, which probably induced Shakespeare to make so few of his plays depend upon female characters, as they must have been performed to great disadvantage. The principal characters of his women are innocence and simplicity, such are Desdemona and Ophelia; and his

specimen of fondness and virtue in Portia is very short. But the power of real and beautiful women was now added to the stage; and all the capital plays of Shakespeare, Fletcher, and Ben Jonson, were divided between the two companies, by their own alternate choice, and the approbation of the court. . . .

It has been frequently a subject of debate, whether the stage be favourable to morals. We do not mean to enter into the controversy; but we shall make an observation or two. It will be allowed by all, that the intention of the players in acting, is to procure money; and the intention of the audience in attending the theatre, is to seek amusement. The players then will only act such plays as they believe will answer their intention. And what sort of plays are these? They are such as correspond with the opinion, manners, and taste, of the audience. If the taste of the audience be gross, therefore the plays will be gross; if delicate and refined, they will be the same. And if we go back to the time of Shakespeare, we shall find that this has been uniformly the case. The conclusion, then, which we draw, is this, if the taste of the audience be pure, free from licentiousness, the plays will be the same, and the stage will be favourable to virtue.

The Need for a Futurist Mind-Set

By Julie Friedman Steele

As massive social, technological, and economic changes continue to unfold over the coming decades, our single greatest challenge will be to compose a new civilizational story line that will guide the evolution of our species. Just as religious narratives led humanity through the agrarian era, and capitalism has been the central organizing “game” of the industrial and service eras, we need a new narrative to propel us through the challenges and opportunities of the emerging epoch.

Our current global “story line” isn’t working. With accelerating technological growth and access to collective knowledge revolutionizing everyday life, the zero-sum-game mentality of capitalism is unsustainable. With automated labor on the horizon, and the looming existential threats of artificial intelligence (AI), nuclear weapons, and climate change, there is too much at stake to prolong the status quo. We can no longer equate blind growth with human progress. Humanity, as a result, needs a new purpose, a new narrative, to define our existence. Can we afford to be passive about our future, leaving the defining decisions of our time in the hands of corporations and institutions that have led us here? Or will we become active participants in shaping our future and building its new narrative together?

For a global community to rise up and take responsibility for the future of our species, it will be incumbent upon us to adopt a *futurist mind-set*. We must cultivate deep awareness of ourselves and our surroundings—by honing *insight*, *hindsight*, and *foresight* as critical life skills—so that we can break free from old patterns and unleash a new wave of imagination and progress.

There are many possible futures, and it is not possible to predict what will happen. But consider a scenario in which the technological revolution makes the world unrecognizable in coming decades. Imagine powerful, omnipresent artificial intelligence anticipating our every move, our physical and digital

Courtesy of Julie Friedman Steele



spaces teeming with life and the collective knowledge of our civilization. Imagine that we will augment our bodies, extend our life spans, enhance our brains, and expand our minds, enabling us to transcend the most vexing human conditions and achieve more than we could even imagine.

As old norms and institutions fall apart, we will need to experiment with new modes of living, new tribes and communities, and new “games” to solve problems, reduce suffering, achieve our dreams, and evolve into something greater. We must be socially, psychologically, and existentially prepared. We must consciously evolve and be able to see outside of ourselves. We must, in other words, cultivate a *futurist mind-set* and become *futurist citizens*. This will be our greatest achievement.

Julie Friedman Steele is the board chair and CEO of the World Future Society. She has a background in entertainment, education, artificial intelligence, technology, and science, and she is on the Board of Advisors of the United Nations Women for Peace, founded the 3D Printer Experience, created an international MPEG standard to make all TV and film searchable and indexable on the Internet, and produced the Genesis Award-winning documentary *Best Friend Forgotten* starring actor David Duchovny.

Articles of Faith

ADAM & EVE

Victims of Bad Press?

Did Adam and Eve get a bum rap? Britannica thought it possible, as it pondered in its 4th Edition (1801–09) whether our “first parents” could really have acted so badly so quickly on that monumental first day of life.

How long our first parents retained their innocence, we are nowhere told. Many assert

The Metropolitan Museum of Art, New York; purchase, Mr. and Mrs. Frank E. Richardson III, et al (accession no. 1987.279); www.metmuseum.org

The Rebuke of Adam and Eve, oil painting by Charles Joseph Natoire, 1740.



that they fell on the very first day of their creation. But Moses mentions so many transactions on that day, as must have engrossed the whole of their attention, and prevented them from falling into such temptations as arise from indolence and want of reflection. Besides, if, in such circumstances as they were placed, they could not refrain from an open violation of the Divine law for the space of one day, it would bespeak a deceitfulness of heart in them greater than in most of their posterity. It is somewhat singular, that many of the great trials recorded in sacred writing were limited to 40 days; which in prophetic style is sometimes equivalent to 40 years. . . . Agreeable to this part of the Divine economy, perhaps the trial of our first parents lasted so long.

ANTI-SEMITISM

Predicting a Dire Future

Britannica made a powerful statement in its 11th Edition (1910–11) with both the scope and seriousness of its coverage of “Anti-Semitism” and with the person it selected to author the piece: Lucien Wolf (1857–1930), a prominent Jewish intellectual, writer, journalist, diplomat, and cultural figure who moved easily and often among the political elite of his day. Wolf played an important role in debunking the bogus Protocols of the Learned Elders of Zion, one of the most infamous anti-Semitic tracts in history, and as foreign secretary of the Joint Foreign Committee of the Board of Deputies of British Jews and the Anglo-Jewish Association, he would soon after writing Britannica’s entry successfully insist that provisions safeguarding the religious and civil rights of Central European Jews be included in the Treaty of Versailles ending World War I. Reprinted below is the prescient final paragraph of his long entry on anti-Semitism, written some 30 years before the Hitler-led Holocaust.

Britannica did see one possible avenue of salvation for Jews—Palestine. (See the entry on “Judaism” that follows in this section.)

Though anti-Semitism has been unmasked and discredited, it is to be feared that its history is not yet at an end. While there remain in Russia and Rumania over six millions of Jews who are being systematically degraded, and who periodically overflow the western frontier, there must continue to be a Jewish question in Europe; and while there are weak governments, and ignorant and superstitious elements in the enfranchised classes of the countries affected, that question will seek to play a part in politics.

APOLLO

A God Among Gods

Here are extracts from the article "Apollo" in Britannica's 3rd Edition (1788-97).

Apollo, in mythology, a Pagan deity worshipped by the Greeks and Romans. Cicero mentions four of his name: the most ancient of whom was the son of Vulcan; the second a son of Corybas, and born in Crete; the third an Arcadian, called *Nomian*, from his being a great legislator; and the last, to whom the greatest honour is ascribed, the son of Jupiter and Latona. . . . As Apollo is almost always confounded by the Greeks with the sun, it is no wonder that he should be dignified with so many attributes. It was natural for the most glorious object in nature, whose influence is felt by all creation, and seen by every animated part of it, to be adorned as the fountain of light, heat, and life. The power of healing diseases being chiefly given by the ancients to medicinal plants and vegetable productions, it was natural to exalt into a divinity the visible cause of their growth. Hence he was also styled the *God of Physic*; and that external heat which cheers and invigorates all nature, being transferred from the human body to the mind, gave rise to the idea of all mental effervescence coming from this god; hence, likewise, poets, prophets, and musicians, are said to be *Numine afflati*, inspired by Apollo.

Whether Apollo was ever a real personage, or only the great luminary, many have doubted. Indeed, Vossius has taken great pains to prove this god to be only a metaphor-

ical being, and that there never was any other Apollo than the sun. . . .

To the other perfections of this divinity the poets have added beauty, grace, and the art of captivating the ear and the heart, no less by the sweetness of his eloquence, than by the melodious sounds of his lyre. However, with all these accomplishments, he had not the talent of captivating the fair, with whose charms he was enamoured. But the amours and other adventures related of this god during his residence on earth, are too numerous, and too well known, to be inserted here.

BUDDHISM

Sober Truth and Glittering Falsehood

Snippets from the life of Gautama Buddha and the world religion founded in his name appear here and there in the early Britannica editions, but it is not until Britannica's scholarly 9th Edition (1875-89) that the faith appears by name and receives a statement that is both lucid and grand in its reflection of that very old system of belief. The following excerpts are from the article "Buddhism," by T.W. Rhys Davids, professor of Pali and Buddhist literature at University College, London.

Buddhism is the name of a religion which formerly prevailed through a large part of India, and is now professed by the inhabitants of Ceylon, Siam, and Burma (the southern Buddhists), and of Nepāl, Tibet, China, and Japan (the northern Buddhists). It arose out of the philosophical and ethical teachings of Siddhārtha Gautama, the eldest son of Suddhōdana, who was rāja in Kapilavastu and chief of the tribe of the Sākya, an Aryan clan seated during the 5th century B.C. on the banks of the Kohain about 100 miles N. of the city of Benāres, and about 50 miles S. of the foot of the Himālaya Mountains.

We are accustomed to find the legendary and the miraculous gathering, like a halo, around the early history of religious leaders, until the sober truth runs the risk of being altogether neglected for the glittering and edifying falsehood. Buddha has not escaped the fate which has befallen the founders of other religions; and as late as the year 1854 the late

Professor Wilson of Oxford read a paper before the Royal Asiatic Society of London in which he maintained that the supposed life of Buddha was a myth, and "Buddha himself merely an imaginary being." No one, however, would now support this view; and it is admitted that, under the mass of miraculous tales which have been handed down regarding him, there is a basis of truth already sufficiently clear to render possible an intelligible history, which will become clearer and clearer as older and better authorities are made accessible. . . .

The two ideas of the utter vanity of all earthly good and the inevitable law of rebirth, decay, and death will be seen to lead naturally to the belief in Nirvāna. If life be an evil, and death itself be no delivery from life, it is necessary to go further back to discover the very origin, the seed, so to speak, of existence; and by destroying that to put an end at last to the long train of misery in which we are compelled to go again and again through the same weary round of experiences, always ending in disappointment. This seed of existence Buddhism finds in "Karma," the sum of merit and demerit, which, as each one's demerit is the greater of the two, often comes practically to much the same thing as sin or error. It forms the second link in the Buddhist chain of causation, and arises itself from ignorance. Destroy that ignorance which brings with it such a progeny, cut the links of this chain of existence, root out karma with the mistaken cleaving to life, and there will be deliverance at last—deliverance from all sorrow and all trouble in the eternal rest of Nirvāna. Anything less than this would be a mockery of hope; for there is no life outside the domain of transmigration, and by the inevitable law of change that which causes existence of any kind would itself be the cause also of decay, and bring with it after a time the whole chain of evils from which the tired heart of man seeks relief.

To reach this end, to destroy karma, and thus to attain Nirvāna, there is only one way—the fourfold path already explained above, which is also summed up in the Buddhist books in the eight divisions, "right views, right thoughts, right speech, right actions, right living, right exertion, right recollection, and right meditation." By these means ignorance will be overcome and karma destroyed, and after the organized being has



Buddha statue in Magha Puja Memorial Buddhist Park, Nakhon Nayok, Thailand.

been dissolved in death, there will be nothing left to bring about the production of another life. For it must be understood that while Buddhism occasionally yielded so far to popular phraseology as to make use of the word soul, it denies altogether that the word is anything more than a convenient expression, or that it has any counterpart in fact. Birth is not rebirth, but new birth; transmigration of soul becomes a transfer of karma; metempsychosis gives way to metamorphosis. As one generation dies and gives way to another—the heir of the consequences of all its vices and all its virtues, the exact result of pre-existing causes—so each individual in the long chain of life inherits all of good or evil that all its predecessors have done or been, and takes up the struggle towards enlightenment precisely there where they have left it. There is nothing eternal, but the law of cause and effect, and change; the kosmos itself is passing away; even karma can be destroyed; nothing is, everything becomes. And so with this organized life of ours, it contains within itself no eternal germ; it passes away like everything else, there only remains the accumulated result of all its actions. One lamp is lighted at another; the second flame differs from the first, to which it owes its existence. A seed grows into a tree and produces a seed from which arises another tree different from the first, though resulting from it. And so the true Buddhist saint does not mar the purity of his

self-denial by lusting after a positive happiness which he himself is to enjoy hereafter. He himself will cease to be, but his virtue will live and work out its full effect in the decrease of the sum of the misery of sentient beings.

CIVILIZATION

Proof of a Supreme Being

Richard Whately (1787–1863) was a logician, theological writer, and archbishop of Dublin. To Britannica's 8th Edition (1852–60) he contributed a lengthy "Dissertation; exhibiting a general view of the Rise, Progress, and Corruptions of Christianity." From it we excerpt an interesting view of the education of our "first parents" in the Garden of Eden. For from the divine instructions that must have been imparted to Adam and Eve came the phenomenon of civilization, and it is civilization that proves, according to the archbishop, the very existence of God.

The earliest history of mankind, by far, that we possess, is that contained in the Book of Genesis. It is extremely brief and scanty; especially the earliest portion of it. But it plainly represents the first of the human race, when in the Garden of Eden, as receiving direct communications from God. We have no detailed account, however, of the instruction they received; and even part of what the history does record is but obscurely intimated. For example, it is rather hinted than expressly stated, that the use of language was imparted to them by revelation. This, however, is generally understood to be the meaning of the passage (Gen. ii. 20), in which it is said that God brought unto Adam the beasts and birds, to see what he would call them, and that Adam gave them names.

But our first parents, or their children, must have received direct from God a great deal of instruction of which no particulars are related. For besides being taught something of religious and moral duty (Gen. ii. 16; iv. 7), it is evident that they must have learned something of the arts of life. The first generations of mankind were certainly not left at all in the condition of mere savages, subsisting on such wild fruits and animals as they might chance

to meet with. We read concerning the first two sons of Adam, that the one was occupied in tilling the ground, and the other in keeping cattle.

And even independently of the Bible history, we might draw the same conclusion from what is matter of actual experience, and as it were before our eyes at this day. For it appears that mere savages, if left to themselves without any instruction, never did, and never can, civilise themselves. And, consequently, the *first* of the human race that did acquire any degree of civilisation, since they could not have had instruction from other men, must have had a superhuman instructor. But for such an instructor, all mankind would have been savages at this day. The mere fact that civilised men do exist, is enough to prove, even to a person who had never heard of the Bible; that, at some time or other, men must have been taught something by a superior Being: in other words, that there must have been a revelation.

HEAVEN & HELL

From Top to Bottom

From its inception Britannica has treated religion fully, carefully, and seriously. But its modern tradition of objectivity took much more than a century to evolve. Today's editors aim to present every responsible view of the subject, and they try to do so without obviously endorsing one over another.

In the early days a strenuous effort was made to present at least a synopsis of what was known about every topic, no matter how arcane, and to describe exotic beliefs that were important enough to merit attention. But Britannica itself represented a single point of view, the one shared by the elite of 18th-century Scotsmen: a pious, Protestant Christianity. Thus when Britannica discussed the Roman Catholic Church or, worse, pagan religions, these "exotic" groups were seen and explained as though they were in a museum of curiosities or the half-fanciful tales of some intrepid traveler. There usually was no malice in this approach: Britannica was simply reporting what could be known of the facts to the true believers in Edinburgh, Glasgow, and outlying

Scotland, and later to other God-fearing Britons.

Catholics were not really equated with the heathens of the East, for Rome, after all, had been a major consolidator and disseminator of Christianity. Britannica's treatment of Judaism also differed, for it was the very foundation of Christianity. Nonetheless, when the early editions of Britannica came to religious subjects, the views from Edinburgh were explicitly Christian, if not specifically Protestant. The topic of heaven was a special case, because the word had a secular as well as a sacred meaning.

The extracts on heaven and hell that follow are from Britannica's 1st edition (1768-71).

Heaven literally signifies the expanse of the firmament, surrounding our earth, and extended every way to an immense distance.

The Hebrews acknowledged three heavens: the first, the aerial heaven, in which the birds fly, the winds blow, and the showers are formed; the second, the firmament in which the stars are placed; the third, the heaven of heavens, the residence of the Almighty, and the abode of saints and angels.

Heaven is considered by Christian divines and philosophers, as a place in some remote part of infinite space, in which the omnipresent Deity is said to afford a nearer and more immediate view of himself, and a more sensible manifestation of his glory, than in the other parts of the universe. This is often called the empyrean, from that splendor with which it is supposed to be invested; and of this place the inspired writers give us the most noble and magnificent descriptions.

The pagans considered heaven as the residence only of the celestial gods, into which no mortals were admitted after death, unless they were deified. As for the souls of good men, they were consigned to the elysian fields.

Hell, the place of divine punishment after death . . .

The Jews placed hell in the centre of the earth, and believed it to be situated under waters and mountains. . . . They likewise acknowledged seven degrees of pain in hell, because they find this place called by seven different names in scripture. Though they believed that infidels, and persons eminently wicked, will continue for ever in hell; yet they maintained, that every Jew who is not infected with some heresy, and has not acted

contrary to the points mentioned by the rabbins, will not be punished therein for any other crimes above a year at most.

The Mahometans believe the eternity of rewards and punishments in another life. In the Koran it is said, that hell has seven gates, the first for the Mussulmans, the second for the Christians, the third for the Jews, the fourth for the Sabians, the fifth for the Magians, the sixth for the pagans, and the seventh for the hypocrites of all religions.

Among Christians, there are two controverted questions in regard to hell; the one concerns locality, the other the duration of its torments. The locality of hell, and the reality of its fire, began first to be controverted by Origen. That father, interpreting the scripture account metaphorically, makes hell to consist not in external punishments, but in a consciousness or sense of guilt, and a remembrance of past pleasures. Among the moderns, Mr Whiston advanced a new hypothesis. According to him, the comets are so many hells appointed in their orbits alternately to carry the damned into the confines of the sun, there to be scorched by its violent heat, and then to return with them beyond the orb of Saturn, there to starve them in these cold and dismal regions. Another modern author, not satisfied with any hypothesis hitherto advanced, assigns the sun to be the local hell. As to the second question, viz. the duration of hell-torments, we have Origen again at the head of those who deny that they are eternal; it being that father's opinion, that not only men, but devils, after a due course of punishment suitable to their respective crimes, shall be pardoned and restored to heaven. The chief principle upon which Origen built his opinion, was the nature of punishment, which he took to be emendatory, applied only as physic for the recovery of the patient's health. The chief objection to the eternity of hell torments among modern writers, is the disproportion between temporary crimes and eternal punishments. Those who maintain the affirmative, ground their opinions on scripture accounts, which represent the pains of hell under the figure of a worm which never dies, and a fire which is not quenched; as also upon the words, "These shall go away into everlasting punishment, but the righteous into life eternal."

HINDOOS

Their Strict Social Classes

Britannica's 3rd Edition (1788–97) devoted a dozen pages to explaining Hinduism, contributing more information, somewhat more accurately, than it did on other religions. Some excerpts follow.

Hindoos, or Gentoos, the inhabitants of that part of India known by the name of *Hindustan* or the *Mogul's empire*, who profess the religion of the Bramins, supposed to be the same with that of the ancient Gymnosophists of Ethiopia.

From the earliest period of history these people seem to have maintained the same religion, laws, and customs, which they do at this day: and indeed they and the Chinese are examples of perseverance in these respects altogether unknown in the western world. In the time of Diodorus Siculus they are said to have been divided into seven casts or tribes; but the intercourse betwixt Europe and India was in his time so small, that we may well suppose the historian to have been mistaken, and that the same tenacity for which they are so remarkable in other respects has manifested itself also in this. At present they are divided only into four tribes; 1. The Bramin; 2. The Khatry; 3. The Bhyse; and, 4. The Soodera. All these have distinct and separate offices, and cannot, according to their laws, intermingle with each other; but for certain offences they are subject to the loss of their cast, which is reckoned the highest punishment they can suffer; and hence is formed a kind of fifth cast named *Pariars* on the coast of Coromandel, but in the Shanscrit or sacred language *Chandalas*. These are esteemed the dregs of the people, and are never employed but in the meanest offices. There is besides a general division which pervades the four casts indiscriminately; and which is taken from the worship of their gods *Vishnou* and *Sheevah*; the worshippers of the former being named *Vishnou-bukht*; of the latter *Sheevah-bukht*.

Of these four casts the bramins are accounted the foremost in every respect; and all the laws have such an evident partiality towards them, as cannot but induce us to suppose that they have had the principal hand in framing them. . . .

No Hindoo is allowed to quit the cast in which he was born upon any account. All of them are very scrupulous with regard to their diet; but the bramins much more so than any of the rest. They eat no flesh, nor shed blood; which we are informed by Porphyry and Clemens Alexandrinus was the case in their time. Their ordinary food is rice and other vegetables, dressed with *ghee* (a kind of butter melted and refined so as to be capable of being kept for a long time), and seasoned with ginger and other spices. The food which they most esteem, however, is milk as coming from the cow; an animal for which they have the most extravagant veneration, inso-much that it is enacted in the code of Gento laws, that any one who exacts labour from a bullock that is hungry or thirsty, or that shall oblige him to labour when fatigued or out of season, is liable to be fined by the magistrates.

JESUS

The Divine Author of the Faith

By the time of the 7th Edition (1830–42), learned clergy were prepared to deal forthrightly with the occasional manifest inconsistencies within the Christian tradition. But swallowing the outrageous conclusions of the worst of the secularists was still beyond the pale. The following excerpts are from the article "Jesus" in Britannica's 7th Edition. The author was the Rev. David Welsh, professor of ecclesiastical history at the University of Edinburgh. He was moderator of the General Assembly of the Church of Scotland, but he helped lead a secession from that body to found the Free Protestant Church of Scotland, and he was its first moderator.

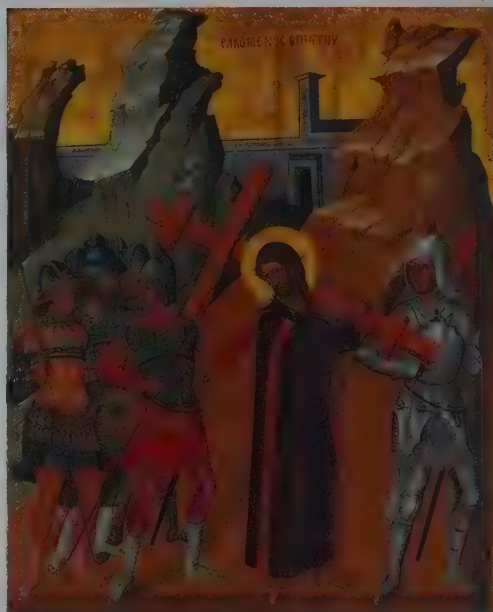
Jesus, the Divine Author of the Christian religion, was born at Bethlehem, a city of the tribe of Judah, about six miles south-east from Jerusalem. His mother was a Jewish virgin named Mary, the betrothed wife of Joseph, both in the humblest rank of life, though both of the royal race of David. The date of his birth is not mentioned in the sacred record; and there has been a difference of opinion among the learned who have en-

gaged in the inquiry, respecting the precise period when it took place. It is now, however, generally agreed upon, that it must be fixed a few years earlier than is indicated by the epoch of our era, which, according to the common computation, corresponds with A. U. 754. We know that Jesus was born before the death of Herod the Great; and it appears from Josephus, that Herod died before the Jewish passover A. U. 750. From calculations founded on other parts of the gospel history, and particularly on a comparison between Luke, iii. 1 and 23, many have supposed that the nativity was in A. U. 747; and in this opinion some have been confirmed by the conjecture of Kepler, that the conjunction between Jupiter and Saturn, which took place in that year, was the star seen by the wise men; though it may be justly questioned how far the principles of scriptural interpretation admit of the supposition that the phenomenon referred to corresponds with the particulars mentioned by St Matthew. In regard to the day or month in which the Saviour was born, a subject to which the devotion of a large proportion of the Christian world has attached much importance, we have no means of accurate knowledge. The description given of shepherds watching their flocks by night, is inconsistent with the idea that it could have been in December or January, or during the heat of the summer months; as we know that in these periods the herds were no longer left in the fields. At other times of the year the flocks might be turned out to pasture day and night in the south of Palestine; but there is no circumstance referred to by any of the evangelists to determine whether it was in spring or in autumn that Jesus was born.

The chronological error in the vulgar era, and in the season for celebrating the festival of Christmas, does not in any way affect the truth of the gospel history; and cannot indeed appear strange, when it is considered that several centuries elapsed before the method of computing time by the birth of Christ was introduced, and that the festival of the nativity was not observed in the primitive church. . . .

The character of Christ, as exhibited in the Gospels, presents to us the only example, anywhere to be found, of the perfection of humanity; and the contemplation of it has ever been considered by his followers as one

The Metropolitan Museum of Art, New York; Bashford Dean Memorial Collection, Funds from various donors, 1929 (accession no. 29.158.746)



Christ Bearing the Cross, oil on wood, by Crete-based icon painter Nicolaos Tzafouris (c. 1455–1501).

of the most edifying and delightful exercises of piety. A constant regard to the will of God, and a delight in doing it, form the distinguishing features of his character. With this was connected the absence of all sordid, or selfish, or ambitious aims, and an enlarged and enlightened philanthropy. There is perhaps nothing more remarkable in the life of Jesus than the apparently inconsistent qualities which are blended together in one harmonious whole. We see in him the most unbending constancy united with great tenderness of feeling—hatred of sin, and compassion for the offender—a heart superior to all the allurements of pleasure, with a condescending indulgence for the innocent relaxations of life—a mind of universal philanthropy, alive to all the domestic charities—views that extended to the whole human race, and a generous compliance with national and individual peculiarities. It is difficult to conceive that the portraiture presented to us in the sacred history can be contemplated without benefit; but the chief benefit will be lost if it is forgotten that he whose life was the model of every virtue laid down that life for the sins of the world.

JUDAISM

Under Attack

Judaism, in Britannica's early years, was always treated under such titles as "Jews" or "Hebrews" or within entries on particular topics. Not until the 13th Edition (1926) did the title "Judaism" appear, and the accompanying article was the first on the subject written by a Jewish scholar instead of a Protestant Christian authority on the Old Testament. This contributor was chief rabbi of the United Hebrew Congregations of the British Empire, Joseph Herman Hertz. His article was written sparsely and beautifully, and the echoes it stirs are all the more haunting when it is read today, more than 70 years after the Holocaust. With Judaism under attack in Europe, and with the doors to the United States barred to persecuted Jews (a reference to the new restrictive immigration law of 1924), Rabbi Hertz saw but one shining light for Jews on the horizon: Palestine. Of course, unbeknownst to Britannica's author, and to the world, Kristallnacht lay a scant dozen years away.

Judaism: 1910–1925—It is no exaggeration to say that the 15 years under review have been to Israel a period of woe and disaster, as well as of consolation and hope, such as no similar period since the Dispersion.

Russia

The darkest part of the picture is Russia, the fountain in modern times of the old Jewish life and, before the War, the home of one-half of the world's Jewish population. When the period opened, Mendel Beilis, and with him Judaism as a religion and the whole Jewish people, stood arraigned in the courts of the Tsar at Kieff to answer the hideous charge of ritual murder. In vain the friends of humanity in England, France and Germany protested that this accusation of religious cannibalism was an utterly baseless libel on Judaism, an insult to Western culture, and a dishonour to those who formulate it. The Russian bureaucracy recoiled from no means that would insure the conviction of Beilis, as it would have furnished a convenient apologia for pogroms, past and future. However, in Nov. 1913, an all-Russian jury acquitted Beilis.

One other instance to show the atmosphere in which Russian Judaism had to live during the last years of the Romanoffs. In the same year, at the International Congress for the Suppression of the White Slave Traffic held in London, Hertz called the attention of the world to the infamy of the Tsarist "yellow ticket," by which any Jewish woman, if she was willing to be registered as a prostitute, was permitted free and unrestricted residence throughout the Empire; whereas all other Jews and Jewesses were confined to the pale of Settlement, which was one of the fiercest battle-grounds of the World War.

The Jewish cities were taken and retaken by the rival armies, with attendant bombardments, burnings and pillagings. Added to these were the summary expulsions and calculated inhumanities which the Russian military authorities perpetrated against the Jewish population. As a result, scores of important communities were ruined, and their religious institutions, their rabbinical academies, together with every form of Jewish cultural activity, destroyed to their foundations. Of the surviving communities, hundreds were later annihilated during the massacres of the Jewish population in the Ukraine during the years 1919–21, massacres that for thoroughness and extent are surpassed by those in Armenia alone.

The Russian revolution completed this break-up of Russian Jewry and its religious life. At first constitutional, the revolution brought full religious emancipation to all, but in the unique persecution of all religion that began soon after the Bolsheviks came into power, Judaism had to suffer most. Jewish communists have, from the first, taken a sinister delight in the proscription of all Jewish religious teaching—whether in the rabbinical colleges, in the elementary religious schools or even in homes. Synagogues were confiscated and converted into workmen's clubs (as late as Sept. 14 1925), and even into stables.

During 1925 the bitter fight against religion seemed to have relaxed somewhat, and Christian and Mahommedan bodies are now allowed to give religious instruction to small "groups" of their children after school hours. In the case of Jews, however, two

children have been declared to constitute a school, and subject to the dire penalties for teaching religion or Bible to children at a school. Religious instruction is therefore given clandestinely, underground or in lofts and at midnight, as in the days of the Inquisition. In Dec. 1925 two teachers were sentenced at Kieff to six months imprisonment with hard labour for this offence; and 200 children were imprisoned at Podolia, for refusing to betray the name and whereabouts of their religious teachers. Zionists were pursued with a Tsar-like ferocity, hundreds of them having been banished to Siberia. The use of Hebrew as a bourgeois language is suppressed. These persecutions called forth among the faithful remnant a new fervour and a deeper self-sacrifice for their faith; but Jewish institutional religion became paralysed in Soviet Russia, and the religious outlook for the growing generation is dark indeed. Before the War, the intense religious and intellectual life of Russian Jewry was duly reflected in the works of a whole galaxy of rabbinical, Hebrew and Yiddish writers. With the outbreak of hostilities all Hebrew and Yiddish publications of any kind were forbidden. After the revolution there was a brief literary revival, which was soon strangled by the Bolsheviks. . . .

The New Diaspora

Eastern European Jewish emigrants, fleeing from racial hatred and economic ruin, find the doors of the United States all but barred and bolted to them. In consequence, they are scattered and dispersed to distant lands where grave dangers await their Jewishness and Judaism. Outside the Argentine Republic, the fresh arrivals find in most Latin-American countries little organised Jewish life and, too often, total abandonment of Judaism on the part of the earlier settlers. The Jewish Colonisation Assn. of Paris appointed I. Raffalovich as Grand Rabbin of Brazil to lay the religious foundations of the new Jewish centres in the youngest diaspora. Mention must also be made of the praiseworthy efforts of Dr. J. Faitlovich to bring the forgotten Jewish tribes of Abyssinia—the Falashas—into touch with the general body and religious currents of European Jewry.

Palestine

The brightest spot on the Jewish horizon throughout this period is Palestine. The beginnings of the Jewish revival in the Holy Land date from long before the Balfour Declaration, when Eliezer ben Yehudah began his gigantic undertaking to make Hebrew the language of everyday speech, as well as of instruction in schools. One half of his monumental *Dictionary of the Hebrew Language, Ancient, Mediaeval and Modern*, was published in his life-time. Palestine became the home of Ahad Ha'am—the philosopher of Zionism—and of Ch. N. Bialik, the great neo-Hebrew poet. A Rabbinate for the whole of Palestine was called into existence, with A. I. Kook (Ashkenazi) and Jacob Meir (Sephardi) as joint Chief Rabbis. A Communities' Ordinance will, it is hoped, be promulgated, providing a democratic religious organisation for the Jewish population of the Holy Land.

The zenith of the spiritual revival was reached when the Hebrew University was opened by the Earl of Balfour on April 1, 1925. It may be some time before the Jerusalem University fulfils the hope of being the sanctuary of the Jewish genius; but a land focuses a people and calls forth, as nothing else can, its spiritual potentialities. It is the ardent faith of the architects of the New Palestine that the resurrection of the Jewish people on its own soil will reopen its sacred fountains of creative energy. As of old, only a remnant will return to the land of their fathers. But it is the national rejuvenation of that remnant that may open a new chapter in the annals of the human spirit.

MOSAIC TIME

Ancient China, Ancient Egypt Never Existed!

"An historian," wrote Britannica in its 1st Edition (1768–71), must be three things: a "man of probity," a person devoid of all "passion or bias," and—most importantly—a believer in the Bible's account of man's origins. To even well-educated observers in the 18th century, there was nothing incongruous about this grouping of requirements: biblical literalism in no way

signified bias. The world, accordingly, was not 4.5 billion years old but a mere 4,000 years, or 6,000 years if one followed Saint Augustine's famed "six ages of the world," whose first millennial stage began with Adam and sixth age with the birth of Christ. Given the Earth's relative youth, therefore, any claims of an ancient past by either China or Egypt were preposterous, declared *Britannica* in its 3rd Edition (1788–97).

Concerning the number of years which have elapsed since the creation of the world, there have been many disputes. The compilers of the *Universal History* determine it to have taken place in the year 4305 B.C. so that, according to them, the world is now in the 6096th year of its age. Others think it was created only 4000 years B.C. so that it hath not yet attained its 6000th year. Be this as it will, however, the whole account of the creation rests on the truth of the Mosaic history; and which we must of necessity accept, because we can find no other which does not either abound with the grossest absurdities, or lead us into absolute darkness. The Chinese and Egyptian pretensions to antiquity are so absurd and ridiculous, that the bare reading must be a sufficient confutation of them to every reasonable person. . . . Some historians and philosophers are inclined to discredit the Mosaic accounts, from the appearances of volcanoes, and other natural phenomena: but their objections are by no means sufficient to invalidate the authority of the sacred writings; not to mention that every one of their own systems is liable to insuperable objections. . . . It is therefore reasonable for every person to accept of the Mosaic account of the creation as truth: but an historian is under an absolute necessity of doing it, because, without it, he is quite destitute of any standard or scale by which he might reduce the chronology of different nations to any agreement; and, in short, without receiving this account as true, it would be in a manner impossible at this day to write a general history of the world.

Truth is, as it were, the very life and soul of history, by which it is distinguished from fable or romance. An historian therefore ought not only to be a man of probity, but void of all passion or bias. He must have the steadiness of a philosopher, joined with the vivacity of a poet or orator.

NOAH'S ARK

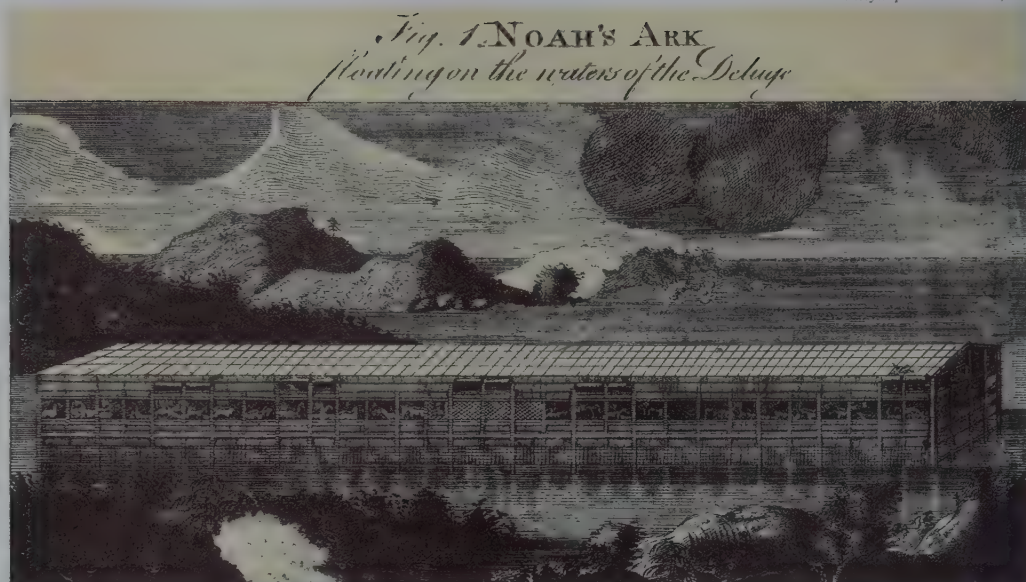
Where Was the Kitchen?

Ever wonder about the size and state of the lodgings for Noah, his family, and the paired animals on board the famous ark? Was there really enough room for everyone and everything? And where was the kitchen? Britannica answered these questions and others, with a surprising sense of surety, in its 3rd Edition (1788–97).

The dimensions of the ark, as given by Moses, are 300 cubits in length, 50 in breadth, and 30 in height; which some have thought too scanty, considering the number of things it was to contain; and hence an argument has been drawn against the authority of the relation. To solve this difficulty, many of the ancient fathers and the modern critics have been put to very miserable shifts: But Buteo and Kircher have proved geometrically, that taking the common cubit of a foot and half, the ark was abundantly sufficient for all the animals supposed to be lodged in it. Snellius computes the ark to have been above half an acre in area. Father Lamy shows, that it was 110 feet longer than the church of St Mary at Paris, and 64 feet narrower: and if so, it must have been longer than St Paul's church in London, from west to east, and broader than that church is high in the inside, and 54 feet of our measure in height; and Dr Arbuthnot computes it to have been 81062 tons. . . .

The things contained in it were, besides eight persons of Noah's family, one pair of every species of unclean animals, and seven pair of every species of clean animals, with provisions for them all during the whole year. The former appears, at first view, almost infinite; but if we come to a calculation, the number of species of animals will be found much less than is generally imagined; out of which, in this case, are excepted such animals as can live in the water; and Bishop Wilkins shows that only 72 of the quadruped kind needed a place in the ark.

By the description Moses gives of the ark, it appears to have been divided into three stories, each ten cubits or 15 feet high; and it is agreed on, as most probable, that the lowest story was for the beasts, the middle for the food, and the upper for the birds, with Noah and his family; each story being subdivided



Noah's Ark, an illustration from Encyclopædia Britannica's 1st Edition (1768–71).

into different apartments, stalls, etc., though Josephus, Philo, and other commentators, add a kind of fourth story under all the rest; being, as it were, the hold of the vessel, to contain the ballast and receive the filth and feces of so many animals; but F. Calmet thinks, that what is here reckoned a story, was no more than what is called the *keel* of ships, and served only for a conservatory of fresh water. . . . As to the number of animals contained in the ark, Buteo computes that it could not be equal to 500 horses; he even reduces the whole to the dimensions of 56 pair of oxen. F. Lamy enlarges it to 64 pair of oxen, or 128 oxen; so that, supposing one ox equal to two horses, if the ark had room for 256 horses, there must have been room for all the animals. But the same author demonstrates, that one floor of it would suffice for 500 horses, allowing nine square feet to a horse. . . .

Bishop Wilkins computes all the carnivorous animals equivalent, as to the bulk of their bodies, and their food, to 27 wolves, and all the rest to 280 beeves. For the former, he allows 1825 sheep; and for the latter, 109,500 cubits of hay: all which will be easily contained in the two first stories, and a deal of room to spare. As to the third story, nobody doubts of its being sufficient for the fowls; with Noah, his sons, and daughters. Upon the whole, the learned bishop remarks, that of the

two, it appears much more difficult to assign a number and bulk of necessary things to answer the capacity of the ark, than to find sufficient room for the several species of animals already known to have been there. . . .

But it must be observed, that, besides the places requisite for the beasts and birds, and their provisions, there was room required for Noah to lock up household utensils, the instruments of husbandry, grains and feeds to sow the earth with after the deluge; for which purpose it is thought that he might spare room in the third story for 36 cabins, besides a kitchen, a hall, four chambers, and a space about 48 cubits in length to walk in.

PRAYER

A Solemn Duty

Prayer was a solemn and universal duty, and after describing its proper elements, Britannica in its 4th Edition (1801–09) sternly addressed sophists who argued against its necessity.

Prayer, a solemn address to God, which, when it is of any considerable length, consists of *adoration, confession, supplication, intercession, and thanksgiving*. . . .

That prayer is a duty which all men ought to perform with humility and reverence, has been generally acknowledged as well by the untaught barbarian as by the enlightened Christian; and yet to this duty objections have been made by which the understanding has been bewildered in sophistry and affronted with jargon. "If God be independent, omnipotent, and possessed of every other perfection, what pleasure, it has been asked, can he take in our acknowledgment of these perfections? If he knows all things past, present, and future, where is the propriety of our confessing our sins unto him? If he is a benevolent and merciful Being, he will pardon our sins, and grant us what is needful for us without our supplications and intreaties; and if he be likewise possessed of infinite wisdom, it is certain that no importunities of ours will prevail upon him to grant us what is improper, or for our sakes to change the equal and steady laws by which the world is governed." . . .

Such are the most plausible objections which are usually made to the practice of prayer; and though they have been set off with all the art of the metaphysical wrangler . . . they appear to us such gross sophisms as can operate only on a very unthinking head, or on a very corrupt heart. For if God certainly exists, and there is not a mathematical theorem capable of more rigid demonstration, it is obvious that no man can think of such a being without having his mind strongly impressed with the conviction of his own constant dependence upon him; nor can he "contemplate the heavens, the work of God's hands, the moon, and the stars which he has ordained," without forming the most sublime conceptions that he can of the Divine power, wisdom, and goodness, etc., . . .

Having evinced the duty of adoration, confession, supplication, and intercession, we need not surely waste our readers' time with a formal and laboured vindication of thanksgiving. Gratitude for benefits received is so universally acknowledged to be a virtue, and ingratitude is so detestable a vice, that no man who lays claim to a moral character will dare to affirm that we ought not to have a just sense of the goodness of God in preserving us from the numberless dangers to which we are exposed, and "in giving us rain from heaven, and fruitful seasons, filling our hearts with food and gladness."

SUNDAY SCHOOLS

Outreach to the Poor

In working-class towns throughout England in the 1780s, a new institution arose to help the children of the slums, often the offspring of poor factory workers: the Sunday school. Wealthy children had tutors, governesses, and private ("public") schools; urban middle-class kids, who were not required to work outside of the home, had the time to attend "grammar schools"; but poor families, with little money or free time, had few options for teaching their children how to read or write or for reinforcing the Christian precepts of right and wrong, moral instruction that could help save their children, who were wage-earners like their parents every day but on the Sabbath, from sliding into a life of delinquency. Britannica was quick to praise this new institution, as seen in the entry below from Britannica's 3rd Edition (1788–97).

Sunday Schools are another species of charity-schools lately instituted, and now pretty common in Great Britain. The institution is evidently of the first importance; and if properly encouraged must have a very favourable effect on the morals of the people, as it tends not only to preserve the children of the poor from spending Sunday in idleness, and of consequence in dissipation and vice, but enables them to lay in for the conduct and comfort of their future life a stock of useful knowledge and virtuous principles, which, if neglected in early life, will seldom be sought for or obtained amidst the hurry of business and the cares and temptations of the world.

The excellent founder of Sunday Schools was Mr Raikes, a gentleman of Gloucestershire, who, together with Mr Stock, a clergyman in the same county, and who, we believe, was equally instrumental in the business with Mr Raikes, shewed the example, and convinced many of the utility of the plan. From Gloucestershire the institution was quickly adopted in every county and almost every town and parish of the kingdom; and we have only further to remark on a plan so generally known, so much approved, and so evidently proper, that we hope men of eminence and weight will always be found sufficiently numerous and willing to bestow their time and countenance in promoting it to the utmost of their power.

Security Is Good, Reconciliation Even Better

By Archbishop Justin Welby, the Archbishop of Canterbury

When we look around us, often the world does not feel like a safe place to live. We are rightly outraged by the ubiquity of violence and war. The reality is, however, that tremendous efforts are being made globally to bring an end to violent conflict; in many places, societies are much safer than ever before in human history. Security is not as rare as we might think. But what is rare is genuine reconciliation.

Part of my role as Archbishop of Canterbury is visiting churches in countries of conflict and post-conflict. One of the things that strikes me more and more in my involvement in reconciliation is that it almost doesn't exist. By that I mean actual reconciliation: the letting go of memories of destruction—not forgetting, but letting go, disempowering them, overthrowing them in the hearts and minds of individuals and societies. How often do we see that? Put simply, most of the places I go to have coexistence without reconciliation.

The first question is why that matters. Reconciliation is rare precisely because it seems like a high ideal, an optional extra once other matters have been resolved. The problem, of course, is that harmonious coexistence which is not rooted in reconciliation is fundamentally fragile. We see this again and again around the world in the re-ignition of old conflicts that seemed to have been resolved long ago. We have also witnessed it in the recent rapid polar-

ization of politics in Western Europe, where apparently peaceful nations have been shown to be deeply, and bitterly, fragmented. Coexistence involves choosing not to seek the annihilation of the other. Reconciliation is about choosing to see the other in a radically different way: in their full humanity. It is making the decision not to be controlled by the deep wounds of past hatred (or indifference) and instead to try to forge a new relationship. It is this new relationship that gives societies and communities strength.

The second, more difficult question is what this reconciliation looks like in practice. From what I have seen, it begins with humility—and the painful recognition that I may be part of the problem, even when I have been wronged. It takes courage to look

Lambeth Palace–Picture Partnership



at ourselves in total honesty and identify the thoughts, prejudices, fears and behaviors that alienate us from the other. But when we do so, it becomes a little more possible to engage in deep humanity with those we would prefer to avoid or ignore. If we can build on that possibility, and go so far as to decide to spend time together and to listen, then we may even reach the stage where the other person's identity becomes a treasure to us, rather than a threat.

When we do this as a society, we can begin to handle diversity creatively and sincerely, honoring one another in our deep difference. We can learn collectively to approach that difference with curiosity and compassion, not assuming that it is intrinsically frightening. We can begin to flourish together in previously unthinkable ways. Reconciliation is the transformation of alienation into a new creation, not only restored but reinvigorated.

So I think one of the greatest challenges of our time is this: Will we have the courage to seek such a remaking of our world?

The Most Reverend Justin Welby has been Archbishop of Canterbury and leader of the Anglican Communion since 2013. Born in London in 1956, he was educated at Eton College and Trinity College, Cambridge, where he studied history and law. For 11 years—five in Paris and six in London—he worked in the oil industry; his booklet, Can Companies Sin?, drew on this corporate experience and evolved from his dissertation at theological college. He has been

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Illustration of Earth with symbols of various religions.

Bishop of Durham, Dean of Liverpool Cathedral, and Canon of Coventry Cathedral, whose international reconciliation work he led for five years. He has long blended deep devotion to his parish communities with Church work around the world, especially in areas of conflict. Archbishop Justin has set three priorities for his ministry: a renewal of prayer and religious communities across the Church; supporting churches and Christians to be agents of reconciliation and peace-making in places of conflict; and encouraging and inspiring Christians to share their faith. He and his wife, Caroline, have two sons and three daughters.

Some Lives

ALEXANDER THE GREAT

Heroes Make Noise

In earlier editions of Britannica the assessment of great careers often boasted a forthright quality missing in our more dispassionate era. This is from Britannica's 4th Edition (1801–09).

To sum up the character of this prince, we cannot be of opinion, that his good qualities did in anywise compensate for his bad ones. Heroes make a noise; their actions glare, and strike the senses forcibly; while the infinite destruction and misery they occasion lie more in the shade, and out of sight. One good legislator is worth all the heroes that ever did or will exist.

The Metropolitan Museum of Art, New York; purchase, John H. and Susan Gutfreund Gift, 1993 (accession no. 1993.65.1), www.metmuseum.org



Alexander the Great, enameled plaque by Colin Nouailher, c. 1541.

ANNE BOLEYN

Playing Hard to Get

The queens who were variously wife, daughter, and grandniece to Henry VIII have in-

evitably received major attention from Britannica editors since the 2nd Edition (the 1st Edition having banned biographies—see the entry on “Biographies” in this volume). This excerpt below, full of the anti-Catholic bias of the day, is from Britannica's 3rd Edition (1788–97).

Anne Boleyn, queen of Henry VIII. of England; memorable in the English history, as the first cause of the reformation, as the mother of queen Elizabeth under whom it was completely established, and also on account of her own sufferings. She was the daughter of Sir Thomas Boleyn, and born in 1507. She was carried into France at seven years of age by Henry VIII's sister, who was wife of Louis XII. . . . The year of her return is not well known: some will have it to have been in 1527, others in 1525. This much is certain, that she was maid of honour to queen Catharine of Spain, Henry VIII's first wife; and that the king fell extremely in love with her. She behaved herself with so much art and address, that by refusing to satisfy his passion, she brought him to think of marrying her: and the king, deceived by her into a persuasion that he should never enjoy her unless he made her his wife, was induced to set on foot the affair of his divorce with Catharine, which at last was executed with great solemnity and form. A celebrated author observes, that “That which would have been very praise-worthy on another occasion, was Anne Boleyn's chief crime: since her refusing to comply with an amorous king, unless he would divorce his wife, was a much more enormous crime than to have been his concubine. A concubine (says he) would not have dethroned a queen, nor taken her crown or her husband from her; whereas the crafty Anne Boleyn, by pretending to be chaste and scrupulous, aimed only at the usurpation of the throne, and the exclusion of Catharine of Arragon and her daughters from all the honours due to them.” In the mean time, Henry could not procure a divorce from the Pope; which, we know, made him resolve at length to disown his authority, and to fling off his

yoke. Nevertheless he married Anne Boleyn privately upon the 14th of November 1532, without waiting any longer for a release from Rome; and as soon as he perceived that his new wife was with child he made his marriage public. He caused Anne Boleyn to be declared queen of England on Easter-eve 1533, and to be crowned the first of June following. She was brought to bed upon the 7th of September of a daughter, who was afterwards queen Elizabeth; and continued to be much beloved by the king, till the charms of Jane Seymour had fired that prince's heart in 1536. . . . When she was imprisoned, she is said to have acted very different parts; sometimes seeming devout and shedding abundance of tears, then all of a sudden breaking out into a loud laughter. A few hours before her death, she said, that the executioner was very handy: and besides, that she had a very small neck; at the same time feeling it with her hands, and laughing heartily. However, it is agreed that she died with great resolution; taking care to spread her gown about her feet, that she might fall with decency. . . . Roman Catholic writers have taken all occasions to rail at this unhappy woman, as well through vexation at the schism which she occasioned, as for the sake of defaming and dishonouring Queen Elizabeth by this means; and they have triumphed vehemently, that in the long reign of that queen, no endeavours were used to justify her mother. But either Queen Elizabeth or

her ministers are greatly to be admired for prudence in this respect; since it is certain, that Anne Boleyn's justification could never have been carried on without discovering many things which must have been extremely prejudicial to the queen, and have weakened her right instead of establishing it. For though the representations of the Papists are in no wise to be regarded, yet many things might have been said to the disadvantage of her mother, without transgressing the laws of true history; as that she was a woman gay even to immodesty, indiscreet in the liberties she took, and of an irregular and licentious behaviour.

DANIEL LAMBERT

A Giant Influence

Daniel Lambert was as large in influence as he was in frame, as Britannica's 11th Edition (1910–11) coverage of him made plain.

Daniel Lambert (1770–1809), an Englishman famous for his great size, was born near Leicester on the 13th of March 1770, the son of the keeper of the jail, to which post he succeeded in 1791. About this time his size and weight increased enormously, and though he had led an active and athletic life he weighed in 1793, thirty-two stone (448 lb). In 1806 he resolved to profit by his notoriety, and resigning his office went up to London and exhibited himself. He died on the 21st of July, 1809, and at the time measured 5 ft. 11 in. in height and weighed 52¾ stone (739 lb). His waistcoat, now in the Kings Lynn Museum, measures 102 in. round the waist. His coffin contained 112 ft. of elm and was built on wheels. His name has been used as a synonym for immensity. George Meredith describes London as the "Daniel Lambert of cities," and Herbert Spencer uses the phrase "a Daniel Lambert of the learning." His enormous proportions were depicted on a number of tavern signs, but the best portrait of him, a large mezzotint, is preserved at the British Museum in Lyson's *Collectanea*.

Daniel Lambert, age 36, weighing some 50 stone (700 pounds), from an 1806 illustration.



BL/Robana—Robana Picture Library/age fotostock

ELIZABETH I

That Deathbed Scene

"Having reportedly indicated James as her successor, Elizabeth died quietly." So does Britannica's current coverage of Elizabeth I laconically account the passing of "Good Queen Bess." An interesting contrast in styles is provided by the excerpt below from Britannica's 2nd Edition (1778–83). Deathbed scenes were catnip to earlier writers.

Elizabeth continued to reign with great glory till the year 1603; but all her greatness could not prevent her from being extremely miserable before her death. She had caused her greatest favourite, and probably her lover, the earl of Essex, to be executed. Though this execution could not be called unjust, the queen's affection (on being informed that he had at last thrown himself entirely on her clemency) returned to such a degree, that she thenceforth gave herself entirely over to despair. She refused food and sustenance; she continued silent and gloomy; sighs and groans were the only vent she gave to her despondence; and she lay for ten days and nights upon the carpet, leaning on cushions, which her maids brought her. Perhaps the faculties of her mind were impaired by long and violent exercise; perhaps she reflected with remorse on some past actions of her life, or perceived, but too strongly, the decays of nature, and the approach of her dissolution. She saw her courtiers remitting in their assiduity to her, in order to pay their court to James the apparent successor. Such a concurrence of causes was more than sufficient to destroy the remains of her constitution; and her end was now visibly seen to approach. Feeling a perpetual heat in her stomach, attended with an unquenchable thirst, she drank without ceasing, but refused the assistance of her physicians. Her distemper gaining ground, Cecil and the lord admiral desired to know her sentiments with regard to the succession. To this she replied, That as the crown of England had always been held by kings, it ought not to devolve upon any inferior character, but upon her immediate heir the king of Scotland. Being then advised by the archbishop of Canterbury to fix her thoughts upon God, she replied, that her thoughts did not in the least wander from him. Her voice

soon after left her; she fell into a lethargic slumber, which continued some hours; and she expired gently without a groan, in the 70th year of her age, 45th of her reign.

GEORGE ELIOT

A Rare Woman's Assessment

The life of George Eliot (pseudonym of Mary Ann Evans) was treated in Britannica's 11th Edition (1910–11) by "John Oliver Hobbes," the pen name of P.M.T. Craigie (Pearl Mary Teresa Craigie, 1867–1906). She was an Anglo-American novelist and playwright who, like her subject, felt it advisable to use a male pseudonym. Her article is noteworthy on two counts. It strikes a quiet, nonaggressive, but firm feminist note, and it is one of the few Britannica articles of its period by a woman. Since the time when she wrote about Eliot, however appreciatively, the reputation of Eliot has risen considerably. Middlemarch is now considered one of the classics of English literature.

George Eliot, the pen-name of the famous English writer, *née* Mary Ann (or Marian) Evans (1810–1880), afterwards Mrs J. W. Cross, born at Arbury Farm, in Warwickshire, on the 22nd of November 1819. . . . She received an ordinary education at respectable schools till the age of seventeen, when her mother's death, and the marriage of her elder sister, called her home in the character of housekeeper. This, though it must have sharpened her sense, already too acute, of responsibility, was an immense advantage to her mind, and, later, to her career, for, delivered from the tiresome routine of lessons and class work, she was able to work without pedantic interruptions at German, Italian and music, and to follow her unusually good taste in reading. . . .

Marian Evans was subdued all through her youth by a severe religious training which, while it pinched her mind and crushed her spirit, attracted her idealism by the very hardness of its perfect counsels. It is not surprising to find, therefore, that when Mr Evans moved to Coventry in 1841, and so enlarged the circle of their acquaintance, she became much interested in some new friends, Mr and

Mrs Charles Bray and Mr Charles Hennell. Mr Bray had literary taste and wrote works on the *Education of the Feelings*, the *Philosophy of Necessity*, and the like. Mr Hennell had published in 1838 *An Enquiry concerning the Origin of Christianity*. Miss Evans, then twenty-two, absorbed immediately these unexpected, and, at that time, daring habits of thought. So compelling was the atmosphere that it led to a complete change in her opinions. Kind in her affection, she was relentless in argument. She refused to go to church (for some time, at least), wrote painful letters to a former governess—the pious Miss Lewis—and barely avoided an irremediable quarrel with her father, a churchman of the old school. Here was rebellion indeed. But rebels come, for the most part, from the provinces where petty tyranny, exercised by small souls, show the scheme of the universe on the meanest possible scale. George Eliot was never orthodox again; she abandoned, with fierce determination, every creed, and although she passed, later, through various phases, she remained incessantly a rationalist in matters of faith and in all other matters. It is nevertheless true that she wrote admirably about religion and religious persons. She had learnt the evangelical point of view; she knew—none better—the strength of religious motives; vulgar doubts of this fact were as distasteful to her as they were to another eminent writer, to whom she refers in one of her letters (dated 1853) as “a Mr Huxley, who was the centre of interest” at some “agreeable evening.” Her books abound in tributes to Christian virtue, and one of her own favourite characters was Dinah Morris in *Adam Bede* . . .

Balzac created a whole world; George Eliot did not create, but her exposition of the upper and middle class minds of her day is a masterpiece of scientific psychology. . . . The death of Mr Lewes in 1878 was also the death-blow to her artistic vitality. She corrected the proofs of *Theophrastus Such* (a collection of essays), but she wrote no more. About two years later, however, she married Mr J. W. Cross, a gentleman whose friendship was especially congenial to a temperament so abnormally dependent on affectionate understanding as George Eliot's. But she never really recovered from her shock at the loss of George Lewes, and died at 4 Cheyne Walk, Chelsea, on the 22nd of December 1880.

No right estimate of her, whether as a woman, an artist or a philosopher, can be formed without a steady recollection of her infinite capacity for mental suffering, and her need of human support. The statement that there is no sex in genius, is on the face of it, absurd. George Sand, certainly the most independent and dazzling of all women authors, neither felt, nor wrote, nor thought as a man. Saint Teresa, another great writer on a totally different plane, was pre-eminently feminine in every word and idea. George Eliot, less reckless, less romantic than the Frenchwoman, less spiritual than the Spanish saint, was more masculine in style than either; but her outlook was not, for a moment, the man's outlook; her sincerity, with its odd reserves, was not quite the same as a man's sincerity, nor was her humour that genial, broad, unequivocal humour which is peculiarly virile. Hers approximated, curiously enough, to the satire of Jane Austen, both for its irony and its application to little everyday affairs. Men's humour, in its classic manifestations, is on the heroic rather than on the average scale: it is for the uncommon situations, not for the daily tea table. . . . Jane Austen despised the greater number of her characters: George Eliot suffered with each of hers. Here, perhaps, we find the reason why she is accused of being inartistic. She could not be impersonal.

Again, George Eliot was a little scornful to those of both sexes who had neither special missions nor the consciousness of this deprivation. Men are seldom in favour of missions in any field.

GEORGE WASHINGTON

Two Views

The Washington biography in Britannica's 8th edition (1852–60) was written by Edward Everett (1794–1865). One of the first American contributors to Encyclopædia Britannica, he was a member of the U.S. House of Representatives and the U.S. Senate, a governor of Massachusetts, the U.S. minister to England, the U.S. secretary of state, and president of Harvard University. He also had the distinction of suffering one of history's cruelest fates. Although



Washington Crossing the Delaware, oil painting by Emanuel Leutze, 1851.

the most famous orator of his day, Everett is remembered most for an oration remembered least: for his two-hour elocution that immediately preceded the most famous two-minute speech in history—Abraham Lincoln's Gettysburg Address. The oratorical style of his time was long, mellifluous, stem-winding, florid, and dramatic, and he wrote in similar fashion. His fulsome and ornate style can be seen from the conclusion, copied below, of his 26-page panegyric.

To sense at once the difference between generational styles, the reader might compare the second passage copied below written by the great American historian and Pulitzer Prize winner Allan Nevins, from whom *Britannica* commissioned a new biography of Washington for its 15th Edition (1974–2012).

Edward Everett, in Britannica's 8th Edition (1852–60):

. . . Without adopting Virgil's magnificent but scornful contrast between scientific and literary skill on the one hand and those masterful arts on the other, by which victories are gained and nations are governed, we must still admit that the chieftain who, in spite of obstacles the most formidable, and vicissitudes the most distressing, conducts great wars to successful issues;—that the statesman who harmonizes angry parties in peace; skill-

fully moderates the counsels of constituent assemblies, and without the resources of rhetoric, but by influence mightier than authority, secures the formation and organization of governments, and in their administration establishes the model of official conduct for all following time—is endowed with a divine principle of thought and action as distinct in its kind as that of Demosthenes or Milton. It is the genius of a consummate manhood. Analysis may describe its manifestations in either case, but cannot define the ulterior principle. It is a final element of character. We may speak of prudence, punctuality, and self-control, of bravery and disinterestedness, as we speak of an eye for colour and a perception of the graceful in the painter; a sensibility to the sublime, the pathetic, and the beautiful in discourse; but behind and above all these there must be a creative and animating principle at least as much in character as in intellect or art. The qualities which pertain to genius are not the whole of genius, in the one case any more than the other. The arteries, the lungs, and the nerves, are essential to life, but they are not life itself—that higher something which puts all the organic functions of the frame in motion. In the possession of that mysterious quality of character manifested in a long life of unambitious service, which, call it by whatever name, inspires the confidence, com-

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mands the respect, and wins the affection of contemporaries, and grows upon the admiration of successive generations, forming a standard to which the merit of other men is referred, and a living proof that pure patriotism is not a delusion, nor virtue an empty name, no one of the sons of men has equalled George Washington.

Allan Nevins, in *Britannica's 15th Edition* (1974–2012):

... Retiring in March 1797 to Mount Vernon, he devoted himself for the last two and a half years of his life to his family, farm operations, and care of his slaves. In 1798 his seclusion was briefly interrupted when the prospect of war with France caused his appointment as commander in chief of the provisional army, and he was much worried by the political quarrels over high commissions; but the war cloud passed away. On December 12, 1799, he exposed himself on horseback for several hours to cold and snow and, returning home exhausted, was attacked late next day with quinsy or acute laryngitis. He was bled heavily four times and given gargles of "molasses, vinegar and butter," and a blister of cantharides (a preparation of dried beetles) was placed on his throat, his strength meanwhile rapidly sinking. He faced the end with characteristic serenity, saying, "I die hard, but I am not afraid to go," and later: "I feel myself going. I thank you for your attentions; but I pray you to take no more trouble about me. Let me go off quietly. I cannot last long." After giving instructions to his secretary, Tobias Lear, about his burial, he died at 10:00 PM on December 14.

MARY SHELLEY

Frankenstein's Mother

The following excerpt from *Britannica's 9th Edition* (1875–89) is scanty on information about the early life of Mary Shelley, then just a recent novelist deserving of "some notice," but it provides an early and interesting literary appreciation of her work, especially her famed Gothic novel *Frankenstein*; or, *The Modern Prometheus* (1818).



Movie poster advertising *Frankenstein* (1931), starring Boris Karloff as the monster.

Mary Wollstonecraft Shelley (1797–1851), the second wife of the poet Shelley, born in London, August 30, 1797, deserves some notice on her own account, as a writer of romance, chiefly imaginative.

When she was in Switzerland with Shelley and Byron in 1816, a proposal was made that various members of the party should write a romance or tale dealing with the supernatural. The result of this project was that Mrs Shelley wrote *Frankenstein*, Byron the beginning of a narrative about a vampyre, and Dr Polidori, Byron's physician, a tale named *The Vampyre*, the authorship of which used frequently in

past years to be attributed to Byron himself. *Frankenstein*, published in 1818, when Mrs Shelley was at the utmost twenty-one years old, is a very remarkable performance for so young and inexperienced a writer; its main idea is that of the formation and vitalization, by a deep student of the secrets of nature, of an adult man, who, entering the world thus under unnatural conditions, becomes the terror of his species, a half-involuntary criminal, and finally an outcast whose sole resource is self-immolation. This romance was followed by others: *Valperga, or the Life and Adventures of Castruccio, Prince of Lucca* (1823), an historical tale written with a good deal of spirit, and readable enough even now; *The Last Man* (1826), a fiction of the final agonies of human society owing to the universal spread of a pestilence,—this is written in a very stilted style, but bears some traces of the imagination which fashioned *Frankenstein*; *The Fortunes of Perkin Warbeck* (1830); *Lodore* (1835); and *Falkner* (1837). Besides these novels there was the *Journal of a Six Weeks' Tour*, which is published in conjunction with Shelley's prose writings; also *Rambles in Germany and Italy* in 1840–42–43 (which shows an observant spirit, capable of making some true forecasts of the future), and various miscellaneous writings.

After the death of Shelley, for whom she had a deep and even enthusiastic affection, marred at times by defects of temper, Mrs Shelley in the autumn of 1823 returned to London. At first the earnings of her pen were her only sustenance; but after a while Sir Timothy Shelley made her an allowance, which would have been withdrawn if she had persisted in a project of writing a full biography of her husband. She was a loving and careful mother, and shared the prosperous fortunes of her son, when, upon the death of Sir Timothy in 1844, he succeeded to the baronetcy. She died in February 1851.

NELL GWYN

Bawdry and Beloved

Gwyn was an English actress and mistress of Charles II whose "frank recklessness, her generosity, her invariable good temper, her ready wit, her infectious high spirits and amazing in-

discretions appealed irresistibly to a generation which welcomed in her the living antithesis of Puritanism," and a hundred years ago, in its 11th Edition (1910–11), *Britannica* provided heaps of delightful detail to back up this titillating summation.

Nell [Eleanor] Gwyn (1650–1687), English actress, and mistress of Charles II., was born on the 2nd of February 1650/1, probably in an alley off Drury Lane, London, although Hereford also claims to have been her birthplace. Her father, Thomas Gwyn, appears to have been a broken-down soldier of a family of Welsh origin. Of her mother little is known save that she lived to some time with her daughter, and that in 1679 she was drowned, apparently when intoxicated, in a pond at Chelsea. Nell Gwyn, who sold oranges in the precincts of Drury Lane Theatre, passed at the age of fifteen, to the boards, through the influence of the actor Charles Hart and of Robert Duncan or Dungan, an officer of the guards who had interest with the management. Her first recorded appearance on the stage was in 1665 as Cydaria, Montezuma's daughter, in Dryden's *Indian Emperor*, a serious part ill-suited to her. In the following year she was Lady Wealthy in the Hon. James Howard's comedy *The English Monsieur*. Pepys was delighted with the playing of "pretty, witty Nell," but when he saw her as Florimel in Dryden's *Secret Love, or the Maiden Queen*, he wrote "so great a performance of a comical part was never, I believe, in the world before" and, "so done by Nell her merry part as cannot be better done in nature" (*Diary*, March 25, 1667). Her success brought her other leading rôles—Bellario, in Beaumont and Fletcher's *Philaster*; Flora, in Rhodes's *Flora's Vagaries*; Samira, in Sir Robert Howard's *Surprisal*; and she remained a member of the Drury Lane company until 1669, playing continuously save for a brief absence in the summer of 1667 when she lived at Epsom as the mistress of Lord Buckhurst, afterwards 6th earl of Dorset. Her last appearance was as Almahide to the Almanzor of Hart, in Dryden's *The Conquest of Granada* (1670), the production of which had been postponed some months for her return to the stage after the birth of her first son by the king.

As an actress Nell Gwyn was largely indebted to Dryden, who seems to have made a

special study of her airy, irresponsible personality, and who kept her supplied with parts which suited her. She excelled in the delivery of the risky prologues and epilogues which were the fashion, and the poet wrote for her some specially daring examples. It was, however, as the mistress of Charles II. that she endeared herself to the public. Partly, no doubt, her popularity was due to the disgust inspired by her rival, Louise de K  roualle, duchess of Portsmouth, and to the fact that, while the Frenchwoman was a Catholic, she was a Protestant. But very largely it was the result of exactly those personal qualities that appealed to the monarch himself. She was *pi-quante* rather than pretty, short of stature, and her chief beauty was her reddish-brown hair. She was illiterate, and with difficulty scrawled an awkward E.G. at the bottom of her letters, written for her by others. But her frank recklessness, her generosity, her invariable good temper, her ready wit, her infectious high spirits and amazing indiscretions appealed irresistibly to a generation which welcomed in her the living antithesis of Puritanism. "A true child of the London streets," she never pretended to be superior to what she was, nor to interfere in matters outside the special sphere assigned her; she made no ministers, she appointed to no bishoprics, and for the high issues of international politics she had no concern. She never forgot her old friends, and, as far as is known, remained faithful to her royal lover from the beginning of their intimacy to his death, and, after his death, to his memory.

Of her two sons by the king, the elder was created Baron Hedington and earl of Burford and subsequently duke of St Albans; the younger, James, Lord Beauclerk, died in 1680, while still a boy. The king's death-bed request to his brother, "Let not poor Nelly starve," was faithfully carried out by James II., who paid her debts from the Secret Service fund, provided her with other moneys, and settled on her an estate with reversion to the duke of St Albans. But she did not long survive her lover's death. She died in November 1687, and was buried on the 17th, according to her own request, in the church of St Martin-in-the-Fields, her funeral sermon being preached by the vicar, Thomas Tenison, afterwards archbishop of Canterbury, who said "much to her praise." Tradition credits the foundation of Chelsea Hospital to her influence over the king.

PHRYNE

That Most Beautiful, Naked Toad

Because of her sallow complexion, she was called by the Greek name for "toad." But no amphibian ever turned as many heads as the courtesan Phryne did in ancient Greece, as Britannica's 11th Edition (1910-11) made clear.

Phryne, Greek courtesan, lived in the 4th century B.C. Her real name was Mnesarete, but owing to her complexion she was called Phryne (toad), a name given to other courtesans. She was born at Thespieae in Boeotia, but seems to have lived at Athens. She acquired so much wealth by her extraordinary beauty that she offered to rebuild the walls of Thebes, which had been destroyed by Alexander the Great (336), on condition that the words "Destroyed by Alexander, restored by Phryne the courtesan," were inscribed upon them. On the occasion of a festival of Poseidon at Eleusis she laid aside her garments, let down her hair, and stepped into the sea in the sight of the people, thus suggesting to the painter Apelles his great picture of Aphrodite Anadyomene, for which Phryne sat as model. She was also (according to some) the model for the statue of the Cnidian Aphrodite by Praxiteles. When accused of profaning the Eleusinian mysteries, she was defended by the orator Hypereides, one of her lovers. When it seemed as if the verdict would be unfavourable, he rent her robe and displayed her lovely bosom, which so moved her judges that they acquitted her. According to others, she herself thus displayed her charms. She is said to have made an attempt on the virtue of the philosopher Xenocrates. A statue of Phryne, the work of Praxiteles, was placed in a temple at Thespieae by the side of a statue of Aphrodite by the same artist.

POPE JOAN

The Groping Chair

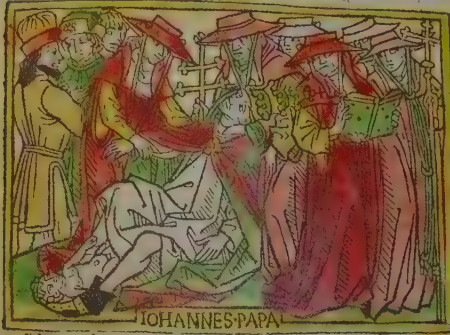
The Roman Catholic Church once had a female pontiff, and a pregnant one no less. Later known as "Pope Joan," she reigned disguised as a man, using the title "John VIII," and she

ruled between 855 and 858. Her subsequent pregnancy, however, blew her cover, whereupon she was dragged "from Rome and stoned to death.

This story of Pope Joan, though apocryphal, appears to have begun in the 11th century and taken root in the 13th, and it was long accepted as fact by even many Catholics; a bust of her was displayed in the cathedral of Siena, where it reportedly resided alongside the busts of other popes from 1400 until the early 17th century.

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namen zenobia von der künigin behielte, by dem pas-
last diu adriani allda endet sie ir leben.



Von Johanne anglica der bābkin das xcy capl.
Ohannes wie wol der nam ains mañes ist
so ward doch ain wēb also geneuet. Ain
junckfrölin zemenz (als etlich fagen) gili-
berra gehaissen / lernet in vätterlicher

Pope Joan giving birth, woodcut illustration
by Johannes Zainer, c. 1474.

Most striking in *Britannica's* coverage of Pope Joan in its 2nd Edition (1778–83) is its final line, which is one of the most vicious ever penned and published by *Britannica*. The editors working in (Protestant) 18th-century Edinburgh obviously felt little need to suppress their anti-Catholic vitriol, which was common to their place and time. The final line was later softened in *Britannica's* 4th Edition (1801–09), but only slightly, as the reader will see.

From *Britannica's* 2nd Edition (1778–83):

Joan (Pope), called by Platina John VIII. is said to have held the holy see between Leo IV. who died in 855, and Benedict III. who died in 858. Marianus Scotus says, she sat two years five months and four days. Num-

berless have been the controversies, fables, and conjectures, relating to this pope. It is said that a German girl, pretending to be a man, went to Athens, where she made great progress in the sciences; and afterward came to Rome in the same habit. As she had a quick genius, and spoke with a good grace in the public disputations and lectures, her great learning was admired, and every one loved her extremely; so that after the death of Leo, she was chosen pope, and performed all offices as such. Whilst she was in possession of this high dignity, she was got with child; and as she was going in a solemn procession to the Lateran church, she was delivered of that child, between the Coliseum and St. Clement's church, in a most public street, before a crowd of people, and died on the spot, in 857. By way of embellishing this story, may be added the precaution reported to have been afterward taken to avoid such another accident. After the election of a pope, he was placed on a chair with an open seat, called the *groping chair*, when a deacon came most devoutly behind and satisfied himself of the pontiff's sex by feeling. This precaution, however, has been long deemed unnecessary, because the cardinals now always get bastards enough to establish their virility before they arrive at the pontificate.

Final line as modified from *Britannica's*
4th Edition (1801–09):

This precaution, however, has been long deemed unnecessary, because the cardinals, it is alleged, take care to become fathers before they arrive at the pontificate.

SHAKESPEARE Bashing the Bard

From the start, *Britannica* treated not specific writers with formal biographies (see the entry on "Biographies" in this volume) but specific aspects of literature. Often these usually compact entries were unstinting in their criticism even of the greatest literary names. In the article "Comparison" in *Britannica's* 1st Edition (1768–71), the editor, William Smellie, devoted

many pages to taking *Shakespeare to task* for his supposed sins.

Intellectuals in the 18th century, still greatly influenced by the medieval conception of the liberal arts, paid more attention to rhetoric than we do. They also felt uneasy when poets digressed from the path of "good sense." Mr. Smellie had little confidence in Shakespeare's command over simile and metaphor. His lengthy discussion, of which only the beginning is given below, is studded with such phrases as "this comparison has scarce any force . . . this error . . . an useless image. . . ."

Comparison, in a general sense, the consideration of the relation between two persons or things, when opposed and set against each other, by which we judge of their agreement or difference.

Instruction is the principal, but not the only end of comparison. It may be employed with success in putting a subject in a strong point of view. A lively idea is formed of a man's courage by likening it to that of a lion; and eloquence is exalted in our imagination by comparing it to a river overflowing its bank, and involving all in its impetuous course. The same effect is produced by contrast: A man in prosperity becomes more sensible of his happiness, by comparing his condition with that of a person in want of bread. Thus comparison is subservient to poetry as well as to philosophy. . . .

But it will be a better illustration of the present head, to give examples where comparisons are improperly introduced. Similes are not the language of a man in his ordinary state of mind, dispatching his daily and usual work: for that reason, the following speech of a gardener to his servant, is extremely improper:

Go bind thou up yon dangling apricocks,
Which, like unruly children, make their sire
Stoop with oppression of their prodigal
weight:
Give some supportance to the bending
twigs.
Go thou, and, like an executioner,
Cut off the heads of too-fast-growing
sprays,
That look too lofty in our common-
wealth:
All must be even in our government.

Richard II, act 3. sc. 7.



Engraved portrait of Shakespeare by Martin Droeshout, from the frontispiece of the First Folio edition of Shakespeare's plays, 1623.

The fertility of Shakespear's vein betrays him frequently into this error.

Shakespeare drew similar fire from James Tytler, editor of Britannica's 2nd Edition (1778–83), as seen in his entry below on "Narration."

Narration, in oratory, poetry, and history, a recital or rehearsal of a fact as it happened, or when it is supposed to have happened.

Concerning Narration and Description, we have the following rules and observations in the Elements of Criticism.

1. The first rule is, That in history the reflections ought to be chaste and solid; for while the mind is intent upon truth, it is little disposed to the operations of the imagination. Strada's Belgic history is full of poetical images, which, being discordant with the subject, are unpleasant; and they have a still worse effect, by giving an air of fiction to a genuine history. Such flowers ought to be scattered with a sparing hand, even in epic poetry; and at no rate are they proper, till the reader be warmed, and by an enlivened imagination be prepared to relish them: in that state of mind, they are agreeable; but while we

are sedate and attentive to an historical chain of facts, we reject with disdain every fiction.

2. Vida, following Horace, recommends a modest commencement of an epic poem: giving for a reason, That the writer ought to husband his fire. Besides, bold thoughts and figures are never relished till the mind be heated and thoroughly engaged, which is not the reader's case at the commencement. Homer introduces not a single simile in the first book of the *Iliad*, nor in the first book of the *Odyssey*. On the other hand, Shakespeare begins one of his plays with a sentiment too bold for the most heated imagination:

Bedford. Hung be the heav'ns with black,
yield day to night!
Comets, importing change of times
and states,
Brandish your crystal tresses in the sky,
And with them scourge the bad
revolting stars,
That have consented unto Henry's
death!
Henry the Fifth, too famous to live long!
England ne'er lost a king of so much
worth.

First part Henry VI.

The passage with which Strada begins his history, is too poetical for a subject of that kind; and at any rate too high for the beginning of a grave performance.

ZALEUCUS

Law and Order Lunacy

In New York City in the 1990s, by cracking down on even minor lawbreakers—from graffiti painters and turnstile jumpers to litterbugs, aggressive cabbies, and “squeegee men”—Mayor Rudy Giuliani earned the sobriquet “the Nanny of New York.” But there was a method to his “madness,” or so he claimed: by cracking down on minor infractions, he would be “sending a message” to all criminals, deterring more serious crime in the city. Many observers believe it worked, but weigh the “method” and the “madness” amid the following law-and-or-

der lunacy, as described in Britannica’s 13th Edition (1926).

Zaleucus, of Locri Epizephyii [ancient city on the eastern side of the “toe” of Italy, founded by Greeks c. 680 B.C.] in Magna Graecia, Greek lawgiver, is supposed to have flourished about 660 B.C. . . . He is said to have been the author of the first written code of laws amongst the Greeks. According to the common story, the Locrians consulted the Delphic oracle as to a remedy for the disorder and lawlessness that were rife amongst them. Having been ordered to make laws for themselves, they commissioned one Zaleucus, a shepherd and slave (in later tradition, a man of distinguished family) to draw up a code. The laws of Zaleucus, which he declared had been communicated to him in a dream by Athena, the patron goddess of the city, were few and simple, but so severe that, like those of Draco, they became proverbial. They remained essentially unchanged for centuries, and the Locrians subsequently enjoyed a high reputation as upholders of the law. One of the most important provisions was that the punishment for different offences was definitely fixed, instead of being left to the discretion of the judge before whom a case was tried. The penalty for adultery was the loss of the eyes, and in general the application of the *lex talionis* was enjoined as the punishment for personal injuries. . . . After the code was firmly established, the Locrians introduced a regulation that, if a citizen interpreted a law differently from the cosmopolis (the chief magistrate), each had to appear before the council of One Thousand with a rope round his neck, and the one against whom the council decided was immediately strangled. Any one who proposed a new law or the alteration of one already existing was subjected to the same test, which continued in force till the 4th century and even later. . . . It is said that one of Zaleucus’s laws forbade a citizen, under penalty of death, to enter the senate-house bearing a weapon. During the stress of war, Zaleucus violated this law; and, on its being pointed out to him, he committed suicide by throwing himself upon the point of his sword, declaring that the law must be vindicated.

Miscellany

AMERICAN REVOLUTION

Good for Both Countries

Britannica's 4th Edition (1801–09) article "America" included a long and explicit history of the American Revolution. Britannica's conclusion about that "contest" overseas was clear: it was good for both parties—America, under the sage leadership of George Washington, had a bright and promising future, and Britain, by losing the war, lost merely part of her "unwieldy" empire that could only "retard her prosperity."

Of course, unbeknownst to everyone at the time this entry appeared, America would be fighting for its very life some 36 months later, against Britain again and the very king to whom Britannica had dedicated its encyclopedia. America's "second war of independence"—the War of 1812—was just around the corner.

Notwithstanding the signal advantages that Lord Cornwallis had obtained over the Americans, his situation in Virginia began by degrees to be very critical; and the rather because he did not receive those reinforcements and supplies from Sir Henry Clinton, of which he had formed expectations, and which he conceived to be necessary to the success of his operations. Indeed, the commander in chief was prevented from sending those reinforcements to Lord Cornwallis which he otherwise might have done, by his fears respecting New York, against which he entertained great apprehensions that General Washington intended to make a very formidable attack. In fact, that able American general appears to have taken much pains, and to have employed great finesse, in order to lead Sir Henry Clinton to entertain this imagination. Letters, expressive of this intention, fell into the hands of Sir Henry, which were manifestly written with a design that

Surrender of Lord Cornwallis, oil painting by John Trumbull, 1820, which hangs in the rotunda of the U.S. Capitol in Washington, D.C.



Architect of the Capitol

they should be intercepted, and only with a view to amuse and deceive the British general. The project was successful; and by a variety of judicious military manoeuvres, in which he completely out-generalled the British commander, he increased his apprehensions about New York, and prevented him from sending proper assistance to Lord Cornwallis. . . .

In the mean time, the most effectual measures were adopted by General Washington for surrounding the British army under Lord Cornwallis. A large body of French troops, under the command of Lieutenant-general the count de Rochambeau, with a very considerable train of artillery, assisted in the enterprise. The Americans amounted to near 8000 continentals and 5000 militia. General Washington was invested with the authority of commander in chief of these combined forces of America and France. On the 29th of September, the investment of York Town was complete, and the British army quite blocked up. The day following, Sir Henry Clinton wrote a letter to Lord Cornwallis, containing assurances that he would do every thing in his power to relieve him, and some information concerning the steps that would be taken for that purpose. A duplicate of this letter was sent to his lordship by Major Cochran on the 3rd of October. That gentleman, who was a very gallant officer, went in a vessel to the capes, and made his way to Lord Cornwallis, through the whole French fleet, in an open boat. He got to York Town on the 10th of the month; and soon after his arrival had his head carried off by a cannon ball. . . .

It was on the 19th of October that Lord Cornwallis surrendered himself and his whole army, by capitulation, prisoners to the combined armies of America and France, under the command of General Washington. He made a defence suitable to the character he had before acquired for courage and military skill; but was compelled to submit to untoward circumstances and superior numbers. It was agreed by the articles of capitulation, that the British troops were to be prisoners to the United States of America, and the seamen to the French king, to whose officers also the British vessels found at York Town and Gloucester were to be delivered up. The British prisoners amounted to more than 6000; but many of them, at

the time of surrender, were incapable of duty. A considerable number of cannon, and a large quantity of military stores, fell into the hands of the Americans on this occasion.

As no rational expectation now remained of a subjugation of the colonies, the military operations that succeeded in America were of little consequence. . . .

Such was the end of the contest between Great Britain and America: A contest in which the latter attained to an independant rank among the nations, that may be productive of more important consequences that can yet be foreseen; and in which the former, happily for herself, was forced to relinquish a sovereignty that served only to repress her own internal industry, and retard her prosperity. She has, in the event, only suffered a diminution of unwieldy empire, which has been more than compensated by an increase of population, commerce, revenues, and wealth. . . .

The convulsions of nations and the calamities and the crimes of mankind, always form the most interesting subject of history; and happy is that people concerning whom the historian finds little to relate. From the period of the acceptance of their constitution, the American states have, in a great degree, enjoyed that fortunate situation. On the 13th of September 1788, the old congress having received the ratification of the constitution from eleven states, declared it to be in force, and appointed the first Wednesday of the following January for choosing the electors, who were to assemble on the first Wednesday in February following, to elect the president and vice-president. The new congress was also appointed to meet on the first Wednesday of March following at New York. Accordingly on the first Wednesday of February 1789, George Washington, who had been the commander in chief of the armies of the United States, and president of the convention of Philadelphia that framed the constitution, was elected president, and John Adams, who had seconded Mr Jefferson in proposing the original declaration of American independence, was at the same time elected vice-president. The popularity of the president was deservedly very great; and, as all parties concurred in supporting the new constitution, much unanimity prevailed in the public councils.

ARITHMETIC

Useful for Counting Captives and War Dead

Scientists everywhere, especially since Newton and Leibniz and the development of calculus, have recognized the centrality of mathematics to the advancement of the sciences. But for early man, according to Britannica in the Supplement (1815–24) to its 4th, 5th, and 6th editions, “palpable arithmetic” was also useful for counting the common, everyday elements of life, such as fish, hunted prey, slaves, and war dead.

Palpable Arithmetic

The idea of number, though not the most easily acquired, remounts to the earliest epochs of society, and must be nearly coëval with the formation of language. The very savage, who draws from the exercise of fishing or hunting a precarious support for himself and family, is eager, on his return home, to count over the produce of his toilsome exertions. But the leader of a troop is obliged to carry farther his skill in numeration. The systematic practice of war and murder has ever distinguished our species from other animals of prey. The chieftain who prepares to attack a rival tribe, marshals his followers; and, after the bloody conflict has terminated, he reckons up the slain, and marks his unhappy and devoted captives. If those numbers were small, they could easily be represented by very portable emblems, by round pebbles, by dwarf-shells, by fine nuts, by hard grains, by small beans, or by knots tied on a string. But to express the larger numbers, it became necessary, for the sake of distinctness, to place those little objects or counters in regular rows, which the eye could comprehend at a single glance; as, in the telling of money, it would soon have become customary to dispose the rude counters, in two, three, four, or more ranks, as circumstances might suggest. The attention would then be less distracted, resting chiefly on the number of marks presented by each separate row.

Language insensibly moulds itself to our wants. But it was impossible to furnish a name for each particular number: No invention could supply such a multitude of words as would be necessary, and no memory could

ever retain them. The only practical mode of proceeding was to have recourse, as on other occasions, to the powers of classification. By conceiving the individuals of a mass to be distributed into successive ranks and divisions, a few component terms might be made sufficient to express the whole. We may discern around us traces, accordingly, of the progress of numeration, through all its gradations.

The earliest and simplest mode of reckoning was by *pairs*, arising naturally from the circumstance of both hands being employed for the sake of expedition. It is now familiar among sportsmen, who use the names of *brace* and *couple*, words that signify *pairing* or *yoking*.—To count by *threes* was another step, though not practised to the same extent. It has been preserved, however, by the same class of men, under the term *leash*, meaning the strings by which *three* dogs and no more can be held at once in the hand.—The numbering by *fours* has had a more extensive application: It was evidently suggested by the custom, in rapid tale, of taking a pair in each hand. Our fishermen, who generally reckon in this way, call every *double pair* of herrings, for instance, a *throw* or *cast*; and the term *warp*, which, from its German origin, has exactly the same import, is employed to denote *four*, in various articles of trade.

Those simple arrangements would, at their first application, carry the reckoning but a very little way. To express larger numbers, it was necessary to repeat the process of classification. The ordinary steps, by which language ascends from particular to general objects, might point out the right path. A collection of *individuals* forms a *species*; a cluster of *species* makes a *genus*; a bundle of *genera* composes an *order*; and a group of *orders* perhaps constitutes a *class*. Such is the method indispensably required in framing the successive arrangement of the almost unbounded subjects of Natural History. A similar mode is pursued in the subdivision and distribution of the members of a vast army.

In following out the classification of numbers, it seemed easy and natural, after the first step had been made, to repeat the same procedure. If a heap of pebbles were disposed in certain rows, it would evidently facilitate their enumeration, to break each of those rows into

similar parcels, and thus carry forward the successive subdivision till it stopped. The heap, so analysed by a series of partition, might then be expressed with a very few low numbers easily formed, and capable of being distinctly retained. The particular system adopted, would soon become clothed with terms borrowed from the vernacular idiom. . . .

In the ruder periods of society, a gradation of counters, accommodated to such a process of numerical analysis, was supplied by pebbles, grains, or shells of different sizes. This series, however, is very limited, and would soon confine the range of decomposition. To reach a greater extent, it was necessary to proceed by a swifter analysis; to distribute the counters, for instance, successively into ten or twenty rows, and to make pebbles, shells, or other marks, having their size only doubled perhaps or tripled, to represent values increased ten or twenty fold. Beyond this stage in the progress of numeration, none of the various tribes dispersed over the vast American Continent seem ever to have passed. In the Old World, it is probable that a long pause of improvement had ensued among the nations which were advanced to the same point in the arts of life. But the necessity, in such arithmetical notation, of employing the natural objects to signify a great deal more than their relative size imports, would lead at last to a most important step in the ascent. Instead of distinguishing the different orders of counters by their *magnitude*, they might be made to derive an *artificial value* from their *rank* alone. It would be sufficient, for that purpose, to employ marks all of the same kind, but disposed on a graduating series of vertical bars or columns. The augmented value which these marks acquire in rising through the successive bars, would evidently be quite arbitrary, depending, in every case, on a key to be fixed by convention. This point in the chain of discovery was attained by the Greeks at a very early period, and communicated to the Romans, who continued, during their whole career of empire, to practise a sort of tangible arithmetic, which they transmitted to their successors in modern Europe. The Chinese also have, from the remotest antiquity, been accustomed to employ a similar mode of calculation, which they are said to manage with singular skill and address.

BACK SCRATCHERS

And Wig Rakes

By the time of this entry from Britannica's 11th Edition (1910–11), back scratchers—rods with elaborately carved human hands that doubled as rakes for large powdered wigs—had already entered the realm of the antique collector.

Backscratcher, a long slender rod of wood, whalebone, tortoiseshell, horn or cane, with a carved human hand, usually of ivory, mounted at the extremity. Its name suggests the primary use of the implement, but little is known of its history, and it was unquestionably also employed as a kind of rake to keep in order the huge “heads” of powdered hair worn by ladies during a considerable portion of the 18th and the early part of the 19th centuries. The backscratcher varies in length from 12 to 20 in., and the more elaborate examples, which were occasionally hung from the waist, are silver-mounted, and in rare instances the ivory fingers bear carved rings. The hand is sometimes outstretched, and sometimes the fingers are flexed; the modeling is frequently good, the fingers delicately formed and the nails well defined. As a rule the rod is finished off with a knob. The hand was now and again replaced by a rake or a bird's claw. The hand was indifferently dexter or sinister, but the Chinese variety usually bears a right hand. Like most of the obsolete appliances of daily life, the backscratcher, or scratch-back, as it is sometimes called, has become scarce, and it is one of the innumerable objects which attract the attention of the modern collector.

BIOGRAPHIES

In Encyclopedias? Scandalous!

As silly as this sounds today, Britannica's first editor, William Smellie, resigned his editorship in protest over the decision by Britannica's publishers to include biographies in its 2nd Edition (1778–83). A reference work, in Smellie's opinion, was no place for this dubious art form; historiography was the way to deal with the past, not through the lives and eyes of mere players

on life's stage. To be fair, work began on the new edition just after the completion of *Britannica's* 1st Edition in 1771, which was still eight years before the first volumes were released of Samuel Johnson's *Lives of the Poets* and still 20 years before the publication of James Boswell's *Life of Samuel Johnson, LL.D.*, two of the seminal works that helped solidify the credibility of biography as a legitimate literary English genre and not a mere subset of history.

To explain and justify their controversial decision to include biographies in the encyclopedia, *Britannica's* publishers wrote the excerpt below in their preface to the 2nd Edition. The biographies in question dealt only with persons deceased; the publishing of biographies of living persons was a battle for another day, but a battle there would be: when *Britannica* introduced the latter into its 11th Edition (1910–11), several longtime contributors, as William Smellie had done before them, terminated their association with *Britannica* and refused to write for the new edition in protest over this latest "novelty."

After surveying any particular science, it will be found equally useful and entertaining to acquire some notion of the private history of such eminent persons as have either invented, cultivated, or improved, the particular art or science in which our attention has been recently engaged. This has induced the compilers to enrich the *Encyclopædia Britannica* with a new department, which is not to be found in any other collection of the same kind, except in the French *Encyclopedie*. Of all historical pursuits, Biography is perhaps the most delightful and instructive. Its tendency to illustrate particular passages in general history, and to diffuse new light through the arts and sciences in which the persons whose lives are related were employed, is too obvious to require explication. Besides, it exhibits the human character in all possible forms and situations. It not only attends its hero through all the bustle of public life, but pursues him to his most sequestered retirements. It shows, how distinguished characters have been involved in misfortunes and difficulties; by what means they were extricated; or with what degree of fortitude and dignity they have discharged the various functions, or sustained the different vicissitudes, of a chequered and fluctuating life. For these reasons

it is, that every man of learning and genius has esteemed the biographical labours of Plutarch among the most precious and valuable remains of antiquity. The lives and characters, therefore, of such personages as have either excelled in the arts of war or peace, of such as have either distinguished themselves in the theatre of action or in the recess of contemplation, will be found under their proper names alphabetically disposed.

BULLS & BEARS

The Economic Zoo

Britannica's 1st Edition (1768–71) discussed a number of economic terms in common use today. The idea of "bull" as a speculative buyer of a stock expected to increase in value, and "bear" as the reverse, was already about 50 years old when the edition appeared, and the terms were growing in popular use.

As there are few subjects of conversation more general than the value of stocks, and hardly any thing so little understood, we shall here give account of them in as clear and concise a manner as possible; presenting our readers with the rationale of the stocks, and a short history of the several companies, describing the nature of their separate funds, the uses to which they are applied, and the various purposes they an-

(continued on page 188)

The "bulls and bears" of Wall Street.



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Multitasking: Let's Tame (Not Kill) the Beast

By Howard Rheingold

Is the discourse about multitasking falling into the fallacy of the excluded middle?

Could it be that instead of a stark choice between the frantic pursuit of getting more done in less time at one extreme or demonizing multitasking at the other end of the spectrum, there is a worthy but relatively unexplored middle, where we could learn to deploy an appropriate level of intention to appropriate media at the appropriate time?

Or is multitasking unequivocally the mental equivalent of bingeing, an addiction to fragmentation, a seductive waste of mind that we should discard, a habit that all decent people should eschew and discourage?

Contemporary discussion about this topic, buttressed by a growing body of empirical evidence, seems to favor the view that people today, and particularly those darn kids, are driven to distraction, attracted by flashy and superficial media gimmickry, hypnotized and addicted, fragmented and disordered.

But I wonder if something valuable is to be found in the deep gulf between the frenetic and the hyper-focused?

Don't get me wrong—I'm alarmed at the way people are texting while walking or even driving. I face university students in my classes on a regular basis who are gazing at their laptops while I or another student talks. As far as I can tell, these screen-tropic students might be taking notes—or they might be rallying their guild in *World of Warcraft* or changing their Facebook status to "It's complicated."

In fact, when I realized that my students didn't know what they looked like from my point of view, I made a short video of them and posted it online, with their permission. When I showed them the video in class, I had a camera capturing their reactions—from the back of the classroom. While I was showing the students' behavior to the same

students on the big screen at the front of the classroom, my assistant zoomed in on the screen of one student who, for reasons I don't understand, decided to watch the same video on his own computer. Then he surfed to my personal website and quickly scrolled the page up and down. Then he went back to checking his e-mail.

But here is what got me thinking: the particular student captured on this video was one of the most attentive and thoughtful students I've taught. His grade in that class was a rare A+. Does he know how to do something that others don't know?

I explore a number of attention probes with my students—sometimes I open the first class meeting by asking them to turn off their phones, shut their laptops, and close their eyes for a minute. Sometimes, only the two students who co-teach with me that week keep their laptops open. Sometimes, 20 percent of the class can have their laptops open. Always, I direct them to pay attention to where their attention is going when their laptops are open or the phones in their pockets buzz. So I'm not ignoring the lack of mindfulness associated with my students'—and my own—use of all the screens of various sizes in our lives.

So I think it's worth asking whether we can learn to use our digital mind amplifiers more effectively. Without a doubt, digital media are encouraging attention to go wild. But what if it could be tamed? Taming wild attention is the center of Buddhist practice, and recent books have delved into the application of Buddhist practices to mindfulness in contemporary life. I'm inquiring into the possibility of bringing similar practices to life online. While there are ample reasons to consider the healthy alternative of spending time offline, for many—more each day—cyberspace is where we learn and work.



One of the courses I teach is Digital Journalism, where I confront the issue relevant to all of us who dwell in the always-on milieu—the need to balance the *quantity* of information at our fingertips with the *quality* of information we actually receive. For a journalist, this is not just a personal need but a professional duty. To this end, I've been instructing students in a combination of mental discipline and technical skills that I call "Infotention."

The point is this: We are in charge of the information we pay attention to, but if we don't actively construct, tune, and manage our own filters, the raw flow of info, misinfo, and disinfo around us will take over. It's up to each consumer of information to make personal decisions about what to pay attention to and what to ignore. That decision-making is a mental process that all humans have always deployed in the world, but the world that we evolved in through pre-digital eons has been hyper-accelerated recently through our use of the media we've created. We need, therefore, to attune

those native attention filters to our contemporary needs. And to those who know how to use them, tools are widely available, free of charge, on the Web to help us with this task. Journalists and others can readily set up dashboards and radars that tune in only streams of information we really want.

But such filtering takes a conscious effort to cultivate the infotentional skill. Is this e-mail, tweet, URL, blog post, video link really worth my immediate attention, or should I bookmark and tag it for later retrieval? Becoming mindful of these decisions is a way of gaining control over the multitasking impulse.

Clearly, neuroscientists and cognitive scientists are providing important clues to the dangers (and even possible benefits) of multitasking and whether we can learn to deploy our attention more effectively through practice. I'm not yet prepared to argue that multitasking athletes actually exist or whether their prowess is congenital or self-taught. But we owe it to ourselves not to close the door prematurely on new ways to use our mind's best tools.

*Howard Rheingold is a pioneer in the development of virtual communities. His book *The Virtual Community: Homesteading on the Electronic Frontier* (1993) was one of the first works to treat the Internet as a social and cultural environment worthy of popular and academic attention. His later books include *Smart Mobs: The Next Social Revolution* (2002) and *Net Smart: How to Thrive Online* (2012). He has taught for 30 years, online and face-to-face, at the University of California, Berkeley; Stanford University; and, most recently, at Rheingold U., a new online learning community.*

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swer, both with respect to the government, the companies themselves, and the community in general. . . .

The method of depositing money in the bank, and exchanging it for notes (though they bear no interest) is attended with many conveniencies; as they are not only safer than money in the hands of the owner himself, but as the notes are more portable and capable of a much more easy conveyance, since a bank note for a very large sum may be sent by the post, and, to prevent the designs of robbers, may, without damage, be cut in two, and sent at two several times. Or bills, called bank post-bills, may be had by application at the bank, which are particularly calculated to prevent losses by robberies, they being made payable to the order of the person who takes them out at a certain number of days after sight; which gives an opportunity to stop bills at the bank if they should be lost, and prevents their being so easily negotiated by strangers as common bank notes are; and whoever considers the hazard, the expence and trouble there would be in sending large sums of gold and silver to and from distant places, must also consider this as a very singular advantage. Beside which, another benefit attends them; for if they are destroyed by time, or other accidents, the bank will, on oath being made of such accident, and security being given, pay the money to the person who was in possession of them. . . .

By the word *stock* was originally meant a particular sum of money contributed to the establishing a fund to enable a company to carry on a certain trade, by means of which the person became a partner in that trade, and received a share of the profit made thereby, in proportion to the money employed. . . .

But as every capital stock or fund of a company is raised for a particular purpose, and limited by parliament to a certain sum, it necessarily follows, that when that fund is compleated, no stock can be bought of the company; though shares already purchased may be transferred from one person to another. This being the case, there is frequently a great disproportion between the original value of the shares, and what is given for them when transferred: for if there are more buyers than sellers, a person who is indiffer-

ent about selling will not part with his share without a considerable profit to himself; and, on the contrary, if many are disposed to sell, and few inclined to buy, the value of such shares will naturally fall, in proportion to the impatience of those who want to turn their stock into specie.

These observations may serve to give our readers some idea of the nature of that unjustifiable and dishonest practice called *stock jobbing*, the mystery of which consists in nothing more than this: The persons concerned in that practice, who are denominated stock-jobbers, make contracts to buy or sell, at a certain distant time, a certain quantity of some particular stock, against which time they endeavour, according as their contract is, either to raise or lower such stock, by raising rumours and spreading fictitious stories in order to induce people either to sell out in a hurry, and consequently cheap, if they are to deliver stock, or to become unwilling to sell, and consequently to make it dearer, if they are to receive stock.

The persons who make these contracts are not in general possessed of any real stock; and when the time comes that they are to receive or deliver the quantity they have contracted for, they only pay such a sum of money as makes the difference between the price the stock was at when they made the contract, and the price it happens to be at when the contract is fulfilled; and it is no uncommon thing for persons not worth 100 l. to make contracts for the buying or selling 100,000 l. stock. In the language of Exchange Alley [the area of London where the city's stock exchange evolved], the buyer in this case is called the Bull, and the seller the Bear.

Beside these, there are another set of men, who, though of a higher rank, may properly enough come under the same denomination. These are your great monied men, who are dealers in stock, and contractors with the government whenever any new money is to be borrowed. These indeed are not fictitious, but real buyers and sellers of stock; but by raising false hopes, or creating groundless fears, by pretending to buy or sell large quantities of stock on a sudden, by using the fore-mentioned set of men as their instruments, and other like practices, are enabled to raise or lower the stocks one or two per cent, at pleasure.

CHEESE

A Fine Cement and Bait

Great minds have long pondered that curiosity of coagulation called cheese. "How can anyone govern a nation that has 246 different kinds of cheese," groused Charles de Gaulle of his beloved France. Novelist James Joyce also pondered the curd but dismissed it with lethal logic. For if "a corpse is meat gone bad," then cheese is merely the "corpse of milk." But Clifton Fadiman, longtime book editor of The New Yorker and member of Britannica's Board of Editors, saw cheese and its milky birth mother in a more hallowed light: "Cheese—milk's leap toward immortality!" What none of these luminaries likely considered is what Britannica suggested in its 4th Edition (1801–09): the virtue of using cheese as cement.

Cheese, a sort of food prepared of curdled milk purged from the serum or whey, and afterwards dried for use.

Cheese differs in quality according as it is made from new or skimmed milk, from the curd which separates spontaneously upon standing, or that which is more speedily produced by the addition of runnet. Cream also affords a kind of cheese, but quite fat and butyraceous, and which does not keep long. Analyzed chemically, cheese appears to partake much more of an animal nature than butter, or the milk from which it was made. It is insoluble in every liquor except spirit of nitre, and caustic alkaline ley. Shaved thin, and properly treated with hot water, it forms a very strong cement if mixed with quicklime. When prepared with the hot water, it is recommended in the Swedish Memoirs to be used by anglers as a bait; it may be made into any form, is not softened by the cold water, and the fishes are fond of it.—As a food, physicians condemn the too free use of cheese. When new, it is extremely difficult of digestion: when old, it becomes acrid and hot; and, from Dr Percival's experiments, is evidently of a septic nature. It is a common opinion that old cheese digests every thing, yet is left undigested itself; but this is without any solid foundation. Cheese made from the milk of sheep digests sooner than that from the

milk of cows, but is less nourishing; that from the milk of goats digests sooner than either, but is also the least nourishing. In general it is a kind of food fit only for the laborious, or those whose organs of digestion are strong.

CIVILIZATION

Separating Man from Beast

*J.H. Robinson (1863–1936), son of a bank president, became one of the intellectual pillars that support our present broadly based conception of history. In a series of influential books (see his pioneering *The New History*, 1912) and a lifetime of teaching, he extended our perspectives so that we no longer think of history as largely diplomatic, dynastic, and military. Britannica, for its new 14th Edition (1929), assigned him to write on "Civilization," a daunting task. Some of his theses, rooted in the James-Dewey pragmatism of his period, remain controversial. As a whole, however, his article was not only trailblazing but retains its relevance, especially in reflecting the West's evolving sensitivity to and realization of the cultural worthiness of the non-Western world. He also pointed out what should have been obvious to the reader: that an encyclopedia, and the painstaking detailed work it contains, not only describes the many aspects of civilized life but is itself a manifestation of civilization that helps prove the latter's very existence.*

This Encyclopaedia is in itself a description of civilization, for it contains the story of human achievement in all its bewildering developments. It shows what men during hundreds of thousands of years have been learning about themselves, their world and the creatures which share it with them. They have reached out into remote space and studied nebulae whose light reaches them after a million years; they have, on the other hand, dissected atoms and manipulated electrons as they might handle pebbles. In the present magnificent series of volumes man's inventions are reviewed from the rudest chipped flint to the most delicately adjusted microscope; his creation of multi-

form beauties of design, colour and word, his ways of dealing with his fellows, his co-operations and dissensions; his ideals and lofty aspirations, his inevitable blunders and disappointments; in short, all his gropings, disheartening failures and unbelievable triumphs are recalled.

Several thousand contributors have been brought together to do each his special part in writing some thirty-five million words on what mankind has hitherto done and said. It might therefore seem at first sight superfluous, and indeed impossible, to treat civilization itself as a separate topic in a few pages. But there is danger that owing to the overwhelming mass of information given in these volumes certain important underlying considerations may be lost sight of. There are highly significant questions concerning the nature and course of human development, the obstacles which have lain in the way of advance; the sources of success and frustration, which could hardly be brought together in dealing with any of the special aspects of human culture. Accordingly an attempt will be made under this caption to scan civilization as a single, unique and astonishing achievement of the human species.

To begin with, it is a startling fact that civilization, which sets off man in so astounding a manner from all other animals, should only lately have begun to be understood. We are immersed in it from infancy; we take it for granted, and are too near it to see it, except in this detail and that. Even to-day, with all our recently acquired knowledge, those who strive most valiantly in imagination to get outside civilization so that they may look upon it dispassionately and appraise it as a whole, are bewildered by its mysteries. As for the great mass of intelligent people, they still harbour many ancient illusions and misapprehensions from which they can only be weaned with great reluctance.

The object of the present article is to describe the newer ways of viewing civilization, its general nature, origin, progress, transmission and chief developments, in the light of information which has been accumulating during the past fifty or sixty years. The study of man himself has been revealing quite as many revolutionary facts and hypotheses during the past half century as the scientific investigation of the world in which he lives. The

history of human achievement has been traced back, at least in vague outline, hundreds of thousands of years; man's original uncivilized nature and equipment have been studied and compared with the behaviour of his nearer relatives; new conjectures have emerged in regard to the functioning of speech and the nature and origin of human reasoning; careful investigations of primitive civilizations have cast great light on more complicated ones; the tremendous importance of childhood and its various implications in the development of civilization have been elaborated.

These and many other discoveries conspire to recast our conception of civilization, its past progress and its future possibilities.

It is instructive to note that the word civilization is by no means an old one. Boswell reports that he urged Dr. Johnson to insert the term in his dictionary in 1772, but Johnson refused. He preferred the older word "civility." This, like "urbanity," reflects the contempt of the townsman for the rustic or barbarian; it is an invidious term, although in a way justified by the fact that only where cities have grown up have men developed intricate civilizations. The arduous and dispersed tasks of the hunter, shepherd and peasant folk do not afford the leisure, or at least the varied human contacts, essential to the generation of new ideas and discoveries. But modern anthropologists have pointed out that peoples without cities, such as the tribes of Polynesia and the North American Indians, are really highly "civilized," in the sense that upon sympathetic examination, they are found to have subtle languages, ingenious arts, admirably suited to their conditions, developed institutions, social and political; religious practices and confident myths, no better and no worse substantiated than many that prevail today among the nations of Europe. All these betoken and presuppose a vastly long development. Among English speaking people the first to point this out clearly was E. B. Tylor, who published his famous *Primitive Society*, in 1871, the same year in which Darwin's *Descent of Man* appeared. These two books would alone have served, by different approaches, to give the word civilization a far more profound meaning than it had ever had before.

COPYRIGHT

Who Owns an Idea?

The status of intellectual property—i.e., useful inventions or original works of literature or music—was much debated in the British Isles, and it was given substantial attention by Encyclopædia Britannica, which itself was repeatedly “pirated” or issued in unauthorized and uncompensated editions, especially in the United States. In Britannica’s Supplement (1815–24) to its 4th, 5th, and 6th editions, the author of the “Copyright” entry—barrister Joseph Lowe—related a brief history of the controversy and then adopted a dialogue format to probe more deeply. By the time this article was written, the U.S. Constitution had already adopted the idea of copyright for a fixed term in Article I, Section 8: “To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”

To avoid perplexity, we shall endeavour to comprise the *pros* and *cons* in these various discussions, in a kind of regular succession, adopting the plan of appending a rejoinder to each argument, as the best method of doing justice to both sides.

Objection. Ideas cannot be the object of property; they are not visible, tangible, or corporeal. (Judge Yates.)

Answer. Whatever admits of exclusive enjoyment may be property. (Hargrave.)

O. Another person may arrive, by his own process of thought, at similar conclusions, would you deny to him what you granted to his predecessor?

A. There is very little apprehension of such a coincidence; the plans and the results of study admit of as infinite variety as the human countenance; the same views, or the same conclusions, will never come from two persons, or even from the same person at different times, in the same language. At all events, an arbitrator or a court of justice can be at no loss to decide, whether a second publication on the same subject comes within the description of plagiarism.

O. A literary composition is undoubtedly the property of the writer, so long as it remains in MS.; but by the act of publishing, he

gives it to the world; he lets the bird fly; his property is gone. (Judge Yates.)

A. He gives the public the free use of the knowledge contained in his book; but this is a very different thing from the profit as publisher. The ten shillings paid for a volume entitles the reader to the use of its contents, but can certainly give him no claim to the hundred pounds which may be expected from a new edition. (Lord Mansfield, Judges Willes, Blackstone, and Aston.)

O. It is not clear that common law ever sanctioned the exclusive enjoyment of copyright; the only titles appear to have been the royal patent and the licence of the Stationers’ Company. (Lord Camden.)

A. It seems to have been always taken for granted by Chancery and other courts, that an exclusive right existed. There was a confirmatory example in the highest quarter; the King is perpetual proprietor of the right of publishing acts of Parliament and all public documents. (Lord Mansfield, Judges Willes, Blackstone, and Aston.)

O. The patentees of mechanical inventions possess but a limited term; none of them ever advanced a claim to perpetuity. (Judge Yates.)

A. Such patentees are much sooner reimbursed than authors; the fruit of their invention is of a more direct practical application. Besides, the stranger who makes a duplicate of a machine, incurs a much greater relative expence than the stranger who reprints an edition of a book,—in the one the materials form the chief part of the cost; in the other, they are comparatively insignificant, and copies may be multiplied by the thousand.

O. The statute of the 8th of Queen Anne, expressly limits the duration of copyright; it enacts that the protecting penalties shall be in force during fourteen years, and no longer. (Judge Yates.)

A. This is, no doubt, the apparent meaning of the statute, but the preamble of the act declares, that it is passed for the protection of literature; to make the act an instrument for curtailing a literary privilege would certainly be at variance with its general language. (Lord Mansfield.)

O. If such property be admitted for a time, is not the term of fourteen years sufficient? What good could the public expect from the writings of men so selfish as to call for a perpetual monopoly?

A. Monopoly is not the proper word; the object may be attained, as will be shown presently, under modifications which insure to the public a complete supply of books at reasonable prices.

O. "Glory," said Lord Camden, "is the reward of science, and those who deserve it scorn all meaner views."

A. Reputation is, and always will be, the grand stimulus to literary exertion, but it requires long-continued exertion; and if we do not enable a writer to live by his works, we confine the possibility of acquiring reputation to a very small class—to the rich, or to those who derive an income from other means. Such, in fact, has hitherto been the case; standard works have been attempted only by men who, like Gibbon, possessed patrimony, or who, like Robertson and Hume, arrived at the possession of income from other sources. No one imagines that our military or naval officers follow their profession for the sake of pay; yet no one would propose to abridge it on the ground of reputation being their primary object.

O. "It was not for gain," said Lord Camden, "that Bacon, Newton, Milton, and Locke, instructed the world."

A. Each of these distinguished men were obliged to trespass on the time devoted to literature, and to seek an income from public employments. How much better would it have been could they have given an undivided and uninterrupted attention to their favourite pursuits?

In comparing these various arguments, the balance is evidently on the side of the advocates of exclusive right in every point except one—the interpretation of the statute of Queen Anne. There the words, "fourteen years and no longer," are too pointed to admit of the construction put on them by Lord Mansfield. In the beginning of 1774, when the question came before the House of Lords, the judges attended and delivered their opinions at length, Lord Mansfield advocating the cause of permanency, while Judge Yates, now supported by his brethren, Baron Eyre and Baron Perrot, asserted once more the necessity of limitation. . . . The House, however, appear to have been alarmed at the idea of perpetuity, and finally decided, that the exclusive right should last only "fourteen years, with a contingent fourteen, if the author happened to be alive at the end of the first period."

DEDICATIONS

The Art of Groveling

Literary dedications are an art form worthy of study in their own right, and Britannica's early ones are especially intriguing. Their popularity skyrocketed in the 18th century, as writers paid glowing homage to their rich patrons. In Britannica's case, these early dedications to the king of England were aimed at placating the crown and ensuring readers that Britannica was a faithful and patriotic loyalist whose sole interest was in the dissemination of knowledge; it had no interest in emulating Diderot and his co-encyclopedists in France, whose radical politicking and views of religion and the state (and whose famed Encyclopédie Britannica attacks outright in the second excerpt below) had attracted their king's scrutiny, criticism, and censors.

There was another, more private reason for Britannica's unctuousness: its second editor, James Tytler (see the entry on "Flying" for more information on him), had authored his own radical screeds on government, sparking a warrant for his arrest on grounds of sedition. To escape arrest Tytler fled the country—and his Britannica duties as well—traveling first to Ireland and later to Salem, Massachusetts. So these ingratiating dedications highlighted below were intended to pointedly distance Britannica from its own contretemps, the Tytler affair.

Britannica's dedications became dual in nature with the start of its 11th Edition (1910–11). Britannica had become an American company by this time, and with Americans making up a larger percentage of its readership and contributor base every year, it only made sense to expand the dedication of its print sets to include the U.S. president alongside the English monarch.

William Howard Taft was the first U.S. president to be so honored, but he allowed the dedication on one condition only, a condition made clear via a White House phone call to Britannica's New York office. President Taft's concern was simple and personal: When it came to positioning the names at the top of the dedication page, whose name was coming first—his or King George V's? Startled by the phone call from the White House and stunned by the question, Britannica's editor recovered quickly, crafting a masterful reply: the president's name

TO THE
K I N G.

S I R,

WHEN the Proprietors of the ENCYCLOPÆDIA BRITANNICA resolved to publish a new and improved Edition of that Work, they naturally requested permission to lay it at the feet of their SOVEREIGN.

YOUR MAJESTY'S gracious compliance with that request, whilst it incited them to employ their utmost efforts to make this Edition not altogether unworthy of Your Royal Protection, procured for their undertaking the favour of that Public by which Your MAJESTY is revered as the Father of Your People, and the enlightened Patron of Arts, Sciences, and Literature.

THAT



TO THE KING.

SIR,

IT proceeds from no vain confidence in my own abilities, that I presume to solicit for this WORK the Protection of a MONARCH, who is not more exalted in station, than he is distinguished, among the Potentates of the Earth, by his Taste in Literature, and his Patronage of Science and the Arts.

IN conducting to its conclusion the ENCYCLOPÆDIA BRITANNICA, I am conscious only of having been uniformly influenced by a sincere desire to do Justice to those Principles of Religion, Morality, and Social Order, of which the Maintenance constitutes the Glory of Your MAJESTY'S Reign, and will, I trust, record Your Name to the latest Posterity, as the Guardian of the Laws and Liberties of Europe.

would naturally come first—on the dedication page of every set sold in the United States, that is. President Taft was satisfied, and the dual dedication was saved (and continued in each Britannica set thereafter, until 2012, when the print set was discontinued).

In the end, however, whether due to printing costs or production time or both, Britannica never did publish two versions of the dedication page. One version had to suffice, and in this battle over dedications and governmental one-upmanship, William Howard Taft lost: English king trumped U.S. president. King George's name came first.

From Britannica's 3rd Edition (1788–97):

TO THE
K I N G.

SIR,

WHEN the Proprietors of the ENCYCLOPÆDIA BRITANNICA resolved to publish a new and improved Edition of that Work, they naturally requested permission to lay it at the feet of their SOVEREIGN.

YOUR MAJESTY'S gracious compliance with that request, whilst it incited them to employ their utmost efforts to make this Edition not altogether unworthy of Your Royal Protection, procured for their undertaking the favour of that Public by which Your MAJESTY is revered as the Father of Your People, and the enlightened Patron of Arts, Sciences, and Literature.

THAT by the Wisdom of Your Councils, and the Vigour of Your Fleets and Armies, Your MAJESTY may be enabled soon to restore Peace to Europe; that You may again have leisure to extend Your Royal Care to the Improvement of Arts, and the Advancement of Knowledge; that You may Reign long over a Free, a Happy, and a Loyal People; and that the Sceptre of the BRITISH Empire may be swayed by Your MAJESTY'S Descendants to the latest Posterity, is the earnest prayer of

YOUR MAJESTY'S

Most dutiful Subjects,
And devoted Servants,

ANDREW BELL

AND

COLIN MACFARQUHAR.

EDINBURGH,
1797.

From Britannica's 3rd Edition Supplement (1801):

TO THE KING.

SIR,

IT proceeds from no vain confidence in my own abilities, that I presume to solicit for this WORK the Protection of a MONARCH, who is not more exalted in station, than he is distinguished, among the Potentates of the Earth, by his Taste in Literature, and his Patronage of Science and the Arts.

IN conducting to its conclusion the ENCYCLOPÆDIA BRITANNICA, I am conscious only of having been uniformly influenced by a sincere desire to do Justice to those Principles of Religion, Morality, and Social Order, of which the Maintenance constitutes the Glory of Your MAJESTY'S Reign, and will, I trust, record Your Name to the latest Posterity, as the Guardian of the Laws and Liberties of Europe.

THE French Encyclopedie has been accused, and justly accused, of having disseminated, far and wide, the seeds of Anarchy and Atheism. If the ENCYCLOPÆDIA BRITANNICA shall, in any degree, counteract the tendency of that pestiferous Work, even these two Volumes will not be wholly unworthy of Your MAJESTY'S Patronage; and the Approbation of my SOVEREIGN, added to the consciousness of my own upright intentions, will, to me, be an ample reward for the many years of labour which I have employed on them, and on the Volumes to which they are Supplementary. I am,

SIR,

YOUR MAJESTY'S

Most faithful Subject,
And most devoted Servant,

STIRLING,
Dec. 10. 1800.

GEORGE GLEIG.

LAUGHTER

Flared Nostrils and 15 Facial Muscles

"Perhaps I know best why it is man alone who laughs; he alone suffers so deeply that he had to invent laughter." Friedrich Nietzsche's philosophical approach to laughter is nowhere emulated in Britannica's early coverage of the topic.

It is all nerves, reflex, and physiology for Britannica, with a reference to sex and death thrown in for good measure. This changed in later years, when Britannica commissioned the noted Hungarian-British novelist Arthur Koestler (Darkness at Noon, 1940) to write an extended article on humor. Britannica's coverage of laughter through the centuries is presented here with snippets from several editions.

From Britannica's 1st Edition (1768–71):

Laughter, an affection peculiar to mankind, occasioned by something that tickles the fancy.

In laughter, the eye-brows are raised about the middle, and drawn down next the nose; the eyes are almost shut; the mouth opens, and shews the teeth, the corners of the mouth being drawn back and raised up; the cheeks seem puffed up, and almost hide the eyes; the face is usually red, and nostrils open, and the eyes wet.

From Britannica's 2nd Edition (1778–83):

Authors attribute laughter to the fifth pair of nerves, which sending branches to the eye, ear, lips, tongue, palate, and muscles of the cheek, parts of the mouth, præcordia [chest cavity], &c. there hence arises a sympathy, or consent, between all these parts; so that when one of them is acted upon, the others are proportionably affected. Hence a savoury thing seen, or smelt, affects the glands, and parts of the mouth; a thing seen, or heard, that is shameful, affects the cheeks with blushes: on the contrary, if it please and tickle the fancy, it affects the præcordia, and muscles of the mouth and face with laughter; if it cause sadness and melancholy, it likewise affects the præcordia, and demonstrates itself by causing the glands of the eyes to emit tears. Dr Willis accounts for the pleasure of kissing from the same cause; the branches of this fifth pair being spread to the lips, the præcordia, and the genital parts; whence arises a sympathy between those parts. . . .

The affection of the mind by which laughter is produced, is seemingly so very different from the other passions with which we are endowed, that it hath engaged the attention of very eminent persons to find it out. . . . "The passion of laughter, (says Mr Hobbes) is nothing

else, but sudden glory arising from some sudden conception of some eminency in ourselves, by comparison with the infirmity of others, or with our own formerly. For men (continues he) laugh at the follies of themselves past, when they come suddenly to remembrance, except when we bring with them any sudden dishonour. . . ."

All these opinions are refuted by Dr Beattie in his Essay on Laughter and Ludicrous Composition, where he has treated the subject in a masterly manner. . . .

"Some authors have treated of ridicule, without marking the distinction between . . . things *ludicrous* and things *ridiculous* [which] have this in common, that both excite laughter; but the former excite pure laughter, the latter excite laughter mixed with disapprobation and contempt. . . .

"When certain objects, qualities, or ideas, occur to our senses, memory, or imagination, we smile or laugh at them, and expect that other men should do the same. To smile on certain occasions is not less natural, than to weep at the sight of distress, or cry out when we feel pain.

"There are different kinds of laughter. . . . There are men, who, by forcing a smile, endeavour sometimes to hide from others, and from themselves too perhaps, their malevolence or envy. Such laughter is unnatural. The sound of it offends the ear; the features distorted by it seem horrible to the eye. A mixture of hypocrisy, malice, and cruel joy, thus displayed on the countenance, is one of the most hateful sights in nature, and transforms the "human face divine" [quotation from John Milton's *Paradise Lost*] into the visage of a fiend.—Similar to this is the smile of a wicked person pleasing himself with the hope of accomplishing his evil purposes. . . . But enough of this. Laughter that makes man a fiend or a monster, I have no inclination to analyse. My inquiries are confined to that species of laughter which is at once natural and innocent.

"Of this there are two sorts. The laughter occasioned by tickling or gladness is different from that which arises on reading the Tale of a Tub [a satiric tale written by Jonathan Swift]. The former may be called *animal* laughter: the latter, (if it were lawful to adopt a new word which has become very common of late) I should term *sentimental*. . . .

PASSIONS.

Plate CCCLXXVIII.

Attention.



Veneration.



Admiration.



Admiration with Astonishment.



Rapture.



Joy with Tranquillity.



Desire.



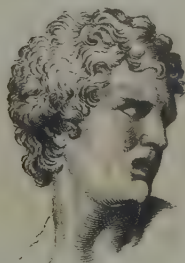
Laughter.



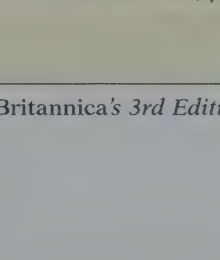
Simple Bodily Pain.



Acute Pain.



Acute Pain. Malicious spite.



Illustrations of facial expressions and emotions from Encyclopædia Britannica's 3rd Edition (1788-97).

"Animal-laughter admits of various degrees; from the gentle impulse excited in a child by moderate joy, to that terrifying and even mortal convulsion which has been known to accompany a change of fortune. This passion may, as well as joy and sorrow, be communicated by sympathy; and I know not whether the entertainment we receive from the playful tricks of kittens and other young animals, may not in part be resolved into something like a fellow-feeling of their vivacity. . . .

"The pleasing emotion, arising from the view of ludicrous ideas, is known to every one by experience; but, being a simple feeling, admits not of definition. It is to be distinguished from the laughter that generally attends it, as sorrow is to be distinguished from tears. . . . Why this agreeable emotion should be accompanied with laughter as its outward sign, or sorrow express itself by tears, or fear by trembling or paleness, I cannot ultimately explain, otherwise than by saying, that such is the appointment of the Author of nature.—All I mean by this inquiry is, to determine, "What is peculiar to those things which produce laughter;—or rather, which raise in the mind that pleasing sentiment or emotion whereof laughter is the external sign."

"Philosophers have differed in their opinions concerning this matter. . . ."

Our author now goes on to lay down his own theory concerning the origin of laughter, which he supposes to arise from the view of things incongruous united in the same assemblage. . . .

"What has been said of the cause of laughter does not amount to an exact description, far less to a logical definition. . . .

"All that can be done in a case of this kind is to prove by a variety of examples, that the theory now proposed is more comprehensive, and better founded, than any of the foregoing." This our author afterwards shews at full length; but as the variety of examples adduced by him would take up too much room to be inserted here, and as every reader must be capable of adducing numberless instances of ludicrous cases to himself, we shall content ourselves with the above explanation of the different theories of laughter, referring those who desire further satisfaction to the treatise already quoted.

From Britannica's 8th Edition (1852–60):

Sir Thomas Urquhart is said to have expired in a paroxysm of laughter, on hearing of the restoration of Charles the Second; a statement which is rendered sufficiently probable by the record of similar cases, and by the eccentric character of the individual. Aretæus, an ancient physician, specifies unextinguishable laughter as one of the causes of death. . . . And other ancient writers have mentioned the names of different persons who died of excessive joy. . . . According to the common account, Sophocles was of this number.

*Arthur Koestler on humor, from
Britannica's 15th Edition (1974–2012):*

In all its many-splendoured varieties, humour can be simply defined as a type of stimulation that tends to elicit the laughter reflex. Spontaneous laughter is a motor reflex produced by the coordinated contraction of 15 facial muscles in a stereotyped pattern and accompanied by altered breathing. Electrical stimulation of the main lifting muscle of the upper lip, the zygomatic major, with currents of varying intensity produces facial expressions ranging from the faint smile through the broad grin to the contortions typical of explosive laughter.

The laughter and smile of civilized man is, of course, often of a conventional kind, in which voluntary intent substitutes for, or interferes with, spontaneous reflex activity; this article is concerned, however, only with the latter. Once laughter is realized to be a humble reflex, several paradoxes must be faced. Motor reflexes, such as the contraction of the pupil of the eye in dazzling light, are simple responses to simple stimuli whose value to survival is obvious. But the involuntary contraction of 15 facial muscles, associated with certain irrepressible noises, strikes one as an activity without any utilitarian value, quite unrelated to the struggle for survival. Laughter is a reflex but unique in that it has no apparent biological purpose. One might call it a luxury reflex. Its only function seems to be to provide relief from tension.

The second related paradox is a striking discrepancy between the nature of the stimulus and that of the response in humorous transactions. When a blow beneath the

Raymond Simpson/AP Images

kneecap causes an automatic upward kick, both “stimulus” and “response” function on the same primitive physiological level, without requiring the intervention of the higher mental functions. But that such a complex mental activity as reading a comic story should cause a specific reflex contraction of the facial muscles is a phenomenon that has puzzled philosophers since Plato. There is no clear-cut, predictable response that would tell a lecturer whether he has succeeded in convincing his listeners; but, when he is telling a joke, laughter serves as an experimental test. *Humour is the only form of communication in which a stimulus on a high level of complexity produces a stereotyped, predictable response on the physiological reflex level.* Thus the response can be used as an indicator for the presence of the elusive quality that is called humour—as the click of the Geiger counter is used to indicate the presence of radioactivity. Such a procedure is not possible in any other form of art; and since the step from the sublime to the ridiculous is reversible, the study of humour provides clues for the study of creativity in general.

LIFE EXPECTANCY

Living to 900

People now live to 70 or 80 years of age because this is Nature's way of ensuring that “the world is neither overstocked, nor kept too thin; but life and death keep a pretty equal pace.” Such was an educated view in the 18th century, as reflected in the pages of Britannica. Of course, that people in much of the world, especially the vast undeveloped regions, never reached these ages in the 18th century—in fact, even now, the average life span for most of the countries of sub-Saharan Africa is still in the 50s or low 60s—this went ignored or unnoticed by Western scholars of the day, whose focus, unless otherwise noted, was squarely on the “civilized world,” of which Africa was not considered a part. Here's Britannica's entry on “Longevity” from its 3rd Edition (1788–97), which begins where all serious discussions of life expectancy then began: the Bible.

Immediately after the creation, when the world was to be peopled by one man and one



Violet Brown, age 117, then the world's oldest person, at her home in Duanvale, Jamaica, on April 16, 2017.

woman, the ordinary age was 900 and upwards.—Immediately after the flood, when there were three persons to stock the world, their age was cut shorter; and none of those patriarchs but Shem arrived at 500. In the second century we find none that reached 240: in the third, none but Terah that came to 200 years; the world, at least a part of it, by that time being so well peopled, that they had built cities, and were cantoned out into distant nations.—By degrees, as the number of people increased, their *longevity* dwindled, till it came down at length to 70 or 80 years: and there it stood and has continued to stand ever since the time of Moses.—This is found a good medium, and by means hereof the world is neither overstocked, nor kept too thin; but life and death keep a pretty equal pace.

OLIO

Making that Spanish Stew

As mentioned elsewhere in this volume, early Britannica was intended to be not only an instrument of general information but also a manual of practical instruction. Britannica's 3rd Edition (1788–97) entry on “Olio,” for

example, is virtually nothing but recipe. It assumes that the reader's household boasts a vast number of ill-paid servants ready and willing to put together some 37 ingredients required to make it.

Olio, or oglio, a savoury dish, or food, composed of a great variety of ingredients; chiefly found at Spanish tables.

The forms of olíos are various. To give a notion of the strange assemblage, we shall here add one from an approved author.

Take rump of beef, neats tongues boiled and dried, and Bologna sausages; boil them together, and, after boiling two hours, add mutton, pork, venison, and bacon, cut in bits; as also turnips, carrots, onions, and cabbage, borage, endive, marigolds, sorrel, and spinach; then spices, as saffron, cloves, mace, nutmeg, &c. This done, in another pot put a turkey or goose, with capons, pheasants, wigeons, and ducks, partridges, teals, and stock-doves, snipes, quails, and larks, and boil them in water and salt. In a third vessel, prepare a sauce of white wine, strong broth, butter, bottoms of artichokes, and chestnuts, with cauliflowers, bread, marrow, yolks of eggs, mace, and saffron. Lastly, dish the olio, by first laying out the beef and veal, then the venison, mutton, tongues, and sausages, and the roots over all; then the largest fowls, then the smallest, and lastly pour on the sauce.

PATIENCE

Toughen Up!

In Britannica's early days moralism, or even preaching, was fair game when it came to disseminating knowledge. Self-improvement and instruction were not separated. Here, for example, from Britannica's 3rd Edition (1788–97) is an extract from its strongly worded entry on "Patience," where Britannica more or less shouted at the reader to "toughen up."

Patience, that calm and unruffled temper with which a good man bears the evils of life, from

a conviction that they are at least permitted, if not sent, by the best of Beings, who makes all things work together for good to those who love and fear him.

The evils by which life is embittered may be reduced to these four: 1. Natural evils, or those to which we are by nature subject as men, and as perishable animals. The greatest of these are, the death of those whom we love, and of ourselves. 2. Those from which we might be exempted by a virtuous and prudent conduct, but which are the inseparable consequences of imprudence or vice, which we shall call punishments; as infamy proceeding from fraud, poverty from prodigality, debility and disease from intemperance. 3. Those by which the fortitude of the good are exercised; such as the persecutions raised against them by the wicked. To these may be added, 4. The opposition against which we must perpetually struggle, arising from the diversity of sentiments, manners, and characters of the persons among whom we live.

Under all these evils patience is not only necessary but useful: it is necessary, because the laws of nature have made it a duty, and to murmur against natural events is to affront providence; it is useful, because it renders our sufferings lighter, shorter, and less dangerous.

Is your reputation sullied by invidious calumnies? rejoice that your character cannot suffer but by false imputations. You are arraigned in a court of judicature, and are unjustly condemned: passion has influenced both your prosecutor and your judge, and you cannot forbear repining that you suffer although innocent. But would it have been better that you should have suffered being guilty? Would the greatest misfortune that can befall a virtuous man be to you a consolation? The opulence of a villain, the elevated station to which he is raised, and the honours that are paid to him, excite your jealousy, and fill your bosom with repinings and regret. What! say you, are riches, dignity, and power, reserved for such wretches as this? Cease these groundless murmurs. If the possessions you regret were real benefits, they would be taken from the wicked and transferred to you.

PART TWO

Classic Voices



ANSEL ADAMS ON *Photographic Art*

Ansel Adams (1902–84) was the most important landscape photographer of the 20th century and perhaps America's most beloved. He was also a Britannica contributor, authoring the following excerpt from his entry "Photographic Art" for Britannica's four-volume set 10 Eventful Years: A Record of Events of the Years Preceding, Including and Following World War II, 1937 Through 1946, published in 1947. Two points from his article are most intriguing: the impact of the world war on photography and photographic quality and the increasingly professionalization of the medium.

Pictorial Press Ltd/Alamy



Historically speaking, the two most significant events in the world of photography during the decade 1937–46 were the flowering of the “Documentarists” and the death of Alfred Stieglitz in 1946. The first opened new vistas of the application of photography to the problems of society, the last closed a noble life dedicated to the application of photography to the deeper needs of the human spirit.

The irresistible impetus of technological expansion during the decade was reflected in the mechanical, social and aesthetic advances of the art and craft of photography. No one could sensibly dispute the stature of the camera in relation to civilization and, specifically, to creative expression. In America, the enthusiasms of the Roosevelt reconstruction, the emphasis on both human and abstract values of expression, and the terrible tensions of World War II, joined to create both a tremendous industry and a mature visual language.

While the mechanical applications were accelerating, many interpretative and contemplative aspects were submerged. The frenetic promotion of "popular" photography, and the wild competitive scramble of the manufacturers to build markets on mass interest stressed obvious and superficial enticements. Few clear distinctions were made between representation and expression; an unfortunate emphasis on *subject* was evidenced in the photographic magazines, in advertisements and even in museum presentations. The pictorial salons, being the focal points of low-intensity expression, maintained the *status quo* of the conventionalist and the hobbyist. The few attempts to inject more serious and personalized work in the salons were feeble in numbers compared with the uncounted thousands of typical "pictorial" examples displayed and accepted by both amateurs and laymen as the type-standard of camera work. In fact, pictorial photography definitely deteriorated during the decade; the most obvious aspect of this deterioration lay in the emphasis on sterile themes and poor print-quality. This relaxation of standards infected commercial photography to the extent that increasing numbers of pseudo-photographic paintings were used by advertisers as obviously more effective than mediocre colour-photographs. Of course, the years of war depleted both photographic talent and materials; most of the younger men were in the armed forces, and the magnitude of industrial production did not favour consistent qualities of equipment and materials, to say nothing of their availability to the civilian. Technical standards in the armed forces were high; expressive standards low. Purely interpretative work suffered a serious decline: the years of war could well be defined as a period of *automatism and observation*.

Fortunately, there were some exceptions to this general statement; some of the war photography—military and press—was most impressive. In times of stress a sincere and intense expressive intention may emerge above the structure of necessity and convention. Significantly perhaps, the greatest operations, the most startling events, do not lend themselves to photographic expression. They are complete in themselves, and it is only by the merest chance that the event and its interpretative perception are coincidental. For example, the photographs of the atom bomb explosions, and the actual burning of London may be emotionally inferior to the organized and integrated images of the shattered city, of a body prone upon a South Pacific landing beach, or a face of misery and starvation. The accidental exposure may be impressive because of the significance of the subject alone—not because of any possible integration by the artist. Photography has been, and probably always will be most effective in relation to the intimate and poignant aspects of the world, to simple things in their *considered* and *felt* moments of highest significance.

Nevertheless a few small but vital circles supported the clarification of aesthetic standards of photography during the decade, and encouraged appreciation of the more subtle objectives of the art. The department of photography of the



Ansel Adams's 1942 photo *The Tetons and the Snake River*.

Museum of Modern Art was established in 1940; for the first time since the Photo-Secessionists under Alfred Stieglitz, a vital, aggressive centre of creative photography commanded public attention and accomplished an important interpretation of functional and aesthetic standards. Under the able direction of Beaumont and Nancy Newhall, in the face of considerable opposition from reactionaries and super-*avant garde* documentarists, exhibits of great historical and creative importance were presented, ranging in time through David O. Hill, Mathew Brady and the American Frontier photographers, and Eugene Atget, to the comparatively recent exhibitions of Edward Weston and Paul Strand. . . .

The ten years suggested one positive and constructive fact, that the day of the casual professional was over. Photography was destined to grow as a universal device of communication and expression and the layman would demand of the professional the same perfection achieved in the higher levels of music, letters and architecture. It was hoped that the layman would be encouraged to enjoy photography both as spectator and creative amateur. While it would always contain aspects of a contemporary folk art and simple hobby, photography would undoubtedly assume a place of dignity among the humanities. The decade revealed the tremendous potential.

Racial Stereotyping: The New Face of Opera?

By George Shirley

Theater is an art form wherein make-believe is of the essence. Playacting is distinctive in its manner of penetrating the human psyche and manipulating the emotions of the audience. The agents of influence are the players, the scenery, and the costumes employed in creating a faux reality powerful enough to hold the audience in thrall for the duration of the drama.

In the art form known as opera, the present trend toward typecasting based on the actor's ability to satisfy the visual image held in the director's mind of the character to be portrayed—a trend I term “Hollywood-izing”—has increased concerns on the part of singers of all ethnicities as to the future of casting, and whether the voice, the *raison d'être* for the existence of opera, will ultimately be overruled by physical appeal. I well understand the genesis of present misgivings expressed by people of color; concerns that spring from their legitimate

desire for inclusion as artists and their long-simmering reaction to the negative, demeaning representation of blackness as personified primarily by operatic characters like Monostatos, Porgy, Bess, Crown, and Sportin' Life.

Singers possessing the vocal and dramatic expertise to portray a particular role should never be eliminated from consideration for hire because of ethnicity or physical appearance. The combined skills of the makeup artist, costumer, and wig master have traditionally served to bring the performer as close to virtual reality as the expertise of the set designer brings the audience to the streets of, say, Paris.

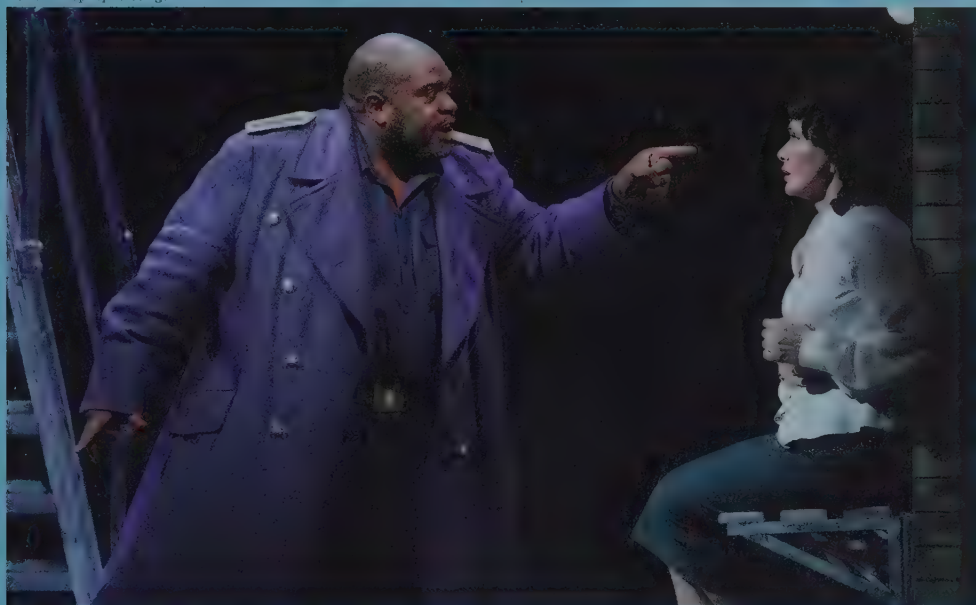
That white tenors have traditionally used dark makeup to portray roles such as Otello and Nadir when black tenors capable of singing these roles are not given serious consideration for them or for portraying white characters; that black and Asian sopranos have endured the insult of typecasting in ethnic roles such as Aida and Cio-Cio-San, whereas white colleagues are hired without such considerations limiting the breadth of roles available to them; these wounds are carved deeply into the cultural psyche, but “Hollywood-izing” proffers no healing balm or hope for recovery.

Characters of differing ethnicities and physical conditions, e.g., Otello and Rigoletto, have long been portrayed by non-Moorish and non-physically challenged singers capable of singing and acting the roles with expertise. How foolish it would be to mandate a change in policy that, in the pursuit of “reality,” would promote only singers of Moorish ancestry or those who are physically tested to portray such roles and to then exclude them from others! Faux reality constitutes the core of theater, and opera is arguably the most unreal of all theatrical endeavors. Humans communicate via speech, not song; thus, insisting on “reality”

George Shirley

Tenor George Shirley as Don Ottavio in Mozart's Don Giovanni, Metropolitan Opera.





Ronald Samm singing lead in Verdi's Otello, Opera North, Leeds, England, January 16, 2013.

in selecting performers according to their "looks" goes against the very essence of the art form.

The answer, then, certainly lies not in restricting roles such as Aida and Otello to blacks, Cio-Cio-San and Turandot to Asians, and Manon and Siegfried to whites. Singers deserve the right to demonstrate their ability to convince the audience via the power of their vocalism and interpretative gifts alone. On the operatic stage, "eye candy" must play second fiddle to the voice.

George Shirley, one of America's most versatile tenors, has performed more than 80 operatic roles in his nearly 60-year career and done so with the world's most renowned conductors, including Solti, Klemperer, Stravinsky, Ormandy, von Karajan, Colin Davis,

*Böhm, Ozawa, Leinsdorf, Boulez, DePreist, Lewis, Dorati, Bernstein, and Maazel. He was the first African American tenor and second African American male to sing leading roles with the Metropolitan Opera, where he remained for 11 years as leading artist. He is the Joseph Edgar Maddy Distinguished University Emeritus Professor of Music (Voice) at the University of Michigan School of Music, Theatre & Dance, and in 2011, with the aid of the Videmus Foundation, he established the George Shirley African American Art Song & Operatic Aria Competition for high school and college students. He has recorded for RCA, Columbia, Decca, Angel, Vanguard, CRI, and Philips, and he received a Grammy Award in 1968 for his role of Ferrando in the prize-winning RCA recording of Mozart's *Così fan tutte*.*

EDWARD WESTON ON *Photographic Art*

Perhaps no one has written more authoritatively on photography's aesthetic foundation than Edward Weston (1886–1958). His entry "Photographic Art," written for Britannica in 1940, for its 14th Edition (1929–73), goes to great and patient lengths to explain why photography, dubbed "the easy art" (since anyone can take a picture with a camera or, now, a smartphone), can and should be considered an art form. Most importantly, concluded Weston, the photographer, like all artists, must first have "something to say."



An anyone who has mastered a few simple instructions can make printable negatives with a pocket Kodak. Because it is impossible for the untrained beginner to achieve such acceptable results in any other medium, photography has sometimes been called "the easy art." But to bridge the gulf between the taking of such casual snapshots and the production of photographs that can be classed as art is certainly no easy task. To the mastering of his tools and the perfecting of his technique, the photographer must devote just as much time and effort as does the musician or the painter. Since the nature of the photographic process determines the artist's approach, we must have some knowledge of the inherent characteristics of the medium in order to understand what constitutes the aesthetic basis of photographic art.

Photography must always deal with things—it cannot record 'abstract ideas—but far from being restricted to copying nature, as many suppose, the photographer has ample facilities for presenting his subject in any manner he chooses.

First, an infinite number of compositions can be achieved with a single stationary subject by varying the position of the camera, the camera angle, or the focal

length of the lens. Second, any or all values can be altered by change of light on the subject, or the use of a colour filter. Third, the registering of relative values in the negative can be controlled by length of exposure, kind of emulsion used, and method of developing. And finally, the relative values in the negative can be further modified by allowing more or less light to affect certain parts of the image in printing. The photographer is restricted to representing objects of the real world, but in the manner of portraying those objects he has vast discretionary powers; he can depart from literal recording to whatever extent he chooses without resorting to any method of control that is not of a photographic (*i.e.*, optical or chemical) nature.

But the artist's use of these controlling powers must be conditioned by two factors: (1) the nature of his recording process, and (2) the nature of his image. There is a frequent cause of mistaken understanding in the belief that the camera's image reproduces nature as the human eye sees it. On the contrary, its ability to record things as the unaided human eye can never see them is one of the most important attributes of photography. The human eye can focus on but one small area at a time; consequently we observe an object or a scene only by letting our eyes rove over it in a series of short jumps. The assortment of images thus recorded are flashed to the brain which sorts and edits them, automatically discarding some as of no importance and emphasizing others, according to its individual conditioning. The impersonal camera-eye makes no such distinctions; every

Dunes, Oceano, *photograph by Edward Weston, 1936.*



© Edward Weston

detail within its field of vision can be recorded instantly and with great clarity. In the time the eye takes to report an impression of houses and a street the camera can record them completely, from their structure, spacing, and relative sizes, to the grain of the wood, the mortar between the bricks, the dents in the pavement. The image that is thus registered has certain characteristics that at once distinguish it from the products of all other graphic processes. In its ability to register fine detail and in its ability to render an unbroken sequence of infinitely subtle gradations, the photograph cannot be equalled by any work of the human hand. For this reason any manual interference with the image at once destroys those very qualities that give the true photograph value as an art form.

From these two facts we may draw an obvious deduction: if the recording process is instantaneous and the nature of the image such that it cannot survive corrective handwork, then it is clear that the artist must be able to visualize his final result in advance. His finished print must be created in full before he makes his exposure, and the controlling powers enumerated above must be used, not as correctives, but as predetermined means of carrying out that original visualization. As in the mastery of any other graphic form, years of experience are necessary in photography before technical considerations can be made entirely subordinate to pictorial aims. The ability to prevision the finished print is the photographer's most important qualification and in order to attain it he must concentrate on learning to see in terms of his tools and processes. . . .

Exposure records the photographer's seeing; developing and printing execute it; so no matter how fine the original vision, if it has not been faithfully carried out in subsequent procedures the resulting print will suffer. The clarity of image and delicacy of gradation that characterize a fine photograph demand a special kind of surface for their best presentation. A rough surface destroys the integrity of the image; a smooth surface retains it. A shiny or reflecting surface enhances the beauty of image quality, while a dull or absorbing surface tends to obscure it.

For beautiful image quality, the best of the old daguerreotypes have never been equalled. The positives were made directly on the metal base and the small pictures were esteemed for their exquisite rendering of fine detail. The photo-painters, who did away with all things characteristically photographic, often used papers of independently beautiful surface texture for their prints. The result of such a combination is that the paper competes with the image instead of becoming a part of it. . . .

Conception and execution so nearly coincide in this direct medium that an artist with unlimited vision can produce a tremendous volume of work without sacrifice of quality. But the camera demands for its successful use a trained eye, a sure, disciplined technique, keen perception, and swift creative judgement. The artist who would use his photographic powers to the full must have all these, plus the first requisite for the artist in any medium—something to say.

GLENN D. LOWRY ON *Museums of Modern Art*

Glenn D. Lowry, who became the sixth director of the Museum of Modern Art (MoMA) in 1995, tackled two objectives in the following entry for Britannica: tracing the origins of museums of modern art, of which his own institution played a seminal role, and outlining many of the serious challenges facing such institutions today. The latter he deals with in a second piece for Britannica, written specifically for this volume's coverage of "Issues of Today, Visions of Tomorrow."

Courtesy of Glenn Lowry, photo by Peter Ross



Museums of modern art, as they are understood today, owe their origins to the Musée du Luxembourg in Paris. Designated by Louis XVIII in 1818 as a venue for the collection and display of the work of living artists, the Musée du Luxembourg acted as a kind of testing ground for recent art to judge its worthiness for admission to the permanent collection of the state. Works acquired by the museum were kept there for a number of years after the death of the artist, at which point those works whose “glory had been confirmed by universal opinion” and that were deemed of national significance were transferred to the Louvre, while others were dispersed to regional museums.

Similar institutions and arrangements developed in Germany and Britain, among other places. In Munich, for instance, the Pinakothek (later renamed the Alte Pinakothek)—established by Louis I of Bavaria (ruled 1825–48) in 1826—was designed to display the Old Masters collection owned by the house of Wittelsbach, while the Neue Pinakothek (opened 1853) contained the collection of “modern” (that is to say, 19th-century) paintings that Louis had begun forming in 1809, while crown prince. In Britain the Tate Gallery (now the Tate Britain, one of four Tate galleries)—founded in 1897 as the National Gallery of British Art (later officially renamed the Tate Gallery in honour of Henry Tate, its initial donor) and part of the National Gallery of Art until 1954, when it formally became an independent

institution—was in 1917 charged with collecting British historical art and forming a national collection of international modern art, while the National Gallery focused on art prior to 1900.

The idea of a museum devoted to modern art was given fresh impetus early in the 20th century by several pioneering directors, including Alexander Dorner in Germany and Alfred H. Barr, Jr., in the United States. Dorner, director (1925–37) of the Landesmuseum in Hanover, was deeply interested in the work of contemporary artists such as Piet Mondrian, László Moholy-Nagy, and Kazimir Malevich and sought to integrate their ideas into the Landesmuseum by inviting several of them to design displays for modern art that would fit the museum's sequence of historical galleries. Dorner saw the museum not simply as an instrument of the Enlightenment that was designed to order and classify works of art of the past but as an "educational facility whose purpose is first to develop a taste for the subject—and secondly, and more importantly, to illustrate the developments of the human spirit in its most independent and liveliest object—in art." It was this idea of the museum as an educational institution and a place for the discovery and interpretation of the work of contemporary artists that so influenced Barr, the founding director of the Museum of Modern Art (MoMA) in New York City.

Barr traveled to Europe in 1927 to study contemporary European culture and to gather material for his intended thesis on the machine in modern art. Much of his thinking about modern art, and ultimately about MoMA, was formulated during this trip. He visited London, Rotterdam, The Hague, Amsterdam, Berlin, Moscow, Leningrad (now St. Petersburg), Warsaw, and Vienna, but he was particularly impressed by Dessau, Germany, which at that time was the home of the Bauhaus. Founded in 1919 by architect Walter Gropius, the Bauhaus was a radical school that endeavoured to teach the interdisciplinarity of the arts and crafts, including painting, textile design, architecture, and photography. Gropius brought together some of the most daring and progressive architects and artists of the day, such as Hannes Meyer, Ludwig Mies van der Rohe, Johannes Itten, Marianne Brandt, Oskar Schlemmer, Wassily Kandinsky, and Paul Klee, the work of all but one of whom (Meyer) would ultimately be collected by MoMA.

Barr was predisposed to the Bauhaus approach, having previously taught a course on modern art at Wellesley College that focused on painting and sculpture—as well as graphic design, decorative arts, music, literature, film, theatre, and architecture—and saw in it a model for approaching art by discipline or medium rather than by epoch or geography. The most important idea he absorbed from Dorner was that of the museum as a place of learning and discovery committed to living artists. These concepts coalesced in the Museum of Modern Art, the first museum in North America to declare itself "modern"; it identified itself with the most progressive tendencies in art, which meant work that was original and

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A young girl listening to an audio guide while viewing Claude Monet's painting Water Lilies at the Museum of Modern Art, New York, 2011.

daring and challenged traditional or established canons. The museum, as Barr understood it, was to be a laboratory in which the public was invited to participate, and it was organized in its early years around departments of painting and sculpture, architecture and design, film, and photography; departments of prints and illustrated books, drawings, and media and performance art were added later.

By emphasizing innovation, MoMA was able to rapidly develop outstanding collections and inventive programs that appealed to an audience that had not been served by preexisting institutions, which paid little, if any, attention to modern art. The catalyst for this was the financial and moral support the museum received in 1929 from its founding trustees, especially Lillie P. Bliss, Mary Quinn Sullivan, and Abby Aldrich Rockefeller, who were determined to create a museum devoted exclusively to the most progressive tendencies in modern art. The museum's success was based on its willingness to take a great deal of risk in the selection of art as well as how that art was displayed and interpreted.

The recognition that the Museum of Modern Art achieved for the artists it championed, combined with the impact of its publications and exhibitions, made it a model for other institutions in North America, Europe, Asia, and Latin America. In some cases, such as those of the San Francisco Museum of Modern Art (1935), the Musée National d'Art Moderne (1947; which succeeded the Musée du

Luxembourg) in Paris, the São Paulo and Rio de Janeiro museums of modern art (which opened within nine months of each other in 1948) in Brazil, and the Museum of Modern Art, Kamakura (1951) in Japan, entirely new museums were founded; at other institutions, such as the Art Institute of Chicago and the Metropolitan Museum of Art in New York, new departments of modern art were created in the 1960s.

Many smaller museums of modern art were also established around this time, often based on private collections. These include the Museum Folkwang in Hagen, Germany, founded in 1902 by Karl Ernst Osthaus and moved to Essen in 1922; the Kröller-Müller State Museum in Otterlo, Netherlands, (1938), the result of a large donation from Helene Kröller-Müller; the Barnes Foundation Galleries in Merion, Pennsylvania, which housed Albert C. Barnes's extensive collection of Impressionist, Post-Impressionist, and early Modernist masterworks and which opened to the public by appointment in 1925; the Ōhara Museum of Art in Kurashiki, outside Ōsaka, Japan, which opened to the public in 1930 and was based on Ōhara Magosaburō's collection of 19th- and 20th-century French paintings and sculptures; and the Solomon R. Guggenheim Museum designed by Frank Lloyd Wright (1959) to house Guggenheim's collection of nonobjective art.

Contemporary Challenges

Growing in tandem with the increased interest in and increasing number of museums of modern and contemporary art is the number of challenges facing such institutions. For example, to what extent is it practical or even desirable to present a coherent overview of a tradition or an era whose history is not yet fully developed or understood? Is it really possible to relate the most recently made art to works now more than a hundred years old? Does it still make sense to divide an institution's collections by medium? How should Western museums deal with art from Latin America, Asia, or the Middle East, where terms such as progressive or avant-garde might have very different meanings? Is there something distinct and unique about the impact of globalization and the explosion of interest in contemporary art that changes what a museum of modern art should be?

There are no easy answers to these questions, and museums of modern art must constantly grapple with how to remain "disruptive" and new while becoming increasingly part of an established order or accepted canon. How can they balance, for instance, their commitment to new and progressive art while simultaneously collecting and displaying works by such artists as Georges Seurat, Vincent van Gogh, and Paul Cézanne, whose still wildly popular works were radical and progressive when they were made but are now well over a century old? Some institutions, like MoMA, have endeavoured to engage with this challenge by imagining

the collection as “metabolic” (to use Barr’s word) and constantly evolving, but it has proved problematic, and at times contentious, to shed works of art that have become recognized masterpieces in favour of the new and not yet fully appreciated. More productively, many museums are experimenting with different ways of presenting their collections, whether through refreshed historical narratives, through new thematic investigations, or by periodic rechangings designed to explore modern and contemporary art from particular perspectives, such as those of gender and identity. To the degree that a museum of modern art implies a dedication to art whose history is not yet fixed, or fully fixed, any attempt to articulate a cohesive and concise narrative about such work is more likely to be provisional than definitive.

One of the most pressing issues for museums of modern art is how to contend with the growth in, and changing nature of, their audiences. Of special concern is the impact of the Internet, given its ability to engage large numbers of art lovers who may never physically visit a museum. This circumstance requires a reconceptualization of both the intellectual and the physical space of a museum. While museums of modern art are committed first and foremost to the artists and works of art they collect and display, the need to engage the public has become an increasingly important aspect of their efforts. Museum space in this context is not simply artistic or intellectual but also social. It encompasses a complex nexus of relationships between viewers and art objects and between viewers and other viewers. What once was an intimate experience shared by a relatively small number of people from similar social and intellectual backgrounds has become a hugely popular experience shared by many people from far more diverse backgrounds. Some critics have seen this explosion of attendance as a detriment to the visitor’s ability to engage directly with discrete objects, thereby undermining the importance of the institution; others have seen this as a fulfillment of modern art’s democratic and populist impulses. Whatever one’s perspective, the idea of the museum as a laboratory must include the notion of the museum as a crucible of experience in both the real world of the physical museum and the virtual world of the Internet that can engage audiences with the most daring and significant works of the day.

MARILYN MCCULLY ON

Pablo Picasso

Born in Málaga, Spain, in 1881, he was christened Pablo Diego José Francisco de Paula Juan Nepomuceno Crispín Crispiniano María Remedios de la Santísima Trinidad Ruiz Picasso, but most folks know him simply as Pablo Picasso—one of the most influential artists in history. Marilyn McCully is an internationally recognized Picasso expert. She was a professor of art history at Princeton University for many years before relocating to London, whence she has organized numerous international exhibitions on Picasso and written widely about the artist, including for Britannica. The excerpt below covers the second half of Picasso's life, from the 1930s onward.



Courtesy of Marilyn McCully

Although Picasso never returned to his native country after a visit in 1934, his sympathies always lay with Spain (the short-lived Republican government named him honorary director of the Prado), and in early 1937 he produced a series of etchings and aquatints (*Dream and Lie of Franco*) to be sold in support of the Republican cause. His major contribution, of course, was the mural painting *Guernica* (named for the Basque town bombed in 1937 by the Fascists), commissioned by the Republican government for the Spanish pavilion at the 1937 World's Fair in Paris. As compensation Picasso was provided with a studio in Paris on rue des Grands Augustins large enough to accommodate the enormous canvas (11.5 25.5 feet [3.49 7.77 metres]). Dora Maar assisted him in the completion of the final work, which was realized in just over three weeks. The imagery in *Guernica*—the gored horse, the fallen soldier, and screaming mothers with dead babies (representing the bullfight, war, and female victims, respectively)—was employed to condemn the useless destruction of life, while at the same time, the bull represented the hope of overcoming the unseen aggressor, Fascism.

World War II and After

The expressive quality of both the forms and gestures in the basically monochromatic composition of *Guernica* found its way into Picasso's other work, especially in the intensely coloured versions of *Weeping Woman* (1937) as well as in related prints and drawings, in portraits of Dora Maar and Nusch Éluard (wife of Picasso's friend the French poet Paul Éluard), and in still lifes (*Still Life with Red Bull's Head* [1938]). Those works led to the claustrophobic interiors and skull-like drawings (sketchbook number 110 [1940]) of the war years, which Picasso spent in France with Maar as well as with Jaime Sabartés, a friend of his student days in Barcelona. Thereafter Sabartés shared Picasso's life as secretary, biographer, and companion and more often than not as the butt of endless jokes (*Portrait of Jaime Sabartés* [1939]; *Retour de Bruxelles*, sketchbook number 137 [1956]).

After the liberation of Paris, Picasso resumed exhibiting his work, notably at the Salon d'Automne of 1944 ("Salon de la Libération"), where his canvases of the preceding five years were received as a shock. That plus the announcement that Picasso had just joined the Communist Party led to demonstrations against his political views in the gallery itself. At the same time, Picasso opened up his studio to both new and old writer and artist friends, including Jean-Paul Sartre, Pierre Reverdy, Éluard, the photographer Brassäi, the English artist Roland Penrose, and the American photographer Lee Miller, as well as many American GIs.

Already in 1943 a young painter, Françoise Gilot, had presented herself at the studio, and within months she became Picasso's mistress. In 1946 Picasso moved to the Mediterranean with Gilot (with whom he was to have two children, Claude in 1947 and Paloma in 1949). First they stayed near Antibes, where Picasso spent

Guernica, oil on canvas by Pablo Picasso, 1937.



World History Archive/age fotostock

four months painting at the Château Grimaldi (*Joie de Vivre* [1946]). The paintings of that time and the ceramics he decorated at the studio in nearby Vallauris, beginning in 1947, vividly express Picasso's sense of identification with the classical tradition and with his Mediterranean origins. They also celebrate his new found happiness with Gilot, who in works of that period is often nymph to Picasso's fauns and centaurs.

Ceramics

Picasso's ceramics are usually set apart from his main body of work and are treated as less important, because at first glance they seem a somewhat frivolous exercise in the decoration of ordinary objects. Plates, jugs, and vases, made by craftsmen at the Madoura pottery in Vallauris, were in Picasso's hands reshaped or painted, gouged out, scratched, or marked by fingerprints and, for the most part, were rendered useless. In turning to craft, Picasso worked with a sense of liberation, experimenting with the play between decoration and form (between two and three dimensions) and between personal and universal meaning.

During that period Picasso's fame increasingly attracted numerous visitors, including artists and writers, some of whom (Hélène Parmelin, Édouard Pignon, Éluard, and especially Louis Aragon) encouraged Picasso's further political involvement. Although he contributed designs willingly (his dove was used for the World Peace Congress poster in Wrocław, Poland, in 1949), it was not so much from a commitment to the communists as from a sincere and lifelong sympathy with any group of repressed people. *War and Peace*, two panels begun in 1952 to adorn the Temple of Peace attached to an old chapel in Vallauris, reflect Picasso's personal optimism of those years.

The Picasso Myth

After World War II an aura of myth grew up around the name of Picasso, and in the last decades of his life his work had, in a sense, moved beyond criticism. Although there were few critics able to keep pace with his latest work, there were few who attacked him. One exception was the British critic John Berger (*The Success and Failure of Picasso* [1965]), who raised questions about Picasso's economic motives and speculated about his inflated public reputation. Picasso's enormous output (especially in printing and drawing) kept his name before the public, even though his work seemed at the time to be far-from-mainstream nonfigurative imagery. For example, in the series that characterized the working methods of his late years, he used figurative imagery to weave a kind of narrative within each series' numerous variations.

In 1953 Françoise Gilot with their two children left Picasso, and he spent several years as a bachelor, dividing his time between Paris and his home at La Californie, near Cannes (from 1955). In 1953 he met Jacqueline Roque, who worked in the pottery shop in Vallauris, and from 1954 (they married in 1961) she not only became his steadfast companion, but also, as his muse, she became the principal image and source of inspiration for practically all of the late work. They are both buried in the castle at Vauvenargues, which Picasso purchased in 1958. But the years from their marriage to Picasso's death they spent in the villa Notre-Dame-de-Vie at Mougins.

History of Art

In his late work Picasso repeatedly turned toward the history of art for his themes. He seemed at times obsessed with the need to create variations on the works of earlier artists; thus, in his many prints, drawings, and paintings of that period, reference is made to artists such as Albrecht Altdorfer, Édouard Manet, Rembrandt, Eugène Delacroix, and Gustave Courbet. Repeatedly Picasso did a complete series of variations on one particular work, the most famous being perhaps the series on *Las Meninas* of Velázquez consisting of 58 discrete pictures. At times Picasso reworked a specific work because he identified personally with it. For example, he was attracted to Delacroix's *Femmes d'Alger* because the figure on the right bore resemblance to Jacqueline. More often he seemed moved by the challenge to rework in his own way the complex pictorial and narrative problems the older artists had originally posed for themselves. In a sense Picasso was writing himself into the history of art by virtue of such an association with a number of his predecessors.

There is a renewed sense of play in the work of Picasso's later years. He transformed paper cutouts into monumental sculptures, and in Henri-Georges Clouzot's film *Le Mystère Picasso* (1956), the artist, the sole star, behaves like a conjurer, performing tricks with his brush. And finally, just as he turned to the paintings of earlier masters, redoing their works in many variations, so he turned to his own earlier oeuvre, prompted by the same impulse. The circus and the artist's studio became once again the stage for his characters, among whom he often placed himself portrayed as an old acrobat or king.

Legacy

Because Picasso's art from the time of the *Demoiselles* was radical in nature, virtually no 20th-century artist could escape his influence. Moreover, whereas other masters such as Henri Matisse or Braque tended to keep within certain stylistic

boundaries, Picasso continued to be an innovator into the last decade of his life. That led to misunderstanding and criticism both in his lifetime and since, and it was only in the 1980s that his last paintings began to be appreciated both in themselves and for their profound influence on the rising generation of young painters. Since Picasso was able from the 1920s to sell works at very high prices, he could keep most of his oeuvre in his own collection. At the time of his death he owned some 50,000 works in various media from every period of his career, a selection of which passed into possession of the French state and the rest to his heirs. Their exhibition and publication has served to reinforce the highest estimates of Picasso's astonishing powers of invention and execution over a span of more than 80 years.

SHOZO SATO 'ON

Kabuki

Shozo Sato taught art and design at the University of Illinois (Urbana-Champaign) for 27 years. A renowned kabuki and ikebana expert, Sato was honored with the Order of the Sacred Treasure, conferred on him by the emperor of Japan, in 2004. Sato garnered international attention for his kabuki adaptation of Western classics, such as Kabuki Lady Macbeth. He wrote the essay below ("Kabuki Goes West") for the 2005 Britannica Book of the Year.

College of Fine + Applied Arts,
University of Illinois at Urbana-Champaign



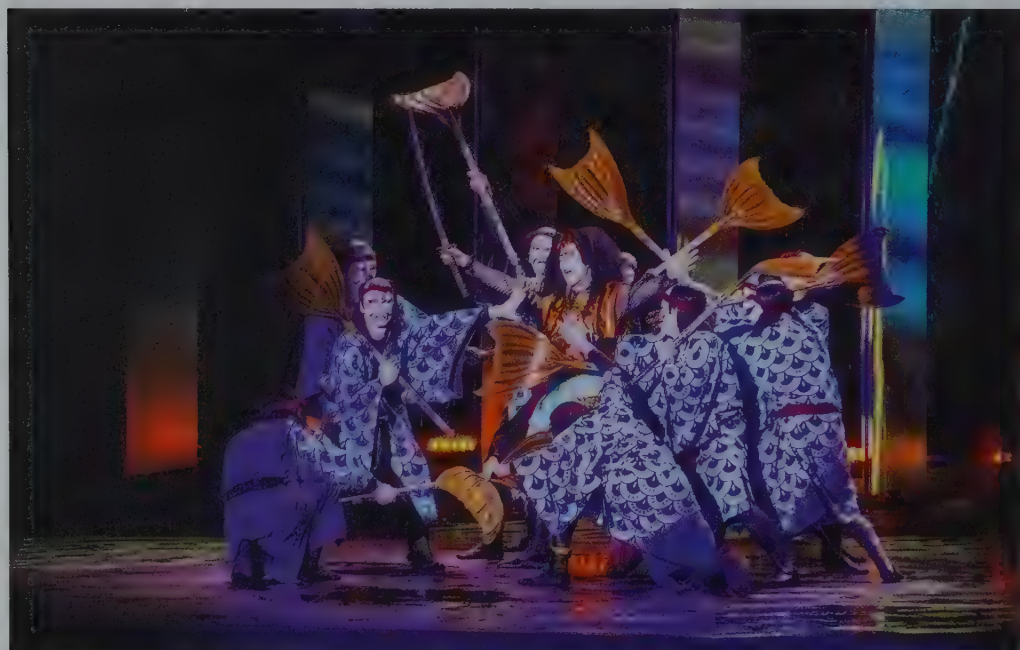
Traditional Japanese popular theatre—kabuki and *nō*—is making inroads in the West. In 2005 *Kabuki Lady Macbeth*, a version of Shakespeare's *Macbeth*, had its world premiere at the Chicago Shakespeare Theater. In that same city three months earlier, audiences had marveled at a *nō* program from Japan's Nōgaku Kyokai, one of the first visits to the United States by this troupe, which includes artists designated as "intangible cultural assets" (an official state distinction for artists who have achieved the pinnacle of their field). Their program replicated the one that was given for Pres. Ulysses S. Grant during his visit to Japan in 1879. For the Chicago *nō* performances, the 900 available tickets were snapped up in less than two hours. The 60 performances of *Kabuki Lady Macbeth* were similarly well-received and well-attended.

The history of kabuki parallels and is roughly contemporaneous with the development of such Western genres as Shakespearean drama, ballet, and opera. In all of these theatrical forms, the plot is already well known, but audiences attend new productions to savour the production values: acting, singing, orchestral playing, direction, set and costume design, and so forth. Tradition is especially strong in kabuki; actors are organized into "families" and often assume the name of a famous line of kabuki masters, adding a number after the name to indicate his generation. For example, in a recent celebration in the kabuki world, Nakamura

Kankuro took on the title of his late father, becoming Nakamura Kanzaburō XVIII, a line that dates back to 1624. Thus, the nuances, characterizations, and skills of a production will vary depending upon which kabuki family is performing. Moreover, an actor known for portraying virile males might appear the following month as an old woman. A young kabuki actor may become very popular, but until he receives a historically important name, he cannot perform certain roles on the main stage.

Ka-bu-ki translates as “song-dance-acting,” but originally it was called *kabuku*, meaning “extraordinary.” The genre began in 1603 as a sort of all-female street theatre, with a simply-clad priestess chanting a sutra, ringing a hand bell, and dancing. In time, other priestesses joined in, and they performed on street corners and empty temporary *nō* stages. Early kabuki gained popular appeal, so much so that prostitutes began to imitate the performances for their own ends. This prompted the officials of the shogunate to prohibit females from performing in public, which in turn was the start of all-male kabuki troupes. Kabuki flourished and gained a reputation for harbouring antiestablishment influences, which troubled the authorities. Other official restrictions led to ingenuity and innovation on the part of the kabuki troupes. In the 17th century, for example, adult males customarily shaved the tops of their heads. In order to perform female roles, the actors needed wigs, and this led to the creation of one of the most advanced wig-making

Japanese kabuki performance, Bellagio hotel and casino, Las Vegas, August 14, 2015.



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technologies in the world. When the government prohibited the use of wigs, however, *onnagata* (males portraying females) covered their foreheads with a rich purple cloth, although silk and gold brocades were reserved for the warrior classes and prohibited for actors. Other official prohibitions included steel swords (the spirit of the samurai; kabuki henceforth used bamboo) and suits of armour (kabuki uses papier maché). *Onnagata* perfected stylized femininity, another departure from realism. Over 400 years kabuki troupes developed some of the greatest theatrical innovations in the world, including the revolving stage, the elevator stage, and the *hanamichi*, a walkway through the audience for performers.

Some influences of Japanese kabuki were felt in professional theatre in New York City beginning in the 1950s, but they were generally short-lived. In the 1970s a few American universities began teaching mostly academically oriented courses on Japanese theatre. The one significant exception was the University of Illinois at Urbana-Champaign (UIUC), where what is now called “fusion kabuki” was developed.

When the UIUC’s Krannert Center for the Performing Arts opened in 1969, I had the honour to be appointed artist in residence. We began staging kabuki plays each year, but our productions were based on translations of the kabuki classics and performed with traditional stage settings, costumes, and conventions. Certainly the American student actors lacked the inheritance and training of the generations of kabuki families, but they nonetheless began to attract attention and were invited to perform at institutions across the country during university vacations.

Fusion kabuki melded plots of well-known Western dramas with kabuki conventions. When traditional kabuki plays were presented in English, the plot-oriented audience most often did not understand the theatrical conventions. What was needed was a kabuki play in which the audience would focus on the acting and staging rather than the story line. Over the years we have produced *Kabuki Macbeth* (1978), *Kabuki Medea* (1983), *Kabuki Othello* (1986), *Kabuki Faust* (1986), *Achilles: A Kabuki Play*, (1991), and, most recently, *Kabuki Lady Macbeth*. We have moved beyond student productions and even for a time enjoyed a professional theatre company, the Wisdom Bridge Theatre of Chicago. Fusion kabuki has been seen at the John F. Kennedy Center for the Performing Arts in Washington, D.C., the Sherover Theatre in Jerusalem, the Deutsches National Theater in Weimar, Ger., in Cairo, and elsewhere.

For *Kabuki Lady Macbeth*, based loosely upon Shakespeare’s *Macbeth* and told from the lady’s point of view, a script was written in contemporary poetic form. The play was performed by American actors using English dialogue. Eastern aesthetics and spiritual values were retained, and all the traditional kabuki staging conventions were followed, including makeup, costuming, stylized body language, and kabuki intonation of the dialogue. A music synthesizer accompanied the *ki*

player (a percussionist garbed in black and seated at stage right), who punctuated action with the sharp sounds of wood striking a board on the floor. Actors began each rehearsal on their hands and knees purifying the work space by polishing the floor with a cloth. A system of warm-up stretching exercises helped clear their mind, and time was allotted for *zazen* (seated meditation) in order to get into character.

Unquestionably, influences from kabuki now have permeated theatre in the West, not only with innovations in stage technology such as those mentioned earlier but also in such novelties as *koken* (onstage assistants to an actor) and *hikinuki* (a quick change of costume for an actor that reveals a change in character of the actor and his true state of mind). Of even greater significance, however, is the fusion of Eastern and Western aesthetics that is taking place. American performers are going beyond mere imitation of a style of acting and developing an understanding of the basis for Japanese aesthetics. This was encouraged at UIUC by having all kabuki students take lessons in other Japanese art forms, such as *chadō* (the tea ceremony), *ikebana* (flower arrangement), *sumi-e* (black-ink painting), and Japanese classical dance. Among other things, students learned the eloquence of silence and the value of empty space. Through universalization of such aesthetic principles, we are gradually transcending our cultural differences.

SISTER WENDY BECKETT ON

The Art of Looking at Art

British contemplative nun Sister Wendy Beckett, who was born in South Africa, was described in 1997 by the New York Times as “a sometime hermit who is fast on her way to becoming the most unlikely and famous art critic in the history of television.” The habit-wearing nun with a speech impediment became internationally famous in the 1990s with her BBC television series on art history that subsequently ran on PBS channels in the United States. Her dozens of books and documentaries that followed have sold in the millions. Her Britannica article, “The Art of Looking at Art,” is highlighted below.

AP Images



Art is made to be seen. In contrast, nature, prodigal and thoughtless, takes no heed of visibility: William Wordsworth celebrates the flowers that “waste their sweetness on the desert air” and the treasures lying hidden in “the dark unfathomed caves of ocean.” But art is diametrically opposed to such “waste” and “desert air.” It is focused, concentrated, intentional, and intent. It is specifically called into material being by the creative activity of a gifted human being, and its primary purpose depends on its being viewed. It would be naive, though, to consider this act of looking a simple one. Life is so multifarious in its impact that we can only move through it by rationing our attention. We semi-look, we skim. Indeed, it requires an effort to look in a serious, focused manner. Who has not seen visitors to a museum emerge not satisfied but rather fatigued?

In order to experience art, we should of course visit museums. They are the prime locus where the uniqueness of an artist’s work can be encountered. Yet even in museums, which are more and more acquiring the significance of churches, art

is seen in very unpromising conditions. Each work was made to be seen alone, but in a museum we are able to appraise it only in a room full of other works, dense with other people, ourselves already distracted by travel and unfamiliarity. Compare this with our relationship to literature: we generally read one book at a time, we spend as much time as it takes, and we read it in comfort. (It has been well said that the basic condition for art appreciation is a chair.) Yet we have to learn how to overcome the hindrances of the museum if encounters with art are to enrich us.

Art cannot be fully experienced without our cooperation, and this involves, above all, our sacrifice of time. Sociologists, lurking inconspicuously with stop-watches, have discovered the average time museum visitors spend looking at a work of art: it is roughly two seconds. We walk all too casually through museums, passing objects that will yield up their meaning and exert their power only if they are seriously contemplated in solitude. Since this is a weighty demand, many of us perhaps must compromise: we do what we can in the imperfect condition of even the most perfect museum, then we buy a reproduction and take it home for prolonged and (more or less) distractionless contemplation. If we do not have access to a museum, we can still experience reproductions—books, postcards, posters, television, film—in solitude, though the work lacks immediacy. We must, therefore, make an imaginative leap (visualizing texture and dimension) if reproduction is our only possible access to art. Whatever the way in which we come into contact with art, the crux, as in all serious matters, is how much we want the experience. The encounter with art is precious, and so it costs us in terms of time, effort, and focus.

Apart from these logistical difficulties, there are psychic blocks to appreciating art. However inviolate our self-esteem, most of us have felt a sinking of the spirit before a work of art that, while highly praised by critics, to us seems meaningless. It is all too easy to conclude, perhaps subconsciously, that others have a necessary knowledge or acumen that we lack. At such moments, it is important to realize that, while the experience of art is by no means limited to art historians and critics, knowledge of the field is always helpful and sometimes essential. Art is created by specific artists living in and fashioned by a specific culture, and it helps to understand this culture if we are to understand and appreciate the totality of the work. This involves some preparation. Whether we choose to “see” a totem pole, a ceramic bowl, a painting, or a mask, we should come to it with an understanding of its iconography. We should know, for example, that a bat in Chinese art is a symbol for happiness and a jaguar in Mesoamerican art is an image of the supernatural. If need be, we should have read the artist’s biography: the ready response to the painting of Vincent van Gogh or Rembrandt, or of Caravaggio or Michelangelo, comes partly from viewers’

sympathy with the conditions, both historical and temperamental, from which these paintings came.

Then, a paradox: we need to do some research, and then we need to forget it. If we only approach art intellectually, we shall never see it as a whole. (It was the child who could see the emperor's nakedness, because the child has no preconceptions.) We have delimited a work if we judge it in advance. Faced with the work, we must try to dispel all the busy suggestions of the mind and simply contemplate the object in front of us. The mind and its facts come in later, but the first, though prepared, experience should be as undefended, as innocent, and as humble as we can make it.

Why should we go to all this trouble? This is a question that those who have learned to appreciate art do not need to ask. We all have access in some form to works of art of supreme genius, which represent humanity at its deepest and most pure. We can emotionally enter into these works, have our limitations stretched, silently discover the potential within us, and understand—perhaps to an extent we would never have been able to accept unaided—what it means to be alive. The knowledge can be painful, but it can also be transforming. That is almost the definition of great art—that it changes us.

Art is our legacy, our means of sharing in the spiritual greatness of other men and women—those who are known, as with most of the great European painters and sculptors, and those who are unknown, as with many of the great carvers, potters, sculptors, and painters from Africa, Asia, the Middle East, and Latin America. Art represents a continuum of human experience across all parts of the world and all periods of history. Indeed, archaeologists recognize the presence of *Homo sapiens* when they find some evidence of creativity, such as a shaped stone or a clay pot. Artists past and present keep alive for us humankind's natural potential for beauty and power and help future generations to examine the fundamental mysteries of life and death, which we both fear and desire to know. While life lasts, let us live it, not pass through as zombies, and let us find in art a glorious passageway to a deeper understanding of our essential humanity.

The passageway provided by art is very wide. No single interpretation of art is ever "right," not even the artist's own. He or she can tell us the intent of the work, but the actual meaning and significance of the art, what the artist achieved, is a very different matter. (It is pitiable to hear the grandiose discussions of artists' work by the least talented of our contemporaries.) We should listen to the appreciations of others, but then we should put them aside and advance toward a work of art in the loneliness of our own truth. Each of us encounters the work alone, and how much we receive from it is wholly the effect of our will to accept this responsibility.

Art Museums and Their Digital Future

By Glenn D. Lowry

With the dramatic growth of museums around the world—over 2,000 built in China alone since the advent of the 21st century and new ones springing up on a regular basis throughout Europe and North America, the Middle East, and Latin America—this is a good moment to reflect on these institutions and their future. Can they sustain this level of growth indefinitely? Will available resources support this many museums? Can museums at the end of the 21st century be as popular as they are today? Will new forms of engagement with the arts replace the unique experiences provided by museums?

The list of questions could go on for pages, but here are two issues that I think merit particular attention from the point of view of today's concerns about technology and utility: Can museums use new technologies to transform themselves from "analog" institutions into "digital" ones; and can they reallocate their resources in order to fully activate their collections?

The rapid evolution of digital technologies has enabled museums to develop an array of platforms—from websites to social media—that have extended their programming and reach within and beyond their walls. But they still think in analog ways.

Oded Balilty/AP Images

In announcing the Israel Museum's participation in the Google Art Project in 2012, curator Debby Hershman holds a 9,000-year-old Neolithic mask, the same as the one displayed on the screen.



The challenge for museums is to use these technologies to learn to think *digitally* and thus to imagine new ways of working with each other as well as engaging the public, to move beyond a hierarchical order of organization and thinking to a networked set of relationships and possibilities. In other words, could partnership among museums replace competition? Could sharing replace ownership? Could conversation replace authority?

In short, could art museums develop new conceptual models that build upon digital thinking to transform themselves into 21st-century institutions where collections are developed jointly by several museums? Where audiences are regularly invited to share their ideas about art with the museums and each other and even encouraged to participate in the making of art and the shaping of the intellectual life of the institutions? Where museums work together on joint educational and community-centered programs about art, on site and online?

An equally pressing concern for art museums is whether they can find the right balance between collecting and programming. Most museums have extensive collections, often only a fraction of which are actually displayed but which consume substantial physical, financial, and human resources. At the same time, museums struggle to find adequate funding to support the kind of robust programming essential to expanding and sustaining audiences, especially new audiences who have grown up in a digital world and expect a rich and deeply engaging experience from museums. Moreover, with the rise of hyper-successful commercial galleries like Gagosian, Hauser & Wirth, and White Cube, among others, that have access to far greater financial resources than museums and that look like

museums with their bookstores, restaurants, and well-curated exhibitions, this issue is acute. Unless museums can rebalance the relationship between the *growth* of their collections (for which there are often endowed funds compelling them to continue purchasing art, which only compounds the problem) and the *use* of their collections (for which there are *rarely* endowed funds), they may find themselves unable to generate the breadth and richness of programming required by audiences in the future.

Art museums, as we know them, have been around since the late 18th century and have proven themselves to be surprisingly resilient, inventing and reinventing themselves in response to changing audiences, interests, and opportunities. Although there is every reason to believe they will continue to do so, there remain serious challenges to be dealt with today and in the future for museums to ensure success and fidelity to their mission.

Glenn D. Lowry has been the director of the Museum of Modern Art in New York since 1995. A strong advocate of contemporary art, he has lectured and written extensively in support of contemporary art and artists and the role of museums in society today. He received his B.A. (1976) from Williams College and his M.A. (1978) and Ph.D. (1982) in art history from Harvard University. His books include Designing the New Museum of Modern Art (2004), Oil and Sugar: Contemporary Art and Islamic Culture (2009), and The Museum of Modern Art in This Century (2009). In 2004 the French government honored him with the title of Officier dans l'Ordre des Arts et des Lettres. Additionally, he is the author of Britannica's entry "museum of modern art," which is also reproduced in this volume.

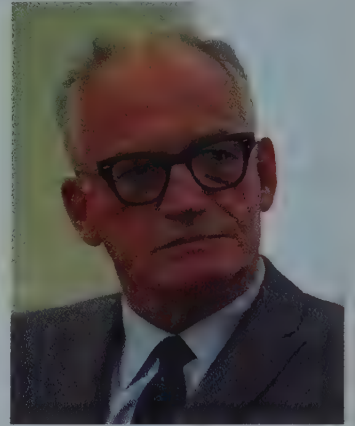
BARRY GOLDWATER ON *Conservatism*

Britannica is proud to have secured in the late 19th century and then in the 20th perspectives on the major political "isms" of the day from their most impassioned and ablest exponents: Russian revolutionist Pyotr Kropotkin on anarchism, The Nation's former editor Max Lerner on liberalism, Nobel Prize-winner George Bernard Shaw on socialism, and U.S. presidential candidate and U.S. Senator Barry Goldwater on conservatism. Communism was also covered, in a very special way by Leon Trotsky in his Britannica biography of Lenin. All of their articles are excerpted in this volume.

Two years before Arizona Senator Barry Goldwater challenged Lyndon B. Johnson in the 1964 U.S. presidential election, he engaged in a debate with a fellow U.S. senator, Jacob K. Javits, in the pages of a Britannica publication, *The Great Ideas Today*. "Does America's best hope for the future lie in political conservatism?" was the question put to both men. This question was inclusive enough to address a number of the pressing issues of 1962, such as: Should the United States seek world disarmament? Should the United Nations increase its role in world affairs? Should a program of medical care for the aged be tied to Social Security principles? Should fallout shelters be built and, if so, by whom?

Although the Cold War is long gone and Medicare and Medicaid are well-established U.S. programs, the principles that animated these questions and made them controversial in 1962 continue to do so today. With the opposition between conservative and liberal ideals alive and well in the 21st century, Goldwater's voice continues to resonate. An excerpt from his 1962 article follows.

The Lyndon Baines Johnson Library and Museum



Fundamentally, what do conservatives believe in? What are they after? What is the basis of their approach to the problems that beset America in the year 1962?

I tried to express the essence of the conservative search, very briefly, in a

speech I delivered in January, 1962. I said then that conservatives desire a nation whose goal is not just security, or prosperity, or peace at any price, but a nation determined to provide for each citizen a maximum of freedom of choice and to require from each citizen the acceptance of the proud obligations of freedom; a nation not afraid of victory, a nation strong in its moral belief, equal to any sacrifice required for the maintenance of freedom.

Upon the defense of freedom, certainly all American conservatives are agreed. After that, they begin to differ. And yet, I think I can set down here a brief summary of the convictions of the typical American conservative. Some might disagree on one point or another; but I am speaking here of the representative American of conservative convictions.

First, he maintains that there is an abiding human nature; and that, under God, there exists a just civil social order which is suited to man's nature. There are certain natural laws, from which flow natural rights. Governments are the creation of human wisdom and experience designed to supply human wants. But governments are legitimate only if they recognize and respect the natural law. As St. Thomas Aquinas says in the *Summa Theologica*: "Every human law has just so much of the character of law as it is derived from the law of nature. But if in any point it differs from the law of nature, it is no longer a law but a corruption of law."

Second, the conservative argues that freedom—moral, political, and economic—is the mark of high civilization; and servitude, under whatever name, is the mark of a barbarous or decadent order. Freedom, in fact, is so much the essence of civilization that Hegel maintains that "the history of the world is nothing but the development of the idea of freedom." The conservative holds that to diminish economic or political freedom is to injure moral freedom. True, no liberty is absolute, for it is limited by other rights and duties. "Political liberty does not consist in an unlimited freedom," says Montesquieu. A good society is one which cherishes the highest degree of freedom consistent with order and justice.

Third, the conservative recognizes that freedom is possible only when order and justice prevail. Order means that there shall be honorable leadership, willingly recognized; and that law rules, not the whims of men. "Justice exists only between men whose mutual relations are governed by law" (Aristotle, *Nicomachean Ethics*). And justice means that, so far as possible, each man in a political community shall have access to the things, and to the work, which are his own—which he inherits or earns or which best suit his talents. Equality of condition is hostile to order and justice and freedom. Aristotle recognized these truths centuries ago: "In democracies of the more extreme type, there has arisen a false idea of freedom which is contradictory to the true interests of the state. . . . Men think that what is just is equal; and that equality is the supremacy of the popular will; and that

freedom means the doing what a man likes. . . . But this is all wrong; men should not think it slavery to live according to the rule of the constitution; for it is their salvation" (*Politics*).

Fourth, the conservative respects the political institutions and customs and traditions which he has inherited, particularly the Constitution of the United States and other great documents of our nation. He believes our heritage of ordered freedom is the product of great wisdom and much practical experience, and he thinks that we would run great risk if we should exchange it for some utopian design.

Fifth, the conservative believes that government is force; and though government is necessary and a great good if kept within proper limits, it is by its very nature potentially dangerous. Therefore, government should be concerned with the things that are its proper province, such as defense of the country and the administration of justice; it ought not try to do things which are better done by individuals or voluntary associations. It would be difficult to improve upon J.S. Mill's description of the proper role of government and the dangers of its doing too much:

The mischief begins when, instead of calling forth the activity and powers of individuals and bodies, it substitutes its own activity for theirs; when, instead of informing, advising, and, upon occasion, denouncing, it makes them work in fetters, or bids them stand aside and does their work instead of them. The worth of a State, in the long run, is the worth of the individuals composing it; and a State which postpones the interests of *their* mental expansion and elevation to a little more of administrative skill, or of that semblance of it which practice gives, in the details of business; a State which dwarfs its men, in order that they may be more docile instruments in its hands even for beneficial purposes—will find that with small men no great thing can really be accomplished; and that the perfection of machinery to which it has sacrificed everything will in the end avail it nothing, for want of the vital power which, in order that the machine might work smoothly, it has preferred to banish" (*On Liberty*).

It follows that government ought to be balanced and hedged, for the sake of freedom, and that there should be some division of governmental powers, as between the federal government and our state governments. The Founding Fathers recognized that the federal system, with powers divided between the local and national governments, provides a "double security" to freedom: ¹

In the compound republic of America, the power surrendered by the people is first divided between two distinct governments, and then the portion allotted to each subdivided among distinct and separate departments.

Hence a double security arises to the rights of the people. The different governments will control each other; at the same time that each will be controlled by itself" (The Federalist).

Sixth, the conservative thinks that we should not forget that Americans have a republic characterized by territorial democracy. Our federal government is republican in form, not directly democratic. Madison distinguished between these two forms of government as follows:

The two great points of difference between a democracy and a republic are: first, the delegation of the government, in the latter, to a small number of citizens elected by the rest; secondly, the greater number of citizens, and greater sphere of country, over which the latter may be extended.

He continued by pointing out how these differences make a republic preferable to a democracy:

The effect of the first difference is . . . to refine and enlarge the public views, by passing them through the medium of a chosen body of citizens, whose wisdom may best discern the true interest of their country, whose patriotism and love of justice will be least likely to sacrifice it to temporary or partial considerations. . . . The other point of difference . . . renders factious combinations less to be dreaded . . . (*The Federalist*).

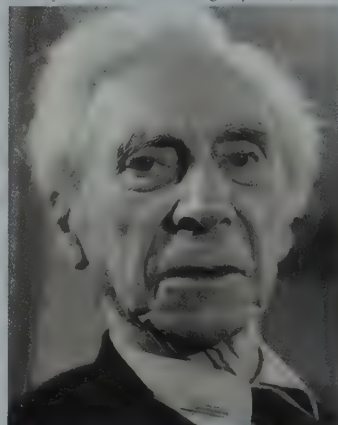
We must retain our republican form of government at the national level, because centralization in our immense nation would produce atrophy of will and disobedience to law. But at the state and local levels we have a high degree of democracy, which remains healthy just as long as it retains its functions. Therefore, it is against the concentration of power in Washington—beyond the authority needed—that the conservative takes his stand. Continuing concentration at the national level can only mean the decay of democracy in our states and localities.

Seventh, the conservative says that politics is the art of the possible. Therefore, he is a political realist. Human nature never can be perfected; life never can be perfectly happy for everyone; and governments never can be perfectly just and omniscient. The conservative doubts that mankind ever will enjoy a civil social order much better than the one we already know here in America. There is no such thing as inevitable progress toward utopia. Therefore, we will be wise if we preserve and protect our present moral and social order, improving it here and there, when we have a good chance, but taking care never to hack at the roots of civilization. The radical is a man who wants to tear our culture out by the roots.

BERTRAND RUSSELL ON *Fake News and Government Propaganda*

Contemporary readers concerned about “fake news” should take heed of Bertrand Russell’s insightful article below. Russell (1872–1970) was not only one of the most significant philosophers of the 20th century but a prolific author, interminable public rabble-rouser—adept at discoursing on seemingly any subject—and recipient of the Nobel Prize for Literature in 1950. He was also a multiple contributor to *Britannica*, composing not only the piece on “The Philosophical Consequences of Relativity” highlighted in this volume but the excerpted piece below, on government propaganda, written for *Britannica*’s *These Eventful Years: The Twentieth Century in the Making As Told by Many of Its Makers* (1924). Russell provided a fascinating brief history of state-generated propaganda and then indicted the new and novel methods for disseminating “fake news”—through motion pictures, public schools, and the adman. This cultural acquiescence to deception, concluded Russell, was nothing short of “a danger to civilised life.”

Courtesy of the British Broadcasting Corporation, London



Government propaganda is no new thing. Herodotus was in the pay of the Athenian State, which accounts for the fact that Athens comes out of his history with so much glory. In the wars of the Guelphs and Ghibellines, the victory of the former was due to the fact that the Pope, through the medium of the friars, outdid the Emperor in the organisation of official propaganda. At the time of the Spanish Armada, both Philip II and Elizabeth organised their propaganda in quite a modern way. Philip II’s activities in this line are exemplified by Cardinal Allen’s *Admonition to the Nobility and People of England and Ireland*, accusing Queen Elizabeth

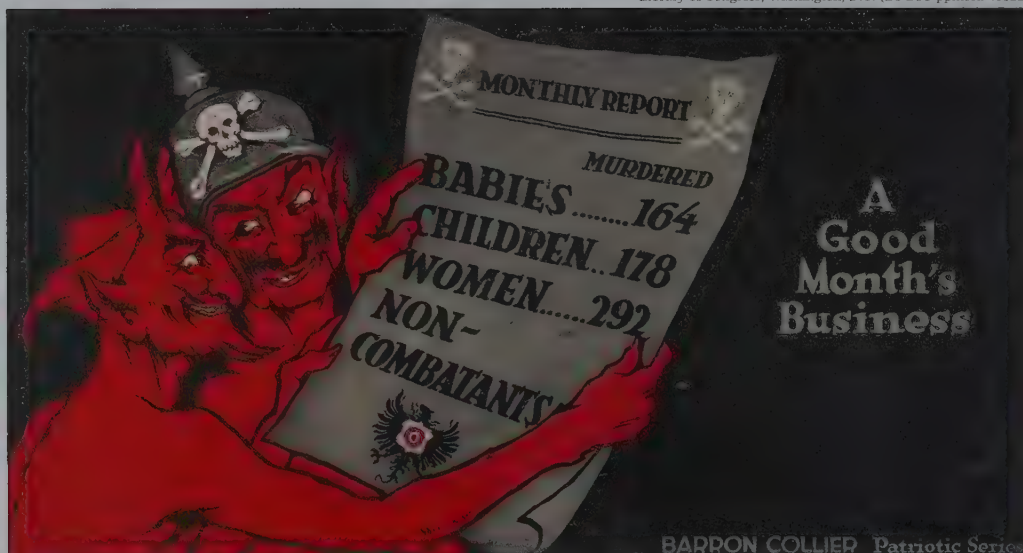
of every imaginable vice (quoted in Frederick Chamberlin's *Private Character of Queen Elizabeth*). The British popular horror of the Spanish Inquisition no doubt is derived from English Government propaganda during Elizabeth's reign. Historians and literary men have always taken part in this work; *Henry VIII* is propaganda for Elizabeth, and *Macbeth* for James I, who appears as a descendant of Banquo wearing a triple crown.

But it is only in recent years that Governments, and even single departments, have instituted regularly organised propaganda bureaux, for the purpose of giving publicity to their own virtues and to the vices of their opponents. Before the World War, there was still a certain subtlety in the methods employed. For example, after the Anglo-Russian Agreement of 1907, most English newspapers ceased to mention instances of Tsarist oppression, London was afforded an opportunity of growing enthusiasm over the Russian ballet, and translations of Russian literature had no difficulty in finding publishers. At the same time the Kaiser was posing as almost a Mahommedan in Turkey and throughout the Near East. But with the outbreak of the World War the methods practised became more direct. The Germans, in this as in other matters, were better prepared; they began at once to publish accounts and professed photographs of Russian atrocities in East Prussia. The German official reply to the [British] Bryce report [of 1915, which was dubbed the Blue Book and which exaggerated the atrocities committed by Germany during its invasion of Belgium in 1914] subsequently complained that these photographs (with the titles changed) had been plagiarised and published by the Allies, as illustrating German atrocities in Belgium. Whether there was any truth in this charge we do not know. In any case, Allied propaganda, through British control of the cables, secured wider publicity than that of Germany, and achieved a notable success in winning the sympathy, and ultimately the coöperation of the United States. In neutral countries both groups of belligerents subsidised newspapers to present their case under the guise of impartiality, but outside Europe the Central Empires had much more difficulty than the *Entente* in carrying through this policy.

The methods adopted by the different Governments were closely analogous, but the British Government, perhaps through its long experience of democracy, was, on the whole, more successful than the Continental belligerents in bringing doubters to its side and increasing the enthusiasm of the converted.

Sir Gilbert Parker, who took a prominent part in propaganda in America while that country was still neutral, explained his methods in *Harper's Magazine* (March, 1917):

We supplied three hundred and sixty newspapers in the smaller states of the United States with an English newspaper which gave a weekly review and comment on the affairs of the war. We established connection with



U.S. anti-German poster from World War I, depicting Kaiser William II as a devil looking at a monthly report of murders, 1918.

the man in the street through cinema pictures of the army and navy, as well as through interviews, articles, pamphlets, etc., and by letters in reply to individual American critics, which were printed in the chief newspaper in the State in which they lived, and were copied in newspapers of the other and neighbouring States. We advised and stimulated many people to write articles; we utilised the friendly services and assistance of confidential friends; we had reports from important Americans constantly, and established association by personal correspondence with influential and eminent people of every profession in the United States, beginning with university and college professors, and scientific men, and running through all the ranges of the population. We asked our friends and correspondents to arrange for speeches, debates, and lectures by American citizens, but we did not encourage Britishers to go to America and preach the doctrine of entrance into the war.

After America's entry into the war, British propaganda, under the direction of Lord Northcliffe, was able to adopt more direct and ambitious methods. In all other countries, also, propaganda suited to their conditions was organised. Numbers of able men and women, of all shades of opinion, were employed to present the British case to different nations and to different sections. Any fact which had a propaganda value was seized upon, not always with a strict regard for truth. For example, world-wide publicity was given to the statement that the Germans boiled down human corpses in order to extract from them gelatine and other useful substances.

This story was widely used in China when that country's participation was desired, because it was hoped that it would shock the well-known Chinese reverence for the bodies of the dead. The story was derived from the fact that the Germans had a *Kadaververwertungsanstalt*, i.e., "establishment for the utilisation of carcasses." The story was set going cynically, by one of the employees in the British propaganda department, a man with a good knowledge of German, perfectly aware that "Kadaver" means "carcase" not a "corpse," but aware also that, with the Allied command of the means of publicity, the misrepresentation could be made to "go down."

Meanwhile the same kind of thing was being done in Germany, to stimulate the hatred of the Allies. The present writer possesses a pamphlet by a well-known German pacifist, Dr. Gumbel, called *Vier Jahre Lüge* (Four years of lying). In this pamphlet German war-propaganda is exposed. It appears that the German people did not know till 1918 that the battle of the Marne was a victory for the Allies. In the matter of Russian atrocities, the Press was officially warned not to throw doubt upon any that were mentioned as genuine in the German White Book [published to counter the British Blue Book] on the subject. For example, on February 9, 1917, the Press were cautioned against mentioning that a certain working woman, who had asserted that her pregnancy was the result of rape by a Russian soldier, had subsequently stated on oath that her child had a different origin. The German Government completely deceived the German nation as to the effectiveness of the U-boats, and denied that the Americans were succeeding in landing their troops in France. Under these circumstances it was impossible for Germans who had no access to secret information to form any idea of the true state of affairs. . . .

Undoubtedly the cinema, or "movies," will be, until some newer invention supersedes it, the most potent of all means of propaganda, because it is frequented by people who are too frivolous to read politics in newspapers, and because it lends itself to insidious methods. It was largely used in the United States to prepare American participation in the war, for example by suggesting a Mexican invasion organised and financed by Germany. (Such a suggestion had to be confined to a thoughtless public.) It was used during the war to concoct atrocity-films, which did much to stimulate the universal mutual hatred. The topical gazette which, in most picture-theatres, gives representations of certain recent events, is of course admirable for propaganda. Grave writers on political theory seldom mention the cinema, because there is nothing about it in Aristotle or Montesquieu; but it is one of the most powerful political forces of our day, and its influence is on the increase.

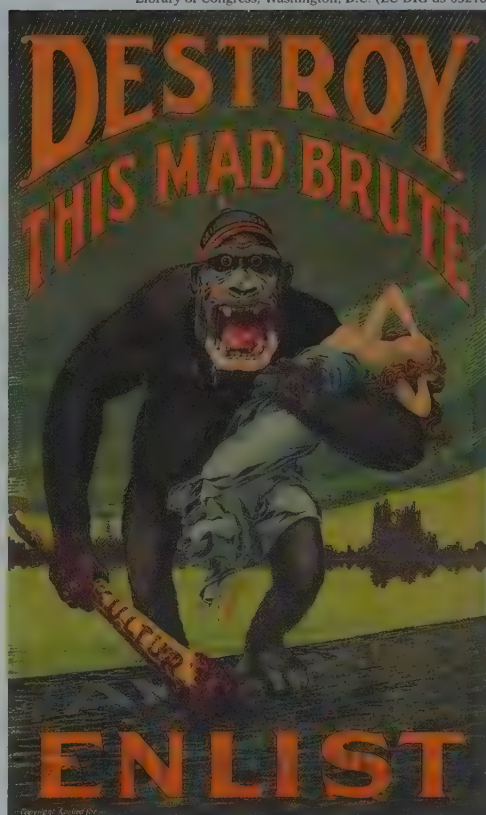
Propaganda is not confined to international matters. Recently Sir Laming Worthington-Evans, the British Postmaster-General, was made the subject of laudatory notices in the Press, which were supplied by a propaganda official in the Post Office. Being new to the office, Sir Laming had not known that he was liable to this

sort of treatment, and took steps to cause it to cease. Other Ministers, however, have been less squeamish. The present writer is not in a position to judge as to the extent of this evil elsewhere. The *New York Freeman* (August 22, 1923) states, *à propos* of this incident: "We believe—though Englishmen may think this an extravagant claim—that the United States suffered more from this sort of prostitution even than the England of Northcliffe and Lloyd George." This statement, however, seems scarcely credible.

It is not only through the Press that Government propaganda is carried on, but also through the schools. In all countries, it is regarded as part of the business of education to instil patriotism. This is done by dwelling on the sins of other nations and the virtues of one's own, thus producing an atmosphere of national self-righteousness. French elementary schoolchildren at the present day are carefully taught to hate the Germans. The present writer has numbered among his friends an Italian and a Greek, both men of learning and high academic distinction, who severally informed him that, while the case for every other belligerent in the World War was obviously unsound, the case for their own country was absolutely unanswerable. In each case they were carried away by propaganda, the effectiveness of which was mainly attributable to the influence of early education.

Government propaganda is also employed in labour disputes, to popularise the case for the employers. This is done in all industrial countries.

The technique of Government propaganda, as applied to adults, is derived from the practice of advertisers. Commercial competition has provided data as to the kind of advertisements that are successful; in America, the psychology of advertising has been carefully studied by eminent psychologists. Advertising is the art of producing belief by reiterated and striking assertions, wholly divorced from all appeal to reason. Experience shows that the average man, if he is told a hundred times a day that A's soap is the best, and fifty times a day that B's is the best, will buy A's, although he knows that A is making the assertion for the sake of his own



U.S. anti-German poster from World War I, 1918.

pocket, not from a disinterested love of truth. This fact is now utilised by Governments, especially through the Press and the cinema, to cause subject populations to believe whatever suits the Governments. Although, in democratic countries, the population is allowed to vote, it is not allowed to form its own opinion on the issues, but is hypnotised into the opinion which is officially considered desirable. A dramatic event, such as defeat in war, causes the whole edifice of hypnotically-induced belief to break down, and leads to a revolution, which puts the apparatus of spell-binding into new hands. But in ordinary times the method works well, and enables the holders of power to secure stability in the Government. The whole method is as yet in its infancy, but it is likely to become developed and perfected with great rapidity, until nothing but defeat in war will suffice to produce any change not desired by those who control publicity. This will make for the preservation of order and the domination of the more "solid" elements in the community.

In spite of these advantages, however, there are certain dangers in the method. There is the danger of revolution, through the sudden overturning of a whole system of beliefs not based on fact. Whenever a fact becomes too patent to be denied, it destroys the credit of propagandists who have been endeavouring to conceal it, with the result that there is a sudden and often dangerous revulsion. If the facts had come to be known gradually, a gradual adaptation to them would have been more possible. All Europe east of the Rhine, in 1917 and 1918, illustrated this danger.

There is also the danger that men become accustomed to potent and irrational stimuli to belief, instead of the milder but more reliable stimulus of reasonable evidence. An irrational stimulus most readily produces belief when it appeals to some primitive instinct, and the continual stirring up of such instincts constitutes a danger to civilised life.

Democratizing the U.S. Supreme Court

By Larry J. Sabato

The U.S. Supreme Court is neither democratic nor easily changed, to some Americans' delight and others' dismay. No one would seriously propose that we elect justices—just take a look at the tawdry contests in states that put their supreme courts and various judicial posts on the ballot. But is the third federal branch so perfect that it is immune from reform?

This question is worth asking again since we probably face yet another, and possibly more than one, Court appointment in the near future. Many have noted the ages of Justices Ruth Bader Ginsburg and Anthony Kennedy, 84 and 81, respectively, particularly after the election of Pres. Donald Trump in 2016. Prior to the election, Democrats (and perhaps the justices themselves) had anticipated that Hillary Clinton would be responsible for filling any vacancies on the Court.

The American public just might be ready to consider a judicial reform or two. While the Supreme Court's approval level in most recent surveys remains close to 50 percent, citizens are not inclined to view the Court as positively as they once did. Conservatives still remember the liberal Warren Court and many unpleasant (to them) decisions since, not least *Roe v. Wade*, while liberals harrumph when they recall *Bush v. Gore* in 2000 or, more recently, the Citizens United decision that some say has opened the floodgates even more for corporate money in the election process.

For starters, what about abolishing lifetime tenure of Supreme Court justices (and maybe lower federal court

judges) and moving toward a nonrenewable fixed term of 15 to 18 years? One could argue that the Constitution doesn't guarantee lifetime tenure anyway, saying only that justices shall serve "during good Behaviour." When justices stay on the Supreme Court for decades—well into their 70s, 80s, and beyond—they often become insular and out of touch with new mores, advanced technologies, and younger generations. Structured properly, staggered appointments of fixed-term seats would also insure that each new president, reflecting the mandate of his or her election, would get an appointment or two.

Given judicial salaries that are low compared to the private sector, perhaps additional highly qualified individuals would be willing to serve in term-limited judicial posts. Chief Justice John Roberts favored a term limit before he was nominated to the Court—and a sizable number of legal scholars have also endorsed this reform. As it is, presidents are overlooking many of the ablest and most experienced legal minds, preferring to seek out young, less-veteran

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The front of the U.S. Supreme Court building, Washington, D.C.



attorneys so that they can leave a long-lasting legacy on the Court.

Absent a term limit, which would be my preference, the nation might want to consider a generous mandatory retirement age. Justices Ginsburg and Kennedy seem vigorous enough, but Court scholars well remember William O. Douglas, who had been incapacitated by a stroke and was infirm at age 76 yet fought to stay on the Court anyway.

Inevitably, these reforms will have political consequences, although they are not immediately predictable. So what? The political nature of the Court has been on display at the confirmation hearings of every recent appointee, and particularly with President Obama's nomination of Judge Merrick Garland following the death of Justice Antonin Scalia. The Republican-controlled Senate refused to even hold a confirmation hearing, instead opting to wait for the end of President Obama's term, leaving the nomination to the next president. Following the election of President Trump, Garland was passed over for conservative Judge Neil Gorsuch.

Court politics also came to the fore at the 2010 State of the Union address. In an extraordinary precedent that went well beyond FDR's criticism of the Court in the 1930s, President Obama sharply rebuked the Court for its Citizens United ruling, while Democratic congressmen stood and cheered. Justice Sam Alito, appointed by Pres. George W. Bush, could be seen to shake his head and mouth the words "not true." This was the latest proof that the Court is naturally political—and that it does not reside on Mount Olympus, in the view of many citizens in and out of public life.

A public opinion survey about the Court, conducted by Fairleigh Dickinson University in January and February 2010, con-

firmed the public's evolving views and desire for a more open and accessible Court. By a margin of 61 to 26 percent, respondents said that "televising Supreme Court hearings would be good for democracy, rather than undermining the [Court's] dignity or authority." Democrats, Republicans, and Independents were in agreement—a rarity in this polarized era.

More remarkably, Americans of all partisan stripes endorsed "limiting any Supreme Court Justice to a maximum term of 18 years on the bench." Overall, respondents favored this proposal by a margin of 56 to 35 percent. (The telephone survey included a random sample of 1,002 registered voters, with a margin of error of 3 percent.)

The people of the United States have come to accept a large role for the judicial branch, despite its undemocratic nature. But the inherent distrust of concentrated, seemingly unlimited power has also given many Americans pause. Under the right set of circumstances, and despite the enormous difficulties involved in changing the Constitution, a constitutional amendment to restructure the Court might receive serious consideration.

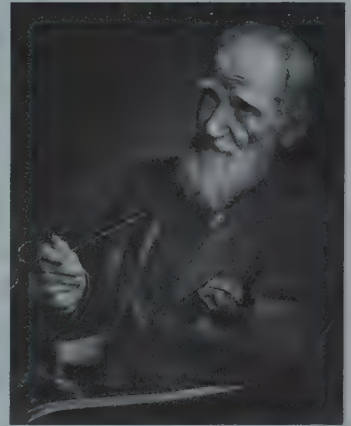
Larry J. Sabato is a New York Times best-selling author, has won two Emmy Awards, and is recognized as one of America's most respected political analysts. He appears multiple times a week on national and international TV, including FOX, CNN, MSNBC, and CNN International. A Rhodes scholar, Sabato is the founder and director of the University of Virginia's Center for Politics and has had visiting appointments at Oxford and Cambridge universities. Sabato is the author or editor of two dozen books on American politics. He has taught more than 20,000 students in his 40-year career, and the University of Virginia gave him its highest honor, the Thomas Jefferson Award.

GEORGE BERNARD SHAW ON

Socialism

George Bernard Shaw—Irish comic dramatist, literary critic, socialist propagandist, and winner of the Nobel Prize for Literature in 1925—was also a Britannica contributor. His forceful, almost hortatory essay on socialism appeared in Britannica's 13th Edition (1926). The long piece, excerpted only briefly below, is interesting on many levels. First, it is, plain and simple, a superb piece of writing. Second, his criticisms of capitalism should resonate with contemporary critics of this economic model under renewed assault today. And third, in view of the end of the Cold War and the complete collapse of the Soviet Union (of which Shaw was a diehard apologist until the day he died in 1950), his article is alive with an accidental irony he could not possibly have foreseen.

Shaw, by the way, was an avid reader of Britannica. He would proudly boast that, in his youth, he had read everything, except the science articles, in the 24 volumes of Britannica's 9th Edition (1875–89).



Karsh/Woodfin Camp and Associates

It is a historic fact, recurrent enough to be called an economic law, that capitalism, which builds up great civilisations, also wrecks them if persisted in beyond a certain point. It is easy to demonstrate on paper that civilisation can be saved and immensely developed by, at the right moment, discarding capitalism and changing the private property profiteering state into the common property distributive state. But though the moment for the change has come again and again it has never been effected, because capitalism has never produced the necessary enlightenment among the masses, nor admitted to a controlling share in public affairs the order of intellect and character outside which Socialism, or indeed politics, as distinguished from mere party electioneering, is incomprehensible. Not until the two main tenets of socialism: abolition of private property (which must not

be confused with personal property), and equality of income, have taken hold of the people as religious dogmas, as to which no controversy is regarded as sane, will a stable socialist state be possible. It should be observed, however, that of the two tenets, the need for equality of income is not the more difficult to demonstrate, because no other method of distribution is or ever has been possible. Omitting the few conspicuous instances in which actual earners of money make extraordinary fortunes by exceptional personal gifts or strokes of luck, the existing differences of income among workers are not individual but corporate differences. Within the corporation no discrimination between individuals is possible; all common labourers, like all upper division civil servants, are equally paid. The argument for equalising the class incomes are that unequal distribution of purchasing power upsets the proper order of economic production, causing luxuries to be produced on an extravagant scale whilst the primitive vital needs of the people are left unsatisfied; that its effect on marriage, by limiting and corrupting sexual selection, is highly dysgenic; that it reduces religion, legislation, education and the administration of justice to absurdity as between rich and poor; and that it creates an idolatry of riches and idleness which inverts all sane social morality.

Unfortunately, these are essentially public considerations. The private individual, with the odds overwhelmingly against him as a social climber, dreams even in the deepest poverty of some bequest or freak of fortune by which he may become a capitalist, and dreads that the little he has may be snatched from him by that terrible and unintelligible thing, state policy. Thus the private person's vote is the vote of Ananias and Sapphira; and democracy becomes a more effective bar to socialism than the pliant and bewildered conservatism of the plutocracy. Under such conditions the future is unpredictable. Empires end in ruins: commonwealths have hitherto been beyond the civic capacity of mankind. But there is always the possibility that mankind will this time weather the cape on which all the old civilisations have been wrecked. It is this possibility that gives intense interest to the present historic moment, and keeps the Socialist movement alive and militant.

JOHN F. KENNEDY ON

Oliver Ellsworth

John F. Kennedy was elected U.S. president in 1960, the year he also became a Britannica contributor. The subject he wrote on was Oliver Ellsworth, a U.S. senator, the third U.S. chief justice of the Supreme Court, and the architect of the 1789 act that created the U.S. federal court system. Ellsworth was one of those governmental luminaries that had long captured Kennedy's attention, like those from the U.S. Senate who formed the basis of his Pulitzer Prize-winning Profiles in Courage (1956). In recent years Britannica commissioned from a contemporary Ellsworth scholar, William R. Casto, a new "Assessment" section based on current scholarship to append to Kennedy's biography, which we also include here for the reader's edification of this important but often overlooked legal light in American history.



White House Collection

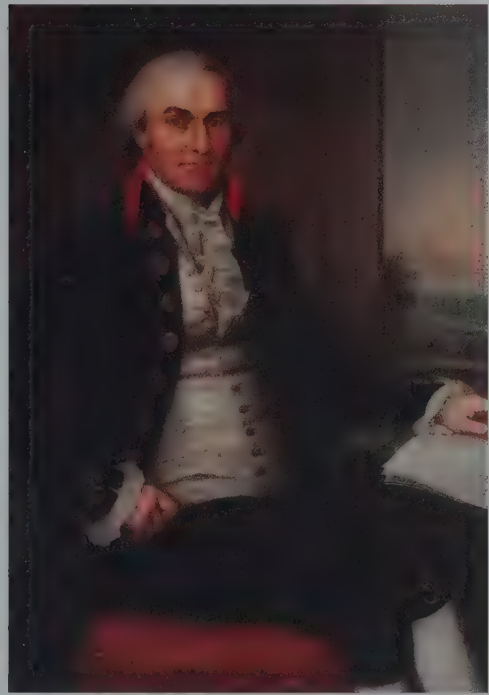
Oliver Ellsworth (born April 29, 1745, Windsor, Conn., U.S.—died Nov. 26, 1807, Windsor), American statesman and jurist, chief author of the 1789 act establishing the U.S. federal court system. He was the third chief justice of the United States.

Life

Ellsworth attended Yale and the College of New Jersey (now Princeton), graduating from the latter in 1766. After pursuing theological and legal studies, he was admitted to the bar in Hartford, which he represented in the Connecticut General Assembly. He was subsequently state's attorney for Hartford county (1777), a member of the Continental Congress (1777–83) and of the Governor's Council of Connecticut (1780–85), and a judge on the state superior court (1785–89).

By William R. Wheeler after Ralph Earl,
Collection of the Supreme Court of the United States

In 1787 Ellsworth, together with Roger Sherman and William Samuel Johnson, represented Connecticut at the Constitutional Convention in Philadelphia, serving as a member of the important committee on detail. At the convention, he proposed with Sherman the decisive “Connecticut compromise,” by which the federal legislature was made to consist of two houses, the upper having equal representation from each state, the lower being chosen on the basis of population. This bargain is a keystone of the U.S. federal system. To secure Southern support for the Constitution, Ellsworth supported free international trade in slaves. He also vigorously defended the Constitution at the Connecticut ratifying convention. His “Letters to a Landholder,” printed in the *Connecticut Courant* and the *American Mercury*, had a broad influence during the ratification debates, much as the Federalist papers did in New York.



Chief Justice Oliver Ellsworth, oil on canvas
by William R. Wheeler after Ralph Earl, 1889.

In 1789 Ellsworth became one of Connecticut's first U.S. senators and the acknowledged Federalist leader in the U.S. Senate. He reported the first Senate rules and suggested a plan for printing the journals, shaped the conference report on the Bill of Rights, framed the measure of admission for North Carolina, helped devise the government of the territory south of the Ohio River, and drafted the first bill regulating the consular service. He was chairman of the committee to establish the federal court system and the chief author of the Federal Judiciary Act of 1789, the principal basis ever since of the U.S. court structure.

In 1796 Pres. George Washington appointed him chief justice of the Supreme Court of the United States, after John Rutledge had failed to receive Senate confirmation and William Cushing, the senior associate justice, had declined. Ellsworth's service on the high court was cut short in 1800 by ill health. In the 1790s Supreme Court justices also served in the circuit courts, and some of Ellsworth's most important decisions were given on circuit. His most controversial opinion was *United States v. Isaac Williams* (1799), which applied in the United States the common-law rule that a citizen may not expatriate himself without the consent of his government.

In 1799 he accepted Pres. John Adams's request to join William Vans Murray and William R. Davie as commissioners to France to negotiate a new treaty. In October

1800 Ellsworth persuaded Napoleon to accept a compromise convention that provided for freedom of commerce between the two nations and in effect concluded the undeclared war between the United States and France.

From France he sent his resignation as chief justice. Until his death in 1807, he lived in Windsor, Conn. Though his career included few acts of genius and little public acclaim, Ellsworth's political skill, balanced judgment, and clarity of purpose entitle him to recognition as a founder of the highest stature.

Assessment

Ellsworth lacked the intellectual brilliance of some of his contemporaries, but, in the arena of practical politics, none of the founders was superior to—and perhaps none even equaled—him in the pragmatic art of effectively wielding power in legislative assemblies. In particular, Ellsworth had an extraordinary ability to fashion workable compromises. He had a clear, sophisticated, and detailed political philosophy and psychology, but he was not a member of the secular Enlightenment. Instead, he was a strict Calvinist who claimed that, as a young man, he had personally experienced his election by God for salvation. His entire personal and public life was ordered by a rigorous Calvinism founded upon a belief in absolute predestination. He firmly believed that everything he did was part of God's plan for mankind. In the political realm, he enthusiastically embraced compromise as long as he was convinced of the overall righteousness of a particular project.

Like all Connecticut Calvinists, Ellsworth firmly opposed slavery on religious grounds. Because he had an abiding faith that, as part of God's plan, slavery inevitably would wither away, he had no qualms about firmly supporting the Southern states' right to import slaves in order to gain Southern support for the Constitution at the Constitutional Convention.

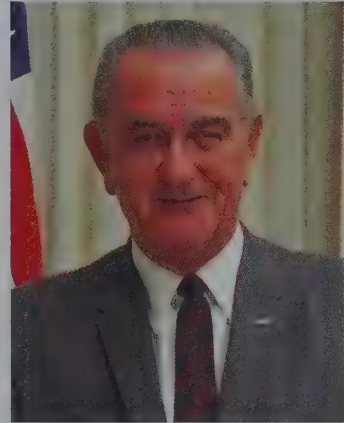
By the time of his mission to France in 1800, he had reluctantly concluded that the federal government was unworkable. He cherished order, but the emergence of Thomas Jefferson's Republican Party and rifts within Ellsworth's Federalist Party presaged disorder and even chaos. Ellsworth resigned from the national government and returned to Connecticut, where he was an active participant in state politics for the rest of his life.

LYNDON B. JOHNSON ON

Sam Rayburn

Like John F. Kennedy before him, Lyndon B. Johnson became a Britannica contributor in the same year he became U.S. president. Also like Kennedy, Johnson's writerly subject was a political figure, in this case the man who had helped to launch his political career and who had long served as his political mentor and a father figure of sorts: Sam Rayburn. As done for the Ellsworth biography written by Kennedy, Britannica in recent years commissioned from a contemporary scholar, in this case Anthony M. Champagne, a new "Assessment" section based on more recent scholarship, which we also reproduce below.

Yoichi R. Okamoto, The Lyndon Baines Johnson Library and Museum/National Archives and Records Administration



Sam Rayburn, in full Samuel Taliaferro Rayburn (born Jan. 6, 1882, Roane county, Tenn., U.S.—died Nov. 16, 1961, Bonham, Texas), was an American political leader who served as speaker of the U.S. House of Representatives for nearly 17 years. He was first elected to the House in 1912 and served there continuously for 48 years 8 months, which at the time of his death was a record tenure. He was elected to Congress 25 consecutive times. The Rayburn House Office Building, a congressional office building on Capitol Hill, was named in his memory.

Life

Rayburn's family, of predominantly Scottish origin, moved from Tennessee to Texas in 1887, and there Rayburn grew up on a 40-acre farm. He worked his way through East Texas Normal College (now Texas A&M University—Commerce), taught school, and became a lawyer. He served in the Texas House of Representatives for six years (1907–13) and in 1911 was elected speaker. The following year he was elected to the U.S. Congress, where he remained for almost a half century.

Energetic, studious, ambitious, and affable, Rayburn quickly became influential behind the scenes in government and in party politics. As chairman (1931–37) of the powerful House Committee on Interstate and Foreign Commerce, he was a major architect of the New Deal. As a member of the House of Representatives, he was coauthor of six important laws—the Emergency Railroad Transportation Act, the “Truth-in-Securities” Act, the Stock Exchange Act, the Federal Communications Act, the Rural Electrification Act, and one of the most bitterly contested of all New Deal laws, the Public Utility Holding Company Act.

Rayburn was elected Democratic leader of the House of Representatives in 1937 and became speaker of the House on Sept. 16, 1940. He held the latter office for almost 17 years, exceeding by a wide margin the previous record set by Kentucky statesman Henry Clay in the first quarter of the 19th century. Noted for his tart common sense, his honesty, and his unflagging patriotism, Rayburn was a trusted adviser to Presidents Franklin D. Roosevelt, Harry Truman, Dwight D. Eisenhower, and John F. Kennedy. A dedicated party man who described himself as a Democrat “without prefix, without suffix, and without apology,” Rayburn was often called “Mr. Democrat.” He was permanent chairman of the Democratic National Convention in 1948, 1952, and 1956. After he won the battle in 1961 to enlarge the House Committee on Rules—the hardest internal House struggle in 50 years—Rayburn’s health failed quickly. Before Congress adjourned that year, he went home to Bonham, Texas, where he died.

Assessment

At the time of his death, Rayburn was regarded as an extraordinarily able legislator who had gone on to become the most effective speaker of the House since Joe Cannon was divested of his power in 1910. That assessment of Rayburn did not change in the decades following his death. His pivotal role in the House as a broker between the Northern and Southern wings of the Democratic Party, however, was later better understood and appreciated. During Rayburn’s tenure, power in the House was lodged in the hands of committee chairs who gained their positions through seniority. Because the American South still was overwhelmingly Democratic and the Republican Party was not competitive there, Southern Democrats in the House—with their seniority and their control over chairs of committees—tended to have great power. Northern Democrats tended to be more liberal than their Southern counterparts, but their lack of seniority and committee chairs diminished their influence in the House. Rayburn brokered the interests of both wings of the Democratic Party.

Although the office of speaker at that time lacked great formal powers, Rayburn used the limited influence of the office to maximum advantage. He also

The National Archives, Washington, D.C.



Speaker of the U.S. House of Representatives Sam Rayburn, taken on V-E Day, June 27, 1945.

relied heavily on his personal prestige, his skill at persuasion, and personal friendships built up over decades in the House to bridge the regional differences within the Democratic Party and to forge a working majority in the House. His leadership style usually resulted in congenial relations not only between the Northern and Southern wings of the Democratic Party but also between Rayburn and the Republican leadership of the House—a considerable accomplishment, especially when viewed in the light of the divisive House of Representatives in the early 21st century.

MAX LERNER ON *Liberalism*

One of American liberalism's most passionate defenders in the 20th century was political commentator and syndicated columnist Max Lerner (1902–92), editor briefly (1936–38) of America's longest-published liberal magazine, The Nation. His Britannica article on liberalism, first published in the 1960 printing of Britannica's 14th edition (1929–74), was not only historically detailed but beautifully written and even poetic in parts, as the reader will see.

Courtesy of the Robert D. Farber University Archives
& Special Collections Department, Brandeis University



Some of the confusions about liberalism arise from the various stages of meaning through which the term passed during a history of several centuries, and from the wide diversity of uses to which it has been put. There were in the second half of the 20th century a number of political parties, in Great Britain, Italy, Germany and elsewhere, called by the name of the “Liberal party” or some variant of it; there was a party of the same name active in the politics of New York state; and even a Liberal International which served as a clearinghouse for liberal political movements throughout the world. But while these parties expressed the liberal outlook, that outlook was not limited to them. Their emphasis was on an economic program and policy which minimized state intervention and control, and which sought to carry out the philosophy of economic freedom under the difficult conditions of modern industrial organization. They thus expressed the outlook of a liberal capitalism on the defensive against various forms of socialism and communism on one side, and against conservatism and the totalitarianisms of the right on the other. “Liberal” political parties tended thus in practice to be caught between the upper and nether millstones, and their appeal was for that reason constricted to a middle ground position.

Yet liberalism as a dynamic philosophy was not at the end of the road. Just as it had its modern origin in the revolutionary movements attending the emergence

of the business class to power and enlisted the most radical energies of the 18th and 19th centuries, so it showed a capacity to absorb many of the ideas of the revolutionary movements which challenged that class. What gave it this resiliency was its master idea of freedom as a method and a credo, this master idea being one of the great seminal revolutionary ideas of world history, not limited to any one economic program nor to the social power of any one class. . . .

To list some of these master ideas [of liberalism] is an artificial process, since they were tied together in an ideological web, and each loses much of its meaning when torn from this web. Yet even a listing may suggest the richness of the intellectual armoury of liberalism.

Central to the whole is the idea of liberty itself—not absolute liberty (“No government allows absolute liberty,” wrote Locke), but the maximizing of the individual’s freedom to think, to believe, to express and discuss his views, to organize (associate) in parties, to find employment, to buy and sell commodities (including his own labour) freely and to keep the rewards, to choose his rulers as well as his form of government and to change both—by revolution, if necessary. So crucial is the idea of liberty that liberalism might be quite summarily defined as the effort to organize liberty socially and to follow out its implications.

As for where this right to maximal liberty comes from, liberalism’s answer was nature. “The laws of Nature and of Nature’s God,” as Thomas Jefferson denominated them in the American Declaration of Independence, formed the true religion of liberalism, and on it they built what the 20th-century U.S. historian Carl Becker called “the heavenly city of the 18th-century philosophers.” The 18th century carried on a love affair with nature, in religion, law, politics, metaphysics and landscape painting. Rousseau in France and Locke in England were the principal 17th- and 18th-century protagonists of the idea that men had rights rooted in nature, which governments must protect and which must be defended even against government.

Bills of rights, petitions of right, declarations of the rights of man and of the citizen—these became the watchwords of the era. Since they were based on nature and in natural law, they were universalized, abstracted and made absolute—“indubitable, inalienable, and infeasible,” as the Virginia constitution put it in describing the natural right of revolution. Actually this notion of natural law came less from theology than it did from Sir Isaac Newton and his colleagues in the scientific revolution, who showed that the operation of the universe could be explained rationally in terms of the laws of nature without bringing in any external divine intervention.

As a result even God became nature’s God, and religion was universalized into a deism, thus diluting the rigours of revealed religious certitude and emphasizing tolerance toward the variety of forms in which nature’s God might be worshipped.

The Renaissance, the scientific revolutions, the march of technology, the rising living standards, all contributed to a growing rationalism in thinking and attitudes and to a secularism of belief. The axis of men's concerns shifted from the next world to this one, and from what had been laid down by tradition in the past to what men could achieve for themselves in the present and future. In place of the idea of sin men began to talk of the idea of progress, in place of predestination they caught a glimpse of the vision of men's perfectibility. Everything seemed possible in the "best of all possible worlds." The test of institutions became the question not of whether they were in the service of God but whether they ministered to the happiness of men.

Armed with these weapons of secularism, progress and happiness, liberalism was able to turn a withering fire on institutions. "Man is born free," wrote Rousseau in the *Contract sociale*, "yet he is everywhere in chains." And in *Émile*: "God makes all things good; man meddles with them and they become evil." It was a basic assumption of the liberal thinkers that man is endowed with reason and goodness, and that only the institutional frame into which he is born corrupts and enslaves him. The enemy was custom, tradition, institutions, social habit. The French *philosophes*, the English utilitarians, the philosophic radicals, the Italian patriot-intellectuals were the "angry young men" of their time, blasting away at the establishment of their day—the church, the feudal order, the aristocratic classes, the dynastic state, the educational system, the censorship. Always they sought to lift from men what Jefferson called the "dead hand of the past."

If it was man's meddling with the natural order that caused all the mischief, then it follows that the best human course is to leave things alone. This powerful nexus linked the liberal intellectuals with the emerging business class, who wanted free markets, the removal of crippling restrictions upon economic activity and the chance to amass wealth and property.

But *laissez faire* in itself was not the whole of the liberal program. To it was added republicanism, popular sovereignty and education—especially the last. The removal of governmental restrictions and the toppling of tyrannical institutions would provide the freedom for reason to function: but reason needed tools with which to function, and education would provide them. Since the liberals believed in man's goodness, they believed also in his perfectibility, and education was the instrument by which it could be furthered. Some of the more realistic liberal thinkers, however, saw the darker side of the moon as well: that if men were by nature good, they were also ruled by ambition, greed for power and the political passions. Hence it was necessary to curb the majority will by a concern for the protection of minorities. And it was especially necessary to provide in government for the separation of powers so that the legislative and executive powers would not be fused into a single tyranny, and the judiciary could remain independent of both.

Thus the liberal image of the state came to mirror the equilibrium physics that the scientific revolution had made familiar. And the liberal image of the human mind came to stress the primacy of self-interest as a drive (egoism), the primacy of reason as an instrument (intellectualism) and the ultimate value of individual efforts toward self-realization (progress, happiness) or of individual nonefforts (*laissez faire*, quietism) in a state of nature.

Men had by the mid-20th century become more aware of some of the weaknesses of this liberal outlook that characterized the vanguard thinking of liberalism's golden age. They knew about its oversimplifications, about its atomism, its primitivism, its utopianism, its naïve cults of nature, progress and happiness. But it is well to remember that in its emergence liberalism was an exciting new movement of thought that released the energies and enlisted the loyalties of men. For a historic moment they caught a vision of human possibility, and this vision armed them for their encounters with what they regarded as the powers and principalities of darkness.

Abundance and Unemployment: Our Future

By Peter H. Diamandis

As described in my book *Abundance*, I believe that exponential technologies are driving us toward a world of ever-increasing abundance. Within the next 30 years, we will be able to meet and exceed the needs of every man, woman, and child. From there on out, I believe we are heading toward more of a *Star Trek* universe (minus the warp drive).

Advances in computation, sensors, networks, artificial intelligence (AI), robotics, synthetic biology, and augmented/virtual reality are effectively democratizing access to low-cost and abundant energy, food, water, health care, and education to the point

where it will be accessible to anyone on (or off) Earth.

While I'm very optimistic about the medium-term (30 years) and longer-term (100 years) future of humanity, my major concerns are for the next two decades. I believe the most pressing issue of our time is posed by AI and robotics.

I'm not concerned about artificial intelligence as the Terminator—far from that, given that I believe AI will be the most important tool humanity has for addressing our grand challenges. But I am concerned about the threat that AI and robotics pose in causing *unemployment*—basically, the

China Nouvelle/SIPA/Newscom

A robot cooking at a restaurant in Hefei, capital of China's Anhui province, 2014.



significant and rapid loss of jobs, from truck driver to anesthesiologist. Don't get me wrong: it is not the *magnitude* of this change that worries me. I believe that people are continually losing their jobs to increasing technology and ultimately "upskilling" themselves (in partnership with technology) to become even better workers. What bothers me is the *speed* of the coming change and the ability for society to adapt.

Humanity has seen large-scale change before. America went from a land of 84 percent farmers in 1810 to under 2 percent today. However, this time, technological unemployment is happening at unprecedented speeds. McKinsey & Co. predicts that 45 percent of jobs today will be automated out of existence in only 20 years.

How will we tame mass societal unrest when large swaths of the population are losing their jobs? Who will they blame? How will we solve this problem? This is what keeps me up at night.

However, I still have faith. I believe that with advanced technology and capital, entrepreneurs will address all of humanity's grand challenges—including technologically driven unemployment—over time. This optimism is what my XPRIZE and Singularity University are all about.

Even with this impending unrest, the future is still promising. I do not believe the blue-collar workers whose jobs will be displaced—cashiers, truck drivers, box boys, etc.—actually grew up dreaming of those jobs as their careers. Instead, that job was a means to an end, putting food on the table, and getting insurance for their family.

One of the likely outcomes of this technologically driven unemployment will be the creation of Universal Basic Income (UBI) programs by governments around the world, programs in which everyone earns an income independent of their profession and employment. Once we no longer have to worry about earning funds to meet our basic needs, it will allow us all to be uplifted and empowered to do what we truly want to do.

So, while I see the potential for societal unrest in the near-term (10 to 30 years), I also see the foundation and framework for a truly better world. A world of abundance.

*Peter H. Diamandis is a physician, engineer, best-selling author, and entrepreneur who has started 17 companies. He earned degrees in molecular genetics and aerospace engineering from MIT and holds an M.D. from Harvard Medical School. He is the founder and executive chairman of the XPRIZE Foundation, which designs and operates large-scale incentive competitions; cofounder and executive chairman of Singularity University, a graduate-level Silicon Valley institution that counsels the world's leaders on exponentially growing technologies; a New York Times best-selling coauthor of two books: *Abundance: The Future Is Better Than You Think* (2012) and *Bold: How to Go Big, Create Wealth, and Impact the World* (2015); and a member of the World Future Society. In 2014 *Fortune* magazine named him one of the World's 50 Greatest Leaders, and in the fall of 2016 the Greek government honored him with a 1.20-euro stamp bearing his photograph.*

PYOTR KROPOTKIN ON

Anarchism

Pyotr Kropotkin (1842–1921), Russian prince, soldier, and geographer, gave up at the age of 29 both his social position and a scientific career of exceptional promise to become an outcast in the name of social justice. As the principal theorist of “anarchist communism,” Kropotkin was at the forefront of the broad social-political movement that kept Europe in constant turmoil during the latter part of the 19th century and the early years of the 20th.

From the time of Britannica’s 9th Edition (1875–89) Kropotkin contributed a great many articles to the encyclopedia, mainly on topics of Asian geography and topography (some of the earliest were apparently sent in from his French prison, where he served three years for sedition). For Britannica’s 11th Edition (1910–11) he wrote the article “Anarchism,” outlining the political principles that had motivated his difficult career and tracing their history. The extracts that follow are from the opening and closing passages of the article.



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Anarchism (from the Gr. *an-*, and *archē*, contrary to authority), the name given to a principle or theory of life and conduct under which society is conceived without government—Harmony in such a society being obtained, not by submission to law, or by obedience to any authority, but by free agreements concluded between the various groups, territorial and professional, freely constituted for the sake of production and consumption, as also for the satisfaction of the infinite variety of needs and aspirations of a civilized being. In a society developed on these lines, the voluntary associations which already now begin to cover all the fields of human activity would take a still greater extension so as to substitute themselves for the state in all its functions. They would represent an interwoven network, composed of an infinite variety of groups and federations of all sizes and degrees, local,

regional, national and international—temporary or more or less permanent—for all possible purposes: production, consumption and exchange, communications, sanitary arrangements, education, mutual protection, defence of the territory, and so on; and, on the other side, for the satisfaction of an ever-increasing number of scientific, artistic, literary and sociable needs. Moreover, such a society would represent nothing immutable. On the contrary—as is seen in organic life at large—harmony would (it is contended) result from an ever-changing adjustment and readjustment of equilibrium between the multitudes of forces and influences, and this adjustment would be the easier to obtain as none of the forces would enjoy a special protection from the state.

If, it is contended, society were organized on these principles, man would not be limited in the free exercise of his powers in productive work by a capitalist monopoly, maintained by the state; nor would he be limited in the exercise of his will by a fear of punishment, or by obedience towards individuals or metaphysical entities, which both lead to depression of initiative and servility of mind. He would be guided in his actions by his own understanding, which necessarily would bear the impression of a free action and reaction between his own self and the ethical conceptions of his surroundings. Man would thus be enabled to obtain the full development of all his faculties, intellectual, artistic and moral, without being hampered by overwork for the monopolists, or by the servility and inertia of mind of the great number. He would thus be able to reach full *individualization*, which is not possible either under the present system of *individualism*, or under any system of state-socialism in the so-called *Volkstaat* (popular state).

The Anarchist writers consider, moreover, that their conception is not a Utopia, constructed on the *a priori* method, after a few desiderata have been taken as postulates. It is derived, they maintain, from an *analysis of tendencies* that are at work already, even though state socialism may find a temporary favour with the reformers. The progress of modern technics, which wonderfully simplifies the production of all the necessities of life; the growing spirit of independence, and the rapid spread of free initiative and free understanding in all branches of activity—including those which formerly were considered as the proper attribution of church and state—are steadily reinforcing the no-government tendency.

As to their economical conceptions, the Anarchists, in common with all Socialists, of whom they constitute the left wing, maintain that the now prevailing system of private ownership in land, and our capitalist production for the sake of profits, represent a monopoly which runs against both the principles of justice and the dictates of utility. They are the main obstacle which prevents the successes of modern technics from being brought into the service of all, so as to produce general

well-being. The Anarchists consider the wage-system and capitalist production altogether as an obstacle to progress. But they point out also that the state was, and continues to be, the chief instrument for permitting the few to monopolize the land, and the capitalists to appropriate for themselves a quite disproportionate share of the yearly accumulated surplus of production. Consequently, while combating the present monopolization of land, and capitalism altogether, the Anarchists combat with the same energy the state, as the main support of that system. Not this or that special form, but the state altogether, whether it be a monarchy or even a republic governed by means of the *referendum*.

The state organization, having always been, both in ancient and modern history (Macedonian empire, Roman empire, modern European states grown up on the ruins of the autonomous cities), the instrument for establishing monopolies in favour of the ruling minorities, cannot be made to work for the destruction of these monopolies. The Anarchists consider, therefore, that to hand over to the state all the main sources of economical life—the land, the mines, the railways, banking, insurance, and so on—as also the management of all the main branches of industry, in addition to all the functions already accumulated in its hands (education, state-supported religions, defence of the territory, &c.), would mean to create a new instrument of tyranny. State capitalism would only increase the powers of bureaucracy and capitalism. True progress lies in the direction of decentralization, both *territorial* and *functional*, in the development of the spirit of local and personal initiative, and of free federation from the simple to the compound, *in lieu* of the present hierarchy from the centre to the periphery.

In common with most Socialists, the Anarchists recognize that, like all evolution in nature, the slow evolution of society is followed from time to time by periods of accelerated evolution which are called revolutions; and they think that the era of revolutions is not yet closed. Periods of rapid changes will follow the periods of slow evolution, and these periods must be taken advantage of—not for increasing and widening the powers of the state, but for reducing them, through the organization in every township or commune of the local groups of producers and consumers, as also the regional, and eventually the international, federations of these groups.

In virtue of the above principles the Anarchists refuse to be party to the present state organization and to support it by infusing fresh blood into it. They do not seek to constitute, and invite the working men not to constitute, political parties in the parliaments. Accordingly, since the foundation of the International Working Men's Association in 1864–1866, they have endeavoured to promote their ideas directly amongst the labour organizations and to induce those unions to a direct struggle against capital, without placing their faith in parliamentary legislation. . . .

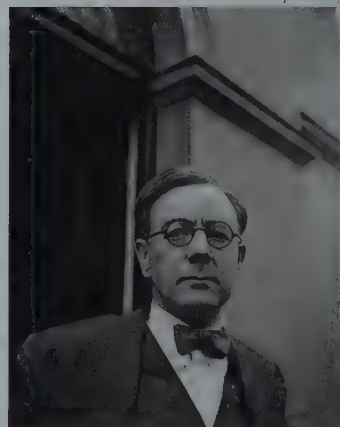
As one of the Anarchist-Communist direction, the present writer for many years endeavoured to develop the following ideas: to show the intimate, logical connexion which exists between the modern philosophy of natural sciences and Anarchism; to put Anarchism on a scientific basis by the study of the tendencies that are apparent now in society and may indicate its further evolution; and to work out the basis of Anarchist ethics. As regards the substance of Anarchism itself, it was Kropotkin's aim to prove that Communism—at least partial—has more chances of being established than Collectivism, especially in communes taking the lead, and that Free, or Anarchist-Communism is the only form of Communism that has any chance of being accepted in civilized societies; Communism and Anarchy are therefore two terms of evolution which complete each other, the one rendering the other possible and acceptable. He has tried, moreover, to indicate how, during a revolutionary period, a large city—if its inhabitants have accepted the idea—could organize itself on the lines of Free Communism; the city guaranteeing to every inhabitant dwelling, food and clothing to an extent corresponding to the comfort now available to the middle classes only, in exchange for a half-day's, or a five-hours' work; and how all those things which would be considered as luxuries might be obtained by every one if he joins for the other half of the day all sorts of free associations pursuing all possible aims—educational, literary, scientific, artistic, sports and so on. In order to prove the first of these assertions he has analysed the possibilities of agriculture and industrial work, both being combined with brain work. And in order to elucidate the main factors of human evolution, he has analysed the part played in history by the popular constructive agencies of mutual aid and the historical rôle of the state.

Without naming himself an Anarchist, Leo Tolstoy, like his predecessors in the popular religious movements of the 15th and 16th centuries, Chojecki, Denk and many others, took the Anarchist position as regards the state and property rights, deducing his conclusions from the general spirit of the teachings of the Christ and from the necessary dictates of reason. With all the might of his talent he made (especially in *The Kingdom of God in Yourself*) a powerful criticism of the church, the state and law altogether, and especially of the present property laws. He describes the state as the domination of the wicked ones, supported by brutal force. Robbers, he says, are far less dangerous than a well-organized government. He makes a searching criticism of the prejudices which are current now concerning the benefits conferred upon men by the church, the state and the existing distribution of property, and from the teachings of the Christ he deduces the rule of non-resistance and the absolute condemnation of all wars. His religious arguments are, however, so well combined with arguments borrowed from a dispassionate observation of the present evils, that the anarchist portions of his works appeal to the religious and the non-religious reader alike.

A. J. P. TAYLOR ON *Otto von Bismarck*

Toward the end of his life, the distinguished British historian and journalist A.J.P. Taylor (1906–90) contributed to Britannica a new biography of Otto von Bismarck (1815–98). Historians may differ on their opinion of the famed German chancellor and prime minister, but few readers would deny Taylor's masterful pen, evidenced in full in his engaging final paragraphs and assessment of his subject, reproduced below.

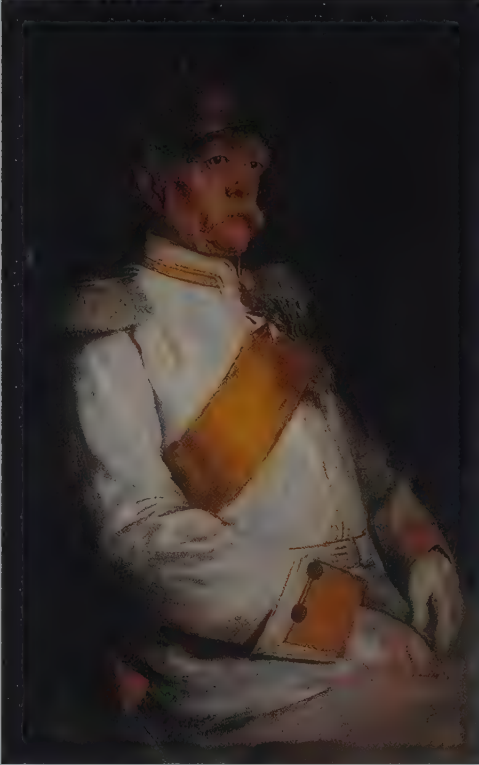
Trinity Mirror/Mirrorpix/Alamy



Bismarck was a political genius of the highest rank, but he lacked one essential quality of the constructive statesman: he had no faith in the future. The revolutions of 1848 convinced him that the old order could not be preserved unchanged, and all his later policy was shaped by this conviction. He went with the modern forces of liberalism and democracy solely to draw their sting. Like Metternich he regarded them as evil; unlike Metternich he turned them to his own purposes. He is sometimes compared with the leaders of the English governing classes, who under Sir Robert Peel also made a compromise with liberalism and democracy. But there was a basic difference. In England there was a genuine compromise, in Germany only a trick. The German people were defrauded, given a shadow instead of the substance.

Bismarck was at his greatest in foreign policy. There he understood, as no one else did, "the art of the possible." He never aspired to dominate Europe; he was content to balance between the great powers. Though he had no moral objection to war, he preferred to get his way by diplomacy and went to war only for limited aims when it was necessary to his policy. The system of alliances that he built up was designed to secure the peace of Europe, and he played the powers off against each other with matchless skill. In fact, though no believer in eternal peace, he was the principal architect of the halcyon age that gave Europe 26 years of peace after the Congress of Berlin.

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Portrait of Chancellor Otto von Bismarck, oil on wood by Franz von Lenbach, 1890; in the Walters Art Museum, Baltimore, Maryland.

In domestic affairs his record is less inspiring. He had a lust for power that grew on him with the years. He wanted Prussia to be supreme in Germany. He wanted the king to be supreme in Prussia; but most of all he wanted to be supreme over the king. His boasted loyalty to the crown vanished as soon as William II showed signs of independence, but he was equally ruthless, though more subtle, with William I. He spoke contemptuously of the old Emperor's intelligence and did not shrink from the most unscrupulous tricks in order to keep his hold. His suspicion of possible rivals was unbounded, and he persecuted them out of public life one after the other. In his latter years all his energies went into the search for the "German Gladstone cabinet," which he was convinced was being prepared against him, a search all the more degrading in that this cabinet was always a creation of his imagination. He battered down any politician who dared

to cross him and refused to allow the Reichstag to pay a posthumous tribute to Eduard Lasker, a sincere National Liberal who had done much for the empire but had shown some independence. Yet Bismarck himself changed course whenever it suited him. He repudiated old friends and old policies without scruple and often showed the disloyalty that he denounced in others. He lived in the age of democracy and German power, and he devoted his life to making these two forces as harmless as possible. Despite his ringing, self-confident phrases, he was at heart a despairing conservative, caring only for the past, dreading the future, and trying to retard its arrival. Gladstone said of him, "He made Germany great and Germans small."

Monuments of Hope, Memorials to a Poisoned Past

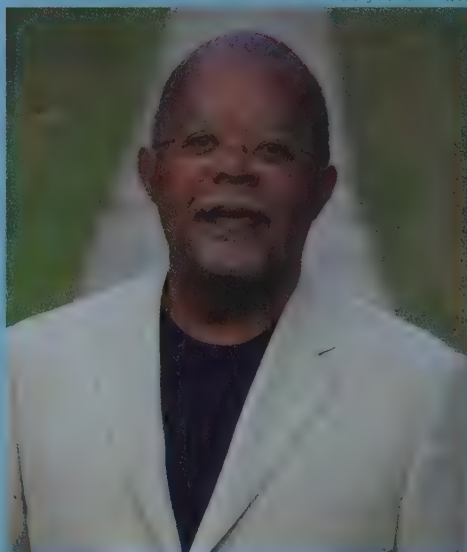
By Henry Louis Gates, Jr.

Looking back at the revolution in democracy that began during the American Civil War and continued during Reconstruction, W.E.B. Du Bois, the preeminent black intellectual of the 20th century, lamented how short-lived the experiment turned out to be. Du Bois himself had been born less than three years after the Confederate surrender at Appomattox, yet he was only nine when Reconstruction ended, a retreat by the federal government that cleared the way for Southern “home rule” and the birth of Jim Crow. In between, a trio of constitutional amendments had been ratified securing to millions of formerly enslaved African Americans their freedom and citizenship, while removing race as a barrier to voting. Though these laws were “on the books,” the will to enforce them then dissipated. Some 60 years on, Du Bois described this horrific state of affairs in his magisterial history, *Black Reconstruction* (1935): “The slave went free; stood a brief moment in the sun; then moved back again toward slavery.”

It would take an entire civil rights movement, including the deaths of too many leaders and foot-soldiers, to cure the sickness that white supremacy and its cultural manifestations—segregation, disenfranchisement, sharecropping, lynching, and vigilante “justice”—afflicted on post-Civil War America. And its victims were both black and white, those who suffered from the harm and those who inflicted it; as James Baldwin observed, “in the face of one’s victim, one sees oneself.”

Reading *Black Reconstruction* today, a half-century after the heroic phase of the civil rights movement and so soon after the two-term presidency of America’s first black president, one cannot help but feel the powerful resonance of Du Bois’s wistfulness. Today, it seems that certain forces are determined to erase Pres. Barack Obama’s legacy.

Courtesy of Henry Louis Gates, Jr.



Adding to the alarm, the recent violence visited upon places from Charleston, South Carolina, to Charlottesville, Virginia, has reminded us of the enduringly charged symbols of the former Confederacy. It also has added to our fears that, instead of embracing the promise of democracy in a diverse society, some want to return us to a far more restrictive time, when freedom was circumscribed by race.

At the same time, Du Bois is a reminder that mobilizing against the forces that ended Reconstruction never really ceased. There were always organizers and institution-builders out there fighting and resisting, even at “the nadir,” from Frederick Douglass and Ida B. Wells to Fannie Lou Hamer and the Rev. Dr. Martin Luther King, Jr. Those resisters are still in our midst today, standing courageously against hate and deploying that most powerful weapon of resistance: the hard-won right to vote.

Fifty or a hundred years from now, my hope for the present generation is that a future Du Bois will look back on our time and

say that, in this era of fracture, we drew a line. We defended the right of every American to vote. We fought to keep the pipeline of opportunity open, and, despite our ideological differences, we found a way to link arms against every form of bigotry. Let it also be said that, in bringing the larger story of our journey forward, we added new monuments of hope and of democratic heroes to a landscape previously dominated by memorials to a poisoned past.

May those of us who love truth and justice, and the principles of democracy and equal opportunity upon which this great nation was founded, stand against division and hate, just as our ancestors did when Reconstruction was abandoned and Jim Crow became the law of the land. With unbroken

faith in America, I remain hopeful that we will succeed in reclaiming and building on the promise of our nation's founding ideals.

Henry Louis Gates, Jr., is the Alphonse Fletcher University Professor and Director of the Hutchins Center for African & African American Research at Harvard University. Emmy Award-winning filmmaker, literary scholar, journalist, cultural critic, and institution builder, Professor Gates has authored or co-authored 22 books and created 18 documentary films. The recipient of 55 honorary degrees, Gates was a member of the first class awarded "genius grants" by the MacArthur Foundation in 1981, and in 1998 he became the first African American scholar to be awarded the National Humanities Medal.

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Dismantled figures from a Confederate monument near the University of Louisville, Kentucky, 2016.



ALGERNON CHARLES SWINBURNE ON *Mary Queen of Scots*

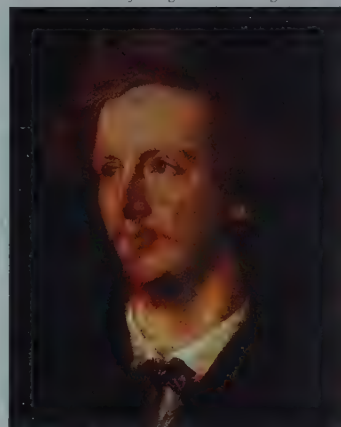
In Britannica's famed "Scholars' Edition"—the 9th (1875–89)—the poet Algernon Charles Swinburne (1837–1909) wrote a passionate encomium in his biography of Mary Queen of Scots, the beheaded former queen of Scotland whom Elizabeth I perceived as a Catholic threat to the English throne. He covered Elizabeth's conduct in the execution of Mary and the latter's gallant comportment in facing death.

Swinburne's devotion to the Scottish queen, so evident in his nine-page biography, was also reflected in his dramatic trilogy on her life, which he was about to complete with the play Mary Stuart (1881) as he submitted his biography to Britannica. A stylistic note: His biography was written in enormous paragraphs, several of them reaching 3,000 or more words in length.

Swinburne was given to what he called "the noble pleasure of praising." It is not a pleasure that many modern encyclopedia writers often indulge in, and so it is all the more interesting to observe its execution by a devotee like Swinburne. Some readers may well conclude that he was a better poet than biographer.

Here are the final paragraphs to his memorable biography.

DEA Picture Library/De Agostini Editore/age fotostock



Elizabeth, fearless almost to a fault in face of physical danger, constant in her confidence even after discovery of her narrow escape from the poisoned bullets of household conspirators, was cowardly even to a crime in face of subtler and more complicated peril. She rejected with resolute dignity the intercession of French envoys for the life of the queen-dowager of France; she allowed the sentence of death to be proclaimed, and welcomed with bonfires and bell-ringing throughout the length of England; she yielded a respite of twelve days to the pleading of the French

ambassador, and had a charge trumped up against him of participation in a conspiracy against her life; at length, on the 1st of February 1587, she signed the death-warrant, and then made her secretaries write word to Paulet of her displeasure that in all this time he should not of himself have found out some way to shorten the life of his prisoner, as in duty bound by his oath, and thus relieve her singularly tender conscience from the guilt of bloodshed. Paulet, with loyal and regretful indignation, declined the disgrace proposed to him in a suggestion "to shed blood without law or warrant"; and on the 7th of February the earls of Shrewsbury and Kent arrived at Fotheringay with the commission of the council for execution of the sentence given against his prisoner. Mary received the announcement with majestic tranquillity, expressing in dignified terms her readiness to die, her consciousness that she was a martyr for her religion, and her total ignorance of any conspiracy against the life of Elizabeth. At night she took a graceful and affectionate leave of her attendants, distributed among them her money and jewels, wrote out in full the various legacies to be conveyed by her will, and charged her apothecary Gorion with her last messages for the king of Spain. In these messages the whole nature of the woman was revealed. Not a single friend, not a single enemy, was forgotten; the slightest service, the slightest wrong, had its place assigned in her faithful and implacable memory for retribution or reward. Forgiveness of injuries was as alien from her fierce and loyal spirit as forgetfulness of benefits; the destruction of England and its liberties by Spanish invasion and conquest was the strongest aspiration of her parting soul. At eight next morning she entered the hall of execution, having taken leave of the weeping envoy from Scotland, to whom she gave a brief message for her son; took her seat on the scaffold, listened with an air of even cheerful unconcern to the reading of her sentence, solemnly declared her innocence of the charge conveyed in it and her consolation in the prospect of ultimate justice, rejected the professional services of Richard Fletcher, dean of Peterborough, lifted up her voice in Latin against his in English prayer, and when he and his fellow-worshippers had fallen duly silent prayed aloud for the prosperity of her own church, for Elizabeth, for her son, and for all the enemies whom she had commended overnight to the notice of the Spanish invader; then, with no less courage than had marked every hour and every action of her life, received the stroke of death from the wavering hand of the headsman.

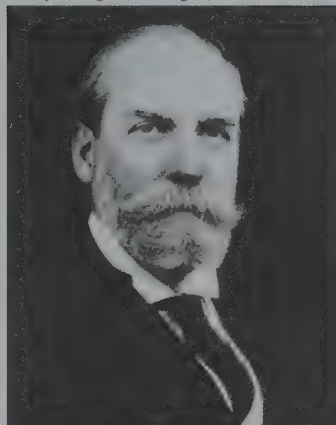
Mary Stuart was in many respects the creature of her age, of her creed, and of her station; but the noblest and most noteworthy qualities of her nature were independent of rank, opinion, or time. Even the detractors who defend her conduct on the plea that she was a dastard and a dupe are compelled in the same breath to retract this implied reproach, and to admit, with illogical acclamation and incongruous applause, that the world never saw more splendid courage at the service of more brilliant intelligence, that a braver if not "a rarer spirit never did steer humanity." A kinder or more faithful friend, a deadlier or more dangerous

enemy, it would be impossible to dread or to desire. Passion alone could shake the double fortress of her impregnable heart and ever active brain. The passion of love, after very sufficient experience, she apparently and naturally outlived; the passion of hatred and revenge was as inextinguishable in her inmost nature as the emotion of loyalty and gratitude. Of repentance it would seem that she knew as little as of fear, having been trained from her infancy in a religion where the Decalogue was supplanted by the Creed. Adept as she was in the most exquisite delicacy of dissimulation, the most salient note of her original disposition was daring rather than subtlety. Beside or behind the voluptuous or intellectual attractions of beauty and culture, she had about her the fresher charm of a fearless and frank simplicity, a genuine and enduring pleasure in small and harmless things no less than in such as were neither. In 1562 she amused herself for some days by living "with her little troop" in the house of a burgess of St Andrews "like a burgess's wife," assuring the English ambassador that he should not find the queen there,—“nor I know not myself where she is become.” From Sheffield Lodge, twelve years later, she applied to the archbishop of Glasgow and the cardinal of Guise for some pretty little dogs, to be sent her in baskets very warmly packed,—“for besides reading and working, I take pleasure only in all the little animals that I can get.” No lapse of reconciling time, no extent of comparative indulgence, could break her in to resignation, submission, or toleration of even partial restraint. Three months after the massacre of St Bartholomew had caused some additional restrictions to be placed upon her freedom of action, Shrewsbury writes to Burghley that “rather than continue this imprisonment she sticks not to say she will give her body, her son, and country for liberty”; nor did she ever show any excess of regard for any of the three. For her own freedom of will and of way, of passion and of action, she cared much; for her creed she cared something; for her country she cared less than nothing. She would have flung Scotland with England into the hellfire of Spanish Catholicism rather than forego the faintest chance of personal revenge. Her profession of a desire to be instructed in the doctrines of Anglican Protestantism was so transparently a pious fraud as rather to afford confirmation than to arouse suspicion of her fidelity to the teaching of her church. Elizabeth, so shamefully her inferior in personal loyalty, fidelity, and gratitude, was as clearly her superior on the one all-important point of patriotism. The saving salt of Elizabeth's character, with all its wellnigh incredible mixture of heroism and egotism, meanness and magnificence, was simply this, that, overmuch as she loved herself, she did yet love England better. Her best though not her only fine qualities were national and political, the high public virtues of a good public servant; in the private and personal qualities which attract and attach a friend to his friend and a follower to his leader, no man or woman was ever more constant and more eminent than Mary Queen of Scots.

CHARLES EVANS HUGHES ON *The Monroe Doctrine*

For the launch of its new 14th Edition in 1929, Britannica had recourse to a great American jurist and statesman, Charles Evans Hughes (1861–1948). Hughes had served as an associate justice on the U.S. Supreme Court (1910–16), just narrowly lost to Woodrow Wilson in the 1916 presidential race, and acted as U.S. secretary of state (1921–25). He would later become the 11th chief justice of the U.S. Supreme Court (1930–41), shepherding the court through the political thicket of Franklin Roosevelt’s massive New Deal legislation. His topic for Britannica was the famed “Hands Off the Western Hemisphere” doctrine of the United States, enunciated by President James Monroe in 1823. An excerpt of his article follows.

Library of Congress, Washington, D.C.



The Monroe Doctrine was the fruition of early American policy. There had long been a deep-seated conviction on the part of the people of the United States that the opportunities of a hard-won freedom would be threatened by the ambitions of European powers and that the aims of the new nation could be achieved only by keeping clear of the toils of European politics and strife. It was this conviction of the necessity of maintaining an independent position which led to the declaration of neutrality in 1793, despite the Treaty of Alliance with France which had sprung from the exigencies of the Revolutionary struggle. The words of Washington’s Farewell Address were more than a solemn admonition; they stated cherished principles. “The great rule of conduct for us,” he said, “in regard to foreign nations, is, in extending our commercial relations, to have with them as little *political* connection as possible. . . . Europe has a set of primary interests which to

us have none, or a very remote relation. Hence she must be engaged in frequent controversies, the causes of which are essentially foreign to our concerns. Hence therefore it must be unwise in us to implicate ourselves by artificial ties in the ordinary vicissitudes of her politics, or the ordinary combinations and collisions of her friendships, or enmities." The people of the United States had watched with deep sympathy the long struggle of their southern neighbours for independence. While Spain maintained a doubtful contest, it was regarded as a civil war, but when that contest became so desperate that Spanish viceroys, governors, and captains-general concluded treaties with the insurgents virtually acknowledging their independence, the United States unreservedly recognized the facts. The republic of Colombia was recognized in 1822, the Government of Buenos Aires and the States of Mexico and Chile early in 1823. The United States was the first to recognize the independent empire of Brazil in May, 1824, not hesitating because of the political form of the Government, and this was followed by the recognition of the Federation of Central American States in August of the same year. Meanwhile, the Holy Alliance formed by the sovereigns of Austria, Russia and Prussia had sought to enforce the divine right of kings against the progress of liberal principles. Joined by France, they undertook "to put an end to the system of representative government" and after France had proceeded accordingly to restore the rule of Ferdinand VII. in Spain, it was proposed to direct their efforts to the overthrowing of the new Governments erected out of the old colonies of Spain in the western hemisphere.

This was the situation when, in Aug. 1823, George Canning, British foreign secretary, wrote to Richard Rush, American minister in London, suggesting a joint declaration in substance that the recovery of the colonies by Spain was hopeless; that neither Great Britain nor the United States was aiming at the possession of any portion of these colonies; and that they could not see with indifference any portion of them transferred to any other power. Great Britain, however, had not at that time recognized the new States in Spanish America. President Monroe sought the advice of Jefferson and Madison. Jefferson regarded the question as "the most momentous" which had arisen since that of Independence. "Our first and fundamental maxim," said he, "should be, never to entangle ourselves in the broils of Europe. Our second, never to suffer Europe to intermeddle with . . . Atlantic affairs." Jefferson favoured the acceptance of the British suggestion in some form and Madison took the same view. John Quincy Adams, Secretary of State, opposed a joint declaration. He wished to take the ground "of earnest remonstrance against the interference of the European powers by force with South America, but to disclaim all interference on our part with Europe; to make an American cause and adhere inflexibly to that." Upon the advice of Adams, and after mature deliberation by the president and his cabinet,

it was decided to make a separate declaration on the sole responsibility of the United States, and this declaration was formulated in the president's message of Dec. 2, 1823.

Original Statement of the Doctrine.—The doctrine is set forth in two paragraphs of this message. The first of these had a genesis distinct from the situation of the former colonies of Spain. It grew out of the question of Russian claims on the north-west coast of North America. . . . It was in connection with this situation that President Monroe . . . declared in his message: "a principle in which the rights and interests of the United States are involved, that the American continents, by the free and independent condition which they have assumed and maintained, are henceforth not to be considered as subjects for future colonization by any European powers. . . ."

Later Extension or Modification.—Not only did the statesmen of the United States fear the extension of European colonization, but they viewed with deep concern the possibility of the transfer of American territory from one European power to another, or the transfer of such territory from an American to a non-American power. . . .

What was said with Europe exclusively in view, must be deemed applicable to all non-American powers; and the opposition to the extension of colonization was not dependent upon the particular method of securing territorial control, and, at least since Polk's time, may be deemed to embrace opposition to acquisition of additional territory through transfer of dominion or sovereignty. Neither of these modifications changes the doctrine in its essentials and it may thus be summarized as being opposed (1) to any non-American action encroaching upon the political independence of American States under any guise, and (2) to the acquisition in any manner of the control of additional territory in the western hemisphere by any non-American power. . . .

Character and Purport of the Doctrine.—The Monroe Doctrine is not a legislative pronouncement; it has been approved by action of Congress, but it does not rest upon congressional sanction. It is not defined by treaty, and it does not draw its force from any international agreement. . . . While it is not a part of international law, it rests, as Elihu Root has stated, "upon the right of self-protection and that right is recognized by international law." It was asserted at a time when the danger of foreign aggression was very real, when the new American States had not yet established a firm basis of independent national life and republican institutions were menaced by the threats of Old World powers. But despite changes in conditions it still remains, to be applied if necessary, as a principle of national security. Its significance lies in the fact that in its essentials as set forth by President Monroe and as forcibly asserted by responsible statesmen, it has been for 100 years, and continues to be, an integral part of national thought

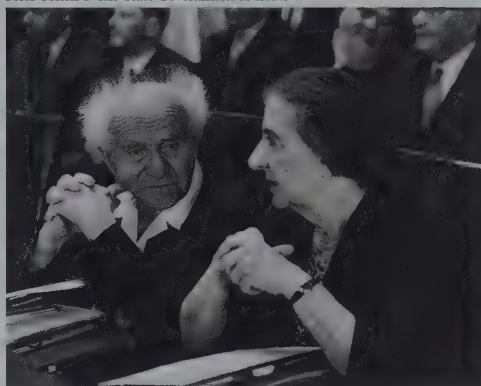
and purpose expressing a profound conviction which even the upheaval caused by the World War [World War I], and the participation of the United States in that struggle upon European soil, did not upset.

The doctrine, as has been stated authoritatively, does not imply, or countenance, a policy of aggression. It does not infringe upon the independence and sovereignty of other American States. It does not attempt to establish a protectorate over Latin American States. The declaration that encroachment by non-American powers upon the independence of American States will be regarded as dangerous to the safety of the United States gives no justification for such encroachment on its part. . . . President Roosevelt in his annual message of 1901 thus referred to the doctrine: "It is in no wise intended as hostile to any nation in the Old World. Still less is it intended to give cover to any aggression by one New World power at the expense of any other. It is simply a step, and a long step, toward assuring the universal peace of the world by securing the possibility of permanent peace on this hemisphere."

DAVID BEN-GURION ON *Theodor Herzl*

David Ben-Gurion was Israel's first prime minister. Revered as the "Father of the Nation," he had the honor of delivering, on May 14, 1948, his country's declaration of independence. The following year, the remains of the man who had struggled for so long for the establishment of a Jewish state—famed Zionist and political leader Theodor Herzl—were moved from their burial grounds in Vienna to the holy city of Jerusalem. Ben-Gurion contributed to Britannica the following biography of Herzl, written shortly before the prime minister's death in 1973.

Fritz Cohen/© The State Government of Israel



Prime Minister David Ben-Gurion with Foreign Minister Golda Meir at the Knesset, Jerusalem, Israel, 1962.

Theodor Herzl was the founder of the so-called Zionist movement to establish a Jewish homeland. Although he died more than 40 years before the establishment of the State of Israel, he was an indefatigable organizer, propagandist, and diplomat who had much to do with making Zionism into a political movement of worldwide significance.

Herzl was born in Budapest, Hungary, on May 2, 1860, of well-to-do middle class parents. He first studied in a scientific secondary school, but to escape from its anti-Semitic atmosphere he transferred in 1875 to a school where most of the students were Jews. In 1878 the family moved from Budapest to Vienna, where he entered the University of Vienna to study law. He received his license to practice law in 1884 but chose to devote himself to literature. For a number of years he was a journalist and a moderately successful playwright.

In 1889 he married Julie Naschauer, daughter of a wealthy Jewish businessman in Vienna. The marriage was unhappy, although three children were born to

it. Herzl had a strong attachment to his mother, who was unable to get along with his wife. These difficulties were increased by the political activities of his later years, in which his wife took little interest.

A profound change began in Herzl's life soon after a sketch he had published in the leading Viennese newspaper, *Neue Freie Presse*, led to his appointment as the paper's Paris correspondent. He arrived in Paris with his wife in the fall of 1891 and was shocked to find in the homeland of the French Revolution the same anti-Semitism with which he had become so familiar in Austria. Hitherto he had regarded anti-Semitism as a social problem that the Jews could overcome only by abandoning their distinctive ways and assimilating to the people among whom they lived. At the same time, his work as a newspaperman heightened his interest in, and knowledge of, social and political affairs and led him to the conviction that the answer to anti-Semitism was not assimilation but organized counterefforts by the Jews. The Dreyfus affair in France also helped crystallize this belief. French military documents had been given to German agents, and a Jewish officer named Alfred Dreyfus had been falsely charged with the crime. The ensuing political controversy produced an outburst of anti-Semitism among the French public. Herzl said in later years that it was the Dreyfus affair that had made a Zionist out of him. So long as anti-Semitism existed, assimilation would be impossible, and the only solution for the majority of Jews would be organized emigration to a state of their own.

Herzl was not the first to conceive of a Jewish state. Orthodox Jews had traditionally invoked the return to Zion in their daily prayers. In 1799 Napoleon had thought of establishing a Jewish state in the ancient lands of Israel. The English statesman Benjamin Disraeli, a Jew, had written a Zionist novel, *Tancred*. Moses Hess, a friend and coworker of Karl Marx, had published an important book, *Rom und Jerusalem* (1862), in which he declared the restoration of a Jewish state a necessity both for the Jews and for the rest of humanity. Among the Jews of Russia and eastern Europe, a number of groups were engaged in trying to settle emigrants in agricultural colonies in Palestine. After the Russian pogroms of 1881, Dr. Leo Pinsker had written a pamphlet, "Auto-Emanzipation," an appeal to western European Jews to assist in the establishment of colonies in Palestine. When Herzl read it some years later, he commented in his diary that if he had known of it, he might never have written *The Jewish State*.

Herzl's first important Zionist effort was an interview with Baron Maurice de Hirsch, one of the wealthiest men of his time. De Hirsch had founded the Jewish Colonization Association with the aim of settling Jews from Russia and Romania in Argentina and other parts of the Americas. The 35-year-old journalist arrived at the Baron's mansion in Paris with 22 pages of notes, in which he argued the need for a political organization to rally the Jews under a flag of their own, rather than leaving everything to the philanthropic endeavours of individuals like the Baron.

World History Archive/Ann Ronan Collection/age fotostock



Theodor Herzl, founder of the political form of Zionism, c. 1902.

The conversation was notable for its effect on Herzl rather than on the Baron de Hirsch, who refused to hear him out. It led to Herzl's famous pamphlet *The Jewish State*, published in February 1896 in Vienna. The Jewish question, he wrote, was not a social or religious question but a national question that could be solved only by making it "a political world question to be discussed and settled by the civilized nations of the world in council." Some of Herzl's friends thought it a mad idea, but the pamphlet won favourable response from eastern European Zionist societies. In June 1896, when Herzl was en route to Constantinople (Istanbul) in the hope of talking to the Ottoman Sul-

tan about obtaining the grant of Palestine as an independent country, his train stopped in Sofia, Bulgaria; hundreds of Jews were present at the station to greet Herzl and to hail him as a leader.

Although he remained in Constantinople for 11 days, he failed to reach the Sultan. But he had begun the career as organizer and propagandist that would end only with his death eight years later. He went to London in an effort to organize the Jews there in support of his program. Not all the Jewish leaders in England were happy to see him because his political approach was not in tune with their ideas, but at public meetings in the East End he was loudly cheered. He was a tall, impressive figure with a long black beard and the mien of a prophet. Despite his personal magnetism, he found that his efforts to influence Jewish leaders in England were of little avail and therefore decided to organize a world congress of Zionists in the hope of winning support from the masses of Jews in all countries. He proposed to hold the congress in Munich, but as the Jews there—who were mostly assimilated—opposed it, he settled upon Basel, Switzerland. The congress met at the end of August 1897, attended by about 200 delegates, mostly from central and eastern Europe and Russia along with a few from western Europe and even the United States. They represented all social strata and every variety of Jewish thought—from Orthodox Jews to atheists and from businessmen to students. There were also several hundred onlookers, including some sympathetic Christians and reporters for the international press. When Herzl's imposing figure came to the podium, there was tumultuous applause. "We want to lay the foundation stone," he declared, "for the house which will become the refuge of the

Jewish nation. Zionism is the return to Judaism even before the return to the land of Israel." One of Herzl's most faithful supporters was the writer Max Nordau, who gave a brilliant address in which he described the plight of the Jews in the East and in the West. The three-day congress agreed upon a program, henceforth to be known as the Basel Program, declaring that "Zionism aspires to create a publicly guaranteed homeland for the Jewish people in the land of Israel." It also set up the Zionist Organization with Herzl as president.

The seven remaining years of his life were devoted to the furtherance of the Zionist cause, although he remained literary editor of the *Neue Freie Presse* in order to earn a living. He established a Zionist newspaper, *Die Welt*, published as a German-language weekly in Vienna. He negotiated unsuccessfully with the Sultan of Turkey for the grant of a charter that would allow Jewish mass settlement in Palestine on an autonomous basis. He then turned to Great Britain, which seemed favourable to the establishment of a Jewish settlement in British territory in the Sinai Peninsula. When this project failed, the British proposed Uganda in East Africa. This offer, which he and some other Zionists were willing to accept, aroused violent opposition at the Zionist congress of 1903, particularly among the Russians. Herzl was unable to resolve the conflict. He died of a heart ailment at Edlach, near Vienna, on July 3, 1904, at the age of 44. He was buried in Vienna, but, in accordance with his wish, his remains were removed to Jerusalem in 1949 after the creation of the Jewish state and entombed on a hill west of the city now known as Mt. Herzl.

After the First Zionist Congress in Basel, Herzl had written in his diary:

If I had to sum up the Basel Congress in one word—which I shall not do openly—it would be this: At Basel I founded the Jewish state. If I were to say this today, I would be greeted by universal laughter. In five years, perhaps, and certainly in 50, everyone will see it.

While the Jewish state was the product of many complex historic forces, including two world wars and the labours of Herzl's many followers, it was he who organized the political force of Jewry that was able to take advantage of the accidents of history. Through the strength of his personality, he aroused the enthusiasm of the Jewish masses and gained the respect of many statesmen of his time, in spite of the opposition of some Jewish leaders to his plans.

JACQUES BARZUN ON *History*

The great polymath Jacques Barzun (1907–2012)—French-born educator, historian, translator, musicologist, essayist, and longtime professor and dean at Columbia University—was famous for two things in particular: the felicity and clarity of his writing and for his passionate insistence that students forsake early specialization in favor of a broad education in the humanities. The discipline of history, and its endless variety, was the focus of his classic essay for Britannica, excerpted below.

Courtesy of University Archives, Columbia University in the City of New York.



Everything that we call the arts and the humanities comes out of some natural desire and acquires value by satisfying it. Painting and music and literature are important not because there are museums and concert halls and libraries to be kept supplied but because human beings want to draw and sing and tell stories as well as enjoy seeing others fulfill these native and universal impulses.

Among the humanities, history holds a special place in that its origin within each of us is not even dependent on impulse. A person may lack altogether the wish to sing or the knack of telling a story, but everybody without exception finds occasion to say: “I was there; I saw it; I remember it very well.” In saying (or even thinking) these words, every man is a historian. History is inescapably a part of consciousness. The Greeks expressed this truth by describing Clio, the muse of history, as the daughter of memory.

Without going into the subtleties of how we are able to remember and what the contents of memory actually are, it is clear that as soon as we take thought about our experiences, whether the farthest back or the nearest and most immediate, we are dealing with what is past. The so-called present vanishes in the very act of reflecting upon it, and the future is all surmise and imagination. Hence the greater our interest in the facts and truths of human existence—our own existence

included—the greater, necessarily, is our concern with the past. “To live in the past” ought not, therefore, to be the phrase of reproach that it commonly is. The larger part of the thoughtful life that one leads during the intervals of action cannot be anything but some form of living in the past. If this part of our lives is to be criticized, it should be in words different from the cliché. One should ask, *How* does he or she live in the past? *What past* does he or she recall, prefer, imagine?

It is at this point that history as the organized story of the whole human past comes in to contribute its pleasures and its illumination to the thoughtful life. A person who remembered only his own past would be pretty poor indeed—living on a starvation diet. Actually, it is a question whether such a life is not an impossible supposition. Everybody remembers pieces of other people’s pasts; everybody, whether he means to or not, finds that he has learned about his country, his town, his street, his business office, or his factory many things that came to pass well before his time. To possess that information, if it is accurate, is in essence a knowledge of history. It differs in extent but not in kind from a knowledge of how Rome rose and fell. And this relation tells us what reading history affords in the first instance. Just as knowing about our neighbours’ and friends’ histories adds to our sense of reality, so does reading history: it gives us vicarious experience.

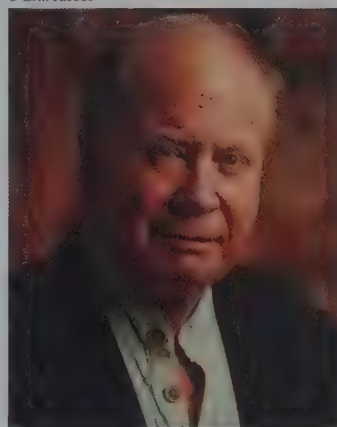
If we add to the habitual, unconscious intake of personal and local history the daily filling of the mind by news reports—which is contemporary history and which usually brings with it fragments of a remoter past—we begin to see that every man who lives in a modern, communicative society is forced to become in some sense a conscious historian. His interest begins with himself and his environment, but it is soon stretched out, haphazardly, into such domains of history as chance or special interests have developed. And special interests need not mean explicitly intellectual ones; baseball and chess, model trains and furniture, pottery and boat-building have their heroes and revolutions too, and whoever cares about these activities or artifacts for themselves inevitably becomes engrossed in their histories.

It is of course true that when we ordinarily speak of someone having an interest in history we mean the political, social, or cultural history of great civilizations; and for a long time history was arbitrarily taken to mean the sequence that leads from the ancient civilizations of the eastern Mediterranean to the modern ones of the West. It is a tremendous spectacle, even though concentrated on a relatively small territory. But now that certain dynamic elements of Western civilization have aroused the rest of the world to both imitation and resistance, it has become imperative to widen the panorama and see behind the vast and confused modern scene the several histories of the great Eastern civilizations as well as the traditions and vicissitudes of the African societies.

JOSEPH J. ELLIS ON *The U.S. Founding Fathers*

*Joseph J. Ellis, a professor of history at Mount Holyoke College in South Hadley, Massachusetts, is one of the most distinguished of American historians. He was awarded the Pulitzer Prize for *Founding Brothers: The Revolutionary Generation* (2000), won the National Book Award for *American Sphinx: The Character of Thomas Jefferson* (1997), and his chronicle of the life of the first U.S. president, *His Excellency: George Washington* (2004), was a New York Times best seller. He contributed multiple articles to *Britannica*, including biographies of Thomas Jefferson and John Adams, an overview of the Thomas Jefferson and Sally Hemings controversy, and an article, excerpted below, on the successes and failures of America's Founding Fathers.*

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What, in the end, did the Founding Fathers manage to do? Once both the inflated and judgmental rhetorics are brushed aside, what did they achieve?

At the most general level, they created the first modern nation-state based on liberal principles. These include the democratic principle that political sovereignty in any government resides in the citizenry rather than in a divinely sanctioned monarchy; the capitalistic principle that economic productivity depends upon the release of individual energies in the marketplace rather than on state-sponsored policies; the moral principle that the individual, not the society or the state, is the sovereign unit in the political equation; and the judicial principle that all citizens are equal before the law. Moreover, this liberal formula has become the preferred political recipe for success in the modern world, vanquishing the European monarchies in the 19th century and the totalitarian regimes of Germany, Japan, and the Soviet Union in the 20th century.

More specifically, the Founding Fathers managed to defy conventional wisdom

in four unprecedented achievements: first, they won a war for colonial independence against the most powerful military and economic power in the world; second, they established the first large-scale republic in the modern world; third, they invented political parties that institutionalized the concept of a legitimate opposition; and fourth, they established the principle of the legal separation of church and state, though it took several decades for that principle to be implemented in all the states. Finally, all these achievements were won without recourse to the guillotine or the firing squad, which is to say without the violent purges that accompanied subsequent revolutions in France, Russia, and China. This was the overarching accomplishment that the British philosopher Alfred Lord North Whitehead had in mind when he observed that there were only two instances in the history of Western civilization when the political elite of an emerging empire behaved as well as one could reasonably expect: the first was Rome under Augustus, and the second was the United States under the Founding Fathers.

The Failure

Slavery was incompatible with the values of the American Revolution, and all the prominent members of the Revolutionary generation acknowledged that fact. In three important areas they acted on this conviction: first, by ending the slave trade in 1808; second, by passing legislation in all the states north of the Potomac River, which put slavery on the road to ultimate extinction; and third, by prohibiting the expansion of slavery into the Northwest Territory. But in all the states south of the Potomac, where some nine-tenths of the slave population resided, they failed to act. Indeed, by insisting that slavery was a matter of state rather than federal jurisdiction, the Founding Fathers implicitly removed the slavery question from the national agenda. This decision had catastrophic consequences, for it permitted the enslaved population to grow in size eightfold (from 500,000 in 1775 to 4,000,000 in 1860), mostly by natural reproduction, and to spread throughout all the southern states east of the Mississippi River. And at least in retrospect, the Founders' failure to act decisively before the slave population swelled so dramatically rendered the slavery question insoluble by any means short of civil war.

There were at least three underlying reasons for this tragic failure. First, many of the Founders mistakenly believed that slavery would die a natural death, that decisive action was unnecessary because slavery would not be able to compete successfully with the wage labour of free individuals. They did not foresee the cotton gin and the subsequent expansion of the "Cotton Kingdom." Second, all the early efforts to place slavery on the national agenda prompted a threat of secession by the states of the Deep South (South Carolina and Georgia were the two states that actually threatened to secede, though Virginia might very well have chosen to join

them if the matter came to a head), a threat especially potent during the fragile phase of the early American republic. While most of the Founders regarded slavery as a malignant cancer on the body politic, they also believed that any effort to remove it surgically would in all likelihood kill the young nation in the cradle. Finally, all conversations about abolishing slavery were haunted by the spectre of a free African American population, most especially in those states south of the Potomac where in some locations blacks actually outnumbered whites. None of the Founding Fathers found it possible to imagine a biracial American society, an idea that in point of fact did not achieve broad acceptance in the United States until the middle of the 20th century.

Given these prevalent convictions and attitudes, slavery was that most un-American item, an inherently intractable and insoluble problem. As Jefferson so famously put it, the Founders held “the wolfe by the ears” and could neither subdue him nor afford to let him go. Virtually all the Founding Fathers went to their graves realizing that slavery, no matter how intractable, would become the largest and most permanent stain on their legacy. And when Abraham Lincoln eventually made the decision that, at terrible cost, ended slavery forever, he did so in the name of the Founders.

The other tragic failure of the Founders, almost as odious as the failure to end slavery, was the inability to implement a just policy toward the indigenous inhabitants of the North American continent. In 1783, the year the British surrendered control of the eastern third of North America in the Peace of Paris, there were approximately 100,000 American Indians living between the Alleghenies and the Mississippi. The first census (1790) revealed that there were also 100,000 white settlers living west of the Alleghenies, swelling in size every year (by 1800 they would number 500,000) and moving relentlessly westward. The inevitable collision between these two peoples posed the strategic and ultimately moral question: How could the legitimate rights of the Indian population be reconciled with the demographic tidal wave building to the east?

In the end, they could not. Although the official policy of Indian removal east of the Mississippi was not formally announced and implemented until 1830, the seeds of that policy—what one historian has called “the seeds of extinction”—were planted during the founding era, most especially during the presidency of Thomas Jefferson (1801–09).

One genuine effort to avoid that outcome was made in 1790 during the presidency of George Washington. The Treaty of New York with the Creek tribes of the early southwest proposed a new model for American policy toward the Indians, declaring that they should be regarded not as a conquered people with no legal rights but rather as a collection of sovereign nations. Indian policy was therefore a branch of foreign policy, and all treaties were solemn commitments by the



Declaration of Independence, oil on canvas, by John Trumbull, 1818; in the rotunda of the U.S. Capitol, Washington, D.C.

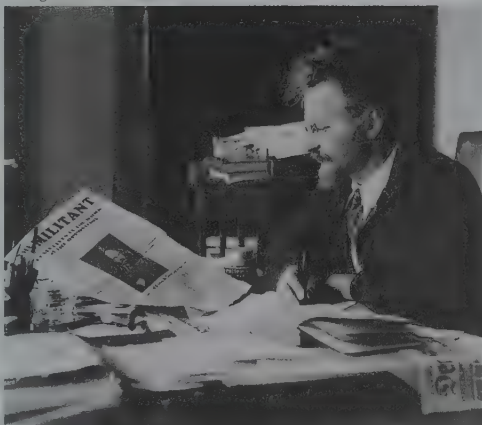
federal government not subject to challenge by any state or private corporation. Washington envisioned a series of American Indian enclaves or homelands east of the Mississippi whose borders would be guaranteed under federal law, protected by federal troops, and bypassed by the flood of white settlers. But, as it soon became clear, the federal government lacked the resources in money and manpower to make Washington's vision a reality. And the very act of claiming executive power to create an Indian protectorate prompted charges of monarchy, the most potent political epithet of the age. Washington, who was accustomed to getting his way, observed caustically that nothing short of "a Chinese Wall" could protect the Native American tribes from the relentless expansion of white settlements. Given the surging size of the white population, it is difficult to imagine how the story could have turned out differently.

LEON TROTSKY ON *Vladimir Ilyich Lenin*

*This excerpted article is highlighted below not because it is trustworthy in its judgments but because it is unique. Here is one giant figure writing about another (who happened to have been his boss) at a time when both had been—until Lenin's death in 1924—engaged in making history. The article has added fascination for us who know that the flawed country Lenin and Trotsky (1879–1940) helped to create has long since died. Trotsky's prose, however, military in its energy, reaching its peak in his *History of the Russian Revolution* (1930), may last longer.*

For the entire article, printed in the 13th Edition (1926), Trotsky received \$106. He completed it just months before Stalin banished him. He had no premonition that he would eventually be murdered with an ice pick by an agent of the dictator.

H. Roger-Viollet



The revolution of Feb. 1917 found Lenin in Switzerland. His attempts to reach Russia met with the decided opposition of the British Government. He accordingly decided to exploit the antagonism of the belligerent countries and to reach Russia through Germany. The success of this plan gave occasion to Lenin's enemies for a fierce campaign of slander, which, however, was powerless to prevent him from assuming the leadership of his party and shortly afterwards of the revolution.

On the night of April 4, on leaving the train, Lenin made a speech in the Finlyandsky station in Petrograd. He repeated and developed the leading ideas it contained in the days which followed. The overthrow of Tsarism, he said, was only the first stage in the revolution. The bourgeois revolution could no longer satisfy the masses. The task of the proletariat was to arm, to strengthen the power of the

Soviets, to rouse the country districts and to prepare for the conquest of supreme power in the name of the reconstruction of society on a Socialist basis.

This far-reaching programme was not only unwelcome to those engaged in propagating patriotic Socialism, but even roused opposition among the Bolsheviks themselves. Plekhanov called Lenin's programme "crazy." Lenin, however, built up his policy not on the inclinations and views of the temporary leaders of the revolution, but on the interrelations of the classes and the logic of mass movements. He foresaw that the distrust of the bourgeoisie and of the Provisional Government would grow stronger daily, that the Bolshevik party would obtain a majority in the Soviets and that the supreme power would pass into their hands. The small daily *Pravda* became at once in his hands a powerful instrument for the overthrow of bourgeois society.

The policy of coalition with the bourgeoisie pursued by the patriotic Socialists, and the hopeless attack which the Allies forced the Russian Army to assume at the front—both these roused the masses and led to armed demonstrations in Petrograd in the first days of July. The struggle against Bolshevism became most intense. On July 5th grossly forged "documents" were published by the counter-revolutionary secret service. These purported to prove that Lenin was acting under the orders of the German general staff. In the evening "reliable" detachments summoned from the front by Kerensky and Cadet officers from the districts round Petrograd occupied the city. The popular movement was crushed. The hounding of Lenin reached its height. He now began to work "underground," hiding first in Petrograd with a worker's family and then in Finland; he managed, however, to keep in touch with the leaders of the party.

The July days and the retributions which followed aroused a burst of energy in the masses—Lenin's forecast proved right in every particular. The Bolsheviks obtained a majority in the Soviets of Petrograd and Moscow. Lenin demanded decisive action to seize the supreme power, and on his side began an unrelenting fight against the hesitations of the leaders of the party. He wrote articles and pamphlets, letters, both official and private, examining the question of the seizure of supreme power from every angle, refuting objections and dispelling doubts. He drew a picture of Russia's conversion into a foreign colony if the policy of Miliukov and Kerensky continued, and he predicted that they would consciously hand over Petrograd to the Germans in order to destroy the proletariat. "Now or never!" he repeated in passionate articles, letters and interviews.

The rising against the Provisional Government coincided with the opening of the second Congress of the Soviets on Oct. 25. On that day, Lenin, after being in hiding for three and a half months, appeared in the Smolny and from there personally directed the fight. In the night sitting of Oct. 27 he proposed, at the session of the Congress of the Soviets, a draft decree about peace which was passed

John Frost Newspapers/Mary Evans Picture Library/age fotostock



The Daily Mirror's coverage of the signing of a peace treaty between Russia and Germany at Brest-Litovsk during World War I, 1918.

unanimously and another about the land, which was passed with one dissident and eight abstentions. The Bolshevik majority, supported by the left wing of the Socialist revolutionaries, declared that supreme power was now vested in the Soviets. The Soviet of People's Commissaries was appointed, with Lenin at their head. Thus Lenin passed straight from the log cabin where he had been hiding from persecution to the place of highest authority.

The proletarian revolution spread quickly. Having obtained the land of the landed estate owners, the peasants forsook the Socialist revolutionaries and

supported the Bolsheviks. The Soviets became masters of the situation both in the towns and the country districts. In such circumstances the constituent assembly which was elected in Nov. and met on Jan. 5 appeared a patent anachronism. The conflict between the two stages of the revolution was now at hand. Lenin did not hesitate for an instant. On the night of Jan. 7 the All-Russian Central Executive Committee, on Lenin's motion, passed a decree dissolving the constituent assembly. The dictatorship of the proletariat, said Lenin, meant the greatest possible degree of actual and not merely formal democracy for the toiling majority of the people. For it guaranteed to them the real possibility of utilising their abilities, putting as it did in the hands of labour all those material goods (buildings for meetings, printing presses and so on) lacking which "liberty" remains an empty word and an illusion. The dictatorship of the proletariat in Lenin's view is a necessary stage in the abolition of class divisions in society. . . .

The exhaustion brought on by excessive hard work over a number of years ruined Lenin's health. Sclerosis attacked his cerebral arteries. At the beginning of 1922 his doctors forbade him daily work. From June to Aug. the disease made rapid progress, and for the first time he began to lose, although transiently, the power of speech. At the beginning of Oct. his health had so much improved that he once again returned to work, but not for long. His last public utterance ends with the expression of his conviction that "from Russia under N. E. P. will come Socialist Russia."

On Dec. 16 he became paralysed in the right arm and leg. However, during Jan. and Feb. he still dictated a number of articles of great importance for the policy of the party on the struggle against bureaucracy in the Soviet and party organisation; on the importance of co-operation in gradually bringing the peasants

into the Socialist organisation; on the struggle against illiteracy; and finally on the policy in regard to nationalities oppressed under Tsarism.

The disease progressed and he lost completely the power of speech. His work for the party came to an end, and very soon his life also. Lenin died on Jan. 21, 1924, at 6:30 P.M., at Gorky, near Moscow. His funeral was the occasion for an unexampled manifestation of love and grief on the part of millions.

The main work of Lenin's life was the organisation of a party capable of carrying through the Oct. revolution and of directing the construction of Socialism. The theory of the proletarian revolution—the methods and tactics to be pursued—constitutes the fundamental content of Leninism which as an international system forms the culminating point of Marxism. Lenin's single aim filled his life from his school days onwards. He never knew hesitation in the fight against those he considered the enemies of the working class. In his passionate struggle there was never any personal element. He fulfilled what he considered to be the demands of an inevitable historical process. Lenin combined the ability to use the materialistic dialectic as a method of scientific orientation in social developments with the deep intuition of the true leader.

Lenin's outward appearance was distinguished by simplicity and strength. He was of middle or rather below the middle height, with the plebeian features of the Slavonic type of face, brightened, however, by piercing eyes; and his powerful forehead and his still more powerful head gave him a marked distinction. He was tireless in work to an unparalleled degree. His thoughts were equally concentrated whether in his Siberian exile, the British Museum or at a sitting of the People's Commissaries. He put the same exemplary conscientiousness into reading lectures in a small workmen's club in Zurich and in organising the first Socialist State in the world. He appreciated and loved to the full science, art and culture, but he never forgot that as yet these things are the property of a small minority. The simplicity of his literary and oratorical style expressed the extreme concentration of his spiritual forces bent on a single aim. In personal intercourse Lenin was even-tempered, courteous and attentive, especially to the weak and oppressed and to children. His way of life in the Kremlin was little different from his life as an emigré abroad. The simplicity of his daily habits, his asceticism in regard to food, drink, clothes and the "good things" of life in general in his case did not spring from so called moral principles, but came about because intellectual work and intense struggle not only absorbed his interests and passions but also gave him such intense satisfaction as to leave no room for subsidiary enjoyments. His thoughts never ceased to labour at the task of freeing the workers till the moment of its final extinction.

MICHAEL BERENBAUM ON

Why Wasn't Auschwitz Bombed?

Michael Berenbaum is a writer, lecturer, filmmaker, and director of the Sigi Ziering Institute: Exploring the Ethical and Religious Implications of the Holocaust at the American Jewish University (formerly the University of Judaism) in Los Angeles. He was instrumental in the creation of the U.S. Holocaust Memorial Museum, serving as deputy director of the President's Commission on the Holocaust (1979–80), project director of the U.S. Holocaust Memorial Museum (1988–93), and then director of the museum's Holocaust Research Institute (1993–97). He is also a prolific writer, authoring and editing not only more than a dozen books but also some 30 articles for Britannica. One of his Britannica contributions, excerpted below, surveys why the Allies never bombed the Nazi death camp at Auschwitz.

Courtesy of Michael Berenbaum



The question “Why wasn’t Auschwitz bombed?” is not only historical. It is also a moral question emblematic of the Allied response to the plight of the Jews during the Holocaust. Moreover, it is a question that has been posed to a series of presidents of the United States.

In their first meeting in 1979, President Jimmy Carter handed Elie Wiesel—a noted author and survivor of Auschwitz who was then chairman of the President’s Commission on the Holocaust—a copy of the soon-to-be-released aerial photographs of the extermination camp at Auschwitz-Birkenau (Auschwitz II), taken by American intelligence forces during World War II. Wiesel was imprisoned in Buna-Monowitz (Auschwitz III), the slave-labour camp of Auschwitz, when in August 1944 Allied planes bombed the IG Farben plant there. Of that event he wrote, “We

were no longer afraid of death; at any rate, not of that death. Every bomb filled us with joy and gave us new confidence in life."

Two months after his initial meeting with Carter, in an address at the first National Days of Remembrance ceremony at the Capitol rotunda on April 24, 1979, Wiesel responded to his gift by saying, "The evidence is before us: The world knew and kept silent. The documents that you, Mr. President, handed to the chairman of your Commission on the Holocaust, testify to that effect." Wiesel was to repeat that accusation to Presidents Ronald Reagan and Bill Clinton. The failure to bomb Auschwitz during World War II also became part of the debate in 1999 over the Allied bombing of Kosovo.

First to the historical issues: The question of bombing Auschwitz first arose in the summer of 1944, more than two years after the gassing of Jews had begun and at a time when more than 90 percent of the Jews who were killed in the Holocaust were already dead. It could not have arisen earlier because not enough was known specifically about Auschwitz, and the camps were outside the range of Allied bombers. By June 1944 information concerning the camps and their function was available—or could have been made available—to those undertaking the mission. German air defenses were weakened, and the accuracy of Allied bombing was increasing. All that was required was the political will to order the bombing.

Before the summer of 1944, Auschwitz was not the most lethal of the six Nazi extermination camps. The Nazis had killed more Jews at Treblinka, where between 750,000 and 900,000 Jews were killed in the 17 months of its operation, and at Belzec, where 600,000 were killed in less than 10 months. In 1943 the Nazis closed both camps. Their mission, the destruction of Polish Jewry, had been completed. But during the summer of 1944 Auschwitz overtook the other death camps not only in the number of Jews killed but in the pace of destruction. The condition of the Jews was desperate.

In March 1944 Germany invaded Hungary. In April the Nazis confined the Hungarian Jews to ghettos. Between May 15 and July 9, the Nazis deported some 438,000 Jews on 147 trains from Hungary to the death camp at Auschwitz-Birkenau. To accommodate the newly arriving Hungarian Jews, the Nazis built a railroad spur directly into Auschwitz-Birkenau. Because the Nazis sent four of five arriving Jews directly to their death, the extermination camp was strained beyond capacity. The gas chambers were operating around the clock, and the crematoria were so overtaxed that bodies were burned in open fields with body fat fueling the flames. Any interruption in the killing process might have saved thousands of lives.

Yet bombing a concentration camp filled with innocent, unjustly imprisoned civilians also posed a moral dilemma for the Allies. To be willing to sacrifice innocent civilians, one would have had to perceive accurately conditions in the camp and to presume that interrupting the killing process would be worth the loss of life



The entrance gates to the Auschwitz concentration camp, near Kraków, Poland; the sign reads "Arbeit Macht Frei" ("Work Liberates").

in Allied bombings. In short, one would have had to know that those in the camps were about to die. Such information was not available until the spring of 1944.

On April 10, 1944, two men escaped from Auschwitz: Rudolph Vrba and Alfred Wetzler. They made contact with Slovak resistance forces and produced a substantive report on the extermination camp at Auschwitz-Birkenau. In great detail, they documented the killing process. Their report, replete with maps and other specific details, was forwarded to Western intelligence officials along with an urgent request to bomb the camps. Part of the report, forwarded to the U.S. government's War Refugee Board by Roswell McClelland, the board's representative in Switzerland, arrived in Washington on July 8 and July 16, 1944. While the complete report, together with maps, did not arrive in the United States until October, U.S. officials could have received the complete report earlier if they had taken a more urgent interest in it.

The Vrba-Wetzler report provided a clear picture of life and death at Auschwitz. As a result, Jewish leaders in Slovakia, some American Jewish organizations, and the War Refugee Board all urged the Allies to intervene. However, the request was far from unanimous. Jewish leadership was divided. As a general rule, the

established Jewish leadership was reluctant to press for organized military action directed specifically to save the Jews. They feared being too overt and encouraging the perception that World War II was a “Jewish war.” Zionists, recent immigrants, and Orthodox Jews were more willing to press for specific efforts to save the Jews. Their voices, however, were more marginal than those of the established Jewish leadership, and their attempts were even less effective.

It would be a mistake to assume that anti-Semitism or indifference to the plight of the Jews—while present—was the primary cause of the refusal to support bombing. The issue is more complex. On June 11, 1944, the Jewish Agency executive committee meeting in Jerusalem refused to call for the bombing of Auschwitz. Jewish leadership in Palestine was clearly neither anti-Semitic nor indifferent to the situation of their brethren. David Ben-Gurion, chairman of the executive committee, said, “We do not know the truth concerning the entire situation in Poland and it seems that we will be unable to propose anything concerning this matter.” Ben-Gurion and his colleagues were concerned that bombing the camps could kill many Jews—or even one Jew. Although no specific documentation reversing the decision of June 11 has been found, officials of the Jewish Agency were forcefully calling for the bombing by July.

What happened between the June 11 refusal to call for bombing and the subsequent action? After the Vrba-Wetzler report arrived in Palestine, the Jewish Agency executive committee had come to understand what was happening in Poland and was much more willing to risk Jewish lives in the camp rather than to permit the gassing to proceed unimpeded.

Jewish Agency officials appealed to British Prime Minister Winston Churchill, who told his foreign secretary Anthony Eden on July 7, “Get anything out of the Air Force you can and invoke me if necessary.” Yet the British never carried through with the bombing.

Requests were also made to American officials to bomb Auschwitz. Similarly they were asked to come to the aid of the Poles in the Warsaw Uprising of 1944 by bombing the city. Yet the Americans denied the requests to bomb Auschwitz, citing several reasons: military resources could not be diverted from the war effort (as they were to support the non-Jewish Poles); bombing Auschwitz might prove ineffective; and bombing might provoke even more vindictive German action. On the other hand, the Americans did not claim that Auschwitz was outside the range of the most effective American bombers.

In fact, as early as May 1944 the U.S. Army Air Forces had the capability to strike Auschwitz at will. The rail lines from Hungary were also well within range, though for rail-line bombing to be effective it had to be sustained. On July 7, 1944, American bombers flew over the rail lines to Auschwitz. On August 20, 127 B-17s, with an escort of 100 P-51 fighter craft, dropped 1,336 500-pound bombs on the

IG Farben synthetic-oil factory that was less than 5 miles (8 km) east of Birkenau. German oil reserves were a priority American target, and the Farben plant ranked high on the target list. The death camp remained untouched. It should be noted that military conditions imposed some restrictions on any effort to bomb Auschwitz. For the bombing to be feasible, it had to be undertaken by day in good weather and between July and October 1944.

In August, Assistant Secretary of War John J. McCloy wrote to Leon Kubowitzki of the World Jewish Congress, noting that the War Refugee Board had asked if it was possible to bomb Auschwitz. McCloy responded:

After a study it became apparent that such an operation could be executed only by the diversion of considerable air support essential to the success of our forces now engaged in decisive operations elsewhere and would in any case be of such doubtful efficacy that it would not warrant the use of our resources. There has been considerable opinion to the effect that such an effort, even if practicable, might provoke even more vindictive action by the Germans.

McCloy's response remains controversial. There had been no study on bombing Auschwitz. Instead, the War Department had decided in January that army units would not be "employed for the purpose of rescuing victims of enemy oppression" unless a rescue opportunity arose in the course of routine military operations. In February an internal U.S. War Department memo stated, "We must constantly bear in mind, however, that the most effective relief which can be given victims of enemy persecution is to insure the speedy defeat of the Axis." No documents have been found in the records of the leaders of Army Air Forces considering the possibility of bombing Auschwitz.

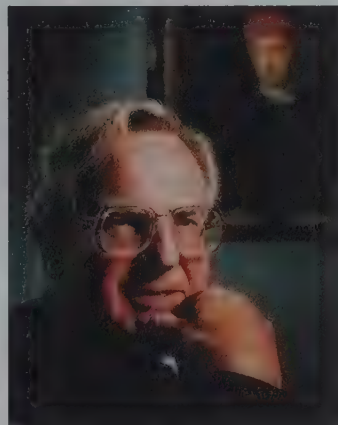
For three decades the failure to bomb Auschwitz was a minor side issue to the war and the Holocaust. In May 1978 American historian David Wyman wrote an article in the magazine *Commentary* titled "Why Auschwitz Was Never Bombed." His article provoked much positive response and was reinforced by the startling photographs published by two leading Central Intelligence Agency photo interpreters, Dino Brugioni and Robert Poirier. Developed with technology available in 1978, but not in 1944, these photographs seemingly gave a vivid demonstration of what U.S. intelligence could have known about Auschwitz-Birkenau, if only they had been interested. One photograph shows bombs dropping over the camp—because the pilot released the bombs early, it appeared that bombs targeted for the Farben plant were dropped on Auschwitz-Birkenau. Another pictures Jews on the way to the gas chambers. Wyman's claims gained considerable attention, and the failure to bomb became synonymous with American indifference.

In the late 1980s and early '90s, debate over the issue intensified. Military historians challenged Holocaust historians in an ineffectual debate characterized as the "Dialogue of the Deaf." In 1993 both Holocaust scholars and military historians of divergent points of view addressed the issue in a symposium at the National Air and Space Museum that marked the opening of the United States Holocaust Memorial Museum. At issue was the nature of the aircraft that could have been used. Was bombing feasible, and when? From what air fields would the bombers take off, and where would they land? What airplanes would be used? What escorts would be required, and at what cost in men and material? Could lives have been saved and how many? At what cost to the Allies? But in addition to military considerations, political questions were at issue. Did the plight of the Jews matter? To whom and how deeply? Were Jews effective or ineffective in advancing the cause of their brethren abroad? Did they comprehend their plight? Were they compromised by their fears of anti-Semitism or by the fears they shared with American political leaders that the World War would be perceived as a Jewish war? Historians are uncomfortable with the counterfactual speculation "What if. . ." But such is the debate over bombing Auschwitz.

We know that, in the end, the pessimists won. They argued that nothing could be done, and nothing was done. The proposals of the optimists, those who argued that something could be done, were not even considered. Given what happened at Auschwitz-Birkenau during the summer of 1944, many have seen the failure to bomb as a symbol of indifference. Inaction helped the Germans achieve their goals and left the victims with little power to defend themselves. The Allies did not even offer bombing as a gesture of protest.

STEWART SUTHERLAND ON *The Scottish Enlightenment*

Lord Sutherland is a distinguished Scottish scholar and public servant and one of Britain's foremost philosophers of religion. He is the former president of the Royal Society of Edinburgh, current president of the Royal Institute of Philosophy, and a member of the House of Lords. He was knighted in 1995, raised to the peerage as Baron Sutherland of Houndwood in 2001, and inducted into the Order of the Thistle in 2002. Lord Sutherland has served as principal of the University of Edinburgh, vice-chancellor of the University of London, and professor of history and philosophy of religion at King's College, London. He was formerly Her Majesty's Chief Inspector of Schools in England and was for several years a member of Britannica's Editorial Board of Advisors, reestablishing the company's historical link to Scotland.



Scottish Enlightenment was the conjunction of minds, ideas, and publications in Scotland during the whole of the second half of the 18th century and extending over several decades on either side of that period. Contemporaries referred to Edinburgh as a “hotbed of genius.” Voltaire in 1762 wrote in characteristically provocative fashion that “today it is from Scotland that we get rules of taste in all the arts, from epic poetry to gardening,” and Benjamin Franklin caught the mood of the place in his *Autobiography* (1794): “Persons of good Sense . . . seldom fall into [disputation], except Lawyers, University Men, and Men of all Sorts that have been bred at Edinburgh.”

The personalities were fundamental: most prominent in retrospect are the philosophers David Hume and Adam Smith, matched at the time by Thomas Reid and Dugald Stewart. However, the Scottish Enlightenment was neither a single school of philosophical thought nor a single intellectual movement. But movement

it was: a movement of ideas and the disputation of those ideas. The men who developed and disputed those ideas as they met in the societies and ate and drank in the taverns of the Old Town in Edinburgh created momentum on many fronts. It was a movement of taste in architecture—Robert Adam and his brother James, followed in due course by William Playfair; a movement of taste in literature and belles lettres—Hugh Blair, the holder of the first chair of rhetoric in the University of Edinburgh, and the poets James Thomson, Allan Ramsay, and the incomparable Robert Burns, as well as the playwright John Home; a movement in the arts, especially in portraiture—the portrait artists Allan Ramsay and Henry Raeburn and the miniature wax and paste portraitists James Tassie, his nephew William Tassie, and John Henning. Equally central were those who made lasting and formative impacts on the development of the sciences of mathematics (Colin Maclaurin), medicine (William Cullen), chemistry (Joseph Black), engineering (James Watt and Thomas Telford), and geology (James Hutton). . . .

The outcome of this ferment of intellectual activity has been sketched in such grand, all-encompassing terms as “the invention of the modern world” or, simply, “modernity,” as historian Arthur Herman has characterized it. Alternatively, it has also been described more specifically in terms of institutions, styles of thinking and writing, or seminal works of philosophy or literature. Likewise, traces of the Scottish Enlightenment can be identified in many major cultural, political, and philosophical movements that followed it.

Herman makes a detailed case for finding key elements of modern society originating or developing significantly in the context of the Scottish Enlightenment. Smith, for instance, has been hailed by politicians and economists in the United States and the United Kingdom as the founder of, and inspiration for, capitalism. There is no doubt that in Smith’s *The Wealth of Nations* the fundamental principles of capitalism—specialization, the division of labour, and the primacy of free markets—are fashioned into the powerful economic and social theory that today dominates politics in much of the developed world. Along with this goes the substitution of merit, talent, and the creation of wealth as the key drivers of economic development, in place of inherited wealth and aristocratic patronage. In practice, the most significant change that the principles formulated by Smith wrought in society was the creation of the middle class. Increasing enfranchisement was an inevitable accompaniment, and with that came seismic shifts in the location and exercise of political power.

Of course, there were many other forces at play here, not all of which can be traced directly to the Scottish Enlightenment. However, the Scots did have important parts to play in the development of industrialization. The importance of Watt’s harnessing of the power of steam can hardly be overestimated, and Herman makes a powerful case for the influence of two Scottish engineers on the

Encyclopædia Britannica, Inc.



The 1st Edition (1768–71) of Encyclopædia Britannica.

development of modern approaches to transport: John McAdam, the inventor of the macadam road surface, and Telford, who made massive contributions to the engineering of bridge building and canal construction. The accomplishments of McAdam and Telford are two examples of a principle central to the Scottish Enlightenment: that of accompanying the extension of knowledge through inquiry, observation, and experiment with the search for applications of that increased understanding as “useful knowledge.”

The importance of education in individual and societal progress was illustrated well and had specific legacies. A group of Scots educated by Stewart and led by Henry Peter Brougham were central to the creation of the first postmedieval university in England, the University of London. They persuaded the citizens of London of the truth of what Edinburgh’s citizens had seen some 250 years earlier: that a capital city needed a university. The University of Edinburgh and its reputation was riding high in international esteem at this time (Thomas Jefferson, for example, had been happy to recommend it to a young relative), and it was taken as an early model in the foundation in 1826 of what is now University College, London. Princeton University in the United States also owed a great deal to Scots formed by Enlightenment learning: John Witherspoon, signatory of the Declaration of Independence and early head of Princeton (then known as the College of New Jersey), had studied at the University of Edinburgh, as had James McCosh, author of the first important book on the history of the philosophy of common sense and president of Princeton in the 19th century.

Less well known is the impact of the philosophy of common sense, particularly the writings of Reid and Stewart, on Andrés Bello, Venezuela’s most celebrated man of letters, who was a tutor and, later, emissary of Simón Bolívar during the early 19th century. Bello spent nearly 20 years in London, much of it in the British Library, as Bolívar’s political representative while Bolívar fought the South American wars of liberation from Spain. Bello’s reward and further responsibilities included founding the University of Chile and writing the Chilean Civil Code (1855), upon which other Latin American countries modeled their own law codes. His philosophical sources went beyond Scotland to France, but his published works show a strong debt to Reid and Stewart in particular.

Undoubtedly, the most enduring outcomes of the Scottish Enlightenment have taken physical form, whether the buildings of the Adam brothers, the portraits of Raeburn, the books of Burns, or the editions of the *Encyclopædia Britannica*. Pre-eminent among these, however, are the philosophical writings of Hume and Smith. In the former case, the tribute from Immanuel Kant that Hume woke him from his “dogmatic slumbers” encapsulates the extent of Hume’s intellectual influence over the ensuing 200 years. Smith’s *The Wealth of Nations* has been definitive in the ways outlined above, and due importance has been increasingly attached to his *The Theory of Moral Sentiments* (1759) as a tool for understanding his economic theory. Many other writings of the Scottish Enlightenment have historical significance for the development of science and philosophy, most notably Hutton’s *Theory of the Earth* and Reid’s *An Inquiry into the Human Mind on the Principles of Common Sense* (1764), but the prize for continuing engagement with the best minds of the 21st century must go to Hume and Smith.

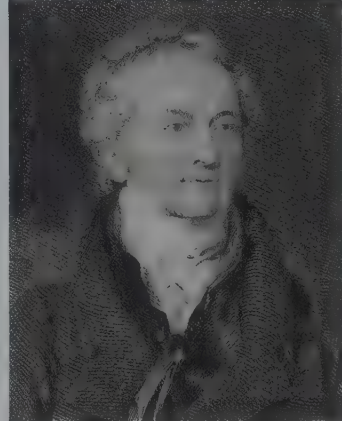
THOMAS YOUNG ON

The Rosetta Stone

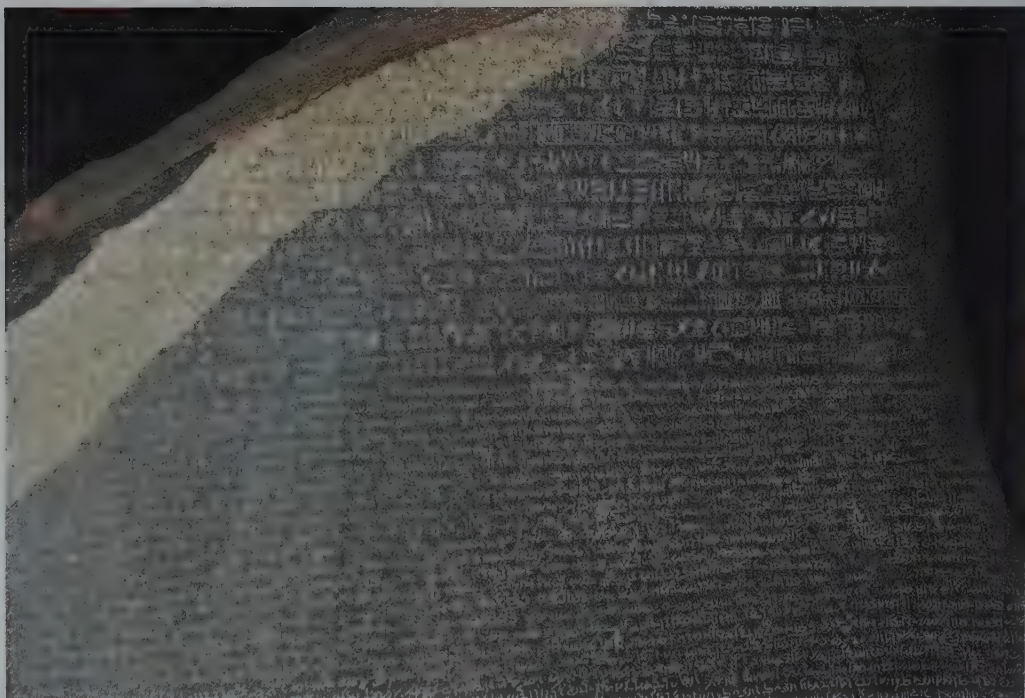
Thomas Young (1773–1829) was an English polymath who as a physician discovered the cause of astigmatism, as a physicist formulated the wave theory of light, and as an Egyptologist and linguist was the first to decipher the famed Rosetta Stone after it was dug up by a Frenchman in Rosetta (Rashid), Egypt, in 1799 and then passed into British hands after the French surrender of Egypt to the British in 1801. That his translation contained some errors is unimportant; independent efforts by Young and, later, the French Egyptologist Jean-François Champollion decisively unlocked Egyptian hieroglyphics to modern interpretation.

Young wrote the article “Egypt” for Britannica’s Supplement (1815–24) to its 4th, 5th, and 6th editions, along with more than 60 other articles for Britannica, most of them biographies. Half or more of his 42-page “Egypt” article recounted his momentous decipherment of the Rosetta Stone. It was the first publication anywhere in the world of news of that remarkable event. A brief extract follows.

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The block or pillar of black basalt, found by the French in digging up some ground at Rosetta, and now placed in the British Museum, exhibits the remains of three distinct inscriptions: and the last, which is in Greek, ends with the information, that the decrees, which it contains, was ordered to be engraved in three different characters, the sacred letters, the letters of the country, and the Greek. Unfortunately a considerable part of the first inscription is wanting: the beginning of the second, and the end of the third, are also mutilated; so that we have no precise points of coincidence from which we can set out, in our attempts to decipher the unknown characters. The second inscription, which it will be safest to distinguish by the Greek name *enchorial*, signifying merely the characters “of the country,” notwithstanding its deficiencies near the beginning, is still sufficiently



The Rosetta Stone, in the British Museum, London.

perfect to allow us to compare its different parts with each other, and with the Greek, by the same method that we should employ if it were entire. Thus, if we examine the parts corresponding, in their relative situation, to two passages of the Greek inscription in which *Alexander* and *Alexandria* occur, we soon recognize two well marked groups of characters resembling each other, which we may therefore consider as representing these names: a remark which was first made by Mr. de Sacy, in his Letter relating to this inscription. A small group of characters, occurring very often in almost every line, might be either some termination, or some very common particle: it must, therefore, be reserved till it is found in some decisive situation, after some other words have been identified, and it will then easily be shown to mean *and*. The next remarkable collection of characters is repeated twenty nine or thirty times in the enchorial inscription; and we find nothing that occurs so often in the Greek, except the word *king*, with its compounds, which is found about thirty seven times. A fourth assemblage of characters is found fourteen times in the enchorial inscription, agreeing sufficiently well in frequency with the name of *Ptolemy*, which occurs eleven times in the Greek, and generally in passages corresponding to those of the enchorial text in their relative situation: and, by a similar comparison, the name of Egypt is identified, although it occurs much more frequently in the enchorial inscription than in the Greek, which often substitutes for it country only, or omits it entirely. Having thus obtained a sufficient

number of common points of subdivision, we may next proceed to write the Greek text over the enchorial, in such a manner that the passages ascertained may all coincide as nearly as possible; and it is obvious that the intermediate parts of each inscription will then stand very near to the corresponding passages of the other.

In this process, it will be necessary to observe that the lines of the enchorial inscription are written from right to left, as, Herodotus tells us, was the custom of the Egyptians; the division of several words and phrases plainly indicating the direction in which they are to be read. It is well known that the distinct hieroglyphical inscriptions, engraved on different monuments, differ in the direction of the corresponding characters: they always face the right or the left of the spectator according as the principal personages of the tablets, to which they belong, are looking in the one or the other direction; where, however, there are no tablets, they almost always look towards the right; and it is easily demonstrable that they must always have been read beginning from the front, and proceeding to the rear of each rank. But the Egyptians seem never to have written alternately backwards and forwards, as the most ancient Greeks occasionally did. In both cases, however, the whole of the characters thus employed were completely reversed in the two different modes of using them, as if they were seen in a glass, or printed off like the impression of a seal.

By pursuing the comparison of the inscriptions, thus arranged, we ultimately discover the signification of the greater part of the individual enchorial words. . . .

We Damn Your Memory! The Confederate Statue Controversy

By Shadi Bartsch-Zimmer

In choosing to remove monuments honoring figures now viewed as objectionable, contemporary Americans are in a world-historical majority. Removing statues is a recourse with a long history. Popular revolutions often bring down statues of hated rulers—one recalls the destruction of Saddam Hussein's statue in Firdaus Square in April 2003, and around the globe Cecil J. Rhodes, Christopher Columbus, and many others have met similar fates. At the very birth of America, shortly after the ratification of the Declaration of Independence in 1776, a statue of King George III was toppled in Manhattan. But we should remember we also deplore such action when it functions as an attempt to erase ideologies deemed undesirable by rulers or religious groups intent on absolute control, the Taliban destruction of the Buddhas of Bamiyan being a recent case.

What many such cases have in common is the condemnation of one set of values by those holding an opposing one. The Confederate leaders' statues exemplify this swerve in the perception of American history: figures judged worthy of honor in the past (or quite recently—Confederate statues were erected as late as 1948) are now judged unworthy of it. As James Young put it in "Memory and Counter-Memory" (1999), "Neither the monument nor its meaning is really everlasting. Both a monument and its significance are constructed in particular times and places, contingent on the political, historical, and aesthetic realities of the moment." The often prominent position of such statues in city centers and parks is particularly problematic: such monuments were intended to remind citizens of their common values and of the sacrifices made to ensure a just and stable state, but they no longer stand for justice in our eyes. The beliefs of most Americans now are not, thankfully, those of the slave-

holding South during the Civil War.

There are, however, more general issues posed by such monuments to which there is no easy solution. Since these monuments are contingent not only on historical and political realities but historical and political moral values, the erasure of visible signs of a past whose values are now unacceptable exposes us to two great risks.

The first is that we risk losing sight of the fact that what is considered morally wrong changes with history. The Declaration of Independence vouchsafed every human being the right to "life, liberty, and the pursuit of happiness" and claimed that "all men are created equal" even as slaves were excluded from this category—and Jews, Native Americans, non-property owners, and women. However, the Founding Fathers' great moral and political advance is now also seen as being undermined by questionable moral compromise. American engagement in World War II still stands, for the majority of Americans, as an earnest attempt to restore justice to the world. Yet the dropping of the atomic bombs on Hiroshima and Nagasaki continues to raise fundamental moral questions. Even in the case of museums, protestors may demand the removal of exhibits viewed by some as morally problematic and/or trauma-inducing, as happened recently with the "Gallows" exhibit at the Walker Art Center in Minneapolis and the B-29 bomber *Enola Gay* at the National Air and Space Museum.

Because this country has a tendency to believe in American exceptionalism, with its inbuilt assumption of national goodness at home and abroad, we need reminders of the fact that our values change and that what looks like justice today may not tomorrow. Rather than assuming that we can ease the unpleasant memories caused by past errors of judgment by toppling statues, we should strive, somehow, to keep a record of what

we would like to forget or dishonor. After all, an empty plinth cannot show that we have chosen to dishonor a quondam “great man.” It shows—nothing.

In imperial Rome, the senate often chose to change the appearance of public statues in honor of a person—usually an emperor—judged no longer worthy of the honor. They voted for *damnatio memoriae*, the “damnation of memory,” which entailed removing all his images from the public eye. Realizing, however, that the literal erasure of a person’s public existence would also leave a greatly diminished memory of the person to be damned, they left visible signs of the original statues. Most of the condemned figures had their features recut as new honorific portraits; sometimes the head would be replaced with a new head while the body was allowed to stand. As a result, viewers could still see the “erasure” of Caligula, Nero, or Domitian: a crude seam at the neck, a body

that didn’t match its head, traces of another hairstyle—all these phenomena spoke to the decision to erase, and thus reminded their viewer of the tyrant’s disgrace.

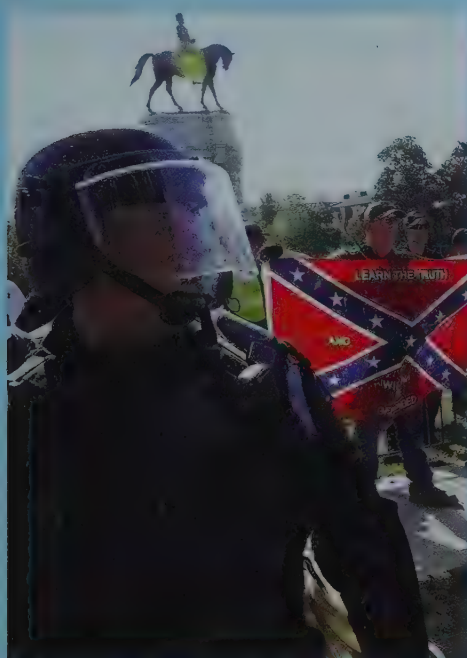
There are no tyrants in American history since the founding of the nation, but we too have to figure out a way to record our desire to remove honor from the formerly honored. Here is where the second great risk may lurk. In a democracy, where values, institutions, and practices depend on the popular will rather than on military leaders, whom we decide to “honor” is up to us. But history and moral opinion have a troubling relationship. In damning prior great men, we must also damn ourselves—or, at least, the members of the democracy that erected the honorific statues in the first place. We must choose: Are we morally right now but never before (in which case what should we teach about our history?), or is moral value at any given moment actually made up of the will of the majority of the people at that point in time (in which case, we cannot claim our moral rectitude as absolute)?

To remove Confederate statues from their honorific perches in 2017 is an effective way to show that we no longer find Robert E. Lee, Stonewall Jackson, Jefferson Davis, and others to be good models for our nation. But let us at least find a way to show we made this particular decision at this particular time. Let there be some visible record of it so that, as a democracy, we have the humility to admit that our moral values, at any given time, may conceal as many problems as they let emerge into the light of day. Otherwise, we will simply pride ourselves on what we have corrected and easily condemn our predecessors—as some day we too may be condemned.

Shadi Bartsch-Zimmer is the director of the Stevanovich Institute on the Formation of Knowledge at the University of Chicago and the Helen A. Regenstein Distinguished Service Professor of Classics. She has authored or edited some 12 books on antiquity and is currently studying the contemporary Chinese reception of the Greco-Roman classics.

Joshua Roberts/Reuters/Newscom

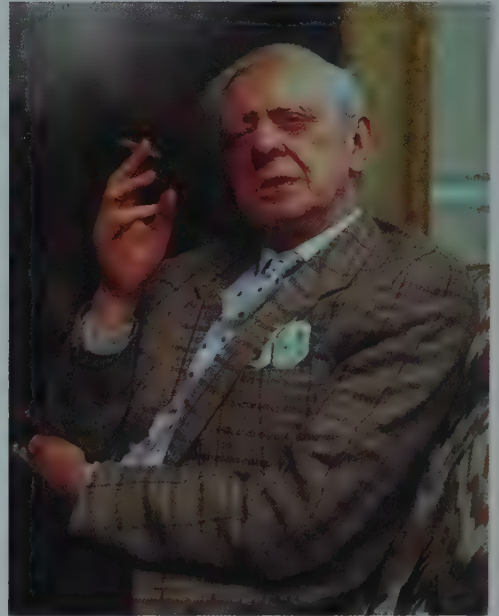
Police provide protection for members of the group New Confederate States of America as they protest the proposed removal of a statue of Confederate General Robert E. Lee in Richmond, Virginia, on September 16, 2017.



ANTHONY BURGESS ON *The Novel*

*The current Britannica is particularly fortunate in having writers who can effectively handle the major literary genres. (See later in this book Howard Nemerov's essay on poetry.) The novel, an interestingly chaotic form, offered a challenge well met by the English novelist, man of letters, linguist, Joycean, and musician Anthony Burgess (1917–93). Burgess was a kind of English Norman Mailer, not afraid of exhibiting temperament and an often bizarre independence. His reputation was established with *A Clockwork Orange* (1962; film 1971). His lengthy Britannica article on the novel was a remarkable job of boxing the compass. No one could have done better in 8,000 words. We excerpt below the introduction to his piece.*

Jonathan Player—Rex Features/AP Images



The novel is a genre of fiction, and fiction may be defined as the art or craft of contriving, through the written word, representations of human life that instruct or divert or both. The various forms that fiction may take are seen less as a number of separate categories than as a continuum or, more accurately, a cline, with some such brief form as the anecdote at one end of the scale and the longest conceivable novel at the other. When any piece of fiction is long enough to constitute a whole book, as opposed to a mere part of a book, then it may be said to have achieved novelhood. But this state admits of its own quantitative categories, so that a relatively brief novel may be termed a novella (or, if the insubstantiality of the content matches its brevity, a novelette), and a very long novel may overflow

the banks of a single volume and become, a *roman fleuve*, or river novel. Length is very much one of the dimensions of the genre. . . .

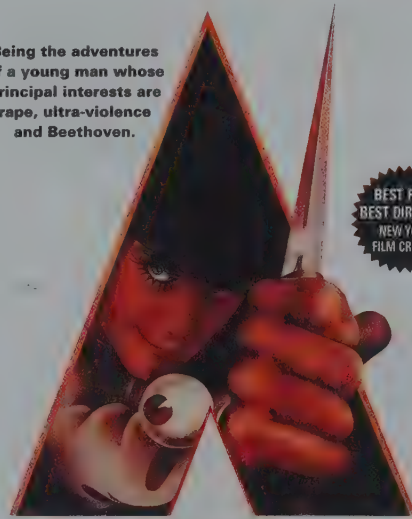
Such early ancient Roman fiction as Petronius' *Satyricon* of the 1st century AD and Lucius Apuleius' *Golden Ass* of the 2nd century contain many of the popular elements that distinguish the novel from its nobler born relative the epic poem. In the fictional works, the medium is prose, the events described are unheroic, the settings are streets and taverns, not battlefields and palaces. There is more low fornication than princely combat; the gods do not move the action; the dialogue is homely rather than aristocratic. It was, in fact, out of the need to find—in the period of Roman decline—a literary form that was anti-epic in both substance and language that the first prose fiction of Europe seems to have been conceived. The most memorable character in Petronius is a *nouveau riche* vulgarian; the hero of Lucius Apuleius is turned into a donkey; nothing less epic can well be imagined.

The medieval chivalric romance (from a popular Latin word, probably *Romanice*, meaning written in the vernacular, not in traditional Latin) restored a kind of epic view of man—though now as heroic Christian, not heroic pagan. At the same time, it bequeathed its name to the later genre of continental literature, the novel, which is known in French as *roman*, in Italian as *romanzo*, etc. (The English term romance, however, carries a pejorative connotation.) But that later genre achieved its first great flowering in Spain at the beginning of the 17th century in an antichivalric comic masterpiece—the *Don Quixote* of Cervantes, which, on a larger scale than the *Satyricon* or *The Golden Ass*, contains many of the elements that have been expected from prose fiction ever since. Novels have heroes, but not in any classical or medieval sense. As for the novelist, he must, in the words of the contemporary British-American W.H. Auden,

Become the whole of boredom, subject to
Vulgar complaints like love, among the Just
Be just, among the Filthy filthy too,

Being the adventures
of a young man whose
principal interests are
rape, ultra-violence
and Beethoven.

BEST FILM
BEST DIRECTOR
NEW YORK
FILM CRITICS



STANLEY KUBRICK'S

A CLOCKWORK
ORANGE

A poster advertising the film *A Clockwork Orange*, 1971.

And in his own weak person, if he can,
Must suffer dully all the wrongs of Man.

The novel attempts to assume those burdens of life that have no place in the epic poem and to see man as unheroic, unredeemed, imperfect, even absurd. This is why there is room among its practitioners for writers of hard-boiled detective thrillers such as the contemporary American Mickey Spillane or of sentimental melodramas such as the prolific 19th-century English novelist Mrs. Henry Wood, but not for one of the unremitting elevation of outlook of a John Milton.

BRUCE STERLING ON *Science Fiction*

Bruce Sterling is a prolific and prominent writer of science fiction who is widely credited with defining and solidifying the sci-fi subgenre of cyberpunk, frequently described as a combination of low life and high-tech. He is a multiple winner of the prestigious Hugo Award, given annually for distinguished writing in the realm of science fiction and science fantasy. An excerpt from his lengthy Britannica entry on "science fiction" follows.

Courtesy of Bruce Sterling



Science fiction, abbreviation SF or sci-fi, is a form of fiction that deals principally with the impact of actual or imagined science upon society or individuals. The term *science fiction* was popularized, if not invented, in the 1920s by one of the genre's principal advocates, the American publisher Hugo Gernsback. The Hugo Awards, given annually since 1953 by the World Science Fiction Society, are named after him. These achievement awards are given to the top SF writers, editors, illustrators, films, and "fanzines."

The World of Science Fiction

Science fiction is a modern genre. Though writers in antiquity sometimes dealt with themes common to modern science fiction, their stories made no attempt at scientific and technological plausibility, the feature that distinguishes science fiction from earlier speculative writings and other contemporary speculative genres such as fantasy and horror. The genre formally emerged in the West, where the social transformations wrought by the Industrial Revolution first led writers and intellectuals to extrapolate the future impact of technology. By the beginning of the 20th century, an array of standard science fiction "sets" had developed around certain themes, among them space travel, robots, alien beings, and time travel. The

customary “theatrics” of science fiction include prophetic warnings, utopian aspirations, elaborate scenarios for entirely imaginary worlds, titanic disasters, strange voyages, and political agitation of many extremist flavours, presented in the form of sermons, meditations, satires, allegories, and parodies—exhibiting every conceivable attitude toward the process of techno-social change, from cynical despair to cosmic bliss.

Science fiction writers often seek out new scientific and technical developments in order to prognosticate freely the techno-social changes that will shock the readers’ sense of cultural propriety and expand their consciousness. This approach was central to the work of H.G. Wells, a founder of the genre and likely its greatest writer. Wells was an ardent student of the 19th-century British scientist T.H. Huxley, whose vociferous championing of Charles Darwin’s theory of evolution earned him the epithet “Darwin’s Bulldog.” Wells’s literary career gives ample evidence of science fiction’s latent radicalism, its affinity for aggressive satire and utopian political agendas, as well as its dire predictions of technological destruction.

This dark dystopian side can be seen especially in the work of T.H. Huxley’s grandson, Aldous Huxley, who was a social satirist, an advocate of psychedelic drugs, and the author of a dystopian classic, *Brave New World* (1932). The sense of dread was also cultivated by H.P. Lovecraft, who invented the famous *Necronomicon*, an imaginary book of knowledge so ferocious that any scientist who dares to read it succumbs to madness. On a more personal level, the works of Philip K. Dick (often adapted for film) present metaphysical conundrums about identity, humanity, and the nature of reality. Perhaps bleakest of all, the English philosopher Olaf Stapledon’s mind-stretching novels picture all of human history as a frail, passing bubble in the cold galactic stream of space and time.

Stapledon’s views were rather specialized for the typical science fiction reader. When the genre began to gel in the early 20th century, it was generally disreputable, particularly in the United States, where it first catered to a juvenile audience. Following World War II, science fiction spread throughout the world from its epicentre in the United States, spurred on by ever more staggering scientific feats, from the development of nuclear energy and atomic bombs to the advent of space travel, human visits to the Moon, and the real possibility of cloning human life.

By the 21st century, science fiction had become much more than a literary genre. Its avid followers and practitioners constituted a thriving worldwide subculture. Fans relished the seemingly endless variety of SF-related products and pastimes, including books, movies, television shows, computer games, magazines, paintings, comics, and, increasingly, collectible figurines, Web sites, DVDs, and toy weaponry. They frequently held well-attended, well-organized conventions, at which costumes were worn, handicrafts sold, and folk songs sung. . . .

High Technologies

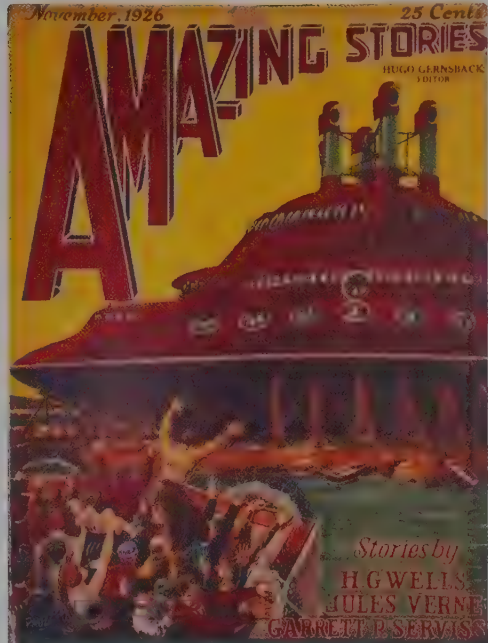
Leo Marx, author of the techno-social study *The Machine in the Garden* (1964), coined the useful term *technological sublime* to indicate a quasi-spiritual haze 'given off by any particularly visible and impressive technological advance. Science fiction dotes on the sublime, which ruptures the everyday and lifts the human spirit to the plateaus of high imagination. Common models of the technological sublime include railroads, photography, aviation, giant dams, rural electrification (a particular Soviet favourite), atomic power and atomic weapons, space flight, television, computers, virtual reality, and the "information superhighway." The most sublime of all technologies are, in reality, not technologies at all but rather technological concepts—time machines, interplanetary starships, and androids.

Humans quickly lose a sense of awe over the technological advancements that have been fully integrated into the fabric of everyday life. Technologies such as immunization, plumbing, recycling, and the birth control pill have had a profound cultural impact, but they are not considered sublime nor are they generally subjects for science fiction. The reason for this is not directly related to the scientific principles involved or any inherent difficulties of the engineering. It is entirely a social judgment, with distinctly metaphysical overtones. Science fiction is one of the arenas in which these judgments are cast.

Space flight is one high technology to which science fiction has shown a passionate allegiance. For the most part, the space shuttle remains sublime, even though it is three decades old and in its final years of operation. Were space shuttles as common as 747s, they would quickly lose their sublime affect.

Outer space and cyberspace—a science fiction term applied to computer networks and simulated spaces—are conceptual cousins, offering the same high-tech thrill through different instruments in different historical periods. Yet with cybertechnology rapidly achieving mass acceptance and becoming commonplace in many parts of the world, its SF allure is fading fast. Science fiction therefore has been once again making tentative overtures to biotechnology, although a relationship has existed at least since Mary Shelley's *Frankenstein* was published. Unlike

Photograph, Christine E. Haycock, M.D.



Cover of Hugo Gernsback's *Amazing Stories*, November 1926.

computers, biotechnology is deeply rooted in ancient and highly conservative pursuits such as medicine and agriculture. Social resistance to gene-altered crops, animals, and especially human children is widespread.

The sheer novelty of computers masked their particular affinity for pornography, swindling, organized crime, and terrorist conspiracy until they were widely present in the home. By contrast, the potential social impact of cloning was easy to recognize and led to a spate of SF works, including Aldous Huxley's *Brave New World* (1932), with its tank-born castes of workers. Czech "biopunk" stories of the 1980s used genetic parables to indict the moral warping of Czech society under Warsaw Pact oppression. Biologically altered "posthumans" are becoming an SF staple. First visualized as menacing monsters or Nietzschean supermen, the genetically altered were increasingly seen as people with unconventional personal problems.

Although many of the technologies that were first envisioned by science fiction have become reality—and become mundane aspects of mainstream fictional works—scientific knowledge is growing exponentially, leaving plenty of room for further speculation about its future impact on society and individuals. It is hard to imagine any contemporary society's being fully immune to the prognosticating lure of science fiction.

E. B. WHITE ON *Harold Ross*

Younger readers will doubtless know E.B. White (1899–1985) as a writer of memorable children's stories, such as *Stuart Little* and *Charlotte's Web*. But older readers likely know him as one of the finest essayists in the English language. A mainstay of *The New Yorker* for 56 years, he was well qualified to write for *Britannica* on the subject of his boss Harold Ross, founding editor of *The New Yorker*. No one but White could, with a handful of tiny touches, impart such warmth to the mini-article he produced for *Britannica's* 14th Edition (1929–73).

Encyclopædia Britannica, Inc.



Harold Wallace Ross, a revolutionary figure in U.S. journalism, founder and first editor of *The New Yorker*, was born in Aspen, Colo., Nov. 6, 1892. He quit high school to become a reporter, and in World War I edited *Stars and Stripes*, the serviceman's newspaper, in France. When he launched *The New Yorker* in 1925 he quickly toppled many conventional literary forms in his quest for ways to capture the contemporary scene in the magazine's pages.

Young new writers and artists, attracted by the rich odour of innovation, were drawn to the magazine. Under Ross's guidance, satire and parody flourished, reporting became lighthearted and searching, humour was allowed to infect everything, biography achieved bold strokes in the "Profiles," the short story enjoyed a reprieve from the heavy burden of plot, and social cartooning became less diagrammatic and more vigorous. In *The New Yorker*, the unknown writer was on equal footing with the established one; the editor sought good writing, not great names. Restless, noisy, consumed by curiosity, driven by a passion for clarity and perfection, Ross spent himself recklessly on each succeeding issue, and with unabating discontent.

Ross died in Boston on Dec. 6, 1951, having to a notable extent changed the face of journalism in his time.

G. K. CHESTERTON ON *Charles Dickens*

Gilbert Keith Chesterton (1874–1936)—the polymathic poet, philosopher, orator, journalist, superb stylist, and author of such classics as The Napoleon of Notting Hill, Orthodoxy, The Everlasting Man, and the sleuthy tales of the priestly Father Brown—is, like the subject he wrote on for Britannica, a giant of English literature and culture. We may know more about Charles Dickens today than Chesterton did—especially in light of the titillating Ellen Ternan revelations, about the middle-age Dickens’s affair with the teenage girl—but it hardly matters. For who could write better about the English giant than G.K.C. did? What we have here

instead is a love letter to what really matters: the novels themselves and the volcanic genius that lay behind them. We reprint below the conclusion to Chesterton’s 8,500-word paean, highlighting what Chesterton saw as Dickens’s ultimate gift to the world. It was published in the inaugural printing of Britannica’s 14th Edition in 1929.

Library of Congress, Washington, D.C. (LC-B2-1272-7b)



His [Dickens’s] life was destined to end in a whirlwind of an entirely new type of activity; which none the less never interrupted that creative work which was the in-dwelling excitement of all his days. He wrote one more complete novel, *Our Mutual Friend* (1864–65), and it is more complete than most. Indeed it is one of the best though not one of the most Dickensian of the Dickens novels. He then turned his restless talent to something in the nature of a detective story, more in the manner of his friend Wilkie Collins; the sort of story which begins by asking a question; in this case a question about the secret and the sequel of the fate of the hero, Edwin Drood. The question will never be answered; for it was cut short by the only thing that could be more dramatic than the death of the hero; the death of the author. Charles Dickens was dead.

He died very suddenly, dropping from his chair at the dinner-table, in the year 1870 at the comparatively early age of fifty-eight. A death so abrupt, and essentially so premature, could not but raise doubts about the wisdom of his impetuous industry and debates almost as varied as those round the secret of Edwin Drood. But without exaggerating any one of the elements that contributed to it, we may note that the very last phase of his life was a new phase; and was almost entirely filled with his new activity in giving public readings from his works. He had gone to America once more in the November of 1867, with this particular purpose; and his campaign of public speaking in this style was truly American in its scope and scale. If he had indeed been unjust to America as a writer, it is curious that he should have reached his final popularity and perhaps his final collapse, in a character so supremely American. Differences exist about how far he exaggerated the function or how far his biographer exaggerated the danger; but his own letters, ragged with insomnia and impatience, full of desperate fatigue and more desperate courage, are alone enough to show that he was playing a very dangerous game for a man approaching sixty. But it is certainly true, as is alleged on the other side, that this was nothing new in the general conduct of Dickens; that he had long ago begun burning the candle at both ends; and there have been few men, in the matter of natural endowments, with so great and glorious a candle to burn.

He was buried in the Poet's Corner of Westminster Abbey; and new and vulgar as many critics had called his work, he was far more of a poet than many who were buried there as poets. He left a will commending his soul to God, and to the mercy of Jesus Christ, and leaving his works to the judgment of posterity; and in both respects the action was symbolic and will remain significant in history. Intellectually limited as he was by the rather cheap and cheery negations of an age of commercial rationalism, he had never been a bitter secularist or anti-clerical; he was at heart traditional and was drawn much more towards Anglican than Puritan Christianity; and his greatest work may yet prove to be the perpetuation of the joyful mystery of Christmas. On the other side, he has suffered and may suffer again the changes in the mere fashions of criticism; but his work was creative, it added something to life; and it is hard to believe that something so added will ever be entirely taken away. The defects of his work are glaring; they hardly need to be detected; they need the less to be emphasized because, unfortunately, he always emphasized them himself. It may be a fault, it is certainly a fact, that he enjoyed writing his worst work as much as his best.

The charge of exaggeration is itself exaggerated. It is also, which is much more important, merely repeated mechanically, without any consideration of its true meaning. Dickens did exaggerate; but his exaggeration was purely Dickensian. In this sense his very vulgarity had the quality of distinction. Mere overstatement, to say that a tall man is ten feet high, to say that a frosty morning froze Niagara;



English novelist Charles Dickens in an undated portrait.

this is something relatively easy to do, though sometimes very cleverly done, especially by Americans. But the distinction of Dickens can be stated even in the common charge against him. He is said to have turned men into monsters of humour or horror, whereas the men were really commonplace and conventional persons in shops and offices. If any critic depreciates the Dickensian method as mere overstatement, the answer is obvious: let him take some of these commonplace people and overstate them. He will soon discover that he has not the vaguest notion of what to overstate. He will soon realise that it is not a simple matter of mere exaggeration, in the sense of mere extension. It is not a matter of making a man a little taller or a morning

a little colder; the challenge to imagination is not whether he can exaggerate, but whether he can find anything worth exaggerating. Now the genius of Dickens consisted in seeing in somebody, whom others might call merely prosaic, the germ of a sort of prose poem. There was in this or that man's attitude, or affectation, or habit of thought, something which only needed a touch of exaggeration to be a charming fantasy or a dramatic contradiction. The books of Dickens are in fact full of bores; of bores who do not bore us, merely because they did not bore him. We have all of us heard a hundred times the tiresome trick of public speakers, of asking themselves rhetorical questions which they do not want answered. Any of us might have heard a fat Dissenting minister doing it at a tea-party and thankfully forgotten all about him. But Dickens seized on the fallacy and turned it into a fantasy; into Mr. Chadband's demands to know why he could not fly, or his wild and beautiful apologue about the elephant and the eel. We talk of the power of drawing people out; and that is the nearest parallel to the power of Dickens. He drew reels and reels of highly coloured caricature out of an ordinary person, as dazzlingly as a conjurer draws reels and reels of highly coloured paper out of an ordinary hat. But if anybody thinks the conjuring-trick is easy to perform, let him try it with the next ordinary person he sees. The exaggeration is always the logical extension of something that really exists; but genius appears, first in seeing that it exists, and second in seeing that it will bear to be thus exaggerated. That is something totally different from giving a man a long nose; it is the delicate

surgical separation or extension of a living nerve. It is carrying a ludicrous train of thought further than the actual thinker carries it; but it requires a little thinking. It is making fools more gloriously foolish than they can be in this vale of tears; and it is not every fool who can do it.

There were other reasons for the injustice in the particular case of Dickens. Though his characters often were caricatures, they were not such wild caricatures as was supposed by those who had never met such characters. And the critics had never met the characters; because the critics did not live in the common life of the English people; and Dickens did. England was a much more amusing and horrible place than it appeared to the sort of man who wrote reviews in *The Quarterly*; and, in spite of all scientific progress or social reform, it is still. The poverty and anarchy of Dickens's early life had stuffed his memory with strange things and people never to be discovered in Tennysonian country houses or even Thackerayan drawing-rooms. Poverty makes strange bedfellows, the same sort of bedfellows whom Mr. Pickwick fought for the recovery of his nightcap. In the vivid phrase, he did indeed live in Queer street and was acquainted with very queer fish. And it is something of an irony that his tragedy was the justification of his farce. He not only learnt in suffering what he taught in song, but what he rendered, so to speak, in a comic song.

It is also true, however, that he caught many of these queer fish because he liked fishing in such troubled waters. A good example of this combination of opportunity and eccentricity is to be found in his affection for travelling showmen and vagabond entertainments of all sorts, especially those that exhibited giants and dwarfs and such monstrosities. Some might see in this truth a sort of travesty of all his travesties. It would be easy to suggest a psychological theory, by which all his art tended to the antics of the abnormal; it would also be entirely false. It would be much truer to say that Dickens created so many wild and fantastic caricatures because he was himself commonplace. He never identifies himself with anything abnormal, in the more modern manner. In his travelling show, the Giant always falls far short of being a Superman. And though he was tempted only too easily to an obvious pathos, there was never anything particularly pathetic about his dwarfs. His fun is more robust; and even, in that sense, more callous. The truth is that Dickens's attitude to the abnormal has been misunderstood owing to the modern misunderstanding of the idea of the normal. He was in many ways a wild satirist, but still a satirist; and satire is founded on sanity. He had his real Cockney limitations. But his moderation was not a limitation but a liberty; for it allowed him to hit out in all directions. It was precisely because he had an ordinary and sensible view of life that he could measure the full madness both of Gradgrind's greed or Micawber's improvidence. It was because he was what we call commonplace that Dombey appeared to him so stiff or Jellaby so slovenly. In a

later generation a real person often assumed such an unreal pose and lost the power of merely laughing at it; as, for example, when Oscar Wilde said seriously all that Skimpole had said absurdly. The Victorian commonsense was not a complete commonsense; and Dickens did suffer from having a narrower culture than Swift or Rabelais. But he did not suffer from being sensible; it was even more from his sense than his sensibility, it was from a sort of inspired irritation and impatience of good sense, that he was able to give us so radiant a fairyland of fools.

His literary work produced of course much more than a literary effect. He was the last great poet, in the true sense of maker, who made something for the people and was in the highest sense popular. He still gives his name, not to a literary clique, but to a league or fellowship numbering thousands all over the world. In this connection it is often noted that he achieved many things even considered as a practical political and social reformer. He let light into dark corners, like the dens of dirt and brutality often called schools, especially in Yorkshire; he probably had much to do with making the professional nurse a duller but more reliable person than Mrs. Gamp; it is likely enough that his vivid descriptions, assisted by the whole trend of the time, hastened the extinction of ordinary imprisonment for debt and clarified much of the original chaos of Chancery. But precisely because this has often been said, it will be well not to say it too often. It has the effect of making his satire appear much more superficial and utilitarian than it really was; for the great satirist is concerned with things not so easily destroyed. We do more honour to Dickens in noting the evils he did not destroy than those he did. The eager worship of a man merely wealthy, however dull and trivial, which appears in the affair of Merdle, has by no means disappeared from our own more recent affairs. The pompous old Barnacle and the agreeable young Barnacle are still almost as much alive as in Dickens's day. The sweeping away of a genuine gentry, in the person of Mr. Twemlow, on the tide of a new plutocracy, represented by Mr. Veneering, has gone much further than in Dickens's day. But this makes Dickens's satire the more rather than the less valuable to posterity. The other mood, which pictures all such abuses as things of the past, tends not to reform but only too much to repose; and to the perpetuation of a rather snobbish and paltry version of the Dickensian tradition. In that spirit we may hear to this day a Stiltstalking telling the House of Commons that Stiltstalkings have perished before the march of progress; or in the law courts a Buzfuz quoting Buzfuz and jeering at himself as an instinct monster.

The future of the fame of Dickens is no part of the Dickens record and a very dubious part of the Dickens criticism. Some have suggested that his glory will fade as new fashions succeed those he satirized; others have said, at least equally reasonably, that the difference itself fades when all the fashions have grown old; and that Aristophanes and Cervantes have outlived their descendants as well as their

contemporaries. But there can be no question of the importance of Dickens as a human event in history; a sort of conflagration and transfiguration in the very heart of what is called the conventional Victorian era; a naked flame of mere natural genius, breaking out in a man without culture, without tradition, without help from historic religions or philosophies or from the great foreign schools; and revealing a light that never was on sea or land, if only in the long fantastic shadows that it threw from common things.

H. L. MENCKEN ON *Americanism*

*The reputation of H.L. Mencken (1880–1956) as a debunker of hypocrisy and piety is so fearsome that it often obscures his immense contribution to philology: his seminal work, *The American Language* (1919; frequent revision), remains a classic. *Britannica's* 13th Edition (1926) engaged the scholar that stood behind the journalist and consummate hell-raiser. The title of his article seemed to leave a certain ambiguity because of his unsparing attacks on superpatriotism. His topic, however, was not nation but language; his style, pungent, pulsing, pure Mencken; and his focus, American words—and how they developed in rich fashion from the indigenous populations of North America, the European settlers, as well as from slaves. Most interesting is what Mencken traces next: the American patois then migrates back to the Mother Country, influencing England, the Mother Tongue, and eventually the world through that new omnipresent means of American entertainment called motion pictures. “Thus,” quipped Mencken, “the tail begins to wag the dog.”*

Library of Congress, Washington, D.C.



Americanism, a term first used by John Witherspoon, president of Princeton University, in 1781, designates (a) any word or combination of words which taken into the English language in the United States, has not gained acceptance in England, or, if accepted, has retained its sense of foreignness; and (b) any word or combination of words which, becoming archaic in England, has continued in good usage in the United States. The first class is the larger and has the longer history. The earliest settlers in Virginia and New England, confronted by plants and animals that were unfamiliar to them, either borrowed the Indian names or invented names of their own.

Examples are afforded by *raccoon* (1608), *chinkapin* (1608), *opossum* (1610) and *squash* (1642) among Indian words and by *bull-frog*, *canvas-back*, *cat-bird* and

live-oak among inventions. The former tended to take anglicised forms. Thus the Indian *isquontersquash* (at least, that is how the early chroniclers recorded it) became *squantersquash* and was then reduced to *squash*, and *otchock* became *woodchuck*. Many other words came in as the pioneers gained familiarity with the Indian life. Such words as *hominy*, *moccasin*, *pone*, *tapioca* and *succotash* remain everyday Americanisms. . . .

Meanwhile, American English had begun to borrow words, chiefly nouns, from the non-English settlers, and to develop many new words of its own. To the former class the Dutch contributed *cruller*, *cold-slaw*, *cockey*, *scow*, *boss*, *smearcase* and *Santa Claus*, and the French contributed *gopher*, *prairie*, *chowder*, *carry-all* and *bureau* (a chest of drawers). Other contributions came from the Germans of Pennsylvania, the Spaniards of the southwest, and negro slaves. The native coinages were large in number, and full of boldness and novelty. To this period belong, for example, *backwoods*, *hoe-cake*, *pop-corn*, *land-slide*, *shell-road*, *half-breed*, *hired-girl*, *spelling-bee*, *moss-back*, *crazy-quilt*, *stamping-ground* and *cat-boat*. These words were all made of the common materials of English, but there was something in them that was redolent of a pioneer people and a new world. In their coinage the elegances were disdained; the thing aimed at was simply vividness. At the same time, verbs were made out of nouns, nouns out of verbs and adjectives out of both.

In 1789 Benjamin Franklin, who had lived in England, denounced *to advocate*, *to progress* and *to oppose* as barbarisms, but all of them are good American to-day, and even good English. Noah Webster, the lexicographer, gave his imprimatur to *to appreciate* (in value); *to eventuate* was popularised by Gouverneur Morris; and no less a hero than Washington is said to have launched *to derange*. Many inventions of that daring era have succumbed to pedagogical criticism, e.g., *to happify*, *to compromit* and *to homologise*. But others equally harsh have gradually gained acceptance, e.g., *to placate* and *to deputise*. And with them have come in a vast number of characteristic American nouns, e.g., *breadstuffs*, *mileage*, *balance* (in the sense of remainder) and *elevator* (a place for storing grain).

Divergent meanings of words. It was during the same period that a number of important words, in daily use, began to show different meanings in England and America. Some familiar examples are *store*, *rock*, *lumber* and *corn*. What Englishmen call a *shop* was called a *store* by Americans as early as 1770, and long before that time *corn*, in American, had come to signify, not grains in general, but only maize. The use of *rock* to designate any stone, however small, goes back still further, and so does the use of *lumber* for *timber*. Many of these differences were produced by changes in English usage. Thus *cracker*, in England, once meant precisely what it now means in the United States. When the English abandoned it for *biscuit* the Americans stuck to *cracker*, and used *biscuit* to designate something else. How *shoe* came to be substituted in America for the English *boot* has yet to

be determined. There is indeed much that remains obscure in the early history of such Americanisms. Until very lately, American philologists kept aloof from the subject, which they apparently regarded as low. Until George P. Krapp, of Columbia University, took it up, there was not even any serious investigation of the history of American pronunciation.

Thus the American dialect of English was firmly established by the time the Republic was well started, and in the half-century following it departed more and more from standard English. The settlement of the West, by taking large numbers of young men beyond the pale of urbane society, made for grotesque looseness in speech. Neologisms of the most extravagant sorts arose by the thousand, and many of them worked their way back to the East. During the two decades before the Civil War everyday American became almost unintelligible to an Englishman; every English visitor marked and denounced its vagaries. It was bold and lawless in its vocabulary, careless of grammatical niceties, and further disfigured by a drawling manner of speech. The congressional debates of the time were full of its phrases; soon they were to show themselves in the national literature.

Policing the language. After the Civil War there was an increase of national self-consciousness, and efforts were made to police the language. Free schools multiplied in the land, and the schoolmarm revealed all her immemorial preciousness. A clan of professional grammarians arose, led by Richard Grant White; it got help from certain of the literati, including [James Russell] Lowell. The campaign went to great lengths. "*It is me*" was banned as barbarous, though it is perfectly sound historically; *eye-ther* was substituted in polite usage for *ee-ther*, though the latter is correct and the former is on the part of an American an absurd affectation.

But the spirit of the language, and of the American people no less, was against such reforms. They were attacked on philological grounds by such iconoclasts as Thomas R. Lounsbury; they were reduced to vanity by the unconquerable speech habits of the folk. Under the very noses of the purists a new and vigorous American slang came into being, and simultaneously the common speech began to run amok. That common speech is to-day almost lawless. As Ring Lardner reports it—and he reports it very accurately—it seems destined in a few generations to dispose altogether of the few inflections that remain in English. "Me and her woulda went" will never, perhaps, force its way into the grammar-books, but it is used daily, or something like it, by a large part of the people of the United States, and the rest know precisely what it means.

On higher levels the language of the Americans is more decorous, but even there it is a genuinely living speech, taking in loan-words with vast hospitality and incessantly manufacturing neologisms of its own. The argot of sport enriches it almost daily. It runs to brilliantly vivid tropes. It is disdainful of grammatical pruderies. In the face of a new situation the American shows a far greater linguistic

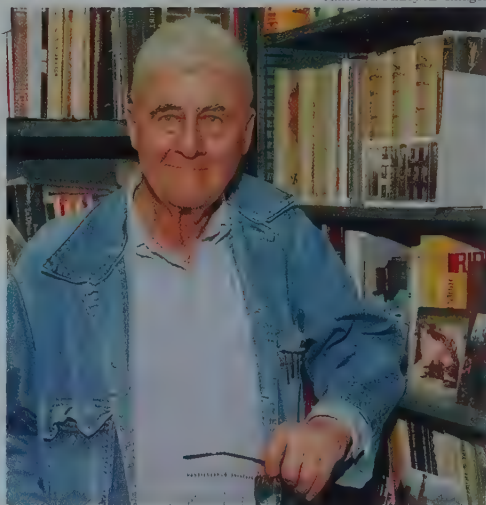
resourcefulness and daring than the Englishman. *Movie* is obviously better than *cinema*, just as *cow-catcher* is better than *plough* and *job-holder* is better than *public-servant*. The English seldom devise anything as pungent as *rubber-neck*, *ticket-scalper*, *lame-duck*, *pork-barrel*, *boot-legger* or *steam-roller* (in its political sense). Such exhilarating novelties are produced in the United States every day, and large numbers of them come into universal use, and gradually take on literary dignity. They are opposed violently, but they prevail. The visiting Englishman finds them very difficult. They puzzle him even more than do American peculiarities of pronunciation.

Of late the increase of travel and other inter-communication between England and America has tended to halt the differentiation of the two dialects. It was more marked, perhaps, before the World War than since. But if it ever vanishes altogether the fact will mark a victory for American. The American cinema floods England (and the rest of the English-speaking world) with American neologisms, but there is very little movement in the other direction. Thus the tail begins to wag the dog. How far the change has gone may be observed in Australia. There a cockneyfied pronunciation holds out, but the American vocabulary is increasingly triumphant. In Canada it long ago overcame the last vestiges of opposition.

HOWARD NEMEROV ON

Poetry

Howard Nemerov (1920–91), one of America's finest poets, was also arguably the wittiest. In 1978 he received the Pulitzer Prize in Arts and Letters and in 1977 the National Book Award for his Collected Poems. He was a pilot in the Royal Canadian Air Force and the U.S. Army Air Force, novelist, critic, professor of English, consultant in poetry to the Library of Congress (1963–64), and poet laureate of the United States (1988–90). His long Britannica entry on poetry ranks among the more masterful and learned pieces ever contributed to Britannica, and we highlight below his section on defining poetry and how to distinguish it from prose.



James A. Finley/AP Images

People's reason for wanting a definition is to take care of the borderline case, and this is what a definition, as if by definition, will not do. That is, if a man asks for a definition of poetry, it will most certainly not be the case that he has never seen one of the objects called poems that are said to embody poetry; on the contrary, he is already tolerably certain what poetry in the main is, and his reason for wanting a definition is either that his certainty has been challenged by someone else or that he wants to take care of a possible or seeming exception to it: hence the perennial squabble about distinguishing poetry from prose, which is rather like distinguishing rain from snow—everyone is reasonably capable of doing so, and yet there are some weathers that are either-neither.

Sensible things have been said on the question. The poet T.S. Eliot suggested that part of the difficulty lies in the fact that there is the technical term “verse” to go with the term “poetry,” while there is no equivalent technical term to distinguish

the mechanical part of prose and make the relation symmetrical. The French poet Paul Valéry said that prose was walking, poetry dancing. Indeed, the original two terms, *prosus* and *versus*, meant, respectively, “going straight forth” and “returning”; and that distinction does point up the tendency of poetry to incremental repetition, variation, and the treatment of many matters and different themes in a single recurrent form such as couplet or stanza.

Robert Frost said shrewdly that poetry was what got left behind in translation, which suggests a criterion of almost scientific refinement: when in doubt, translate; whatever comes through is prose, the remainder is poetry. And yet to even so acute a definition the obvious exception is a startling and a formidable one: some of the greatest poetry in the world is in the Authorized Version of the Bible, which is not only a translation but also, as to its appearance in print, identifiable neither with verse nor with prose in English but rather with a cadence owing something to both.

There may be a better way of putting the question by the simple test alluded to above. When people are presented with a series of passages drawn indifferently from poems and stories but all printed as prose, they will show a dominant inclination to identify everything they possibly can as prose. This will be true, surprisingly enough, even if the poem rhymes and will often be true even if the poem in its original typographical arrangement would have been familiar to them. The reason seems to be absurdly plain: the reader recognizes poems by their appearance on the page, and he responds to the convention whereby he recognizes them by reading them aloud in a quite different tone of voice from that which he applies to prose (which, indeed, he scarcely reads aloud at all). It should be added that he makes this distinction also without reading aloud; even in silence he confers upon a piece of poetry an attention that differs from what he gives to prose in two ways especially: in tone and in pace.

In place of further worrying over definitions, it may be both a relief and an illumination to exhibit certain plain and mighty differences between prose and poetry by a comparison. In the following passages a prose writer and a poet are talking about the same subject, growing older.

Between the ages of 30 and 90, the weight of our muscles falls by 30 percent and the power we can exert likewise. . . . The number of nerve fibres in a nerve trunk falls by a quarter. The weight of our brains falls from an average of 3.03 lb. to 2.27 lb. as cells die and are not replaced. . . . (Gordon Rattray Taylor, *The Biological Time Bomb*, 1968.)

Let me disclose the gifts reserved for age
 To set a crown upon your lifetime's effort
 First, the cold friction of expiring sense

Without enchantment, offering no promise
But bitter tastelessness of shadow fruit
As body and soul begin to fall asunder.
Second, the conscious impotence of rage
At human folly, and the laceration
Of laughter at what ceases to amuse.
' And last, the rending pain of re-enactment
Of all that you have done, and been. . . .
(T.S. Eliot, *Four Quartets*.)

Before objecting that a simple comparison cannot possibly cover all the possible ranges of poetry and prose compared, the reader should consider for a moment what differences are exhibited. The passages are oddly parallel, hence comparable, even in a formal sense; for both consist of the several items of a catalog under the general title of growing old. The significant differences are of tone, pace, and object of attention. If the prose passage interests itself in the neutral, material, measurable properties of the process, while the poetry interests itself in what the process will signify to someone going through it, that is not accidental but of the essence; if one reads the prose passage with an interest in being informed, noting the parallel constructions without being affected by them either in tone or in pace, while reading the poetry with a sense of considerable gravity and solemnity, that too is of the essence. One might say as tersely as possible that the difference between prose and poetry is most strikingly shown in the two uses of the verb "to fall":

The number of nerve fibres in a nerve trunk falls by a quarter
As body and soul begin to fall asunder

It should be specified here that the important differences exhibited by the comparison belong to the present age. In each period, speaking for poetry in English at any rate, the dividing line will be seen to come at a different place. In Elizabethan times the diction of prose was much closer to that of poetry than it later became, and in the 18th century authors saw nothing strange about writing in couplets about subjects that later would automatically and compulsorily belong to prose—for example, horticulture, botany, even dentistry. Here is not the place for entering into a discussion of so rich a chapter in the history of ideas; but it should be remarked that the changes involved in the relation between poetry and prose are powerfully influenced by the immense growth of science, commerce, and number in man's ways of describing, even of viewing, the world.

Returning to the comparison, it is observable that though the diction of the poem is well within what could be commanded by a moderately well-educated

speaker, it is at the same time well outside the range of terms in fact employed by such a speaker in his daily occasions; it is a diction very conscious, as it were, of its power of choosing terms with an effect of peculiar precision and of combining the terms into phrases with the same effect of peculiar precision and also of combining sounds with the same effect of peculiar precision. Doubtless the precision of the prose passage is greater in the more obvious property of dealing in the measurable; but the poet attempts a precision with respect to what is not in the same sense measurable nor even in the same sense accessible to observation; the distinction is perhaps just that made by the French scientist and philosopher Blaise Pascal in discriminating the spirits of geometry and finesse; and if one speaks of “effects of precision” rather than of precision itself, that serves to distinguish one’s sense that the art work is always somewhat removed from what people are pleased to call the real world, operating instead, in Immanuel Kant’s shrewd formula, by exhibiting “purposefulness without purpose.” To much the same point is what Samuel Taylor Coleridge remembers having learned from his schoolmaster:

I learnt from him, that Poetry, even that of the loftiest and, seemingly, that of the wildest odes, had a logic of its own, as severe as that of science; and more difficult, because more subtle, more complex, and dependent on more, and more fugitive causes. In the truly great poets, he would say, there is a reason assignable, not only for every word, but for the position of every word.

(*Biographia Literaria*, ch. I)

Perhaps this is a somewhat exaggerated, as it is almost always an unprovable, claim, illustrating also a propensity for competing with the prestige of science on something like its own terms—but the last remark in particular illuminates the same author’s terser formulation: “prose = words in the best order, poetry = the best words in the best order.” This attempt at definition, impeccable because uninformative, was derived from Jonathan Swift, who had said, also impeccably and uninformatively, that style in writing was “the best words in the best order.” Which may be much to the same effect as Louis Armstrong’s saying, on being asked to define jazz, “Baby, if you got to ask the question, you’re never going to know the answer.” Or the painter Marcel Duchamp’s elegant remark on what psychologists call “the problem of perception”: “If no solution, then maybe no problem?” This species of gnomic, riddling remark may be determinate for the artistic attitude toward definition of every sort; and its skepticism is not confined to definitions of poetry but extends to definitions of anything whatever, directing one not to dictionaries but to experience and, above all, to use: “Anyone with a watch can tell you what time it is,” said Valéry, “but who can tell you what is time?”

Happily, if poetry is almost impossible to define, it is extremely easy to recognize in experience; even untutored children are rarely in doubt about it when it appears:

Little Jack Jingle,
He used to live single,
But when he got tired of this kind of life,
He left off being single, and liv'd with his wife.

It might be objected that this little verse is not of sufficient import and weight to serve as an exemplar for poetry. It ought to be remembered, though, that it has given people pleasure so that they continued to say it until and after it was written down, nearly two centuries ago. The verse has survived, and its survival has something to do with pleasure, with delight; and while it still lives, how many more imposing works of language—epic poems, books of science, philosophy, theology—have gone down, deservedly or not, into dust and silence. It has, obviously, a form, an arrangement of sounds in relation to thoughts that somehow makes its agreeable nonsense closed, complete, and decisive. But this somewhat muddled matter of form deserves a heading and an instance all to itself.

Laptops v. Learning

By David Cole

“Could you repeat the question?” As I discussed in a *Washington Post* op-ed more than 10 years ago, that used to be the most common response from my law students at Georgetown University. It was inevitably asked while the student, called upon for a response in the Socratic method that I, like most law professors, use, glanced up from the laptop screen that otherwise occupied his or her field of vision. After I repeated the question, the student’s gaze, as often as not, returned to the computer screen, as if the answer might appear there. Who knows? With instant messaging, maybe it would?

Some years back, our law school, like many universities, high schools, and even grade schools around the country, wired its classrooms with Internet hookups. It’s the way of the future, I was told. Now we have a wireless campus, and incoming students are required to have laptops. So my first-year students are more than a bit surprised when I tell them that laptops are banned from my classroom.

I ban laptops for two reasons. Note-taking on a laptop encourages verbatim transcription. The note-taker tends to go into stenographic mode and no longer processes information in an active way that is conducive to the give-and-take of classroom discussion. Because taking notes the old-fashioned way, by hand, is so much slower, the student actually has to listen, think, and prioritize the most important themes. Of course, if one’s idea of a lecture is a process by which the notes of the teacher get transferred to the notes of the student without passing through the brain of either, then laptops may be the perfect transcribing tools. But if the goal is an interactive classroom, I find that laptops just get in the way.

Studies have found that students who take notes by hand retain the information communicated more effectively than those who transcribe it on a computer. One study gave

students the same videotaped lecture and had half the students take notes by hand, the other half by computer. (The computers had no Internet access, so there was no issue of distraction.) Those who took notes by hand performed markedly better on a test administered shortly afterward.

But, of course, most laptops are connected to the Internet. And as such, they create a temptation to do the many other things one can do there—surf the Web, check e-mail, shop for shoes, play solitaire, or review Instagram and Facebook. That’s not only distracting to the student who is checking baseball scores and statistics but for all those who see him and many others doing something besides being involved in class. It also takes the student out of the classroom discussion, which itself has collective costs for the learning environment as a whole. (In deference to the modern era, I permit two volunteers each class to use laptops to take notes that are then made available to all students—online, of course.)

When I initially raised with my colleagues the idea of cutting off laptop access, some accused me of being paternalistic, authoritarian, or worse. We daydreamed and did crosswords when we were students, they argue, so how can we prohibit our students, who are adults, after all, from using their time in class as they deem fit?

A crossword hidden under a book is one thing. But with the aid of Microsoft and Google, we have effectively put at every seat a library of magazines, a television, and the opportunity for real-time side conversations and invited our students to check out whenever they find their attention wandering.

David Cole is the Hon. George J. Mitchell Professor in Law and Public Policy at Georgetown University, the national legal director of the American Civil Liberties Union, and the author, most recently, of Engines of Liberty: How Citizen Movements Succeed (2017).

ISAAC BASHEVIS SINGER ON *Jewish Art and Literature*

From the Jewish Chronicle Archive/Heritage-Images

The Polish-born American writer Isaac Bashevis Singer (1904–91), noted for his novels, short stories, and essays in Yiddish, won the Nobel Prize for Literature in 1978 “for his impassioned narrative art which, with roots in a Polish-Jewish cultural tradition, brings universal human conditions to life.” He memorably depicted Jewish life in Poland as it existed before the Holocaust. Several films were adapted from his writings, including The Magician of Lublin (1979) and Yentl (1983). An excerpt of his entry on Jewish art and literature, written for the inaugural printing of Britannica’s 15th Edition (1974), follows.



Yiddish is the main colloquial language of the majority of Ashkenazic (central and east European) Jews and one of their two literary languages (the other is Hebrew). Literature written in the Yiddish language began with the need of the Jews living in the Germanic Frankish lands of western Europe during the Middle Ages for a literature in their own vernacular: most of them no longer had enough knowledge of Hebrew, which had become the language of prayer and scholarship, to understand fully new works written in it. (Popular literature in Hebrew, intertwined with Yiddish traditions, developed much later.) Living among people speaking Middle High German, the Jews had adopted that language, but they continued to need a religious usage terminology, which had to be Hebrew. Thus there evolved an amalgam of the two languages called Jüdisch-Deutsch (Judeo-German), soon corrupted to Yiddish-Teitch; and finally called simply Yiddish. For a time there was little difference between Yiddish-Teitch and Middle High German, except for the infusion of Hebrew words; but eventually (possibly as early as the 9th century) Yiddish-Teitch became a separate language. With the Jewish migrations to eastern Europe after the massacres during the Crusades, the language acquired a strong

Slavonic element and, cut off from its German source, developed on independent lines, flowering into a rich literary language. An oral and manuscript Yiddish literature first appeared in the 12th and 13th centuries, a printed literature in the 16th century.

Part of the cultural and spiritual transition of many Jews from the 18th-century ghetto to the modern 19th-century Western world was the adoption of modern European languages as literary vehicles. It is questionable whether—and in what ways—such literature can be characterized as Jewish. . . .

In Yiddish

Early history. Yiddish, like many other languages, was for a long time looked upon as a vulgar tongue, good enough for the spoken but not the written word. The language of the scholars was Hebrew. When the first Yiddish books were written in the 12th and 13th centuries, they were intended only for women and the ignorant. These works were of two types: religious and liturgical—translations from the Bible, prayer books, and religious poems and secular writing, consisting mainly of adaptations from the German and Italian—the literature of the so-called *Spielmann* period, named after the German minstrels of the medieval period. Jewish folk singers and jesters sang or performed these texts at various entertainments. Most of them were verse romances, tales of knights and their ladies. Some even had erotic connotations. One of the most famous of these works, the *Bove-Buch*, was written in 1507 (and printed in 1541) by Elijah Bachur, more popularly known as Elijah Levita, a German Jew who emigrated to Italy in 1496, a time of trouble for Jews in his native country. Written in ottava rima (an eight-line stanza with a rhyme scheme of ABABABCC), it is a heroic tale adapted from an Italian romance (*Buovo d'Antona*) for its Jewish public. Another work by the same author is *Paris un Viene*, published posthumously in 1595. Both books are rhymed romances, written in the spirit of the Renaissance. They are at the same time fantastic, realistic, and highly dramatic. Another, earlier work, the *Shmuel Buch* (1544; "Samuel Book"), by an unknown writer, is a retelling of the Book of Samuel, with King David possessing all the characteristics of a medieval knight. Rabbis and pious Jews condemned these works as frivolous; but they tolerated them because they recognized that the Jewish woman of the day, who was as often as not breadwinner as well as wife and mother, needed some diversion. . . .

By the second half of the 18th century, Yiddish had become exclusively the language of eastern European Jews. With the coming of the Ḥasidic movement (a revolt, based on the mystical enthusiasm, against the aridity of the rabbinic intellectualism), a number of Ḥasidic storybooks began to appear in Yiddish. The greatest of them are the stories of Rabbi Naḥman of Bratslav (then Russian). He was

born in the south of Russia and was a great-grandson of Ba'al Shem Tov, the founder of Hasidism. He did not write his stories himself but dictated them to his disciple Rabbi Nathan Nemeirover. These tales, which have achieved fame in the German translation, by Martin Buber, are masterworks of Jewish folklore. . . .

Beginnings of modern literature. Modern prose in Yiddish began in the 1850s with the stories of Eisik Meir Dik; the satiric novel *Dos poilische Yngel* (1869; *The Polish Boy*) by Isaac Joel Linetzky; and the novels of Sholem Yakov Abramovitsch, better known as Mendele Mokher Sforim (Mendele the Itinerent Bookseller), "the grandfather" of modern Yiddish literature. Mendele also wrote in Hebrew and is a classic in both languages. Among his best Yiddish works are *Dos Vinschfingerl* (1865; "The Wishing Ring"), *Die Klatsche* (1873; "The Mare"), and *Fishke der Krumer* (1869; "Fishke, the Lame"). Mendele, like all of these writers, deplored and mocked the unworldliness of the Russian and Polish Jews, the exaggerated piety, and their obsolete system of educating their children. He also castigated the community elders who, for their private gains, exploited the poor Jews. By Mendele's time, great numbers of Jews already lived in the large cities of Russia, western Europe, and the United States. Jewish professors held high positions in the universities of the world. The revolutionary movement had reached even the Jews in the small villages of Poland and the Ukraine. Young men and women left their homes to rebuild Palestine. There was also an increasing emigration to the United States, South America, and elsewhere. But Mendele chose to write about the poorest and the most backward citizens of Kabtzansk (Pauper Village) and Glupsk (Village of Fools). From a purely literary point of view, Mendele himself was rather backward. His achievement was social; his themes did much to modernize the Jewish masses of eastern Europe. . . .

Yiddish literature in the United States began to blossom after World War I. The writers before that period were mostly Socialist propagandists, such as Morris Wintehevsky, David Edelstadt, and Joseph Bovshover. Among the foremost Yiddish novelists and storytellers in the United States are: Lamed Shapiro, *Der Tseilem* (*The Cross*); Joseph Opatoshu, who wrote *In poilische Velder* (1921; *In the Forest of Poland*); David Pinski; the brilliant short story writer Yona Rosenfeld; O.B. Berkowitch, Boruch Glassman; Leon Kobrin, M. Chaimovitch; Isaac Raboy; Shaye Miller, I. Metzger; Benjamin Ressler; Shmuel Izban, Benjamin Demblin, Yitzchok Perlov, and Chaim Grade.

A writer who achieved considerable fame outside the Yiddish literary world and who, in 1933, emigrated to the United States, was Israel Joshua Singer [the author's older brother]. His novel *The Brothers Ashkenazi* (1936), which describes the growth of the industrial city of Łódź as mirrored in the rise and fall of the Ashkenazi family, is considered a classic work. His other works are *Yoshe Kalb* (1932; *The Sinner*, 1933), a description of Hasidic life in Galicia, and *The Family*

Carnovsky (1969), the story of refugees from Germany before and during World War II. He also wrote short stories and plays that were performed in Yiddish both in Europe and the United States. He was a realist without a trace of the sentimentality characteristic of most of the Yiddish writers. . . .

In modern European languages

To define what Jewish literature is in any language other than Yiddish or Hebrew is no easy matter. Are Saul Bellow and Bernard Malamud Jewish writers or American writers who happen to be Jews? Was Franz Kafka a Jewish, German, or Czech writer? Is it enough to write on Jewish themes to be called a Jewish writer? No one considered Edna Ferber or Harold Pinter a Jewish writer because they were Jews. Was Ludwig Lewisohn a Jewish writer because he wrote on Jewish themes and in his later years fervently expounded his faith in his writings? Was Abraham Cahan (1860–1951), who wrote both in English (*Yerkl* and *The Rise of David Levinsky*) and in Yiddish (*Bletter fun mein Leben* ["Pages from My Life"]) and preached Socialism and atheism, a Jewish writer, a Yiddish writer, an American writer? . . .

If there is any common characteristic among the writers who deal with Jewish life in languages other than Yiddish and Hebrew, it is that they thrive on thin soil and have short cultural roots. Often both the authors and their protagonists are children of immigrants who are not yet truly acclimated to the land their parents adopted. Their literature lacks the richness that is the result of a generation-long way of life. With few exceptions, writers who write in a language that is comparatively new to them are inclined to either exaggerated admiration for their own kind or an exaggerated self-hatred. Immigration and assimilation are not the healthiest soil for literature. Literature must have a factual and cultural address.

THOMAS BABINGTON MACAULAY ON *Samuel Johnson*

One of the giants of 18th-century English letters was the great writer and conversationalist Samuel Johnson (1709–84). Britannica's 8th Edition (1852–60) contained a biography of Johnson by one of the giants of the next century, Thomas Babington Macaulay (1800–59). That celebrated Whig statesman, essayist, poet, and historian was a close friend of Britannica's then publisher, Adam Black, and he readily agreed to contribute a number of biographical sketches for Britannica's new edition. All were completed in the last few years of Macaulay's life, even as he was putting the finishing touches on his most famous work, his five-volume History of England.



Lord Macaulay's entry on Johnson, excerpted below and written in 1857, just two years before his death, was a classic of short biography, though there really was nothing abbreviated about it. Coming in at a robust 17,000 words, the piece displayed in painful detail the wretched poverty, physical infirmities, and at times brutish deportment that frequently characterized Johnson. Macaulay refused, by the way, to accept any payment for his Britannica writings, which included briefer biographies of Francis Atterbury, Oliver Goldsmith, William Pitt, and John Bunyan. All of the pieces bear the distinguishing marks of his still underrated prose style.

Samuel Johnson, one of the most eminent English writers of the eighteenth century, was the son of Michael Johnson, who was, at the beginning of that century, a magistrate of Lichfield, and a bookseller of great note in the midland counties. . . . At his house, a house which is still pointed out to every traveller who visits Lichfield, Samuel was born on the 18th of September 1709. In the child the physical,

intellectual, and moral peculiarities which afterwards distinguished the man were plainly discernible; great muscular strength accompanied by much awkwardness and many infirmities; great quickness of parts, with a morbid propensity to sloth and procrastination; a kind and generous heart, with a gloomy and irritable temper. He had inherited from his ancestors a scrofulous taint, which it was beyond the power of medicine to remove. His parents were weak enough to believe that the royal touch was a specific for this malady. In his third year he was taken up to London, inspected by the court surgeon, prayed over by the court chaplains, and stroked and presented with a piece of gold by Queen Anne. One of his earliest recollections was that of a stately lady in a diamond stomacher and a long black hood. Her hand was applied in vain. The boy's features, which were originally noble and not irregular, were distorted by his malady. His cheeks were deeply scarred. He lost for a time the sight of one eye; and he saw but very imperfectly with the other. But the force of his mind overcame every impediment. Indolent as he was, he acquired knowledge with such ease and rapidity, that at every school to which he was sent he was soon the best scholar. From sixteen to eighteen he resided at home, and was left to his own devices. He learned much at this time, though his studies were without guidance and without plan. He ransacked his father's shelves, dipped into a multitude of books, read what was interesting, and passed over what was dull. An ordinary lad would have acquired little or no useful knowledge in such a way: but much that was dull to ordinary lads was interesting to Samuel. He read little Greek; for his proficiency in that language was not such that he could take much pleasure in the masters of Attic poetry and eloquence. But he had left school a good Latinist, and he soon acquired, in the large and miscellaneous library of which he now had the command, an extensive knowledge of Latin literature. . . .

While he was thus irregularly educating himself, his family was sinking into hopeless poverty. Old Michael Johnson was much better qualified to pore upon books, and to talk about them, than to trade in them. His business declined: his debts increased: it was with difficulty that the daily expenses of his household were defrayed. It was out of his power to support his son at either university; but a wealthy neighbour offered assistance; and, in reliance on promises which proved to be of very little value, Samuel was entered at Pembroke College, Oxford. When the young scholar presented himself to the rulers of that society, they were amazed not more by his ungainly figure and eccentric manners than by the quantity of extensive and curious information which he had picked up during many months of desultory, but not unprofitable study. On the first day of his residence he surprised his teachers by quoting Macrobius; and one of the most learned among them declared, that he had never known a freshman of equal attainments.

At Oxford, Johnson resided during about three years. He was poor, even to raggedness; and his appearance excited a mirth and a pity, which were equally



Portrait of Samuel Johnson, oil on canvas by Sir Joshua Reynolds, c. 1756; in the National Portrait Gallery, London.

intolerable to his haughty spirit. He was driven from the quadrangle of Christ Church by the sneering looks which the members of that aristocratical society cast at the holes in his shoes. Some charitable person placed a new pair at his door; but he spurned them away in a fury. Distress made him, not servile, but reckless and ungovernable. No opulent gentleman commoner, panting for one-and-twenty, could have treated the academical authorities with more gross disrespect. The needy scholar was generally to be seen under the gate of Pembroke, a gate now adorned with his effigy, haranguing a circle of lads, over whom, in spite of his tattered gown and dirty linen, his wit and audacity gave him an undisputed ascendancy. In every mutiny against the discipline of the college he was the ring-leader. Much was pardoned, however, to a youth so highly distinguished by abilities and acquirements. He had early made himself known by turning Pope's *Messiah* into Latin verse. The style and rhythm, indeed, were not exactly Virgilian; but the translation found many admirers, and was read with pleasure by Pope himself.

The time drew near at which Johnson would, in the ordinary course of things, have become a Bachelor of Arts: but he was at the end of his resources. Those promises of support on which he had relied had not been kept. His family could do nothing for him. His debts to Oxford tradesmen were small indeed, yet larger than he could pay. In the autumn of 1731, he was under the necessity of quitting the university without a degree. In the following winter his father died. The old man left but a pittance; and of that pittance almost the whole was appropriated to the support of his widow. The property to which Samuel succeeded amounted to no more than twenty pounds.

His life, during the thirty years which followed, was one hard struggle with poverty. The misery of that struggle needed no aggravation, but was aggravated by the sufferings of an unsound body and an unsound mind. Before the young man left the university, his hereditary malady had broken forth in a singularly cruel form. He had become an incurable hypochondriac. He said long after that he had been mad all his life, or at least not perfectly sane; and, in truth, eccentricities less strange than his have often been thought grounds sufficient for absolving felons, and for setting aside wills. His grimaces, his gestures, his mutterings, sometimes diverted and sometimes terrified people who did not know him. At a dinner table he would, in a fit of absence, stoop down and twitch off a lady's shoe. He would amaze a drawing room by suddenly ejaculating a clause of the Lord's Prayer. He would conceive an unintelligible aversion to a particular alley, and perform a great circuit rather than see the hateful place. He would set his heart on touching every post in the streets through which he walked. If by any chance he missed a post, he would go back a hundred yards and repair the omission. Under the influence of his disease, his senses became morbidly torpid, and his imagination morbidly active. At one time he would stand poring on the town clock without being able to tell the hour. At another, he would distinctly hear his mother, who was many miles off, calling him by his name. But this was not the worst. A deep melancholy took possession of him, and gave a dark tinge to all his views of human nature and of human destiny. Such wretchedness as he endured has driven many men to shoot themselves or drown themselves. But he was under no temptation to commit suicide. He was sick of life; but he was afraid of death; and he shuddered at every sight or sound which reminded him of the inevitable hour. In religion he found but little comfort during his long and frequent fits of dejection; for his religion partook of his own character. The light from heaven shone on him indeed, but not in a direct line, or with its own pure splendour. The rays had to struggle through a disturbing medium: they reached him refracted, dulled and discoloured by the thick gloom which had settled on his soul; and, though they might be sufficiently clear to guide him, were too dim to cheer him.

With such infirmities of body and of mind, this celebrated man was left, at two-and-twenty, to fight his way through the world.

THOMAS DE QUINCEY ON *Samuel Taylor Coleridge*

Thomas De Quincey (1785–1859) wrote copiously for Britannica. Indeed, some of his finest work may be found in that unlikely repository. In this article on the English Romantic poet, critic, and philosopher Samuel Taylor Coleridge (1772–1834), the author of Confessions of an English Opium-Eater celebrated a writer close to the taste of his own period. This terminal excerpt from his biography hails from Britannica's 8th Edition (1852–60).

Mary Evans Picture Library/age fotostock



The intellect of Coleridge is to be estimated rather by that of which it was capable, which it contemplated, and which it suggested, than by that which it achieved. Thrown upon life, poor and unsupported except by the benevolence of private friends, the inspired “charity boy,” in his mission as the Apostle of Ideas, had a severe contest to fight. The friend of no party, he was obnoxious to all. Coleridge’s bark sailed between the Scylla and Charybdis of the Edinburgh and Quarterly Reviews. It is to his credit, and to that of Southey and Wordsworth, that, in the face of a hostile age, they vindicated the freedom of poetical, political, and philosophical conscience; that, like the Scottish baron of old, they did “bide their time;” for all of them have left on the age that is succeeding an impress that will not soon be effaced. The literary fortitude of Coleridge under the continually-expressed conviction of the unpopularity of his writings is admirable. What would he not have achieved if this impassible fortitude had been animated by the aggressive vigour of industry and action so necessary in all who promulgate systems! The whole labours of Coleridge present the appearance of an unfinished city: the outline of the streets exhibits only how splendid they might have been; the base-moment of a pillar shows how gorgeous might have been its capital. A small, compact, complete beauty of poesy or of thought, pains us with the reflection that it stands surrounded by mere fragments of a similar promise. His works resemble a

Californian valley, out of which may be dug in hundreds solid lumps of priceless gold from among materials useless or inappreciable. Besides the absence of a resolute will, another defect in the structure of Coleridge's mind was want of exactness. He had no capacity, he confesses himself, in the retention of facts: his mind was at home in the outline of generic ideas. Hence, while it could frequently chalk that outline with astonishing sagacity and philosophical accuracy, when it descended into the natural history of fact it frequently is found in "wandering mazes lost." . . .

With his ardent benevolence and desire for the moral and intellectual elevation of humanity, was mingled much of a species of academic contempt for the myriads of God's immortal and intelligent creatures, commonly characterized as "the masses." With the fear of the French revolution before him, he seems to have viewed them as "dogs of war," with innate tendencies to turn upon and rend society, especially when society deigned to cast before them her pearls of instruction and philosophy. He seems to have deemed that they should be nourished with food convenient not so much for themselves as for the peace and prosperity of the "clerisy" and "special state" whom he appoints their overseers; that an episcopal crook and an act of Parliament are the keys to the whole duty of man as a unit in the "masses;" that scholarship and philosophy walk in silver slippers in a higher sphere, and that learning is degraded when it is popularized. "From a philosophical populace, good Lord deliver us," is, if we remember rightly, one of his expressions of this contempt. If he wrote only for philosophers, who can wonder that he should complain of a somewhat unappreciating audience? . . .

Coleridge's whole mind was imbued with the love of truth and of beauty; for truth he wandered through the mazes of all philosophy, and wherever he found her, he grappled her to his soul with hooks of steel. When an extended horizon of Christianity enabled him to see the real position of his Socinian opinions, he embraced unchangeably with his whole heart "the truth as it is in Jesus." The very obscurities of Coleridge are "dark with excessive bright;" from his intense feeling of the beautiful, they are "golden mists" that rise from the morning of a pure heart; or they are lucid seas whose very depth prevents the eye from penetrating its extent. His prose style is disfigured by turgidity, and the affected use of words. His written humour is ponderous and unwieldy.

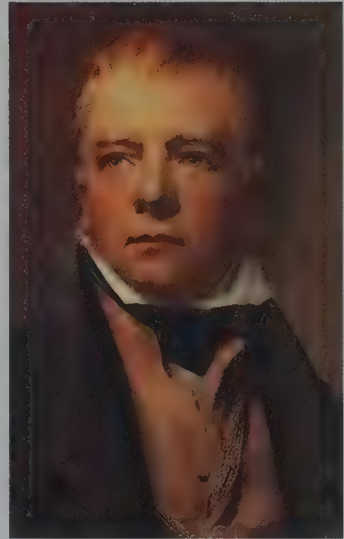
He was capable of immense services to poetry; but in this, as in other spheres of labour, he lived on the future; and Coleridge's future was a bad bank on which to draw; its bills were perpetually dishonoured. The conspicuous features of his poetry are its exquisite and original melody of versification, whose very sound chains the ear and soul; the harmonious grouping and skilful colouring of his pictures; statuesqueness and purity of taste in his living figures, and truth, in luxuriance or in simplicity, in majesty or in smallness, in his descriptions of nature. In

sentiment, he opens with charming artlessness his own bosom in sorrow and in joy; this, it may be remarked, is a feature characteristic of the poetry of our own age above all that have preceded. There exists in general a decided contrast between the simplicity and lucidness of Coleridge's poetical style of expression, and the involved cloud-like fashion of his prose. Apart from his German translations and his dramas, there are few compositions of any extent complete in the works of Coleridge. "Christabel" is a fragment—a beauteous strain creeping in the ear, mysterious yet enrapturing as a celestial melody; but the import of whose language we scarcely comprehend, while we feel its sweetness. Capriciously it ceases in a moment, and leaves us in the position of Ariel's admirers in the tune played by the picture of nobody. The "Ancient Mariner" is, apart from certain defects in machinery, a composition the stature of whose idea "reaches the sky," and stretches its arms into other worlds; but it vanishes from the reader's grasp in a huddled conclusion—a moral utterly partial, like that of "Christabel," when viewed in reference to the piece as a whole. "Cain," the promise of a Titanic birth, and "Kubla Khan," a literal dream of oriental glory, withered in the blight of an unexecuting will. But how exquisite in their completeness are the "Hymn to Mont Blanc" (though, by the bye, this is one of the accused pieces), "Love," the "Odes," and many lesser jewels! He often expends his genius on trifles; and, even in his greater efforts, it is to be regretted that his idealism has placed much of his poetry beyond popular relish or sympathy. His dramatic pieces, like most modern efforts of this class, exhibit rather scenery, poetry, and sentiment, than character; but the surviving fragments of this dramatic criticism show that they need only completeness to be sufficient alone for his immortality. The best tribute to Coleridge's genius consists in its admiration—nay, imitation—by the highest minds among his contemporaries, Byron and Scott, while all must perceive that his melody and his phraseology still murmur in the finest strains that emanate from the present age.

WALTER SCOTT ON *Chivalry*

Britannica's Supplement to its 4th, 5th, and 6th editions (1815–24) devoted 30 double-column pages to a topic little read about today—chivalry. Britannica's author was the inimitable author of Ivanhoe (1819), Sir Walter Scott, the father of the historical novel. Scott had assented to the request of Britannica's publisher, Archibald Constable, to write three articles (on "Chivalry," "Romance," and "Drama"), which eventually comprised 94 printed pages. When the editor, Macvey Napier, proffered £100 in payment, Scott first assured himself that it would not come from the pocket of Napier, whom he considered "a literary brother," then took the money, observing that he had no conscience as to the purse of his "fat friend, to wit, Constable."

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In every age and country valour is held in esteem, and the more rude the period and the place, the greater respect is paid to boldness of enterprise and success in battle. But it was peculiar to the institution of Chivalry, to blend military valour with the strongest passions which actuate the human mind, the feelings of devotion and those of love. The Greeks and Romans fought for liberty or for conquest, and the knights of the middle ages for God and for their ladies. Loyalty to their sovereigns was a duty also incumbent upon these warriors, but although a powerful motive, and by which they often appear to have been strongly actuated, it entered less warmly into the composition of the chivalrous principle than the two preceding causes. Of patriotism, considered as a distinct predilection to the interests of one kingdom, we find comparatively few traces in the institutions of knighthood. But the love of personal freedom, and the obligation to maintain and defend it in the persons of others as in their own, was a duty particularly incumbent on those who attained the honour of chivalry. Generosity, gallantry, and an

unblemished reputation, were no less necessary ingredients in the character of a perfect knight. He was not called upon simply to practise these virtues when opportunity offered, but to be sedulous and unwearied in searching for the means of exercising them, and to push them without hesitation to the brink of extravagance, or even beyond it. Founded on principles so pure, the order of chivalry could not, in the abstract at least, but occasion a pleasing, though a romantic developement of the energies of human nature. But as, in actual practice, every institution becomes deteriorated and degraded, we have too much occasion to remark, that the devotion of the knights often degenerated into superstition,—their love into licentiousness,—their spirit of loyalty or of freedom into tyranny and turmoil,—their generosity and gallantry into hair-brained madness and absurdity.

We have mentioned devotion as a principal feature in the character of chivalry. At what remote period the forms of chivalry were first blended with those of the Christian religion, would be a long and difficult inquiry. The religion which breathes nothing but love to our neighbour and forgiveness of injuries, was not, in its primitive purity, easily transferable into the warlike and military institutions of the Goths, the Franks, and the Saxons. At its first infusion, it appeared to soften the character of the people among whom it was introduced so much, as to render them less warlike than their heathen neighbours. Thus the pagan Danes ravaged England when inhabited by the Christian Saxons,—the heathen Normans conquered Neustria from the Franks,—the converted Goths were subdued by the sword of the heathen Huns,—the Visigoths of Spain fell before the Saracens. But the tide soon turned. As the necessity of military talent and courage became evident, the Christian religion was used by its ministers (justly and wisely so far as respected self-defence) as an additional spur to the temper of the valiant. Those books of the Old Testament which Ulphilas declined to translate, because they afforded too much fuel for the military zeal of the ancient Goths, were now commented upon to animate the sinking courage of their descendants. Victory and glory on earth, and a happy immortality after death, were promised to those champions who should distinguish themselves in battle against the infidels. And who shall blame the preachers who held such language, when it is remembered that the Saracens had at one time nearly possessed themselves of Aquitaine, and that but for the successful valour of Charles Martel, Pepin, and Charlemagne, the crescent might have dispossessed the cross of the fairest portion of Europe. The fervent sentiments of devotion which direct men's eyes toward heaven, were then justly invoked to unite with those which are most valuable on earth,—the love of our country and its liberties. . . .

The next ingredient in the spirit of Chivalry, second in force only to the religious zeal of its professors, and frequently predominating over it, was a devotion to the female sex, and particularly to her whom each knight selected as the chief

object of his affection, of a nature so extravagant and unbounded as to approach to a sort of idolatry.

The original source of this sentiment is to be found, like that of Chivalry itself, in the customs and habits of the northern tribes, who possessed, even in their rudest state, so many honourable and manly distinctions, over all the other nations in the same stage of society. The chaste and temperate habits of these youth, and the opinion that it was dishonourable to hold sexual intercourse until the twentieth year was attained, was in the highest degree favourable not only to the morals and health of the ancient Germans, but must have contributed greatly to place the females in that dignified and respectable rank which they held in society. Nothing tends so much to blunt the feelings, to harden the heart, and to destroy the imagination, as the worship of the Vaga Venus in early youth. Wherever women have been considered as the early, willing, and accommodating slaves of the voluptuousness of the other sex, their character has become degraded, and they have sunk into domestic drudges and bondswomen among the poor,—the slaves of a haram among the more wealthy. On the other hand, the men, easily and early sated with indulgences, which soon lose their poignancy when the senses only are interested, become first indifferent, then harsh and brutal to the unfortunate slaves of their pleasures. The sated lover,—and perhaps it is the most brutal part of humanity,—is soon converted into the capricious tyrant, like the successful seducer of the modern poet.

“Hard! with their fears and terrors to behold
The cause of all, the faithless lover cold,
Impatient grown at every wish denied,
And barely civil, soothed and gratified.”

Crabbe's *Borough*, p. 213. . . .

After the love of God and of his lady, the Preux Chevalier was to be guided by that of glory and renown. He was bound by his vow to seek out adventures of risk and peril, and never to abstain from the quest which he might undertake, for any unexpected odds of opposition which he might encounter. It was not indeed the sober and regulated exercise of valour, but its fanaticism, which the genius of chivalry demanded of its followers. Enterprizes the most extravagant in conception, the most difficult in execution, the most useless when achieved, were those by which an adventurous knight chose to distinguish himself. There were solemn occasions also, on which these displays of chivalrous enthusiasm were specially expected and called for. It is only sufficient to name the tournaments, single combats, and solemn banquets, at which vows of chivalry were usually formed and proclaimed. . . .

The third and highest rank of chivalry was that of Knighthood. In considering this last dignity, we shall first inquire, how it was conferred; secondly, the general privileges and duties of the order; thirdly, the peculiar ranks into which it was finally divided, and the difference betwixt them.

Knighthood was, in its origin, an order of a republican, or at least an oligarchic nature; arising, as has been shown, from the customs of the free tribes of Germany, and, in its essence, not requiring the sanction of a monarch. On the contrary, each knight could confer the order of knighthood upon whomsoever prepara-

tory noviciate and probation had fitted to receive it. The highest potentates sought the *accolade*, or stroke which conferred the honour, at the hands of the worthiest knight whose achievements had dignified the period. Thus Francis I. requested the celebrated Bayard, the *Good Knight without reproach or fear*, to make him; an honour which Bayard valued so highly, that, on sheathing his sword, he vowed never more to use that blade, except against Turks, Moors, and Saracens. The same principle was carried to extravagance in a romance, where the hero is knighted by the hand of Sir Lancelot of the Lake, when dead. A sword was put into the hand of the skeleton, which was so guided as to let it drop on the neck of the aspirant. In the time of Francis I. it had already become customary to desire this honour at the hands of greatness rather than valour; so that the King's request was considered as an appeal to the first principles of chivalry. In theory, however, the power of creating knights was supposed to be inherent in every one who had reached that dignity. But it was natural that the soldier should desire to receive the highest military honour from the general under whose eye he was to combat, or from the prince or noble at whose court he passed as page and squire through the gradations of his noviciate. It was equally desirable, on the other hand, that the prince or noble should desire to be the immediate source of a privilege so important. And thus, though no positive regulation took place on the subject, ambition on the

Stained glass panel with a knight and his patron saint, c. 1505–08.



The Metropolitan Museum of Art, New York; bequest of George D. Pratt, 1935 (accession no. 41.170.104a-c); www.metmuseum.org

part of the aspirant, and pride and policy on that of the sovereign princes and nobles of high rank, gradually limited to the latter the power of conferring knighthood, or drew at least an unfavourable distinction between the knights dubbed by private individuals, and those who, with more state and solemnity, received the honoured title at the hand of one of high rank. Indeed, the change which took place respecting the character and consequences of the ceremony, naturally led to a limitation in the right of conferring it. While the order of knighthood merely implied a right to wear arms of a certain description, and to bear a certain title, there could be little harm in entrusting, to any one who had already received the honour, the power of conferring it on others. But when this highest order of chivalry conferred not only personal dignity, but the right of assembling under the banner, or pennon, a certain number of soldiers, when knighthood implied not merely personal privileges, but military rank, it was natural that sovereigns should use every effort to concentrate the right of conferring such distinction in themselves, or their immediate delegates. And latterly it was held, that the rank of knight only conferred those privileges on such as were dubbed by sovereign princes. . . .

The weapons of offence, however, most appropriate to knighthood were the lance and sword. They had frequently a battle axe or mace at their saddlebow, a formidable weapon even to men sheathed in iron like themselves. The knight had also a dagger which he used when at close quarters. It was called the dagger of mercy, probably because, when unsheathed, it behoved the antagonist to crave mercy or to die. The management of the lance and of the horse was the principal requisite of knighthood. To strike the foeman either on the helmet or full upon the breast with the point of the lance, and at full speed, was accounted perfect practice; to miss him, or to break a lance across, *i.e.* athwart the body of the antagonist, without striking him with the point, was accounted an awkward failure; to strike his horse, or to hurt his person under the girdle, was conceived a foul or felon action, and could only be excused by the hurry of a general encounter. When the knights, from the nature of the ground, or other circumstances, alighted to fight on foot, they used to cut some part from the length of their spears, in order to render them more manageable, like the pikes used by infantry. But their most formidable onset was when mounted and in host. They seem then to have formed squadrons not unlike the present disposition of cavalry in the field,—their squires forming the rear-rank, and performing the part of serrefiles. As the horses were trained in the tourneys and exercises to run upon each other without flinching, the shock of two such bodies of heavy-armed cavalry was dreadful, and the event usually decided the battle; for, until the Swiss showed the superior steadiness which could be exhibited by infantry, all great actions were decided by the men at arms. The yeomanry of England, indeed, formed a singular exception; and, from the dexterous use of the long bow, to which they were

trained from infancy, were capable of withstanding and destroying the mail-clad chivalry both of France and Scotland. Their shafts, according to the exaggerating eloquence of a monkish historian, Thomas of Walsingham, penetrated steel coats from side to side, transfixed helmets, and even splintered lances and pierced through swords! But, against every other pedestrian adversary, the knights, squires, and men-at-arms had the most decided advantage, from their impenetrable armour, the strength of their horses, and the fury of their onset. To render success yet more certain, and attack less hazardous, the horse, on the safety of which the riders so much depended, was armed *en-barbe*, as it was called, like himself. A masque made of iron covered the animal's face and ears; it had a breast-plate, and armour for the croupe. The strongest horses were selected for this service; they were generally stallions, and to ride a mare was reckoned base and unknightly. . . .

We are arrived at the third point proposed in our arrangement, the causes, namely, of the decay and extinction of Chivalry.

The spirit of chivalry sunk gradually under a combination of physical and moral causes; the first arising from the change gradually introduced into the art of war, and the last from the equally great alteration produced by time in the habits and modes of thinking in modern Europe. Chivalry began to dawn in the end of the tenth, and beginning of the eleventh century. It blazed forth with high vigour during the Crusades, which indeed may be considered as exploits of national knight-errantry, or general wars, undertaken on the very principles which actuated the conduct of individual knights adventurers. But its most brilliant period was during the wars between France and England, and it was unquestionably in those kingdoms, that the habit of constant and honourable opposition, unembittered by rancour or personal hatred, gave the fairest opportunity for the exercise of the virtues required from him whom Chaucer terms a very perfect gentle knight. Froissart frequently makes allusions to the generosity exercised by the French and English to their prisoners, and contrasts it with the dungeons to which captives taken in war were consigned, both in Spain and Germany. Yet both these countries, and indeed every kingdom in Europe, partook of the spirit of Chivalry in a greater or less degree; and even the Moors of Spain caught the emulation, and had their orders of knighthood as well as the Christians. But, even during this splendid period, various causes were silently operating the future extinction of the flame, which blazed thus wide and brightly.

An important discovery, the invention of gunpowder had taken place, and was beginning to be used in war, even when chivalry was in its highest glory. It is said Edward III. had field-pieces at the battle of Cressy, and the use of guns is mentioned even earlier. But the force of gunpowder was long known and used, ere it made any material change in the art of war. The longbow continued to be the

favourite, and it would seem the more formidable missile weapon, for well nigh two centuries after guns had been used in war. Still every successive improvement was gradually rendering the invention of fire arms more perfect, and their use more decisive of the fate of battle. In proportion as they came into general use, the suits of defensive armour began to be less generally worn. It was found, that these cumbrous defences, however efficient against lances, swords, and arrows, afforded no effectual protection against these more forcible missiles. The armour of the knight was gradually curtailed to a light head-piece, a cuirass, and the usual defences of men-at-arms. Complete harness was only worn by generals and persons of high rank, and that rather, it would seem, as a point of dignity than for real utility. The young nobility of France, especially, tired of the unwieldy steel coats in which their ancestors sheathed themselves, and adopted the slender and light armour of the German Reiters or mercenary cavalry. They also discontinued the use of the lance; in both cases, contrary to the injunctions of Henry IV and the opinion of Sully. At length, the arms of the cavalry were changed almost in every particular from those which were proper to chivalry; and as, in such cases, much depends upon outward show and circumstance, the light armed cavalier, who did not carry the weapons, or practice the exercises of knighthood, laid aside, at the same time, the habits and sentiments peculiar to the order. . . .

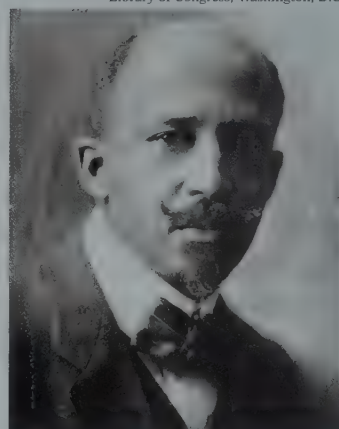
The system, as we have seen, had its peculiar advantages during the middle ages. Its duties were not, and indeed could not always be performed in perfection, but they had a strong influence on public opinion; and we cannot doubt that its institutions, virtuous as they were in principle, and honourable and generous in their ends, must have done much good and prevented much evil. We can now only look back on it as a beautiful and fantastic piece of frostwork, which has dissolved in the beams of the sun! But though we look in vain for the pillars, the vaults, the cornices, and the fretted ornaments of the transitory fabric, we cannot but be sensible that its dissolution has left on the soil valuable tokens of its former existence. We do not mean, nor is it necessary to trace, the slight shades of chivalry, which are yet received in the law of England. An appeal to combat in a case of treason, was adjudged in the celebrated case of Ramsay and Lord Reay, in the time of Charles I. An appeal of murder seems to have been admitted as legal within the last year, and is perhaps still under decision. But it is not in such issues, rare as they must be, that we ought to trace the consequences of chivalry. We have already shown, that its effects are rather to be sought in the general feeling of respect to the female sex; in the rules of forbearance and decorum in society; in the duties of speaking truth and observing courtesy; and in the general conviction and assurance, that, as no man can encroach upon the property of another without accounting to the laws, so none can infringe on his personal honour, be the difference of rank what it may, without subjecting himself to personal responsibility.

W. E. B. D U B O I S O N

“Negro Literature”

American sociologist W.E.B. Du Bois—cofounder of the NAACP, the most significant black activist of the first half of the 20th century, and author of the classic *The Souls of Black Folk* (1903)—was tapped by Britannica to write its entry on “Negro Literature” for its new 13th Edition (1926). Toward the end of his piece he praises *The Crisis*, the NAACP journal he edited for its first 24 years and where his evolution from hopeful social activist on behalf of racial justice to frustrated black separatist was captured in high relief.

Library of Congress, Washington, D.C.



The plight of the Africans brought to America during the slave trade and of their descendants is one of the most dramatic in human history. That there should arise a literature written by black Americans touching their own situation depended on many things—their education, their economic condition, their growth in group consciousness. Before 1910, the books written by American Negroes were with some exceptions either a part of the general American literature or individual voices of Americans of Negro descent.

There began, however, about 1910 something that can be called a renaissance. It came because of oppression, because the spread of education made self-expression possible, and because a larger number of these 10,000,000 people were raising themselves above the lowest poverty. The first sign of this renaissance was naturally a continuation of the self-revelations current during the abolition controversy in the slave narratives, of which Frederick Douglass's *Life and Times* (1892) was the most striking and Booker Washington's *Up from Slavery*, published in 1901, the last great example. Since 1910, other autobiographies have followed. In these later stories there is, of course, less of the older spontaneity, little of adventure and more self-consciousness. John R. Lynch published his revealing *Facts of Reconstruction* in 1913. Alexander Walters (a black bishop),

R. R. Moton (the successor of Booker Washington) and many others published autobiographies.

A more careful consideration of the Negro's social problems has characterised the period 1910–26. This is perhaps best illustrated by the three or four volumes of essays published by Kelley Miller, the trenchant work of William Pickens, W. E. B. DuBois's *Darkwater* (1920), and J. A. Rogers's *From Superman to Man* (1917), and especially by the files of the growing weekly Negro press. These general considerations have led to a number of scientific studies. Foremost among these are the series of Atlanta University studies covering 13 years and touching such matters as *Efforts for Social Betterment among Negro Americans* (1910); *The College-Bred Negro American* (1911); *The Common School and the Negro American* (1912); *The Negro American Artisan* (1913); *Morals and Manners among Negro Americans* (1915). There came also as a result of the Chicago riot the careful study of *The Negro in Chicago* (Illinois-Chicago Commission on Race Relations, 1922). The *Tuskegee Negro Year Book*, edited by M. N. Work annually since 1915, and the work of Dr. George E. Haynes have been along the same lines.

More striking work, however, begins with the rewriting of American history from the Negro point of view. The doyen of this effort since 1910 has been Carter G. Woodson, whose work has been prolific and painstaking. Beginning with 1916 he has published a considerable number of books, including the *Journal of Negro History*, 10 large volumes filled with documents, essays and research. Next comes Benjamin G. Brawley with his *Short History of the American Negro* (1913 and 1919), *Social History of the American Negro* (1921) and his study of *The Negro in Literature and Art in the United States* (1921). With these may be noted Steward's *The Haitian Revolution, 1791 to 1804* (1914), Emmett J. Scott's *The American Negro in the World War* (1919) and *The Gift of Black Folk: the Negroes in the Making of America* (1924), by W. E. B. DuBois, published by the Knights of Columbus.

But not in propaganda, science nor history has the essence of the renaissance shown itself. Rather the true renaissance has been a matter of the spirit and has shown itself among the poets as well as among the novelists and dramatists. In poetry, there are a dozen or more writers whose output has been small but significant. George McClellan, with his somewhat didactic and conventional verse, forms the link between past and present. Then comes James Weldon Johnson, Claude McKay, Leslie Hill, Joseph Cotter, Jr., Georgia Douglas Johnson, Countée Cullen and Langston Hughes, besides a half-dozen others. It is notable that already several critical anthologies (by James Weldon Johnson, Robert Kerlin, White and Jackson) have appeared. William Stanley Braithwaite has appeared as a widely read critic of poetry. The development in fiction is still newer and includes some earlier attempts like *The Quest of the Silver Fleece* by W. E. B. DuBois (1911) and James Weldon Johnson's *Autobiography of an Ex-Coloured Man* (1912), and newer

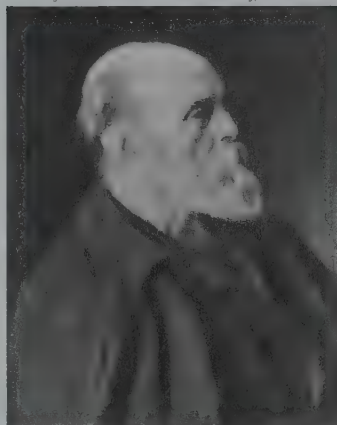
and more significant work by Rudolph Fisher, Jessie Fauset, Walter White and Jean Toomer. In the drama, Willis Richardson and one or two others have been writing effectively, while in the explanation and collection of Negro music and folklore we have J. Rosamond Johnson, T. W. Talley and J. W. Cotter.

Perhaps the extent of this renaissance of Negro literature can be summed up in two works. One is the 15 volumes of *The Crisis* magazine, which began publication in Nov. 1910, and has since been a compendium of occurrences, thoughts and expression among American Negroes. Most of the newer Negro writers found first publication in its pages. The second is the book called *The New Negro*, published in 1925 and edited by Alain Locke, in which some 30 contemporary Negro writers express the spirit of their day. All these things are beginnings rather than fulfilments, but they are significant beginnings. They mean much for the future.

WILLIAM ROSSETTI ON *Percy Bysshe Shelley*

*The English Romantic poet Percy Bysshe Shelley (1792–1822), whose enormous promise began to be realized in the last three or four years of his short life of 30 years, was the subject of a biography in Britannica’s 9th Edition (1875–89) by the acclaimed art critic William Rossetti (1829–1919), brother of the painter and poet Dante Gabriel Rossetti and the poet Christina Rossetti and diarist of the Pre-Raphaelite Brotherhood movement. William Rossetti was the author of, among other books, *Lives of Famous Poets* (1878). Some extracts from his *Britannica* article follow.*

Courtesy of the National Portrait Gallery, London



In the character of Percy Bysshe Shelley three qualities become early manifest, and may be regarded as innate: impressionableness or extreme susceptibility to external and internal impulses of feeling; a lively imagination or erratic fancy, blurring a sound estimate of solid facts; and a resolute repudiation of outer authority or the despotism of custom. These qualities were highly developed in his earliest manhood. . . . Shelley was a shy, sensitive, mopish sort of boy from one point of view,—from another a very unruly one, having his own notions of justice, independence, and mental freedom; by nature gentle, kindly, and retiring,—under provocation dangerously violent. He resisted the odious fagging system, exerted himself little in the routine of school-learning, and was known both as “Mad Shelley” and as “Shelley the Atheist.” . . . Shelley entered University College, Oxford, in April 1810, returned thence to Eton, and finally quitted the school at midsummer, and commenced residence in Oxford in October. Here he met a young Durham man, Thomas Jefferson Hogg, who had preceded him in the university by a couple of months; the two youths at once struck up a warm and intimate friendship. . . . In religious matters both were sceptics, or indeed decided anti-Christians; whether Hogg, as the senior and more informed disputant, pioneered Shelley into

strict atheism, or whether Shelley, as the more impassioned and unflinching speculator, outran the easy-going jeering Hogg, is a moot point; we incline to the latter opinion. Certain it is that each egged on the other by perpetual disquisition on abstruse subjects, conducted partly for the sake of truth and partly for that of mental exercitation, without on either side any disposition to bow to authority or stop short of extreme conclusions. The upshot of this habit was that Shelley and Hogg, at the dose of some five months of happy and uneventful academic life, got expelled from the university. . . .

Percy and his incensed father did not at once come to terms, and for a while he had no resource beyond pocket-money saved up by his sisters (four in number altogether) and sent round to him, sometimes by the hand of a singularly pretty school-fellow, Miss Harriet Westbrook, daughter of a retired and moderately opulent hotel-keeper. . . . Harriet not unnaturally fell in love with him; and he, though not it would seem at any time ardently in love with her, dallied along the flowery pathway which leads to sentiment and a definite courtship. . . . Shelley therefore returned to London, where he found Harriet agitated and wavering; finally they agreed to elope, travelled in haste to Edinburgh, and there, according to the law of Scotland, became husband and wife on 20th August. Shelley, it should be understood, had by this time openly broken, not only with the dogmas and conventions of Christian religion, but with many of the institutions of Christian polity, and in especial with such as enforce and regulate marriage; he held—with William Godwin and some other theorists—that marriage ought to be simply a voluntary relation between a man and a woman, to be assumed at joint option and terminated at the after option of either party. . . .

Harriet Shelley was not only beautiful; she was amiable, accommodating, adequately well educated and well bred. She liked reading, and her reading was not strictly frivolous. But she could not (as Shelley said at a later date) “feel poetry and understand philosophy”. . . .

At Tanyrallt Shelley was (to trust his own and Harriet’s account, confirmed by the evidence of Miss Westbrook, the elder sister, who continued an inmate in most of their homes) attacked on the night of 26th February by an assassin who fired three pistol-shots. The motive of the attack was undefined; the fact of its occurrence was generally disbelieved; both at the time and by subsequent inquirers. To analyse the possibilities and probabilities of the case would lead us too far; we can only say that we rank with the decided sceptics. Shelley was full of wild unpractical notions; he dosed himself with laudanum as a palliative to spasmodic pains; he was given to strange assertions and romancing narratives (several of which might properly be specified here but for want of space), and was not incapable of conscious fibbing. His mind no doubt oscillated at times along the line which divides sanity from insane delusion. It

is difficult to suppose that he simply invented such a monstrous story to serve a purpose. . . .

The Shelleys revisited Ireland, and then settled for a while in London. Here, in June 1813, Harriet gave birth to her daughter Ianthe Eliza (she married a Mr Esdaile, and died in 1876). Here also Shelley brought out his first poem of any importance, *Queen Mab*; it was privately printed, as its exceedingly aggressive tone in matters of religion and morals would not allow of publication.

The speculative sage whom Shelley especially revered was William Godwin, the author of *Political Justice* and of the romance *Caleb Williams*; in 1796 he had married Mary Wollstonecraft, authoress of *The Rights of Woman*, who died shortly after giving birth, on 30th August 1797, to a daughter Mary. With Godwin Shelley had opened a volunteered correspondence late in 1811, and he had known him personally since the winter which closed 1812. . . . It was towards May 1814 that Shelley first saw Mary Wollstonecraft Godwin as a grown-up girl (she was well on towards seventeen); he instantly fell in love with her, and she with him. Just before this, 24th March, Shelley had remarried Harriet in London, though with no obviously cogent motive for doing so; but, on becoming enamoured of Mary, he seems to have rapidly made up his mind that Harriet should not stand in the way. . . . The upshot came on 28th July, when Shelley aided Mary to elope from her father's house, Claire Clairmont deciding to accompany them. They crossed to Calais, and proceeded across France into Switzerland. Godwin and his wife were greatly incensed. Though he and Mary Wollstonecraft had entertained and avowed bold opinions regarding the marriage-bond, similar to Shelley's own, and had in their time acted upon these opinions, it is not clearly made out that Mary Godwin had ever been encouraged by paternal influence to think or do the like. Shelley and she chose to act upon their own likings and responsibility,—he disregarding any claim which Harriet had upon him, and Mary setting at nought her father's authority. Both were prepared to ignore the law of the land and the rules of society. . . . Shelley, and Mary as well, were on moderately good terms with Harriet, seeing her from time to time. His peculiar views as to the relations of the sexes appear markedly again in his having (so it is alleged) invited Harriet to return to his and Mary's house as a domicile; of course this curious arrangement did not take effect. Shelley and Mary (who was naturally always called Mrs Shelley) now settled at Bishopgate, near Windsor Forest; here he produced his first excellent poem, *Alastor, or the Spirit of Solitude*, which was published soon afterwards along with a few others. In May 1816 the pair left England for Switzerland, together with Miss Clairmont, and their own infant son William. They went straight to Sécheron, near Geneva; Lord Byron, whose separation from his wife had just then taken place, arrived there immediately afterwards. A great deal of controversy has lately arisen as to the motives and incidents of this foreign sojourn. The clear fact is that Miss Clairmont, who had a

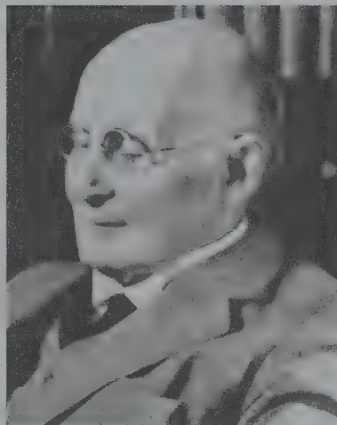
fine voice and some inclination for the stage, had seen Byron, as connected with the management of Drury Lane theatre, early in the year, and an amorous intrigue had begun between them in London. *Prima facie* it seems quite reasonable to suppose that she had explained the facts to Shelley or to Mary, or to both, and had induced them to convoy her to the society of Byron abroad. . . .

This was the time when Shelley began to see a great deal of Leigh Hunt, the poet and essayist, editor of *The Examiner*; they were close friends, and Hunt did something (hardly perhaps so much as might have been anticipated) to uphold the reputation of Shelley as a poet—which, we may here say once for all, scarcely obtained any public acceptance or solidity during his brief lifetime. . . . In Pisa Byron and Shelley were very constantly together, having in their company at one time or another Captain Medwin (cousin and schoolfellow of Shelley, and one of his biographers), Lieutenant and Mrs Williams, to both of whom our poet was very warmly attached, and Captain Trelawny, the adventurous and romantic-natured seaman who has left important and interesting reminiscences of this period. Byron admired very highly the generous, unworldly, and enthusiastic character of Shelley, and set some value on his writings; Shelley half-worshipped Byron as a poet, and was anxious, but in some conjunctures by no means able, to respect him as a man. . . .

The last residence of Shelley was the Casa Magni, a bare and exposed dwelling on the Gulf of Spezia. He and his wife, with the Williamses, went there at the end of April 1822, to spend the summer, which proved an arid and scorching one. Shelley and Williams, both of them insatiably fond of boating, had a small schooner named the "Don Juan" built at Genoa after a design which Williams had procured from a naval friend, and which was the reverse of safe. They received her on 12th May, found her rapid and alert, and on 1st July started in her to Leghorn, to meet Leigh Hunt, whose arrival in Italy had just been notified. After doing his best to set things going comfortably between Byron and Hunt, Shelley returned on board with Williams on 8th July. It was a day of dark, louring, stifling heat. Trelawny took leave of his two friends, and about half-past six in the evening found himself startled from a doze by a frightful turmoil of storm. The "Don Juan" had by this time made Via Reggio; she was not to be seen, though other vessels which had sailed about the same time were still discernible. Shelley, Williams, and their only companion, a sailor-boy, perished in the squall. . . . The great poet's ashes were then collected, and buried in the new Protestant cemetery in Rome. He was, at the time of his untimely death, within a month of completing the thirtieth year of his age—a surprising example of rich poetic achievement for so young a man.

ALFRED NORTH WHITEHEAD ON *Mathematics*

Alfred North Whitehead (1861–1947), the great British mathematician who was Bertrand Russell's teacher, friend, and collaborator, was, like Russell, a lucid expositor of math for the lay reader. He reviewed the subject, with a substantial focus on applied mathematics, in Britannica's famous 11th edition (1910–11). Some excerpts follow.



Mathematics (from “learning” or “science”), the general term for the various applications of mathematical thought, the traditional field of which is number and quantity. It has been usual to define mathematics as “the science of discrete and continuous magnitude.” Even Leibnitz, who initiated a more modern point of view, follows the tradition in thus confining the scope of mathematics properly so called, while apparently conceiving it as a department of a yet wider science of reasoning. A short consideration of some leading topics of the science will exemplify both the plausibility and inadequacy of the above definition. Arithmetic, algebra, and the infinitesimal calculus, are sciences directly concerned with integral numbers, rational (or fractional) numbers, and real numbers generally, which include incommensurable numbers. It would seem that “the general theory of discrete and continuous quantity” is the exact description of the topics of these sciences. Furthermore, can we not complete the circle of the mathematical sciences by adding geometry? Now geometry deals with points, lines, planes and cubic contents. Of these all except points are quantities: lines involve lengths, planes involve areas, and cubic contents involve volumes. Also, as the Cartesian geometry shows, all the relations between points are expressible in terms of geometric quantities. Accordingly, at first sight it seems reasonable to define geometry in some such way as “the science of dimensional quantity.” Thus every subdivision

of mathematical science would appear to deal with quantity, and the definition of mathematics as “the science of quantity” would appear to be justified. We have now to consider the reasons for rejecting this definition as inadequate.

Types of critical questions. What are numbers? We can talk of five apples and ten pears. But what are “five” and “ten” apart from the apples and pears? Also in addition to the cardinal numbers there are the ordinal numbers: the fifth apple and the tenth pear claim thought. What is the relation of “the fifth” and “the tenth” to “five” and “ten”? “The first rose of summer” and “the last rose of summer” are parallel phrases, yet one explicitly introduces an ordinal number and the other does not. Again, “half a foot” and “half a pound” are easily defined. But in what sense is there “a half,” which is the same for “half a foot” as “half a pound”? Furthermore, incommensurable numbers are defined as the limits arrived at as the result of certain procedures with rational numbers. But how do we know that there is anything to reach? We must know that $\sqrt{2}$ exists before we can prove that any procedure will reach it. An expedition to the North Pole has nothing to reach unless the earth rotates.

Also in geometry, what is a point? The straightness of a straight line and the planeness of a plane require consideration. Furthermore, “congruence” is a difficulty. For when a triangle “moves,” the points do not move with it. So what is it that keeps unaltered in the moving triangle? Thus the whole method of measurement in geometry as described in the elementary textbooks and the older treatises is obscure to the last degree. Lastly, what are “dimensions”? All these topics require thorough discussion before we can rest content with the definition of mathematics as the general science of magnitude; and by the time they are discussed the definition has evaporated. . . .

Definition of mathematics. It has now become apparent that the traditional field of mathematics in the province of discrete and continuous number can only be separated from the general abstract theory of classes and relations by a wavering and indeterminate line. Of course a discussion as to the mere application of a word easily degenerates into the most fruitless logomachy. It is open to any one to use any word in any sense. But on the assumption that “mathematics” is to denote a science well marked out by its subject matter and its methods from other topics of thought, and that at least it is to include all topics habitually assigned to it, there is now no option but to employ “mathematics” in the general sense of the “science concerned with the logical deduction of consequences from the general premisses of all reasoning.”

Geometry. The typical mathematical proposition is: “If $x, y, z \dots$ satisfy such and such conditions, then such and such other conditions hold with respect to them.” By taking fixed conditions for the hypothesis of such a proposition a definite department of mathematics is marked out. For example, geometry is such a

department. The “axioms” of geometry are the fixed conditions which occur in the hypotheses of the geometrical propositions. . . . It is sufficient to observe here that they are concerned with special types of classes of classes and of classes of relations, and that the connexion of geometry with number and magnitude is in no way an essential part of the foundation of the science. In fact, the whole theory of measurement in geometry arises at a comparatively late stage as the result of a variety of complicated considerations. . . .

Applied mathematics. The selection of the topics of mathematical inquiry among the infinite variety open to it has been guided by the useful applications, and indeed the abstract theory has only recently been disentangled from the empirical elements connected with these applications. For example, the application of the theory of cardinal numbers to classes of physical entities involves in practice some process of counting. It is only recently that the *succession* of processes which is involved in any act of counting has been seen to be irrelevant to the idea of number. Indeed, it is only by experience that we can know that any definite process of counting will give the true cardinal number of some class of entities. It is perfectly possible to imagine a universe in which any act of counting by a being in it annihilated some members of the class counted during the time and only during the time of its continuance. A legend of the Council of Nicea illustrates this point: “When the Bishops took their places on their thrones, they were 318; when they rose up to be called over, it appeared that they were 319; so that they never could make the number come right, and whenever they approached the last of the series, he immediately turned into the likeness of his next neighbour.” Whatever be the historical worth of this story, it may safely be said that it cannot be disproved by deductive reasoning from the premisses of abstract logic. The most we can do is to assert that a universe in which such things are liable to happen on a large scale is unfitted for the practical application of the theory of cardinal numbers. The application of the theory of real numbers to physical quantities involves analogous considerations. In the first place, some physical process of addition is presupposed, involving some inductively inferred law of permanence during that process. Thus in the theory of masses we must know that two pounds of lead when put together will counterbalance in the scales two pounds of sugar, or a pound of lead and a pound of sugar. Furthermore, the sort of continuity of the series (in order of magnitude) of rational numbers is known to be different from that of the series of real numbers. Indeed, mathematicians now reserve “continuity” as the term for the latter kind of continuity; the mere property of having an infinite number of terms between any two terms is called “compactness.” The compactness of the series of rational numbers is consistent with quasi-gaps in it—that is, with the possible absence of limits to classes in it. Thus the class of rational numbers whose squares are less than 2 has no upper limit among the rational numbers. But among

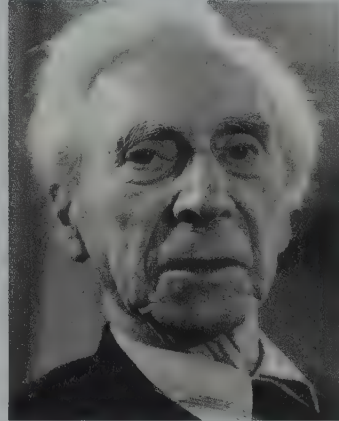
the real numbers all classes have limits. Now, owing to the necessary inexactness of measurement, it is impossible to discriminate directly whether any kind of continuous physical quantity possesses the compactness of the series of rationals or the continuity of the series of real numbers. In calculations the latter hypothesis is made because of its mathematical simplicity. But, the assumption has certainly no a priori grounds in its favour, and it is not very easy to see how to base it upon experience. For example, if it should turn out that the mass of a body is to be estimated by counting the number of corpuscles (whatever they may be) which go to form it, then a body with an irrational measure of mass is intrinsically impossible. Similarly, the continuity of space apparently rests upon sheer assumption unsupported by any a priori or experimental grounds. Thus the current applications of mathematics to the analysis of phenomena can be justified by no a priori necessity.

In one sense there is no science of applied mathematics. When once the fixed conditions which any hypothetical group of entities are to satisfy have been precisely formulated, the deduction of the further propositions, which also will hold respecting them, can proceed in complete independence of the question as to whether or no any such group of entities can be found in the world of phenomena. Thus rational mechanics, based on the Newtonian Laws, viewed as mathematics is independent of its supposed application, and hydrodynamics remains a coherent and respected science though it is extremely improbable that any perfect fluid exists in the physical world. But this unbendingly logical point of view cannot be the last word upon the matter. For no one can doubt the essential difference between characteristic treatises upon "pure" and "applied" mathematics. The difference is a difference in method. In pure mathematics the hypotheses which a set of entities are to satisfy are given, and a group of interesting deductions are sought. In "applied mathematics" the "deductions" are given in the shape of the experimental evidence of natural science, and the hypotheses from which the "deductions" can be deduced are sought. Accordingly, every treatise on applied mathematics, properly so-called, is directed to the criticism of the "laws" from which the reasoning starts, or to a suggestion of results which experiment may hope to find. Thus if it calculates the result of some experiment, it is not the experimentalist's well-attested results which are on their trial, but the basis of the calculation. Newton's *Hypotheses non fingo* was a proud boast, but it rests upon an entire misconception of the capacities of the mind of man in dealing with external nature.

BERTRAND RUSSELL ON *Philosophical Consequences of Relativity*

Not many scientists can write clearly for the lay reader about such matters as the theory of relativity. One who could was the philosopher-logician-mathematician Bertrand Russell, recipient of the Nobel Prize for Literature in 1950 and a multiple contributor to Britannica (also composing the piece on government propaganda highlighted in this volume). In his long and virtually hyperactive life Lord Russell spread scientific understanding as well as philosophical inquiry and reflection, atheism, pacifism, and left-wing socialist activism. His Britannica article on the "Philosophical Consequences of Relativity" (13th Edition, 1926) clarified the space-time concept in a very reader-friendly way (much more accessibly, in fact, than Einstein was able to do in his contribution to Britannica, also featured in this volume).

Courtesy of the British Broadcasting Corporation, London



Of the consequences in philosophy which may be supposed to follow from the theory of relativity, some are fairly certain, while others are open to question. There has been a tendency, not uncommon in the case of a new scientific theory, for every philosopher to interpret the work of Einstein in accordance with his own metaphysical system, and to suggest that the outcome is a great accession of strength to the views which the philosopher in question previously held. This cannot be true in all cases; and it may be hoped that it is true in none. It would be disappointing if so fundamental a change as Einstein has introduced involved no philosophical novelty.

Space-time. For philosophy, the most important novelty was present already in the special theory of relativity; that is, the substitution of space-time for space

and time. In Newtonian dynamics, two events were separated by two kinds of interval, one being distance in space, the other lapse of time. As soon as it was realised that all motion is relative (which happened long before Einstein), distance in space became ambiguous except in the case of *simultaneous* events, but it was still thought that there was no ambiguity about simultaneity in different places. The special theory of relativity showed, by experimental arguments which were new, and by logical arguments which could have been discovered any time after it became known that light travels with a finite velocity, that simultaneity is only definite when it applies to events in the same place, and becomes more and more ambiguous as the events are more widely removed from each other in space.

This statement is not quite correct, since it still uses the notion of "space." The correct statement is this: Events have a four-dimensional order, by means of which we can say that an event A is nearer to an event B than to an event C; this is a purely ordinal matter, not involving anything quantitative. But, in addition, there is between neighbouring events a quantitative relation called "interval," which fulfils the functions both of distance in space and of lapse of time in the traditional dynamics, but fulfils them with a difference. If a body can move so as to be present at both events, the interval is time-like. If a ray of light can move so as to be present at both events, the interval is zero. If neither can happen, the interval is space-like. When we speak of a body being present "at" an event, we mean that the event occurs in the same place in space-time as one of the events which make up the history of the body; and when we say that two events occur at the same place in space-time, we mean that there is no event between them in the four-dimensional space-time order. All the events which happen to a man at a given moment (in his own time) are, in this sense, in one place; for example, if we hear a noise and see a colour simultaneously, our two perceptions are both in one place in space-time.

When one body can be present at two events which are not in one place in space-time, the time-order of the two events is not ambiguous, though the magnitude of the time-interval will be different in different systems of measurement. But whenever the interval between two events is space-like, their time-order will be different in different equally legitimate systems of measurement; in this case, therefore, the time-order does not represent a physical fact. It follows that, when two bodies are in relative motion, like the sun and a planet, there is no such physical fact as "the distance between the bodies at a given time"; this alone shows that Newton's law of gravitation is logically faulty. Fortunately, Einstein has not only pointed out the defect, but remedied it. His arguments against Newton, however, would have remained valid even if his own law of gravitation had not proved right.

Time not a single cosmic order. The fact that time is private to each body, not a single cosmic order, involves changes in the notions of substance and cause,

and suggests the substitution of a series of events for a substance with changing states. The controversy about the aether thus becomes rather unreal. Undoubtedly, when light-waves travel, events occur, and it used to be thought that these events must be “in” something; the something in which they were was called the aether. But there seems no reason except a logical prejudice to suppose that the events are “in” anything. Matter, also, may be reduced to a law according to which events succeed each other and spread out from centres; but here we enter upon more speculative considerations.

Physical laws. Prof. Eddington has emphasised an aspect of relativity theory which is of great philosophical importance, but difficult to make clear without somewhat abstruse mathematics. The aspect in question is the reduction of what used to be regarded as physical laws to the status of truisms or definitions. Prof. Eddington, in a profoundly interesting essay on “The Domain of Physical Science,” states the matter as follows:—

In the present stage of science the laws of physics appear to be divisible into three classes—the identical, the statistical and the transcendental. The “identical laws” include the great field-laws which are commonly quoted as typical instances of natural law—the law of gravitation, the law of conservation of mass and energy, the laws of electric and magnetic force and the conservation of electric charge. These are seen to be identities, when we refer to the cycle so as to understand the constitution of the entities obeying them; and unless we have misunderstood this constitution, violation of these laws is inconceivable. They do not in any way limit the actual basal structure of the world, and are not laws of governance.

It is these identical laws that form the subject-matter of relativity theory; the other laws of physics, the statistical and transcendental, lie outside its scope. Thus the net result of relativity theory is to show that the traditional laws of physics, rightly understood, tell us almost nothing about the course of nature, being rather of the nature of logical truisms.

This surprising result is an outcome of increased mathematical skill. As the same author says elsewhere:—

In one sense deductive theory is the enemy of experimental physics. The latter is always striving to settle by crucial tests the nature of the fundamental things; the former strives to minimise the successes obtained by showing how wide a nature of things is compatible with all experimental results.

The suggestion is that, in almost any conceivable world, *something* will be conserved; mathematics gives us the means of constructing a variety of mathematical expressions having this property of conservation. It is natural to suppose that it is useful to have senses which notice these conserved entities; hence mass, energy, and so on *seem* to have a basis in our experience, but are in fact merely certain quantities which are conserved and which we are adapted for noticing. If this view is correct, physics tells us much less about the real world than was formerly supposed.

Force and gravitation. An important aspect of relativity is the elimination of "force." This is not new in idea; indeed, it was already accepted in rational dynamics. But there remained the outstanding difficulty of gravitation, which Einstein has overcome. The sun is, so to speak, at the summit of a hill, and the planets are on the slopes. They move as they do because of the slope where they are, not because of some mysterious influence emanating from the summit. Bodies move as they do because that is the easiest possible movement in the region of space-time in which they find themselves, not because "forces" operate upon them. The apparent need of forces to account for observed motions arises from mistaken insistence upon Euclidean geometry; when once we have overcome this prejudice, we find that observed motions, instead of showing the presence of forces, show the nature of the geometry applicable to the region concerned. Bodies thus become far more independent of each other than they were in Newtonian physics: there is an increase of individualism and a diminution of central government, if one may be permitted such metaphorical language. This may, in time, considerably modify the ordinary educated man's picture of the universe, possibly with far-reaching results.

Realism in relativity. It is a mistake to suppose that relativity adopts an idealistic picture of the world—using "idealism" in the technical sense, in which it implies that there can be nothing which is not experience. The "observer" who is often mentioned in expositions of relativity need not be a mind, but may be a photographic plate or any kind of recording instrument. The fundamental assumption of relativity is realistic, namely, that those respects in which all observers agree when they record a given phenomenon may be regarded as objective, and not as contributed by the observers. This assumption is made by common sense. The apparent sizes and shapes of objects differ according to the point of view, but common sense discounts these differences. Relativity theory merely extends this process. By taking into account not only human observers, who all share the motion of the earth, but also possible "observers" in very rapid motion relatively to the earth, it is found that much more depends upon the point of view of the observer than was formerly thought. But there is found to be a residue which is not so dependent; this is the part which can be expressed by the method of "tensors."

The importance of this method can hardly be exaggerated; it is, however, quite impossible to explain it in non-mathematical terms.

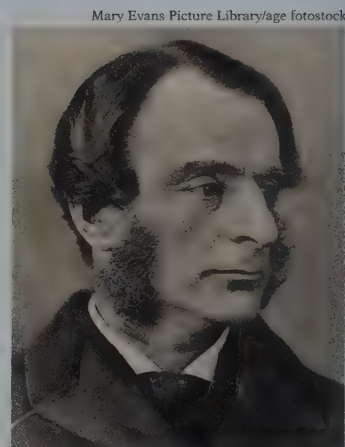
Relativity physics. Relativity physics is, of course, concerned only with the quantitative aspects of the world. The picture which it suggests is somewhat as follows:—In the four-dimensional space-time frame there are events everywhere, usually many events in a single place in space-time. The abstract mathematical relations of these events proceed according to the laws of physics, but the intrinsic nature of the events is wholly and inevitably unknown except when they occur in a region where there is the sort of structure we call a brain. Then they become the familiar sights and sounds and so on of our daily life. We know what it is like to see a star, but we do not know the nature of the events which constitute the ray of light that travels from the star to our eye. And the space-time frame itself is known only in its abstract mathematical properties; there is no reason to suppose it similar in intrinsic character to the spatial and temporal relations of our perceptions as known in experience. There does not seem any possible way of overcoming this ignorance, since the very nature of physical reasoning allows only the most abstract inferences, and only the most abstract properties of our perceptions can be regarded as having objective validity. Whether any other science than physics can tell us more, does not fall within the scope of the present article.

Meanwhile, it is a curious fact that this meagre kind of knowledge is sufficient for the *practical* uses of physics. From a practical point of view, the physical world only matters in so far as it affects us, and the intrinsic nature of what goes on in our absence is irrelevant, provided we can predict the effects upon ourselves. This we can do, just as a person can use a telephone without understanding electricity. Only the most abstract knowledge is required for practical manipulation of matter. But there is a grave danger when this habit of manipulation based upon mathematical laws is carried over into our dealings with human beings, since they, unlike the telephone wire, are capable of happiness and misery, desire and aversion. It would therefore be unfortunate if the habits of mind which are appropriate and right in dealing with material mechanisms were allowed to dominate the administrator's attempts at social constructiveness.

CHARLES KINGSLEY ON *The Murder of Hypatia*

The Athens-educated Hypatia of Alexandria—philosopher, astronomer, and teacher who was the first notable woman in mathematics—is doubtless best known for the viciousness of her murder by a mob in March 415 CE amid a citywide feud between the local bishop, Cyril, and prefect, Orestes, and the best-known book about her, one of the most popular books of the 19th century—Hypatia (1853). The book, a rather erotic rendering by clergyman, novelist, and social reformer Charles Kingsley (1819–75), is seldom read today, largely due to its off-putting racial and religious inclinations, common to Kingsley's day. But in the mid-

19th century, there would have been no bigger fish than Kingsley for Britannica to catch for a biography of the tragic mathematician for its 8th Edition (1852–60), and catch him it did. Kingsley's rather eclectic biography of Hypatia follows.



Hypatia is one of those whose names are glorified rather by wrongs than by merits; and had she not died, few would now know, and fewer care, whether she ever lived.

Her tragedy is well known by the account of Gibbon, drawn from *Socrates*, bk. vii., §15; and from Theodoret, who asserts Cyril's complicity. Theodoret knew Cyril [bishop of Alexandria] well enough to suspect him of anything; at least, to say of him, after his death, that "the only fear was that hell would find him too unpleasant a guest, and send him back to earth." And certainly all we know of him justifies the sneer; at least, it seems certain that Cyril protected her murderers.

Hypatia's death seems to have happened thus:—The minds of the Nitrian monks, and of the Alexandrian populace, had been inflamed by her intimacy with Orestes, the prefect, who was at open war with Cyril. Hating her both as what she was, the championess of an eclectic Polytheism; and as what she was not, a

profligate woman, they laid wait for her at the door of that lecture-room in the Mouseion, where (to the envy of Cyril) her admirers' chariots and slaves were wont to wait. She was seized, stript naked, dragged into the Kaisareion (then a Christian church), and torn piece-meal, with fragments of shells and pottery. The flesh was scraped from the bones, and what remained burned in the Kinaron.

Thus ended, or seems to have ended, the last noble woman whom Greek paganism produced. But, indeed, Hypatia is at best but a myth and a shade; and two centuries more saw her transfigured into the famous Saint Catharine of Alexandria [an unproved theory]; the Christians whom she opposed into pagan philosophers confuted; Cyril into Maxentius the persecutor, the pot-sherds of the Kinaron into the toothed wheels miraculously broken by lightning from heaven; and Hypatia installed for a thousand years to come as one of the four virgin saints of Christendom. So does the whirligig of Time bring round its revenges; and every noble soul, even under a feigned name and circumstance, has its nobleness acknowledged, and does—not the work which it intended, but the work of which it was really capable.

Death of the Philosopher Hypatia, in Alexandria, *illustration from an 1866 book by Louis Figuier.*



Mary Evans Picture Library/age fotostock

Our Nonconscious Future

By Yuval Noah Harari

Within the next century or two, we humans are likely to upgrade ourselves into gods and change the most basic principles of the evolution of life. Traditional mythologies depicted gods as powerful beings that could design and create life according to their wishes. In the coming two centuries we will probably learn how to engineer and manufacture various life forms according to our wishes. We will use bio-engineering in order to create new kinds of organic beings; we will use direct brain-computer interfaces in order to create cyborgs (beings that combine organic and inorganic parts); and advances in machine learning and AI might even allow us to set in motion the creation of completely inorganic beings. The main products of the future economy will not be food, textiles, and vehicles but rather bodies, brains, and minds.

This will be not just the greatest revolution in history but the greatest revolution in biology since the appearance of life on

Earth. For four billion years life was governed by the laws of natural selection. During all these eons, whether you were a virus or a dinosaur, you evolved according to the principles of natural selection. In addition, no matter what strange and bizarre shapes life took, it remained confined to the organic realm. Whether a cactus or a whale, you were made of organic compounds and you remained subject to the laws of organic chemistry. In the next two centuries, however, science could be ushering in the era of inorganic life shaped by intelligent design. Not the intelligent design of some god above the clouds—but *our* intelligent design and the intelligent design of our cloud computing.

In the process, *Homo sapiens* itself will likely disappear. In 200 years Earth will probably be dominated by entities more different from us than we are different from Neanderthals or chimpanzees. Today we still share with Neanderthals and chimpanzees most of our bodily structures, phys-

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ical abilities, and mental faculties. Not only our hands, eyes, and brains are distinctly hominid, but so are our lust, our love, our anger, and our social bonds. Within 200 years the combination of biotechnology and AI might result in bodily, physical, and mental traits that completely break free of the hominid mold. For example, brain-computer interfaces could result in distributed bodies—beings whose organs are spread widely in space. Some believe that consciousness might be severed from any organic structure and could surf cyberspace free of traditional biological and physical constraints.

On the other hand, we might witness the decoupling of intelligence from consciousness. Intelligence is the ability to solve problems. Consciousness is the ability to feel things, such as pain, joy, love, and anger. In mammals the two go together. Mammals solve problems by feelings things. But computers are very different. So far the amazing development of computer intelligence

has not been accompanied by any development of computer consciousness. There might be several alternative ways leading to superintelligence, only some of which pass through the straights of consciousness. For millions of years mammalian evolution has been slowly sailing along the conscious route. The evolution of inorganic life forms, however, may completely bypass these narrow straights, charting a different and much quicker course to superintelligence. We might end up with a world dominated by superintelligent but completely nonconscious entities.

Yuval Noah Harari is the author of the international best sellers Sapiens: A Brief History of Humankind (2015) and Homo Deus: A Brief History of Tomorrow (2017). He was born in Haifa, Israel, in 1976, received his Ph.D. from the University of Oxford in 2002, and is now a lecturer in the Department of History at the Hebrew University of Jerusalem.

IAN STEWART ON *Number Symbolism*

Another member of Britannica's cadre of academics who can write well and explain difficult subjects for the lay person is Ian Stewart, an emeritus professor of mathematics at Warwick University and at Gresham College, London. He is best known for his popular science writing and public appearances, mainly on behalf of furthering public awareness of mathematics. As part of this mission he has made some 450 radio broadcasts and 80 television appearances and published more than 80 books, including popular works of science fiction. He is the recipient of numerous prizes and medals and was elected a Fellow of the Royal Society in 2001. The subject he addressed for Britannica, highlighted below, was the ever-entertaining topic of number symbolism.



Courtesy of Ian Stewart

Humanity has had a love-hate relationship with numbers from the earliest times. Bones dating from perhaps 30,000 years ago show scratch marks that possibly represent the phases of the Moon. The ancient Babylonians observed the movements of the planets, recorded them as numbers, and used them to predict eclipses and other astronomical phenomena. The priesthood of ancient Egypt used numbers to predict the flooding of the Nile. Pythagoreanism, a cult of ancient Greece, believed that numbers were the basis of the entire universe, which ran on numerical harmony. The Pythagoreans' ideas were a mixture of prescience (the numerical features of musical sounds) and mysticism (3 is male, 4 is female, and 10 is the most perfect number). Numbers were associated with names for magical purposes: the biblical "number of the beast," 666, is probably an example of this practice. More recently, cranks have sought the secrets of the universe in the dimensions of the Great Pyramid of Giza, an aberration so common that it even has a name—pyramidology. Millions of otherwise rational people are ter-

rified of the number 13, to the extent that hotels omit it from their floors, airplanes do not have a row 13, and the numbers for Formula 1 racing cars skip from 12 to 14 so that, for example, 22 cars would be numbered from 1 to 23. Learned tomes are written about the significance of such stalwarts as the golden number (1.618034), which does occur in flowering plants and modern architecture but does not occur in the shell of the nautilus and ancient Greek architecture, despite endless myths to the contrary. Many religions have their sacred numbers, as do organizations such as Freemasonry; Wolfgang Amadeus Mozart's music, notably the *Magic Flute* (1791), includes many intentional references to Masonic numerology.

Mathematics is the study of numbers, shapes, and related structures. Number mysticism belongs elsewhere and is generally categorized as numerology. Numerology sheds light on the innermost workings of the human mind but very little on the rest of the universe. Mathematics, meanwhile, sheds light on much of the universe but, as yet, very little on human psychology. Between the two lies fruitful scientific ground, yet to be cultivated extensively.

Numerals and Numerology

Numerical coincidences abound, and they are often so remarkable that it is difficult to explain them rationally. Not surprisingly, many people become convinced that these coincidences have irrational explanations. What, for example, should be made of the following similarities (not all of them numerological) between U.S. Presidents Abraham Lincoln and John F. Kennedy, taken from a far more extensive list in Martin Gardner's *The Magic Numbers of Dr. Matrix* (1985)?

- Lincoln was elected president in 1860, Kennedy in 1960.
- Both were assassinated on a Friday.
- Lincoln was killed in Ford's Theatre; Kennedy was killed riding in a Lincoln convertible made by the Ford Motor Company.
- Both were succeeded by Southern Democrats named Johnson.
- Andrew Johnson was born in 1808, Lyndon Johnson in 1908.
- The first name of Lincoln's private secretary was John, the last name of Kennedy's private secretary was Lincoln.
- John Wilkes Booth was born in 1839, Lee Harvey Oswald in 1939.
- Booth shot Lincoln in a theatre and fled to a warehouse; Oswald shot Kennedy from a warehouse and fled to a theatre.
- *John Wilkes Booth* and *Lee Harvey Oswald* both have 15 letters.
- The first public suggestion that Lincoln should run for president proposed that his running mate should be John Kennedy. (John Pendleton Kennedy was a Maryland politician.)

- Shift each letter of *FBI* forward by six letters in the alphabet and you get *LHO*, the initials of Lee Harvey Oswald.

One explanation for coincidences of this kind is selective reporting. Anything that fits is kept; anything that does not is discarded. Thus, the coincidence of day of the week for the assassinations is emphasized; the differences in month and number of day in the month are ignored. (Lincoln was assassinated on April 14, Kennedy on November 22.) More subtly, only one choice is made from many possibilities, the one that maintains the numerological pattern. Sometimes the date of birth is used, sometimes the date of election. If those do not work, how about the dates of college graduation, marriage, firstborn child, first election to office, or death? Moreover, some “facts” turn out to be false. The correct birth date for Booth is now thought to be 1838, not 1839, and Booth actually fled to a barn. It is common for coincidences to be exaggerated in this manner. And once one starts looking . . . Lincoln had a beard. Did Kennedy? No, he was clean-shaven. Do not mention beards, then.

Many of the coincidences listed here are exaggerations, lies, elaborations chosen from an infinite range of potential targets, or the result of a hidden selective process. Still, a few of the coincidences are quite startling. Although rational explanations exist, a true believer cannot be convinced. It is in this fertile territory that number mysticism thrives. . . .

Cultural Associations of Some Numbers

The enormous range of symbolic roles that numbers have played in various cultures, religions, and other systems of human thought can be gauged from a brief sample.

1

Not surprisingly, the number 1 is generally treated as a symbol of unity. Therefore, in monotheistic religions, it often symbolizes God or the universe. The Pythagoreans did not consider 1 to be a number at all because number means plurality and 1 is singular. However, they considered it to be the source of all numbers because adding many 1s together can create any other (positive whole) number. In their system, where odd numbers were male and even numbers female, the number 1 was neither; instead, it changed each to the other. If 1 is added to an even number, it becomes odd; similarly, if 1 is added to an odd number, it becomes even.

2

The number 2 symbolizes many of the basic dualities: me/you, male/female, yes/no, alive/dead, left/right, yin/yang, and so on. Dualities are common in human approaches to the world, probably because of our preference for two-valued logic—yet another duality, true/false. Although 2 was female to the Pythagoreans, other numerological schemes viewed it as male. In Agrippa von Nettesheim's *De occulta philosophia* (1533; "On the Philosophy of the Occult"), 2 is the symbol for man, sex, and evil. One reason that some have associated 2 with evil is that the biblical book of Genesis does not use the formula "and it was good" when referring to the second day of Creation.

Some religions are dualistic, with two gods in place of the one God of monotheism. Examples include Zoroastrianism, where Ahura Mazdā (the god of light and goodness) battles with Ahriman (the god of darkness and evil). The number 2 is often associated with negatives, as in the words *duplicity* and *two-faced*. Northwest Coast Indians required the parents of twins to observe various taboos because they believed that supernatural powers would bring the wishes of twins to fruition.

3

The number 3 is a very mystical and spiritual number featured in many folktales (three wishes, three guesses, three little pigs, three bears, three billy goats gruff). In ancient Babylon the three primary gods were Anu, Bel (Baal), and Ea, representing Heaven, Earth, and the Abyss. Similarly, there were three aspects to the Egyptian sun god: Khepri (rising), Re (midday), and Atum (setting). In Christianity there is the Trinity of God the Father, God the Son, and God the Holy Spirit. Plato saw 3 as being symbolic of the triangle, the simplest spatial shape, and considered the world to have been built from triangles. In German folklore a paper triangle with a cross in each corner and a prayer in the middle was thought to act as protection against gout, as well as protecting a cradle from witches. Three black animals were often sacrificed when attempting to conjure up demons. On the other hand, a three-coloured cat was a protective spirit. In William Shakespeare's *Macbeth* (1606–07) there are three witches, and their spell begins, "Thrice the brindled cat hath mewed," reflecting such superstitions. Also, 3 is the dimension of the smallest magic square in which every row, column, and diagonal sums to 15. . . .

10

As already stated, 10 was the Pythagorean symbol of perfection or completeness. Humans have ten fingers and ten toes. Counting on fingers probably led to the

decimal number system, with its symbols 0–9 and its place values whereby the 7 in 703 counts as 7 hundreds, but in 173 it is 7 tens and in 507 it is 7 units. We consider powers of 10, such as 100 or 1,000, to be “round numbers.” However, there is nothing special about 10, and any other number from 2 onward can be used as a number base. Indeed, computers use base 2, or the binary number system, written using only the symbols 0 and 1. Mathematicians distinguish “genuine” properties of numbers, which are true independent of any notational base, with “accidental” ones that arise only because of the notational system—for example, that 153 (the number of fish in the Gospel According to John) is the sum of the cubes of its digits, $1^3 + 5^3 + 3^3 = 1 + 125 + 27 = 153$.

Occurrences of 10 and its powers are so common that there is no point in listing them here. However, the Ten Commandments of the Bible deserve mention, especially given that Buddhism too has its own ten commandments—five for monks and five for the laity. . . .

13

Triskaidekaphobes believe 13 to be unlucky, especially when the 13th day of the month is a Friday, a fear that was reinforced by the explosion that almost wrecked

Elevator panel reflecting the lack of a 13th floor.



© Kasia Biel/Dreamstime.com

the Apollo 13 lunar spacecraft in 1970. Skeptics note that it returned to Earth safely, unlike any other manned spacecraft that has exploded, making its crew some of the luckiest people on the planet. The fear of 13 may relate to Judas Iscariot's having been the 13th person to arrive at the Last Supper, but its negative undertones go back much earlier, probably because an extra 13th item spoils the auspicious 12. There are 13 lunar months in the year (with a small error), which led the Maya and the Hebrews to consider 13 as auspicious. In medieval theology $13 = 10 + 3$ (Commandments plus Trinity), and therefore the number had some positive aspects. . . .

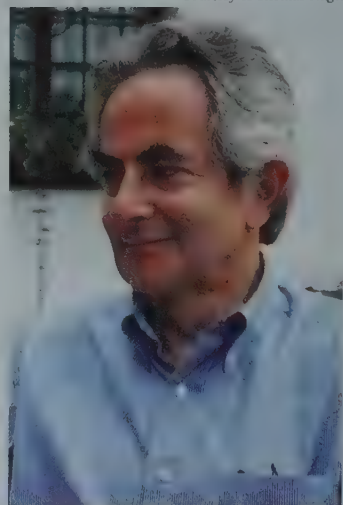
100

Because our notational system for numbers is decimal (base 10), the number 100 takes on a significance that it would probably not possess if we employed other systems of notation. It is a round number and holds hints of perfection. The Western calendar is divided into the decade (10 years), century (100 years), and millennium (1,000 years), with the century as the most important unit. Thus, one refers to the 20th or 21st century as a way to establish a broad historical period. In the game of cricket, scoring 100 runs (a century) is a major feat for a batsman, but to be out at 99 is a significant failure. A half-century (50) is also a sign of good play, whereas falling short at 49 is undesirable. (If we had seven fingers and counted in base 7, we would write 49 as 100, so presumably 49 would be considered an excellent score in such a culture.) The dollar is divided into 100 cents, and many other currencies (pound sterling, euro) involve a similar subdivision of the main unit of currency. The Celsius temperature scale has 100 degrees as the boiling point of water. "A hundred" often just means "a lot"; for example, the Roman centurion did not always command exactly 100 men.

By the same token, 101 often means "a lot" too, but it is manifestly bigger than 100, and its lack of roundness makes it sound more precise, such as in the Disney-Company-produced *101 Dalmatians* (1961).

THOMAS NAGEL ON *Bernard Williams and Ethics*

Here we have one of the world's leading philosophers discussing the life and work of another leading philosopher. Thomas Nagel of New York University has been garnering attention, and causing wide-scale academic debate and controversy since the early 1970s, especially after his famous essay, "What Is It Like to Be a Bat?", a 1974 essay on consciousness, became standard reading for philosophy students. Nagel's topic for Britannica, as seen excerpted below, was the great English philosopher Sir Bernard Williams (1929–2003).



Courtesy of Thomas Nagel

Some philosophers, in the tradition of David Hume (1711–76), have denied that there can be objective truth in ethics on the ground that this would have to mean, very implausibly, that moral propositions are true because they represent moral entities or structures that are part of the furniture of the world—moral realities with which humans have some kind of causal interaction, as they do with the physical objects of scientific knowledge. Williams was also doubtful about objectivity in ethics, but his criticism does not depend on this false analogy with science and is more interesting.

Moral judgments, according to Williams, are about what people should do and how they should live; they do not at all purport to represent how things are in the outside world. So, if there is any objectivity in moral judgments, it would have to be sought in a different analogy with scientific objectivity. Objective truth in ethics would have to consist not in ethical entities or properties added to the absolute conception of the external world but in the objective validity of the reasoning that supports certain practical, rather than descriptive, judgments about what people should do and how they should live. The analogy with scientific objectivity would reside in the fact that the way to arrive at such objective and universally valid truth would be to detect and correct for the biases and distortions introduced into

one's practical judgment by contingencies of one's personal or parochial perspective. The more distortions one could correct, the closer one would get to the truth.

But it is just this aim, central to the idea of moral objectivity, that Williams thinks is fundamentally misguided. Williams finds something bizarre about the theoretical ambition of discovering a standard for practical judgment that escapes the perspectival peculiarities of the individual point of view. This applies to any ethical theory with a strong basis in impartiality or with a claim to universal validity. Williams's basic point is that, in the practical domain, the ambition of transcending one's own point of view is absurd. If taken seriously, it is likely to be profoundly self-deceived in its application. To Williams, the ambition is akin to that of the person who tries to eliminate from his life all traces of the fact that it is his.

Williams developed this objection through his general view that practical reasons must be "internal" rather than "external": that is, reasons for action must derive from motives that a person already has; they cannot create new motives by themselves, through the force of reason alone. He also defended a limited form of ethical relativism. He believed that, while there can be ethical truth, it is local and historically contingent and based on reasons deriving from people's actual motives and practices, which are not timeless or universal. Consequently, moral judgments cannot be applied to cultures too far removed in time and character from the culture in which they originate.

These arguments appear in *Ethics and the Limits of Philosophy* (1985), "A Critique of Utilitarianism" (1973; in *Utilitarianism: For and Against*), and some of the essays reprinted in *Moral Luck* (1981) and *Making Sense of Humanity* (1995). The debate provoked by Williams's claim that impersonal moral standards undermine the integrity of personal projects and personal relations, which give life its very meaning, was an important part of the moral and political philosophy of the later 20th century. Even philosophers who did not accept Williams's conclusions were in most cases led to recognize the importance of accommodating the personal point of view as a factor in moral theory.

Williams also raised and explored the deep question of whether a person's moral status is immune to "luck," or purely contingent circumstances, as Kant had argued (for Kant, the moral status of an individual depends only on the quality of his will). Williams invented the concept of "moral luck" and offered strong reasons to think that people are morally vulnerable to contingencies beyond their control, a conception he found exemplified in Greek tragedy. Oedipus, for example, is not relieved of guilt for killing his father and marrying his mother by the fact that he did not know at the time that that was what he was doing. Williams's remarkable philosophical-literary-historical work, *Shame and Necessity* (1993), presented these ideas in a rich study of Greek ethical thought.

Williams came to the conclusion that, instead of following the model of natural science, the project of understanding human nature should rely on history, which provides some distance from the perspective of the present without leaving the fullness of the human perspective behind. During the later part of his career, this viewpoint coincided with his admiration for Nietzsche, whose genealogical method was an example of historical self-exploration. In Williams's last book, *Truth and Truthfulness* (2002), he applied these ideas to the importance of truth in the theoretical and practical spheres as well as in political and personal relations.

Williams's major published works, in addition to those mentioned above, include *Morality: An Introduction to Ethics* (1972); *Problems of the Self: Philosophical Papers* (1973); *In the Beginning Was the Deed: Realism and Moralism in Political Argument* (2005); *The Sense of the Past: Essays in the History of Philosophy* (2005); *Philosophy as a Humanistic Discipline* (2005); and *On Opera* (2006).

ADAM GOPNIK ON

The United States

A mainstay of The New Yorker since 1986, serving as its art critic from 1987 to 1995, Adam Gopnik has written hundreds of pieces of fiction and nonfiction, from humor and book reviews to profiles and reports from abroad. Winner of three National Magazine awards, he is also a frequent speaker and book author. His books are just as varied, ranging from collections of essays on Paris to food and children's stories. For Britannica he addressed, for its extensive coverage of the United States, the "high" and "low" aspects of American culture.

Brigitte Lacombe



The great art historian Sir Ernst Hans Josef Gombrich once wrote that there is really no such thing as “art”; there are only artists. This is a useful reminder to anyone studying, much less setting out to try to define, anything as big and varied as the culture of the United States. For the culture that endures in any country is made not by vast impersonal forces or by unfolding historical necessities but by uniquely talented men and women, one-of-a-kind people doing one thing at a time—doing what they can, or must. In the United States, particularly, where there is no more a truly “established” art than an established religion—no real academies, no real official art—culture is where one finds it, and many of the most gifted artists have chosen to make their art far from the parades and rallies of worldly life.

Some of the keenest students of the American arts have even come to dislike the word *culture* as a catchall for the plastic and literary arts, since it is a term borrowed from anthropology, with its implication that there is any kind of seamless unity to the things that writers and poets and painters have made. The art of some of the greatest American artists and writers, after all, has been made in deliberate seclusion and has taken as its material the interior life of the mind and heart that shapes and precedes shared “national” experience. It is American art be-



Mark Twain, lithograph from *Puck*, 1885.

fore it is the culture of the United States. Even if it is true that these habits of retreat are, in turn, themselves in part traditions, and culturally shaped, it is also true that the least illuminating way to approach the poems of Emily Dickinson or the paintings of Winslow Homer, to take only two imposing instances, is as the consequence of large-scale mass sociological phenomenon.

Still, many, perhaps even most, American culture makers have not only found themselves, as all Americans do, caught in the common life of their country—they have chosen to make the common catch their common subject. Their involvement with the problems they share with their neighbours, near and far, has given their art a common shape and often a common substance. And if one quarrel has absorbed American artists

and thinkers more than any other, it has been that one between the values of a mass, democratic, popular culture and those of a refined elite culture accessible only to the few—the quarrel between “low” and “high.” From the very beginnings of American art, the “top down” model of all European civilization, with a fine art made for an elite class of patrons by a specialized class of artists, was in doubt, in part because many Americans did not want that kind of art, in part because, even if they wanted it, the social institutions—a court or a cathedral—just were not there to produce and welcome it. What came in its place was a commercial culture, a marketplace of the arts, which sometimes degraded art into mere commerce and at other times raised the common voice of the people to the level of high art.

In the 20th century, this was, in some part, a problem that science left on the doorstep of the arts. Beginning at the turn of the century, the growth of the technology of mass communications—the movies, the phonograph, radio, and eventually television—created a potential audience for stories and music and theatre larger than anyone could previously have dreamed that made it possible for music and drama and pictures to reach more people than had ever been possible. People in San Francisco could look at the latest pictures or hear the latest music from New York City months, or even moments, after they were made; a great per-

formance demanded a pilgrimage no longer than the path to a corner movie theatre. High culture had come to the American living room.

But, though interest in a “democratic” culture that could compete with traditional high culture has grown in recent times, it is hardly a new preoccupation. One has only to read such 19th-century classics as Mark Twain’s *The Innocents Abroad* (1869) to be reminded of just how long, and just how keenly, Americans have asked themselves if all the stained glass and sacred music of European culture is all it is cracked up to be, and if the tall tales and Cigar-Store Indians did not have more juice and life in them for a new people in a new land. Twain’s whole example, after all, was to show that American speech as it was actually spoken was closer to Homer than imported finery was.

In this way, the new machines of mass reproduction and diffusion that fill modern times, from the daguerreotype to the World Wide Web, came not simply as a new or threatening force but also as the fulfillment of a standing American dream. Mass culture seemed to promise a democratic culture: a cultural life directed not to an aristocracy but to all men and women. It was not that the new machines produced new ideals but that the new machines made the old dreams seem suddenly a practical possibility.

The practical appearance of this dream began in a spirit of hope. Much American art at the turn of the 20th century and through the 1920s, from the paintings of Charles Sheeler to the poetry of Hart Crane, hymned the power of the new technology and the dream of a common culture. By the middle of the century, however, many people recoiled in dismay at what had happened to the American arts, high and low, and thought that these old dreams of a common, unifying culture had been irrevocably crushed. The new technology of mass communications, for the most part, seemed to have achieved not a generous democratization but a bland homogenization of culture. Many people thought that the control of culture had passed into the hands of advertisers, people who used the means of a common culture just to make a buck. It was not only that most of the new music and drama that had been made for movies and radio, and later for television, seemed shallow; it was also that the high or serious culture that had become available through the means of mass reproduction seemed to have been reduced to a string of popularized hits, which concealed the real complexity of art. Culture, made democratic, had become too easy.

Louis Armstrong, 1953.



New York World-Telegram and the Sun Newspaper Photograph Collection/
Library of Congress, Washington, D.C. (LC-USZ62-127236)

As a consequence, many intellectuals and artists around the end of World War II began to try to construct new kinds of elite “high” culture, art that would be deliberately difficult—and to many people it seemed that this new work was merely difficult. Much of the new art and dance seemed puzzling and deliberately obscure. Difficult art happened, above all, in New York City. During World War II, New York had seen an influx of avant-garde artists escaping Adolf Hitler’s Europe, including the painters Max Ernst, Piet Mondrian, and Joan Miró, as well as the composer Igor Stravinsky. They imported many of the ideals of the European avant-garde, particularly the belief that art should always be difficult and “ahead of its time.” (It is a paradox that the avant-garde movement in Europe had begun, in the late 19th century, in rebellion against what its advocates thought were the oppressive and stifling standards of high, official culture in Europe and that it had often looked to American mass culture for inspiration.) In the United States, however, the practice of avant-garde art became a way for artists and intellectuals to isolate themselves from what they thought was the cheapening of standards.

And yet this counterculture had, by the 1960s, become in large American cities an official culture of its own. For many intellectuals around 1960, this gloomy situation seemed to be all too permanent. One could choose between an undemanding low culture and an austere but isolated high culture. For much of the century, scholars of culture saw these two worlds—the public world of popular culture and the private world of modern art—as irreconcilable antagonists and thought that American culture was defined by the abyss between them.

As the century and its obsessions closed, however, more and more scholars came to see in the most enduring inventions of American culture patterns of cyclical renewal between high and low. And as scholars have studied particular cases instead of abstract ideas, it has become apparent that the contrast between high and low has often been overdrawn. Instead of a simple opposition between popular culture and elite culture, it is possible to recognize in the prolix and varied forms of popular culture innovations and inspirations that have enlivened the most original high American culture—and to then see how the inventions of high culture circulate back into the street, in a spiraling, creative flow. In the astonishing achievements of the American jazz musicians, who took the popular songs of Tin Pan Alley and the Broadway musical and inflected them with their own improvisational genius; in the works of great choreographers like Paul Taylor and George Balanchine, who found in tap dances and marches and ballroom-bebop new kinds of movement that they then incorporated into the language of high dance; in the “dream boxes” of the American avant-garde artist Joseph Cornell, who took for his material the mundane goods of Woolworth’s and the department store and used them as private symbols in surreal dioramas: in the work of all of these artists,

and so many more, we see the same kind of inspiring dialogue between the austere discipline of avant-garde art and the enlivening touch of the vernacular.

This argument has been so widely resolved, in fact, that, in the decades bracketing the turn of the 21st century, the old central and shaping American debate between high and low has been in part replaced by a new and, for the moment, still more clamorous argument. It might be said that if the old debate was between high and low, this one is between the “centre” and the “margins.” The argument between high and low was what gave the modern era its special savour. A new generation of critics and artists, defining themselves as “postmodern,” have argued passionately that the real central issue of culture is the “construction” of cultural values, whether high or low, and that these values reflect less enduring truth and beauty, or even authentic popular taste, than the prejudices of professors. Since culture has mostly been made by white males praising dead white males to other white males in classrooms, they argue, the resulting view of American culture has been made unduly pale, masculine, and lifeless. It is not only the art of African Americans and other minorities that has been unfairly excluded from the canon of what is read, seen, and taught, these scholars argue, often with more passion than evidence; it is also the work of anonymous artists, particularly women, that has been “marginalized” or treated as trivial. This argument can conclude with a rational, undeniable demand that more attention be paid to obscure and neglected writers and artists, or it can take the strong and often irrational form that all aesthetic values are merely prejudices enforced by power. If the old debate between high and low asked if real values could rise from humble beginnings, the new debate about American culture asks if true value, as opposed to mere power, exists at all.

Our Future Eco-Cities: Beyond Automobile Dependence

By Jeff Kenworthy

Cities are where two-thirds of the world's population will live by 2050, but many cities are already straining at the seams with immense problems on every level. Housing, water, food, sanitation, energy, waste management, urban governance, and many more issues confront the world's unprecedented rapid urban growth.

But perhaps one of the biggest problems is transport. Motor vehicles fill the streets of every city from Los Angeles to Lagos, from Beijing to Berlin, causing chronic congestion, chaotic parking, air pollution, noise, crippled bus systems, traffic deaths, and despoiled public environments, which make walking and cycling, the most sustainable modes, extremely difficult. How are cities going to cope with billions more people and vehicles competing for scarce urban space?

The automobile is one of the most useful and yet destructive inventions of the last 130 years. Every city, regardless of its level of development, is struggling with the vexed problems associated with mobility. When the local environmental, social, and economic problems of excessive car use (as in the US or Australia) or rapidly growing car use (as in emerging economies) are combined with regional and global scale problems, such as peak oil production and climate change, then how we build new cities and extend or modify existing ones becomes a question of survival.

The voracious appetite of cities for raw materials, food, energy, and water (their "ecological footprint," which is many times greater than their physical area) is

a major cause of declining natural habitats worldwide but also our greatest hope for reducing this impact through making better cities. The alarming destruction of terrestrial and aquatic natural systems, which form Earth's life support system, is the reason why some say we are now living through the planet's sixth major extinction event.

But is it all doom and gloom? No, for we have all the knowledge we need to build better cities, and most of the strategies depend on getting our urban transport systems right.

Cities up to 1850 were all walking cities and were small, very dense places, and many still exist on every continent. After that came transit systems (trams, trains, buses), which produced transit cities. These were still very compact and sustainable and, just like walking cities, were surrounded by or infused with nature and local food growing. The industrial food system did not exist and urban inhabitants still had strong contact with nature. Cities were rather self-sufficient locally for their energy, water, food, and other needs.

Vincent Callebaut/Solent News/Splash News/Newscom

Architectural rendering of a proposed eco-friendly resort in the Philippines. The towers would rotate throughout the day to ensure constant exposure to sunlight.



Starting before World War II in the United States, but increasing dramatically afterward, the automobile, through mass production and highway construction, became a key consumer item in the developed world. Cities sprawled outward at very low densities and everything became separated or zoned. This necessitated vast travel distances, which could only be conveniently accomplished in a car. The automobile city was born, and with it came an exponential escalation in problems as more land and energy were consumed and more pollution was produced.

Since then, the automobile has spread across the globe, but its use has already reached breaking points in many areas (e.g., São Paulo, Beijing, Bangkok). We are now seeing a slowing down in this growth in automobile dependence as such cities are unable to accommodate more traffic and are changing their form. They are rapidly developing urban rail transit and returning to bicycles, especially e-bikes.

So, while cities in the developed world have long been attempting to minimize cars by building new and restoring old walking and transit city fabrics, cities in the emerging economies have been embracing the car. However, they have reached limits very rapidly. Their dense urban forms and limited space have proven unable to handle increased traffic. Their car use is now plateauing, and their wealth creation has decoupled from car use, as it has in developed cities. Chinese cities such as Shanghai and Beijing are becoming transit metropolises, with the biggest (in length) metro systems in the world. Mumbai, a megalopolis of 21 million people, is still a walking city with 60 percent of all daily trips by nonmotorized modes, 32 percent by transit, and only 8 percent by private motorized modes (compared to 9 percent in 1996).

So, what are the key pillars of future cities that will enable people to live both sustainably and with a higher quality of life?

(1) Cities will become denser with more mixed land-use. Using land efficiently will protect the natural environment, biodiversity, and food-producing areas.

(2) The city and its hinterland will provide a good proportion of food needs. Cities will have large areas of urban agriculture, such as urban farming and community gardens.

(3) Freeways will be reduced, while transit (especially rail) and nonmotorized modes (NMM) of transport (walking, cycling) will increase. Car and motorcycle use will decline, and “Mobility as a Service” using mobile apps will link all transport modes, allowing payment with a single card.

(4) Environmental technologies for water, energy, and waste will be extensively used—cities will become closed-loop systems, reducing urban ecological footprints.

(5) The city’s centers will become human-oriented, emphasizing non-automobile access and will absorb most new employment and residential growth.

(6) Cities will have beautiful, shared, green public areas expressing public culture, community, equity, and good governance.

(7) The urban design of the city will be highly legible, permeable for using NMM, robust for changing needs, varied, rich, personalized and satisfying of human needs.

(8) Innovation, creativity, and the uniqueness and quality of local environments, culture, and history will drive the city economy. Smart City (advanced IT) processes will enhance urban governance.

(9) Future city planning will be a visionary “debate and decide” process relying on people setting a shared direction and vision, not a “predict and provide” process that creates more roads, and more parking.

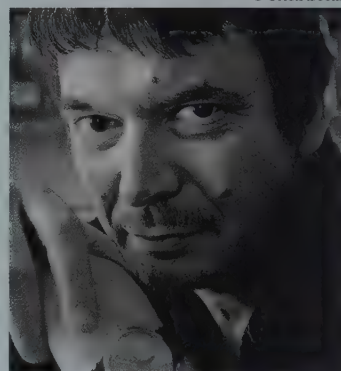
(10) Decision-making will integrate social, economic, environmental, and cultural needs and will be hopeful, democratic, inclusive, and empowering.

Life after automobile dependence is entirely feasible and within reach. It is indeed beginning to happen in many cities, enabling them to evolve into more sustainable and livable forms.

Jeff Kenworthy is a professor at the Curtin University Sustainability Policy Institute in Perth, Western Australia.

IAN RANKIN ON *Edinburgh*

Popular Scottish novelist and crime writer Ian Rankin is noted for his many Inspector Rebus stories in particular and for the scores of shows he has hosted or contributed to on British television, including his own TV series—Ian Rankin's Evil Thoughts and Rankin on the Staircase. The recipient of more than 20 literary awards and honorary doctorates, Rankin is also a Britannica contributor, writing a piece on his hometown, and the birthplace of Britannica: "Edinburgh: A City of Stories."



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It is impossible to be an author in Edinburgh without being conscious of the many previous generations of writers for whom the city has provided sustenance and inspiration. The visitor who arrives in Edinburgh by train emerges from Waverley Station (named after Sir Walter Scott's first novel) onto Princes Street and cannot fail to notice the jagged, towering presence of the Scott Monument (at some 60 metres [200 feet] in height, it is the tallest structure in the world built to celebrate a writer's life and legacy). Other statues and memorials are dotted around the city, commemorating Robert Louis Stevenson, Robert Fergusson, and the world's most famous detective, Sherlock Holmes. There are pubs with names such as the Jekyll and Hyde and the Conan Doyle. Walking downhill from Edinburgh Castle—down what is known as the Royal Mile—the pedestrian passes, in quick succession, the Writers' Museum (dedicated to Scott, Stevenson, and Robert Burns), the city's two main libraries, the offices of Canongate Books (Scotland's most successful and enterprising independent book publisher), the Scottish Storytelling Centre, the Scottish Book Trust, and the Scottish Poetry Library. At the end of this walk sits a recent structure, home to the Scottish Parliament, on whose exterior walls are carved quotes from Scottish authors of the past. Literature, it seems, is not just part of the city's heritage but has seeped into the very structure of the place.

Kenneth Grahame, author of *The Wind in the Willows*, was born in Edinburgh. So too was Muriel Spark, who wrote so vividly of the city in her masterpiece *The Prime of Miss Jean Brodie*. J.M. Barrie, creator of Peter Pan, attended university in Edinburgh (as, for a time, did Charles Darwin and Thomas Carlyle). The adventure novel *The Coral Island*, still in print a century and a half after publication, was written by R.M. Ballantyne, who was born and educated in Edinburgh. The philosopher David Hume is another whose statue can be found on the Royal Mile. Hume was active at a time when Edinburgh was known as a “hotbed of genius,” with thinkers and visionaries from Adam Smith to Benjamin Franklin nourished by conversation in the city’s clubs and taverns. Moreover, the *Encyclopædia Britannica* was first published in Edinburgh, while *The Chambers Dictionary* still makes Edinburgh its home.

The above—by no means an exhaustive list—may go some way toward explaining why Edinburgh was chosen in 2004 by UNESCO to be the world’s first City of Literature. But Edinburgh offers something more: a lively contemporary writing and publishing scene. The area of the city where I make my home is known locally as “writers’ block,” in the main because J.K. Rowling, Alexander McCall Smith, and I live within a few hundred yards of each other. Nor do we keep ourselves to ourselves: local café owners know that Ms. Rowling still writes at various tables with a mug of coffee beside her; Professor McCall Smith and myself have been known to share a few drams of malt of an evening, while discussing everything and anything. Irvine Welsh (of *Trainspotting* fame) also keeps a home in the city, and novelist Kate Atkinson, who won a Whitbread Book Award for *Behind the Scenes at the Museum*, is another Edinburgh resident. Meantime, the annual Edinburgh International Book Festival is the largest in Europe, bringing authors of worldwide repute such as Harold Pinter, Gore Vidal, and Seamus Heaney to the city to meet, converse, and share tales and anecdotes—very like the get-togethers of old where Scott or Burns might be liable to drop in. Edinburgh remains very much a city of stories. But why?

Edinburgh as Literary Metaphor

One answer may lie in its very design. The original city (stretching in a steep and narrow line from Edinburgh Castle to the Palace of Holyroodhouse) was, in the 18th century, at danger from overcrowding. Sanitation was a problem, as were the precarious tenements which housed the majority of the population and which had a tendency to fall down. The answer was to build the “New Town” to the north of the Nor Loch (itself now drained and forming Princes Street Gardens). This geographical dividing of the city—into the rational and planned (the New Town, where the wealthy made their homes) and the mazy, dark, and nefarious Old Town—gave



Picturesque Dean Village along the Water of Leith in Edinburgh, Scotland.

rise to literary metaphors for the human condition and provided Stevenson with his major inspiration for *Strange Case of Dr. Jekyll and Mr. Hyde*. In turn, Stevenson's story continues to be an inspiration to contemporary authors. My own first crime novel, *Knots and Crosses*, was (in part) an attempt to update the themes of *Dr. Jekyll and Mr. Hyde*, a project which continued with my second Inspector Rebus outing, *Hide and Seek*. Likewise, another classic Edinburgh story of the 19th century, James Hogg's sinister and mesmerizing *The Private Memoirs and Confessions of a Justified Sinner*, provided the impetus for my novel *The Black Book*.

I arrived in Edinburgh in 1978, aged 18, from a small coal-mining town to the north. Within a few weeks, I knew which howffs (bars) the poets and thinkers frequented—much the same ones Hugh MacDiarmid and his circle had been comfortable in a generation before. I remember buying a couple of drinks for Norman MacCaig at Bennet's Bar on Leven Street while picking his brains on how to get my own callow poetry published. Yet, while bumping into (and supping with) poets and playwrights was fun, still there seemed something stifling about this weight of tradition. No one, it was assumed, was going to write a contemporary equivalent of MacDiarmid's masterpiece, *A Drunk Man Looks at the Thistle*, while Muriel Spark was reckoned to have produced the perfect Edinburgh novel in her internationally acclaimed *The Prime of Miss Jean Brodie*. Ironically, it took two Glasgow writers to shake things up. Alasdair Gray's astonishing *Lanark* (1981) was followed three years later by James Kelman's first novel, *The Busconductor Hines*. Both were published in Edinburgh, and both showed that the contemporary Scottish novel could be challenging, inventive, vibrant, visceral, and relevant. Alongside this rise in activity, the punk ethos had infiltrated publishing: small (often short-lived) mag-

azines sprang up, public readings were organized, and writing groups prospered. My own first publisher—Kelman's, too—was a student-run cooperative venture called Polygon (these days known for its work with Alexander McCall Smith). At around the same time, a University of Edinburgh student called Jamie Byng took over the running of the Canongate publishing house and began to revolutionize its list. (The result would be a Booker Prize winner and a still-growing reputation for risk taking and innovation.) Edinburgh no longer seemed in thrall to its literary past. Suddenly, it was possible to write about the contemporary scene in a contemporary idiom, with publishers and a ready audience waiting.

What followed was Irvine Welsh's *Trainspotting*, published in 1993. It took as its subject matter the drug-taking scene of that time and was written in a street demotic which gave the novel added grit and a sense that these were real, contemporary lives. "Douce" Edinburgh, the city of Miss Jean Brodie and her "girls," would never be the same. However, something about the city balked at easy compartmentalization. Instead of *Trainspotting* clones, Edinburgh threw up a bewildering variety of writers working in very different styles and with different intentions. The "Edinburgh novel" proved an elusive beast. Alexander McCall Smith lives in the city, but he has been made famous by his gentle detective stories set in Botswana. Similarly, the Harry Potter books are written in Edinburgh without this fact being discernible to any great degree in their pages, while Kate Atkinson doesn't feel the need to set all her books in the city she's made her home.

All of which seems quite proper. Sherlock Holmes . . . Peter Pan . . . *Treasure Island* . . . *The Wind in the Willows*. These were Edinburgh creations only tangentially. Stevenson may have had the notorious Edinburgh scoundrel Deacon Brodie (gentleman by day, hoodlum by night) in mind when he wrote *Dr. Jekyll and Mr. Hyde*, yet he chose to set that book in London. One theory for the shift in geography is that the first draft of the story said too much about its author's own darker proclivities. (That draft, now lost, is thought to have been tossed onto the fire after Stevenson's wife, Fanny, objected to it.) By not setting the story in his native city, the author could hide more comfortably behind it. . . .

Big Questions in a Small Country

The arrival of the Scottish Parliament in 1999 has been one further important factor in the quality and quantity of Scottish writers. There is a new confidence about this small, relatively isolated country. People are beginning to ask big questions about identity and nationhood, about our current situation and possible future. Book-length histories of Scotland appear on a regular basis, evidence both of a ready, questioning audience and of a desire on the part of historians and thinkers to interpret the past so as to provide route maps for the journey to come.

This journey has brought Edinburgh into the 21st century. Like the rest of Scotland, it has had little need to enforce the smoking ban implemented in 2006: the city's drinkers fell into line with little fuss or dissent, even when it was noticed that such a ban would have an effect on cultural life (so that an actor playing Winston Churchill onstage would no longer be able to puff on a cigar). New buildings have gone up—not just the Parliament building, but a state-of-the-art dance studio and the Scottish Storytelling Centre. The world changes, and these changes are taken on board by the city's creative artists, and yet . . .

For many of us, the beauty of Edinburgh is that it is possible to be invisible here. The annual arts festival takes over the city each August, and with it comes a temporary doubling of the population. Edinburgh contains these multitudes and still retains its tranquil spots, areas such as the extinct volcano called Arthur's Seat, where isolation is possible. The city has always thrived on invisible industries such as banking and insurance, industries which make a difference without any huge physical manifestation—you can't see monetary transactions or policy documents in the same way you notice ships or cars being rolled out. The people who make Edinburgh their home seem to like this. Centuries back, they would hide from invading armies in the warren of tunnels beneath the castle and the Royal Mile, and in a sense they are still hiding. When August ends and the festivalgoers depart, Edinburgh comes up for air.

All of which suits the writer, since writing, too, is largely an invisible act. The reader sees only the finished product, not the work behind it. Sometimes, only glimpses of the author can be had—on book jackets or during the occasional promotional tour. As I walk through the streets of my adopted home, I can feel that Edinburgh is holding something back from me. After more than 15 Rebus novels, there are still so many things I don't know about the place, so many secrets and mysteries lying just behind its fabric, stories waiting to be told.

With Edinburgh's designation as a UNESCO City of Literature, new avenues seem to be opening up for the city's writers. A monthly "salon" has enabled writers, publishers, and arts administrators to gather and exchange ideas and gossip. Meantime, the walls between our various artistic compartments are breaking down. Writers are engaging in projects with musicians, painters, and sculptors. For me, this is an exciting and significant development. Authors can, of course, remain invisible if they wish—Edinburgh allows them that privilege—but they can also participate in new cross-cultural ventures. The city's publishers and writing groups are as vibrant as ever. Small magazines still come and go (often, these days, to be found online rather than in actual printed form). Journalists from across the globe arrive in Edinburgh (many decanting at Waverley Station) to ask why this small city—a city the size of a town that sometimes feels like a village—is punching so far above its weight in literary terms.

JOHN MUIR ON *Yosemite*

John ("John of the Mountains") Muir (1838–1914)—a Scots-born, Wisconsin-reared, and entirely self-taught naturalist and conservationist—was almost single-handedly responsible for the designation of the Yosemite Valley of California as a national park. Indeed, the park was not yet an established fact when Muir wrote this brief entry for Britannica's 10th Edition (1902–03), and he may have considered the writing of it as part of his remarkable campaign for the preservation of Yosemite. His love of the place is strikingly evident in the article, and its survival today as a bit of nature at its most splendid is Muir's best memorial.

George Grantham Bain Collection/Library of Congress, Washington D.C. (LC-USZ62-52090)



A famous valley on the western slope of the Sierra Nevada of California, about 150 miles east of San Francisco and 4000 feet above the sea, Yosemite is 7 miles long, half a mile to a mile wide, and nearly a mile deep, eroded out of hard massive granite by glacial action. Its precipitous walls present a great variety of forms and sculpture, determined by the grain or cleavage of the rock—domes, gables, towers, battlements, and majestic mountain cliffs, partially separated and individualized by recesses and side cañons. The bottom, a filled-up lake basin, is level and park-like, diversified with groves of oak and pine, clumps of flowering shrubs, and spacious ferny meadows and wild gardens through which the river Merced meanders in tranquil beauty; while the whole valley resounds with the booming of its unrivalled waterfalls. The most notable of the wall rocks are: El Capitan, 3300 feet high, a sheer, plain mass of granite, the end of one of the most enduring of the mountain ridges, which stands forward beyond the general line of the north wall in imposing grandeur; the Three Brothers, North Dome, Glacier Point,



A view of some of Yosemite National Park's most magnificent features, including El Capitan (left); Half Dome (distant center, behind clouds); and Bridalveil Fall (right).

the Sentinel, Cathedral, Sentinel Dome and Cloud's Rest, from 2800 to nearly 6000 feet high; and Half Dome, the noblest of all, which rises at the head of the valley from a broad, richly-sculptured base to the height of 4740 feet. These rocks are majestic glacial monuments, illustrating on a grand scale the action of ice in mountain sculpture. For here five large glaciers united to form the grand trunk glacier that eroded the valley and occupied it as its channel. Its moraines, though mostly obscured by vegetation and weathering, may still be traced; while on the snowy peaks at the headwaters of the Merced a considerable number of small glaciers, once tributary to the main Yosemite glacier, still exist. The Bridal Veil Fall, 900 feet high, is one of the most interesting features of the lower end of the valley. Towards the upper end the great Yosemite Fall pours its white floods from a height of 2600 feet, bathing the mighty cliffs with clouds of spray and making them tremble with its thunder-tones. The valley divides at the head into three branches, the Tenaya, Merced, and South Fork cañons. In the main (Merced) branch are the Vernal and Nevada Falls, 400 and 600 feet high, in the midst of most novel and sublime scenery. The Nevada is usually ranked next to the Yosemite among the five main falls of the valley. Its waters are chafed and dashed to foam in a rough channel before they arrive at the head of the fall, and are beaten yet finer by impinging on a sloping portion of the cliff about halfway down, thus making it the whitest of all the falls. The Vernal, about half a mile below the Nevada, famous for its afternoon rainbows, is staid and orderly, with scarce a hint of the passionate enthusiasm of its neighbour. Nevertheless it is a favourite with visitors, because it is better seen than any other. One may safely saunter along the edge of the river

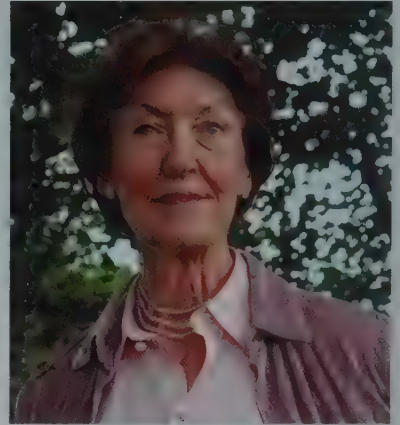
above it, and stand beside it at the top, as it calmly bends over the brow of the precipice. At flood time it is a nearly regular sheet about 80 feet wide, changing as it descends from green to purplish grey and white, and is dashed into clouds of irised foam on a rugged boulder talus that fills the gorge below. In the south branch, a mile from the head of the main valley, is the Illilouette Fall, 600 feet high, one of the most beautiful of the Yosemite choir. It is not nearly as grand a fall as the Yosemite, as symmetrical as the Vernal, or as airily graceful as the Bridal Veil; nor does it ever display as tremendous an outgush of snowy magnificence as the Nevada; but in fineness and beauty of colour and texture it surpasses them all.

Considering the great height of the snowy mountains about the valley, the climate of the Yosemite is remarkably mild. The vegetation is rich and luxuriant. The tallest pines are over 200 feet high; the trunks of some of the oaks are from 6 to 8 feet in diameter; violets, lilies, goldenrods, ceanothus, manzanita, wild rose, and azalea make broad beds and banks of bloom in the spring; and on the warmest parts of the walls flowers are in blossom every month of the year.

SHIRLEY HAZZARD ON *Naples*

*The novels and short stories of the Australian-born, American writer Shirley Hazzard (1931–2016)—her masterpiece and breakthrough novel, *The Transit of Venus*, appearing in 1980—were acclaimed for both their literary refinement and emotional complexity. Many of her stories, including her first two novels, were set in Italy, where she was stationed during her work with the United Nations in the 1950s, and Naples, where she then lived and worked, was the subject of her article for *Britannica*, excerpted below.*

Justin Williams/REX/Shutterstock/AP Images



Generations of observers have described Naples as a vast popular theatre, a designation applying as much to the city's aspect of a tiered arena as to its animated street life. It may also be characterized as an immense *presepio*, in evocation of the populous scene of the traditional Neapolitan Christmas crèche—the expansive natural setting being countered, within the town itself, by a congested vitality. In the shadow of Vesuvius, within the sweep of the bay, the Neapolitan decor is still predominantly one of moldering palaces in red or ochre and ancient churches in stone or stucco. Although the narrow old streets, teeming and traffic-ridden, clamber up hillsides topped by new constructions, few buildings in central Naples as yet rise more than 10 stories. Three fortified castles—two of them on the seafront and one on a central eminence—still define the city's heart. . . .

The People

Travelers in Italy accustomed to grand public squares where visitors may at leisure observe the monuments and manners of the town are often puzzled by the apparent lack of such focal points in Naples—not because great piazzas do not ex-

ist there, but because they are often used as mere traffic arteries and because the city's life is not so much concentrated in such places as diffused around them. The city's heart will rather be discovered in the small, populous enclaves—animated in the mornings, dormant by afternoon, revived at evening—which, each with distinctive character, make up the town's traditional districts. Intimacy with such a city is necessarily gradual, requiring a state of mind amounting to a revelation.

Naples, which, following the 18th-century discoveries of the buried cities of Vesuvius, long remained essential to cultivated travel, now serves visitors mainly as a wayside halt to neighbouring sites and resorts. Already in decline, tourism at Naples was sharply reduced by the effects of World War II, which left the city a shambles, and by the cessation of regular sea travel, which no longer brought visitors to the port of Naples. Many of the city's monuments were, moreover, embedded in what modern travelers often viewed as uninviting squalor; and random street crime—making it unsafe to carry items of value—compounded the disadvantages. A new touristic emphasis on brevity, velocity, and large numbers imposed, in turn, requirements that Naples could not meet—the city's riches of ancient continuity and of a slowly unfolding charm being unsuited to a hasty or systematic approach.

Bypassed by the foreign influx, Naples has thus preserved much authenticity and some skepticism toward modern tenets. Goethe's generalization that Neapolitans "wish even their work to be a recreation" is still valid, however incompatible with economic and administrative realities. While Goethe himself could not resist the northern cliché that Neapolitans are childlike, the tolerant penetration of motive, the graceful absence of envy, belligerence, or nationalism, and above all the civilizing Neapolitan sense of mortality, seem indicative, rather, of a long transmitted comprehension in human affairs.

Intellectual life in Naples, which is mainly centred around scholars concerned with the classical and Neapolitan past, is marked by high distinction and strong animosities and generates an important and varied literature. Despite the growth of a middle class and a notable advance in the status of women, emphatic divisions persist between prosperous and poor, while, in all classes, history has fatally extinguished—with rare exceptions—the flame of civic spirit. Government corruption and neglect are intensified by bureaucratic confusion and by the violent interventions of the Camorra, an illicit Neapolitan association analogous to the Sicilian Mafia. Nevertheless, with infinite adaptation, a sense of identity is maintained. Many festivals have fallen victim to traffic, and the old Neapolitan songs—now electronically diffused—have no successors. But fervour and fireworks still greet saints and football (soccer) players alike. The ironic Neapolitan dialect holds its own. Individuality and family loyalty remain strong, as does a capacity not only for pleasure but for joy. . . .



Piazza Trieste e Trento in Naples, Italy.

The Modern City

Deprived of territorial power, the city of Naples has, since the late 19th century, increasingly sought survival in an elusive and temperamentally incompatible degree of industrialization and in the ingenuity of its citizens, whose gifts for improvisation have been called forth no less by modern bureaucratic riddles than by the indifference of past monarchies. The cholera epidemic of 1884 aroused a transient spirit of reform, reflected in slum clearance, modernization of water and transport systems, and other public works. (A striking contemporary account of the epidemic and its context may be found in *Il ventre di Napoli*, by the journalist Matilde Serao. In 1973, during a brief reappearance of cholera in the city, this book, reissued, was found all too apposite.) The optimism of the *risanamento* was blighted by the onset of World War I.

The rise of fascism in Italy, compounded by the Great Depression of the 1930s, darkened the interval between the wars—from which, at Naples, the philosopher Benedetto Croce and other enlightened figures stand forth in defense of humanity and reason. While Naples shared with all Italy the degradation of fascism, few Italian cities suffered so heavily in World War II or made so painful and incomplete a recovery. Concerted restoration of decaying monuments was only inaugurated, in any appreciable degree, in the 1980s. That the city survived the postwar period without complete economic and social collapse can be attributed almost exclusively to the vitality and philosophy of its populace and to the Neapolitan ability to combine strong passions with a resilient endurance.

AL KOOPER ON

Bob Dylan

As a musician, songwriter, and producer, Al Kooper has been involved with rock music since 1958. A member of the seminal blues-rock band the Blues Project, he also founded the jazz-rock group Blood, Sweat and Tears and discovered Southern rock pioneers Lynyrd Skynyrd and produced their hit singles "Sweet Home Alabama" and "Free Bird." He performed on hundreds of records with such legends as the Rolling Stones, Jimi Hendrix, B.B. King, the Who, Cream, Joe Cocker, Alice Cooper, among many others. He performed with Bob Dylan at the historic 1965 Newport Folk Festival featuring Dylan's first electric guitar set and public performance of "Like a Rolling Stone" (in which Kooper played the organ parts). He also produced Dylan's *New Morning* album in 1970, toured with the singer, and, in more recent years, wrote *Britannica's* biography of Dylan, excerpted below. In 2008 Kooper celebrated his 50th year in the music business and was inducted into the Musicians Hall of Fame in Nashville.

Anthony Sanchez



American folksinger Bob Dylan, original name Robert Allen Zimmerman (born May 24, 1941, Duluth, Minnesota, U.S.), moved from folk to rock music in the 1960s, infusing the lyrics of rock and roll, theretofore concerned mostly with boy-girl romantic innuendo, with the intellectualism of classic literature and poetry. Hailed as the Shakespeare of his generation, Dylan sold tens of millions of albums, wrote more than 500 songs recorded by more than 2,000 artists, performed all over the world, and set the standard for lyric writing. He was awarded the Nobel Prize for Literature in 2016. . . .

Dylan's eponymous first album was released in March 1962 to mixed reviews. His singing voice—a cowboy lament laced with Midwestern patois, with an obvious nod

to Guthrie—confounded many critics. It was a sound that took some getting used to. By comparison, Dylan's second album, *The Freewheelin' Bob Dylan* (released in May 1963), sounded a clarion call. Young ears everywhere quickly assimilated his quirky voice, which divided parents and children and established him as part of the burgeoning counterculture, "a rebel with a cause." Moreover, his first major composition, "Blowin' in the Wind," served notice that this was no cookie-cutter recording artist. About this time, Dylan signed a seven-year management contract with Albert Grossman, who soon replaced Hammond with another Columbia producer, Tom Wilson.

In April 1963 Dylan played his first major New York City concert, at Town Hall. In May, when he was forbidden to perform "Talkin' John Birch Paranoid Blues" on Ed Sullivan's popular television program, he literally walked out on a golden opportunity. That summer, championed by folk music's doyenne, Joan Baez, Dylan made his first appearance at the Newport Folk Festival and was virtually crowned the king of folk music. The prophetic title song of his next album, *The Times They Are A-Changin'* (1964), provided an instant anthem.

Millions jumped on the bandwagon when the mainstream folk trio Peter, Paul and Mary reached number two on the *Billboard* pop singles chart in mid-1963 with their version of "Blowin' in the Wind." Dylan was perceived as a singer of protest songs, a politically charged artist with a whole other agenda. (Unlike Elvis Presley, there would be no film of Dylan singing "Rock-a-Hula Baby" surrounded by bikini-clad women.) Dylan spawned imitators at coffeehouses and record labels everywhere. At the 1964 Newport Folk Festival, while previewing songs from *Another Side of Bob Dylan*, he confounded his core audience by performing songs of a personal nature rather than his signature protest repertoire. Although his new lyrics were as challenging as his earlier compositions, a backlash from purist folk fans began and continued for three years as Dylan defied convention at every turn.

On his next album, *Bringing It All Back Home* (1965), electric instruments were openly brandished—a violation of folk dogma—and only two protest songs were included. The folk rock group the Byrds covered "Mr. Tambourine Man" from that album, adding electric 12-string guitar and three-part harmony vocals, and took it to number one on the singles chart. Other rock artists were soon pilfering the Dylan songbook and joining the juggernaut. As Dylan's mainstream audience increased rapidly, his purist folk fans fell off in droves. The maelstrom that engulfed Dylan is captured in *Don't Look Back* (1967), the telling documentary of his 1965 tour of Britain, directed by D.A. Pennebaker.

In June 1965, consorting with "hardened" rock musicians and in kinship with the Byrds, Dylan recorded his most ascendant song yet, "Like a Rolling Stone." Devoid of obvious protest references, set against a rough-hewn, twangy rock underpinning, and fronted by a snarling vocal that lashed out at all those who questioned his legitimacy, "Like a Rolling Stone" spoke to yet a new set of listeners and reached

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Bob Dylan playing a Fender Jazz Bass during a recording session at Columbia's Studio A in New York, January 13–15, 1965.

number two on the *Billboard* chart. It was the final link in the chain. The world fell at Dylan's feet. And the album containing the hit single, *Highway 61 Revisited* (1965), further vindicated his abdication of the protest throne.

At the 1965 Newport Folk Festival, Dylan bravely showcased his electric sound, backed primarily by the Paul Butterfield Blues Band. After an inappropriately short 15-minute set, Dylan left the stage to a hail of booing—mostly a response to the headliner's unexpectedly abbreviated performance rather than to his electrification. He returned for a two-song acoustic encore. Nonetheless, reams were written about his electric betrayal and banishment from the folk circle. By the time of his next public appearance, at the Forest Hills (New York) Tennis Stadium a month later, the audience had been "instructed" by the press how to react. After a well-received acoustic opening set, Dylan was joined by his new backing band (Al Kooper on keyboards, Harvey Brooks on bass, and, from the Hawks, Canadian guitarist Robbie Robertson and drummer Levon Helm). Dylan and the band were booed throughout the performance; incongruously, the audience sang along with "Like a Rolling Stone," the number two song in the United States that week, and then booed at its conclusion.

Backed by Robertson, Helm, and the rest of the Hawks (Rick Danko on bass, Richard Manuel on piano, and Garth Hudson on organ and saxophone), Dylan

toured incessantly in 1965 and 1966, always playing to sold-out, agitated audiences. On November 22, 1965, Dylan married Sara Lowndes. They split their time between a townhouse in Greenwich Village and a country estate in Woodstock, New York.

In February 1966, at the suggestion of his new producer, Bob Johnston, Dylan recorded at Columbia's Nashville, Tennessee, studios, along with Kooper, Robertson, and the cream of Nashville's play-for-pay musicians. A week's worth of marathon 20-hour sessions produced a double album that was more polished than the raw, almost punklike *Highway 61 Revisited*. Containing some of Dylan's finest work, *Blonde on Blonde* peaked at number nine in *Billboard*, was critically acclaimed, and pushed Dylan to the zenith of his popularity. He toured Europe with the Hawks (soon to reemerge as the Band) until the summer of 1966, when a motorcycle accident in Woodstock brought his amazing seven-year momentum to an abrupt halt. Citing a serious neck injury, he retreated to his home in Woodstock and virtually disappeared for two years.

During his recuperation, Dylan edited film footage from his 1966 European tour that was to be shown on television but instead surfaced years later as the seldom-screened film *Eat the Document*. In 1998 some of the audio recordings from the film, including portions of Dylan's performance at the Free Trade Hall in Manchester, England, were released as the album *Live 1966*.

In 1967 the Band moved to Woodstock to be closer to Dylan. Occasionally they coaxed him into the basement studio of their communal home to play music together, and recordings from these sessions ultimately became the double album *The Basement Tapes* (1975). In early 1968 Columbia released a stripped-down album of new Dylan songs titled *John Wesley Harding*. At least partly because of public curiosity about Dylan's seclusion, it reached number two on the *Billboard* album chart (eight places higher than *Bob Dylan's Greatest Hits*, released in 1967).

In January 1968 Dylan made his first postaccident appearance at a memorial concert for Woody Guthrie in New York City. His image had changed; with shorter hair, spectacles, and a neglected beard, he resembled a rabbinical student. At this point Dylan adopted the stance he held for the rest of his career: sidestepping the desires of the critics, he went in any direction but those called for in print. When his audience and critics were convinced that his muse had left him, Dylan would deliver an album at full strength, only to withdraw again.

Dylan returned to Tennessee to record *Nashville Skyline* (1969), which helped launch an entirely new genre, country rock. It charted at number three, but, owing to the comparative simplicity of its lyrics, people questioned whether Dylan remained a cutting-edge artist. Meanwhile, rock's first bootleg album, *The Great White Wonder*—containing unreleased, "liberated" Dylan recordings—appeared in independent record stores. Its distribution methods were shrouded in secrecy (certainly Columbia, whose contract with Dylan the album violated, was not involved).

Over the next quarter century Dylan continued to record, toured sporadically, and was widely honoured, though his impact was never as great or as immediate as it had been in the 1960s. In 1970 Princeton (New Jersey) University awarded him an honorary doctorate of music. His first book, *Tarantula*, a collection of unconnected writings, met with critical indifference when it was unceremoniously published in 1971, five years after its completion. In August 1971 Dylan made a rare appearance at a benefit concert that former Beatle George Harrison had organized for the newly independent nation of Bangladesh. At the end of the year, Dylan purchased a house in Malibu, California; he had already left Woodstock for New York City in 1969.

In 1973 he appeared in director Sam Peckinpah's film *Pat Garrett and Billy the Kid* and contributed to the sound track, including "Knockin' on Heaven's Door." *Writings and Drawings*, an anthology of his lyrics and poetry, was published the next year. In 1974 he toured for the first time in eight years, reconvening with the Band (by this time popular artists in their own right). *Before the Flood*, the album documenting that tour, reached number three.

Released in January 1975, Dylan's next studio album, *Blood on the Tracks*, was a return to lyrical form. It topped the *Billboard* album chart, as did *Desire*, released one year later. In 1975 and 1976 Dylan barnstormed North America with a gypsylike touring company, announcing shows in radio interviews only hours before appearing. Filmed and recorded, the Rolling Thunder Revue—including Joan Baez, Allen Ginsberg, Ramblin' Jack Elliott, and Roger McGuinn—came to motion-picture screens in 1978 as part of the four-hour-long, Dylan-edited *Renaldo and Clara*.

Lowndes and Dylan divorced in 1977. They had four children, including son Jakob, whose band the Wallflowers experienced pop success in the 1990s. Dylan was also stepfather to a child from Lowndes's previous marriage. In 1978 Dylan mounted a yearlong world tour and released a studio album, *Street-Legal*, and a live album, *Bob Dylan at Budokan*. In a dramatic turnabout, he converted to Christianity in 1979 and for three years recorded and performed only religious material, preaching between songs at live shows. Critics and listeners were, once again, confounded. Nonetheless, Dylan received a Grammy Award in 1980 for best male rock vocal performance with his "gospel" song "Gotta Serve Somebody."

By 1982, when Dylan was inducted into the Songwriters Hall of Fame, his open zeal for Christianity was waning. In 1985 he participated in the all-star charity recording "We Are the World," organized by Quincy Jones, and published his third book, *Lyrics: 1962–1985*. Dylan toured again in 1986–87, backed by Tom Petty and the Heartbreakers, and in 1987 he costarred in the film *Hearts of Fire*. A year later he was inducted into the Rock and Roll Hall of Fame, and the Traveling Wilburys (Dylan, Petty, Harrison, Jeff Lynne, and Roy Orbison) formed at his house in Malibu and released their first album.

In 1989 Dylan once again returned to form with *Oh Mercy*, produced by Daniel Lanois. When *Life* magazine published a list of the 100 most influential Americans of the 20th century in 1990, Dylan was included, and in 1991 he received a lifetime achievement award from the Recording Academy. In 1992 Columbia Records celebrated the 30th anniversary of Dylan's signing with a star-studded concert in New York City. Later this event was released as a double album and video. As part of Bill Clinton's inauguration as U.S. president in 1993, Dylan sang "Chimes of Freedom" in front of the Lincoln Memorial.

As the 1990s drew to a close, Dylan, who was called the greatest poet of the second half of the 20th century by Allen Ginsberg, performed for the pope at the Vatican, was nominated for the Nobel Prize for Literature, received a Kennedy Center Honor, and was made Commander in the Order of Arts and Letters (the highest cultural award presented by the French government). In 1998, in a comeback of sorts, he won three Grammy Awards—including album of the year—for *Time Out of Mind* (1997). In 2000 he was honoured with a Golden Globe and an Academy Award for best original song for "Things Have Changed," from the film *Wonder Boys*. Another Grammy (for best contemporary folk album) came Dylan's way in 2002, for *Love and Theft* (2001).

In 2003 he cowrote and starred in the film *Masked & Anonymous* and began favouring keyboards over guitar in live appearances. The next year he released what portended to be the first in a series of autobiographies, *Chronicles: Volume 1*. In 2005 *No Direction Home*, a documentary directed by Martin Scorsese, appeared on television. Four hours long, yet covering Dylan's career only up to 1967, it was widely hailed by critics. A sound track album that included 26 previously unreleased tracks came out before the documentary aired. In 2006 Dylan turned his attention to satellite radio as the host of the weekly *Theme Time Radio Hour* and released *Modern Times*, which won a Grammy Award for best contemporary folk album. Dylan also received an award for best solo rock vocal performance for "Someday Baby."

In presenting to Dylan Spain's Prince of Asturias Prize for the Arts in 2007, the jury called him a "living myth in the history of popular music and a light for a generation that dreamed of changing the world," and in 2008 the Pulitzer Prize Board awarded him a special citation for his "profound impact on popular music and American culture." In 2009 Dylan released *Together Through Life*, which debuted at the top of the British and American album charts. He was still actively performing as he entered his 70s, and his 35th studio album, the rootsy *Tempest* (2012), found him as vigorous as ever. Dylan was awarded the Presidential Medal of Freedom in 2012. In 2016 he won the Nobel Prize for Literature for, as noted by the prize-bestowing Swedish Academy, "having created new poetic expressions within the great American song tradition."

ALFRED HITCHCOCK ON

Film Direction

Five years after his film Psycho forever changed perspectives on taking a shower, the legendary film director and “master of suspense” Alfred Hitchcock (1899–1980) shared his knowledge in the 1965 printing of Britannica’s 14th Edition (1929–73). His large piece on film production was part of an even larger entry on motion pictures written by a collection of experts, and only one section from Hitchcock’s contribution is offered below. His comments on film direction were lucid and compelling, especially his regret that film direction was largely underappreciated by mass audiences because, with the relative recentness of motion pictures, schools had yet to establish film counterparts to their music and art appreciation courses; fortunately, this is seldom the case today. What is also clear in his comments below are his well-known feelings about actors, whom he famously said elsewhere should be “treated like cattle.” In a Hitchcock film there was no question who was in charge—the director—and any actor interested in improvisation was free to peddle his wares elsewhere—perhaps to Broadway, or Woody Allen.

Universal Pictures



Film direction was born when for the first time a man held a motion-picture camera and turning it on his friend said, “Do something.” This was the first step in creating movement for the camera. To create things that move for the camera is the aim at all times of the storytelling director.

Documentary direction is different. Its directors are primarily editors or, rather, discoverers. Their material is provided beforehand by God and man, noncinema man, man who is not doing things primarily for the camera. On the other hand, pure cinema has nothing in itself to do with actual movement. Show a man look-

ing at something, say a baby. Then show him smiling. By placing these shots in sequence—man looking, object seen, reaction to object—the director characterizes the man as a kindly person. Retain shot one (the look) and shot three (the smile) and substitute for the baby a girl in a bathing costume, and the director has changed the characterization of the man.

It was with the introduction of these techniques that film direction departed from the theatre and began to come into its own. Still more is this the case when the juxtaposition of images involves a noticeable change, a striking variation in the size of the image, the effect of which is best illustrated by a parallel from music, namely in the sudden transition from a simple melody played on the piano to a sudden burst of music by the brass section of the orchestra.

The essence of good direction then is to be aware of all these possibilities and to use them to show what people are doing and thinking and, secondarily, what they are saying. Half the work of direction should be accomplished in the script, which then becomes not merely a statement of what is to be put before the camera but in addition a record of what the writer and the director have already seen as completed on the screen in terms of fast-moving rhythm. This, because it is a motion picture that is visualized and not a play or novel—an adventure carried along by a central figure. In a play, the action is moved forward in words. The film director moves his action forward with a camera—whether that action is set on a prairie or confined to a telephone booth. He always must be searching for some new way of making his statement, and above all he must make it with the greatest economy and in particular the greatest economy of cutting; that is to say, in the minimum of shots. Each shot must be as comprehensive as a statement as possible, reserving cutting for dramatic purposes. The impact of the image is of the first importance in a medium that directs the concentration of the eye so that it cannot stray. In the theatre, the eye wanders, while the word commands. In the cinema, the audience is led wherever the director wishes. In this, the language of the camera resembles the language of the novel. Cinema audiences and readers of novels, while they remain in the theatre or continue to read, have no alternative but to accept what is set before them.

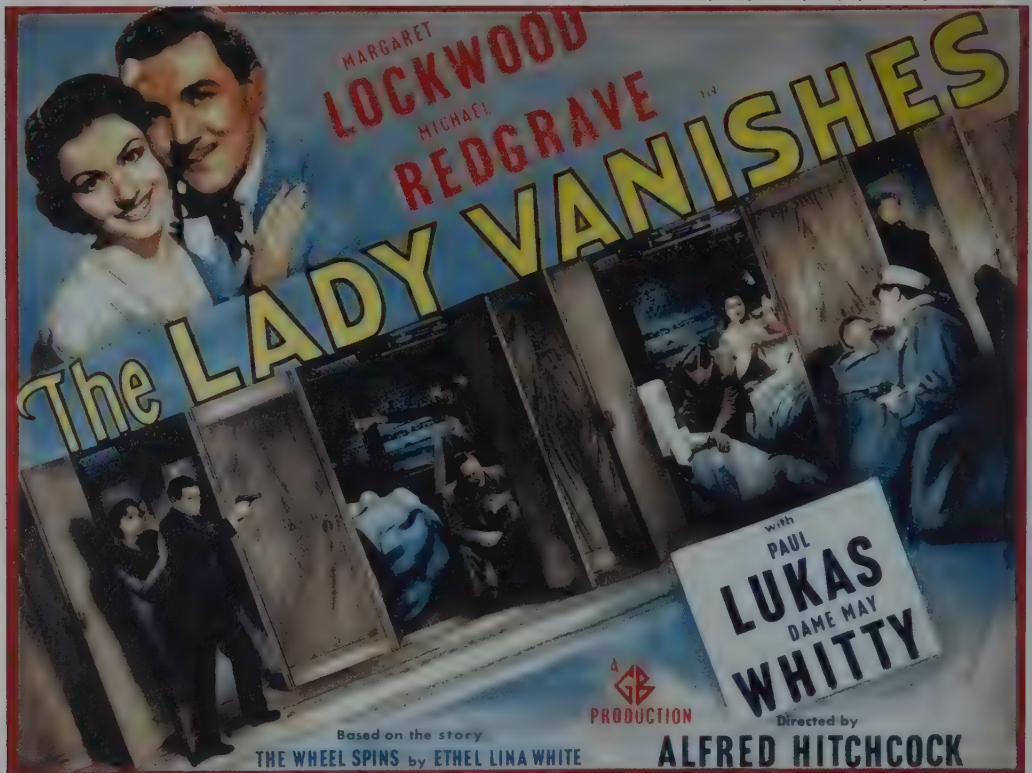
Then comes the question of how they are to see what they are shown. In a mood of relaxation? Not relaxed? It is how the director handles his images that creates the state of mind, of emotion, in the audience. That is to say, the impact of the image is directly on emotions. Sometimes the director goes quietly along in a mood of simple, normal photography, and the eye is pleased as it follows the story. Then suddenly the director wishes to hit hard. Now the pictorial presentation changes. There is a bursting impact of images, like a change in orchestration. Indeed, orchestration is perhaps the best simile for film, even to the parallel of recurrent themes and rhythms. And the director is, as it were, the conductor.

Given the skill that permits a man to direct, skills shared in varying degrees, perhaps the most significant and individually important thing about a director is his style. The style is evidenced by both his choice of subject and his manner of directing it. Important directors are known for their style. The record speaks of Ernst Lubitsch as having a style characterized by cinematic wit, or the pictorial quip. Charlie Chaplin is spoken of as having a style, and it is interesting to notice that it was his incursion into dramatic direction in *A Woman of Paris* that seemed to crystallize this style.

On the whole, style was slower to manifest itself in U.S. pictures, always excepting the extravaganzas of C. B. deMille and the work of Griffith and Ince. In the early 1920s the Germans gave great evidence of style. Whether or not it was something imposed by the studios, or individual to the directors, it is clearly in evidence in the work of Fritz Lang, F. W. Murnau and many others. Some directors are more concerned with style and the treatment of the content than with securing new themes. This is to say that, for the director, as often as not, what is important is the manner of telling his tale. The more original will revolt against the traditional and the cliché. They will want to show contrast, to present melodrama in a revolutionary way, to take melodrama out of the dark night into the bright day, to show murder by a babbling brook, adding a touch of blood to its limpid waters. Thus the director can impose his ideas on nature and, taking what savours of the ordinary, can, in the way he handles it, render it extraordinary. So there emerges a kind of counterpoint and sudden upheaval in the ordinary things of life.

Motion pictures would be a source of much richer enjoyment, as is the case in other arts, if the audience were aware of what is and what is not well done. The mass audience has had no education in technique of cinema, as they frequently have in art and music, from their school days. They think only of story. The film goes by them too fast. The director, then, must be aware of this and must seek to remedy it. Without the audience being aware of what he is doing, he will use his technique to create an emotion in them. Suppose he is presenting a fight—the traditional fight in the barroom or elsewhere. If he puts the camera far enough back to take in the whole episode at once, the audience will follow at a distance, and objectively, but they will not so really feel it. If the director moves his camera in and shows the details of the fight—flaying hands, rocking heads, dancing feet, put together in a montage of quick cuts—the effect will be totally different and the spectator will be writhing in his seat, as he would be at a real boxing match.

Styles in direction can be individual; they can show trends or fashions. In recent times, the Italian directors have worked in the manner or style known as neo-realism. They were concerned with the hardships of World War II as currently manifested in the life of the man in the street. There was a style, too, in German



Poster from Alfred Hitchcock's *The Lady Vanishes* (1938), starring Margaret Lockwood, Michael Redgrave, Paul Lukas, and Dame May Whitty.

films in the silent days. More recent films from Germany show little new development. The French directors are well served by their cameramen and their art directors, who have great originality and a fine understanding of the cinematic. In the United States, there has been a movement in the direction of realism, but in the key areas of photography and settings the director is still forced to work in an atmosphere of artificiality. The plush architecture of Hollywood militates against a pure atmosphere and destroys realism. Only gradually is the situation changing, and it is not so long ago that the artist was shown to be starving in an attic as large and as luxurious as the living room of a wealthy house.

Sets, lighting, music and the rest are of immense importance to the director, but everything, as Ingmar Bergman has said, begins with the actor's face. It is to the features of this face that the eye of the spectator will be guided, and it is the organization of these oval shapes within the rectangle of the screen, for a purpose, that exercises the director. What figure is to be shown and how? Near to—or at a distance? Often it is wiser for a director to save long shots for a dramatic purpose. He may need them, for example, to express loneliness, or to make some other verbal statement. Whatever his choice, the content of the pictorial frame must have

an impact. This is the real meaning of the word dramatic. It signifies that which has emotional impact. So it may be said that the rectangle of the screen must be charged with emotion.

At all times the director must be aware of his intention. What is his purpose, and how can he effect it in the most economical way? Not only must he provide images that add up to a language; he must also know what it is that makes it a language.

The most apparent and, to the outsider, the main function of the director is the actual staging of the action of the film. From a director's point of view, this staging is best described as the mechanical process of setting up the action so that the actors can move in and bring their emotions to bear, not spontaneously, however, but under his strict supervision.

In the theatre, albeit after long and intensive rehearsal, the actor is finally free and on his own, so that he is able to respond to the live audience. In the studio, he responds to the director, who is staging the action not only piecemeal but, as often as not, out of sequence. The director controls every movement of the screen actor, working for the most part intimately and closely upon him.

The amount of action contained within a frame should convey neither more nor less than what the director wishes to convey. There must be nothing extraneous. The actor, therefore, cannot operate at will, spontaneously improvising. The restrictions that this imposes on the actions of the body are readily seen.

Certain special considerations apply to the face. In this regard, the chief requisite for a good screen actor is the capacity to do nothing—well. Furthermore, the director must bear in mind that the audience is not absolutely sure of the precise significance of the expression until it has seen what causes it. At the same time, this reaction must be made with the greatest measure of understatement.

In a world of images, in which both actors and things are alike capable of such significant statements, what is the role of dialogue? The answer is that the introduction of dialogue was an added touch of realism—the final touch. With dialogue, that last unreality of the silent film, the mouth that opens and says nothing audible disappeared. Thus, in pure cinema, dialogue is a complementary thing. In the films that for the most part occupy the screens of the world, this is not the case. As often as not, the story is told in dialogue, and the camera serves to illustrate it.

And so it is that the last infirmity of both writer and director, when invention fails, is to take refuge and perhaps relief in the thought that they can “cover it in dialogue,” just as their silent predecessors “covered it with a title.”

CECIL B. DEMILLE ON *Film Acting and Directing*

For its coverage of motion pictures in its new 14th edition (1929), Britannica sought out one of the giants in cinematic history: Cecil B. DeMille. Dominating Hollywood for nearly five decades, DeMille was famous for his grand spectacles, including such epics as The Greatest Show on Earth (1952), which won the Academy Award for Best Picture, and his final and most famous film, The Ten Commandments (1956), one of the highest-grossing movies of all time. As seen in the following brief excerpt, DeMille believed good film directors must above all tell a story, and that they could only do so by controlling two things: first, the actors, controlling them like "the conductor controls the instruments of his orchestra," and then, the film's tempo, masterfully achieved in one ever-important arena—the cutting room.



Encyclopædia Britannica, Inc.

The element of acting is obviously of vital importance to the value of the photoplay, and it is an element which comes most closely under the director's control. He not only chooses his cast with great care that each part is suited to the actor, but he has much to do with the actor's performance. He controls his actors as the conductor controls the instruments of his orchestra. His function is not to teach acting any more than the conductor's is to teach his musicians how to play their instruments. But he must co-ordinate character conceptions so that each may stand in relation to the other as the story's true development demands. There is constant temptation to let an interesting character become too important for the proper story value of the moment, to over-emphasize a part in its relation to the whole. Careful contrasting of types, balancing a cast, harmonizing and moulding the conception of his characters until each is perfectly adjusted to the dramatic mechanism of which it is a part, are among his most delicate and most important duties. In his relation to the actor, the director must study the individual person-

ality and method of each player and, if he is wise, he fits the part to the actor as much as he fits the actor to the part; he must, to some extent, vary his method to suit the need of each actor, if he is to attain the greatest result of which the actor is capable.

Technique. In general, the director faces this problem: to perfect each moment of the story separately and then to combine these bits into a smoothly flowing drama in which every moment will bear its proper relation to every other moment. In this connection, the question of tempo becomes most important, for the *crecendo* and *diminuendo* of drama are partly achieved through the varying *tempi* of successive scenes. Here again, the analogy of the motion picture to the symphony is close. But the director is powerless to control the speed at which the picture is projected in the theatre, and his carefully done work is frequently hurt by being run so fast as to lose all semblance of human life. . . .

As the picture progresses it is assembled in a rough cut which corresponds to the first draft of a play. Every scene and incident is in this first assembly, which almost invariably runs from twice to four times the length of the finished product. But in studying this rough assembly the director gets the "feel" of his picture; he senses its length and *tempo* and, frequently, changes his idea of its relative values. He guides himself accordingly in that part of the picture still to be made; he sees that certain incidents are less effective in their context than they felt when they were being made; that others are capable of further development than the first outline indicated; and so, sometimes groping his way, sometimes with true inspirational vision he finishes the "shooting" of the picture.

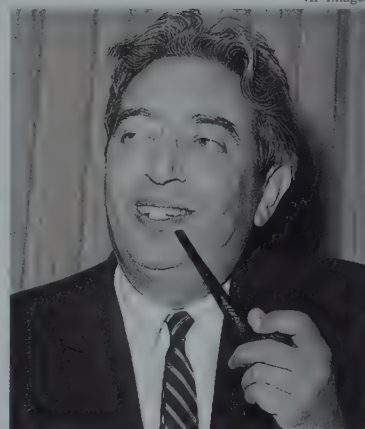
Then follows the task of editing the film; of reducing 30 reels to ten; of seeing the picture for the first time concretely, as a whole; of studying the new values which inevitably appear and, frequently, of compensating for values which seem to have disappeared. In the process of shortening the film captions must be rewritten, some left out as unnecessary, others put in where action has been so changed in the cutting that it is not sufficiently clear in pantomime alone. The importance of the cutting-room can hardly be over-stated; it is here that the director selects and proportions the elements of his picture until its final form is achieved.

In the last analysis the director is a story-teller. His must be the art of combining the arts of others into one creation, and he must balance the values contributed by those other arts so that none of them is out of proportion to the true symmetry of the whole. He may not have conceived the story first, but he has to make it part of himself before he can put it on the screen; he may not have written it, but it is he who tells it; and upon the force, the clearness and the art of his telling depends the value of the work.

IRVING WALLACE ON

P.T. Barnum

Irving Wallace was one of the most-read and best-selling American authors of all time. When he died in 1990, the New York Times reported that his 16 novels and 17 nonfiction books had sold more than 120 million copies. The subject he addressed for Britannica was the topic of his popular 1959 book, The Fabulous Showman: The Life and Times of P.T. Barnum. His biography of the great showman follows.



AP Images

In a flamboyant career that spanned half a century, Phineas Taylor Barnum (1810–91) established himself as the most innovative and celebrated showman ever to flourish in the United States. It was Barnum who popularized for mass audiences such amusements as the public museum, the musical concert, and the three-ring circus. In doing so, he created techniques of presentation and publicity that were to become widely imitated in vaudeville, motion pictures, and television variety shows of the 20th century, and in partnership with James A. Bailey, he made the American circus a popular and gigantic spectacle, the so-called Greatest Show on Earth.

Barnum was 15 years old when his father died, and the support of his mother and his five sisters and brothers fell largely upon his shoulders. After holding a variety of jobs, he became publisher of a Danbury, Connecticut, weekly newspaper, *Herald of Freedom*. Arrested three times for libel, he enjoyed his first taste of notoriety.

In 1829, at age 19, Barnum married a 21-year-old Bethel woman, Charity Hallett, who was to bear him four daughters. In 1834 he moved to New York City, where he found his vocation as a showman one year later when he successfully presented Joice Heth, a wizened black woman whom he advertised as the 161-year-old nurse to General George Washington. This human relic, on her death, was exposed as a hoax.

Casting about for a legitimate undertaking, Barnum outmaneuvered wealthier bidders to acquire John Scudder's American Museum, in New York City, a five-story

marble structure filled with stuffed animals, waxwork figures, and similar conventional exhibits. The new owner rapidly transformed the museum into a carnival of live freaks, dramatic theatricals, beauty contests, and other sensational attractions. Although driven at the outset of his career by a desire for wealth and fame, Barnum may have been basically motivated by less selfish reasons. "This is a trading world," he wrote, "and men, women, and children, who cannot live on gravity alone, need something to satisfy their gayer, lighter moods and hours, and he who ministers to this want is in a business established by the Author of our nature." Playing upon the public's interest in the unusual and bizarre, Barnum scoured the world for curiosities, living or dead, genuine or fake. By means of outrageous stunts, repetitive advertising, and exaggerated publicity, Barnum excited international attention and made his showcase of wonders a landmark.

Between 1842, when he took over the American Museum, and 1868, when he gave it up after fires twice had all but destroyed it, Barnum's gaudy showmanship enticed 82 million visitors—among them Henry and William James, Charles Dickens, and Edward VII, then prince of Wales—into his halls and to his other enterprises.

Barnum's first successful exhibit in the museum was the Feejee Mermaid, which had a seemingly human head topping the finned body of a fish and was, of course, found later to be a fake. Among the genuine curiosities were Chang and Eng, Siamese twins connected by a ligament below their breastbones. It was, however, Charles Stratton, a man only 25 inches tall who was discovered by Barnum, that proved to be his most profitable exhibit. Ballyhooing Stratton as General Tom Thumb, Barnum sold 20 million tickets to the museum. After being received by President Abraham Lincoln, Barnum and Tom Thumb enjoyed a triumphal tour abroad, during which the latter gave a command performance before Queen Victoria.

Eager to change his image from promoter of freaks to impresario of artistic attractions, Barnum risked his entire fortune by importing Jenny Lind, a Swedish soprano whom he had never seen or heard and who was almost unknown in the United States. Dubbing Lind "The Swedish Nightingale," Barnum mounted the most massive publicity campaign he had ever attempted. Lind's opening night in New York City, before a capacity audience of 5,000, and her nine months of concerts across the United States earned immense sums.

At the peak of his career, Barnum's own appearance was nearly as familiar to the public as the exhibits he promoted. An impressive figure six feet two inches tall, semibald, with blue eyes, a bulbous nose, and a potbelly, he called himself the "Prince of Humbugs." He dwelt in a three-story Oriental mansion, named Iranistan, on a 17-acre estate in Bridgeport, Connecticut, where he played host to such notables as Mark Twain, Horace Greeley, and Matthew Arnold. Close friends regarded him as good-natured, thoughtful, and kind, as well as parsimonious and egotistical.



Circus poster featuring the skeleton of P.T. Barnum's famous elephant, Jumbo, on public display, 1888.

His avocations were politics and writing. After serving two terms in the Connecticut state legislature, he was elected mayor of Bridgeport, in which post he fought prostitution and union discrimination against blacks. In 1855 he published his autobiography, *The Life of P.T. Barnum, Written by Himself*; and because he frankly revealed some of the deceptions he had employed, he was harshly taken to task by the majority of critics. Stung, Barnum continually modified the book in many revised versions, which, he claimed, sold a total of 1,000,000 copies. By 1884, eager more for publicity than for profit, Barnum placed his autobiography in the public domain, allowing anyone to print and sell it without copyright infringement. Though the cynicism "There's a sucker born every minute" has long been attributed to Barnum, there is no proof that he ever wrote or spoke these words.

Barnum's family life was not entirely happy. One daughter died in childhood; another was dropped from his will for committing adultery. Disappointed because he had no male heir, Barnum left a sizable bequest to a grandson on the condition that he agree to use Barnum as part of his name. After 44 years of marriage, Charity Barnum died in 1873. The following year, Barnum, who was then 64, took the 24-year-old Nancy Fish, the daughter of a British admirer, for his second wife.

Although his name has been popularly linked with the circus, Barnum did not, in fact, become a circus showman until he was past age 60. Barnum did not invent the modern circus, but, in partnership with the retiring, efficient Bailey, he did give the American spectacle its gigantic size, its most memorable attractions, and its widest popularity, attempting to make it what he called "the greatest show on earth." Barnum capped his circus career by purchasing a six-and-a-half-ton elephant named Jumbo, who quickly earned back his purchase price during his first season under the big top.

In his 81st year, Barnum fell gravely ill. At his request, a New York newspaper published his obituary in advance so that he might enjoy it. Two weeks later, after inquiring about the box office receipts of the circus, Barnum died in his Connecticut mansion. *The Times* of London echoed the world press in its final tribute: "He created the *métier* of showman on a grandiose scale. . . . He early realized that essential feature of a modern democracy, its readiness to be led to what will amuse and instruct it. . . . His name is a proverb already, and a proverb it will continue."

JOHN SAYLES ON *John Ford*

Film director, screenwriter, novelist, and actor John Sayles has, since the 1980s, been among the most prominent independent filmmakers in the United States. Twice nominated for Academy Awards, Sayles's films include Return of the Secaucus 7 (1980), The Brother from Another Planet (1984), Matewan (1987), Eight Men Out (1988), Passion Fish (1992), The Secret of Roan Inish (1994), Lone Star (1996), Men with Guns (1997), Limbo (1999), Sunshine State (2002), Casa de Los Babys (2003), Silver City (2004), Honeydripper (2007), Amigo (2010), and Go for Sisters (2013). For Britannica he discussed the life and work of one of America's most influential directors, John Ford.



Ford was an Irish American and a New Englander, born to immigrant parents. He began his movie work in the silent era, serving as a jack-of-all-trades apprentice on many early pictures made by his actor-director brother Francis. By the end of the silents, Ford had directed more than 60 films (many “two-reelers” and a handful of films approaching what is now considered feature length), including dozens of westerns, often starring Harry Carey in the persona of “Cheyenne Harry,” a hard-drinking, often down-at-the-heels outlaw with a weakness for helping the defenseless. Ford proved able to satisfy the expectations of producers and audiences alike while adding small touches, whether gritty or sentimental, that gave his films an extra human dimension often lacking in the generic programmers of the day. He gambled with his reputation as an efficient, no-nonsense helmer-for-hire in the production of *The Iron Horse* (1924), his over-budget schedule-busting epic about the construction of the transcontinental railroad in the 1860s. Ford was

pressured by the studio but allowed to finish, and the film became a huge financial and critical success, placing Ford in the Olympian company of predecessors D.W. Griffith and Cecil B. DeMille.

1930s to World War II

And then came the talkies. Ford made another 60-plus sound-era features, a format that introduced a tension between the visual storyteller and the loquacious, poetically sentimental Irish yarn-spinner. Acting styles age more rapidly than visual mechanics, and works highly regarded at the time—such as *The Informer* and *The Long Voyage Home* (1940)—are less valued today than Ford's generically terse westerns. Although Ford was often only a contract director who did his best with the material at hand, he recognized and valued a good story and, when possible, bought literary material and developed it with able screenwriters. When the budget allowed, he was able to work on a large canvas, placing his characters—singly or in groups—as elements in huge indifferent, if not hostile, natural settings. This approach is as effective in *The Lost Patrol* (1934) or *The Prisoner of Shark Island* (1936) as it is in the westerns that he shot in Utah and Arizona's Monument Valley. Ford's stately, carefully staged and composed medium and long shots of groups of characters interacting (with a relatively spare use of "star" close-ups) are deceptively simple. Famous for shooting few takes and no extraneous angles, Ford was notoriously stingy with information for the cast or crew regarding what would be happening next or why, and he was quick to publicly chastise those who dared to ask for it. His contrariness became a personal trademark. Ford was likely to play either the erudite student of history and culture or the blunt, no-frills working stiff whenever insulted that the opposite was supposed of him.

World War II was a watershed for Ford: he finally had the opportunity (or perhaps the inescapable duty) to live up to the masculine code he had helped define in his many films. Already in the Naval Reserve, he made films for the Navy Department's photographic unit—two of which, *The Battle of Midway* (1942) and *December 7th* (1943), won Academy Awards for best documentary—and, working for the Office of Strategic Services, he was present at Omaha Beach on D-Day. Having been personally under fire and a witness to slaughter, he was so proud of his military service and status that his gravestone memorializes him as Admiral John Ford (he had left active service with rank of captain and was later made honorary rear admiral). His one true World War II movie, *They Were Expendable* (1945), is a remarkable film, though he sometimes derided it. It chronicles an American defeat (the rout of U.S. troops by the Japanese in the Philippines) and contains the quintessential Ford character scene. A group of officers considered "vital" to the war effort sit on a transport plane, waiting to be flown out of the debacle to rel-

ative safety. At the very last moment, a pair of more valued men arrive, and two of the junior officers are asked to step out of the plane (and most likely into what became known as the Bataan Death March). They do so quietly, uncomplaining, willing to sacrifice personal survival for the common good. Ford, acutely aware of the sham aspect of Hollywood mythmaking, underplays the moment that provides the backbone of the film.

Postwar Career

The postwar Ford took care of some debts and omissions. *Cheyenne Autumn* (1964) recognizes the brutal treatment he believed the various American Indian nations had suffered at the hands of white men, *Sergeant Rutledge* (1960) involves buffalo soldiers, the African American troops who fought in the West, and Ford overtly challenged his own legacy in *The Man Who Shot Liberty Valance* (1962). Without a lavish budget and shot in black and white, this film is somewhat visually claustrophobic but notable in how the persona developed by John Wayne in the many films he starred in for Ford hardened over the years. Gone is grinning Ringo Kid from *Stagecoach* (1939), who marches down the street to face the three Plummer brothers in a “fair fight.” In his place, at the end of *Liberty Valance*, Wayne’s Tom Doniphon bushwhacks Lee Marvin’s Liberty from a side street, shot-gunning him

John Ford (seated with megaphone) during the filming of “The Civil War,” a segment of How the West Was Won (1962).



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like a rabid dog, and then allows the book-toting Easterner played by James Stewart, who has stolen the love of Doniphon's life, to take credit for killing the outlaw in a face-to-face gunfight. Doniphon sinks into alcohol and misery while Stewart's character launches a successful political career. There is no cynicism here—both characters are presented as brave, honourable men, but the idea of silent sacrifice to a notion of “what's right” receives here its most extreme celebration in all of Ford's work, and the film's famous tagline (“This is the West, sir—when the legend becomes fact, print the legend”) does not seem ironic. The master storyteller was comfortable with the public's hunger for defining myths.

Though a maker of stars, Ford was never—if his one directorial dance with Shirley Temple in *Wee Willie Winkie* (1937) is discounted—a maker of star vehicles. This is no more apparent than in his *Wagon Master* (1950). Its protagonists are a pair of cowpokes played by the familiar character actors Ben Johnson and Harry Carey, Jr., amiable and uncomplicated. Their heroic moment is both reluctant and over in a flash, leaving viewers to assume that they go back to being simple cowpokes. Frontier values found in common men, in a situation that is morally clear-cut—this was the attraction of the western in the first half of the 20th century. As that simple comforting vision grew less viable in the years of McCarthyism, the civil rights movement, and the Vietnam War, a more nihilistic western evolved, finding its iconic figure in Clint Eastwood's “Man with No Name.” Although Ford drifted from being a Franklin D. Roosevelt Democrat to a Richard M. Nixon Republican, his films were neither reactionary nor even basically conservative, and never, ever, amoral. More attracted to questions of individual character than collective politics or cultural shifts, Ford helped create an archetypical code of masculine ethics and behaviour that has profoundly affected the American psyche.

LEE STRASBERG ON *Acting*

Actor, director, and teacher Lee Strasberg was the chief American exponent of the popular but controversial Stanislavsky “method” of acting, in which actors are encouraged to use their own emotional experience and memory in preparing to “live” a role. (Actress Lillian Gish famously quipped, “It’s ridiculous. How would you portray death if you had to experience it first?”) Strasberg was one of the cofounders in 1931 of the Group Theatre, which for 10 years staged a number of brilliant experimental plays; from 1948 to 1982 he directed the famed Actors Studio, the prestigious professional actors’ workshop in New York City and a leading center of the Stanislavsky method, whose distinguished alumni include Al Pacino and Paul Newman; and in 1974 his role as gangster Hyman Roth in the film *The Godfather, Part II* earned him an Oscar nomination. Strasberg was also a *Britannica* contributor, writing the article on “Acting, Directing and Production” for the 1959 printing of *Britannica’s* 14th Edition (1929–73); a brief excerpt follows.



Constantine Stanislavsky (1863–1938) set himself to fuse all the random thought and experiences into a form that could help the beginner and be of service to the experienced actor. His aim was to find a “grammar of acting,” to achieve that level of inspiration, or of living on stage, which great actors had found accidentally and sporadically. Without minimizing the value of voice, speech and body training, which are the actor’s tools, Stanislavsky tried to find means to stimulate and develop the actor’s essential requirements: his concentration, his belief and his imagination. He did not seek to fabricate inspiration, but to create the proper foundation for its appearance.

The actor, according to Stanislavsky, should come on the stage not to play-act but to perform the activities required of the character; to act. His appearance on the stage is not the beginning, but is a continuation of the given circumstances that have previously taken place. The actor trains his concentration so that he is able to create the impression of being private in public. He trains his senses so that he is able to see, hear, touch, taste, smell and relate to the many objects which compose his imaginary situation. He learns to use not only intellectual knowledge but emotional experience by means of affective memory. Wordsworth has defined poetry as originating in "emotion recollected in tranquillity." Shaw emphasized that "vital art work comes from a cross between art and life." Thomas Wolfe in one of his short stories and Proust in a passage in *Swann's Way* have brilliantly described the workings of affective memory. It is not limited to the ability to recreate one's previously experienced real emotions, but also to learn to repeat previously experienced stage emotions. The actor's training of himself goes hand in hand with the actor's work on a role. The actor learns to delve beneath the lines to find the meaning or subtext of a play. He learns to find the "kernel" or core of a part, to find the actions of the character that define the important sections, to set smaller tasks or problems for his concentration throughout each section. In later years Stanislavsky tried to correct the overly intellectual approach of this part of the work by simplifying the action work in terms of physical or psychophysical actions. Some have interpreted this as a reversal of his previous methods. Actually, it was intended not to rule out or contrast with, but to serve as a life belt by means of which the previous preparation and work on a role could be securely held onto, like the notes of a melody.

LILLIAN GISH ON *Silent Film*

*Lillian Gish (1893–1993), with her sister Dorothy (1898–1968), starred in many early D.W. Griffith classics. Her work in his *Birth of a Nation* (1915) established her as one of silent cinema's greatest stars. She was also a distinguished stage actress and, less well known, an expert in the technical aspects of filmmaking and a poetic expositor of the unique virtues of this budding art form. Her latter abilities are fully evident in the excerpt below from the 1929 article she wrote for Britannica's new 14th Edition (1929–73). Although "talkies" had debuted in 1927, Gish's theory of motion pictures as a kind of aesthetic Esperanto is based on what she knew best—silent films.*

Hartsook/Library of Congress, Washington, D.C.
(LC-USZ62-97197)



The motion picture, by virtue of its intrinsic nature, is a species of amusing and informational Esperanto, and, potentially at least, a species of aesthetic Esperanto. Of all the arts, if it may be classified as one, the motion picture has in it, perhaps more than any other, the resources of universality. Even a simple waltz by Johann Strauss may remain alien and unassimilable to the musical ear of the Chinese; a Michelangelo fresco may fail to impress its significant beauty upon a Japanese or Hindu; a drama by Ibsen may remain completely unintelligible, even in competent translation, to a maharaja of India, just as Chinese music must ever remain strange, peculiar and incomprehensible to the Anglo-Saxon ear. But the motion picture art of Charlie Chaplin will inevitably make a Japanese laugh as heartily as a Dane.

The reason is simple. Pantomime is the aboriginal means of human communication and intercourse, and pictures bring to a child his first acquaintance with and understanding of the world about him. The motion picture, combining the two, is thus addressed to a common human understanding. It begins with the el-

ementals of human perception and comprehension; it starts at the outset with the advantage of the fundamentals of human intercommunication and explicitness. It is for this reason that the moving picture has spread through the world and has been accepted far and wide in what has seemed an unbelievably short space of time.

The motion picture tells its stories directly, simply, quickly and elementally, not in words but in pictorial pantomime. To see is not only to believe; it is also in a measure to understand. In theatrical drama, seeing is closely allied with hearing, and hearing, in turn, with mental effort. In the motion picture, seeing is all—or at least nine-tenths of all.

This, of course, is the screen in its fundamental aspect. This is the motion picture simple and unsophisticated. This is the universal *engine* that is the cinema. The motion picture, plainly enough, in certain of its manifestations may remain largely vague and ambiguous to a people alien to the source of its imagination, preparation and making. But the motion picture in itself and in the aggregate is based upon materials of easy, common appreciation. Love, hate, desolation, despair, joy, ecstasy, defeat, triumph—these are universal emotions. Conveyed by words, as drama conveys them, they may offer difficulties to remote and various peoples. But conveyed by the movements of the human face and body, by smiles and tears, troubled brows and dejected shoulders, sparkling eyes and fluttering hands, they are immediately recognizable. A laugh or a sob is the same the world over. They need no words to explain them.

In another phase of the cinema, the so-called news-reel has already proved itself to be a form of journalistic Esperanto, just as the so-called educational moving picture has shown itself to be a form of informational Esperanto. The news-reel has brought to the far corners of the earth the life and daily activities of all nations and people. The educationals, as they are known, have acquainted the audiences of the world with various phenomena associated with invention, manufacture, discovery, ingenuity and enterprise peculiar to a certain country. The news-reel has informed every country of its neighbour, his leaders, his achievements, his troubles, his pleasures, his problems. It has spread a direct acquaintanceship with alien lands, peoples and customs to other lands. It has provided an international newspaper self-adapted to the understanding of all peoples, and a running commentary on contemporaneous history.

The motion picture is at once the common story-book, newspaper and text-book of the 20th century. In its loftier aspects, it may conceivably elude the comprehension of audiences remote from its birthplace. That is, when it abandons its more elemental nature and strives for isolation as an art form. But that is the fate of art, all art, wherever it be found. Art is for the few, unfortunately; the generality of people have difficulty in taking it into their understanding. Shakespeare and

the Orient may remain strangers; Leonardo and Dostoievsky may find no sympathy and hospitality in the consciousness of half a dozen lands. But there is probably no land where the spectacle of soldiers marching off to war or a fat man being struck with a custard pie is not instantaneously hailed with understanding. It is in *elementary* excitements and humours such as these, together with the thousand and one others that they connote, that the motion picture, reaching constantly after higher things, finds the mainspring of its wide and comprehensive appeal. It deals for the most part with primitive instincts, primitive impulses, primitive human peace and alarm, happiness and ache, ambition and dream. These may be dressed in strange costumes and may be shown through strange peoples, but underneath they are the emotions and inspirations and trials of all the human race. The backgrounds may be unfamiliar, but the hearts that beat and struggle, triumph or fall, are the hearts of all mankind. And so the world laughs with Chaplin and Lloyd, cries with Seastrom and Murnau and Griffith, startles at the revelations of Eisenstein, gasps pleasurably at Fairbanks and Valentino, feels tenderness with Mary Pickford and warms to the homely loveliness of Wolheim and Beery.

LON CHANEY, ON

Movie Makeup

SNAP/ZUMAPRESS.com/age fotostock

*Perhaps no one was better prepared for a career in silent cinema than Lon Chaney (1883–1930). His skills were honed during his childhood, when he learned to communicate with his deaf parents through facial expression, pantomime, and sign language. Famous as the “Man of a Thousand Faces,” his macabre and memorable characterizations became cinematic classics. These roles included the horrifying but endearing protagonist in *The Hunchback of Notre Dame* (1923), a role that required him to wear a 50-pound hump on his back, a fleshy covering over one eye, and prosthetics that grossly exaggerated his cheekbones, nose, and lips; the acid-scarred Erik in *The Phantom of the Opera* (1925); a vampire (and a police inspector) in *London After Midnight* (1927), and an armless knife thrower in *The Unknown* (1927). A major aspect of these roles was his amazing makeup, which Chaney was a master of in Hollywood. He developed this talent because he thought his own features were too ordinary for a star performer, and movie makeup was the subject he addressed for *Britannica* in its new 14th Edition (1929). An excerpt follows.*



The need of make-up in motion pictures was evident from the beginning, but few of the principles of stage make-up could be applied to the new art. Actors found that the make-up of the stage appeared in films in a vastly different way. Red, orange and brown photograph as black or nearly so; blue, pink, yellow and mauve photograph as white. Pink cheeks became a dirty grey, gold fillings in teeth appeared as black specks; freckles “picked up” more black than the eye could see; disguises applied after the stage fashion became, under the merciless eye of the camera, ludicrous. Actors, in experimenting with different colours, found that pinks with bluish tones photographed better, and today some stars use a make-up

that appears purple. Women, especially, found that applying the laws of photography to their make-up enabled them to correct defects in their faces. For instance, many actresses paint the upper eyelids green, which photographs as a light grey, and tends to make eyes that protrude slightly recede. Double chins can be partly obliterated by a tint of red, which, photographing in a darker tone than the rest of the face, places the offending chin in an apparent shadow. Red under the nose casts an optical shadow, and various colours are used about the eyes to make them appear as desired on the films.

These first make-ups, of course, were achieved by the use of the grease-paint and powder of the stage. But on the stage such make-up is worn only a short time; in films the actor has to wear it all day. Perspiration, dust and great activity before the camera made necessary frequent renewals of the grease-paint make-up. Cosmeticians began experimenting to find combinations that would last longer. Liquid make-up was devised, in which the colouring pigment was suspended in a solution containing a gelatin-like material. This make-up was found to require less patching or repairing. Later a gelatinous make-up was developed, containing materials rich in violet, which requires less light to photograph. The invention of the panchromatic film gave a greater latitude to the camera in dealing with colours, thus permitting the natural face to be filmed, and eliminating the "straight" make-up, which is designed to allow the face to be more readily photographed. To-day men use little or no make-up for "straights," and women use a make-up which tends to bring out the good points of their faces and hide the poor ones, but in both cases the make-up is much simpler than ever before. With a knowledge of the fundamentals of stage and screen make-up and the many possibilities in the use of various paints and pigments, it remains for every screen actor to study the anatomy of his own face in order to appear "natural" before the searching close-up of the camera. The following instructions should be kept in mind for practical make-up.

Methods of Make-up

Materials Used.—The necessities for make-up are: cold cream; grease-paint or liquid "ground" colours, graded from No. 1, a very light pink, to No. 13, a very dark brown, with No. 14, lavender; and No. 15, white; lining pencils, in black, brown, grey, blue, green and red; powder, ranging from white to olive; rouge and lipsticks, in four shades of red; starch or aluminium powder for whitening hair, also liquid colourings and brilliantine; nose putty; plasto, or undertaker's wax, for building up face, and collodion or "new skin" for scars; gutta-percha, black wax and white enamel for teeth; spirit gum and crêpe hair.

Straight or Foundation Make-up.—Apply cold cream, then wipe it off, to fill

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pores. Put on "ground" colour, grease-paint or liquid, and spread evenly, fading to nothing at nape of neck. After make-up for eyes, nose, etc., suggested below, powder thoroughly with lighter shade than "ground" paint, as it darkens when dry. To remove the entire make-up, apply plenty of cold cream and wipe off with towel.

The Eyes.—Shading is done with blue or violet lining pencils for soft shadows. Some use reds or grey-greens to shade blue or grey eyes. Black can be used, but with extreme caution, shading gradually to the eyebrows. For the eyelashes, women especially use mascara or sometimes a heavy black grease-paint.

The Nose.—A broad nose may be narrowed by drawing a high-light down the ridge of the nose with light paint, shading with red at the sides to determine the contour. Small nostrils are widened by inserting red around the edges, and large ones can be narrowed by high-lighting the same way.

The Lips.—Work the "ground" colour well into the edges and reshape with lip rouge, making corners come to a point. A small mouth can be enlarged by extending the red beyond the corners, and vice versa.

Hints on Character Make-up.—Shaping the nose, building up cheek-bones, blotting out the eyebrows and making the eyelids heavy can best be accomplished by the use of putty or plasto wax. To puff out the face, cotton wool is often inserted between the teeth and the cheeks. This material is also used for making bags under the eyes. Cut into a crescent shape, affix with spirit gum and paint over, mixing a little olive oil with the paint. To broaden the nose, negro style, cut three-eighth inch ends of two rubber cigar holders and insert into nostrils. For scars, brush on collodion, which draws the skin; apply a second coat for deeper scars. To remove, add more collodion to soften the scar, then peel it off. For very old age, a thin coat of putty can be applied to the face and lines graved into it with a sharp point for criss-crossing deep wrinkles. Trace the lines with red water-colours. Do not line the eyes. Make shadows with colour a little darker than the foundation, and where face would sink the most make the shadow darkest, always keeping the anatomy of the face in mind.



Lon Chaney in his role as Erik in *The Phantom of the Opera*, November 1925.

For Chinese make-up use bits of library mending tissue to draw back the corners of the eyes, thus giving a slant to them. Cover with the "ground" colour, and then paint the eyebrows with an upward tilt. A number of light black lines downward from the inner corners of the eyes and upward from the outer corners accentuate the slant.

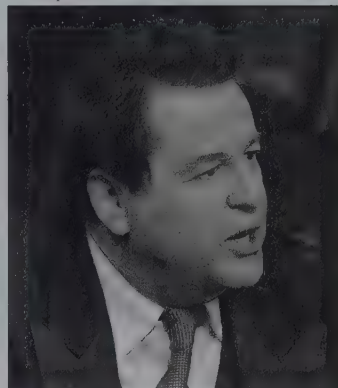
False teeth can be made by fitting dental rubber over the natural teeth, carving the sort of teeth wanted on this and painting with tooth enamel. False beards should be made with crêpe hair a little lighter than the natural hair. Comb out well, press in a book, cut off a straight edge, and after applying spirit gum on the face attach the straight edge to the face, and trim with scissors to the required shape. To grey the hair, apply starch or aluminium powder. The latter is better but much harder to wash out. "Polished brass" bronze powder, sold by paint stores, will "blonde" a brunette.

MARTIN LEWIS ON

Beatlemania

There are few things the British-born, American Martin Lewis has not done in the world of entertainment. Inspired by his early work with such renaissance men as Sir Peter Ustinov, Peter Cook, and Monty Python members John Cleese, Terry Jones, and Michael Palin, Lewis has hosted radio and TV programs and produced films, TV, radio, and stage shows, as well as records, documentaries, and music concerts, including the long-running Secret Policeman's Ball benefits (featuring leading musicians, actors, and comedians) for Amnesty International. He is also a renowned Beatles expert. A protégé of Beatles publicist Derek Taylor, his multiple Beatles-related projects include compiling the discography for their authorized biography, consulting on The Beatles Anthology, producing the DVD edition of A Hard Day's Night, working on several Paul McCartney projects, and writing the following article on Beatlemania for the Britannica Book of the Year.

Josh Kaplan



The year 2013 marked the 50th anniversary of the year that the Beatles emerged from being the object of affection of a few hundred teenagers in a provincial English town to becoming a phenomenon that engulfed Britain and Europe. The year 1963 was the one in which the group began to make its massive worldwide footprint on popular culture and laid the foundations for its enduring popularity. As of January the group had released just one single (a vinyl disc containing two songs: "Love Me Do" and "P.S. I Love You") that had scraped the lower regions of the U.K. record charts. The Beatles were practically unknown except to devotees in their Liverpool hometown, but by year's end an unprecedented tidal wave of popularity dubbed "Beatlemania" was sweeping the Continent. As improbable as it was, the last five days of 1963 saw the start of an even greater tsunami of fervour in the U.S. that within weeks would replicate and even surpass the group's initial breakthrough.



*Crowds gathering to catch sight of the Beatles before the premiere of *A Hard Day's Night* in Liverpool, July 10, 1964.*

The speed and depth of the Beatles' rise to fame had no precedent in British entertainment. Formed under the name the Quarrymen in late 1956 by then 16-year-old John Lennon, the group evolved into a tight-knit ensemble over the years—taking the name the Beatles in August 1960. They initially played their own version of American rock and roll, but by 1962 they were increasingly performing songs composed by Lennon and bandmate Paul McCartney. The core trio of Lennon, McCartney, and George Harrison was in place by February 1958, and in August 1962 the familiar lineup was finally set with the recruitment of drummer Ringo Starr.

Even with their natural teenage daydreams of conquering the world, the “Fab Four” faced immense odds in their quest to succeed. They were just one of more than 300 such groups in Liverpool. The British entertainment industry was London-centric and disdainful of aspirants from a working-class city in England's impoverished north. It was this sheer mountain face that the group surveyed at the start of 1963. However, the resolve and self-belief that had fueled them for five long years were an integral part of their determination to defy all the odds. A convergence of forces and circumstances resulted in the fission that detonated the Beatles' explosion. In songwriting, although Lennon and McCartney had started out simply emulating their musical heroes, their innate creativity resulted in compositions that conveyed experiences and emotions with an authenticity, an originality, and a verve that were beyond the scope of their early influences. As per-

formers the quartet exuded an exuberant optimism. The principal team supporting the group was also crucial to their breakthrough. Manager Brian Epstein, who discovered them in November 1961, had polished their rough presentational edges (without impinging on their music) to make them accessible to a mass audience and was their indefatigable evangelist, accurately predicting that they would become “bigger than Elvis.” Producer George Martin harnessed, nurtured, and shaped their nascent talent.

In the course of a few recordings—all brimming with the same insouciant energy—Martin captured the Beatles on audiotape. Their early songs were released approximately every three months. The jubilant qualities in the recordings were fresh to the audience’s ears, accustomed at that time to anodyne American pop and its anemic British imitations. Coinciding with the release of their records was Epstein’s orchestration of a virtual blitzkrieg of the airwaves by the group. Their natural energy made them compelling listening on radio. Their appearance rendered them even more effective on television, with their very unusual “moptop” hairstyles and collarless suits. Their most striking quality, though, was their charisma and the sheer joy they took in performing, a characteristic that was so different from the glazed “showbizzy” smiles of most entertainers.

The combination of so many songs bubbling with self-confidence and the wide exposure of the public to the Beatles resulted in an ever-growing succession of chart-topping hits for the group and a matching hysteria at their numerous live appearances. After “Please Please Me” topped the U.K. charts in February, the floodgates opened. A best-selling album (in March) followed rapidly by the singles “From Me to You” (in April) and “She Loves You” (in August) transformed the Beatles first into a teen fad, then into a pop-cultural phenomenon, and finally into a national treasure performing for Britain’s royal family in a plush theatre in the heart of London.

For many years British pop music had been under the control of middle-aged puppet masters, who churned out obedient teen idols singing assembly-line ditties and reciting scripted pabulum when interviewed. The Beatles were self-contained as writers and musicians and refreshingly and patently spontaneous free spirits when they met the media. The mixture of self-confidence and self-deprecation was endearing and proved to be a winning combination.

Nothing summed up the cheeky spirit of the Beatles more than their much-anticipated appearance at Britain’s Royal Variety Performance that November. How would the notoriously mischievous Lennon behave toward the cream of British aristocracy, nobility, and conspicuous wealth? Lennon exhorted the audience to join in on their final song: “Would the people in the cheaper seats clap your hands? And the rest of you—if you’ll just rattle your jewelry.” The Beatles were not only vivacious but also naturally witty.

In the latter months of 1963, the Beatles' attention was also turning to the U.S. Capitol Records, the American subsidiary of the group's U.K. record company, had thrice turned down requests from London to release Beatles recordings—branding them unsuitable for the American market. Consequently, smaller American labels had released the Beatles' discs but had enjoyed no success, a factor that compounded the belief that the group's next offering, "I Want to Hold Your Hand," would also fail to interest American ears. Nevertheless, Epstein persevered and took a different tack. In mid-November meetings in New York City with Ed Sullivan, the producer-host of the country's foremost variety show, Epstein personally persuaded him to book the Beatles for an unprecedented three consecutive appearances in February 1964. Armed with Sullivan's commitment, Epstein then persuaded Capitol to sign the Beatles and commit considerable promotional resources to launching the group in January 1964.

The Beatles' American aspirations would not have been part of their 1963 history but for a set of fateful circumstances. Their first record on Capitol was scheduled for release in mid-January 1964 as a ramp-up to their Sullivan debut appearance on Sunday, February 9. When U.S. Pres. John F. Kennedy was assassinated on Nov. 22, 1963, the tragedy set in motion a chain of events that led American news anchor Walter Cronkite to play a short film sequence from Britain about the Beatles on the *CBS Evening News* on Tuesday, December 10. Cronkite reasoned that a lighthearted segment about four English youngsters sporting quirky haircuts and playing rock and roll might help cheer up a nation still stricken with grief. The story did much more than that. It triggered an immediate demand from American youngsters to hear more of this brashly optimistic quartet. As an avalanche of interest grew quite naturally, unprompted by the record label, Capitol then made a savvy decision. It rushed the Beatles single to market on December 26—three weeks earlier than scheduled—and the record became an instant sensation on radio. Teenagers in a grieving nation were immediately captivated by this jubilant, uplifting record, which in its first five days of release, sold over a quarter of a million copies.

In 1964 the Beatles—already soaring into the skies—would streak through the entertainment stratosphere on what would become an Apollonian voyage into total cultural domination. Six more active years lay ahead of the group, who would both artistically and commercially break the boundaries of song composition, audio recording, and live performance. Their social and political passions and their quests for spiritual and artistic growth inspired changes in multiple spheres beyond those of the arts and entertainment. Then, defying all the previously known laws of celebrity physics, they became evergreens in popular culture. Though they disbanded in 1970, their popularity remains undimmed, and their influence continues to be profoundly felt. Fifty years on, their music and spirit appear to be timeless.

RICKY JAY ON *Conjuring*

American magician, actor, and author Ricky Jay is one of the world's greatest sleight-of-hand artists. He has appeared in numerous films and TV series and written and hosted documentaries on magic for HBO, CBS, the BBC, and A&E. But Jay is also a serious student of his art, as evidenced by his many books and the entry on conjuring that he wrote for Britannica, highlighted below. Jay briefly discusses the great Houdini, who was also a Britannica contributor and whose piece can be found excerpted in the "Automatic Writing" entry in this volume.

Courtesy of Ricky Jay



Magician Ricky Jay performing the cup and ball trick, one of the oldest sleight-of-hand maneuvers.

Conjuring, also called magic, prestidigitation, or sleight of hand, is the theatrical representation of the defiance of natural law. *Legerdemain*, meaning "light, or nimble, of hand," and *juggling*, meaning "the performance of tricks," were the terms initially used to designate exhibitions of deception. The words *conjuring* and *magic* had no theatrical significance until the end of the 18th century. Descriptions of magical demonstrations were recorded in Egypt as early as 2500 BCE. Such accounts reflect an inevitable mix of fact and fantasy, a quality they share with even their most modern counterparts.

One of the tenets of magic—indeed, one employed and exploited by some of its foremost practitioners—is that spectators cannot perceive correctly the miraculous effects they have witnessed. Perhaps conjurers have always understood that when

viewers are in a state of amazement, their capacity for accurate recall is diminished. The use of psychology, therefore, is one of the principal techniques of the conjurer, especially in the practice of misdirection, in which a spectator's attention is directed to a specific point determined by the performer. The knowledge of scientific principles, the implementation of ingenious mechanical devices, and impressive physical dexterity are also essential tools of the successful magician. . . .

Many sources, beginning with the earliest works on magic, describe the attributes common to the best practitioners of the art and detail the skills they must cultivate. *Hocus Pocus Junior: The Anatomie of Legerdemain; or, the Art of Jugling* . . . (1634) suggests the following:

First, he must be one of an impudent and audacious spirit. . . . Secondly, he must have a nimble and cleanly conveyance. Thirdly, he must have strange terms and emphatical words. . . . Fourthly, . . . such gestures of body as may lead away the spectators eyes from a strict and diligent beholding his manner of conveyance.

The great French magician Jean-Eugène Robert-Houdin (1805–71) stated: “To succeed as a conjurer, three things are essential—first, dexterity; second, dexterity; and third, dexterity.” But he also stressed the study of science and the application of mental subtleties. Harry Kellar (1849–1922), the most famous American magician in the early years of the 20th century, suggested more-unconventional qualifications for the successful conjurer: “The will, manual dexterity, physical strength, the capacity to perform things automatically, an accurate, perfectly ordered and practically automatic memory, and a knowledge of a number of languages, the more the better.”

Although some conjurers are cited by name in the early literature, accounts devoted to particular magicians are fragmentary until the 18th century. Isaac Fawkes (d. 1731), the English fairground conjurer, and Matthew Buchinger (1674–1739), “The Little Man of Nuremberg”—who exhibited the classic cups and balls effect although he had no arms or legs—were the best-known performers in the first half of the century. By the 1780s the Italian wizard Chevalier Pinetti (1750–1800) had introduced magic in a theatrical setting, liberating it from centuries of itinerant performance in street fairs and taverns.

Two great conjurers emerged in the 19th century: the previously mentioned Robert-Houdin, a watchmaker who combined a scientific approach to conjuring with the social graces of a gentleman and who is considered the father of modern magic; and the Viennese enchanter Johann Nepomuk Hofzinser, a master of both inventive apparatus and original sleight of hand, especially with playing cards. Both men performed in small, elegant theatres and elevated the art to its highest

levels, making the performance of magic as viable for the beau monde as a trip to the ballet or opera.

At the turn of the 20th century, magic was a successful form of popular entertainment. Elaborate stage shows such as that offered by Alexander Herrmann (1844–96) in the United States or John Nevil Maskelyne (1839–1917) and David Devant (1868–1941) in London became the rage. In 1903, Okito, T. Nelson Downs, the Great Lafayette, Servais LeRoy, Paul Valadon, Howard Thurston, and Horace Goldin, a veritable all-star team of renowned conjurers, appeared simultaneously in different London theatres. At the same time, Max Malini (1873–1942) traveled the globe giving impromptu performances in private settings for members of high society and nobility. In the United States, Harry Houdini specialized in a single aspect of the art, escapology—extrication from restraints such as handcuffs or straitjackets—to become magic's most famous practitioner in the vaudeville era, while Kellar, Thurston, and Harry Blackstone, Sr. (1885–1965), conducted large and popular touring shows. After a considerable slump in the popularity of stage illusion, Doug Henning revitalized the art by appearing on Broadway in the 1970s and paved the way for the success of the magic show of David Copperfield and the Las Vegas extravaganza of Siegfried and Roy. What may have been the most lasting contribution to the magic art in the 20th century was the advancement of close-up or sleight-of-hand magic in intimate performance. The greatest exponent of this branch of conjuring was the Canadian-born Dai Vernon (1894–1992), who revolutionized the art and whose legacy is shared by professional performers and by thousands of amateur enthusiasts around the world.

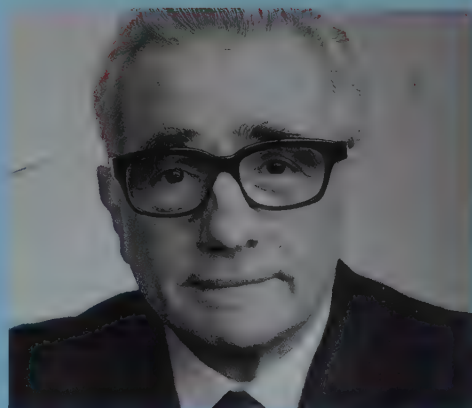
Magic is a universal art form. Although it may reflect specific features of nationality, ethnicity, or religion, it thrives without regard to them, and it has developed independently in various cultures. It has survived hundreds of years of exposure and trivialization. No matter how often and how egregiously its secrets are revealed, the passage of years, a change of context, and the power of a splendid performer can rekindle an old principle to create a performance miracle.

Film Preservation: A Dire Need

By Martin Scorsese

The term “film preservation” now has an official ring to it. In one sense, that’s progress—it means that people take it seriously, which was not always the case. On the other hand, the fact that it has become official means that it has also ceased to be urgent, that the problem has been solved, and that it can now be taken for granted. In reality, nothing could be further from the truth. Film preservation is always urgent. It always will be urgent. For every neglected film print or set of film elements that is not being stored under optimal conditions, that has not been checked or cleaned or scanned, the clock is ticking. And even if a title has been transferred to digital media, the clock is still ticking. It is always ticking, just as it is for every painting and every manuscript in every museum or archive.

And then, there’s that question that is still asked from time to time: why? Why preserve films at all when there are so many more important and urgent things to spend money on? The answer is very simple. The cinema gives us something precious: a record of ourselves in time, documented and interpreted. The need to incorporate time and motion into our representations of



Photograph © Brigitte Lacombe

ourselves goes back to the beginning of humanity—you can see it in the paintings on the walls of the caves at Lascaux. And, on a fundamental level, that is true of every art form. The cinema gives us a way of dealing with the mystery of who and what we are.

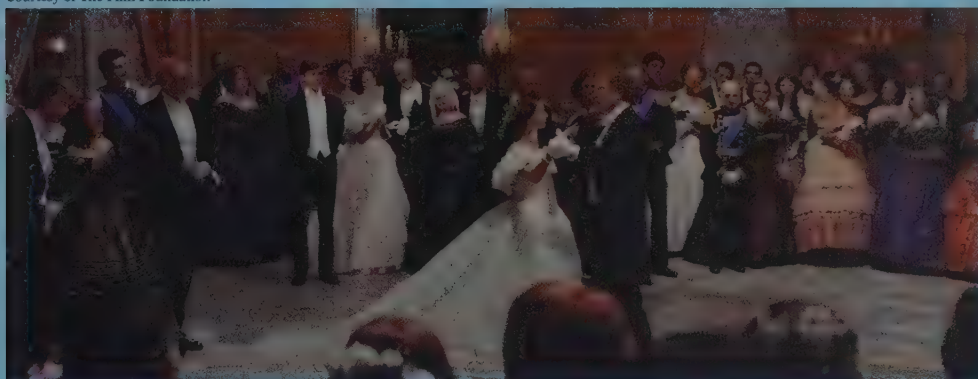
We now know how much of the cinema has been lost to us. But we came very close to losing much more.

In the late 1970s I went to a screening of a film made in the mid-’50s called *The Seven Year Itch*, by Billy Wilder, shot in the Eastmancolor process. This was the studio archival print of the picture with the iconic image of Marilyn Monroe. The lights went down, the screening began, and we were shocked by what we saw. The color had faded so dramatically that it was almost impossible to actually see the film. In those pre-home video days we’d grown used to seeing film prints that were a couple of generations away from the original negative, that were scratched and spliced and worn, and—in the case of pictures that had been shot in color—that were sometimes faded. However, this was beyond mere fading. This was visible evidence of deterioration and, since it was the studio print, of neglect. But beyond the fact that the color was lost, I realized that the performances were lost as well, and the characters along with them. The eyes of the actors had been reduced to smudged

Courtesy of The Film Foundation

The Pawnshop, 1916 film directed by Charlie Chaplin, restored by Cineteca di Bologna in association with The Film Foundation.





The Leopard (Italian: *Il Gattopardo*), 1963 film directed by Luchino Visconti, restored by Cineteca di Bologna and Twentieth Century Fox in association with The Film Foundation.

orbs of brown or blue, which meant that their emotional connections to each other and to the audience had been lost. They walked across the screen like phantoms. This meant that the entire narrative was lost. In essence, the film itself was lost.

So that night, we all realized that something had to be done.

I received a quick education. I came to understand that Eastmancolor was particularly unstable and prone to fading, that films shot in the Technicolor process were far more stable, but that all film prints and elements, whether black and white or color, were susceptible to chemical decomposition if they weren't stored in sufficiently dry and cool conditions. They would develop what became known as "vinegar syndrome"—as the film base (either pre-1948 nitrate or post-1948 acetate) degrades, the print starts to actually smell like vinegar and becomes brittle, it buckles and shrinks. Once a print develops vinegar syndrome, the degradation is irreversible.

Then I made a truly terrifying discovery: due to chemical decomposition, wear, fires (more prevalent during the era of nitrate, which was extremely flammable), or some combination thereof, 50 percent of pre-1950 American cinema and 80 percent of American silent cinema had been lost. Gone. Forever. This seemed inconceivable to me and to my friends who were also filmmakers and film lovers. On the one hand, there were countless celebrations of the greatness

of Hollywood and the Golden Age of Movies. On the other hand, over half of it was gone, and that included several celebrated titles that had won multiple Oscars. There was no consciousness whatsoever of systematic preservation, or, when needed, of restoration. And this was just here in America, where the resources are vast. What about the rest of the world?

After I led a campaign to develop a more stable color film stock, I met Bob Rosen, who was then the director of UCLA's Film and TV Archives, and we tried to build bridges between the independent archives and the studios. This led to The Film Foundation, which I formed in 1990 with Woody Allen, Francis Ford Coppola, Stanley Kubrick, George Lucas, Sydney Pollack, Robert Redford, and Steven Spielberg. Since then, we've made possible the restoration of more than 800 films from around the world. During the '90s and the early years of the 21st century, the consciousness of the fragility of cinema seemed to come into focus. There seemed to be an increasing awareness of the need for preservation.

Through the mid-'90s, film restoration work was done photochemically. Then, in 1996, a late silent film by Frank Capra called *The Matinee Idol* was restored with digital techniques. Damaged frames could be scanned and repaired information cloned from cleaner frames, and a picture that would previously have been presented in fragments or severely truncated form could now be seen in something close to

its original version. This was a huge leap forward.

In the years since 1996, everything has changed. Almost all restoration work is now done digitally, which has its pluses and minuses: on the one hand, films can be given whole new lives that often fulfill and sometimes surpass the original intentions of the filmmakers; on the other hand, the technology sometimes drives the restoration choices when in fact it should be the reverse.

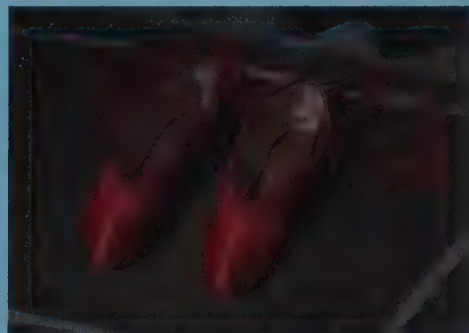
Today, there are very few film labs left in the world. Almost all pictures are shot with digital cameras, and even the ones that are actually shot on film are edited and color-timed and finished digitally. When a print of a new or even a restored picture is made and projected, it is now an event. At this point, when you are watching a film projected in a theater, you are usually seeing a Digital Cinema Package, or DCP, which is either sent to the theater in question over the Internet or in the form of a drive that is plugged into the projector, which “ingests” the file (the movie) that is activated with a code supplied by the distributor. The drives that contain the DCPs are the same exterior drives that you use to store digital information at home. And as we all know, digital information sometimes simply disappears. This has happened to more than one major studio picture. “Systematic migration” from the current state-of-the-art digital format to the next evolving format is now the goal, but this requires more vigilance than ever on the part of the owners. At this point the majority of film-watching is not done in movie theaters but via streaming to computers or homescreen systems, which means that the standards of acceptability for restoration, preservation, and presentation have changed and, I think, loosened. In the future the memory of the actual film image will have to be preserved as carefully and lovingly as an ancient artifact at the Met. That is why the Film Foundation always insists on the creation of actual film elements—a negative and a positive—for every restoration in which we are involved.

Meanwhile, actual film—now Mylar-based and stronger than ever—is still the most reliable and durable means of preserving movies.

Martin Scorsese is an Academy Award-winning director and one of the most influential filmmakers working today. He has directed critically acclaimed, award-winning films including Mean Streets, Taxi Driver, Raging Bull, The Last Temptation of Christ, Goodfellas, Gangs of New York, The Aviator, The Departed, which won an Academy Award for best director and best picture, Shutter Island, and Hugo, for which he received a Golden Globe for best director. For The Wolf of Wall Street (2013) he received DGA, BAFTA, and Academy Award nominations for best director, as well as a Golden Globe and an Academy Award nomination for best film. He has also directed numerous documentaries including the Peabody Award-winning No Direction Home: Bob Dylan and A Letter to Elia as well as Italianamerican, The Last Waltz, A Personal Journey with Martin Scorsese Through American Movies, Il mio viaggio in Italia, Public Speaking, and George Harrison: Living in the Material World, for which he received Emmy Awards for Outstanding Directing for Nonfiction Programming and Outstanding Nonfiction Special. Scorsese codirected The 50 Year Argument in 2014 with his longtime documentary editor David Tedeschi and executive produced the HBO series Boardwalk Empire, winning an Emmy and a DGA Award for directing the pilot episode. Scorsese is also the founder and chair of The Film Foundation, a nonprofit organization dedicated to the preservation and protection of motion picture history.

Courtesy of The Film Foundation

The Red Shoes, 1948 film directed by Michael Powell and Emeric Pressburger, restored by UCLA Film & Television Archive in association with The Film Foundation.



ROGER EBERT ON

The Future of Feature Films

Roger Ebert (1942–2013)—film critic for the Chicago Sun-Times for more than 40 years—was the first person to receive a Pulitzer Prize for film criticism (1975). That same year he and Gene Siskel, lead film critic of the rival Chicago Tribune, launched a televised movie-review program that became famous as Siskel & Ebert. As part of his on-air commentary, Ebert originated the famed thumbs-up, thumbs-down rating system, and the phrase “two thumbs up” was later copyrighted. Each week Ebert and Siskel carried on unscripted discussions of the films they reviewed, and their immense popularity was in part due to frequently diverging opinions and a willingness to conduct heated arguments on the air. Their programs received seven prime-time Emmy Award nominations between 1984 and 1997.

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The lucidness and candidness for which Ebert became famous on television were evident as well in the long essay he contributed to *Britannica*. Weighing in at 17,000 words and entitled “Beyond Narrative: The Future of the Feature Film,” it appeared in the 1978 edition of *Britannica*’s *The Great Ideas Today*. Readers might notice that Ebert expressed the same opinion that Alfred Hitchcock did in his entry for *Britannica* some 15 years earlier (also highlighted in this volume): an underappreciation by the masses of the artistry of filmmaking.

The movies probably inspire more critical nonsense than any other art form, and they are also probably looked at and written about with more ignorance. That may be a tribute of sorts: We assume we require some sort of preparation for the full experience of a work of painting, music, or dance, but film absolutely encourages us to let go of all our critical facilities—our self-consciousness, even—and simply sit back while pure experience washes over us.

It seems to follow that the bad movie directors are the ones who call attention to their work in self-conscious shots and self-evident strategies. The good ones, on the other hand, would seem to be those who, having an instinctive affinity for the medium, know how to let their movies flow, without the distractions of easily visible strategies. John Ford, so long ignored as a serious film artist, used to tell his interviewers again and again about “invisible cutting,” by which he meant filming and then editing a picture so smoothly that the narrative momentum meant more to the audience than anything else.

The mass movie audiences of the 1930s and 1940s would probably not have known what to make of Ford and his theory, but they knew that they liked his movies and those of the other great Hollywood craftsmen. They were also much less interested in the camera work than they were in whether the hero would get the girl. They were, to that degree, successful audiences, because they were passive ones. They let the movie happen to them, and no other art form encourages or rewards passive escapism more readily than film.

Maybe that is why movies have been held morally suspect from their earliest days. Great freedom of speech battles were fought and won for books such as *Ulysses*, but few people thought to apply the First Amendment to the movies. Of course movies could, and should, be censored!—just as Congress could, and should, exempt professional baseball from the protections of the Constitution. Movies were almost like drugs; they contained secrets, they could prey on us, they could influence our morals and our lives. If we were Catholics in the years before Vatican II, we even got up in church once a year and raised our right hands and took the pledge of the Legion of Decency and vowed to avoid immoral films. No other venue of possible transgression (not the pool hall, the saloon, not even the house of prostitution) was thought seductive enough to require a similar public pledge.

The movies were different. For most of us, in the first place, they were probably deeply associated with our earliest escapist emotions. We learned what comedy was in the movies. We learned what a hero was. We learned (although we hooted as we learned) that men and women occasionally interrupted the perfectly logical things they were doing, and . . . kissed each other! And then, a few years down the line, we found ourselves turning away from the screen to kiss our dates—for surely more first kisses have taken place in movie theaters than anywhere else. In adolescence, we tried out various adult role possibilities by watching films about them. We rebelled by proxy. We grew up, lusted, and learned by watching movies that considered so many concerns we did not find included in our daily possibilities.

During all these years of movies and experiences, though, we never really took the movies *seriously*. They found their direct routes into our minds, memories, and behavior, but they never seemed to pass through our thought processes. If we

finally did, in college, subscribe to the fashionable belief that the director was the author of the film, and that one went to the new Hitchcock and not the new Cary Grant, we still had a sneaky suspicion that a good movie was a direct experience, one to be felt and not thought about. Walking out of the new Antonioni, Fellini, Truffaut, or Buñuel and meeting friends who had not seen it, we immediately fell into the old way of talking about who was in it, and what happened to them. It rarely occurred to us to discuss a specific shot or camera movement, and never to discuss a film's overall visual strategy.

Movie criticism often fell (and still falls) under the same limitation. It is the easiest thing in the world to discuss a plot. It is wonderful to quote great lines of dialogue. We instinctively feel a sympathy for those actors and actresses who seem to connect with sympathies or needs we feel within ourselves. But the actual stuff of the movies—shots, compositions, camera movements, the use of the frame, the different emotional loads of the various areas of the screen—is of little interest. We may never forget what Humphrey Bogart said to Ingrid Bergman in Rick's Cafe Americain in *Casablanca*, but we have already forgotten, if we ever knew, where they were placed in the frame. Fish do not notice water, birds do not notice air, and moviegoers do not notice the film medium.

That is how the great directors want it. Figuratively they want to stand behind our theater seats, take our heads in their hands, and command us: *Look here, and now there, and feel this, and now that, and forget for the moment that you exist as an individual and that what you are watching is "only a movie."* It is not a coincidence, I believe, that so many of the films that have survived the test of time and are called "great" are also called, in the industry's term, "audience pictures." They tend to be the films in which the audience is fused together into one collective reacting personality. We enjoy such films more when we see them with others; they encourage and even demand the collective response.

Time will more and more reveal, I think, that the bad directors are the ones whose visual styles we are required to notice. Go to see Antonioni's *The Red Desert* on the same bill with Fellini's *8 1/2*, as I once did, and you will feel the difference instantly: Antonioni, so studied, so self-conscious, so painstaking about his plans, creates a movie we can appreciate intellectually, but it bores us. Fellini, whose mastery of the camera is so infinitely more fluid, sweeps us through his fantasies without effort, and we are enthralled. . . .

How do we choose, approach, and respond to a film?

That used to be a question with a fairly obvious answer. "Film appreciation" classes were held at which, after it was generally agreed that the photography was beautiful and the performances were fine, the discussion quickly turned to the film's

“meaning.” Bad films were trashy, aimed at the hypothetical twelve-year-old intelligence of what was taken as Hollywood’s average audience. Good films, on the other hand, contained lessons to be learned. John Ford’s *Stagecoach* was dismissed as a Western (worse, a John Wayne Western), but Ford’s *The Grapes of Wrath* was plundered for its insights into the Depression. That both films shared essentially the same subject (a band of people with a common interest attempt to penetrate the West in the face of opposition from unfriendly natives) was overlooked or ignored.

Indeed, “film appreciation” routinely ignored the very aspects that made films different from the presentation of the same source material in another medium. Laurence Olivier’s odd and enchanting approach to *Richard III* was never the issue; such a film was used as a “visual aid” to a more formal classroom study of Shakespeare’s text, when what was needed was aid in seeing the “visual aid” itself. Who had the audacity to suggest that the artist of consequence in the film was Olivier, not Shakespeare?

“Film appreciation” is still often the standard approach in the increasing number of high schools that offer courses in film. But at the university level, more sophisticated approaches are now in vogue. They began to grow possible, I imagine, at about the moment in the late 1950s when we began to hear, all at once, about the French New Wave and its key word, *auteurism*. . . .

How should we experience a film?

Narrative films can have such an overwhelming storytelling force that most filmgoers have become fixed on that level: They ask, “What’s it about?” And the answer satisfies their curiosity about the movie. Movie advertising and promotion executives believe a sure key to box office success is a movie that can be described in one easy sentence:

It’s about a giant shark.

Marlon Brando meets this girl in an empty apartment; and they . . .

It’s two hours of “Flash Gordon,” only with great special effects.

It’s about the tallest building in the world catching on fire.

It’s about a slum kid who gets a crack at the heavyweight title.

There did seem to be a brief moment, in the late 1960s, when narrative films were becoming obsolete. *Easy Rider*, mentioned before, inspired a wave of films with structures that were frankly fragmented. Some of them merely abandoned carefully plotted narrative for the easier, and much older, narrative structure of the picaresque journey; there was a subgenre of “road pictures” in which the heroes

hit the road and let what happened to them, happen. Road pictures often functioned as clotheslines on which the director could hang out some of his ideas about American society, at a particularly fragmented moment in our own history. *Easy Rider* itself, for example, contained episodes on a rural commune, a drug-dealing subplot, a visit to Mardi Gras, a scene in which the protagonists got stoned on marijuana around a campfire, and episodes in which stereotyped rednecks and racists murdered the hippie heroes.

Other films abandoned narrative altogether. One of the period's most popular films, the documentary *Woodstock*, never overtly organized its material, depending instead on a rhythmic connection of the music and images at its awesomely large rock concert. Underground and psychedelic films surfaced briefly in commercial houses. The Beatles' *Yellow Submarine* was a free-fall through fantasy images and music. Stanley Kubrick's *2001: A Space Odyssey* teased its audiences with documentarylike titles ("To Infinity—and Beyond") but abandoned all traditional narrative logic in its conclusion.

The films I have mentioned were successful, but most of the period's nonnarrative films were not. The hugely successful films of the 1970s have all been built on sound narrative structures: *The French Connection*, *The Godfather*, *Patton*, *Chinatown*, *The Sting*, *Star Wars*. Because these films can be understood so completely through their stories, audiences have found them very satisfactory on that level. Nobody has been much interested that some of them (*The Godfather* and *Chinatown*, for example) may have richer levels of psychological and visual organization.

It appears, then, that films aimed only at the eye and the emotions cannot find large audiences. Experimental filmmakers can try out fascinating combinations of color, light, pulse, cutting, and sound (as Jordan Belsen did). They can even create works in which the actual cone of light from the projector was the work of art, and instruct the audience to stand where the screen would be (as Anthony McCall has done). But their nonnarrative works play in museums and galleries and on the campus; commercial feature filmmaking and its audience seem as committed as ever to good stories, well told.

I am enough a member of the generation that went to the Saturday matinees of the 1940s to love fine narrative movies (I sometimes list among my favorite films Hitchcock's *Notorious*, Carol Reed's *The Third Man*, and the first Humphrey Bogart classic that comes to mind). But I believe the future of feature films as an art form lies in the possibilities beyond narrative—in the intuitive linking of images, dreams, and abstractions with reality, and with the freeing of them all from the burden of relating a story. I certainly do not believe the day will come soon when large audiences forsake narrative. But I am concerned that three things are slowing the natural evolution of cinema—the eminence of the "event film" (already

discussed), our obsessive insistence on a paraphrasable narrative, and the reduced visual attention span caused by over-consumption of television.

My concern about television should be almost self-explanatory. Most of us probably spend too much time watching it. Most of it is not very good. To catch and retain our attention, it has to go by quickly. There are thousands of little climaxes on the networks every night: Small, even perfunctory moments when someone is killed, slams a door, falls out of a car, tells a joke, is kissed, weeps, does a double take, or is merely introduced ("Here's Johnny"). These smaller climaxes are interrupted at approximately nine-minute intervals by larger climaxes, called commercials. A commercial can sometimes cost more than the show surrounding it and can look it. Made-for-television movie scripts are consciously written with the thought that they must be interrupted at regular intervals; the stories are fashioned so that moments of great interest are either arrived at or (as often) postponed for the commercial.

I have expressed concern about our obsessive love for narrative, our demand that movies tell us a story. Perhaps I should be just as concerned with what television is doing to our ability to be told a story. We read novels for many reasons, E. M. Forster tells us in a famous passage from *Aspects of the Novel*, but most of all we read them to see how they will turn out. Do we, anymore? Traditional novels and films were often all of a piece, especially the good ones, and one of the pleasures of progressing through them was to see the structure gradually revealing itself. Hitchcock's frequent practice of "twinning" is an example: His films, even such very recent ones as *Frenzy* (1972), show his delight in the pairing off of characters, scenes, and shots so that ironic comparisons can be made. Is the mass audience still patient enough for such craftsmanship? Or has the violent narrative fragmentation of television made visual consumption a process rather than an end? . . .

Perhaps I am talking about two kinds of audiences—or moviegoers who will want to join different audiences and different collective states of mind for different movies. The mass audience still seeks experience, pure and simple. I remember a practice that was popular during the reserved-seat engagements of *2001* in the late 1960s. Lovers of the film would mingle with the intermission crowds on the sidewalk, then slip inside to rest flat on their backs on the floor in front of the screen, the more thoroughly to enjoy Kubrick's space-and-time "light show." This is consuming a movie in the same way one might consume a roller coaster; while the experience is undeniably entertaining, it is not the way I would suggest to deal with a serious film.

There are, however, great and serious films that require something of the same willing giving over of moment-to-moment consciousness from the viewer to the filmmaker. The better these films are, and the more central to shared human ex-

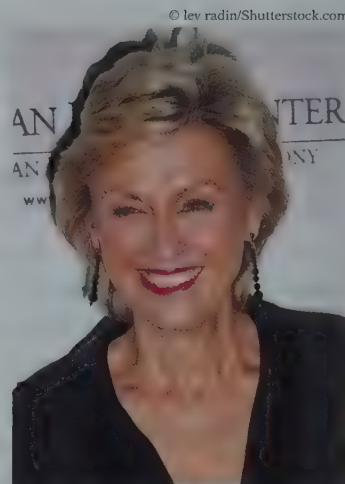
perience, the more readily some filmgoers seem to shy away from them. Ingmar Bergman's *Cries and Whispers* (1972) is a case in point. I thought it was the best work of the year and said so in an annual review of the year's films. A reader called to ask: "But should we go to see it?" "Well, yes, of course," I said. "My friend and I were thinking," the reader said, "that if it's really *that* good, then maybe we'd have more fun going to see something else. . . ."

How does a critic build bridges between what is new, best, and most daring at the movies, and the built-in desire of the mass audience to see the kinds of movies it has known best and longest—and can depend on? Where do the two audiences meet? The daily newspaper reviewer is faced with this dilemma more frequently, and more bafflingly, than writers for audiences who have already made part or all of the journey to those lands where the best new movies reside. There are a great many people for whom going to the movies still means a decision in favor of the new Clint Eastwood film instead of, say, the new Charles Bronson film. There are those who would rather see *Saturday Night Fever* ten times than see *Saturday Night Fever* once and then see nine other films.

I do not mean to reject filmgoing on that level, but I do want to insist that the most original new work will not be found there. It is fine with me if there are two, ten, or a hundred cinemas, but I think we have to understand that the most important new movies will not be coming from the directors who make better and better films in conventional narrative modes, no matter how much we may admire and enjoy what they accomplish. The key films of the coming years, whether or not they are immediately (or ever) successful, will be the ones that explore and try to understand the powerful three-way connection between cinema, emotion, and the mind.

TINA BROWN ON *Princess Diana*

Tina Brown, one of this era's most prominent and controversial magazine editors—she has edited Tatler in England and Vanity Fair and The New Yorker in the United States—wrote The Diana Chronicles in 2007. Brown knew Diana, princess of Wales, and in fact she met with her a final time mere weeks before Diana's death in a car accident in Paris on August 31, 1997. In 2007, on the 10-year anniversary of Diana's death, Britannica asked several cultural critics and writers about Diana to comment on the princess's legacy, and as part of this forum Britannica contributor Victoria Lautman interviewed Brown. The full interview follows.



Question: You recently asked Prime Minister Tony Blair about Diana's legacy and significance and whether she taught the monarchy a new way to be royal. His reply was swift: "No. Diana taught us a new way to be British." How so?

Tina Brown: Blair meant that Diana gave the stiff upper lip, uptight, emotion-denying old Establishment face of England a way to be modern, caring, and less locked in outworn class judgments. She was the most well-born girl imaginable, and very good at putting a brave face on things when she was sad, but she also made people who had problems they had always felt were shameful feel better about themselves. She did that by sharing her own. When she talked in public about her bulimia, she let a generation of young girls out of the closet on that issue. Her keen awareness of people less lucky than herself was matched by the spirit and message of Blair's New Labour party that won the election shortly before Diana died. Both PM and Princess were in sync with Britain's desire to put the hard-faced Thatcher years behind them.

Question: When you lunched with Diana just weeks before her death, you say what struck you most was how much celebrityhood had seemingly transformed her appearance. In one of the most commented on sections of your book, you even suggest that “the heads of world-class celebrities literally seem to enlarge.” What exactly do you mean by this?

Tina Brown: I mean that very famous people do seem to expand under the glare of media spotlight and public attention. Perhaps it is because as they accrue money, poise, grooming and an acute sense of who they are, everything about them gets exaggerated. Hair gets blonder, faces enhanced with plastic surgery, trademark characteristics are emphasized until they almost become cartoons. In Diana’s case she was enormously tall. And as she cared less about having to please the shorter Prince of Wales and worked out obsessively in the gym, where once she shyly slouched, after fifteen years in the spotlight she stood more upright and was unafraid to wear high heels.

Question: You’ve stated that Diana accelerated the media’s frenzied obsession with celebrity, that “Diana sold papers like no one has ever sold papers,” and that the problem today is “that there are so many outlets that there aren’t enough real celebrities to go round.” You also castigate the press and the paparazzi in particular, because, by the time of Diana’s death, “subjects and photographers alike had been degraded by the media’s inexhaustible appetite for celebrity images.” Gaby Wood in *Slate* magazine said such comments are a bit like the pot calling the kettle black, that, in this regard, you write as both “expert and perpetrator.” How do you respond to such criticism, and is there a difference between the kind of attention accorded Diana and the kind doted on celebrities like Paris Hilton? Is power, and not simply money and moniker, a key element here?

Tina Brown: I am indeed both expert and perpetrator, the study of celebrity having absorbed a great deal of my professional life. My point is that with the multiplication of outlets there is an A-list celebrity famine. In order to fill the covers of magazines the bar has been lowered to create stars out of total nonentities. Real stars are so rare and probably always have been. Media today is as voracious as it is infinite but there are probably only ever six major marquee names that people truly care about at any one time. So the manufacture of wannabes and nobodies has become a subindustry of Hollywood that threatens to drown the real commodity. I think Diana and perhaps JFK Jr. . . . on the male side were the last two golden icons that exuded true glamour, that sense of untouchability however accessible they seemed to be. Paris Hilton is just a stand-in. Money gave her a bit of an edge, sure, but let’s not kid ourselves. It’s the porn video that made her. Money

and sex were the potent combination that kicked her up into the stratosphere.

Question: You've said that, because of the trajectory of your own fame, you've developed a better understanding of what it's like to be inaccurately portrayed and have every move tracked, and consequently you can pursue stories with more clarity, fairness, and insight. Does this mean you're more sympathetic to celebrities now, and would this understanding have changed your approach to stories, say, 10 or 20 years ago?

Tina Brown: It's not so much a question of being more sympathetic as being less reductive. When you are written about yourself you become keenly aware—and bored

to death by—the way journalists so often try to cram a story into the same boring old narrative rather than allow that people can be complicated, have motives that are mixed, or pressures that haven't been understood. For instance, Katie Couric when she was in her last years at the *Today* show—the narrative was she was a b-tch, temperamental, beastly to staff and her numbers were off because audiences were tired of her. That narrative totally ignored the fact that she was being temperamental because *Today* had foisted on her a producer who wasn't cutting it. She was being made to take the heat for the fact that the show was much less good than in the past and she couldn't get herself heard at the management level. Eventually she got her way and that producer was fired. And what happened—the show immediately improved and the ratings went up again. But no one wrote that that was the scenario. The deliciousness of pumping out the same old narrative—that old female diva story—was too irresistible for anyone to write the truth.

Question: I've been thinking about all the celebrities who have leveraged their fame for global good: Bono, Angelina, DiCaprio, Madonna . . . the list goes on. But you credit Diana with paving this path for “celebrity humanitarians” when she first began visiting AIDS patients, hand-held lepers, and traipsed through fields of land mines. In your opinion, how much of her effort was utterly sincere and how much was the type of calculated media manipulation of which she was so fond? And is there anybody you see now or on the horizon who can hold a candle to the kind of celebrity Diana became, and who might eventually fill her void?



Diana, princess of Wales, 1989.

Tina Brown: One aspect of Diana where I never found her fake was in her humanitarian work. Sometimes it is true, she would exploit her visits for a photo-op that would make her look good during her wars with Charles. But once she was present in the company of the sick, the disabled, the elderly or whomever she was genuinely, authentically involved and empathetic. She had been that way ever since she was a very young girl and had a real gift for making the mental patients she visited happy on class social service trips. I also discovered that she did many, many acts of kindness out of the public eye—keeping in touch with the relatives of the terminally ill she had consoled in hospices, phoning sick kids she had met on her visits. I can't think of anyone right now who has as much of a powerful natural empathy as Diana. She really lit up and warmed the lives of the patients and the underprivileged she visited. The current celebrity humanitarians are doing a great job at spotlighting the ills of the world, but they don't seem to have anything like Diana's special connection to the people they help.

Question: Writer Catherine Whitney, author of *The Women of Windsor* (2007), said [here in the Britannica forum]:

The idea that royal duty is a harness that cannot coexist with personal satisfaction is challenged daily by the remarkable success of Prince Charles and Camilla's pairing. Current public opinion favors allowing Camilla to assume the mantle of queen should Charles ascend to the throne. This previously unthinkable bow to modern marital complexities signals that the people may be ready to save their monarchy by bringing it out of the dark ages. Diana deserves a great deal of credit for this shift in public tolerance. Ironically, Diana's legacy may be that the crown will one day rest on the head of her fiercest rival.

Tina Brown: Yes, but it will not be for long. Queen Elizabeth II is still going strong and Camilla is already long in the tooth. Diana will have the last laugh when her gorgeous son becomes King William.

Question: Britannica reaches readers around the world. Given this wide exposure, could you say a few words about how perceptions of Diana differ in different regions, from Africa to Asia, and if, for instance, the British were more critical of her and Americans more fawning, what accounts for this? Could the size of a country, and the structure of its mass media, affect how a celebrity like Diana is portrayed?

Tina Brown: The global Princess Diana is better understood than the princess in the palace at home. Britain has a uniquely vicious, gossipy and plural press. Few high-

profile lives can retain their dignity when trashed the way the British tabloids go at it. After a time, it's almost impossible to see the contours of a person's achievements so mired are they in sensational stories and made-up intrigue and lurid exposes. What people in Africa and Asia and America saw in Diana was a unique combination of glamour, empathy, and good intentions. After all, why was a princess bothering to visit an AIDS ward in Harlem, or a wretched rundown hospital in Angola, or leprosy clinic in Indonesia unless she cared, unless she wanted to send a message of compassion, unless she felt her presence would shine a light in dark places? It may still take more than ten years for the British people to see her with such clarity, but I hope my book has gone some way to making that happen.

ADAM RIESS ON

Dark Energy

Adam Riess, a distinguished professor of physics at Johns Hopkins University and its Space Telescope Science Institute, was co-winner of the 2011 Nobel Prize for Physics for his discovery of that mysterious force called “dark energy,” a subject he explained in his Britannica article below.

Dark energy is the repulsive force that is the dominant component (69.4 percent) of the universe. The remaining portion of the universe consists of ordinary matter and dark matter. Dark energy, in contrast to both forms of matter, is relatively uniform in time and space and is gravitationally repulsive, not attractive, within the volume it occupies. The nature of dark energy is still not well understood.

A kind of cosmic repulsive force was first hypothesized by Albert Einstein in 1917 and was represented by a term, the “cosmological constant,” that Einstein reluctantly introduced into his theory of general relativity in order to counteract the attractive force of gravity and account for a universe that was assumed to be static (neither expanding nor contracting). After the discovery in the 1920s by American astronomer Edwin Hubble that the universe is not static but is in fact expanding, Einstein referred to the addition of this constant as his “greatest blunder.” However, the measured amount of matter in the mass-energy budget of the universe was improbably low, and thus some unknown “missing component,” much like the cosmological constant, was required to make up the deficit. Direct evidence for the existence of this component, which was dubbed dark energy, was first presented in 1998.

Courtesy of the John D. & Catherine T. MacArthur Foundation



Dark energy is detected by its effect on the rate at which the universe expands and its effect on the rate at which large-scale structures such as galaxies and clusters of galaxies form through gravitational instabilities. The measurement of the expansion rate requires the use of telescopes to measure the distance (or light travel time) of objects seen at different size scales (or redshifts) in the history of the universe. These efforts are generally limited by the difficulty in accurately measuring astronomical distances. Since dark energy works against gravity, more dark energy accelerates the universe's expansion and retards the formation of large-scale structure. One technique for measuring the expansion rate is to observe the apparent brightness of objects of known luminosity like Type Ia supernovas. Dark energy was discovered in 1998 with this method by two international teams that included American astronomers Adam Riess (the author of this article) and Saul Perlmutter and Australian astronomer Brian Schmidt. The two teams used eight telescopes including those of the Keck Observatory and the MMT Observatory. Type Ia supernovas that exploded when the universe was only two-thirds of its present size were fainter and thus farther away than they would be in a universe without dark energy. This implied the expansion rate of the universe is faster now than it was in the past, a result of the current dominance of dark energy. (Dark energy was negligible in the early universe.)

Studying the effect of dark energy on large-scale structure involves measuring subtle distortions in the shapes of galaxies arising from the bending of space by intervening matter, a phenomenon known as "weak lensing." At some point in the last few billion years, dark energy became dominant in the universe and thus prevented more galaxies and clusters of galaxies from forming. This change in the structure of the universe is revealed by weak lensing. Another measure comes from counting the number of clusters of galaxies in the universe to measure the volume of space and the rate at which that volume is increasing. The goals of most observational studies of dark energy are to measure its equation of state (the ratio of its pressure to its energy density), variations in its properties, and the degree to which dark energy provides a complete description of gravitational physics.

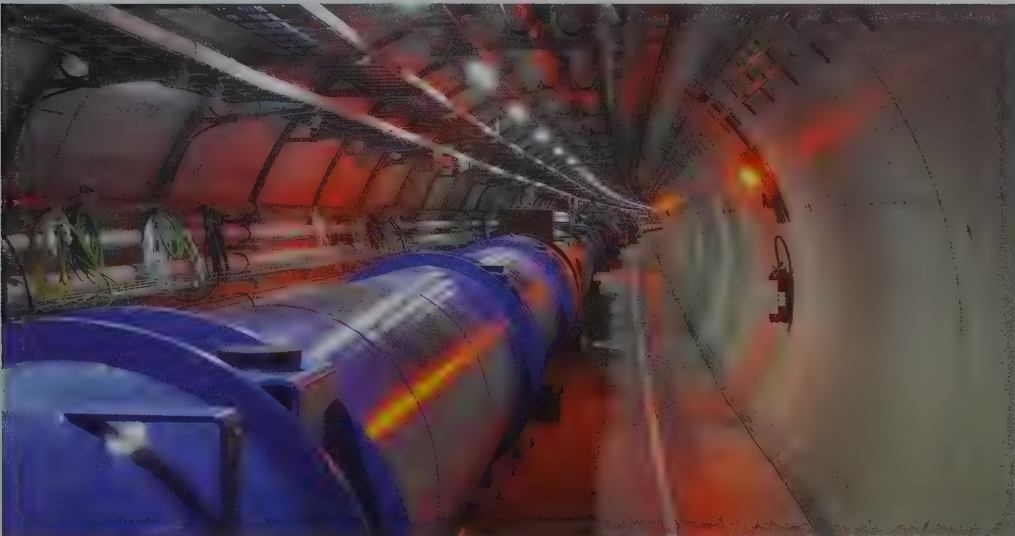
In cosmological theory, dark energy is a general class of components in the stress-energy tensor of the field equations in Einstein's theory of general relativity. In this theory, there is a direct correspondence between the matter-energy of the universe (expressed in the tensor) and the shape of space-time. Both the matter (or energy) density (a positive quantity) and the internal pressure contribute to a component's gravitational field. While familiar components of the stress-energy tensor such as matter and radiation provide attractive gravity by bending space-time, dark energy causes repulsive gravity through negative internal pressure. If the ratio of the pressure to the energy density is less than $-1/3$, a possibility for a component with negative pressure, that component will be gravitationally self-

repulsive. If such a component dominates the universe, it will accelerate the universe's expansion.

The simplest and oldest explanation for dark energy is that it is an energy density inherent to empty space, or a “vacuum energy.” Mathematically, vacuum energy is equivalent to Einstein’s cosmological constant. Despite the rejection of the cosmological constant by Einstein and others, the modern understanding of the vacuum, based on quantum field theory, is that vacuum energy arises naturally from the totality of quantum fluctuations (i.e., virtual particle-antiparticle pairs that come into existence and then annihilate each other shortly thereafter) in empty space. However, the observed density of the cosmological vacuum energy density is $\sim 10^{-10}$ ergs per cubic centimetre; the value predicted from quantum field theory is $\sim 10^{110}$ ergs per cubic centimetre. This discrepancy of 10^{120} was known even before the discovery of the far weaker dark energy. While a fundamental solution to this problem has not yet been found, probabilistic solutions have been posited, motivated by string theory and the possible existence of a large number of disconnected universes. In this paradigm the unexpectedly low value of the constant is understood as a result of an even greater number of opportunities (i.e.; universes) for the occurrence of different values of the constant and the random selection of a value small enough to allow for the formation of galaxies (and thus stars and life).

Another popular theory for dark energy is that it is a transient vacuum energy resulting from the potential energy of a dynamical field. Known as “quintessence,” this form of dark energy would vary in space and time, thus providing a possible

The Large Hadron Collider (LHC), the world's most powerful particle accelerator.



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way to distinguish it from a cosmological constant. It is also similar in mechanism (though vastly different in scale) to the scalar field energy invoked in the inflationary theory of the big bang.

Another possible explanation for dark energy is topological defects in the fabric of the universe. In the case of intrinsic defects in space-time (e.g., cosmic strings or walls), the production of new defects as the universe expands is mathematically similar to a cosmological constant, although the value of the equation of state for the defects depends on whether the defects are strings (one-dimensional) or walls (two-dimensional).

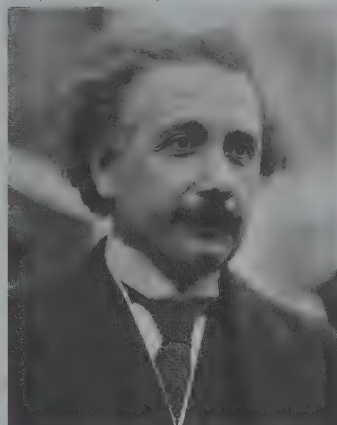
There have also been attempts to modify gravity to explain both cosmological and local observations without the need for dark energy. These attempts invoke departures from general relativity on scales of the entire observable universe.

A major challenge to understanding accelerated expansion with or without dark energy is to explain the relatively recent occurrence (in the past few billion years) of near-equality between the density of dark energy and dark matter even though they must have evolved differently. (For cosmic structures to have formed in the early universe, dark energy must have been an insignificant component.) This problem is known as the “coincidence problem” or the “fine-tuning problem.” Understanding the nature of dark energy and its many related problems is one of the most formidable challenges in modern physics.

ALBERT EINSTEIN ON *Space-Time*

Britannica published for its new 13th Edition (1926) three notable articles on aspects of "relativity," the subject famously associated with the extraordinary Albert Einstein. Its main article, "Relativity," was written by the British mathematician and physicist James (later Sir James) H. Jeans (1877–1946), well known for his ability to write about difficult scientific topics for the intelligent lay audience. Equally lucid was a second piece (highlighted elsewhere in this anniversary volume), on the "Philosophical Consequences of Relativity," written by Nobel laureate Bertrand Russell. The third article, on "Space-Time," was written by the master himself, Einstein. Alas, vast portions of Einstein's entry are unfathomable to most readers, given the considerable higher-level thinking and mathematical training required to understand the many equations discussed, and they have consequently been left out of the following excerpt, which is challenging enough. But despite its difficulties, the article remains a landmark, a masterpiece of reflection on two of the most elusive and important concepts in science. Readers willing to plow through the piece will come away with his or her mind enlarged and in motion, not least because of the opportunity to witness how this giant of history explained himself and his famed concepts.

Harris & Ewing/Library of Congress, Washington, D.C. (LC-DIG-hec-31012)



All our thoughts and concepts are called up by sense-experiences and have a meaning only in reference to these sense-experiences. On the other hand, however, they are products of the spontaneous activity of our minds; they are thus in no wise logical consequences of the contents of these sense-experiences. If, therefore, we wish to grasp the essence of a complex of abstract notions we must for the one part investigate the mutual relationships between the concepts and the assertions made about them; for the other, we must investigate how they are related to the experiences.

So far as the way is concerned in which concepts are connected with one another and with the experiences there is no difference of principle between the concept-systems of science and those of daily life. The concept-systems of science have grown out of those of daily life and have been modified and completed according to the objects and purposes of the science in question.

The more universal a concept is the more frequently it enters into our thinking; and the more indirect its relation to sense-experience, the more difficult it is for us to comprehend its meaning; this is particularly the case with pre-scientific concepts that we have been accustomed to use since childhood. Consider the concepts referred to in the words "where," "when," "why," "being," to the elucidation of which innumerable volumes of philosophy have been devoted. We fare no better in our speculations than a fish which should strive to become clear as to what is water.

Space

In the present article we are concerned with the meaning of "where," that is, of space. It appears that there is no quality contained in our individual primitive sense-experiences that may be designated as spatial. Rather, what is spatial appears to be a sort of order of the material objects of experience. The concept "material object" must therefore be available if concepts concerning space are to be possible. It is the logically primary concept. This is easily seen if we analyse the spatial concepts for example, "next to," "touch," and so forth, that is, if we strive to become aware of their equivalents in experience. The concept "object" is a means of taking into account the persistence in time or the continuity, respectively, of certain groups of experience-complexes. The existence of objects is thus of a conceptual nature, and the meaning of the concepts of objects depends wholly on their being connected (intuitively) with groups of elementary sense-experiences. This connection is the basis of the illusion which makes primitive experience appear to inform us directly about the relation of material bodies (which exist, after all, only in so far as they are thought).

In the sense thus indicated we have (the indirect) experience of the contact of two bodies. We need do no more than call attention to this, as we gain nothing for our present purpose by singling out the individual experiences to which this assertion alludes. Many bodies can be brought into permanent contact with one another in manifold ways. We speak in this sense of the position-relationships of bodies (*Lagenbeziehungen*). The general laws of such position-relationships are essentially the concern of geometry. This holds, at least, if we do not wish to restrict ourselves to regarding the propositions that occur in this branch of knowledge merely as relationships between empty words that have been set up according to certain principles.

Pre-scientific thought. Now, what is the meaning of the concept “space” which we also encounter in pre-scientific thought? The concept of space in pre-scientific thought is characterised by the sentence: “we can think away things but not the space which they occupy.” It is as if, without having had experience of any sort, we had a concept, nay even a presentation, of space and as if we ordered our sense-experiences with the help of this concept, present *a priori*. On the other hand, space appears as a physical reality, as a thing which exists independently of our thought, like material objects. Under the influence of this view of space the fundamental concepts of geometry: the point, the straight line, the plane, were even regarded as having a self-evident character. The fundamental principles that deal with these configurations were regarded as being necessarily valid and as having at the same time an objective content. No scruples were felt about ascribing an objective meaning to such statements as “three empirically given bodies (practically infinitely small) lie on one straight line,” without demanding a physical definition for such an assertion. This blind faith in evidence and in the immediately real meaning of the concepts and propositions of geometry became uncertain only after non-Euclidean geometry had been introduced.

Reference to the earth. If we start from the view that all spatial concepts are related to contact-experiences of solid bodies, it is easy to understand how the concept “space” originated, namely, how a thing independent of bodies and yet embodying their position-possibilities (*Lagerungsmöglichkeiten*) was posited. If we have a system of bodies in contact and at rest relatively to one another, some can be replaced by others. This property of allowing substitution is interpreted as “available space.” Space denotes the property in virtue of which rigid bodies can occupy different positions. The view that space is something with a unity of its own is perhaps due to the circumstance that in pre-scientific thought all positions of bodies were referred to one body (reference body), namely the earth. In scientific thought the earth is represented by the co-ordinate system. The assertion that it would be possible to place an unlimited number of bodies next to one another denotes that space is infinite. In pre-scientific thought the concepts “space” and “time” and “body of reference” are scarcely differentiated at all. A place or point in space is always taken to mean a material point on a body of reference.

Euclidean geometry. If we consider Euclidean geometry we clearly discern that it refers to the laws regulating the positions of rigid bodies. It turns to account the ingenious thought of tracing back all relations concerning bodies and their relative positions to the very simple concept “distance” (*Strecke*). Distance denotes a rigid body on which two material points (marks) have been specified. The concept of the equality of distances (and angles) refers to experiments involving coincidences; the same remarks apply to the theorems on congruence. Now, Euclidean geometry, in the form in which it has been handed down to us from Eu-

clid, uses the fundamental concepts “straight line” and “plane” which do not appear to correspond, or at any rate, not so directly, with experiences concerning the position of rigid bodies. On this it must be remarked that the concept of the straight line may be reduced to that of the distance. (A hint of this is contained in the theorem: “the straight line is the shortest connection between two points.” This theorem served well as a definition of the straight line, although the definition played no part in the logical texture of the deductions.) Moreover, geometers were less concerned with bringing out the relation of their fundamental concepts to experience than with deducing logically the geometrical propositions from a few axioms enunciated at the outset. . . .

Difficulties. A serious difficulty is encountered in the above represented interpretation of geometry in that the rigid body of experience does not correspond *exactly* with the geometrical body. In stating this I am thinking less of the fact that there are no absolutely definite marks than that temperature, pressure and other circumstances modify the laws relating to position. It is also to be recollected that the structural constituents of matter (such as atom and electron) assumed by physics are not in principle commensurate with rigid bodies, but that nevertheless the concepts of geometry are applied to them and to their parts. For this reason consistent thinkers have been disinclined to allow real contents of facts (*reale Tatsachenbestände*) to correspond to geometry alone. They considered it preferable to allow the content of experience (*Erfahrungsbestände*) to correspond to geometry and physics conjointly.

This view is certainly less open to attack than the one represented above; as opposed to the atomic theory it is the only one that can be consistently carried through. Nevertheless, in the opinion of the author it would not be advisable to give up the first view, from which geometry derives its origin. This connection is essentially founded on the belief that the ideal rigid body is an abstraction that is well rooted in the laws of nature.

Foundations of geometry. We come now to the question: what is *a priori* certain or necessary, respectively in geometry (doctrine of space) or its foundations? Formerly we thought everything—yes, everything; nowadays we think—nothing. Already the distance-concept is logically arbitrary; there need be no things that correspond to it, even approximately. Something similar may be said of the concepts straight line, plane, of three-dimensionality and of the validity of Pythagoras’ theorem. Nay, even the continuum-doctrine is in no wise given with the nature of human thought, so that from the epistemological point of view no greater authority attaches to the purely topological relations than to the others. . . .

Just as in Euclidean geometry the space-concept refers to the position-possibilities of rigid bodies, so in the general theory of relativity the space-time-concept refers to the behaviour of rigid bodies and clocks. But the space-time-continuum

differs from the space-continuum in that the laws regulating the behaviour of these objects (clocks and measuring-rods) depend on where they happen to be. The continuum (or the quantities that describe it) enters explicitly into the laws of nature, and conversely these properties of the continuum are determined by physical factors. The relations that connect space and time can no longer be kept distinct from physics proper.

Nothing certain is known of what the properties of the space-time-continuum may be as a whole. Through the general theory of relativity, however, the view that the continuum is infinite in its time-like extent but finite in its space-like extent has gained in probability.

Time

The physical time-concept answers to the time-concept of the extra-scientific mind. Now, the latter has its root in the time-order of the experiences of the individual, and this order we must accept as something primarily given.

I experience the moment "now," or, expressed more accurately, the present sense-experience (*Sinnen-Erlebnis*) combined with the recollection of (earlier) sense-experiences. That is why the sense-experiences seem to form a series, namely the time-series indicated by "earlier" and "later." The experience-series is thought of as a one-dimensional continuum. Experience-series can repeat themselves and can then be recognised. They can also be repeated inexactly, wherein some events are replaced by others without the character of the repetition becoming lost for us. In this way we form the time-concept as a one-dimensional frame which can be filled in by experiences in various ways. The same series of experiences answer to the same subjective time-intervals.

The transition from this "subjective" time (*Ich-Zeit*) to the time-concept of pre-scientific thought is connected with the formation of the idea that there is a real external world independent of the subject. In this sense the (objective) event is made to correspond with the subjective experience. In the same sense there is attributed to the "subjective" time of the experience a "time" of the corresponding "objective" event. In contrast with experiences external events and their order in time claim validity for all subjects.

This process of objectification would encounter no difficulties were the time-order of the experiences corresponding to a series of external events the same for all individuals. In the case of the immediate visual perceptions of our daily lives, this correspondence is exact. That is why the idea that there is an objective time-order became established to an extraordinary extent. In working out the idea of an objective world of external events in greater detail, it was found necessary to make events and experiences depend on each other in a more complicated way.

This was at first done by means of rules and modes of thought instinctively gained, in which the conception of space plays a particularly prominent part. This process of refinement leads ultimately to natural science.

The measurement of time is effected by means of clocks. A clock is a thing which automatically passes in succession through a (practically) equal series of events (period). The number of periods (clock-time) elapsed serves as a measure of time. The meaning of this definition is at once clear if the event occurs in the immediate vicinity of the clock in space; for all observers then observe the same clock-time simultaneously with the event (by means of the eye) independently of their position. Until the theory of relativity was propounded it was assumed that the conception of simultaneity had an absolute objective meaning also for events separated in space.

This assumption was demolished by the discovery of the law of propagation of light. For if the velocity of light in empty space is to be a quantity that is independent of the choice (or, respectively, of the state of motion) of the inertial system to which it is referred, no absolute meaning can be assigned to the conception of the simultaneity of events that occur at points separated by a distance in space. Rather, a special time must be allocated to every inertial system. If no co-ordinate system (inertial system) is used as a basis of reference there is no sense in asserting that events at different points in space occur simultaneously. It is in consequence of this that space and time are welded together into a uniform four-dimensional continuum.

ALDOUS HUXLEY ON

Space Travel

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In each annual issue of The Great Ideas Today, published by Britannica from 1961 to 1998, several high-profile thinkers were asked to ponder in prose an important topic of the day. One of the contributors to its 1963 issue was British writer and critic Aldous Huxley, most famous for his 1932 dystopian novel Brave New World. The question he and the other contributors addressed was, "Has Man's Conquest of Space Increased or Diminished His Stature?" It was a particularly apt topic, given the feverish "Cold War" and "Space Race" then ongoing between the United States and the Soviet Union and America's commitment to putting a man on the Moon by the end of the decade, a national goal set forth just months earlier in 1962 by Pres. John F. Kennedy. Most delightful is Huxley's rhetorical flair, in which "rocket enthusiasts" and "cosmic imperialists" appear and reappear like a haunting refrain, and "suicidal vampirism" becomes a synonym for mankind's quest to conquer nature. An extended excerpt from his 5,000-word essay follows.



In the ethical system of the Greeks, *hubris*—the overweening bumptiousness of individuals or groups in their dealings with other human beings or with the natural order—was regarded as a very grave and since it invited condign punishment, an extremely dangerous form of delinquency. Monotheism de-sanctified Nature, with the result that, while *hubris* in relation to one's fellow man was still condemned, *hubris* in relation to the non-human environment ceased, under the new dispensation, to be regarded as a sacrilege or a breach of the moral code. And even today, when the consequences of our destructive bumptiousness are threatening, through erosion, through deforestation and soil exhaustion, through the pro-

gressive pollution and depletion of water resources, to render further human progress ever more difficult, perhaps in a relatively short time impossible—even today the essential wickedness of man's inhumanity to Nature remains unrecognized by the official spokesmen of morality and religion, by practically everyone, indeed, except a few conservationists and ecologists. Acculturated man's "conquest of nature" goes forward at an accelerating pace—a conquest, unfortunately, analogous to that of the most ruthless imperialist exploiters of the colonial period. Man, the species, is now living as a parasite upon an earth which acculturated man is in the process of conquering to the limit—and the limit is total destruction. Intelligent parasites take care not to kill their hosts; unintelligent parasites push their greed to the point of murder and, destroying their own food supply, commit suicide. Boasting all the while of his prowess as a conqueror, but behaving, while he boasts, less intelligently than the flea or even the hookworm, man, the acculturated parasite, is now busily engaged in murdering his host. It is still possible for him to give up his suicidal vampirism and to establish a symbiotic relationship with his natural environment—still possible, but admittedly (with human numbers threatening to double in less than forty years) very difficult. If this very difficult choice is not made, made soon, and made successfully, acculturated man's misdirected cleverness may conquer nature too thoroughly for the survival of his own high culture, perhaps even for the survival of man, the species.

The picturesque, but wholly inappropriate, military metaphor in terms of which acculturated man has chosen to speak of his parasitic relationship to our planet is now being used in relation to Russian and American successes in launching artificial satellites and putting astronauts into orbit. Space may well be infinite; and, even if finite, the universe is unimaginably vast. In a world where there are galaxies separated from our own by a distance of six billion light-years, any talk by rocket enthusiasts about "man's conquest of space" seems a trifle silly. Men will land on the moon within the next few years, and within a generation, no doubt, will land on Mars. If there is life on Mars, every round trip by an astronaut will involve grave biological dangers for all concerned. Micro-organisms, to which living things on earth possess no inherited or acquired immunity, may be brought back from our sister planet. Conversely, living things on Mars may succumb to the viruses and bacteria introduced by visitors from Earth. The fruits of this first and, in relation to the whole universe, insignificant "conquest of space" might easily prove to be sudden and irreparable disaster for two biological systems, developed through three or four thousand million years of evolution. And of course the same sort of risks would be run by earthlings visiting any life-supporting globe in any part of the universe.

Acculturated man is immensely clever, and his representatives will soon be able to land an astronaut on another planet and bring him back alive. By journalists

NASA



Pres. John F. Kennedy delivering his famed Rice Stadium speech in Houston, Texas, on September 12, 1962, where he spoke about the United States' intention to put a man on the Moon by the end of the decade.

and political propagandists, this future ability has been nicknamed “the conquest of space.” In what way will this “conquest of space” affect “man’s stature”?

Obviously, if the coming and going between planets should result in a biological disaster to human beings or their principal sources of nourishment, the stature of man, the species, would be diminished—conceivably to zero. But the worst may never happen. Let us assume, for the sake of argument, that round trips to other planets can be made under completely aseptic conditions or, alternatively, that terrestrial organisms will turn out to be immune to extra-terrestrial bacteria and viruses. In this event, how will the “conquest of space” affect the stature of man, the species, man, the product and producer of culture, and man, the unique individual and locus of unshareable experiences?

Preoccupied as they are with new worlds to conquer, the rocket enthusiasts are apt to forget that their much-touted Space Age is also the Age of Exploding Populations. Like unintelligent parasites draining the lifeblood of their host, three thousand millions of human beings now live, most of them very poorly, on the surface of our planet. By the end of the twentieth century there will be, in all probability, six thousand millions, desperately trying to extract twice as much food and, if industrialization becomes general, four times as much water and at least ten

times as much fossil fuel and metallic ore as are being extracted from the earth today. When the attention of our high-flying rocket enthusiasts is called down to these simple, grisly facts of terrestrial arithmetic, they airily insist that the demographic problem of man, the species, together with all the social, political, and economic problems stemming from the enormous and accelerating increase in human members, can be solved very simply. How? By shooting two or three billion people into space and telling them to go and colonize some other planet.

This method of increasing the stature of man, the species, by peopling other worlds with the overplus of this world's numbers was proposed many years ago by Professor J. B. S. Haldane in his *Possible Worlds* and again in the *Last and First Men* of Olaf Stapledon. Inasmuch as their authors thought in terms of startling genetic changes and enormous lapses of time, these books may be described as Evolutionary Utopias. Given enough time, evolution can accomplish practically anything. In the course of the last three or four billion years it has performed the almost infinitely improbable feat of developing a human being out of a giant molecule. In the future, directed by human intelligence, it might perform hardly less improbable feats in considerably shorter periods of time. But by the standards of human history, even these shorter periods will be extremely long. In the Evolutionary Utopias of Haldane and Stapledon many thousands, even millions, of years were required for the development, by controlled breeding, of new sub-races of human beings capable of surviving and reproducing themselves in the forbidding environments of other planets. The rocket enthusiasts seem to imagine that migration to some wholly alien world could be undertaken, within the next hundred years or so, by men and women in no way different, genetically speaking, from ourselves. Being engineers and not life scientists, they are pretty certainly mistaken in this matter. In the present context it is the Utopian dreamers of biological dreams, not the so-called "practical men," who make sense. And even in relation to such an easily calculable factor as expense, the rocket enthusiasts are wildly unrealistic. To land as few as five thousand adequately equipped colonists on another planet would cost several times the combined budgets of the U.S.A. and the U.S.S.R. Moreover, even if it were physically, financially, and politically feasible to fire off whole boatloads of emigrants into outer space, would the forcible displacement of, say, five hundred million uprooted men and women solve the primary demographic problem, or any of the related social, political, and economic problems, now confronting us? During the nineteenth century millions of Europeans emigrated to the New World; but Europe's political and economic problems were not thereby eliminated, and Europe's population went on steadily increasing, as though nothing out of the ordinary had happened. There seems to be no good reason for supposing that emigration to Mars will do more for Earth as a whole than emigration to the Americas and the Antipodes did for nineteenth-century Europe.

We see, then, that our "conquest of space" is a conquest only in some picturesquely Pickwickian sense. It seems very unlikely, at least in the near future, that man, the species, will increase his stature by becoming a cosmic imperialist. Moreover, even if cosmic imperialism should ever be within our power, the colonization of other planets will bring no automatic solution to this planet's demographic, political, and economic problems. Man, the species, might add a few cubits to his stature; but the stature of acculturated man, of the creature who, for all these centuries, has been trying to make a go of collective living, will probably remain as low as it has been in the past and is today.

Star Trek and Our Nuclear World

By Lawrence Krauss

After atomic bombs were detonated over the Japanese cities of Hiroshima and Nagasaki, Albert Einstein wrote, "The release of atomic power has changed everything except our way of thinking." More than 70 years have passed since then, and our thinking has not changed. The world possesses more than 15,000 nuclear weapons, each far more powerful than the weapons that destroyed those cities in 1945.

In the United States alone, more than 1,000 nuclear weapons remain on high alert, ready to be launched in minutes, without any good reason. And many of the nuclear states are planning major upgrades to their arsenals in violation of the spirit, if not the letter, of the Treaty on the Non-Proliferation of Nuclear Weapons that requires them to reduce their arsenals, even as it requires non-nuclear states to pledge not to obtain nuclear weapons. States like North Korea view obtaining nuclear weapons as a

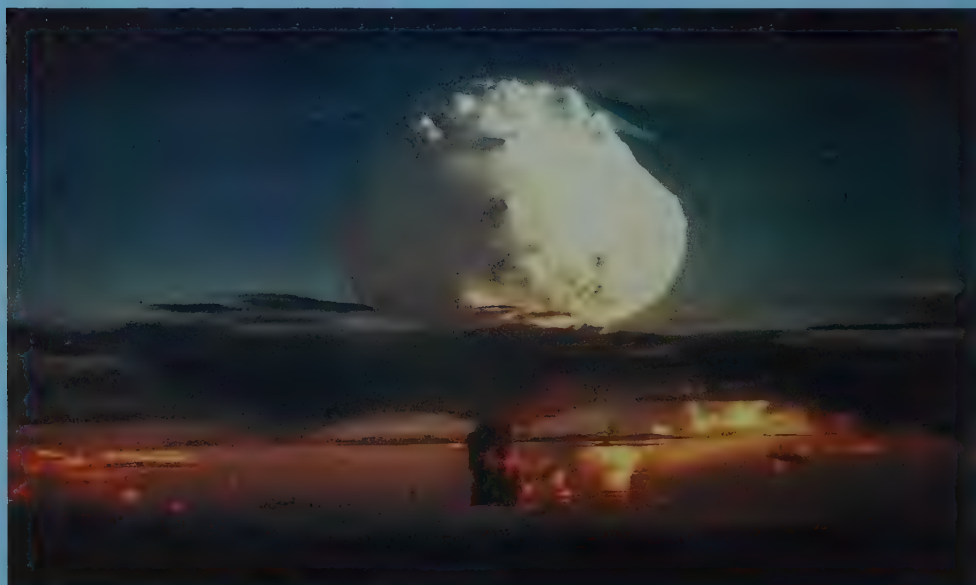
key component of their defense against outside aggression. And in the current world, they may not be wrong.

Not only has our thinking about the dangers of nuclear weapons not changed, but people have grown complacent, interpreting the lack of a global nuclear catastrophe, a lucky accident in many cases, as some sort of guarantee that we will be equally protected in the future.

What really changed in the aftermath of 1945 was that for the first time in human history, humanity could globally alter the nature of life on this planet on a human timescale. What is often local—violent conflicts, for example—could instantaneously become global. And while technology has exponentially increased the human footprint on this planet—not just by changing the tools humans use but by increasing the ability of humans to successfully reproduce, resulting in a global human population that

U.S. Air Force photograph

Thermonuclear hydrogen bomb detonated in the Marshall Islands in the fall of 1952.



continues to double almost every generation—human institutions, and public awareness, have not kept up with these changes.

Nuclear weapons are not the only existential change agents in the current world. Since the mid-1970s, it has become clear that industrial development, and the carbon dioxide by-products this produces, is globally changing Earth's environment, from the acidity of oceans to sea levels and the melting of polar ice caps, the strength of storms, and the occurrence of droughts.

The global challenge facing humanity in these times is obvious, at least to many, but there is no concomitant global response. Some countries are taking action to alleviate their contributions to climate change and to aim for a sustainable local future. But even when there was an attempt to globally address the issue through international treaties, very few of the major carbon-emitting nations pledged action at the levels necessary to halt the increasing carbon footprint of humanity in any substantial way, and one of the world's worst polluters, the United States, just backed out of the treaty altogether.

As a physicist, I have written about the world of science fiction, as represented by the television series *Star Trek*, addressing those aspects of *Star Trek* technology that might be realistic or unrealistic. Perhaps what is most remarkable about the future envisioned by the writers of that program is that unlike many science fiction futures, this one is not dystopic. In the *Star Trek* future, humanity has somehow come together as one to overcome local xenophobia, national rivalry, poverty, and warfare.

Even as we on Earth long to move out into the cosmos, perhaps to Mars, or even beyond, it is increasingly clear that before we can reach such a future, we too need to

change the way we think of our global problems here on Earth. If the present world situation is any guide, it could be that the most unrealistic aspect of the fictional world of *Star Trek* is not warp drive or time travel but the abilities of humans to transcend their national rivalries to take global responsibility for the sustainability of our planet and the health and welfare of the billions of people whose existence is becoming increasingly intertwined by the technologies we ourselves have produced.

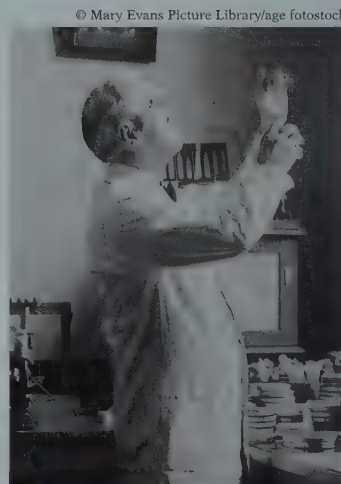
A hundred years after Einstein developed his General Theory of Relativity, we have now discovered the ripples in space that theory predicted—a major triumph of human persistence and intellect. It is high time that similar strides were made in the way we govern ourselves and approach our truly global human challenges if we are to successfully address the worry Einstein posed about the future once humanity possessed the tools for its own annihilation.

Lawrence Krauss is the director of the Origins Project at Arizona State University and Foundation Professor at ASU's School of Earth and Space Exploration and Physics Department. He has written more than 300 scientific publications and 10 popular books, including the international best sellers The Physics of Star Trek (2007) and A Universe from Nothing (2013). His latest book is The Greatest Story Ever Told—So Far: Why Are We Here? (2017). He writes regularly for magazines and newspapers, including the New York Times and The New Yorker and frequently appears on radio and television; he has also appeared in several feature films. He has received the highest awards from all three U.S. physics societies and the 2012 Public Service Award from the National Science Board.

ALEXANDER FLEMING ON

Antiseptics

Writing on the very eve (1928) of his famed accidental discovery of that world-changing antibiotic he called penicillin, Scottish bacteriologist and Nobel Prize winner Alexander Fleming (1881–1955), later Sir Alexander, laid out the problem his work would begin to solve. Fleming's co-author was Walter Sydney Lazarus-Barlow, a member of the British Ministry of Health and medical editor for Britannica's new 14th Edition (1929), from which this brief extract below on "Antiseptics" is taken.



During recent years the study of antiseptics has gone mainly along two lines—to produce more efficient antiseptics for use in the ordinary way by external application, and to elaborate chemical substances which can be injected into the circulation and destroy the infecting microbes. At the same time many studies have been made on the natural antiseptics by which the body rids itself of infection. . . .

Sterilization

While antiseptics have not been very successful in killing bacteria in infected tissues in the body, they are invaluable in sterilizing apparatus, instruments and infected matter of many kinds outside the body. An infected water supply can be efficiently and economically sterilized by the use of a small quantity of chlorine; the infective excreta from cases of typhoid fever and similar diseases can be rendered harmless by treating them with carbolic acid or other similar antiseptic; catgut for use in surgical operations can only be sterilized by the use of chemical antiseptics, and there are innumerable other ways in which these chemicals fulfil their function of destroying bacteria.

BRIAN GREENE ON

String Theory

The Washington Post called Brian Greene, a professor of physics and mathematics at Columbia University, “the single best explainer of abstruse concepts in the world today.” His New York Times best-selling books include *The Elegant Universe*, *The Fabric of the Cosmos*, and *The Hidden Reality*, and he has hosted two Peabody and Emmy Award-winning television mini-series based on his publications. For *Britannica* Greene tackled the tantalizing subject of “string theory,” which possibly holds the key to the long elusive goal of Albert Einstein: a grand unified conception of the universe that explains, once and for all, all forces and matter large and small, from blazing stars to whirling subatomic particles.

Courtesy of Brian Greene



String theory, in particle physics, is a theory that attempts to merge quantum mechanics with Albert Einstein’s general theory of relativity. The name *string theory* comes from the modeling of subatomic particles as tiny one-dimensional “stringlike” entities rather than the more conventional approach in which they are modeled as zero-dimensional point particles. The theory envisions that a string undergoing a particular mode of vibration corresponds to a particle with definite properties such as mass and charge. In the 1980s, physicists realized that string theory had the potential to incorporate all four of nature’s forces—gravity, electromagnetism, strong force, and weak force—and all types of matter in a single quantum mechanical framework, suggesting that it might be the long-sought unified field theory. While string theory is still a vibrant area of research that is undergoing rapid development, it remains primarily a mathematical construct because it has yet to make contact with experimental observations.

Relativity and Quantum Mechanics

In 1905 Einstein unified space and time with his special theory of relativity, showing that motion through space affects the passage of time. In 1915 Einstein further unified space, time, and gravitation with his general theory of relativity, showing that warps and curves in space and time are responsible for the force of gravity. These were monumental achievements, but Einstein dreamed of an even grander unification. He envisioned one powerful framework that would account for space, time, and all of nature's forces—something he called a unified theory. For the last three decades of his life, Einstein relentlessly pursued this vision. Although from time to time rumours spread that he had succeeded, closer scrutiny always dashed such hopes. Most of Einstein's contemporaries considered the search for a unified theory to be a hopeless, if not misguided, quest.

In contrast, the primary concern of theoretical physicists from the 1920s onward was quantum mechanics—the emerging framework for describing atomic and subatomic processes. Particles at these scales have such tiny masses that gravity is essentially irrelevant in their interactions, and so for decades quantum mechanical calculations generally ignored general relativistic effects. Instead, by the late 1960s the focus was on a different force—the strong force, which binds together the protons and neutrons within atomic nuclei. Gabriele Veneziano, a young theorist working at the European Organization for Nuclear Research (CERN), contributed a key breakthrough in 1968 with his realization that a 200-year-old formula, the Euler beta function, was capable of explaining much of the data on the strong force then being collected at various particle accelerators around the world. A few years later, three physicists—Leonard Susskind of Stanford University, Holger Nielsen of the Niels Bohr Institute, and Yoichiro Nambu of the University of Chicago—significantly amplified Veneziano's insight by showing that the mathematics underlying his proposal described the vibrational motion of minuscule filaments of energy that resemble tiny strands of string, inspiring the name *string theory*. Roughly speaking, the theory suggested that the strong force amounted to strings tethering together particles attached to the strings' endpoints.

Predictions and Theoretical Difficulties

String theory was an intuitively attractive proposal, but by the mid-1970s more-refined measurements of the strong force had deviated from its predictions, leading most researchers to conclude that string theory had no relevance to the physical universe, no matter how elegant the mathematical theory. Nevertheless, a small number of physicists continued to pursue string theory. In 1974 John Schwarz of the California Institute of Technology and Joel Scherk of the École

Normale Supérieure and, independently, Tamiaki Yoneya of Hokkaido University came to a radical conclusion. They suggested that one of the supposedly failed predictions of string theory—the existence of a particular massless particle that no experiment studying the strong force had ever encountered—was actually evidence of the very unification Einstein had anticipated.

Although no one had succeeded in merging general relativity and quantum mechanics, preliminary work had established that such a union would require precisely the massless particle predicted by string theory. A few physicists argued that string theory, by having this particle built into its fundamental structure, had united the laws of the large (general relativity) and the laws of the small (quantum mechanics). Rather than merely being a description of the strong force, these physicists contended, string theory required reinterpretation as a critical step toward Einstein's unified theory.

The announcement was universally ignored. String theory had already failed in its first incarnation as a description of the strong force, and many felt it was unlikely that it would now prevail as the solution to an even more difficult problem. This view was bolstered by string theory's suffering from its own theoretical problems. For one, some of its equations showed signs of being inconsistent; for another, the mathematics of the theory demanded the universe have not just the three spatial dimensions of common experience but six others (for a total of nine spatial dimensions, or a total of ten space-time dimensions).

Dimensions and Vibrations

Because of these obstacles, the number of physicists working on the theory had dropped to two—Schwarz and Michael Green, of Queen Mary College, London—by the mid-1980s. But in 1984 these two die-hard string theorists achieved a major breakthrough. Through a remarkable calculation, they proved that the equations of string theory were consistent after all. By the time word of this result had spread throughout the physics community, hundreds of researchers had dropped what they were working on and turned their full attention to string theory.

Within a few months, string theory's unified framework took shape. Much as different vibrational patterns of a violin string play different musical notes, the different vibrations of the tiny strands in string theory were imagined to yield different particles of nature. According to the theory, the strings are so small that they appear to be points—as particles had long been thought to be—but in reality they have length (about 10^{-33} cm); the mass and charge of a particle is determined by how a string vibrates. For example, string theory posits that an electron is a string undergoing one particular vibrational pattern; a quark is imagined as a string undergoing a different vibrational pattern. Crucially, among the vibrational

patterns, physicists argued, would also be the particles found by experiment to communicate nature's forces. Thus, string theory was proposed as the sought-for unification of all forces and all matter.

What of the six extra spatial dimensions required by string theory? Following a suggestion made in the 1920s by Theodor Kaluza of Germany and Oskar Klein of Sweden, string theorists envisioned that dimensions come in two distinct varieties. Like the unfurled length of a long garden hose, dimensions can be big and easy to see. But like the shorter, circular girth of the garden hose, dimensions can also be far smaller and more difficult to detect. This becomes more apparent by imagining that the circular cross section of the garden hose is shrunk ever smaller, below what can be seen with the naked eye, misleading a casual observer into thinking the garden hose has only one dimension, its length. Similarly, according to string theory, the three dimensions of common experience are large and manifest, while the other six dimensions are crumpled so small that they have so far evaded detection.

During the decade from 1984 to 1994, many theoretical physicists strove to fulfill string theory's promise by developing this abstract, wholly mathematical framework into a concrete, predictive theory of nature. Because the infinitesimal size of strings has precluded their direct detection, theorists have sought to extract indirect implications of the theory that might be testable. In this regard, the extra dimensions of string theory have proved a major hurdle. Imagining these extra dimensions as small and hidden is a reasonable explanation for their apparent absence. Nevertheless, their detailed geometry is required for the theory to offer predictions. The reason is that strings are so small that they would vibrate within the tiny extra dimensions. Studies showed that, much as the shape and size of a French horn affect the vibrational patterns of airstreams coursing through the instrument, the exact shape and size of the extra dimensions would affect how strings vibrate. And since the strings' vibrations determine quantities such as particle masses and charges, predictivity requires knowledge of the geometrical form of the extra dimensions. Unfortunately, the equations of string theory allow the extra dimensions to take many different geometric forms, making it difficult to extract definitive testable predictions. . . .

Today the understanding of many facets of string theory is still in its formative stage. Researchers recognize that, although remarkable progress has been made over the past five decades, collectively the work is burdened by its piecemeal development, with incremental discoveries having been joined like pieces of a jigsaw puzzle. That the pieces fit coherently is impressive, but the larger picture they are filling out—the fundamental principle underlying the theory—remains mysterious. Equally pressing, the theory has yet to be supported by observations and hence remains a totally theoretical construct.

Supersymmetry and Cosmological Signature

One essential quality of string theory is known as supersymmetry, a mathematical property that requires every known particle species to have a partner particle species, called superpartners. (This property accounts for string theory often being referred to as superstring theory.) As yet, no superpartner particles have been detected experimentally, but researchers believe this may be due to their weight—they are heavier than their known counterparts and require a machine at least as powerful as the Large Hadron Collider at CERN to produce them. If the superpartner particles are found, string theory still will not be proved correct, because more-conventional point-particle theories have also successfully incorporated supersymmetry into their mathematical structure. However, the discovery of supersymmetry would confirm an essential element of string theory and give circumstantial evidence that this approach to unification is on the right track.

Even if these accelerator-based tests are inconclusive, there is another way that string theory may one day be tested. Through its impact on the earliest, most extreme moments of the universe, the physics of string theory may have left faint cosmological signatures—for example, in the form of gravitational waves or a particular pattern of temperature variations in the cosmic microwave background radiation—that may be observable by the next generation of precision satellite-borne telescopes and detectors. It would be a fitting conclusion to Einstein's quest for unification if a theory of the smallest microscopic component of matter were confirmed through observations of the largest astronomical realms of the cosmos.

Nonbiological Man: He's Closer Than You Think

By Ray Kurzweil

The very nature of what it means to be human is being both enriched and challenged, as our species breaks the shackles of its genetic legacy and achieves inconceivable heights of intelligence, material progress, and longevity. The rate of this “paradigm shift” is now doubling every decade, so the 21st century will actually see 20,000 years of progress at today’s pace. Computation, communication, biological technologies (for example, DNA sequencing), brain scanning, knowledge of the human brain, and human knowledge in general are all accelerating at an even faster pace, generally doubling in performance, capacity, and bandwidth every year. Three-dimensional molecular computing will provide the hardware for human-level “strong” AI well before 2030. The more important software insights will be gained in part from the reverse-engineering of the human brain, a process well under way. While the social and philosophical ramifications of these changes will be profound, and the threats they pose considerable, we will ultimately merge with our machines, live indefinitely, and be a billion times more intelligent . . . all within the next three to four decades.

We will connect our biological neocortex to synthetic neocortex in the cloud. This will use medical nano-robots that go into the brain through the capillaries and provide wireless communication between our neocortical modules and the cloud in the same way that your smartphone today has wireless communication with the cloud. And the same way that your smartphone today amplifies its capabilities by connecting to many computers in the cloud, we will do the same thing with our neocortex.

This is a 2030s and 2040s scenario. Our thinking then will become a hybrid of the biological and nonbiological thinking in the cloud. As a result, we will become smarter, more musical, funnier, etc. But our thinking

will become increasingly *nonbiological* as we extend further into the cloud and as the cloud becomes more powerful.

Digital processes are inherently backed up, and we in turn will be able to back up our “mind file” or at least most of it. Being backed up is not an absolute guarantee of “living forever,” which will be clear to anyone who has ever lost a file, but it does provide another layer of protection. I don’t like to speak about immortality but rather indefinite extensions to the existence of our mind file. The “mind file” is not just an abstraction—there is literally information in our brains that define our memories, our skills, and our personality. And it is not backed up today. Its survival is dependent on the survival of one piece of hardware. So being able to back up our mind file or most of it will provide significant added protection.

But it is not an absolute protection. I won’t be able to come to you at some point in the future and say, “I’ve done it, I’ve lived forever,” because it is never forever.

Author, inventor, and futurist Ray Kurzweil is currently a director of engineering at Google, where he heads up a team developing machine intelligence and natural language understanding. He was the principal inventor of the first CCD flatbed scanner, omni-font optical character recognition, print-to-speech reading machine for the blind, text-to-speech synthesizer, music synthesizer capable of re-creating the grand piano and other orchestral instruments, and commercially marketed large-vocabulary speech recognition software. He received a Grammy Award for outstanding achievements in music technology; was the recipient of the National Medal of Technology; was inducted into the National Inventors Hall of Fame; holds 21 honorary doctorates, and received honors from three U.S. presidents.

CHARLES F. KETTERING ON *The Motor Car*

Various experiments with steam carriages were carried out in the prosperous scientific climate of the 17th and 18th centuries, and in the 19th century even more prototypes were built. But the motor vehicle that became the mainstay of modern land transport had to await the development of the internal (as opposed to external) combustion engine. Britannica's first article on motor vehicles appeared in its 10th Edition (1902-03), but nowhere is the early history presented more gracefully and concisely than in the article "Motor Car," highlighted below, from Britannica's 14th Edition (1929). It was written by Charles F. Kettering (1876-1958), the auto pioneer and inventor and legendary head of research for the General Motors Corporation.

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Reflecting the modern world's passionate, ongoing love affair with the automobile, *Britannica's* current edition devotes almost twenty-seven columns to the subject, treating it under the more general title of "Transportation." We think of it as peculiar to our time, but the idea of a self-powered vehicle is part of our mythic tradition. It is first recorded in the *Iliad*. In a single day, Homer informs us, Vulcan made one hundred and twenty tricycles which

Wondrous to tell instinct with spirit rolled
From place to place, around the blest abodes,
Self-moved, obedient to the beck of gods.

It is difficult to assign definite dates for events in the progress of the automobile. Many men were working on the same problems in different places. This brief outline can point out only the trends and major developments. The self-

propelled vehicle dates back to the middle of the 18th century. Credit for the first "road wagon" propelled by its own engine, is generally given to Nicholas Cugnot, a Frenchman, who about 1770 built a three-wheeled carriage, with a cumbersome steam power plant operating on the single front wheel. It is claimed that this steam carriage could run at the rate of 2 m. per hour, but it had to stop every hundred feet or so to make steam. Cugnot's second vehicle, produced in 1771, is still preserved in the Conservatoire des Arts et Métiers, Paris. (Some histories of the automobile state that his first car is still preserved and not his second car.) During the latter half of the 18th century a few other attempts were made to build steam carriages, many of which were not capable of operating under their own power. The next century, however, saw a number of steam vehicles put to practical use in transporting passengers. Among these early experimenters were: Oliver Evans in America, making a car in 1787; Trevithick, England (1801); Gordon, England (1824); James, England (1824); Gurney, England (1828); James, America (1829); Summers and Ogle, England (1831); Hancock, England (1824-36); Church, England (1832); Maceroni and Squires, England (1834); Dudgeon, America (1857); and Butler, England (1883). Gurney put three steam coaches into operation on a route near London covering about 3,644 miles. Around the same time Walter Hancock built the first of nine steam carriages that were to operate on a route regularly.

Starting about 1831, the English parliament enacted laws which practically eliminated the steam coaches from the roads. Among these might be mentioned the Red Flag Law, which required that a man precede the horseless carriage, carrying a red flag by day and a red lantern by night. In addition, the toll roads and bridges raised the charges for the steam carriages until they could no longer operate at a profit. As a result, there was little development of the horseless carriages in England until after 1896, then the restrictive law was repealed. In Germany and France interest turned toward the internal combustion engine to replace the cumbersome power plant of these early steam vehicles. In 1885-86 Gottlieb Daimler (Germany), patented his high speed internal combustion engine, which is generally credited with revolutionizing automotive transportation. Nevertheless, there is some disagreement among historians on this point. Some state that in 1875 Siegfried Narkus (Austria) built a four-wheeled vehicle powered by an internal combustion engine. Benz (Germany), in 1885, produced a tricycle with an internal combustion engine. Credit is commonly given to Krebs for the first petrol or gasoline automobile incorporating many of the essential features of the modern car. In 1894 he designed the Panhard car with a vertical engine under a bonnet or hood, at the front, and a modern type chassis. The car also had the common type of sliding gear transmission operated by the right hand, clutch and brake pedals, and a foot accelerator.



A De Dion automobile, c. 1901.

About 1896 or 1897 considerable work was carried on in Germany, France, England and the United States on the development of vehicles driven by internal combustion engines. These cars varied greatly in detailed design; some had the same general arrangement as the Panhard, while others were patterned on the familiar horse-drawn carriages which they were expected to supplant. The motor car is not the product of a single inventor nor even of men within a single century. Among the European pioneers there were: Daimler, Benz, Maybach, Krebs, Panhard, Levassor, Royce, Serpollet, De Dion, Bouton, Gibbon and Roots; and among the American pioneers were Duryea, Olds, Haynes, Winton, Ford, King, Maxwell, Apperson, Riker, Clarke, Stanley, White and Franklin. These automobiles were produced, of course, in very small numbers because of the limited manufacturing facilities and of the small consumer demand.

In 1903 the Association of Licensed Automobile Manufacturers was formed in America to grant licences to manufacture motor cars under the Selden patent (U.S. patent No. 549,160, Nov. 5, 1895), and for eight years was a powerful force in the

development of the new industry. By limiting licences to concerns which were held to be "good and reliable," the association doubtless protected both the automobile industry and its customers from unscrupulous exploitation, and stabilized somewhat the general conditions of production and market competition. The National Automobile Chamber of Commerce was organized in 1913 to succeed the association (strictly speaking, the National Automobile Chamber of Commerce succeeded the Automobile Board of Trade, which succeeded the Association of Licensed Automobile Manufacturers). Among its activities was the "cross-licence" agreement whereby any member might use the patents held by any other member, without paying a royalty. While never adhered to quite universally, this agreement still (1928) holds for patents issued previous to 1925. At that time the life of the agreement ran out; and it was not renewed mostly on account of the commercial aspect of large private developments.

Until 1909-12 the automotive industry was, in general, chiefly concerned with developing a product that at least would operate. Some cars, of course, were marketed in this period; these in essential details were nearly as satisfactory as cars designed in recent years. During the experimental period, cars of every description were produced with alternatively chain, bevel gear or friction drive: bar, tiller or wheel steering; planetary or sliding gear transmissions; and with the number of cylinders ranging from one to eight, with a few twelves and sixteens. The prejudice against a new and radical invention, poor road conditions, the comparatively high original cost, the cost of maintenance and the general unreliability of the cars, all tended to retard rapid introduction of motor vehicles. The sporting phase of the automobile was recognized long before it was commonly appreciated that the automobile provides a thoroughly reliable, economical, comfortable and rapid means of individual transportation.

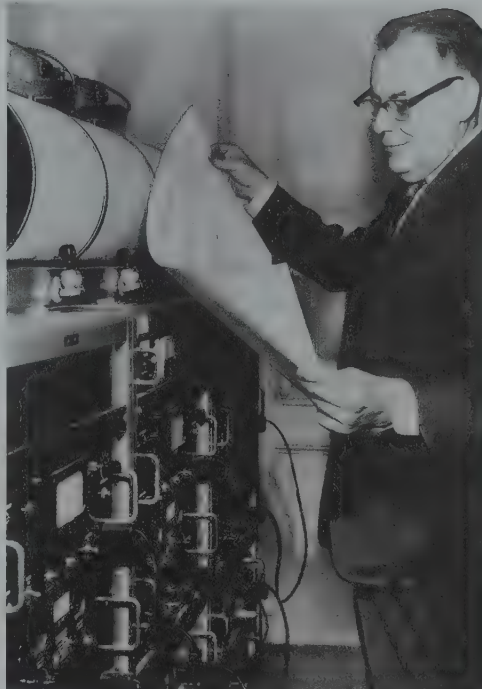
After 1909-12 the production of sufficient cars for a growing demand and marketing and distributing facilities became of great importance. Problems of time payments and the extensive purchasing of cars on an instalment payment basis, trade in used cars, dealer organization and advertising have been demanding the attention of manufacturers, in addition to problems of quantity production and engineering. During this period also the internal combustion engine has almost entirely superseded both steam and electric motors for propelling automobiles. The electric vehicle is confined, for the most part, to use for short distances, over improved roads. The expansion and growth of the motor car has, in a large measure, proceeded abreast with the building of good roads, development of alloy steels and improvement of rubber. The need for rapid and reliable individual, or private, transport has existed for a long time; and when the automobile was recognized as fulfilling that need, its adoption was rapid not only in Europe and America, but in late years, all over the world.

CHARLES F. RICHTER ON

Earthquakes

Human knowledge about that cataclysmic force, the earthquake, progressed slowly. Britannica's 1st Edition (1768–71) gave it a single sentence: "Earthquake, in natural history, a violent agitation or trembling of some considerable part of the earth generally attended with a terrible noise like thunder, and sometimes with an eruption of fire, water, wind, etc." The 2nd Edition (1778–83) devoted 14 pages to the topic, but it mostly comprised anecdotes mixed with conjecture, some of which implicated electricity. Two centuries later, the American geophysicist and seismologist Charles F. Richter (1900–85), who in 1935 devised the scale by which the severity of earthquake shocks is universally measured—the famed Richter scale—set forth lucid answers to the age-old questions. A brief taste of his Britannica article follows.

AP Images



Earthquakes can originate in various ways, but one principal cause is responsible for all large earthquakes and for a majority of small ones. This is the fracturing of rocks in the outer part of the Earth as a result of the gradual accumulation of strain during geological processes. Sudden fracture occurs when strain exceeds the strength of the rocks; generally, rupture follows established lines and surfaces of weakness, which are active geologic faults. Fracture usually begins at depths of 17 to 34 kilometres (11 to 21 miles) or much more; but in large earthquakes, it often extends to the surface, and relative displacements of the two sides

are observed along the line or zone of intersection between the fault and the surface. This fault displacement may be vertical, horizontal, or both.

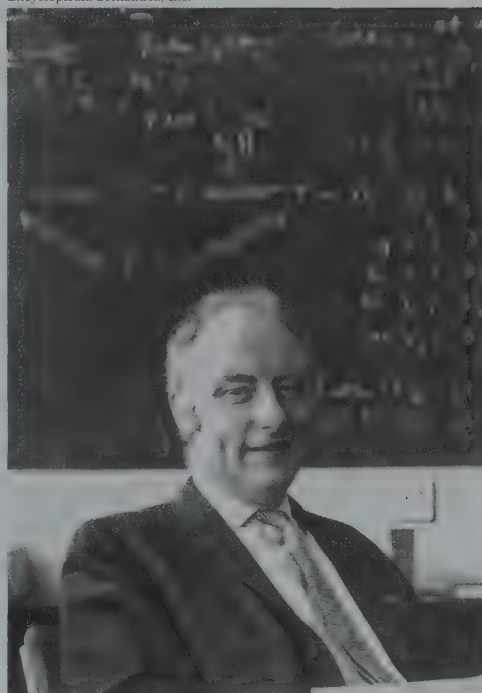
The ultimate cause of distortion and faulting is the same as that responsible for the warping and breaking of the crust of the Earth during geological time, thereby producing mountain ranges and ocean basins. An earlier generation of workers confidently attributed all this to the wrinkling of the surface of a cooling and shrinking Earth. That idea gradually became untenable and has been replaced by variations of a hypothesis that the flow of heat within the Earth causes transfer of material by convection, and that these slow but inexorable motions provide the driving forces for geologic changes. The latest and most fruitful development, called plate tectonics, has revived the temporarily neglected idea of continental drift and combined it with the notions of sea-floor spreading and transform (offset) faulting, phenomena that are substantiated by the paleomagnetic history of oceanic rocks. . . .

The most important of the minor causes of earthquakes is volcanism. Earthquakes are caused not merely by explosions and other eruptive processes, but also by gradual displacements of subterranean volcanic material, or magma. . . .

FRANCIS CRICK ON *Biological Complexity*

British biophysicist Francis Harry Compton Crick (1916–2004) was at the heart of one of the most important discoveries of the 20th century, a discovery recognized and honored in 1962 when Crick, along with James Watson and Maurice Wilkins, won the Nobel Prize for Physiology or Medicine for their determination of the molecular structure of DNA (deoxyribonucleic acid), the chemical substance ultimately responsible for hereditary control of life functions. This accomplishment became a cornerstone of genetics. In 1980, for Britannica's publication The Great Ideas Today, Crick contributed a delightfully readable and informative article on "The Explosion of Biological Information," excerpted below.

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The complexity of biology is to some extent a matter of everyday observation. Even a child living in a city knows something about animals and plants. A fish is very different from a sparrow and neither of them is anything like a cabbage. Our own bodies, although we tend to take them for granted, seem quite complicated objects to us, especially if something goes wrong with them. The insides of a human being seem to have at least as many parts as the insides of an automobile.

What this naive view of biology does not take into account is just how immense the complexity is. As we learn more about the living world we discover that not only are there many different types of fish, amphibia, reptiles, birds and mammals, of which we see only a tiny fraction in even the largest zoo, but that

in addition to these familiar vertebrates there are many invertebrates as well, among which are large ones, such as the lobster and the octopus, and many small ones, such as the million or so species of insects. Plants also are extremely various, from the familiar flowering trees and bushes of our streets and gardens, down to mushrooms, lichens, and fungi of all sorts. Less visible are the microorganisms, both protozoa and bacteria, many of which can scarcely be seen with the naked eye. Even smaller are the viruses, parasites which can multiply only within a living cell, and which straddle the borderline between the living and the nonliving.

As if this catalog were not enough, we must remember that, of all the species of organisms which ever existed on the earth, the great majority are now extinct. Not only are there no woolly mammoths anymore, the entire world of dinosaurs has vanished, as have many other strange creatures known to us only from fossils. The total number of species that ever existed must run into many billions.

When we look closely at the individuals of one particular species we find, at least for higher organisms, that although they look roughly the same, they are really all different from each other, though the differences may be small. This is most obvious to us from our knowledge of human beings, no two of whom look alike to us unless they are identical twins. More detailed studies of individuals show this impression to be well founded. Leaving aside differences produced by upbringing, we can easily show that individual people (twins aside) are genetically unique. Thus even within a species there is considerable genetic variability.

Finally we need to look more closely at the complexity of a single individual. Modern biochemistry has shown convincingly that organisms are far more complicated than our superficial impressions would suggest. A small bacterium, which we can hardly see unless we use a high-powered microscope, is a carefully organized self-reproducing chemical factory with thousands of distinct components, each one built with precision at the atomic level. One of our own cells is even more complex, and our tissues and organs, built of many cells cooperating together, are necessarily still more elaborate. Our bodies are not constructed of uniform chunks of "flesh," built on the scale of everyday life. They are delicately engineered at a level which is far too small for us to see. If they were not, they could not carry out the many complex operations needed for survival.

The world of biology, past and present, is vast, both in its detail and in its variety. It would take a huge number of parameters to describe it adequately. But do we need to have all this information in order to understand biology? Is it not enough to understand the general laws which govern biological behavior, provided we have sufficient well-studied examples to illustrate them? To some extent it is, and yet we must remember that biological laws are not exactly like the basic laws of physics. The latter operate mainly on relatively simple objects, such as electrons, which show little variety. One electron is indistinguishable from any other

electron. Other physical laws, such as Newton's Law of Gravity, are true for more complex objects because the property studied—in gravity, it is mass—is strictly additive under a wide variety of conditions. Biological laws are rather different. It would perhaps be better to refer to them as mechanisms (the mechanism of natural selection, for example). They tend to be less compelling than physical laws, with curious complications and exceptions. For that reason we must study many more examples than would otherwise be necessary. Perhaps the most important difference is that the laws of physics are the same everywhere in the universe, whereas, if there is life on other worlds, it is unlikely that the major generalizations of biology here will all be true there. Much of biology, especially at the molecular level, is frozen history and might well be different in important respects if it all happened a second time.

FRANCISCO JOSÉ AYALA ON *Intelligent Design*

Born in Spain but long based at the University of California, Irvine, the former Dominican priest turned evolutionary biologist and author Francisco José Ayala is perhaps best known for his criticism of creationism and intelligent design and his passionate belief that Darwinism and religious faith are not mutually exclusive. "I feel that science is compatible with religious faith in a personal, omnipotent and benevolent God," he has frequently explained. For Britannica he covered, in lucid prose amid a swiftly flowing narrative, the wide-ranging cultural impact of Darwinism, past and present, and we reproduce below his section on "Intelligent Design and Its Critics" from his larger entry on "Evolution." In 2010 Ayala won the prestigious Templeton Prize for "exceptional contribution to affirming life's spiritual dimension, whether through insight, discovery, or practical works."

Courtesy of Francisco José Ayala



William Paley's *Natural Theology*, the book by which he has become best known to posterity, is a sustained argument explaining the obvious design of humans and their parts, as well as the design of all sorts of organisms, in themselves and in their relations to one another and to their environment. Paley's keystone claim is that "there cannot be design without a designer; contrivance, without a contriver; order, without choice; . . . means suitable to an end, and executing their office in accomplishing that end, without the end ever having been contemplated." His book has chapters dedicated to the complex design of the human eye; to the human frame, which, he argues, displays a precise mechanical arrangement of bones, cartilage, and joints; to the circulation of the blood and the disposition of blood vessels; to the comparative anatomy of humans and animals; to the digestive system, kidneys, urethra, and bladder; to the wings of birds and the fins of fish; and much more. For more than 300 pages, Paley conveys extensive and

accurate biological knowledge in such detail and precision as was available in 1802, the year of the book's publication. After his meticulous description of each biological object or process, Paley draws again and again the same conclusion—only an omniscient and omnipotent deity could account for these marvels and for the enormous diversity of inventions that they entail.

On the example of the human eye he wrote:

I know no better method of introducing so large a subject, than that of comparing . . . an eye, for example, with a telescope. As far as the examination of the instrument goes, there is precisely the same proof that the eye was made for vision, as there is that the telescope was made for assisting it. They are made upon the same principles; both being adjusted to the laws by which the transmission and refraction of rays of light are regulated. . . . For instance, these laws require, in order to produce the same effect, that the rays of light, in passing from water into the eye, should be refracted by a more convex surface than when it passes out of air into the eye. Accordingly we find that the eye of a fish, in that part of it called the crystalline lens, is much rounder than the eye of terrestrial animals. What plainer manifestation of design can there be than this difference? What could a mathematical instrument maker have done more to show his knowledge of [t]his principle, his application of that knowledge, his suiting of his means to his end . . . to testify counsel, choice, consideration, purpose?

It would be absurd to suppose, he argued, that by mere chance the eye

should have consisted, first, of a series of transparent lenses—very different, by the by, even in their substance, from the opaque materials of which the rest of the body is, in general at least, composed, and with which the whole of its surface, this single portion of it excepted, is covered: secondly, of a black cloth or canvas—the only membrane in the body which is black—spread out behind these lenses, so as to receive the image formed by pencils of light transmitted through them; and placed at the precise geometrical distance at which, and at which alone, a distinct image could be formed, namely, at the concourse of the refracted rays: thirdly, of a large nerve communicating between this membrane and the brain; without which, the action of light upon the membrane, however modified by the organ, would be lost to the purposes of sensation.

The strength of the argument against chance derived, according to Paley, from

a notion that he named *relation* and that later authors would term *irreducible complexity*. Paley wrote:

When several different parts contribute to one effect, or, which is the same thing, when an effect is produced by the joint action of different instruments, the fitness of such parts or instruments to one another for the purpose of producing, by their united action, the effect, is what I call relation; and wherever this is observed in the works of nature or of man, it appears to me to carry along with it decisive evidence of understanding, intention, art . . . all depending upon the motions within, all upon the system of intermediate actions.

Natural Theology was part of the canon at Cambridge for half a century after Paley's death. It thus was read by Darwin, who was an undergraduate student there between 1827 and 1831, with profit and "much delight." Darwin was mindful of Paley's relation argument when in the *Origin of Species* he stated: "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find out no such case. . . . We should be extremely cautious in concluding that an organ could not have been formed by transitional gradations of some kind."

In the 1990s several authors revived the argument from design. The proposition, once again, was that living beings manifest "intelligent design"—they are so diverse and complicated that they can be explained not as the outcome of natural processes but only as products of an "intelligent designer." Some authors clearly equated this entity with the omnipotent God of Christianity and other monotheistic religions. Others, because they wished to see the theory of intelligent design taught in schools as an alternate to the theory of evolution, avoided all explicit reference to God in order to maintain the separation between religion and state.

The call for an intelligent designer is predicated on the existence of irreducible complexity in organisms. In Michael Behe's book *Darwin's Black Box: The Biochemical Challenge to Evolution* (1996), an irreducibly complex system is defined as being "composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning." Contemporary intelligent-design proponents have argued that irreducibly complex systems cannot be the outcome of evolution. According to Behe, "Since natural selection can only choose systems that are already working, then if a biological system cannot be produced gradually it would have to arise as an integrated unit, in one fell swoop, for natural selection to have anything to act on." In other words, unless all parts of the eye come

simultaneously into existence, the eye cannot function; it does not benefit a precursor organism to have just a retina, or a lens, if the other parts are lacking. The human eye, they conclude, could not have evolved one small step at a time, in the piecemeal manner by which natural selection works.

The theory of intelligent design has encountered many critics, not only among evolutionary scientists but also among theologians and religious authors. Evolutionists point out that organs and other components of living beings are not irreducibly complex—they do not come about suddenly, or in one fell swoop. The human eye did not appear suddenly in all its present complexity. Its formation required the integration of many genetic units, each improving the performance of preexisting, functionally less-perfect eyes. About 700 million years ago, the ancestors of today's vertebrates already had organs sensitive to light. Mere perception of light—and, later, various levels of vision ability—were beneficial to these organisms living in environments pervaded by sunlight. Different kinds of eyes have independently evolved at least 40 times in animals, which exhibit a full range, from very uncomplicated modifications that allow individual cells or simple animals to perceive the direction of light to the sophisticated vertebrate eye, passing through all sorts of organs intermediate in complexity. Evolutionists have shown that the examples of irreducibly complex systems cited by intelligent-design theorists—such as the biochemical mechanism of blood clotting or the molecular rotary motor, called the flagellum, by which bacterial cells move—are not irreducible at all; rather, less-complex versions of the same systems can be found in today's organisms.

Evolutionists have pointed out as well that imperfections and defects pervade the living world. In the human eye, for example, the visual nerve fibres in the eye converge on an area of the retina to form the optic nerve and thus create a blind spot; squids and octopuses do not have this defect. Defective design seems incompatible with an omnipotent intelligent designer. Anticipating this criticism, Paley responded that “apparent blemishes . . . ought to be referred to some cause, though we be ignorant of it.” Modern intelligent-design theorists have made similar assertions; according to Behe, “The argument from imperfection overlooks the possibility that the designer might have multiple motives, with engineering excellence oftentimes relegated to a secondary role.”

This statement, evolutionists have responded, may have theological validity, but it destroys intelligent design as a scientific hypothesis, because it provides it with an empirically impenetrable shield against predictions of how “intelligent” or “perfect” a design will be. Science tests its hypotheses by observing whether predictions derived from them are the case in the observable world. A hypothesis that cannot be tested empirically—that is, by observation or experiment—is not scientific. The implication of this line of reasoning for U.S. public schools has been recognized not only by scientists but also by nonscientists, including politicians

and policy makers. The liberal U.S. senator Edward Kennedy wrote in 2002 that “intelligent design is not a genuine scientific theory and, therefore, has no place in the curriculum of our nation’s public school science classes.”

Scientists, moreover, have pointed out that not only do imperfections exist but so do dysfunctions, blunders, oddities, and cruelties prevail in the world of life. For this reason theologians and religious authors have criticized the theory of intelligent design, because it leads to conclusions about the nature of the designer at odds with the omniscience, omnipotence, and omnibenevolence that they, like Paley, identify as the attributes of the Creator. One example of a “blunder” is the human jaw, which for its size has too many teeth; the third molars, or wisdom teeth, often become impacted and need to be removed. Whereas many people would find it awkward, to say the least, to attribute to God a design that a capable human engineer would not even wish to claim, evolution gives a good account of this imperfection. As brain size increased over time in human ancestors, the concurrent remodeling of the skull entailed a reduction of the jaw so that the head of the fetus would continue to fit through the birth canal of the adult female. Evolution responds to an organism’s needs not by optimal design but by tinkering, as it were—by slowly modifying existing structures through natural selection. Despite the modifications to the human jaw, the woman’s birth canal remains much too narrow for easy passage of the fetal head, and many thousands of babies die during delivery as a result. Science makes this understandable as a consequence of the evolutionary enlargement of the human brain; females of other animals do not experience this difficulty.

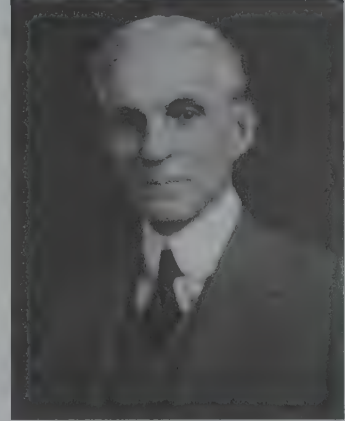
The world of life abounds in “cruel” behaviours. Numerous predators eat their prey alive; parasites destroy their living hosts from within; in many species of spiders and insects, the females devour their mates. Religious scholars in the past had struggled with such dysfunction and cruelty because they were difficult to explain by God’s design. Evolution, in one respect, came to their rescue. A contemporary Protestant theologian called Darwin the “disguised friend,” and a Roman Catholic theologian wrote of “Darwin’s gift to theology.” Both were acknowledging the irony that the theory of evolution, which at first had seemed to remove the need for God in the world, now was convincingly removing the need to explain the world’s imperfections as outcomes of God’s design.

HENRY FORD ON

Mass Production

The appearance of this article in Britannica's 13th Edition (1926) epitomized one of the changes in editorial policy at that time, the decision to do away with as much as possible of the ponderousness and abstruseness that, at least in the popular mind, characterized much of the encyclopedia's contents. So Britannica went after and secured a commission from one of the most influential Americans of the day, Henry Ford, the famed American industrialist who revolutionized factory production with his assembly-line methods and transformed American life by bringing affordable transportation, the Ford Model T (1908–27), to the common man. As the reader will see in the excerpt below, Ford addressed both the positive and negative perceptions of mass production at that time.

Ford Motor Company



The term mass production is used to describe the modern method by which great quantities of a single standardised commodity are manufactured. As commonly employed it is made to refer to the quantity produced, but its primary reference is to method. In several particulars the term is unsatisfactory. Mass production is not merely quantity production, for this may be had with none of the requisites of mass production. Nor is it merely machine production, which also may exist without any resemblance to mass production. Mass production is the focussing upon a manufacturing project of the principles of power, accuracy, economy, system, continuity and speed. The interpretation of these principles, through studies of operation and machine development and their co-ordination, is the conspicuous task of management. And the normal result is a productive organisation that delivers in quantities a useful commodity of standard material, workmanship and design at minimum cost. The necessary, precedent condition of mass production is a capacity, latent or developed, of *mass consumption*, the ability to absorb

large production. The two go together, and in the latter may be traced the reasons for the former. . . .

The motor industry leads the way. To the motor industry is given the credit of bringing mass production to experimental success, and by general consent the Ford Motor Co. is regarded as having pioneered in the largest development of the method under a single management and for a single purpose. It may, therefore, simplify the history of mass production and the description of its principles if the experience of this company is taken as a basis. It has been already suggested that mass production is possible only through the ability of the public to absorb large quantities of the commodity thus produced. These commodities are necessarily limited to necessities and conveniences. The greatest development of mass production methods has occurred in the production of conveniences. The automobile represents a basic and continuous convenience-transportation.

Mass production begins, then, in the conception of a public need of which the public may not as yet be conscious and proceeds on the principle that use-convenience must be matched by price-convenience. Under this principle the element of service remains uppermost; profit and expansion are trusted to emerge as consequences. As to which precedes the other, consumption or production, experiences will differ. But granted that the vision of the public need is correct, and the commodity adapted to meet it, the impulse to increased production may come in anticipation of demand, or in response to demand, but the resulting consumption is always utilised to obtain such increase of quality, or such decrease of cost, or both, as shall secure still greater use-convenience and price-convenience. As these increase, consumption increases, making possible still greater production advantages, and so on to a fulfilment that is not yet in view.

The commodities that conduce to civilised living are thus far enjoyed by only a small fraction of the world's inhabitants. The experience of the Ford Motor Co. has been that mass production precedes mass consumption and makes it possible, by reducing costs and thus permitting both greater use-convenience and price-convenience. If the production is increased, costs can be reduced. If production is increased 500%, costs may be cut 50%, and this decrease in cost, with its accompanying decrease in selling price, will probably multiply by 10 the number of people who can conveniently buy the product. This is a conservative illustration of production serving as the cause of demand instead of the effect. . . .

As to shop detail, the keyword to mass production is simplicity. Three plain principles underlie it: (a) the planned orderly progression of the commodity through the shop; (b) the delivery of work instead of leaving it to the workman's initiative to find it; (c) an analysis of operations into their constituent parts. These are distinct but not separate steps; all are involved in the first one. To plan the progress of material from the initial manufacturing operation until its emergence

as a finished product involves shop planning on a large scale and the manufacture and delivery of material, tools and parts at various points along the line. To do this successfully with a progressing piece of work means a careful breaking up of the work into its "operations" in sequence. All three fundamentals are involved in the original act of planning a moving line of production.

This system is practised, not only on the final assembly line, but throughout the various arts and trades involved in the completed product. The automobile assembly line offers an impressive spectacle of hundreds of parts being quickly put together into a going vehicle, but flowing into that are other assembly lines on which each of the hundreds of parts have been fashioned. It may be far down the final assembly line that the springs, for example, appear, and they may seem to be a negligible part of the whole operation. Formerly one artisan would cut, harden, bend and build a spring. To-day the making of one leaf of a spring is an operation of apparent complexity, yet is really the ultimate reduction to simplicity of operation. . . .

Some criticisms answered. Mass production has also been studied with reference to what has been called the monotony of repetitive work. This monotony

Henry Ford standing between his first automobile, the Quadricycle, and the "Ten Millionth" Model T, 1933.



Glasshouse Images/Newscom

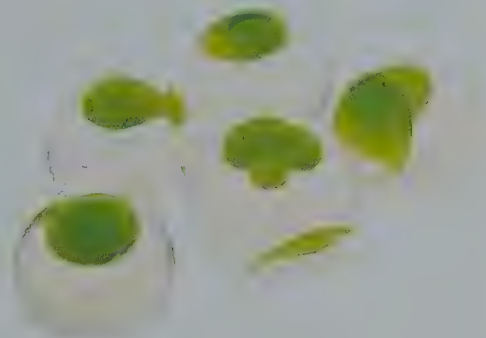
does not exist as much in the shops as in the minds of theorists and bookish reformers. There is no form of work without its hardness; but needless hardship has no place in the modern industrial scheme. Mass production lightens work, but increases its repetitive quality. In this it is the opposite of the mediaeval ideal of craftsmanship where the artisan performed every operation, from the preparation of the material to its final form. It is doubtful, however, if the mass of mediaeval toil was as devoid of monotony as has sometimes been pictured, but it is absolutely certain that it was less satisfactory in its results to the worker. In well-managed modern factories the tendency to monotony is combatted by frequent changes of task.

The criticism of mass production as a means of reducing employment has long since been out of court. The experience of the Ford Motor Co. is that wherever the number of men has been reduced on manufacturing operations, more jobs have been created. A continuous programme of labour reduction has been paralleled by a continuous increase in employment. As to the effect of mass production on wages and the relations between managers and men, there is little need to speak. It is perhaps the most widely understood fact about mass production that it has resulted in higher wages than any other method of industry. The reason is at hand. The methods of mass production enable the worker to earn more and thus to have more. Moreover, the methods of mass production have thrown so much responsibility on the craftsmanship of management, that the old method of financial adjustment by reduction of wages has been abandoned by scientific manufacturers. A business that must finance by drafts out of the wage envelopes of its employees is not scientifically based. It is the problem of management so to organise production that it will pay the public, the workmen and the concern itself. Management that fails in any of these is poor management. Disturbed labour conditions, poor wages, uncertain profits indicate lapses in management. The craftsmanship of management absorbs the energies of many thousands of men who, without mass production methods, would have no creative opportunity. Here the modern method broadens instead of narrows individual opportunity.

HERVÉ THIS & NATHAN MYHRVOLD ON *Molecular Gastronomy*

Ryan Matthew Smith/Modernist Cuisine, LLC

Hervé This, a chemist at the Institut National de la Recherche Agronomique at AgroParisTech and the main author of the piece below, was one of the founders of the culinary field known as “molecular gastronomy.” This application of science and lab tools to the field of cooking has led to new and novel methods of preparing and presenting food, the rise of avant-garde restaurants around the world, as well as a cadre of ardent critics. These naysayers are



Tomato and basil spheres.

also discussed below, in a special section by inventor Nathan Myhrvold, Microsoft's first chief technology officer and recent founder of The Cooking Lab of Bellevue, Washington, where an interdisciplinary team of scientists and chefs has dedicated itself to “advancing the state of culinary art through the creative application of scientific knowledge and experimental techniques.”

Molecular gastronomy is the scientific discipline concerned with the physical and chemical transformations that occur during cooking and the application of such knowledge to the creation of new dishes and culinary techniques.

The discipline was established in 1988 by Hervé This [this author], a physical chemist, and Nicholas Kurti, a former professor of physics at the University of Oxford, who were interested in the science behind the transformative chemical and physical properties of cooking. Although the study of food science had existed for some time, its focus had historically been on the industrial production and nutritional properties of food. Molecular gastronomy, on the other hand, focuses on the application of scientific scrutiny to culinary processes at the level of domestic and

Courtesy of Hervé This



Hervé This.

restaurant cooking, an area that had historically tended to rely heavily on tradition and anecdotal information. Molecular gastronomy seeks to generate new knowledge on the basis of the chemistry and physics behind culinary processes—for example, why mayonnaise becomes firm or why a soufflé swells—and to develop new ways of cooking rooted in science.

Theoretical Foundations

A program was proposed for molecular gastronomy that took into account the fundamentally important artistic and social components of cooking as well as the technical element. A distinction was also made between the parts of recipes: “culinary definitions”—descriptions of the objective of recipes—and “culinary precisions”—the technical details of a recipe. Thus, a program for molecular gastronomy emerged: first, to model recipes, or culinary definitions; second, to collect and test culinary precisions; third, to scientifically explore the artistic component of cooking; and, finally, to scientifically explore the social aspects of cooking.

In giving a name to the new study, Kurti and This looked to the definition of gastronomy given by Anthelme Brillat-Savarin, author of *Physiologie du goût* (1825; *The Physiology of Taste*): “the intelligent knowledge of whatever concerns man’s nourishment.” The adjective *molecular* was added to further define that branch of science, which includes elements of physics, chemistry, and biology.

Beginning in 1988, research teams were established in the field of molecular gastronomy at universities in several countries, including France, the Netherlands, Ireland, Denmark, Italy, Spain, and the United States. Educational initiatives were also introduced within the main framework of physical chemistry education, such as the Experimental Cuisine Collective, launched in 2007 at New York University. Molecular gastronomy was shown to be an excellent educational tool, allowing students in chemistry, physics, and biology to observe and understand the practical use of the theories that they learned. In fall 2010 Harvard University debuted a new course on science and cooking taught in part by Catalan chef Ferran Adrià.

A formalism called “complex disperse systems/non periodical organization of space” (CDS/NPOS) was introduced in 2002 in order to describe the organization and material of food in particular but also of all formulated products (including drugs, cosmetics, paintings, etc.), and new analytic methods were introduced for the study of the transformation of foods either in isolation or in aqueous solutions such as broths and stocks.

Historical Precedents and Developments

Molecular gastronomy has famous ancestors. These include 18th-century chemist Claude-Joseph Geoffroy, who studied essential oils in plants; 18th-century French chemist Antoine-Laurent Lavoisier, who studied meat stock and is celebrated as one of the founders of modern chemistry; American-born British physicist Sir Benjamin Thompson, count von Rumford, who developed modern theories regarding heat and was also interested in meat cooking; German chemist Friedrich Christian (Fredrick) Accum, whose *A Treatise on Adulterations of Food and Culinary Poisons* (1820) raised awareness of food safety; and 19th-century French chemist Michel-Eugène Chevreul, who analyzed the chemical composition of animal fats. In the 20th century, French microbiologist Édouard de Pomiane published best-selling books on cooking, notably the influential *La Cuisine en dix minutes; ou, l'adaptation au rythme moderne* (1930; *French Cooking in Ten Minutes; or, Adapting to the Rhythm of Modern Life*).

Molecular gastronomy developed very quickly, but about 1999 it was determined that different names had to be applied to distinguish the scientific activity on the one hand from the culinary enterprise on the other. The name *molecular cooking* (and its variations *molecular cookery* and *molecular cuisine*) was introduced to refer to the kind of technologically oriented way of cooking that was developed by some of the world's top chefs. Proposed just before 2000, this new terminology gained momentum, and by 2010 it was established that the term *molecular gastronomy* should be used to designate the scientific discipline that investigates the mechanisms of phenomena that occur during culinary transformation, whereas the term *molecular cooking* and its variations should be used to describe the culinary trend in which chefs use “new” tools, ingredients, and methods developed through research in molecular gastronomy.

Yet the use of the word *new* in itself was problematic. Tools such as laboratory filters (for clarification), decanting bulbs (used in skimming stocks), vacuum evaporators (for making extracts), siphons (for producing foams), and ultrasonic probes (for emulsions) were not new in chemistry laboratories. Gelling agents such as carrageenan, sodium alginate, and agar were certainly not entirely new in the food industry. Liquid nitrogen (used to make sherbets and to flash freeze almost anything) had been proposed for use in the kitchen as early as 1907. None of those tools or ingredients, however, was present in cookbooks as recently as the 1980s. Indeed, it was an objective of Kurti and This to rationalize culinary activity as well as to modernize it (for example, to improve the efficiency of some traditional heating systems, in which the energy loss regularly reached 80 percent).

Molecular cooking was perfected by such noted chefs as Adrià and Andoni Luis Aduriz in Spain, Denis Martin in Switzerland, Ettore Bocchia in Italy, Alex Atala

Ryan Matthew Smith/Modernist Cuisine, LLC



Nathan Myhrvold

in Brazil, René Redzepi in Denmark, Sang-Hoon Degeimbre in Belgium, Heston Blumenthal in the United Kingdom, and Thierry Marx in France. In the United States, Fritz Blank, a former clinical microbiologist, opened the Philadelphia restaurant Deux Cheminées (closed 2007). At his restaurant wd~50 (closed 2014) in New York City, Wylie Dufresne invented such singular creations as deep-fried mayonnaise and noodles made with protein (such as shrimp) instead of flour. In Chicago chefs Homaru Cantu at Moto and Grant Achatz at Alinea devised such innovations as edible ink and paper and dishes nestled on aromatic pillows, respectively. Even chefs who did

not specialize in molecular cuisine introduced to their menus spherification (liquids that create their own spherical “skin” through gelling agents), culinary foams (popularized by Adrià), and flash-frozen popcorn balls, among other concoctions.

Critics of Molecular Gastronomy

Although nontraditionalist chefs such as Adrià and Blumenthal have been media darlings since early in their careers and their respective establishments—elBulli in Catalonia, Spain (closed in 2011), and The Fat Duck in Berkshire, England, respectively—have routinely been ranked among the greatest restaurants ever opened, both chefs have been criticized and mocked for their novel approaches to food. The prominent Catalan writer Josep Maria Fonalleras accused Adrià of “talking about dishes as if he were discussing mathematics rather than cooking” and said that “those who watch how . . . Adrià uses a screwdriver to coil a thread of sugar to make it into a ring will split their sides with laughter.”

Blumenthal too was excoriated by critics and fellow chefs. Nico Ladenis, the British chef who gave back his three Michelin stars when he decided to concentrate on “simpler food,” said in 2004 that Blumenthal “debases himself by cooking [his egg-and-bacon ice cream].” Similarly, Germany’s most-famous restaurant critic, Wolfram Siebeck, called Blumenthal’s mustard ice “a fart of nothingness” and compared his cooking techniques to something out of Frankenstein’s lab.

Chefs adopting this new approach to cooking and food disapproved of the label “molecular gastronomists.” (A term preferable to many of them is “Modernist.”) Similarly, the perception of them as “mad scientists” wielding beakers of mysterious chemicals provoked hostile reactions from some diners, who felt alienated by the idea of science’s being applied too blatantly in the kitchen. As William Grimes wrote in *The New York Times* in 2000,



Modern cuisine being prepared with a blowtorch.

Spanish foam has finally washed ashore on Manhattan Island. It was only a matter of time. For much of the past year, the food press has been enthralled with the mad experiments of Ferran Adrià . . . who delights in turning traditional recipes inside out and, in a kind of culinary alchemy, presents flavors in foams, gels, and even puffs of smoke.

Some traditionalist chefs joined the chorus of critics. One of the most vocal was Santi Santamaria, the late chef at Can Fabes in Barcelona, which was the first restaurant in Spain to attain three Michelin stars. He condemned molecular gastronomy and postulated in 2009 that

. . . this style of cooking will destroy the brains of the people. . . . It's not honest to take a chemical powder and put it in food that people eat. It's not a natural ingredient. This is a big mistake. You don't need chemical gimmicks to make good food.

Adrià defended himself, saying that "the additives under debate account for just 0.1 percent of my cooking."

Famed TV chef Gordon Ramsay, who later became a fan of Adrià's cooking, said that "food should not be played with by scientists. A chef should use his fingers and his tongue, not a test tube." Noted French chef Alain Ducasse agreed, saying in a 2007 interview,

I prefer to be able to identify what I'm eating. [This new cooking is] 'wow'-effect food, virtual food. If we were surrounded by these restaurants, we would be in trouble.

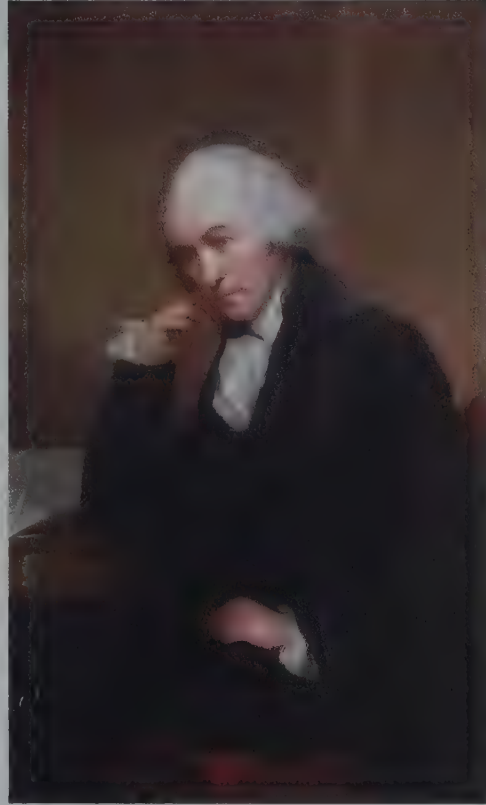
Especially irksome to traditionalists was the number of restaurants that then copied the style of Adrià and other Modernist chefs and the way the Internet stoked the fires of their revolutionary approach to cooking. When a new dish goes on the menu anywhere in the world, the chances are good that it will quickly be the subject of pictures and commentary on social-media sites—often posted online via smartphones before a diner has even received the check. News of the new dish then reverberates further when picked up by the countless food-related blogs and Web sites. That instant connectivity spurs the innovators and critics alike.

JAMES WATT 'ON *The Steam Engine*

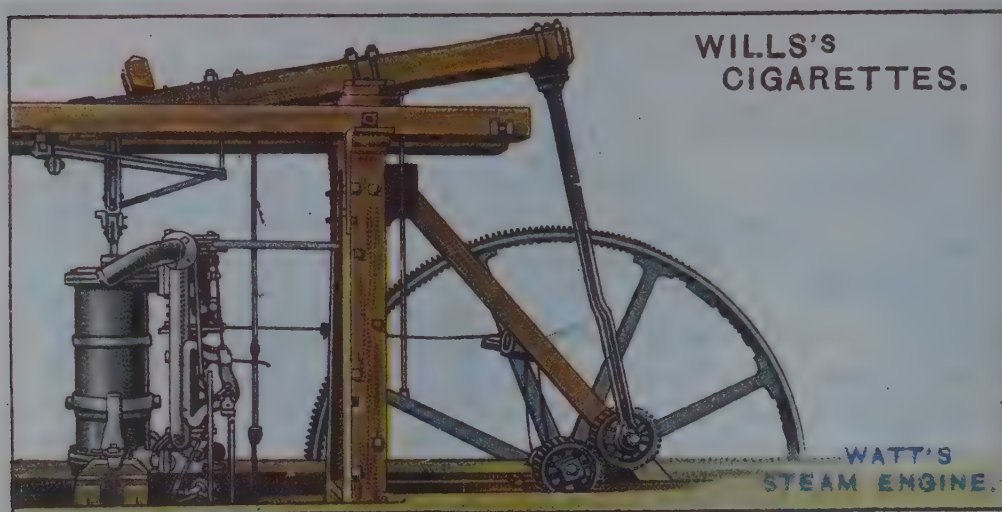
Among the pleasures to be derived from venturing through the early editions of *Britannica* is the one we think of as “being present at the creation.” Steam engines had been around as novelties for centuries, but the first practical ones were invented by the Englishmen Thomas Savery in 1698 and Thomas Newcomen about 1712. About the time *Britannica* was searching for its first editor, James Watt (1736–1819) was beginning a succession of improvements that would bring new and real efficiency to the steam engine, making it the power plant of the Industrial Revolution.

Watt agreed to revise *Britannica*’s 3rd Edition (1788–97) article on steam power but died before finishing the job. His preparatory notes, relating his successful experiments, were nevertheless included in the later updating done for the 7th Edition (1830–42). These notes were presented “as is” in the first person. Excerpts follow.

The Institution of Mechanical Engineers/Mary Evans
 Picture Library/age fotostock



In the winter of 1764–5, I made experiments at Glasgow on the subject, in the course of my endeavours to improve the steam-engine, and as I did not then think of any *simple* method of trying the elasticities of steam at temperatures less than that of boiling water, and had at hand a digester by which the elasticities at greater heats could be tried, I considered that, by establishing the ratios in which they proceeded, the elasticities at lower heats might be found nearly enough for



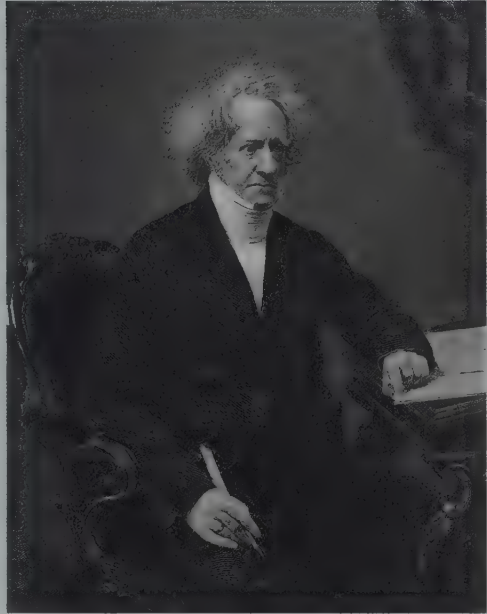
An illustration of Watt's steam engine as featured on a Wills's cigarette card, 1915.

my purpose. I therefore fitted a thermometer to the digester, with its bulb in the inside, placed a small cistern with mercury also within the digester, fixed a small barometer tube with its end in the mercury, and left the upper end open. I then made the digester boil for some time, the steam issuing at the safety valve, until the air contained in the digester was supposed to be expelled. The safety valve being shut, the steam acted upon the surface of the mercury in the cistern, and made it rise in the tube. When it reached to 15 inches above the surface of the mercury in the cistern, the heat was 236° ; and at 30 inches above that surface, the heat was 252° . Here I was obliged to stop, as I had no tube longer than 34 inches, and there was no white glass made nearer than Newcastle-upon-Tyne. I therefore sealed the upper end of the tube hermetically, whilst it was empty, and when it was cool immersed the lower end in the mercury, which now could only rise in the tube by compressing the air it contained. The tube was somewhat conical; but, by ascertaining how much it was so, and making allowances accordingly, the following points were found, which, though not exact, were tolerably near for an *aperçu*. At $29\frac{1}{2}$ inches (with the sealed tube) the heat was 252° , at $75\frac{1}{2}$ inches the heat was 264° , and at $110\frac{1}{2}$ inches 292° . (That is, after making allowances for the pillar of mercury supported, and the pillar which would be necessary to compress the air into the space which it occupied, these were the results.) From these elements I laid down a curve, in which the abscissae represented the temperatures, and the ordinates the pressures, and thereby found the law by which they were governed, sufficiently near for my then purpose. It was not till the years 1773–4, that I found leisure to make further experiments on this subject.

JOHN F.W. HERSCHEL ON *Telescopes*

Continuing progress in astronomy relied heavily on advances in the development of telescopes, and in the early 19th century such activity was widespread. At this time Britannica was an important medium for disseminating knowledge of new improvements not only to laymen and amateurs but also to astronomers themselves. The great English astronomer Sir John F.W. Herschel (1792–1871), in his article “Telescope” for Britannica’s 8th Edition (1852–60), shared useful information on fabricating the speculum or mirror for a reflecting telescope—spiced with a tart critical comment on the work of one of his colleagues.

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The raw material of metallic specula at present in use is an alloy of pure copper with pure tin. . . . In making the mixture it is indispensable to cast the metal first into ingots, and then to remelt it (which requires a much lower heat than that required for the first melting, which must be that of melting copper), adding a small quantity of tin to replace that destroyed by oxidation, and stirring the melted metal before pouring with a wooden pole (as in the “poleing” of copper castings).

The destruction of the more brittle metal, by cracking in a close mould, is owing to the violent tension induced in the internal portions of the mass by the simultaneous fixation of the *whole external crust*, while the interior remains fluid, and which cannot then contract in dimension without solution of continuity. Mr Potter (Brewster’s *Jour.*, N.S. iv. 18, 1831), by casting the metal into a mould, the

lower surface of which consisted of a thick mass of steel, succeeded in determining the rapid fixation of the lower surface, and the subsequent abstraction of the heat by conduction through it in the same direction, and thus solidifying the mass in successive strata from below upwards, allowing each new stratum to accommodate itself in some degree to the already contracted state of the previous one. Dr Macculloch (*Journ. of Science*, June 1828) had previously recommended quick cooling to the fixing point, not to obviate fracture, but to prevent crystallization, but without a word as to the mode of accomplishing it.

JOHN LESLIE · ON

Barometers

Measurement of atmospheric pressure was so essential to physical experimentation that the invention of the barometer by Evangelista Torricelli (1608–47) in the early 17th century was one of the most important opening wedges of the scientific revolution. Every edition of Britannica had an article on the subject, and hosts of other articles treating physics dealt in passing with barometric measurements. In a long disquisition in Britannica's Supplement (1815–24) to its 4th, 5th, and 6th editions, the great physicist John Leslie (1766–1832) reviewed the literature on this important subject; in his opening paragraph he rather grandly disparaged earlier efforts.

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The *Encyclopaedia* contains such an account of the discovery and construction of this most valuable instrument, as could be drawn from the popular treatises of natural philosophy in the English language. But, unfortunately, our compilers of elementary works have seldom taken the trouble to remount to the original sources of information, and have frequently, by substituting their own fancies, or servilely copying the mistakes of others, contrived to disfigure egregiously the relation of facts, and the history of the progress of invention. We now purpose, therefore, as far as our limits will admit, to remodel the article; and, passing rather slightly over the description of the different kinds of barometers, and other practical details already given, to dwell more especially on the successive steps which led to the fine discovery of atmospheric pressure, and its application to physical science. . . .

In the course of his article Leslie described Blaise Pascal's various influential experiments with Torricelli's barometer, and then went on, in fine Protestant dudgeon against the Church of Rome, to recount some of young Pascal's resulting tribulations with the Jesuits.

Pascal, then only twenty-four years of age, proposed to write a treatise on the subject of those inquiries; but thought proper, in the meantime, to publish a short abstract of it, which appeared in 1647, and involved him in a wretched controversy. Father Noël, rector of the Jesuits' College at Paris, keenly attacked it, armed with all the miserable sophisms of the schools, and the absurd dogmas of the Romish church. He contended, that the space above the mercurial column was corporeal, because it was visible and admitted light; that a void being a mere non-entity, cannot have different degrees of magnitude; that the separation produced in the experiments was violent and unnatural; and he presupposed that the atmosphere, like blood, containing a mixture of the several elements, the fire and the finer part of the air were detached from it, and violently forced through the pores of the glass, to occupy the deserted space. To enforce these puerile arguments, the reverend Jesuit did not scruple to employ the poisoned weapon which his order has often wielded with deadly effect,—the hinting an oblique charge of heresy. This rude attack only roused Pascal, and disposed him boldly to throw off the fetters of inveterate opinion. . . .

But Pascal did not rest satisfied with mere reasoning, however strictly conducted; and he soon devised an experiment which should palpably mark, under different circumstances, the varying effects of atmospheric pressure. It occurred to him, that, if the mercury in the Torricellian tube were really supported by the counterpoising weight of the atmosphere, it would be affected by the mass of superincumbent fluid, and must therefore partially subside in the higher elevations. He was impatient to have his conjecture tried in a favourable situation, and, in November 1647, he wrote a letter communicating those views to his brother-in-law, Perier, who filled an office of considerable trust in the province, and commonly resided at Clermont in Auvergne, in the immediate vicinity of the Puy de Dôme, a lofty conical mountain, which rose, according to estimation, above the altitude of 500 toises. Various avocations, however, prevented that intelligent person from complying with his instructions, till the following year. Early in the morning of the 19th of September 1648, a few curious friends joined him in the garden of a monastery, situate near the lowest part of the city of Clermont, where he had brought a quantity of mercury, and two glass tubes hermetically sealed at the top. These he filled and inverted, as usual, and found the mercury to stand in both at the same height, namely, 26 inches and 3 lines, or 28 English inches. Leaving one of the tubes behind, in the custody of the subprior, he proceeded with the

other to the summit of the mountain, and repeated the experiment, when his party were surprised and delighted to see the mercury sink more than three inches under the former mark, and remain suspended at the height of 23 inches and 2 lines, or 24.7 English inches. In his descent from the mountain, he observed, at two several stations, that the mercury successively rose; and, on his return to the monastery, he found it stood exactly at the same point as at first. Encouraged by the success of this memorable experiment, Perier repeated it on the highest tower of Clermont, and noted a difference of two lines at an elevation of 20 toises. Pascal, on his part, as soon as the intelligence reached him at Paris, where he then chanced to be, made similar observations on the top of a high house, and in the belfry of the church of St Jacques des Boucheries, near the border of the Seine; and so much was he satisfied with the results, that he proposed already the application of the barometer for measuring the relative height of distant places on the surface of the globe.

The investigation of the existence and effects of atmospheric pressure was now completed, and it threw a sudden blaze over the whole contexture of physical science.

JULIAN HUXLEY ON *Evolution*

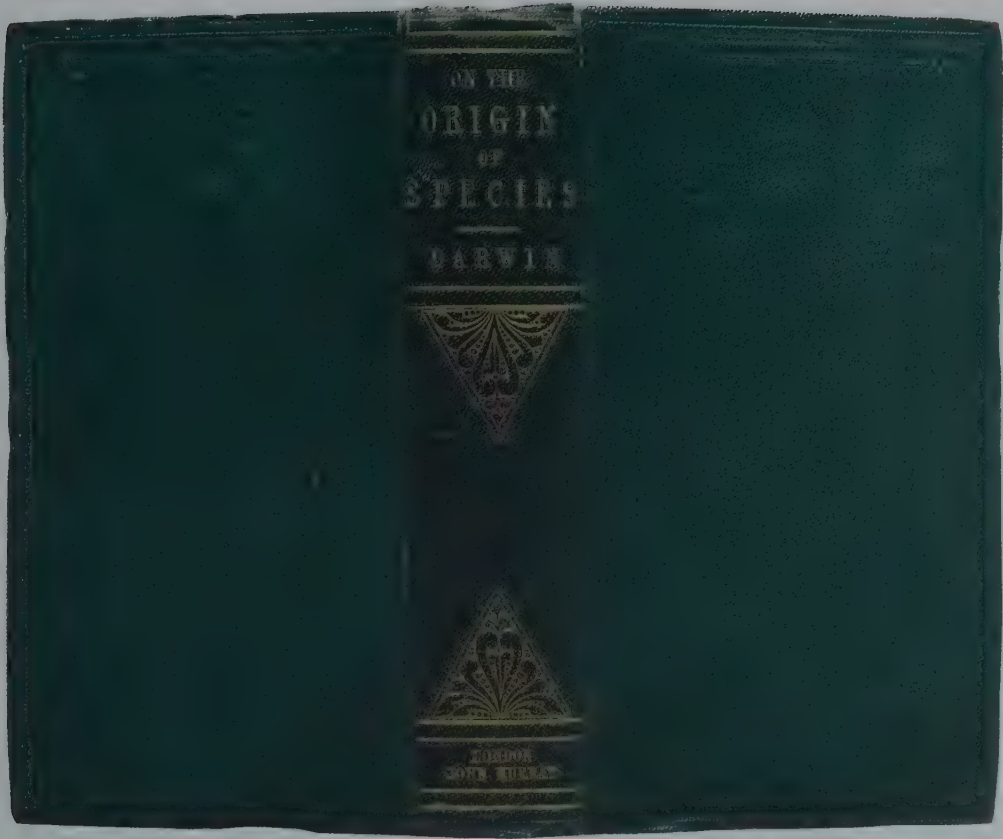
For Britannica's 9th Edition (1875–89) T.H. Huxley (1825–95) discussed evolution as part of his larger article on "Biology." For him the period of controversy had ended; he could foretell neither the Scopes trial nor American Fundamentalism. Here is a paragraph from his masterly account:

Under these circumstances, only one alternative was left for those who denied the occurrence of evolution; namely, the supposition that the characteristic animals and plants of each great province were created, as such, within the limits in which we find them. And as the hypothesis of "specific centres," thus formulated was heterodox from the theological point of view, and unintelligible under its scientific aspect, it may be passed over without further notice, as a phase of transition from the creational to the evolutionary hypothesis.

The family tradition was carried on by his famous grandson, Sir Julian Huxley (1887–1975), educator, biologist, and creative transformer of the zoo at Regent's Park, London. From his classic treatment of evolution in Britannica's 13th Edition (1926) we have drawn the section dealing with the evidence for evolution.



The topic of evolution is a very wide one. In its broadest sense it denotes little more than gradual change, as is indicated by the common French equivalent *transformisme*. In a somewhat more restricted sense it implies orderly change,



Second edition copy (1860) of Charles Darwin's *On the Origin of Species* (1859).

while certain authors wish to combine it with orderly and progressive change. The two fields, however, in which it is most often applied are those of cosmic and of organic evolution, the former dealing with the development of stars and stellar systems, the latter with the changes undergone by life upon this planet. Here, only the topic of organic evolution will be discussed.

I. General Survey

Organic evolution. There are three quite distinct angles from which the subject can be treated. In the first place, there is the question of the *fact* of evolution: has organic evolution occurred or has it not occurred? Secondly, there is the *method* of evolution: by what mechanism has evolution been brought about? And thirdly, there is the *course* of evolution: granted that it has occurred, what were the main results of the process?

The evidence. The evidences on the first point are well known. They are chiefly drawn from the facts of comparative anatomy, of embryology, of geographical distribution and of palaeontology.

Palaeontology. The last, or the history of life as revealed by actual fossil remains of organisms in the sedimentary rocks, affords the most direct evidence, since we find that many past organisms are now extinct, and that there are frequently to be traced long evolutionary chains, leading up from primitive extinct forms to specialised modern types.

Embryology. That of embryology is, however, equally important. The majority of animals run through, in the course of their development, stages which resemble other organisms. The fact that a fowl or a man passes through a stage in which its organisation is essentially like that of a fish is meaningless, save on the assumption that land vertebrates originally evolved from fish-like, aquatic ancestors.

Distribution of Animals. The distribution of animals and plants over the earth's surface is, further, such that it cannot be explained except by assuming that evolution has occurred. If certain types have had their origins in certain areas, and have then spread thence, the facts are intelligible, but not otherwise. In the same way, the fact that oceanic islands contain but a very limited fauna and flora, and that, in oceanic archipelagoes, the types of animal life are often represented by different species on each different island, is readily explicable on the idea of chance spreading, followed by isolation and consequent evolutionary divergence.

Comparative Anatomy. The evidence from comparative anatomy, though perhaps the most indirect, is equally strong, and was historically the first to attract attention. When we examine a series of, say, vertebrates, we soon perceive that a common general plan runs through them all, in spite of great differences in their various modes of life. The same is true for each particular organ. The hand and arm of man, the foreleg of a dog, the wing of a bird, the flipper of a whale—all these, and indeed the fore-limbs of all terrestrial vertebrates, show the same essential plan, though often much modified to suit the exigencies of the animal's particular mode of life. It must not be supposed that no other general ground-plan can exist: far from it. The insect or the crustacean is built on a wholly different general plan, and the special plan of its limbs is entirely different from that of the vertebrate limb. It is very difficult to explain these facts except on the theory of evolution.

Vestigial Organs. The conclusion is strengthened by the existence of vestigial organs (often called rudimentary organs), which are useless to their possessor, although corresponding (homologous) organs in other species are of service. The vestigial hair on the surface of the human body affords one excellent example, while another is provided by the wholly useless remnants of limbs in various snakes. Often vestigial organs are recapitulatory as well, being better developed in the embryo or young than in the adult (hair and tail of man, teeth of certain whales, etc.).

Natural Selection. The evidences for evolution having taken place were first cogently marshalled by Charles Darwin in the *Origin of Species* (1859). No satisfactory alternative explanation of the data he adduced has ever been advanced,

and the fact of evolution has passed beyond the realm of discussion. Darwin, however, accomplished much more than this. He also advanced a theory as to the method of evolution, and one so reasonable that it could be and is still widely held by scientific men. This was the theory of natural selection. He assumed as a fact the existence of variation, showed the universal presence of a struggle for existence due to the invariable birth of more young than can come to maturity, and then pointed out that this would inevitably lead on the average to the survival of those that were best fitted to survive and so to evolutionary change and progress. By so doing at one stroke he cut the ground from under the feet of those who, like Paley, argued that organic adaptations were evidences of conscious design.

Sexual Selection. He also advanced the subsidiary hypothesis of sexual selection to account for the development of special sexual adornments employed in courtship or display. . . . This theory has been much criticised, but has now, in somewhat modified form, been shown to rest on a firm basis.

Darwin also, in part, adopted the second main theory of the method of evolution, that of Lamarck, by assigning some weight to the direct effect of the environment and to the effects of use and disuse.

Three other main types of hypothesis to account for evolutionary change have also been advanced. The first has been styled Orthogenesis. It is frequently observed by palaeontologists that evolutionary trends in particular directions can be traced in series of fossils. The theory of orthogenesis assumes that the straight course pursued by such evolving types is due not to moulding, direct or indirect, from without, but to inner necessity, the hereditary constitution of the race unfolding and changing according to predetermined laws. Next, there is what may be called the crude theory of mutation, according to which species may enter upon a mutating period, and rapidly throw off a number of new and markedly distinct types, which may often be merely new without being better or worse suited to the environment. Finally, there is the view urged by Lotsy, that new types arise by recombination of characters after crossing. We know that when very distinct types are crossed and are fertile, there is (as demanded by the Mendelian theory) great diversity among their offspring from the second generation onward. Lotsy imagines that very wide crosses may occur, with enormous resultant variation, and that this variation is the sole raw material of evolutionary change. We may call this the recombination hypothesis, since it supposes that evolutionary novelty is due to new combinations of old characteristics. . . .

It cannot be said that the problem is yet by any means solved. In particular, the first origin of variations remains one of the great problems of biology. It would appear, however, that all theories can contribute something of value, although an adjustment of the theory of natural selection to a modified mutation theory will probably account for the majority of the facts.

LEE IACOCCA ON *Walter P. Chrysler*

Lee Iacocca was at the heart of three seminal events in the history of the American automotive industry. He spearheaded the production of the Ford Mustang, one of the most popular sports cars in history, in the 1960s; he produced the controversial Pinto in the 1970s; and then, in the 1980s, he brought Chrysler back from the abyss of bankruptcy, leveraging TV advertising in an unprecedented way for a company president, even becoming a celebrity. His signature TV line became, "If you can find a better car, buy it." He also wrote two articles for Britannica, one on Chrysler and the other on the company's founder, Walter P. Chrysler (1875–1940). The latter is highlighted below.

Courtesy, The Iacocca Foundation



Chrysler was the third of four children of Henry ("Hank") and Anna Marie ("Mary") Chrysler. When he was three, his family moved to Ellis, Kan., where his father, a lifelong railroad engineer, went to work for the Kansas Pacific Railroad (later a division of the Union Pacific Railroad Company).

As a child, Walter Chrysler dreamed of following in his father's footsteps in the railroad business. He developed a passion for machinery that would last his entire life. Although Hank Chrysler was adamant that his son go to college, Walter defied him and began an apprenticeship in a railroad machine shop when he was 17 years old. He spent the next 20 years working his way up the echelons of railroad engineering, developing a reputation for his creative mechanical mind and his tireless enthusiasm. Quoting the poet Walt Whitman, he once said of his work, "To me, every hour of the day and night is an unspeakably perfect miracle."

In 1901, after an engagement of nearly five years, Chrysler married his childhood sweetheart, Della Forker, and they settled in Salt Lake City, Utah, where Chrysler was working for the Denver and Rio Grande Railway (later part of the

Denver and Rio Grande Western Railroad Company). The couple had four children—Thelma, Bernice, Walter, Jr., and Jack. Chrysler enjoyed the itinerant life of the railroad business, and the family moved frequently as he accepted positions of increasing responsibility. He made a name for himself as a master of plant efficiency, culminating in a position as works manager of the American Locomotive Company in Pittsburgh, Pa., at a starting salary of \$8,000 a year.

In 1908 Chrysler bought his first car, the Locomobile. He had fallen in love with the sleek vehicle when he saw it at the Chicago Auto Show, but its \$5,000 price tag was far above his means. He had only \$700 in savings and a family to support, and he did not know how to drive. But, unable to get the car out of his mind, he borrowed \$4,300 to make the purchase and had the car shipped home by rail. Before he even figured out how to drive his new possession, Chrysler spent time studying its mechanical system, taking it apart and putting it back together again, until he knew it through and through.

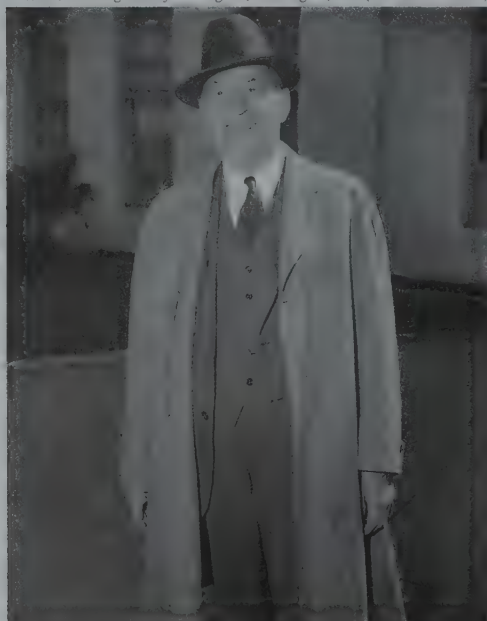
At General Motors

Chrysler did not enter the automobile business until he was 36 years old, when he met Charles Nash, president of General Motors (GM). At the time, Chrysler was earning \$12,000 a year at the American Locomotive Company, but Nash persuaded him to join GM as the manager of the Buick plant in Flint, Mich., for only half that amount. In the years to come, Chrysler would completely revolutionize Buick's manufacturing system, introducing assembly-line processes pioneered by Henry Ford and more than tripling production.

In 1915, when William ("Billy") Durant, the GM founder, returned to run the company, he took note of Chrysler's achievements, and in 1916 he made him president of Buick. Under Chrysler's leadership, Buick became the strongest unit of General Motors and the most successful automobile brand in the country.

Durant and Chrysler were both men of strong personalities, and they were often in conflict, especially over expenditures. Chrysler was a brilliant cost-cutter who had always maintained that keeping the company lean was the secret to building affordable cars. He was famous for having said, "Whenever there is a hard job to be done I assign it to a lazy man; he is sure to find an easy [i.e., efficient] way of doing it." In contrast, Durant was a dreamer who favoured the idea that spending more money could lead to greater growth. In 1919 the two men's different philosophies came to a head over the cost of frame manufacturing. Chrysler wanted to sign a contract with an outside company to supply Buick with its frames, at an estimated savings of close to \$2 million a year. Durant simultaneously announced plans to build a \$6 million Buick frame plant in Flint. Chrysler, unable to stomach such a wild expenditure, resigned from the company.

Harris & Ewing/Library of Congress, Washington, D.C. (LC-DIG-hec-23465)



Walter P. Chrysler at the White House, October 8, 1937.

Although Durant and Chrysler did not see eye-to-eye on business matters, they remained lifelong friends, and Durant dedicated his unfinished autobiography in part to Chrysler.

From Maxwell Motors to Chrysler

Within a year of his resignation from Buick, Chrysler had assumed direction of both Willys-Overland Company and Maxwell Motor Company, Inc. At the time, Maxwell was an ailing company, drowning in debt. Chrysler set about reviving it, introducing the Chrysler Six in January 1924 during the New York Automobile Show. The genius of Chrysler's new car was not only its advanced engine technology and its stylish appearance but

its price: under \$2,000, it was priced for average folk. The low-cost car was a hit with the public, and some 32,000 units were built and sold in a single year. The Chrysler brand was such a success that in 1925 the Maxwell Motor Corporation was reorganized into the Chrysler Corporation.

In 1928 Chrysler purchased Dodge Brothers, Inc., and later that year introduced the first Plymouth model to compete with modestly priced Fords and Chevrolets. The corporation became a major company in the American automotive industry, and Chrysler was named *Time* magazine's 1928 Man of the Year. He was riding high that year, as the Chrysler Corporation entered the top tier of American automaking, alongside General Motors and the Ford Motor Company.

Not content just to build iconic automobiles, Chrysler turned his attention to the erection of an iconic building. Between 1928 and 1930 he supervised the construction of the Chrysler Building, a striking Art Deco skyscraper, 77 stories high, on the corner of Lexington Avenue and 42nd Street in New York City. Until the Empire State Building was completed in 1931, the Chrysler Building was the tallest building in the world. The structure was a separate endeavour from the auto business, designed as a business venture for Chrysler's two sons, who were not interested in joining their father in the car industry.

Chrysler retired as president of his company in 1935, though he stayed on as chairman of the board until his death. In 1937 he published his life story in serial format; these articles were later gathered into an autobiography, *Life of an*

American Workman (1950). Chrysler's life story was as much a story of love as it was of work. As he wrote,

The fun I had experienced in making things as a boy was magnified a hundredfold when I began making things as a man. There is in manufacturing a creative joy that only poets are supposed to know. Some day I'd like to show a poet how it feels to design and build a railroad locomotive.

In 1938 Chrysler suffered a stroke at his home on Long Island, N.Y., and that same year his wife died of a cerebral hemorrhage. Two years later Chrysler suffered a second stroke and died at age 65. He was buried beside his wife in the family mausoleum at the Sleepy Hollow Cemetery, Tarrytown, N.Y.

The Chrysler Airflow, on display at the Chrysler Building, New York, 1937.



F.S. Lincoln/Library of Congress, Washington, D.C. (LC-USZC4-4839)

The Fourth Industrial Revolution

By Klaus Schwab

The Fourth Industrial Revolution heralds a series of social, political, cultural, and economic upheavals that will unfold over the 21st century. Building on the widespread availability of digital technologies that were the result of the Third Industrial, or digital revolution, the Fourth Industrial Revolution will be driven largely by the convergence of digital, biological, and physical innovations.

Like the First Industrial Revolution's steam-powered factories, the Second Industrial Revolution's application of science to mass production and manufacturing, and the Third Industrial Revolution's start into digitization, the Fourth Industrial Revolution's technologies, such as artificial intelligence, genome editing, augmented reality, robotics, and 3-D printing, are rapidly changing the way humans create, exchange, and distribute value. As occurred in the previous revolutions, this will profoundly transform institutions, industries, and individuals. More importantly, this revolution will be guided by the choices that people make today: the world in 50 to 100 years from now will owe a lot of its character to

how we think about, invest in, and deploy these powerful new technologies.

It's important to appreciate that the Fourth Industrial Revolution involves a systemic change across many sectors and aspects of human life: the crosscutting impacts of emerging technologies are even more important than the exciting capabilities they represent. Our ability to edit the building blocks of life has recently been massively expanded by low-cost gene sequencing and techniques such as CRISPR; artificial intelligence is augmenting processes and skill in every industry; neurotechnology is making unprecedented strides in how we can use and influence the brain as the last frontier of human biology; automation is disrupting century-old transport and manufacturing paradigms; and technologies such as blockchain and smart materials are redefining and blurring the boundary between the digital and physical worlds.

The result of all this is societal transformation at a global scale. By affecting the incentives, rules, and norms of economic life, it transforms how we communicate, learn, entertain ourselves, and relate to one another and how we understand ourselves as human beings. Furthermore, the sense that new technologies are being developed and implemented at an increasingly rapid pace has an impact on human identities, communities, and political structures. As a result, our responsibilities to one another, our opportunities for self-realization, and our ability to positively impact the world are intricately tied to and shaped by how we engage with the technologies of the Fourth Industrial Revolution. This revolution is not just happening to us—we are not its victims—but rather we have the opportunity and even responsibility to give it structure and purpose.

As economists Erik Brynjolfsson and Andrew McAfee have pointed out, this revolution could yield greater inequality, particu-



larly in its potential to disrupt labor markets. As automation substitutes for labor across the entire economy, the net displacement of workers by machines might exacerbate the gap between returns to capital and returns to labor. On the other hand, it is also possible that the displacement of workers by technology will, in aggregate, result in a net increase in safe and rewarding jobs.

All previous industrial revolutions have had both positive and negative impacts on different stakeholders. Nations have become wealthier, and technologies have helped pull entire societies out of poverty, but the inability to fairly distribute the resulting benefits or anticipate externalities has resulted in global challenges. By recognizing the risks, whether cybersecurity threats, misinformation on a massive scale through digital media, potential unemployment, or increasing social and income inequality, we can take the steps to align common human values with our technological progress and ensure that the Fourth Industrial Revolution benefits human beings first and foremost.

We cannot foresee at this point which scenario is likely to emerge from this new revolution. However, I am convinced of one thing—that in the future, talent, more than capital, will represent the critical factor of production.

With these fundamental transformations underway today, we have the opportunity to proactively shape the Fourth Industrial Rev-

olution to be both inclusive and human-centered. This revolution is about much more than technology—it is an opportunity to unite global communities, to build sustainable economies, to adapt and modernize governance models, to reduce material and social inequalities, and to commit to values-based leadership of emerging technologies.

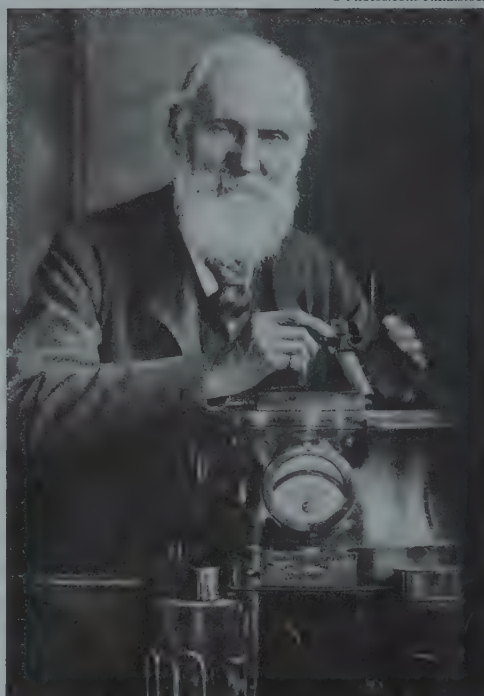
The Fourth Industrial Revolution is therefore not a prediction of the future but a call to action. It is a vision for developing, diffusing, and governing technologies in ways that foster a more empowering, collaborative, and sustainable foundation for social and economic development, built around shared values of the common good, human dignity, and intergenerational stewardship. Realizing this vision will be the core challenge and great responsibility of the next 50 years.

Klaus Schwab is founder and executive chairman of the World Economic Forum, which he began in 1971. The WEF is most famous for its annual meeting in Davos-Klosters, Switzerland, which attracts leading business, government, and civil society leaders from around the world. He holds doctorates in mechanical engineering and economics as well as numerous honorary doctorates. In 1998, with his wife, Hilde, he created the Schwab Foundation for Social Entrepreneurship, which supports more than 350 social entrepreneurs around the world.

LORD KELVIN

ON *Heat*

The age-old puzzle of heat was eventually solved by Sir William Thomson, later Baron Kelvin (1824–1907), the Scottish engineer, mathematician, and physicist who devised the dynamical theory of heat, along with many other substantial scientific discoveries and formulations of the Victorian era. In Britannica's 9th Edition (1875–89) Kelvin handily dispatched the two previously held theories of heat. One was the “subtle elastic fluid” notion, the other that it was an “intestine” or internal commotion in matter.



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From the dawn of science till the close of last century two rival hypotheses had been entertained regarding the nature of heat, each with more or less of plausibility, but neither on any sure experimental basis:—one that heat consisted of a subtle elastic fluid permeating through the pores or interstices among the particles of matter, like water in a sponge; the other that it was an intestine commotion among the particles or molecules of matter. In the year 1799 Davy, in his first published work entitled *An Essay on Heat, Light, and Combinations of Light*, conclusively overthrew the former of these hypotheses, and gave good reason for accepting as true the latter, by his celebrated experiment of converting ice into water by rubbing two pieces of ice together, without communicating any heat from surrounding matter. A few years earlier Rumford had been led to the same conclusion, and had given very convincing evidence of it in his observation of the great amount of heat produced in the process of boring cannon in the military arsenal at Munich, and the experimental investigation on the excitation of heat

by friction with which he followed up that observation. He had not, however, given a perfect logical demonstration of his conclusion, nor even quite a complete experimental basis on which it could be established with absolute certainty. According to the materialistic doctrine it would have been held that the heat excited by the friction was not *generated*, but was *produced*, squeezed out, or let flow out like honey from a broken honeycomb, from those parts of the solid which were cut or broken into small fragments, or rubbed to powder in the frictional process. If this were true, the very small fragments or powder would contain much less heat in them than an equal mass of continuous solid of the same substance as theirs. But unhappily the caloristic doctrine, besides its fundamental hypothesis, which we now know to be wrong, had given an absurd and illogical test for quantity of heat in a body, of which a not altogether innocuous influence still survives in our modern name "specific heat"; and Rumford actually, in trying to disprove the materialistic doctrine, was baffled by this sophism. That is to say, he measured the specific heat or "capacity for heat" of the powder, and he found that the powder took as much heat to warm it to a certain degree as did an equal mass of the continuous solid, and from this he concluded that the powder did not contain less heat than the continuous solid at the same temperature. This conclusion is so obviously unwarranted by the premises that it is difficult to imagine how Rumford could have for a moment put forward the "capacity for heat" experiment as proving it, or could have rested in the conclusion without a real proof, or at least the suggestion of a real proof. All that Rumford's *argument* proved was that the fundamental hypothesis of the "calorists" and their other altogether gratuitous doctrine of equality of "specific heat" as a test for equality of whole quantities of heat in matter could not be both true; and any one not inclined to give up the materialistic hypothesis might have cheerfully abandoned the minor doctrine, and remained unmoved by Rumford's argument. If Rumford had but melted a quantity of the powder (or dissolved it in an acid), and compared the heat which it took with that taken by an equal weight of the continuous solid, he would have had no difficulty in proving that the enormous quantity of heat which he had found to be excited by the friction had not been squeezed, or rubbed, or pounded, out of the solid matter, but was really brought into existence, and therefore could not be a material substance. He might even, without experiment, have pointed out that, if the materialistic doctrine were true, it would follow that sufficiently long-continued pounding of any solid substance by pestle and mortar, whether by hand or by aid of machinery, would convert it into a marvellous powder possessing one or other of two properties about equally marvellous. Either the smallest quantity of it thrown into an acid would constitute a freezing mixture of unlimited intensity,—the longer it had been pounded, the more intense would be its frigorific effect on being dissolved,—or the powder would be

incapable of being warmed by friction, because it had already parted with all the heat which friction could rub out of it.

The real effect of Rumford's argument seems to have been to salve the intellectual consciences of those who were not inclined to give up the materialistic doctrine, and to save them from the trouble of reading through Rumford's paper and thinking for themselves, by which they would have seen that his philosophy was better than his logic, and would inevitably have been forced to agree with him in his conclusion. It is remarkable that Davy's logic, too, was at fault, and on just the same point as Rumford's, but with even more transparently logical fallaciousness, because his argument is put in a more definitely logical form.

MARIE CURIE ON *Radium*

Marie Skłodowska Curie (1867–1934), the Polish-born French chemist and physicist, working with her husband, Pierre, discovered polonium and radium, thus effectively raising the curtain on “radiation,” a word she coined. For their work they received the Nobel Prize for Physics in 1903, and she alone won the Nobel Prize for Chemistry in 1911. Curie discussed her discoveries in the excerpt below, from an article she wrote for These Eventful Years: The Twentieth Century in the Making As Told by Many of Its Makers, published by Britannica in 1924.



Every cultivated person has heard about radium, either in connection with its importance in science, or because of its use in hospitals for the cure of disease. From the chemical point of view, however, radium is what a chemist calls an *element*, that is to say, a substance which cannot be decomposed into simpler constituents by means of chemical analysis. Chemistry knows more than 80 elements (iron, copper, sulphur, etc.). The special significance of radium in nature is due to its property of emitting rays; because of that, it is called a *radioactive element*, a general name for all substances having this property.

The radioactive elements give out a spontaneous emission of rays, by which they may be detected, and it is precisely by its rays that radium was discovered. The discovery could hardly have been made in any other way, because the proportion of radium in the ores is extremely small, less than one part in two million. There may be in the earth inactive elements, in equally minute proportions, which still remain unknown.

This property of spontaneous radiation, called radioactivity, was discovered by H. Becquerel in 1896, in connection with the element *uranium* and its compounds. If some uranium salt is placed on a photographic plate protected from light by an envelope of black paper, on developing the plate we notice a dark spot, produced by uranium rays. There is another way of testing these rays, by their effect on a charged electroscope; in the absence of rays, a charged gold-leaf electroscope, well insulated, retains its charge for more than a day, but if uranium compounds are placed near it, the charge is gradually lost, the gold leaf moves down, and the speed of its motion gives a measure of the intensity of the rays.

In 1898 it was found (Marie Curie, G. Schmidt) that thorium compounds emit a similar kind of radiation, and it was established by an extensive study of all available material (Marie Curie) that the property of emitting did not belong to any known element or its compounds, except those of uranium and thorium. It appeared also that the radioactivity, measured by the electrical method described below, is an *atomic property* of uranium and thorium, the intensity of the rays for any compound being in proportion to its uranium or thorium content.

Discovery of Radium

In extending this study to several minerals, and especially to those of uranium and thorium, I obtained a very unexpected result: These minerals had a stronger radioactivity than could be presumed from the known content of active elements. I thought therefore that there must be in the mineral, some unknown substance far more radioactive than uranium and thorium. Professor Curie and I undertook to find and separate this element by a new chemical method of investigation, in which the analysis is accompanied by electrical measurements of radioactivity for all the products. In this way we are able to follow the concentration of radioactivity, and this corresponds to the concentration of the new radioactive element. We recognised that there were at least two such elements in the pitchblende (uranium ore) from St. Joachimsthal. We called them *polonium* and *radium* (1898). It took years of hard work to complete the discovery by the isolation of pure radium salts, which requires the treatment of great quantities of ore. This was particularly difficult in the precarious conditions arising from the lack of means, of help, and of a convenient laboratory. In fact, the work was done in a kind of abandoned shed, arranged in the most primitive way, without any suitable chemical equipment. In 1902, I finally succeeded in getting the first decigramme of very pure *radium chloride* and determining the atomic weight (226) of the new element radium. Later, I prepared more of this pure salt, and in 1910 I could also separate the metal radium, which is a very difficult operation.

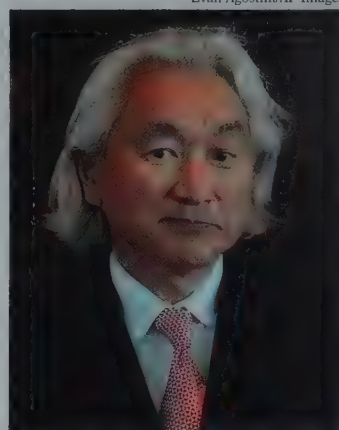
Other radioactive elements (actinium, mesothorium, ionium, etc.) have been discovered by several scientists, using the same method, but none has yet been obtained in a state of purity. Pure radium has proved itself over a million times stronger as a radioactive than uranium. . . .

We see how much we owe to the study of radium and radioactivity. Besides the great benefit to mankind in relief to human suffering, this new knowledge is properly the science of atomic structure. By it, we have learned that some atoms can undergo transformations, and what this transformation is; moreover, we have learned that any atom is composed of a nucleus and of electrons, and the nucleus itself of a few kinds of well-known elements of small atomic weight. When a nucleus breaks up, the news of this atomic event comes to us through the emission of rays, reminding us of the hidden internal energy of this recently perceived world, which is but now opening to our understanding.

MICHIO KAKU ON

Albert Einstein

Britannica's current biography of Albert Einstein was written by Michio Kaku, the renowned theoretical physicist at the City College of New York, a best-selling author, and a well-known popularizer of science. He is a co-founder of string field theory (a branch of string theory) and continues Einstein's search to unite the four fundamental forces of nature into one unified theory. He has appeared frequently on television, written for popular science publications such as Discover, Wired, and New Scientist, been featured in documentaries such as Me & Isaac Newton (1999), and hosted many of his own documentaries and science programs. The final three sections of his biography of Einstein are reproduced below.

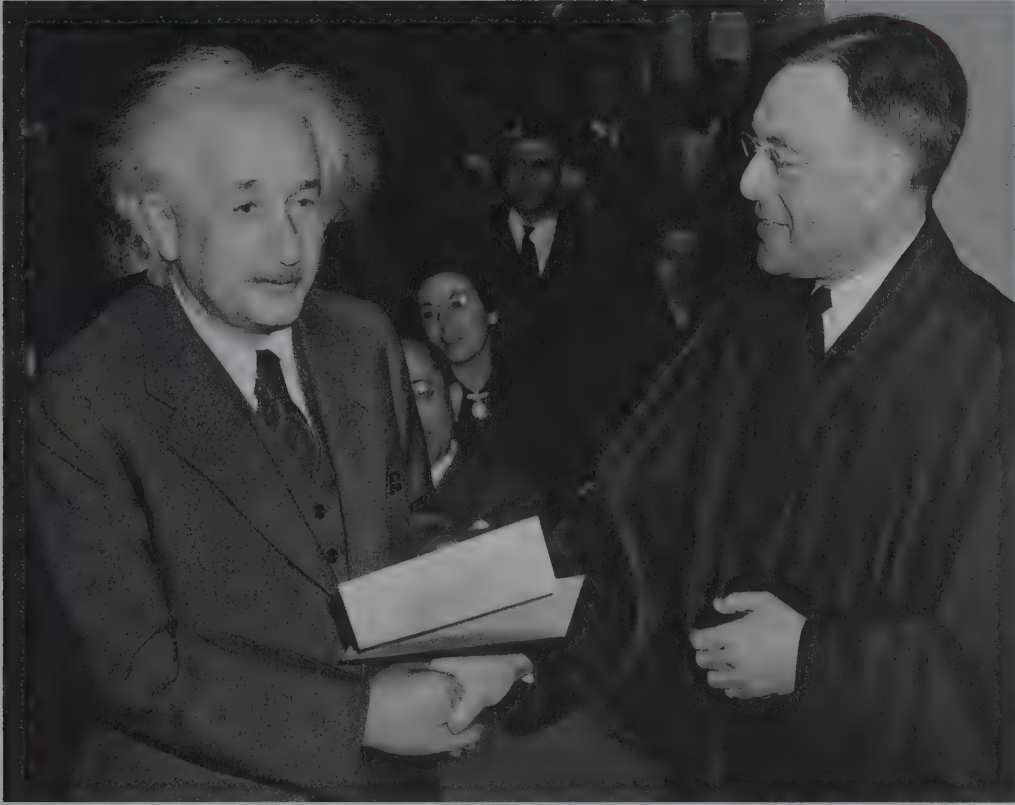


Evan Agostini/AP Images

The 1930s were hard years for Einstein. His son Eduard was diagnosed with schizophrenia and suffered a mental breakdown in 1930. (Eduard would be institutionalized for the rest of his life.) Einstein's close friend, physicist Paul Ehrenfest, who helped in the development of general relativity, committed suicide in 1933. And Einstein's beloved wife, Elsa, died in 1936.

To his horror, during the late 1930s, physicists began seriously to consider whether his equation $E = mc^2$ might make an atomic bomb possible. In 1920 Einstein himself had considered but eventually dismissed the possibility. However, he left it open if a method could be found to magnify the power of the atom. Then in 1938–39 Otto Hahn, Fritz Strassmann, Lise Meitner, and Otto Frisch showed that vast amounts of energy could be unleashed by the splitting of the uranium atom. The news electrified the physics community.

In July 1939 physicist Leo Szilard convinced Einstein that he should send a letter to U.S. President Franklin D. Roosevelt urging him to develop an atomic bomb. With Einstein's guidance, Szilard drafted a letter on August 2 that Einstein signed,



Albert Einstein receiving his certificate of American citizenship from Judge Phillip Forman, October 1, 1940.

and the document was delivered to Roosevelt by one of his economic advisers, Alexander Sachs, on October 11. Roosevelt wrote back on October 19, informing Einstein that he had organized the Uranium Committee to study the issue.

Einstein was granted permanent residency in the United States in 1935 and became an American citizen in 1940, although he chose to retain his Swiss citizenship. During the war Einstein's colleagues were asked to journey to the desert town of Los Alamos, New Mexico, to develop the first atomic bomb for the Manhattan Project. Einstein, the man whose equation had set the whole effort into motion, was never asked to participate. Voluminous declassified Federal Bureau of Investigation (FBI) files, numbering several thousand, reveal the reason: the U.S. government feared Einstein's lifelong association with peace and socialist organizations. (FBI director J. Edgar Hoover went so far as to recommend that Einstein be kept out of America by the Alien Exclusion Act, but he was overruled by the U.S. State Department.) Instead, during the war Einstein was asked to help the U.S. Navy evaluate designs for future weapons systems. Einstein also helped the war effort by auctioning off priceless personal manuscripts. In particular, a

handwritten copy of his 1905 paper on special relativity was sold for \$6.5 million. It is now located in the Library of Congress.

Einstein was on vacation when he heard the news that an atomic bomb had been dropped on Japan. Almost immediately he was part of an international effort to try to bring the atomic bomb under control, forming the Emergency Committee of Atomic Scientists.

The physics community split on the question of whether to build a hydrogen bomb. J. Robert Oppenheimer, the director of the atomic bomb project, was stripped of his security clearance for having suspected leftist associations. Einstein backed Oppenheimer and opposed the development of the hydrogen bomb, instead calling for international controls on the spread of nuclear technology. Einstein also was increasingly drawn to antiwar activities and to advancing the civil rights of African Americans.

In 1952 David Ben-Gurion, Israel's premier, offered Einstein the post of president of Israel. Einstein, a prominent figure in the Zionist movement, respectfully declined.

Increasing Professional Isolation and Death

Although Einstein continued to pioneer many key developments in the theory of general relativity—such as wormholes, higher dimensions, the possibility of time travel, the existence of black holes, and the creation of the universe—he was increasingly isolated from the rest of the physics community. Because of the huge strides made by quantum theory in unraveling the secrets of atoms and molecules, the majority of physicists were working on the quantum theory, not relativity. In fact, Einstein would engage in a series of historic private debates with Niels Bohr, originator of the Bohr atomic model. Through a series of sophisticated “thought experiments,” Einstein tried to find logical inconsistencies in the quantum theory, particularly its lack of a deterministic mechanism. Einstein would often say that “God does not play dice with the universe.”

In 1935 Einstein's most celebrated attack on the quantum theory led to the EPR (Einstein-Podolsky-Rosen) thought experiment. According to quantum theory, under certain circumstances two electrons separated by huge distances would have their properties linked, as if by an umbilical cord. Under these circumstances, if the properties of the first electron were measured, the state of the second electron would be known instantly—faster than the speed of light. This conclusion, Einstein claimed, clearly violated relativity. (Experiments conducted since then have confirmed that the quantum theory, rather than Einstein, was correct about the EPR experiment. In essence, what Einstein had actually shown was that quantum mechanics is nonlocal; i.e., random information can travel faster than

light. This does not violate relativity, because the information is random and therefore useless.)

The other reason for Einstein's increasing detachment from his colleagues was his obsession, beginning in 1925, with discovering a unified field theory—an all-embracing theory that would unify the forces of the universe, and thereby the laws of physics, into one framework. In his later years he stopped opposing the quantum theory and tried to incorporate it, along with light and gravity, into a larger unified field theory. Gradually Einstein became set in his ways. He rarely traveled far and confined himself to long walks around Princeton with close associates, whom he engaged in deep conversations about politics, religion, physics, and his unified field theory. In 1950 he published an article on his theory in *Scientific American*, but because it neglected the still-mysterious strong force, it was necessarily incomplete. When he died five years later of an aortic aneurysm, it was still unfinished.

Assessment

In some sense, Einstein, instead of being a relic, may have been too far ahead of his time. The strong force, a major piece of any unified field theory, was still a total mystery in Einstein's lifetime. Only in the 1970s and '80s did physicists begin to unravel the secret of the strong force with the quark model. Nevertheless, Einstein's work continues to win Nobel Prizes for succeeding physicists. In 1993 a Nobel Prize was awarded to the discoverers of gravitation waves, predicted by Einstein. In 1995 a Nobel Prize was awarded to the discoverers of Bose-Einstein condensates (a new form of matter that can occur at extremely low temperatures). Known black holes now number in the thousands. New generations of space satellites have continued to verify the cosmology of Einstein. And many leading physicists are trying to finish Einstein's ultimate dream of a "theory of everything."

NEIL DEGRASSE TYSON ON

Bringing Science to the Masses

*American astrophysicist Neil deGrasse Tyson has been one of the most popular popularizers of science in recent years. As part of his mission “to bring science down to Earth,” he did two things in 2014: he served as host of the TV miniseries *Cosmos: A Spacetime Odyssey*, a continuation of Carl Sagan’s 1980 documentary series *Cosmos*; and second, he wrote the following essay for the *Britannica Book of the Year*. In his article reproduced below, he divides people into three types: those who like science, those who do not know they like science, and those who are convinced they do not like it. It is important, he argues, to reach all three groups, and pop culture and the novel new methods of communicating can be useful tools in this mission to bring science to the masses.*

Richard Drew/AP Images



Most people will agree that nowhere in society, except in a lecture hall, is a lecture the preferred mode of communication between people. Therein is the challenge of academic professionals who may wish to share their expertise with people who are not formally students. If you do not teach on a college campus, you cannot require others to come to you or even to meet halfway. You must learn the ways of the public, just as an anthropologist studies a tribe. Only then can you navigate the obstacles that disrupt a person’s mental learning pathways or figure out how to remove those obstructions entirely.

The urge is strong for an academic scientist to speak to the public with the same level of precision and lexicon that one would speak with colleagues, but this approach can thoroughly alienate an audience. . . .

The public’s appetite for learning tends to divide cleanly into three groups: (1) those who know that they like science, (2) those who do not know that they like science, and (3) those who know that they do not like science. The methods, tools,

and tactics of communication vary from group to group. This task is easier for scientists, however, than one might expect, because science—all branches of it—exists all around us, all the time. So the cultural and physical world serves as a fertile landscape of relevance in all efforts to communicate science.

Those Who Know that They Like Science

This demographic learned science in school and enjoyed it. No matter their profession as adults, they continue to consume scientific discovery through all manner of media that supply it. Their sources of information have traditionally included radio, TV, film, magazines, newspapers, public talks, and book signings but in modern times may also encompass Twitter, Facebook, podcasts, and the blogosphere.

People in this demographic will even use one medium's access to science to supplement another. Twitter, for example, with its 140-character limit per morsel of communication, is best used to provide links and pointers to other, more-substantial sources that serve the subject of the tweet. This community will seek out and embrace the academic scientist who writes books or appears as a talking head in a documentary or newscast. The leading example of this is the Facebook page "I F*%king Love Science," an aggregator of intriguing science articles, images, and videos across the Internet that as of 2014 has attracted some 20 million subscribers.

Those Who Do Not Know that They Like Science

This community is simply unaware and indifferent to science. Science was just another class taken in school, like any other, and since they are no longer in school, they no longer have to think about it. Nor do they fully know or see why science matters to their lives. This community will not tune in to the science channels on television. They will not download science podcasts. They will not buy books or read articles on science. Life has enough distractions in it, including—especially—all forms of entertainment. For this demographic, the task

Bill Nye in the Netflix series Bill Nye Saves the World.



"Bill Nye Saves the World," A Netflix Original Series; Artwork © 2017 Netflix, Inc. All Rights Reserved.

of the educator is to extract from one's field of expertise that which makes people want to learn more—all that is fun, interesting, or “cool.” As a first pass, one can access this knowledge by watching what stories are being covered by newspapers, magazines, and the evening news. These outlets serve as ready-made pop-science interest filters.

Health-related subjects often trigger popular interest. In 2000 the Human Genome Project was declared complete and was the lead story everywhere, including the *New York Times*. More recently, other branches of science have been making headlines. When the long-sought Higgs boson was discovered in 2012 at the European Organization for Nuclear Research (CERN) in Switzerland, the story also appeared on the front page of the *New York Times*. The same was true in 2013 when NASA announced that the Voyager 1 space probe, launched in 1977, had finally exited the solar system.

For more-nuanced access, I continually make note of the facial expressions and comments of people I speak with about my expertise. Are they bored or bright-eyed? Fuzzy or focused? Indifferent or intrigued? The medium of Twitter is a way to achieve the same goal, but by reaching many more people at one time, I monitor my stream to determine which tweets draw commentary, further questions, or even apathy. In the field of astrophysics, we know from this kind of experience that the origin of the universe is more interesting to the public than the origin of Earth. The search for planets is more intriguing than the search for comets. Stellar explosions are more compelling than stellar atmospheres. The search for intelligent life is more engaging than the search for microbial life. This topic-filter reliably opens communication channels that were not previously explored.

Those Who Know that They Do Not Like Science

The resentment of science can come from several directions. Often it is simply a bad experience with a science teacher in school. At other times, a person's capacity to evaluate objective scientific truths has been hijacked by prevailing political or cultural philosophies. Many new-age philosophies, as well as elements of post-modernist philosophy, assert that science is no better than any other way of knowing the physical universe. Meanwhile, fundamentalist religions of all denominations tend to find themselves perennially at odds with basic understandings of the natural and physical world. A growing segment of the population has come to mistrust science—ascribing the worst of all human motives to the conduct of scientists in their work, including greed, deception, bias, deceit, and jealousy. Another force in play is the “backfire effect,” in which telling people that they are wrong in their beliefs—and even showing them evidence contrary to their thinking—can lead to an even-more-ossified hold on their belief system than before. . . .

Specially seeded acts of personal discovery can chip away at this “inviolable” state of mind. This approach, at its best, entertains people, provides a new place to view the world, and empowers them to arrive at their own conclusions. A good sound bite serves some of this need with a few sentences that simultaneously are true, provoke a smile, convey tasty information, and create an urge to tell others. For example, in describing black holes, a bad sound bite would be: “They’re a region of space surrounding a singularity, within which the fabric of space-time has collapsed in on itself.” Although this is fun to listen to and even intriguing, it is not memorable. An okay sound bite might be: “They are the gravitational collapse of high mass stars. They create a hole in the fabric of space-time that not even light escapes.” A bit jargonny but entertainingly mysterious. A better sound bite would be: “They’re how high-mass stars die. Avoid them at all cost. Not even light can escape their gravitational embrace. If you fall in, their intense gravity will stretch you head-to-toe, ripping apart your body, atom by atom.” The best sound bite engages the audience, in part, by including each listener in the answer itself.

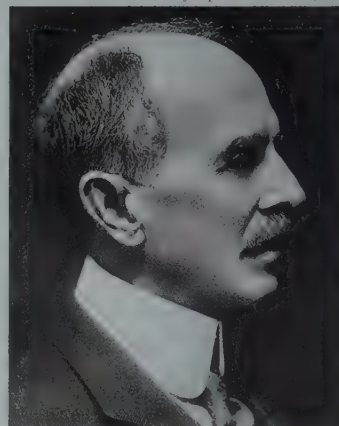
The value of scientific information is further enhanced when juxtaposed or interwoven with pop-culture references. This fact is especially true for those who reject science. In a simple but clear example: during the second half of the 2013 Super Bowl, played in New Orleans’s Superdome, the lights mysteriously went dark in the stadium. I had been tweeting the physics of American football during the game. But during the darkness, I decided to tweet lightbulb-inspired information about how much power a human generates (about 100 W). That posting received about 3,500 retweets (a direct measure of a posting’s popularity). Meanwhile, the pop-music icon Beyoncé had delivered a high-energy halftime performance of singing and dancing. So I followed the first tweet with: “Beyoncé radiates about 500 watts, is my guess. But to be certain, I’d have to run a special calculation just for her.” That tweet, to precisely the same audience, within minutes of the first, instead triggered 5,200 retweets.

With these easily relatable approaches, people become empowered to embrace science fluency on their own. Nobody is preaching. Nobody is telling you what to believe or think. People begin to see that science is not just a class they took in school to be forgotten thereafter. Science is a way to learn how the world works: not only from its abstract laws and concepts but also from our lives—at home, at work, and at play.

ORVILLE WRIGHT ON *Wilbur Wright*

For its new 14th Edition in 1929, Britannica sought a biography of that pioneering 20th-century Daedalus, Wilbur Wright. To write the piece Britannica tapped Wilbur's comrade of the skies, his brother, Orville. Written with charming modesty, the piece is a legendary example of fraternal biography.

Encyclopædia Britannica, Inc.



Wright, Wilbur (1867–1912), American inventor, son of Milton and Susan Catharine (Koerner) Wright, was born near Millville, Ind., on April 16, 1867. When Wilbur Wright was one month old his father was elected editor of the official organ of the Church of the United Brethren in Christ, necessitating moving his family to Dayton, O.; and eight years later he was elected a bishop of that denomination requiring other changes of residence. As a result Wilbur Wright received his education in the public schools of Dayton, Ohio, Richmond, Indiana, and Cedar Rapids, Iowa. Just when he was expecting to enter college, an accident, while playing in a game of ice hockey, disabled him for some six or eight years for active work. These years of poor health he devoted to the care of his invalid mother and to assisting his father in legal matters connected with the church. In 1890 he joined his brother, Orville, who was publishing a small weekly newspaper.

Experiments in gliding. Reading of the experiments of Otto Lilienthal in Germany, Wilbur and his brother became intensely interested in gliding as a sport. Lilienthal's experiments were suddenly ended in 1896 by his death, resulting from an accident due to insufficient control of the equilibrium of his glider. Lilienthal had balanced his machine by shifting the weight of his body. The brothers, believing this method incapable of expansion to meet the requirements of flight, set about to develop a more effective system. They developed a system in which the centre of gravity remained constant and the equilibrium was maintained by varying the air pressures on different parts of the machine through adjustments of the

angles of the wings and auxiliary surfaces. This system, patented by them, is now generally known as aileron control.

Although Wilbur and his brother had taken up aeronautics merely as a sport, their chief interest soon turned to its more scientific aspects. Having found in their experiments that the existing scientific data was almost altogether untrustworthy, they cast it all aside and began investigations of their own, using methods which avoided many of the errors in the work of their predecessors. In 1901 they set up a small wind tunnel in their work-shop at Dayton in which they made measurements of the lift and drag of a great number of different-shaped aerofoils at angles from zero to 45 degrees. The results derived from this tunnel so stimulated their interest that often they worked into the early hours of the morning. Measurements also were made to determine the position of the centre of pressure on cambered surfaces and to determine the effect on the lift and drag when one surface was placed above another or when one surface followed another.

The first motor-driven aeroplane. With this mass of data in their possession they thought it now possible to predict from calculation the performance of a flying machine; they thought they could design a machine which would require not over one-half to one-fourth of the power that would have been necessary for any of the earlier proposed machines. Accordingly in Oct. 1902, they began the design of a motor-driven aeroplane. When completed the machine including the pilot weighed 750 lb. and was propelled by a four cylinder petrol motor of 12 horse power. Tested at Kitty Hawk, N.C., on Dec. 17, 1903, the machine carrying a man made four sustained free flights. The longest of these had a duration of 59 seconds and a speed of 30 m. an hour. This machine is now exhibited in the Science museum at South Kensington, London.

The Wright brothers with their second airplane, the Flyer II, on Huffman Prairie, near Dayton, Ohio, 1904.

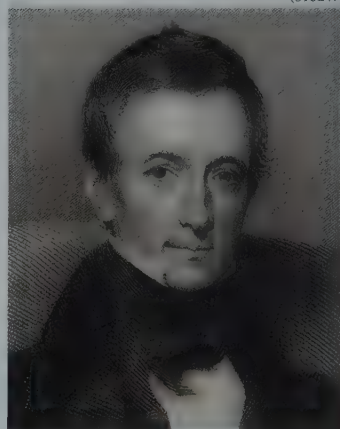


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PETER MARK ROGET ON *Cranioscopy*

Measuring the heads of strangers with weirdly shaped noggins? Inciting street fights among boys just to study their behavior? All in a day's work for the eccentric Dr. Franz Joseph Gall (1758–1828), as Britannica explained in the Supplement (1815–24) to its 4th, 5th, and 6th editions. This Viennese physician had correctly determined that different parts of the brain were responsible for different human functions—and he was the first to associate the gray matter of brains with active tissue (neurons) and the white matter with conducting tissue (ganglia)—but he was wrong in concluding that these different sections had “organs” that could be felt on the skull or that personality traits and mental and moral faculties could be determined (and even predicted) by the shape of one's head. Britannica, to its credit, as seen in its extensive coverage of “Cranioscopy” excerpted below, dismissed this pseudoscience as quackery. Nonetheless, these errant beliefs caught on and gave rise to a cultish school of inquiry that Gall's followers called “phrenology,” which flourished throughout the 19th century, and to the very strange research methods described below. Equally interesting is the author of Britannica's entry: Peter Mark Roget (1779–1869), the great physician and philologist known for the world-famous thesaurus that bears his name. Roget did little to mask his contempt for the intellectual buffoonery he addressed for Britannica.

The New York Public Library; The Miriam and Ira D. Wallach Division of Art, Prints and Photographs (510d47)



Cranioscopy, or the inspection of the cranium, is a term recently invented to express the study of the external form of the skull in men and animals, with the view of ascertaining the form, size, and respective functions of the subjacent parts of the brain, and of deriving from thence indications relative to the natural dispositions, propensities, and intellectual powers of each individual. This science, whether founded on a real or imaginary basis, may be said to have originated with

Dr Gall, a physician of Vienna, whose system, matured in conjunction with Dr Spurzheim, has of late attracted so much attention, and been so keenly discussed both here and on the Continent, that we think it our duty to present our readers with a general outline of its doctrines. . . .

In the pursuit of this speculation, no one has engaged with more ardour and perseverance than Dr Gall, who, after many years of patient labour, and much fruitless wandering in search of the truth, conceives that he has at last discovered the clue which is to conduct us through the mazes of this labyrinth, and enable us to arrive at a more accurate knowledge of human nature, and the means which may conduce to its perfection. The account which he gives of the circumstances that gradually drew his attention to the subject, and of his progress in this new path of discovery, is as follows: Brought up in the midst of a numerous family, and naturally gifted with the talent for observation, he was struck, even when a boy, with the diversities of disposition and of character among his brothers and sisters, and the companions with whom he was educated. He remarked that each excelled in a particular study, or was distinguished by a peculiar turn of mind. One was noted for the beauty of his handwriting; another for his quickness at arithmetic; a third for his aptitude in learning languages; a fourth for remembering every thing that he read in history. This diversity was apparent in all that they did; thus the style of composition of the one was remarkable for its flowing and elegant periods; of another for its baldness and dryness; of a third for its condensation and vigour. Many displayed talents for arts which had never been taught them; they excelled, perhaps, in drawing, or in the execution of works of mechanism; some sought for amusement in noisy sports, others preferred cultivating their gardens; a few placed their chief delight in rambling through fields and forests, and in collecting birds, insects, and flowers. One was of a social and affectionate disposition, another was selfish and reserved; a third was fickle, and not to be depended upon. The great facility with which some of his school-fellows could commit their tasks to memory, which to him was a work of immense labour, although in matters of reasoning and judgment he felt himself their superior, often proved a grievous source of mortification, and excited in him a strong desire to know the cause of this difference. . . .

Whence, he [Dr. Gall] would ask himself, can arise the wide diversity of character and talent among individuals?

The solution of this difficult question was not to be hoped for, unless by means of observations conducted on the largest possible scale. He therefore set about examining all the skulls he could lay hold of, that had belonged to individuals whose history was known. He looked out for all persons in any way distinguished for a particular talent or moral quality. He examined their heads with great attention, and noted the peculiarities in their shape. He also collected observations on other individuals, who were remarkable for the weakness of any

faculty, and then compared together the positive and negative indications. On the other hand, when he chanced to meet with a head that presented some singularity of shape, he was at much pains to obtain information as to the moral and intellectual character of the person to whom it belonged. . . . We are also told, that he was in the habit of collecting around him boys he met in Vienna, and of inducing them, by petty bribes, to confess their own faults, and betray those of their companions. He excited them, for instance, to fight together, in order to discover which possessed most courage, and thence drew inferences as to the organ which prompted that sentiment. In order to obtain more precise data for his conclusions, he endeavoured to procure models of the more remarkable heads that he met with, and generally got permission from the individuals themselves to take a cast of their heads in plaster of Paris. . . . If he happened to hear of the death of any one whose head he had already moulded, he was at great pains to procure his skull, that he might compare the form of its different parts with the shape of the head during life. As it was soon known that the doctor aimed chiefly at those who possessed some remarkable talent, a very general alarm spread itself among the inhabitants of Vienna; and not a few were pursued with the terror of being selected as the subjects of cranioscopical investigation, and of their skulls being destined, to make a figure in his anatomical cabinet. . . .

The discerning reader may already have perceived strong indications of this bias in the framers of the system of cranioscropy, from the account we have already given of its origin and history, and of the kind of evidence on which they pretend to establish its doctrines. In order, however, to enable him to form a correct idea of the species of logic which they are in the habit of employing, and which they deem conclusive, and of the tone of mind with which they prosecute the investigation of subjects where nothing but the exercise of consummate prudence can secure us from error, we shall conclude by offering one or two specimens of their mode of reasoning. . . . We shall refrain from criticising the wonderful accounts of people who were insane on one side of the head only, and observed their insanity with the other side; and of others who heard angels sing, and devils roar, only on one side; nor stop to investigate the curious case of the woman who declared in a court of justice, when accused of having destroyed her infant, that her sole motive for becoming pregnant was that she might enjoy the exquisite pleasure of killing her child. Neither shall we venture to involve ourselves in that metaphysical labyrinth of the *thirty-three special faculties* into which they have analyzed the human soul; but content ourselves with examining what in fact alone deserves examination, the sort of evidence brought forward to establish the relation between each faculty and a particular defined portion of the brain. . . .

In order to render intelligible the latter part of his argument, the reader should be informed that Drs Gall and Spurzheim believe, that when any faculty of the

mind is strongly excited, the action of the corresponding organ in the brain tends to raise that part of the head in which it is situated: so that the person has a propensity to lay his finger upon the nearest external part of the head; or sometimes to apply his hand to it, either to cool it when too hot, or to warm it when too cold: and that he is occasionally prompted to rub it in order to excite it when too sluggish. Thus, when we endeavour to recollect a name or a word, we unconsciously slap our foreheads, or rub the skin a little above the eyes, or perhaps higher still, just where the appropriate organ of memory is situated, that it may awake and exercise its peculiar faculty. When embarrassed by any difficulty, we gently stimulate, in like manner, the organ of contrivance, by scratching the head at the part under which is the seat of *constructiveness*. The timid man scratches his head on the organ of courage behind his ear, as if he tried to rouse the feeble organ into activity. A proud man holds his head erect upon his shoulders, and raises himself upon his toes, for no other reason than because the organ of the sentiment lies at the very top of his head, and is therefore elevated by the action. A sense of danger, or the necessity of *circumspection*, leads all animals, man not excepted, to stretch their necks forwards horizontally, thus presenting the broad extent of that organ, as it were in front. Devotion raises the head gently; and our adorations are all directed upwards, not because we regard the Deity as above, but because the organ of adoration is situated in the centre of the upper part of the head. When busied in deep contemplation, we cover the whole forehead with our hands, as it is there that the reflecting faculties are lodged: and, accordingly, when we reproach any one for his want of reflection, we put our hand to this part of the head; and exclaim, "he wants it here." If we try to recollect a date, we put into action the organ of time, which being situated over the eyebrows, and a little to one side, occasions an involuntary movement of the eyes upwards and towards the temples. In beating time to a musical air, we make the head oscillate from side to side, because the organs of tone as well as of time, being situated on each side, and being alternately in action, occasion these gesticulations. Sterne excelled in wit: and we find him represented in all his portraits with his head leaning on his hand, the fore-finger of which is placed on a particular part of the forehead. Dr Spurzheim considers this as one of the proofs that the organ of wit occupies that very spot.

With minds capable of allowing any weight to such observations, and imbued with such notions of the nature of philosophical induction, as are implied by the grave admission of such frivolous arguments as these, the investigation of the laws of nature must be an easy and delightful task. With the abundant and all powerful resources, which their indulgent method of reasoning is ever ready to supply, all difficulties may be smoothed away, all chasms immediately filled up, and all obstacles made to vanish the moment they arise.

T. H. HUXLEY ON *Biology*

Although his formal education occurred between the ages of 8 and 10, plus four or five years at medical school, T.H. Huxley (Thomas Henry, 1825–95) displayed outstanding scholarship and research abilities on a Royal Navy exploratory expedition to the South Seas in his early 20s and soon was recognized as one of the world's pre-eminent biologists. He was made a fellow of the Royal Society at the tender age of 26. Upon publication of Darwin's *On the Origin of Species* (1859), Huxley became perhaps the staunchest supporter of Darwin's theories of evolution, earning the moniker "Darwin's bulldog." He was also a multiple contributor to *Britannica*. Among the many articles he wrote for *Britannica's* 9th Edition (1875–89) was "Biology," which includes a discussion of evolution in which Huxley bears his bulldog teeth.

An interesting sidenote: Writing for *Britannica* became a family tradition. Huxley's grandson, biologist Sir Julian Huxley, wrote *Britannica's* 13th Edition coverage of evolution in 1926, and Julian's brother, novelist and critic Aldous Huxley, addressed the topic of space travel for *Britannica* in 1963; extracts from both of these articles are also highlighted in this volume.



U.S. National Library of Medicine (B011455)

The broad distinctions which, as a matter of fact, exist between every known form of living substance and every other component of the material world, justify the separation of the biological sciences from all others. But it must not be supposed that the differences between living and not-living matter are such as to justify the assumption that the forces at work in the one are different from those

which are to be met with in the other. Considered apart from the phenomena of consciousness, the phenomena of life are all dependent upon the working of the same physical and chemical forces as those which are active in the rest of the world. It may be convenient to use the terms "vitality" and "vital force" to denote the causes of certain great groups of natural operations, as we employ the names of "electricity" and "electrical force" to denote others; but it ceases to be proper to do so, if such a name implies the absurd assumption that "electricity" and "vitality" are entities playing the part of efficient causes of electrical or vital phenomena. A mass of living protoplasm is simply a molecular machine of great complexity, the total results of the working of which, or its vital phenomena, depend,—on the one hand, upon its construction, and, on the other, upon the energy supplied to it; and to speak of "vitality" as anything but the name of a series of operations is as if one should talk of the "horology" of a clock. . . .

Of the causes which have led to the origination of living matter, then, it may be said that we know absolutely nothing. But postulating the existence of living matter endowed with that power of hereditary transmission, and with that tendency to vary which is found in all such matter, Mr Darwin has shown good reasons for believing that the interaction between living matter and surrounding conditions, which results in the survival of the fittest, is sufficient to account for the gradual evolution of plants and animals from their simplest to their most complicated forms, and for the known phenomena of Morphology, Physiology, and Distribution.

Mr Darwin has further endeavoured to give a physical explanation of hereditary transmission by his hypothesis of Pangenesis; while he seeks for the principal, if not the only, cause of variation in the influence of changing conditions.

It is on this point that the chief divergence exists among those who accept the doctrine of Evolution in its general outlines. Three views may be taken of the causes of variation:—

a. In virtue of its molecular structure, the organism may tend to vary. This variability may either be indefinite, or may be limited to certain directions by intrinsic conditions. In the former case, the result of the struggle for existence would be the survival of the fittest among an indefinite number of varieties; in the latter case, it would be the survival of the fittest among a certain set of varieties, the nature and number of which would be predetermined by the molecular structure of the organism.

b. The organism may have no intrinsic tendency to vary, but variation may be brought about by the influence of conditions external to it. And in this case also, the variability induced may be either indefinite or defined by intrinsic limitation.

c. The two former cases may be combined, and variation may to some extent depend upon intrinsic, and to some extent upon extrinsic, conditions.

At present it can hardly be said that such evidence as would justify the positive adoption of any one of these views exists.

If all living beings have come into existence by the gradual modification, through a long series of generations, of a primordial living matter, the phenomena of embryonic development ought to be explicable as particular cases of the general law of hereditary transmission. On this view, a tadpole is first a fish, and then a tailed amphibian, provided with both gills and lungs, before it becomes a frog, because the frog was the last term in a series of modifications whereby some ancient fish became an urodele amphibian; and the urodele amphibian became an anurous amphibian. In fact, the development of the embryo is a recapitulation of the ancestral history of the species.

If this be so, it follows that the development of any organism should furnish the key to its ancestral history; and the attempt to decipher the full pedigree of organisms from so much of the family history as is recorded in their development has given rise to a special branch of biological speculation, termed *phylogeny*.

In practice, however, the reconstruction of the pedigree of a group from the developmental history of its existing members is fraught with difficulties. It is highly probable that the series of developmental stages of the individual organism never presents more than an abbreviated and condensed summary of ancestral conditions; while this summary is often strangely modified by variation and adaptation to conditions; and it must be confessed that, in most cases, we can do little better than guess what is genuine recapitulation of ancestral forms, and what is the effect of comparatively late adaptation.

The only perfectly safe foundation for the doctrine of Evolution lies in the historical, or rather archaeological, evidence that particular organisms have arisen by the gradual modification of their predecessors, which is furnished by fossil remains. That evidence is daily increasing in amount and in weight; and it is to be hoped that the comparison of the actual pedigree of these organisms with the phenomena of their development may furnish some criterion by which the validity of phylogenetic conclusions, deduced from the facts of embryology alone, may be satisfactorily tested.

VLADIMIR ZWORYKIN ON *Television*

The experiments with wireless television to which Guglielmo Marconi alluded in Britannica's 13th Edition (1926), an article ("Telegraphs to Television") also highlighted in this volume, had made enough progress just a few years later to justify a stand-alone article entitled "Television" in Britannica's 14th Edition (1929). The latter would be updated annually over the years that followed, reflecting the steady progress made and obstacles that remained in the effort to transmit and receive images. By 1948 so much progress had been made that a whole new article was necessary, and the author of the piece was the man who had invented both the transmission tube (iconoscope) and the television receiver (kinescope) that enabled television, once and for all, to work entirely by electronics. The famed inventor and contributor was Vladimir Zworykin (1889–1982), director of research at the Radio Corporation of America. Extracts from his 1948 article on "Television" follow.

Underwood Archives/age fotostock



Television pioneer Vladimir Zworykin at the Westinghouse Research Laboratories, 1929.

Essentially three steps are involved in television, namely: (1) the analysis of the light image into electrical signals; (2) the transmission of the electrical signals to the points of reception; and (3) the synthesis of a visible reproduction of the original image from the electrical signals. . . .

As early as 1905 Boris Rosing proposed the use of a Braun cathode-ray tube as a means of reconstructing television images, and demonstrated by experiment

that this was feasible. In 1911 Campbell-Swinton suggested a special cathode-ray tube which would function as an image pick-up device. The proposed tube was of theoretical interest only and was never reduced to practice. It was not until the early 1920s that electronic pick-up tubes were actually shown to be operative. The first electronic device of this type was the iconoscope, invented by V. K. Zworykin in 1923. This was followed in 1928 by a totally different form of pick-up tube, termed a dissector tube, invented by P. T. Farnsworth.

Television developed rapidly under the impetus given it by the new electronic pick-up and viewing devices. By the latter part of the 1930s, just before World War II, regular programs were being broadcast, under commercial licence, from New York City and Schenectady, N. Y., Philadelphia, Pa., Chicago, Ill., and San Francisco, Calif., in the United States; in England by the BBC from London, and also from a number of points in continental Europe. In the United States and England many thousand home receivers were in private hands and were in regular use receiving these programs. Program material included: sporting events, such as the outdoor pick-up of football, baseball and tennis, and indoor pick-up of boxing, wrestling and hockey, news events, studio production of plays, dance recitals, musical shows and



The "Octagon" television set by General Electric, 1928.

general entertainment features as well as moving-picture film programs.

During the war years, 1940–45, commercial television activities were drastically curtailed. However, research in the field of television continued because of its potential military value. As a result of this work, television emerged from World War II with many important improvements which have been applied to television broadcasting to make possible a greater range of subject material, and better reproduced images. . . .

The problem of analyzing a picture into information suitable for electrical



An early Italian television, c. 1929–32.



An early television set by Western Television Corp., 1931.

transmission and later resynthesis does not have a unique solution. However, the process known as scanning is the only one which by 1946 had proved to be satisfactory, and is the only one that will be discussed in this article.

The process of scanning is that of exploring the image area by means of a sensitive analyzing element which moves in a continuous or discontinuous line covering the entire surface of the picture. In general the size of the sensitive exploring element is equal to or smaller than a picture element. The analyzing element generates either directly or indirectly an electrical signal which corresponds to the brightness of the area of the image at which it is located. As the analyzing element traces out the scanning pattern over the surface of the picture the electrical signal varies, forming a characteristic complex wave known as the video signal.

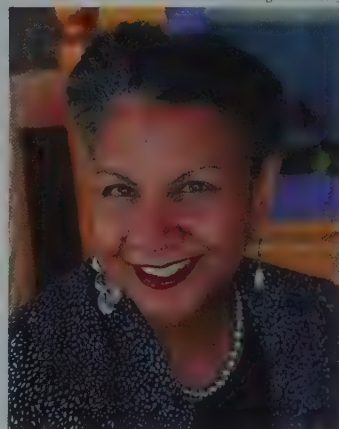
At the picture reproducer or receiver the reproducing element moves over the viewing area in a scanning pattern which is geometrically similar to that at the transmitter. The brightness or its equivalent (i.e., optical transmission, reflectivity, etc.) of the reproducing element is a monotonic function of the instantaneous amplitude of the video signal. The motion of this element is so synchronized with that of the exploring element that when

instantaneous amplitude of the video signal associated with a particular point in the picture being transmitted reaches it, the reproducing element is at the corresponding point of the viewing area. Therefore a reproduction of the picture being transmitted is formed on the viewing area of the receiver.

A'LELIA BUNDLES ON *Madam C. J. Walker*

Madam C. J. Walker was a pioneering but little-remembered entrepreneur and philanthropist who is generally acknowledged to be the first black female millionaire in the United States. The author of Britannica's biography of Walker, reproduced below, is actually a great-great-granddaughter of Walker. A network television news executive for 30 years (for NBC and ABC), A'Lelia Bundles chairs the board of the National Archives Foundation, is vice chairman of Columbia University's Board of Trustees, and is a member of the advisory boards of the Schlesinger Library on the History of Women in America at Harvard's Radcliffe Institute for Advanced Study and of the March on Washington Film Festival. She is also founder of the Madam Walker Family Archives.

Joanna Eldredge Morrissey



Madam C. J. Walker, née Sarah Breedlove (b. Dec. 23, 1867, Delta, Louisiana, U.S.—d. May 25, 1919, Irvington, N.Y.), was a businesswoman and philanthropist generally acknowledged to be the first black female millionaire in the United States.

Sarah Breedlove was born on the same cotton plantation where her parents, Owen and Minerva Anderson Breedlove, had been enslaved before the Civil War. The first child in her family born after the Emancipation Proclamation, she was orphaned at age seven. She married Moses McWilliams at 14, she said, to escape the abuse of a “cruel” brother-in-law. A widow at 20 with a young daughter, she moved to St. Louis, Missouri, where her older brothers were barbers.

She worked as a poorly paid washerwoman for more than a decade and joined St. Paul African Methodist Episcopal Church, where she sang in the choir and was mentored by teachers and members of the National Association of Colored Women. During that time she tried various commercial hair dressings and began experimenting with her own formula to cure scalp infections that caused baldness. For

Smith Collection/Gado/age fotostock



Madam C. J. Walker at the wheel of a car, 1911.

about two years, she was a sales agent for Annie Turnbo, the founder of the Poro Company. After moving to Denver, Colorado, in 1905, Walker worked as a cook for a pharmacist from whom she learned the basic chemistry that allowed her to perfect an ointment that healed dandruff and other hygiene-related ailments that were common during a time when most Americans lacked indoor plumbing. In 1906, she married Charles Joseph Walker and began achieving local success with what later became known as the “Walker Method” or “Walker System of Beauty Culture.” Thenceforward she was known as Madam C. J. Walker.

In 1908, after two years of training Walker agents and “beauty culturists” throughout the Southern and Eastern United States, Walker and her husband settled in Pittsburgh, where she opened Lelia College of Beauty Culture, a school named for her daughter. Drawn to the prosperous black business community in Indianapolis, she re-located the headquarters of the Madam C. J. Walker Manufacturing Company to the Indiana capitol in 1910.

She continued to develop her business by traveling across the United States and providing career opportunities and economic independence for thousands of African American women who otherwise would have been consigned to jobs as maids, cooks, laundresses and farmhands. In 1913 she expanded internationally when she visited the Caribbean and Central America. By 1919, she claimed 25,000 active Walker sales agents.

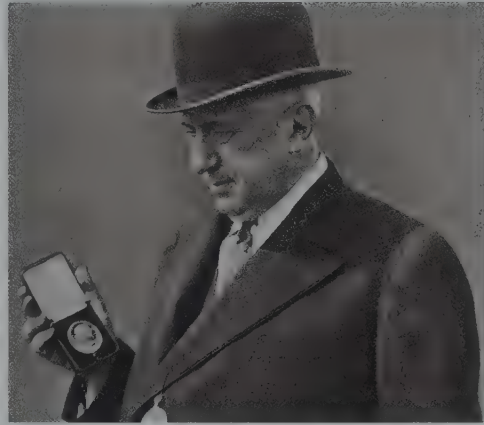
Walker simultaneously made her mark as a philanthropist, most notably with her \$1,000 gift to the African American Young Men's Christian Association building fund in Indianapolis in 1911 and her \$5,000 contribution to the National Association for the Advancement of Colored People's anti-lynching fund in 1919. She provided scholarships for students at several black colleges and boarding schools, as well as financial support for orphanages, retirement homes, YMCAs, YWCAs and the fund to preserve Frederick Douglass's home in the Anacostia neighborhood of Washington, D.C. She also became politically active, speaking out against lynching at the Negro Silent Protest Parade and during a visit to the White House in 1917, and by advocating for the rights of African American soldiers who served in France during World War I.

Among her shrewd real estate investments were her Harlem townhouse (the site of her New York beauty school as well as the Dark Tower, a cultural salon hosted by her daughter, A'Lelia Walker, during the Harlem Renaissance of the 1920s) and Villa Lewaro, her Irvington, New York, mansion that now is a National Historic Landmark and a National Trust for Historic Preservation National Treasure. Before her death in 1919, Walker purchased property in downtown Indianapolis that in 1927 became the site of the Madam Walker Theatre Center, another National Historic Landmark.

In 1998, Walker was honored with a United States postage stamp. In 2016, a new line of Madam C. J. Walker Beauty Culture hair products was launched in conjunction with the 110th anniversary of the founding of the Madame C. J. Walker Manufacturing Company.

CHARLES M. SCHWAB ON *Labor-Management Harmony*

Classic Vision/age fotostock



*He healed the wounds between labor and management after the bloody Homestead Strike in Pennsylvania in 1892; he served as president of both the Carnegie Steel Company and the United States Steel Corporation; he directed wartime shipbuilding for President Woodrow Wilson during World War I; he founded Bethlehem Steel and became the spokesperson for the U.S. steel industry. Some called him a “merchant of death” for the vast wealth he had accumulated during the war, while others called him a genius of industry. But what was clear to Britannica was Charles M. Schwab’s qualifications for writing on a subject dear to his heart: the need for harmony between labor and management. His article appeared in Britannica’s *These Eventful Years: The Twentieth Century in the Making As Told by Many of Its Makers* (1924). A sad but interesting sidenote: Despite his great wealth, Schwab died broke in 1939, his estimated fortune of \$200 million falling prey to the Depression and his lavish lifestyle.*

This is an age of science, and no man more than the engineer is applying the lessons of science to the promotion of the well-being and the happiness of mankind. The achievements of the American engineer are among the wonders of the modern world. The Panama Canal, the railways, the New York subways, the sky-scrapers, the great aqueduct tunnels, to say nothing of the stupendous manufacturing enterprises—these are among the most spectacular achievements which have yet come from the mind of man.

But there is one respect not so often talked about in which engineers are today taking the lead, and that is in the development of human engineering. We may

build great buildings, dig deep tunnels, span rivers with stupendous bridges, erect great factories and lay uncounted miles of railway, but unless the men who must do the ordinary routine work of operation are imbued with the right spirit and have a healthy orientation toward their work, there can be no success. And so in recent years the engineers—and I use the term engineers in the broadest sense—have directed their great mechanical achievements but toward the amicable relations with labour.

The people who labour are not and cannot be treated like dumb, driven cattle; they are human beings, with feelings and sentiments, hopes and aspirations, and the fundamental problem of all industry is so to relate the human elements in the men who do the work, to the machines which they operate that the men themselves shall be happy and healthy, and so that they shall thus be able to operate their machines with spirit and efficiency.

Few things in our modern world are more wonderful than the great enterprise which Henry Ford has developed. Mr. Ford has taught many new lessons in the handling of machinery and large-scale production. But all of Mr. Ford's machinery and plans would have amounted to little had he not been able to build upon the foundation of satisfied and happy employees. When during the World War I was placed at the head of the Emergency Fleet Corporation, I realised that the need was not so much for machinery, or more machinery, as to put spirit and power into the hearts, minds and muscles of the rank and file of the men who were doing the work. To build great plants, to erect huge machines, would take time, and the war would not wait. To put new life and spirit into the men who were doing the job could be accomplished in a very short time. I paid, therefore, little attention to the mechanical and material end of the business. I devoted my time to going among the men, both the superintendents and the rank and file, and seeking to promote in them a spirit which would enable them to get almost miraculous results with the materials at their command.

Many people conceived the relationship between capital and labour as one of stress and struggle. They talk as though the interest of the two were different. My experience is that there can be no success in industry unless there is at least a measurable appreciation of what is so fundamentally true, namely, that the interests of labour and capital are identical. Perhaps the division of the effort of industry as between labour and capital is not always equitable, but the effort of all engaged in industry should be to make that division ever more equitable. And that is the direction which human engineering is taking to-day.

There is a distinct movement among industries all over the world toward giving the men a greater voice in the management, towards securing for the employees representation with the management in the consideration of problems of mutual interest. There is a sincere effort being made to give every man the bene-

fit of the economies and the improvements which his efforts make possible, and great progress is being realised in making the men understand that their interest and the interest of the corporations for whom they work are the same.

As an illustration of the possibilities in this direction, the Bethlehem Steel Corporation is enabling and assisting its employees to purchase the preferred stock of the Company in order to create interest on the part of the employees in the activities of the Company. Another and similar instance of importance in securing cooperation between management and employees is being worked out in the Pennsylvania Railroad.

There are many other organisations, many groups of men, engaged in this movement for the perfection of human engineering. It is not only a movement which will promote the material well-being of our civilisation and continue to produce *big things*, but it is also a movement in which American engineers can well take greater pride, because it will produce *great men*.

Education Can Remain the “Great Equalizer”

By Arne Duncan

Horace Mann, a pioneer of American public schools in the 19th century, famously called education the “great equalizer of the conditions of men.” But the inverse is also true. Students who receive a poor education, or who drop out of school before graduating, can end up on the wrong side of a lifelong gap in employment, earnings, even life expectancy.

Too often, the difference between a life of promise and a life in peril hinges not on a student’s potential, but on the quality of their local public school. That means Americans have a choice to make: whether we will allow education to be a wedge that widens inequality, or whether we will use its power, as Horace Mann envisioned it, to create opportunity for all.

The stakes are high. In Chicago, where I grew up—and where I now work with young, at-risk men to help break the cycle of poverty and gun violence—I’ve seen the

price that whole communities pay when our schools fail. In neighborhoods where high school dropouts land in gangs, education can be a matter of life and death.

Today’s students don’t have to suffer the same fate. The problems plaguing underperforming schools are not only solvable—they’re actually being solved by school administrators, parents, and teachers in districts across the country. Here is some of what we know is working:

Early childhood education. The years between birth and age five are a critical time for every child’s cognitive and social-emotional development. For children from underserved communities, programs such as Head Start help level the playing field and make sure every child has the chance to make a healthy start.

During the Obama administration, we helped bring the number of states offering state-funded preschool up to 46. Now we’ve got to finish the job.

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Higher standards. As secretary of education, I saw firsthand that wealthy school districts and impoverished ones had a big thing in common: wherever we raised our expectations, our kids rose to meet them. As more states have adopted college and career-ready standards, the national graduation rate has hit a record high, with some of the greatest gains made by low-income students, English-language learners, and Black, Native, and Hispanic students.

Turning around the lowest-performing schools. One of the key contributors to the nation's soaring graduation rate has been successful efforts to turn around the nation's lowest-performing schools, where students were previously dropping out at rates of 40 percent or higher. At schools such as Jeremiah E. Burke High School in Dorchester, Massachusetts, an infusion of federal grant funding helped fuel changes—including lengthened school days, more individualized attention, and better teamwork among teachers—that dramatically improved student behavior and academic achievement.

We've built a playbook filled with hundreds of examples like this one—successful efforts that other districts, in other parts of the country, can learn from and emulate. These models are the culmination of more than a decade of relentless investigation, imagination, and iteration in our public schools. Today, as a result, we have a clear understanding of which interventions work and how to replicate them. These strategies are already transforming schools—and lives—across the country.

Still, too much of our progress is concentrated in small pockets of excellence. Our task

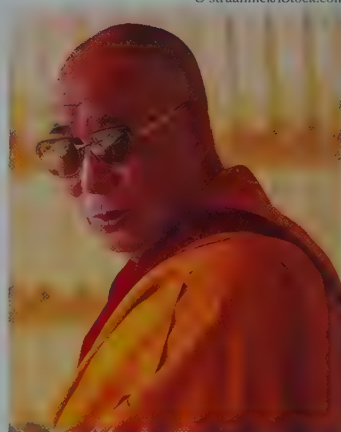
now, and going forward, is to broaden our impact by identifying, sharing, and scaling this success. To do that, our leaders need the will and the courage to take bolder action.

In autumn 2017 more than five million children began their public education journeys in either pre-kindergarten or kindergarten. The choices we make today and over the next decade will help determine their trajectory. Policymakers and administrators like me tend to frame our goals for education in lofty, moon-shot terms. But this isn't a moon shot. Our targets are closer than they appear. We've already taken the measurements, launched the rocket, and have gone a great distance on our arc of progress. If we make education a top priority, if we use the tools we've developed and scale the models that work, it is well-within our ability to complete the mission that Horace Mann set out more than a century ago.

Arne Duncan was chief executive officer of the Chicago Public Schools (2001–08) and then U.S. secretary of education (2009–15) in the administration of President Barack Obama. From 1987 to 1991 he played professional basketball in Australia, where he worked with underprivileged children. He is currently managing partner at the Emerson Collective, which centers its work on education, immigration reform, the environment, and other social justice initiatives, as well as a nonresident senior fellow at the Brookings Institution. He works, as part of the Emerson Collective, in his hometown of Chicago, to create jobs and life opportunities for disconnected youth between the ages of 17 and 24.

DALAI LAMA XIV ON *Compassion*

As a child, the newly proclaimed Dalai Lama and his family were held for ransom by a powerful Chinese warlord, and after the Tibetan government paid it, he was enthroned as the 14th Dalai Lama in 1940. A renowned figure on the international stage, he is the most famous Buddhist teacher in the world. For seeking a peaceful “middle way” solution between independence for his homeland of Tibet and its complete absorption by China, he was awarded the Nobel Prize for Peace in 1989. In thinking about the new millennium in 2000, the Dalai Lama contributed to Britannica the following short essay on compassion.



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When we are concerned mainly with our own interests, inevitably we tend to neglect others' interests. Because of this, preoccupation with our own interests—our own narrow desires, ambitions, and goals—undermines our ability to be compassionate. And since compassion is the source of happiness, self-centeredness prevents us from attaining that spiritual peace—peace of heart and mind—which is the principal characteristic of lasting happiness. Conversely, the more we concern ourselves with providing for others' well-being, the more meaningful our lives become and the happier we ourselves will be.

This is not to suggest that we all become full-time charity workers. What is more helpful—and practical—is that we become full-time workers of “charity” in the sense of kindness and compassion towards all others. As we do so, we will discover that ultimately there is no sharp distinction between our own interests and others' interests. We all desire and appreciate affection, forbearance, truth, justice, and peace. And these are all both contained within and the fruits of compassion.

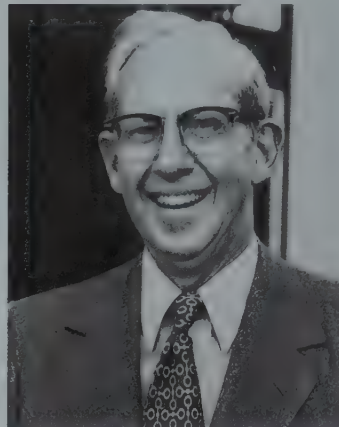
In helping others, we provide for our own happiness because happiness is not, we find, an end in itself. Rather it is a by-product of those actions we take for the

benefit of others. Thus in serving others we serve ourselves. This is why I sometimes call compassion “wise selfishness.” Compassion entails exercising restraint and disciplining our negative thoughts and emotions out of a sense of responsibility towards all others. Yet alongside kindness, generosity, patience, tolerance, forgiveness, humility, and so on, these are the very things that happiness consists in. Compassion makes us happy!

GEORGE J. STIGLER ON *Price Systems*

George J. Stigler (1911–91), winner of the 1982 Nobel Prize for Economics and an anchor of the so-called Chicago school of economics, was one of those rare birds perched prominently in his field who could write clearly, and with panache, for the layperson. Evidence of this is found below, in his excerpted article on price systems, written for the inaugural printing of Britannica's new 15th Edition in 1974.

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The price system, as it exists in western Europe and the Americas, is a means of organizing economic activity. It does this primarily by coordinating the decisions of consumers, producers, and owners of productive resources. Millions of economic agents who have no direct communication with each other are led by the price system to supply each other's wants. In a modern economy the price system enables a consumer to buy a product he has never previously purchased, produced by a firm of whose existence he is unaware, which is operating with funds partially obtained from his own savings.

Prices are an expression of the consensus on the values of different things, and every society that permits exchanges among men has prices. Because prices are expressed in terms of a widely acceptable commodity, they permit a ready comparison of the comparative values of various commodities—if shoes are \$15 per pair and bread 30 cents per loaf, a pair of shoes is worth 50 loaves of bread. The price of anything is its value in exchange for a commodity of wide acceptability (a money): the price of an automobile may be some 50 ounces of gold or 25 pieces of paper bearing the picture of an eminent statesman.

A system of prices exists because individual prices are related to each other. If, for example, copper rods cost 40 cents a pound and the process of drawing a rod into wire costs 25 cents a pound, then, if the price of wire exceeds 65 cents, it will be profitable to produce wire; and if the price of wire falls below 65 cents,

it will be ruinous to produce wire. Competition, therefore, will hold the price of wire about 25 cents per pound above that of rods. A variety of such economic forces ties the entire structure of prices together.

The system of prices can be arranged to reward or penalize any kind of activity. Society discourages the production of electric shoe-string-tying machines by the simple expedient of making such a machine's attainable selling price less than the prices of the resources necessary to produce it. Society stimulates men of large athletic promise to learn golf (rather than polo or cricket) by the immense prizes (= prices) that are given to tournament winners. The air in many cities is dirty because no one is charged a price for dirtying it and no one can pay a price for having it cleaned. . . .

The foregoing discussion has been confined to the price system as it exists in capitalist economies. The Communist countries have prices, but not autonomous price systems; in those countries the direction of economic activity is largely in the hands of the central authorities, and prices are used mainly as a marketing device. None of the three allocative functions of an economy—determination of what will be produced, of how it will be produced, and of who will get the product—is performed by the price mechanism in the Soviet-type economies.

The relative scarcities that money prices measure exist, of course, in all countries and would exist in a world where no money or exchanges were allowed. Robinson Crusoe had a problem of allocating his time between sleep, garnering food, building shelter, etc.; and he confronted implicit costs of extending any one activity, for more food meant less of other things. The economist calls these implicit exchange ratios "shadow prices," and they appear in one form or another in all areas of life in which men make deliberate choices.

Price systems are therefore the result of scarcity. The basic proposition of economics, that scarcities are essentially ubiquitous, is often phrased as "there is no such thing as a free lunch"; and it reminds one that the price of the lunch may be future patronage, a reciprocal lunch, or a boring monologue. The task of economic organization is the task of devising price systems that allow a society to achieve its basic goals.

J. EDGAR HOOVER ON *The FBI*

J. Edgar Hoover, director of the Federal Bureau of Investigation (FBI) from 1924 to 1972, is remembered for two things in particular: for transforming the nascent agency into one of the most effective investigative police forces in the world and for then using its wide-ranging and hard-won power against not just criminals but those he considered political subversives. In an article on the FBI first published in the 1956 printing of Britannica's 14th Edition (1929–73), Hoover chronicled its specific achievements under his leadership, from its pursuit of John Dillinger and other infamous American gangsters to its efforts to prevent the infiltration of the federal government by "persons whose loyalty was subject to question," notably suspected communists. For the 1961 version of the article, reproduced in part below, Hoover updated the statistics in his account of the FBI's accomplishments. He was also the author of Britannica's coverage of fingerprints, proof of his personal investment in leveraging science and technology in the service of policing.



Established in 1908 as the investigative arm of the U.S. department of justice, the Federal Bureau of Investigation is a fact-finding agency which does not evaluate the results of its investigations or recommend prosecutive action. In general, it is responsible for the enforcement of all federal criminal statutes except those specifically delegated to other federal agencies. In 1958 there were approximately 140 federal matters over which it had investigative jurisdiction. The two primary areas of FBI activity are general investigations and security operations. Within the latter field, it has jurisdiction over espionage, sabotage and subversive activities on a nation-wide scale.

In addition to investigating violations of laws of the United States, the FBI is charged with collecting evidence in cases in which the United States is or may be

a party in interest and with other duties imposed by law. It reports the results of its investigation to the attorney general, chief legal officer of the United States, his assistants and the various U.S. attorneys in federal districts throughout the United States for decisions as to prosecutive action. The FBI is also a service agency which assists law enforcement agencies in identification, technical and training matters.

History

Originally known as the Bureau of Investigation, the FBI was created by the then attorney general Charles J. Bonaparte on July 26, 1908. The internationally known name, Federal Bureau of Investigation, was adopted on July 1, 1935.

In 1924 John Edgar Hoover was appointed director of the bureau by Harlan Fiske Stone, then attorney general, and he was reappointed by each succeeding head of the department of justice. Hoover inaugurated the policies which constitute the foundation of the present organization. Political considerations were divorced from personnel appointments, and promotions were placed on a merit basis.

Less than a decade after this reorganization, the FBI was faced with enlarged responsibilities. A wave of lawlessness in the early 1930s aroused considerable public concern. Local police officers, often inadequately trained and hampered by the restrictions imposed by state boundaries, were unable to cope effectively with the modern weapons and transportation available to organized criminal gangs. To meet this situation, congress passed a number of laws which extended the jurisdiction of the FBI. In 1932 the federal kidnapping statute was enacted, making unlawful the interstate transportation of a kidnapped person. All kidnapping cases referred to the FBI the following year were solved. The federal Bank Robbery act was passed in 1934 to stem the rising tide of bank robberies. Again in 1934, special agents of the FBI were authorized by congress to carry firearms and to make arrests. With the passage of these and other crime bills, the FBI was given authority to act against the criminal gangs which previously had met little effective opposition. In 1934 alone, three vicious fugitives who had gained national notoriety were killed. John Dillinger, Charles Arthur (Pretty Boy) Floyd and Lester Gillis, alias "Baby Face" Nelson, met death while resisting arrest. In 1935 Russell Gibson and Kate and Fred Barker fell before the guns of special agents. The arrest of Alvin Karpis by Hoover in 1936 marked the end of the powerful Barker-Karpis gang, while Alfred James Brady and an accomplice were killed in a gun battle with FBI agents in 1937. Numerous other kidnapers, bank robbers and lesser criminals were sent to federal penitentiaries during this period.

The war on crime was not halted but was overshadowed as the international developments leading to World War II placed additional responsibilities on the FBI. During this period, federal statutes relating to subversive activities were the basis

GET-DILLINGER!
\$15,000 Reward
 A PROCLAMATION

WHEREAS, One John Dillinger stands charged officially with numerous felonies including murder in several states and his banditry and degradation stamp him as an outlaw, a fugitive from justice and a vicious menace to life and property;


NOW, THEREFORE, We, Paul McNutt, Governor of Indiana; George White, Governor of Ohio; F. B. Glavin, Governor of Minnesota; William A. Connelley, Governor of Michigan; and Henry Horner, Governor of Illinois; do hereby proclaim and offer a reward of Five Thousand Dollars (\$5,000.00) to be paid to the person or persons who apprehend and deliver the said John Dillinger into the custody of any sheriff of any of the above-mentioned states or his duly authorized agent.

THIS IS IN ADDITION TO THE \$10,000.00 OFFERED BY THE FEDERAL GOVERNMENT FOR THE ARREST OF JOHN DILLINGER.

HERE IS HIS FINGERPRINT CLASSIFICATION and DESCRIPTION. — FILE THIS FOR IDENTIFICATION PURPOSES.

John Dillinger, (w) age 30 yrs. 5-8";
 160 lbs.; gray eyes; med chest; hair, med.
 gen. med. build. Devian O. P. D. No.
 10587. O. S. D. No. 559 646.

F.P.C. (12) M D R O O
 11 10 00 00 8
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FRONT VIEW

 Be on the lookout for this desperado. He is heavily armed and usually is protected with bullet-proof vest. Take no unnecessary chances in getting this man. He is thoroughly prepared to shoot his way out of any situation.

GET HIM DEAD OR ALIVE
 Notify any Sheriff or Chief of Police of Indiana, Ohio, Minnesota, Michigan, Illinois.
 or THIS BUREAU

BACK VIEW


ILLINOIS STATE BUREAU OF CRIMINAL IDENTIFICATION AND INVESTIGATION
 J. P. Sullivan, Supt. Springfield, Illinois

A wanted poster for gangster John Dillinger, c. 1934.

uniformed personnel. This action by the president obviated the confusion experienced in World War I when more than 20 agencies investigated security in the United States.

The scientific techniques which had been developed by the FBI in its war against organized gangsterism were employed to thwart the spy and the saboteur. In June 1941 the FBI climaxed its investigation of a Nazi espionage ring in New York city with the arrest of 33 persons. All pleaded guilty or were convicted in federal court.

An effective pan-American intelligence force was created under the bureau's leadership to oppose the activities of Axis spy and sabotage rings in the western hemisphere. From July 1, 1940, through June 30, 1946, more than 15,000 Axis operators and sympathizers in South America were expelled, interned or rendered harmless. More than 460 spies, saboteurs and propaganda agents were apprehended, and 30 secret radio transmitters were eliminated.

In 1939 the FBI undertook a program of surveying industrial plants engaged in the manufacture of strategic war material. Before it had concluded its responsibility in this program, more than 2,300 plants had been surveyed and recommendations made for their protection. In the period preceding the attack on Pearl

for counteraction by the bureau against intelligence operations of foreign powers. Several espionage agents were arrested before the outbreak of hostilities in Europe. On Sept. 6, 1939, a presidential directive was issued providing that the FBI should take charge of investigative work in matters relating to espionage, sabotage, subversive activities and related matters. The president also called upon all enforcement officers, both federal and state, to report all information in these fields promptly to the FBI, which was charged with the responsibility of correlating this material and referring matters under the jurisdiction of any other federal agency with responsibilities in this field to the appropriate agency. The FBI's responsibility in these matters was reiterated by presidential directives of Jan. 8, 1943, and July 24, 1950. By agreement, the armed forces handle investigations concerning their

Harbor new field offices were opened in the continental United States and its territorial possessions. Additional personnel was trained by the FBI to investigate the flood of complaints regarding suspicious activities which citizens were encouraged to report, and its rolls of clerical and investigative employees reached an allotted peak of 14,300.

A mass of intelligence information had been accumulated by Dec. 7, 1941, when Japan attacked at Pearl Harbor. By the following day, 1,771 potentially dangerous enemy aliens had been arrested and detained. As formal declarations of war were made, German and Italian aliens, known or suspected to be dangerous, were arrested. In all, more than 16,000 such apprehensions were made by the FBI with the assistance of local law enforcement authorities in an orderly manner and in marked contrast with the disorganized vigilante activities of World War I. Precautions against espionage and sabotage were increased.

In 1942 eight saboteurs, landed by submarine from Germany, were quickly taken into custody. German plans to send such groups to the United States every six weeks were thwarted. Two additional saboteurs were dispatched by Germany in 1944 and were quickly apprehended. The normal channels for enemy agents to enter the country were closed, and spies were then sent to the United States as refugees. Spies intercepted by the FBI often became double agents, identifying other espionage agents and transmitting misleading information to their principals.

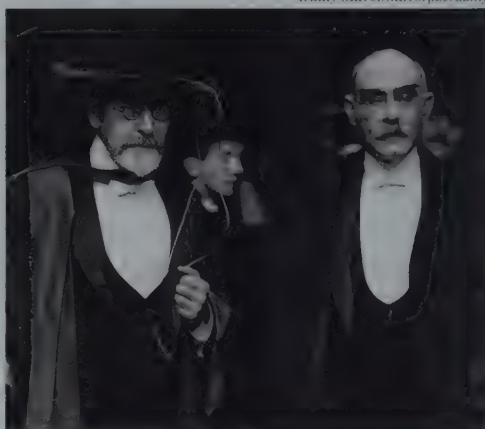
After the war the nation found itself confronted with a crime wave of serious proportions. In 1945 major crimes increased 12.3% over 1944. Crime in 1946 continued its upward trend, increasing 7.6% over 1945. The war-born scarcity of consumer goods created a lucrative market for stolen merchandise and contributed to the reactivation of old criminal gangs. The finely geared machinery of the FBI was able to face this condition without pause.

During the postwar period there was increased public concern in matters relating to Communism and the infiltration of government and essential industry by persons whose loyalty was subject to question. On Aug. 1, 1946, congress passed the Atomic Energy act, charging the FBI with the responsibility of determining the character, associations and loyalty of employees of the Atomic Energy commission and of all persons having access to restricted atomic energy data. Following the issuance by the president on March 21, 1947, of executive order 9835, the FBI was given the duty of investigations concerning the loyalty of employees and applicants for positions in the executive branch of the federal government. The result was to increase greatly the investigative work of the FBI.

JAMES FRAZER ON *Totemism and Taboo*

Britannica sowed the seeds of a revolution in the budding field of anthropology when it commissioned a young Cambridge don, James George Frazer (1854–1941), to write two articles, excerpted below, for its 9th Edition (1875–89). The young Scottish scholar spent seven months researching the articles, on the “primitive practices” of totem and taboo, and he was so intrigued by the topics that he focused his career on these subjects, developing into one of the world’s most eminent and influential social anthropologists. His *Britannica* articles grew into the 12 volumes of *The Golden Bough* (1890; 1907–15), a classic

of anthropology, and it made Frazer (later Sir James G.) famous to this day. Although his theory of the evolutionary sequence of magical, religious, and scientific thought is no longer accepted, his work enabled him to synthesize and compare a wider range of information about religious and magical practices than has been achieved subsequently by any other single anthropologist. His language, naturally, with its discussion of “primitive” and “savage” cultures, was that of the late 19th century and has long been discarded.



Trinity Mirror/Mirrorpix/Alamy

Sir James G. Frazer (left) at a ceremony honoring Rudyard Kipling (right), University of Paris, November 21, 1921.

A totem is a class of material objects which a savage regards with superstitious respect, believing that there exists between him and every member of the class an intimate and altogether special relation. The name is derived from an Ojibway (Chippeway) word which was first introduced into literature, so far as appears, by J. Long, an Indian interpreter of last century, who spelt it *totam*. The connexion between a man and his totem is mutually beneficent: the totem pro-

fects the man, and the man shows his respect for the totem in various ways, by not killing it if it be an animal, and not cutting or gathering it if it be a plant. As distinguished from a fetich, a totem is never an isolated individual, but always a class of objects, generally a species of animals or of plants, more rarely a class of inanimate natural objects, very rarely a class of artificial objects.

Considered in relation to men, totems are of at least three kinds:—(1) the clan totem, common to a whole clan, and passing by inheritance from generation to generation; (2) the sex totem, common either to all the males or to all the females of a tribe, to the exclusion in either case of the other sex; (3) the individual totem, belonging to a single individual and not passing to his descendants. Other kinds of totems exist and will be noticed, but they may perhaps be regarded as varieties of the clan totem. The latter is by far the most important of all; and where we speak of totems or totemism without qualification the reference is always to the clan totem.

The clan totem. The clan totem is revered by a body of men and women who call themselves by the name of the totem, believe themselves to be of one blood, descendants of a common ancestor, and are bound together by common obligations to each other and by a common faith in the totem. Totemism is thus both a religious and a social system. In its religious aspect it consists of the relations of mutual respect and protection between a man and his totem; in its social aspect it consists of the relations of the clansmen to each other and to men of other clans. In the later history of totemism these two sides, the religious and the social, tend to part company; the social system sometimes survives the religious; and, on the other hand, religion sometimes bears traces of totemism in countries where the social system based on totemism has disappeared. We begin with the religious side.

Totemism as a religion, or the relation between a man and his totem. The members of a totem clan call themselves by the name of their totem, and commonly believe themselves to be actually descended from it.

Thus the Turtle clan of the Iroquois are descended from a fat turtle, which, burdened by the weight of its shell in walking, contrived by great exertions to throw it off, and thereafter gradually developed into a man. The Cray-Fish clan of the Choctaws were originally cray-fish and lived underground, coming up occasionally through the mud to the surface. Once a party of Choctaws smoked them out, and, treating them kindly, taught them the Choctaw language, taught them to walk on two legs, made them cut off their toe nails and pluck the hair from their bodies, after which they adopted them into the tribe. But the rest of their kindred, the cray-fish, are still living underground. The Osages are descended from a male snail and a female beaver. The snail burst his shell, developed arms, feet, and legs, and became a fine tall man; afterwards he married the beaver maid. Some of the

clans of western Australia are descended from ducks, swans, and other waterfowl. In Senegambia each family or clan is descended from an animal (hippopotamus, scorpion, &c.) with which it counts kindred.

Somewhat different are the myths in which a human ancestress is said to have given birth to an animal of the totem species. Thus the Snake clan among the Moquis of Arizona are descended from a woman who gave birth to snakes. The Bakalai in western equatorial Africa believe that their women once gave birth to the totem animals; one woman brought forth a calf, others a crocodile, hippopotamus, monkey, boa, and wild pig.

Believing himself to be descended from, and therefore akin to, his totem, the savage naturally treats it with respect. If it is an animal he will not, as a rule, kill nor eat it. In the Mount Gambier tribe (South Australia) "a man does not kill or use as food any of the animals of the same subdivision with himself, excepting when hunger compels; and then they express sorrow for having to eat their *wingong* (friends) or *tumanang* (their flesh). When using the last word they touch their breasts, to indicate the close relationship, meaning almost a part of themselves.

Shorter, but no less interesting and significant, was Frazer's article "Taboo."

Taboo (also written Tabu and Tapu) is the name given to a system of religious prohibitions which attained its fullest development in Polynesia (from Hawaii to New Zealand), but of which under different names traces may be discovered in most parts of the world. The word "taboo" is common to the different dialects of Polynesia, and is perhaps derived from *ta*, "to mark," and *pu*, an adverb of intensity. The compound word "taboo" (tapu) would thus originally mean "marked thoroughly." Its ordinary sense is "sacred." It does not, however, imply any moral quality, but only "a connexion with the gods or a separation from ordinary purposes and exclusive appropriation to persons or things considered sacred; sometimes it means devoted as by a vow." Chiefs who trace their lineage to the gods are called *arii tabu*, "chiefs sacred," and a temple is called a *uahi tabu*, "place sacred." The converse of taboo is *noa* (in Tonga *gnofoba*), which means "general" or "common." Thus the rule which forbade women to eat with men, as well as, except on special occasions, to eat any fruits or animals offered in sacrifice to the gods, was called *ai tabu*, "eating sacred"; while the present relaxation of the rule is called *ai noa*, eating generally, or having food in common. Although it was employed for civil as well as religious purposes, the taboo was essentially a religious observance. In Hawaii it could be imposed only by priests; but elsewhere in Polynesia kings and chiefs, and even to a certain extent ordinary individuals, exercised the same power. The strictness with which the taboo was observed depended largely on the

influence of the person who imposed it: if he was a great chief it would not be broken; but a powerful man often set at nought the taboo of an inferior.

A taboo might be general or particular, permanent or temporary. A general taboo applied, *e.g.*, to a whole class of animals; a particular taboo was confined to one or more individuals of the class. Idols, temples, the persons and names of kings and of members of the royal family, the persons of chiefs and priests, and the property (canoes, houses, clothes, etc.) of all these classes of persons were always taboo or sacred. By a somewhat arbitrary extension of this principle a chief could render taboo to (*i.e.*, in favour of) himself anything which took his fancy by merely calling it by the name of a part of his person. Thus, if he said "That axe is my backbone," or "is my head," the axe was his; if he roared out "That canoe! my skull shall be the baler to bale it out," the canoe was his likewise. The names of chiefs and still more of kings were taboo, and could not be uttered. If the name of a king of Tahiti was a common word or even resembled a common word, that word dropped out of use and a new name was substituted for it. Thus in course of time most of the common words in the language underwent considerable modifications or were entirely changed.

Certain foods were permanently taboo to (*i.e.*, in favour of or for the use of) gods and men, but were forbidden to women. Thus in Hawaii the flesh of hogs, fowls, turtle, and several kinds of fish, cocoa-nuts, and nearly everything offered in sacrifice were reserved for gods and men, and could not, except in special cases, be consumed by women. In the Marquesas Islands human flesh was tabooed from women. Sometimes certain fruits, animals, and fish were taboo for months together from both men and women. In the Marquesas houses were tabooed against water: nothing was washed in them; no drop of water might be spilled in them. If an island or a district was tabooed, no canoe or person might approach it while the taboo lasted; if a path was tabooed, no one might walk on it. Seasons generally kept taboo were the approach of a great religious ceremony, the time of preparation for war, and the sickness of chiefs. The time during which they lasted varied from years to months or days. In Hawaii there was a tradition of one that lasted thirty years, during which men might not trim their beards, etc. A common period was forty days. A taboo was either common or strict. During a common taboo the men were only required to abstain from their ordinary occupations and to attend morning and evening prayers. But during a strict taboo every fire and light on the island or in the district was extinguished; no canoe was launched; no person bathed; no one, except those who had to attend at the temple, was allowed to be seen out of doors; no dog might bark, no pig grunt, no cock crow. Hence at these seasons they tied up the mouths of dogs and pigs, and put fowls under a calabash or bandaged their eyes. The taboo was imposed either by proclamation or by fixing cer-

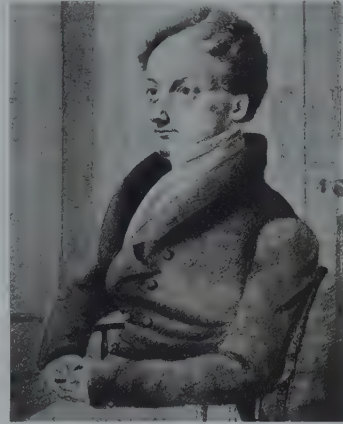
tain marks (a pole with a bunch of bamboo leaves, a white cloth, etc.) on the places or things tabooed.

The penalty for the violation of a taboo was either religious or civil. The religious penalty inflicted by the offended *atuas* or spirits generally took the form of a disease: the offender swelled up and died, the notion being that the *atua* or his emissary (often an infant spirit) had entered into him and devoured his vitals. Cases are on record in which persons who had unwittingly broken a taboo actually died of terror on discovering their fatal error. Chiefs and priests, however, could in the case of involuntary transgressions perform certain mystical ceremonies which prevented this penalty from taking effect. The civil penalty for breaking a taboo varied in severity. In Hawaii there were police officers appointed by the king to see that the taboo was observed, and every breach of it was punished with death, unless the offender had powerful friends in the persons of priests or chiefs. Elsewhere the punishment was milder; in Fiji (which, however, is Melanesian) death was rarely inflicted, but the delinquent was robbed and his gardens despoiled. In New Zealand this judicial robbery was reduced to a system. No sooner was it known that a man had broken a taboo than all his friends and acquaintances swarmed down on him and carried off whatever they could lay hands on. Under this system (known as *muru*) property circulated with great rapidity. If, e.g., a child fell into the fire, the father was robbed of nearly all he possessed.

JAMES MILL ON *Education*

James Mill (1773–1836), the historian and early Utilitarian philosopher, wrote more major articles for Britannica's celebrated Supplement to the 4th, 5th, and 6th editions (1815–24) than any other contributor. One of these articles, on government, became an influential book. He was already well known as an uncommonly lucid writer, and at the time that he wrote the article "Education," excerpted below, he was busily practicing what he preached, seeing to every detail of the education of his brilliant son, the preeminent Utilitarian philosopher (and early feminist) John Stuart Mill (1806–72). That education was going forward at home, in the very room where the elder Mill was writing his Britannica essays.

Courtesy of the trustees of the British Museum;
photograph, J.R. Freeman & Co. Ltd.



The end of education is to render the individual, as much as possible, an instrument of happiness, first to himself, and next to other beings.

The properties, by which he is fitted to become an instrument to this end, are, partly, those of the body, and, partly, those of the mind.

Happiness depends upon the condition of the Body, either immediately, as where the bodily powers are exerted for the attainment of some good; or mediately, through the mind, as where the condition of the body affects the qualities of the mind.

Education, in the sense in which it is usually taken, and in which it shall here be used, denotes the means which may be employed to render the *mind*, as far as possible, an operative cause of happiness. The mode in which the *body* may be rendered the most fit for operating as an instrument of happiness is generally considered as a different species of inquiry, and is thought to belong to physicians and others, who study the means of perfecting the bodily powers.

Education, then, in the sense in which we are now receiving it, may be de-

finer, the best employment of all the means which can be made use of, by man, for rendering the human mind to the greatest possible degree the cause of human happiness. Every thing, therefore, which operates, from the first germ of existence, to the final extinction of life, in such a manner as to affect those qualities of the mind on which happiness in any degree depends, comes within the scope of the present inquiry. The grand question of education embraces nothing less than this—namely, What can be done by the human powers, by aid of all the means which are at human disposal, to render the human mind the instrument of the greatest degree of happiness? It is evident, therefore, that nothing, of any kind, which operates at any period of life, however early, or however late, ought to be left out of the account. Happiness is too precious an effect, to let any cause of it, however small, run to waste and be lost. The means of human happiness are not so numerous that any of them can be spared. Not to turn every thing to account, is here, if any where, bad economy, in the most emphatical sense of the phrase.

The field, it will easily be seen, is exceedingly comprehensive. It is everywhere, among enlightened men, a subject of the deepest complaint, that the business of education is ill performed; and that, in this, which might have been supposed the most interesting of all human concerns, the practical proceedings remain far behind the actual state of the human mind. It may be remarked, that, notwithstanding all that has been written on the subject, even the *theory* of education has not kept pace with the progress of philosophy; and it is unhappily true, that the *practice* remains to a prodigious distance behind the theory. One reason why the theory, or the combination of ideas which the present state of knowledge might afford for improving the business of education, remains so imperfect, probably is, that the writers have taken but a partial view of the subject; in other words, the greater number have mistaken a part of it for the whole. And another reason of not less importance is, that they have generally contented themselves with vague ideas of the object or end to which education is only useful as means. One grand purpose of the present inquiry will be to obviate all these mistakes; and, if not to exhibit that comprehensive view, which we think is desirable, but to which our limits are wholly inadequate; at any rate, to conduct the reader into that train of thought which will lead him to observe for himself the ultimate boundaries of the field; and, conceiving more accurately the end, to form a better estimate of what is desirable as the means.

LOREN EISELEY ON

Why We Are Here

*Loren Eiseley (1907–77), a well-known anthropologist, was a bit of an odd bird in the academic world—he wrote poetry and, more to the point, was master of an eloquent, poetical prose style, highly uncommon among the practitioners of his field and evident in two of his most moving books, *The Immense Journey* (1957) and his autobiography, *All the Strange Hours* (1975). The essay he wrote for *Britannica*, titled “The Cosmic Orphan,” is but briefly excerpted below.*

From the University Archives and Records Center, University of Pennsylvania



Loren Eiseley at University Museum, University of Pennsylvania, May 1960.

When I was a young lad of that indefinite but important age when one begins to ask, Who am I? Why am I here? What is the nature of my kind? What is growing up? What is the world? How long shall I live in it? Where shall I go? I found myself walking with a small companion over a high railroad trestle that spanned a stream, a country bridge, and a road. One could look fearfully down, between the ties, at the shallows and ripples in the shining water some 50 feet below. One was also doing a forbidden thing, against which our parents constantly warned. One must not be caught on the black bridge by a train. Something terrible might happen, a thing called death.

From the abutment of the bridge we gazed down upon the water and saw among the pebbles the shape of an animal we knew only from picture books—a turtle, a very large, dark mahogany-coloured turtle. We scrambled down the embankment to observe him more closely. From the little bridge a few feet above the stream, I saw that the turtle, whose beautiful markings shone in the afternoon sun, was not alive and that his flippers waved aimlessly in the rushing water. The reason for his death was plain. Not too long before we had come upon the trestle,

someone engaged in idle practice with a repeating rifle had stitched a row of bullet holes across the turtle's carapace and sauntered on.

My father had once explained to me that it took a long time to make a big turtle, years really, in the sunlight and the water and the mud. I turned the ancient creature over and fingered the etched shell with its forlorn flippers flopping grotesquely. The question rose up unbidden. Why did the man have to kill something living that could never be replaced? I laid the turtle down in the water and gave it a little shove. It entered the current and began to drift away. "Let's go home," I said to my companion. From that moment I think I began to grow up.

"Papa," I said in the evening by the oil lamp in our kitchen. "Tell me how men got here." Papa paused. Like many fathers of that time, he was worn from long hours, he was not highly educated, but he had a beautiful resonant voice and he had been born on a frontier homestead. He knew the ritual way the Plains Indians opened a story.

"Son," he said, taking the pattern of another people for our own, "once there was a poor orphan." He said it in such a way that I sat down at his feet. "Once there was a poor orphan with no one to teach him either his way, or his manners. Sometimes animals helped him, sometimes supernatural beings. But above all, one thing was evident. Unlike other occupants of Earth he had to be helped. He did not know his place, he had to find it. Sometimes he was arrogant and had to learn humility, sometimes he was a coward and had to be taught bravery. Sometimes he did not understand his Mother Earth and suffered for it. The old ones who starved and sought visions on hilltops had known these things. They were all gone now and the magic had departed with them. The orphan was alone; he had to learn by himself; it was a hard school."

My father tousled my head; he gently touched my heart. "You will learn in time there is much pain here," he said. "Men will give it to you, time will give it to you, and you must learn to bear it all, not bear it alone, but be better for the wisdom that may come to you if you watch and listen and learn. Do not forget the turtle, nor the ways of men. They are all orphans and they go astray; they do wrong things. Try to see better."

"Yes, papa," I said, and that was how I believe I came to study men, not the men of written history but the ancestors beyond, beyond all writing, beyond time as we know it, beyond human form as it is known today. Papa was right when he told me men were orphans, eternal seekers. They had little in the way of instinct to instruct them, they had come a strange far road in the universe, passed more than one black, threatening bridge. There were even more to pass, and each one became more dangerous as our knowledge grew. Because man was truly an orphan and confined to no single way of life, he was, in essence, a prison breaker. But in ignorance his very knowledge sometimes led from one terrible prison to another.

Was the final problem then, to escape himself, or, if not that, to reconcile his devastating intellect with his heart? All of the knowledge set down in great books directly or indirectly affects this problem. It is the problem of every man, for even the indifferent man is making, unknown to himself, his own callous judgment.

Long ago, however, in one of the Dead Sea Scrolls hidden in the Judaeian Desert, an unknown scribe had written: "None there be, can rehearse the whole tale." That phrase, too, contains the warning that man is an orphan of uncertain beginnings and an indefinite ending. All that the archaeological and anthropological sciences can do is to place a somewhat flawed crystal before man and say: This is the way you came, these are your present dangers; somewhere, seen dimly beyond, lies your destiny. God help you, you are a cosmic orphan, a symbol-shifting magician, mostly immature and inattentive to your own dangers. Read, think, study, but do not expect this to save you without humility of heart. This the old ones knew long ago in the great deserts under the stars. This they sought to learn and pass on. It is the only hope of men.

What have we observed that might be buried as the Dead Sea Scrolls were buried for 2,000 years, and be broken out of a jar for human benefit, brief words that might be encompassed on a copper scroll or a ragged sheet of vellum? Only these thoughts, I think, we might reasonably set down as true, now and hereafter. For a long time, for many, many centuries, Western man believed in what we might call the existent world of nature; form as form was seen as constant in both animal and human guise. He believed in the instantaneous creation of his world by the Deity; he believed its duration to be very short, a stage upon which the short drama of a human fall from divine estate and a redemption was in progress.

Worldly time was a small parenthesis in eternity. Man lived with that belief, his cosmos small and man-centred. Then, beginning about 350 years ago, thoughts unventured upon since the time of the Greek philosophers began to enter the human consciousness. They may be summed up in Francis Bacon's dictum: "This is the foundation of all. We are not to imagine or suppose, but to *discover*, what nature does or may be made to do."

When in following years scientific experiment and observation became current, a vast change began to pass over Western thought. Man's conception of himself and his world began to alter beyond recall. "'Tis all in pieces, all coherence gone," exclaimed the poet John Donne, Bacon's contemporary. The existing world was crumbling at the edges. It was cracking apart like an ill-nailed raft in a torrent—a torrent of incredible time. It was, in effect, a new nature comprising a past embedded in the present and a future yet to be.

Could the Non-digital Complement Our Digital Classrooms?

By Mark Bauerlein

When the *Boston Globe* reported some years ago that an elite prep school in Massachusetts had set out to give away all its books and go one-hundred percent digital, most readers probably shrugged. This was just a sign of the times. American educators and parents generally assume a paperless future of learning through screens is inevitable in spite of some holdovers who stick with Norton anthologies and Penguin paperbacks. After all, the headmaster of the school told the *Globe*, “When I look at books, I see an outdated technology, like scrolls before books.” In this time of innovation, nobody wants to appear out-of-touch and old-fashioned. What professional wouldn’t look forward to every school a decade hence displaying a marvelous, wondrous array of technology in every classroom, in the library, in study hall?

But we are now in 2018, many years into the digital breakthrough. More and more schools have computerized their materials, incorporated social media into the curriculum, and distributed laptops and tablets to students, but America doesn’t seem to be getting much academic benefit from this national trend. Reading and writing scores for high school students have generally been down, and critical thinking and problem-solving scores for college students show small improvement from first year to graduation. You’ll have to search hard to find many college teachers and employers of young Americans who say that these well-connected youths read, write, and calculate better than ever before.

As more semesters pass and the disappointments continue, educators will begin to wonder whether the high expense of computers is really worth it. Must we digitize every square foot of the campus and every minute of the school day?

In 2028 schools will indeed sport fabulous gadgets, devices, and interfaces of learning,

but circumspect school leaders will also maintain a few contrary spaces, small preserves that have no devices or access, no connectivity at all. There, we will find, students will study basic subjects without screens or keyboards present—only pencils, books, old newspapers and magazines, blackboards and slide rules. Students will compose paragraphs by hand, do percentages by long division, and look up a fact by opening a book and not by doing a Google search. When they get a research assignment, they’ll head to the stacks, the reference room, and the microfilm drawers.

It sounds like a Luddite desire, but even the most pro-technology folks will, in fact, welcome the non-digital space as a crucial part of the curriculum. That’s because over the next 10 years, educators will recognize that certain aspects of intelligence are best developed with a mixture of digital and non-digital tools. Some understandings and dispositions evolve best the slow way. At this time, for instance, the research is pretty solid on the advantages of taking lecture notes by hand over taking notes on a keyboard. Once they mature, yes, students will implement digital technology to the full. But to reach that point, the occasional slowdown and log-off is essential.

Writing is, perhaps, the clearest case. Today, students write more words than ever before. They write them faster, too. What happens, though, when teenagers write fast? They select the first words that come to mind, words that they hear and read and speak all the time. They have an idea, a thought to express, and the vocabulary and sentence patterns they are most accustomed to spring to mind. With the keyboard at hand, phrases go right up on the screen, and the next thought proceeds. In other words, the common language of their experience ends up on the page, yielding a flat, blank, conventional idiom of social ex-

change. They like the method because it's faster and easier than pen and paper. But what they take as benefits are, in fact, pitfalls. I see it all the time in freshman papers, prose that passes along information in featureless, bland words.

Good writing doesn't happen that way. As more kids grow up writing in snatches on speed-inducing tools in the conventional pattern, problems will become impossible to overlook. Colleges will put more first-year students into remedial courses, and businesses will hire more writing coaches for their own employees. The trend is well under way, and educators will increasingly see the non-digital space as a way of countering it. For a small but critical part of the day, wise teachers will hand students a pencil, paper, dictionary, and thesaurus and slow them down. Writing by hand, students will give more thought to the craft of composition. They will pause over a verb, review a transition, check sentence lengths, and say, "I can do better than that."

The non-digital space will appear, then, not as an anti-technology reaction but as a non-technology complement. Before the digital age, pen and paper were normal tools of writing, and students had no alternative to them. The personal computer and the Internet have displaced them, creating a new

technology and a whole new set of writing habits. Pen-and-paper has a new identity, a critical, even adversarial one. When students enter the non-digital space, they have a different attitude, one that resists the pressures of speed and innovation, thinks and writes against the fast and faster modes of the Web. Disconnectivity serves a crucial educational purpose, forcing students to recognize the technology everywhere around them and to see it from a critical distance.

This is but one aspect of the curriculum of the future. It allows a better balance of digital and non-digital outlooks. Yes, there will be tension between the non-digital space and the rest of the school, but it will be understood as a productive tension, not one to be overcome. The Web is, indeed, a force of empowerment and expression, but like all such forces, it also fosters conformity and stale behaviors. The non-digital space will stay the powers of convention and keep digital spheres a fresh and illuminating medium.

Mark Bauerlein is a professor of English at Emory University, senior editor at First Things magazine, and author of The Dumbest Generation: How the Digital Age Stupefies Young Americans and Jeopardizes Our Future (Or, Don't Trust Anyone Under 30) (2008).

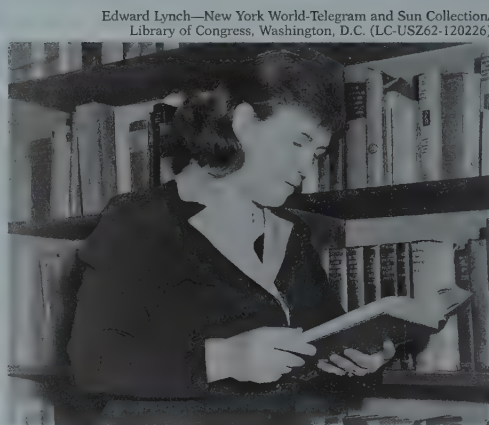
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MARGARET MEAD ON *Wolf Children*

The “feral child”—a child supposedly raised by animals in the wild, exhibiting little if any human behavior or language skills—is a prominent figure in Western mythology and literature, from Romulus and Remus (the legendary founders of Rome) to Kipling’s Mowgli in The Jungle Book, Edgar Rice Burrough’s Tarzan, and even the 1960s cartoon character and subsequent film star George of the Jungle. But do “feral” children really exist? In a curi-

ous little piece written for Britannica in 1968, shoehorned into its coverage of child psychology, the celebrity anthropologist Margaret Mead answered “no”—the majority of these cases were either dubiously documented, if not outright hoaxes, or involved developmentally challenged, “autistic” children. Many of the latter, we now know, were not autistic but victims of years of severe physical abuse by their parents, which accounts for their under- or non-developed language and social skills. The relatively recent case of “Genie,” for example, involved a girl in California whose father kept her tethered to a potty or tied up in a cage in a small, dimly lit room for nearly 12 years; she escaped with her mother in 1970, and only since the 1990s, after extensive investigation by social scientists, has the full extent of her abuse become widely known, accounting for what previously was deemed her “feral” behavior.



Occasional reports from various parts of the world and over many years have described children said to have been reared by wolves or other animals. In outline these reports resemble accounts in earlier centuries of individuals found wandering naked and speechless in European forests. The Bear Boys of Lithuania (1657), Wild Peter (1724), the girl of Châlons-sur-Marne (1731), the Wild Boy of Aveyron (1798), and others excited extraordinary interest, particularly among early

Melissa Lytle/St. Petersburg Times/PSG/Newscom



Nine-year-old Danielle Lierow, an abused and neglected child from Plant City, Florida, who had never been taught to speak and who frequently used her feet as hands, in 2009.

students of man. Observed, examined by the limited techniques of the period, and painstakingly described, they became widely known, and the details of their behaviour, more animal-like than human, led Linnaeus to classify them as a separate species, *Homo ferus*, feral man. In the 20th century reports came from India about feral children who had been stolen and reared by wolves. Modern anthropologists and psychologists no longer doubted that these wolf children belonged to our species, *Homo sapiens*, but they hoped that their history would shed light on the question of the relative importance of nature and nurture in individual human development. In the 1920s, two “wild” girls were found in Midnapur, India. One died soon afterward, but the other, known as Kamala, was reared by the Rev. J. A. Singh, whose careful notes on the process were published with an exhaustive analysis by Robert M. Zingg. Though she, too, died when she was about 18 years old, the record of her life was sufficiently persuasive to capture the interest of Arnold Gesell, who accepted the claim that the children actually had been reared by wolves and, interpreting Kamala’s strange behaviour as the result of her wolf rearing, thought that her human traits had survived even though her maturation was slowed down.

Later research has effectively cleared up the question of whether human children have been reared by wolves or bears and has shown how these individuals came into being and how the stories about them originated.

It was known for a long time that children wandered away or were purposely abandoned at the edge of the forest. Their destruction could readily be explained as theft by a wolf, a belief strengthened by the occasional child found in a wild, desperate state. In 1943, David Mandelbaum outlined this explanation of the wolf mythology of India: the so-called wolf children were children who had been abandoned and later were found by other people. But it remained for a detailed, on-the-spot investigation by sociologist William Ogburn to verify this theory when, in 1958, looking into the case of a child allegedly found in a wolf den, he demonstrated that, actually, no one had witnessed the find. Each had heard the story from someone else. Independent evidence by the child analyst Bruno Bettelheim showed that the behaviour of emotionally damaged, autistic children—children so damaged that they fail to relate to other people and do not talk—matches the described behaviour of the wolf children. This provided a rationale for their strange behaviour. All these data, taken together with our growing knowledge about the species-characteristic behaviour of animals, finally dispels the old myth.

Wolf children are to be understood as children who were abandoned and who survived for weeks or months before they were found, just in time. The literature on the successive finds of these wild children remains a fascinating chapter in man's attempt to understand what part of human behaviour is innate.

ROBERT BADEN-POWELL ON *The Boy Scouts*

Creative and courageous in equal measures was Sir Robert Baden-Powell. He garnered attention for his novel use of observation balloons in warfare in Bechuanaland (now Botswana) and the Sudan in 1884–85; he became a national hero for his 217-day defense of the besieged British outpost in Mafeking during the South African (Boer) War of 1899–1902; and when his 1899 military manual describing the games and contests he instituted for training cavalry troops in the art of scouting became popular among British teachers and youth alike, he released a new book, Scouting for Boys (1908), that spurred millions of sales and the worldwide scouting movement that continues to this day. He provided an overview of the principles and practices of the Boy Scouts in an article for Britannica's 13th Edition (1926). An excerpt follows.

Arnoldo Mondadori Editore S.P.—
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The Boy Scout movement, which was established in 1908 in the British Is., extends to-day to every civilised country in the world.

Ideals and Method.—The aim of the movement is the promotion of good citizenship among the rising generation. The method adopted is that of active self-expression and the desire to learn on the part of the boy, rather than his passive reception of instruction. The scope is unlimited by class, creed, colour or political distinctions. The movement is non-military, non-political, non-class and interdenominational. Honour is made the high ideal for the boys. The Scout Law, on which the movement hinges, and which is binding on every scout, was taken from the code of the knights.

Every boy, on joining the movement, makes the following promise:—

I promise on my honour to do my best—
To do my duty to God and the King
To help other people at all times
To obey the Scout Law.

The principles underlying the training are identical for each group, but the details differ to suit the different stages of development.

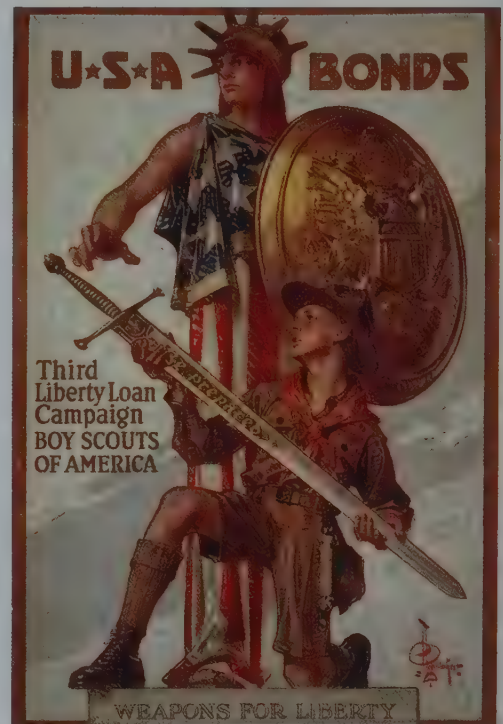
The training is carried out generally under four main headings:—

1. Character and intelligence.
2. Skill and handicraft.
3. Physical health and self-care.
4. The practice of service for others and for the state.

The activities and practices of scouting are framed to develop in (1), (2) and (3) the efficient individual and then to harness his individuality for the good of the community, *i.e.*, (4) citizenship. The training is carried out mainly through activities in the open air, and the attributes of frontiersmen, backwoodsmen and explorers are held up as examples for Scouts to emulate. Military training is not employed as being contrary to the ideals of peace and educationally wrong. Through an extensive system of badges for proficiency the boys are encouraged to develop their natural gifts, to become all round handy-men, and to specialise in those subjects which are likely to help them afterwards in making a career. Through the daily "good turn" they are gradually led on to the practice of service for others and so to unselfish citizenship.

Progress and Results.—From a trial experimental camp in 1907 the movement has spread with remarkable rapidity to every part of the world. In 1908 the handbook, *Scouting for Boys*, was published in fortnightly parts. By 1910 the movement in the British Empire num-

U.S. war bonds poster featuring the Boy Scouts of America and its motto, "Be prepared," 1917.



J.C. Leyendecker—American Lithographic Co. N.Y./
Library of Congress, Washington, D.C. (LC-USZC4-1127)

Harris & Hsing/Library of Congress, Washington, D.C. (LC-DIG-hec-00572)



Boy Scouts making a fire on the steps of the White House portico during Robert Baden-Powell's visit to Washington, D.C., 1911.

bered over 123,000 members and had been taken up in many foreign countries. In 1912 the aims and methods of the movement were inquired into by the Privy Council and a royal charter of incorporation granted. Over 100,000 Scouts served in His Majesty's Forces during the World War, 10,000 of whom gave their lives. Those who were under serving age carried out public duties at home, one notable service being that of coastwatchers, in place of the coastguardsmen who were called up for service afloat. This service was maintained by Boy Scouts from the outbreak of the War until after the declaration of peace, some 23,000 boys in all taking their turn at it.

The movement, though hampered by the loss of practically every able-bodied scoutmaster, managed not only to hold its own, but to increase steadily in numbers throughout the years of war. Numbers of troops were carried on entirely by their patrol leaders and courts of honour, without the help of officers. In 1920 an international meeting or *jamboree* was held at Olympia, London, in which Scouts of 26 nations took part. As a result of this meeting an international council was formed, with a bureau in London. A second international jamboree took place in 1924 at Copenhagen, at which 33 nations were represented. The fundamental principles, the Scout Promise and Law, are in every country identical with those of the parent movement, the details of training differing slightly here and there to suit climatic and temperamental differences. The Scout movement in 1925 extended to every corner of the world, and numbered nearly 2,000,000 members. Of these, some 700,000 belonged to the United States.

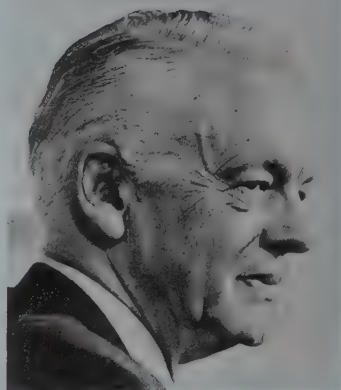
ROBERT MAYNARD HUTCHINS

ON

The Great Books and a Liberal Education

Encyclopædia Britannica, Inc.

For the first edition of Britannica's Great Books of the Western World (1952), Robert Maynard Hutchins—president (named at age 30) of the University of Chicago (1929–46), chancellor of the University of Chicago (1946–51), chairman of Britannica's Board of Editors (1943–74), editor in chief of the 54-volume Great Books, and coeditor, with Mortimer Adler, of Britannica's annual The Great Ideas Today (1961–77)—wrote a masterful essay entitled "The Great Conversation." His message was actually a passionate plea: that, amid an increasingly dangerous and globalized world, where misunderstandings could have the direst of consequences, a broad reading of the classics of Western culture, and a pondering of the grand issues and ideas therein contained, should remain the heart of a liberal education. And the need was pressing, he believed, given the rate at which academic specialization was taking over higher education.



U ntil lately the West has regarded it as self-evident that the road to education lay through great books. No man was educated unless he was acquainted with the masterpieces of his tradition. There never was very much doubt in anybody's mind about which the masterpieces were. They were the books that had endured and that the common voice of mankind called the finest creations, in writing, of the Western mind.

In the course of history, from epoch to epoch, new books have been written that have won their place in the list. Books once thought entitled to belong to it

have been superseded; and this process of change will continue as long as men can think and write. It is the task of every generation to reassess the tradition in which it lives, to discard what it cannot use, and to bring into context with the distant and intermediate past the most recent contributions to the Great Conversation. . . .

The Tradition of the West

The tradition of the West is embodied in the Great Conversation that began in the dawn of history and that continues to the present day. Whatever the merits of other civilizations in other respects, no civilization is like that of the West in this respect. No other civilization can claim that its defining characteristic is a dialogue of this sort. No dialogue in any other civilization can compare with that of the West in the number of great works of the mind that have contributed to this dialogue. The goal toward which Western society moves is the Civilization of the Dialogue. The spirit of Western civilization is the spirit of inquiry. Its dominant element is the *Logos*. Nothing is to remain undiscussed. Everybody is to speak his mind. No proposition is to be left unexamined. The exchange of ideas is held to be the path to the realization of the potentialities of the race.

At a time when the West is most often represented by its friends as the source of that technology for which the whole world yearns and by its enemies as the fountainhead of selfishness and greed, it is worth remarking that, though both elements can be found in the Great Conversation, the Western ideal is not one or the other strand in the Conversation, but the Conversation itself. It would be an exaggeration to say that Western civilization means these books. The exaggeration would lie in the omission of the plastic arts and music, which have quite as important a part in Western civilization as the great productions included in this set. But to the extent to which books can present the idea of a civilization, the idea of Western civilization is here presented.

These books are the means of understanding our society and ourselves. They contain the great ideas that dominate us without our knowing it. There is no comparable repository of our tradition.

To put an end to the spirit of inquiry that has characterized the West it is not necessary to burn the books. All we have to do is to leave them unread for a few generations. On the other hand, the revival of interest in these books from time to time throughout history has provided the West with new drive and creativeness. Great books have salvaged, preserved, and transmitted the tradition on many occasions similar to our own.

The books contain not merely the tradition, but also the great exponents of the tradition. Their writings are models of the fine and liberal arts. They hold be-

fore us what Whitehead called "the habitual vision of greatness." These books have endured because men in every era have been lifted beyond themselves by the inspiration of their example. Sir Richard Livingstone said: "We are tied down, all our days and for the greater part of our days, to the commonplace. That is where contact with great thinkers, great literature helps. In their company we are still in the ordinary world, but it is the ordinary world transfigured and seen through the eyes of wisdom and genius. And some of their vision becomes our own," . . .

The Next Great Change

Since education is concerned with the future, let us ask ourselves what we know positively about the future.

We know that all parts of the world are getting closer together in terms of the mechanical means of transportation and communication. We know that this will continue. The world is going to be unified, by conquest or consent.

We know that the fact that all parts of the world are getting closer together does not by itself mean greater unity or safety in the world. It may mean that we shall all go up in one great explosion.

We know that there is no defense against the most destructive of modern weapons. Both the victor and the defeated will lose the next war. All the factors that formerly protected this country, geographical isolation, industrial strength, and military power, are now obsolete.

We know that the anarchy of competing sovereign states must lead to war sooner or later. Therefore we must have world law, enforced by a world organization, which must be attained through world cooperation and community.

We know that it will be impossible to induce all men to agree on all matters. The most we can hope for is to induce all men to be willing to discuss all matters instead of shooting one another about some matters. A civilization in which all men are compelled to agree is not one in which we would care to live. Under such circumstances one world would be worse than many; for in many worlds there is at least the chance of escape from one to another. The only civilization in which a free man would be willing to live is one that conceives of history as one long conversation leading to clarification and understanding. Such a civilization presupposes communication; it does not require agreement.

We know that time is of the essence. Every day we read announcements of advances in transportation and "advances" in destruction. We can now go round the world in the time it used to take to go from New York to Boston; and we can kill a quarter of a million people with one bomb. We are promised bigger and better instruments of mass murder in every issue of our daily papers. At the same time the hostility among sovereign states is deepening by the hour.

How can we prepare for a future like this?

We see at once that the primary, not the incidental, participants in an educational program designed to cope with a future like this must be adults. They are in charge of the world. The rising generation, unless the adults in charge of the world can find some way of living together immediately, may never have a chance to rise. . . .

The United States is now the most powerful country in the world. It has been a world power for a very short time. It has not had centuries of experience in which to learn how to discharge the responsibilities of a position into which it was catapulted against its will. Nor has it had the kind of education, in the last fifty years, that is conducive to understanding its position or to maintaining it with balance, dignity, and charity. An educational system that aims at vocational training, or social adjustment, or technological advance is not likely to lead to the kind of maturity that the present crisis demands of the most powerful nation in the world.

A country that is powerful, inexperienced, and uneducated can be a great danger to world peace. The United States is unlikely to endanger peace through malevolence. The people of this country do not appear to bear any ill will toward any other people; nor do they want anything that any other people have. Since they are devoted to their own kind of society and government, they do not want any other nation to threaten the continued prosperity of their society and government. Any military moves made by the United States will be made in the conviction that they are necessary for the defense of this country.

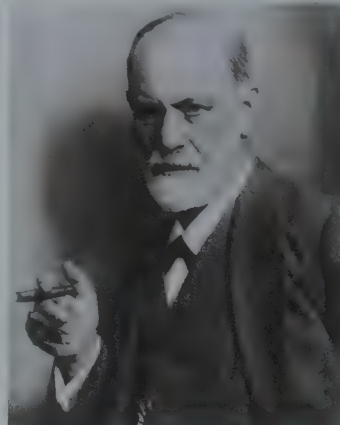
But this conviction may be mistaken. It may be hysterical, or it may be ignorant. We can easily blunder into war. Since we may have committed such a blunder even before these words appear in print, I must repeat that I do not wish to exaggerate the importance of these books, or any other means of adult education, as a method of preventing such a blunder. The time is short, and education is long. What I am saying is that, since education is long, and since it is indispensable, we should begin it right away.

When Marshal Lyautey was in Africa, he asked his gardener to plant a certain tree, the foliage of which he liked very much. The gardener said that a tree of this kind took two hundred years to reach maturity. "In that case," said the marshal, "there is no time to lose. Plant it today."

SIGMUND FREUD ON *Psychoanalysis*

Mary Evans/Sigmund Freud Copyrights (courtesy of W.E. Freud)

For a treatment of the Freudian school of psychoanalysis for its new 13th Edition (1926), Britannica went directly to the fountainhead, as they did in the analogous case of Einstein. Freud's account is remarkable on several counts: its modesty, its concision, its clarity. It is fascinating to get this authoritative glimpse of the subject as it appeared to its master (1856–1939) nearly a century ago. His article is reprinted here in its entirety.



In the years 1880–2 a Viennese physician, Dr. Josef Breuer (1842–1925), discovered a new procedure by means of which he relieved a girl, who was suffering from severe hysteria, of her various symptoms. The idea occurred to him that the symptoms were connected with impressions which she had received during a period of excitement while she was nursing her sick father. He therefore induced her, while she was in a state of hypnotic somnambulism, to search for these connections in her memory and to live through the “pathogenic” scenes once again without inhibiting the affects that arose in the process. He found that when she had done this the symptom in question disappeared for good.

This was at a date before the investigations of Charcot and Pierre Janet into the origin of hysterical symptoms, and Breuer's discovery was thus entirely uninfluenced by them. But he did not pursue the matter any further at the time, and it was not until some 10 years later that he took it up again in collaboration with Sigmund Freud. In 1895 they published a book, *Studien über Hysterie*, in which Breuer's discoveries were described and an attempt was made to explain them by the theory of *Catharsis*. According to that hypothesis, hysterical symptoms originate through the energy of a mental process being withheld from conscious influence and being diverted into bodily innervation (“*Conversion*”). A hysterical symptom would thus be a substitute for an omitted mental act and a reminiscence

of the occasion which should have given rise to that act. And, on this view, recovery would be a result of the liberation of the affect that had gone astray and of its discharge along a normal path (*"Abreaction"*). Cathartic treatment gave excellent therapeutic results, but it was found that they were not permanent and that they were dependent on the personal relation between the patient and the physician. Freud, who later proceeded with these investigations by himself, made an alteration in their technique, by replacing hypnosis by the method of free association. He invented the term *"psychoanalysis,"* which in the course of time came to have two meanings: (1) a particular method of treating nervous disorders and (2) the science of unconscious mental processes, which has also been appropriately described as *"depth-psychology."*

Subject matter of psychoanalysis. Psychoanalysis finds a constantly increasing amount of support as a therapeutic procedure, owing to the fact that it can do more for certain classes of patients than any other method of treatment. The principal field of its application is in the milder neuroses—hysteria, phobias and obsessional states, but in malformations of character and in sexual inhibitions or abnormalities it can also bring about marked improvements or even recoveries. Its influence upon dementia praecox and paranoia is doubtful; on the other hand, in favourable circumstances it can cope with depressive states, even if they are of a severe type.

In every instance the treatment makes heavy claims upon both the physician and the patient: the former requires a special training, and must devote a long period of time to exploring the mind of each patient, while the latter must make considerable sacrifices, both material and mental. Nevertheless, all the trouble involved is as a rule rewarded by the results. Psychoanalysis does not act as a convenient panacea (*"cito, tute, jucunde"*) upon all psychological disorders. On the contrary, its application has been instrumental in making clear for the first time the difficulties and limitations in the treatment of such affections.

The therapeutic results of psychoanalysis depend upon the replacement of unconscious mental acts by conscious ones and are operative in so far as that process has significance in relation to the disorder under treatment. The replacement is effected by overcoming internal resistances in the patient's mind. The future will probably attribute far greater importance to psychoanalysis as the science of the unconscious than as a therapeutic procedure.

Depth-psychology. Psychoanalysis, in its character of depth-psychology, considers mental life from three points of view: the dynamic, the economic and the topographical.

From the first of these standpoints, the *dynamic* one, psychoanalysis derives all mental processes (apart from the reception of external stimuli) from the interplay of forces, which assist or inhibit one another, combine with one another, en-

ter into compromises with one another, etc. All of these forces are originally in the nature of *instincts*; that is to say, they have an organic origin. They are characterised by possessing an immense (somatic) persistence and reserve of power ("*repetition-compulsion*"); and they are represented mentally as images or ideas with an affective charge ("*cathexis*"). In psychoanalysis, no less than in other sciences, the theory of instincts is an obscure subject. An empirical analysis leads to the formation of two groups of instincts: the so-called "ego-instincts," which are directed towards self-preservation and the "object-instincts," which are concerned with relations to an external object. The social instincts are not regarded as elementary or irreducible. Theoretical speculation leads to the suspicion that there are two fundamental instincts which lie concealed behind the manifest ego-instincts and object-instincts: namely (a) Eros, the instinct which strives for ever closer union, and (b) the instinct of destruction, which leads toward the dissolution of what is living. In psychoanalysis the manifestation of the force of Eros is given the name "*libido*."

Pleasure-pain principle. From the *economic* standpoint psychoanalysis supposes that the mental representations of the instincts have a cathexis of definite quantities of energy, and that it is the purpose of the mental apparatus to hinder any damming-up of these energies and to keep as low as possible the total amount of the excitations to which it is subject. The course of mental processes is automatically regulated by the "*pleasure-pain principle*"; and pain is thus in some way related to an increase of excitation and pleasure to a decrease. In the course of development the original pleasure principle undergoes a modification with reference to the external world, giving place to the "*reality-principle*," whereby the mental apparatus learns to postpone the pleasure of satisfaction and to tolerate temporarily feelings of pain.

Mental topography. *Topographically*, psychoanalysis regards the mental apparatus as a composite instrument, and endeavours to determine at what points in it the various mental processes take place. According to the most recent psychoanalytic views, the mental apparatus is composed of an "*id*," which is the reservoir of the instinctive impulses, of an "*ego*," which is the most superficial portion of the id and one which is modified by the influence of the external world, and of a "*super-ego*," which develops out of the id, dominates the ego and represents the inhibitions of instinct characteristic of man. Further, the property of consciousness has a topographical reference; for processes in the id are entirely unconscious, while consciousness is the function of the ego's outermost layer, which is concerned with the perception of the external world.

At this point two observations may be in place. It must not be supposed that these very general ideas are presuppositions upon which the work of psychoanalysis depends. On the contrary, they are its latest conclusions and are in every

respect open to revision. Psychoanalysis is founded securely upon the observation of the facts of mental life; and for that very reason its theoretical superstructure is still incomplete and subject to constant alteration. Secondly, there is no reason for astonishment that psychoanalysis, which was originally no more than an attempt at explaining pathological mental phenomena, should have developed into a psychology of normal mental life. The justification for this arose with the discovery that the dreams and mistakes ("*parapraxes*," such as slips of the tongue, etc.) of normal men have the same mechanism as neurotic symptoms.

Theoretical basis. The first task of psychoanalysis was the elucidation of nervous disorders. The analytical theory of the neuroses is based upon three ground-pillars: the recognition of (1) "*repression*," of (2) the importance of the sexual instincts and of (3) "*transference*."

Censorship. There is a force in the mind which exercises the functions of a censorship, and which excludes from consciousness and from any influence upon action all tendencies which displease it. Such tendencies are described as "repressed." They remain unconscious; and if the physician attempts to bring them into the patient's consciousness he provokes a "*resistance*." These repressed instinctual impulses, however, are not always made powerless by this process. In many cases they succeed in making their influence felt by circuitous paths, and the indirect or substitutive gratification of repressed impulses is what constitutes neurotic symptoms.

Sexual instincts. For cultural reasons the most intensive repression falls upon the sexual instincts; but it is precisely in connection with them that repression most easily miscarries, so that neurotic symptoms are found to be substitutive gratifications of repressed sexuality. The belief that in man sexual life begins only at puberty is incorrect. On the contrary, signs of it can be detected from the beginning of extra-uterine existence; it reaches a first culminating point at or before the fifth year ("early period"), after which it is inhibited or interrupted ("latency period") until the age of puberty, which is the second climax of its development. This double onset of sexual development seems to be distinctive of the genus *Homo*. All experiences during the first period of childhood are of the greatest importance to the individual, and in combination with his inherited sexual constitution, form the dispositions for the subsequent development of character or disease. It is a mistaken belief that sexuality coincides with "genitality." The sexual instincts pass through a complicated course of development, and it is only at the end of it that the "primacy of the genital zone" is attained. Before this there are a number of "pre-genital organisations" of the libido—points at which it may become "fixated" and to which, in the event of subsequent repression, it will return ("*regression*"). The infantile fixations of the libido are what determine the form of neurosis which sets in later. Thus the neuroses are to be regarded as inhibitions in the development of the libido.

The Oedipus complex. There are no specific causes of nervous disorders; the question whether a conflict finds a healthy solution or leads to a neurotic inhibition of function depends upon quantitative considerations, that is, upon the relative strength of the forces concerned. The most important conflict with which a small child is faced is his relation to his parents, the "*Oedipus complex*"; it is in attempting to grapple with this problem that persons destined to suffer from a neurosis habitually fail. The reactions against the instinctual demands of the Oedipus complex are the source of the most precious and socially important achievements of the human mind; and this probably holds true not only in the life of individuals but also in the history of the human species as a whole. The super-ego, the moral factor which dominates the ego, also has its origin in the process of overcoming the Oedipus complex.

Transference. By "*transference*" is meant a striking peculiarity of neurotics. They develop toward their physician emotional relations, both of an affectionate and hostile character, which are not based upon the actual situation but are derived from their relations toward their parents (the Oedipus complex). Transference is a proof of the fact that adults have not overcome their former childish dependence; it coincides with the force which has been named "suggestion"; and it is only by learning to make use of it that the physician is enabled to induce the patient to overcome his internal resistances and do away with his repressions. Thus psychoanalytic treatment acts as a second education of the adult, as a corrective to his education as a child.

Within this narrow compass it has not been possible to mention many matters of the greatest interest, such as the "*sublimation*" of instincts, the part played by symbolism, the problem of "*ambivalence*," etc. Nor has there been space to allude to the applications of psychoanalysis, which originated, as we have seen, in the sphere of medicine, to other departments of knowledge (such as Anthropology, the Study of Religion, Literary History and Education) where its influence is constantly increasing. It is enough to say that psychoanalysis, in its character of the psychology of the deepest, unconscious mental acts, promises to become the link between Psychiatry and all of these other fields of study.

The psychoanalytic movement. The beginnings of psychoanalysis may be marked by two dates: 1895, which saw the publication of Breuer and Freud's *Studien über Hysterie*, and 1900, which saw that of Freud's *Traumdeutung*. At first the new discoveries aroused no interest either in the medical profession or among the general public. In 1907 the Swiss psychiatrists, under the leadership of E. Bleuler and C. G. Jung, began to concern themselves in the subject; and in 1908 there took place at Salzburg a first meeting of adherents from a number of different countries. In 1909 Freud and Jung were invited to America by G. Stanley Hall to deliver a series of lectures on psychoanalysis at Clark University, Worcester, Mass.

From that time forward interest in Europe grew rapidly; it showed itself, however, in a forcible rejection of the new teachings, characterised by an emotional colouring which sometimes bordered upon the unscientific.

The reasons for this hostility are to be found, from the medical point of view, in the fact that psychoanalysis lays stress upon psychical factors, and from the philosophical point of view, in its assuming as an underlying postulate the concept of unconscious mental activity; but the strongest reason was undoubtedly the general disinclination of mankind to concede to the factor of sexuality such importance as is assigned to it by psychoanalysis. In spite of this widespread opposition, however, the movement in favour of psychoanalysis was not to be checked. Its adherents formed themselves into an International Association, which passed successfully through the ordeal of the World War, and at the present time comprises local groups in Vienna, Berlin, Budapest, London, Switzerland, Holland, Moscow and Calcutta, as well as two in the United States. There are three journals representing the views of these societies: the *Internationale Zeitschrift für Psychoanalyse*, *Imago* (which is concerned with the application of psychoanalysis to non-medical fields of knowledge), and the *International Journal of Psycho-Analysis*.

During the years 1911–3 two former adherents, Alfred Adler, of Vienna, and C. G. Jung, of Zürich, seceded from the psychoanalytic movement and founded schools of thought of their own. In 1921 Dr. M. Eitingon founded in Berlin the first public psychoanalytic clinic and training-school, and this was soon followed by a second in Vienna. For the moment these are the only institutions on the continent of Europe which make psychoanalytic treatment accessible to the wage-earning classes.

THOMAS MALTHUS ON *Population Control*

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In the Rev. Thomas Robert Malthus (1766–1834) we meet a representative of that class of thinkers called seminal. By this term is usually meant a thinker who, by the novelty or force or outrageousness of his argument, arouses others for many years afterward to research, debate, and action. Malthus was reared on and according to the doctrines of Rousseau; and he demonstrated perfectly the propensity of each generation to overthrow the fondest schemes of the last, by publishing in 1798, when he was 32 years old, an Essay on the Principle of Population in which he painted the gloomiest picture imaginable of the human prospect. His central thesis is well known: that population, tending to grow at a geometric rate, will ever press against the food supply, which at best increases only arithmetically, and thus poverty and misery are forever inescapable. This idea is altogether plausible, if simplistic, and its rapid adoption by theorists of the laissez-faire school is largely responsible for the designation of economics as the “dismal science.”



Malthus's argument had a profounder effect on, oddly, the science of biology, for it was the reading of his essay that sparked the idea of natural selection by survival of the fittest in the minds of both Charles Darwin and Alfred Wallace. By the time Malthus was asked to write an article on “Population” for Britannica's 1824 Supplement, he had somewhat moderated the bleakness of his original essay, at least to the extent of adding to the “positive checks” on population—war, starvation, and so on—the idea of more benign “preventive checks,” prudential acts like the purposeful delay of marriage and childbearing. Malthus and his wife, as it happens, had two children.

Britannica, therefore, could offer its readers a unique spectacle: a powerful mind grappling with a powerful idea whose implications disturb us even more today—in our world of nearly eight billion people, who are consistently living longer due to improvements in science, medicine, and social services—than they did in Malthus's time.

Consider . . . the nature of those checks which have been classed under general heads of Preventive and Positive.

It will be found that they are all resolvable into *moral restraint*, *vice*, and *misery*. And if, from the laws of nature, some check to the increase of population be absolutely inevitable, and human institutions have any influence upon the extent to which each of these checks operates, a heavy responsibility will be incurred, if all that influence, whether direct or indirect, be not exerted to diminish the amount of vice and misery.

Moral restraint, in application to the present subject, may be defined to be, abstinence from marriage, either for a time or permanently, from prudential considerations, with a strictly moral conduct towards the sex in the interval. And this is the only mode of keeping population on a level with the means of subsistence, which is perfectly consistent with virtue and happiness. All other checks, whether of the preventive or the positive kind, though they may greatly vary in degree, resolve themselves into some form of vice or misery.

The remaining checks of the preventive kind, are the sort of intercourse which renders some of the women of large towns unprolific: a general corruption of morals with regard to the sex, which has a similar effect; unnatural passions and improper arts to prevent the consequences of irregular connections. These evidently come under the head of vice.

The positive checks to population include all the causes, which tend in any way prematurely to shorten the duration of human life; such as unwholesome occupations—severe labour and exposure to the seasons—bad and insufficient food and clothing arising from poverty—bad nursing of children—excesses of all kinds—great towns and manufactories—the whole train of common diseases and epidemics—wars, infanticide, plague, and famine. Of these positive checks, those which appear to arise from the laws of nature, may be called exclusively misery; and those which we bring upon ourselves, such as wars, excesses of all kinds, and many others, which it would be in our power to avoid, are of a mixed nature. They are brought upon us by vice, and their consequences are misery. . . .

Prudence cannot be enforced by laws, without a great violation of natural liberty, and a great risk of producing more evil than good. But still, the very great influence of a just and enlightened government, and the perfect security of property in creating habits of prudence, cannot for a moment be questioned. . . .

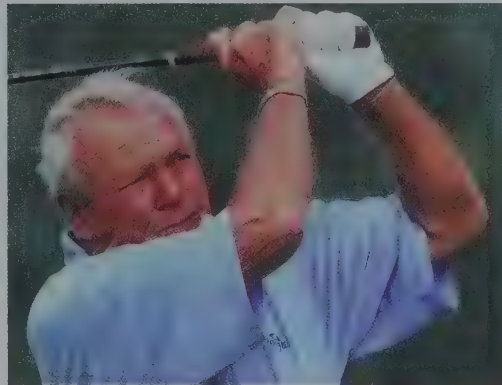
The existence of a tendency in mankind to increase, if unchecked, beyond the possibility of an adequate supply of food in a limited territory, must at once determine the question as to the natural right of the poor to full support in a state of society where the law of property is recognized. The question, therefore, resolves itself chiefly into a question relating to the necessity of those laws which

establish and protect private property. It has been usual to consider the right of the strongest as the law of nature among mankind as well as among brutes; yet, in so doing, we at once give up the peculiar and distinctive superiority of man as a reasonable being, and class him with the beasts of the field. . . . If it be generally considered as so discreditable to receive parochial relief, that great exertions are made to avoid it, and few or none marry with a certain prospect of being obliged to have recourse to it, there is no doubt that those who were really in distress might be adequately assisted, with little danger of a constantly increasing proportion of paupers; and in that case a great good would be attained without any proportionate evil to counterbalance it.

ARNOLD PALMER ON *The Masters Tournament*

Arnold Palmer was the first golfer to win the coveted Masters Tournament four times, the first to earn \$1 million in tournament prize money, and the first of the four legendary linksmen—the others being Jack Nicklaus, Colin Montgomerie, and Padraig Harrington—to write on the four “majors” of golf for Britannica. A revered figure in golf from the late 1950s through the mid-’60s and one of the great ambassadors of the sport, Palmer attracted a vast and faithful following known as “Arnie’s Army.” What made the Masters in Augusta, Georgia, so special each April was the topic of his contribution to Britannica.

Courtesy, Arnold-Palmer Enterprises; photograph, Eiko Oizumi



The Masters Tournament is the invitational golf tournament held annually since 1934 from Thursday through Sunday during the first full week of April at the private Augusta National Golf Club in Augusta, Georgia. The tournament was conceived by American golfer Bobby Jones. It is considered one of the four “majors”—the other major golf tournaments being the U.S. Open, the British Open (Open Championship), and the Professional Golfers’ Association of America (PGA) Championship. It is the only one of them played annually at the same site. Most of the entrants are professionals, although a few amateurs are invited each year.

In 1930, at age 28, Jones retired from competitive golf and formed a consortium with Wall Street financier Clifford Roberts. They bought a 365-acre (150-hectare) commercial nursery in Augusta for \$70,000 with the goal of creating an exclusive golf club—with no swimming pool and no tennis courts. The 72-hole golf course was planned by the noted English designer Alister MacKenzie. The club opened in early 1933 with a members’ tournament commemorating the occasion. One year later, Jones expanded the tournament, and the Masters was born.



Arnold Palmer at the 1962 Masters Tournament in Augusta, Georgia. Palmer defeated Dow Finsterwald (pictured in the background) and Gary Player in a playoff to capture his third of four Masters titles.

The Masters is one of the world's most-prestigious sporting events. Golfers are invited to compete on the basis of their past achievements. Besides a monetary prize, now worth several million dollars, winners are presented with a gold medal, awarded a lifetime invitation to the Masters, and granted automatic invitations to the other three majors for the next five years. In addition, winners have been presented with a club member's distinctive green jacket since 1949 and have had their names engraved on the club's silver Masters Trophy since 1961.

Many professional golfers say that Augusta National is the most beautiful golf course they have ever played. The sun seems brighter there, the sky bluer, the wind gentler, the pines more stately, and the azaleas more colourful than on any other golf course in the world. Sam Snead once said,

I don't want to sound overly sentimental about it. But with the course looking the way it does and the spirit of Bobby Jones running around, sometimes it feels as though the Masters is played on hallowed ground.

Prior to the 2002 Masters, in response to changing equipment technology and the improved strength conditioning of contemporary golfers, the course at Augusta National was lengthened by 285 yards (261 metres). At the same time, the fairway bunkers on three holes were reshaped to make them more dangerous for long drivers. Before the 2006 Masters, the course was lengthened again, this time by 155

yards (142 metres) to a length of 7,445 yards (6,808 metres). The course will likely continue to be modified to keep up with the modern game.

Because of their physical proximity and some pivotal moments in Masters history that occurred there, the green on the 11th hole, the entire 12th hole, and the tee for the 13th hole have become known as Amen Corner. These are among the most famous and challenging holes in golf, and it was these holes that marked a turning point for me en route to my victory at the 1958 Masters.

Notable moments in Masters history include Jack Nicklaus winning the tournament for the sixth time in 1986 at age 46 and Tiger Woods capturing his first Masters championship in 1997 while shooting 270 to break the 72-hole tournament scoring record.

Millions of fans have watched over the years on a Sunday afternoon as the leader comes down the fairway to the final green at Augusta with the crowd cheering. This author has been fortunate to win the Masters on four occasions and can confirm that those final moments are as exhilarating as anything in golf.

BARNABY CONRAD ON

Bullfighting

Whether seen as animal cruelty or as a cherished cultural tradition, bullfighting remains a popular pastime and spectacle in many areas of the Spanish-speaking world. Britannica's distinguished writer on the subject, Barnaby Conrad, covered both the controversy and essence of bullfighting, and a better writer on the subject could hardly have been found. For Conrad was not only a prolific author of numerous books on the spectacle but a former matador himself. He began his career as an amateur bullfighter at the University of Mexico, where he studied painting, and while later serving as the American vice consul to Sevilla, Málaga, and Barcelona, he continued his studies of tauromachy, learning from three of history's greatest bullfighters: Belmonte, Manolete, and Arruza. He was long cited as the only American to have fought bulls on three continents, in Spain, Mexico, and Peru. A short excerpt from his long article follows.

Bullfighting has long generated commentary and controversy. To anthropologists and psychologists, the corrida has signified everything from a confrontation between culture and nature to a symbolic exposition of gender, sexual, or filial relations. In centuries past, clerics assailed bullfighting for degrading the work ethic and diverting public attention away from the church and prayer. Many observers—from Renaissance popes and Bourbon kings to contemporary animal-rights activists—have seen bullfighting as barbaric, as a perversion of the Christian principle of animal stewardship. Others have blamed the spectacle on a debased elite class, which historically held corridas in commemoration of royal weddings and to celebrate the graduation of doctoral students; in the latter case, graduates adorned a wall of their college with the blood of the bull, a tradition that lingers today but in the form of applying red paint, not blood. To still others, blame for the bullfight lies not with a decadent elite but with mass popular culture's taste for bread-and-circuses kinds of entertainment. To many Spanish intellectuals (especially to the Generation of 1898, which grappled with the meaning of the loss of the Spanish empire, and to many intellectuals after the death of Francisco Franco in 1975), the corrida has been a window into the soul of Spain and its people, an unrelenting

reminder of the so-called Spanish “problem”: Spain’s supposed rejection of the Enlightenment and the modern world, a refusal to “Europeanize,” which hurts Spain’s standing in world opinion and its stature in the European community of civilized nations. The European Union, however, has declared bullfighting a protected activity under the heading of “national culture.”

Bullfighting’s defenders are as passionate as its detractors, and they have hailed from all social and economic classes. Jean-Jacques Rousseau credited bullfighting with keeping alive a certain “vigour” in the Spanish people. Other defenders point out that the corrida employs hundreds of thousands of people worldwide and generates much-needed revenue for private charities and state welfare agencies, not unlike the role gambling and lotteries play in many nonbullfighting countries. To still others, bullfighting is but another form of contemporary commercialized mass entertainment—less violent than professional boxing, less injurious than American football, and less cruel to the animal than the ignoble fate that awaits the slaughterhouse steer. Many bullfighters take a more philosophical view and see in the bullring a morality play of sorts, a rare microcosm of the world in its various manifestations. As described by Conchita Cintrón, the most acclaimed female bullfighter of modern times,

Within its small circle one finds life, death, ambition, despair, success, failure, faith, desperation, valor, cowardliness, generosity, and meanness—all condensed into the actions of a single afternoon or even a single moment.

The classic Spanish type of bullfighting, which this article largely deals with, is often characterized as a sport, but it is not considered as such by its supporters and enthusiasts. While most sporting events value victory over method, in modern bullfighting the method is the essence of the spectacle. Its supporters see it as an art form not unlike ballet but with one major difference. As bullfighting aficionado Ernest Hemingway famously said in *Death in the Afternoon* (1932), “Bullfighting is the only art in which the artist is in danger of death.” . . .



Bullfighting poster showing the matador Granero, by Carlos Ruano Llopi, 1921.

Bullfighting and the Arts

It is highly probable that artistic renderings of bulls arose nearly simultaneously with art itself. Excavations at Çatalhöyük in Anatolia, a site dating to 6700–5650 BCE, have uncovered temples adorned with bull heads as well as furniture and pillars composed of stylized bull horns. This art is thought to have been used to ward off evil, as were the pairs of human-headed bulls that were commonly carved as protective creatures on the porticoes of important buildings in ancient Sumer and Assyria. Bull gods and bull-slaying cults were common in prehistoric and ancient Europe and the Middle East, and the animal was widely revered as a symbol of strength and fertility; the bull-god Apis was worshipped in Memphis (founded c. 2925 BCE), capital of ancient Egypt, and Nandi the bull has long been revered and portrayed in Indian art and architecture as either the zoomorphic form of the Hindu god Shiva or as Shiva's vehicle.

Scenes of man's struggles with bulls and wild beasts are also common. Such struggles are depicted in the Paleolithic paintings (which date between 15,000 and 10,000 BCE) found in the caves of France and Spain and are a mainstay of world literature. Hercules' battle with the Nemean lion, Theseus's slaying of the Minotaur, and Mithra's vanquishing of a bull, a scene often depicted in Hellenistic art—all these examine this common theme. Perhaps the first matador in recorded literature is the hero of the *Epic of Gilgamesh*, the most important literary product of ancient Mesopotamia. As the 4,000-year-old Babylonian legend states, "And Gilgamesh, like a huntsman, thrusts his sword between nape and horns" and slays the bull sent to destroy him. The frescoes of ancient Crete depict acrobatic dances or games with bulls, and, although these scenes do not show bullfighting as it is known today, they are interesting in showing both girls and boys vaulting over the horns of the charging animals. Mary Renault recreated these ancient games and times in her novels *The King Must Die* (1958) and *The Bull from the Sea* (1962).

The traditional bullfight—that "dance with death" which has been called "indefensible but irresistible"—has long captured the attention and imagination of painters, novelists, poets, photographers, sculptors, and cinematographers. The Spaniard Francisco de Goya was the first major painter to record the spectacle artistically and in all its aspects. Goya was an amateur torero himself, and his *La tauromaquia* series of etchings (1815–16) show what the corrida looked like in the early 19th century. One of his masterpieces depicts two spirited bullfights, divided by a fence, taking place in the Madrid bullring.

Édouard Manet often painted taurine themes, *The Dead Toreador* (1864) being perhaps his most famous example. Pablo Picasso began drawing bullfights as a boy in Málaga, Spain, and continued to depict taurine subjects in his mature art. John Fulton, the North American matador promoted to the corrida's highest

rank in Spain, also painted, and many of his most popular works in private and public galleries were done with a single pigment: the blood of the bulls he had dispatched in the ring. This corresponds, he wrote, "to the ancient art of primitive matador-painters who had to limit themselves to natural media taken from the very animals they killed." A major contribution to taurine art occurred in the 1920s and '30s with the flashy, impressionistic bullfight posters (*carteles*). Most popular were those of Roberto Domingo and Carlos Ruano Llopis and their later imitator Juan Reus.

Sculptors such as Mariano Benlliure (from Spain) and Humberto Peraza (from Mexico) have also been drawn to bullfighting themes. A superb example of Benlliure's work can be seen in the graveyard at Sevilla where, depicted in bronze, are 12 life-size figures carrying the open coffin of the great Joselito, who was killed by a bull in 1920. Peraza's enormous bronze bulls and matadors can be seen outside the arenas in Mexico City and Tijuana, Mexico.

Female matador Cristina Sánchez during a San Isidro festival bullfight, Las Ventas bullring, Madrid, Spain, May 21, 1996.



Denis Doyle/AP Images

Bullfighting, not surprisingly, has been a theme for Spanish writers for centuries, and Spanish novels about bullfighting are too numerous to mention. Perhaps the most famous novel about bullfighting in Spain is *Sangre y arena* (1909; *Blood and Sand*, 1922), by Vicente Blasco Ibáñez, which was adapted for film many times, arguably the most famous version starring Rita Hayworth and Tyrone Power (1941). The best-known poem of Federico García Lorca is *Llanto por Ignacio Sánchez Mejías* (1935; Eng. trans. *Lament for a Bullfighter*), each verse of which ends with the line “at five in the afternoon.” (Mejías was a writer, a close friend of Lorca’s, and a bullfighter who was killed in the ring in 1934.) Unquestionably the most important nonfiction piece of taurine literature is by Spanish historian José María de Cossío, who in 1943 published the first volume of the monumental work *Los toros*. This multivolume set explores every aspect of bullfighting and analyzes every torero, bullring, and bull of importance then known.

Bullfighting is at the heart of one of the most beloved operas, Georges Bizet’s *Carmen* (1875). The opera is based on Prosper Mérimée’s 1846 novella of a spirited girl from Sevilla and her bullfighter lover. If the traditional female role in bullfighting has been that of “beautiful spectator” as depicted in classic bullfighting posters, it is that of grief-stricken wife, suffering mother, or femme fatale in much bullfighting fiction. In fact, according to literary convention, the brave, Byronic protagonist is often seduced to his peril by the wiles of a beautiful woman. Some critics see this as an ironic twist, considering the matador can be viewed as playing a similar female role with the bull in the ring, teasing and seducing the male animal to its death. Henry de Montherlant’s *Les Bestiaires* (1926; *The Bullfighters*) also deals with the matador’s ever-present threat of death in the ring.

In English there are few books that truly reflect or understand the spectacle. One of the first to do so faithfully was Frank Harris’s *Montes the Matador and Other Stories* (1900). But the first truly accurate, comprehensive, and unblinking overview of bullfighting in English—and certainly the most influential—was Ernest Hemingway’s *Death in the Afternoon* (1932). It is in this nonfiction work that Hemingway opines why so few Americans and Englishmen become matadors:

We, in games, are not fascinated by death, its nearness and its avoidance. We are fascinated by victory and we replace the avoidance of death by the avoidance of defeat.

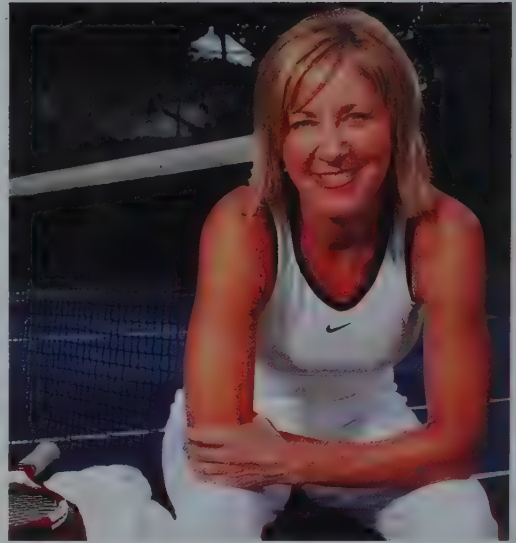
Hemingway also included bullfighting scenes in his novels *The Sun Also Rises* (1926) and *For Whom the Bell Tolls* (1940), and his last major literary work, *The Dangerous Summer* (1960), was an account of the rivalry between two great matadors, Dominguín and his brother-in-law, Antonio Ordóñez (who was the son of the bullfighter who inspired the character in *The Sun Also Rises*). Hemingway’s short

story *The Capital of the World* (1936) was turned into a ballet of the same name in 1953. The plot of the story and ballet revolves around the young, idealistic Paco, who goes to Madrid to become a matador but grows disillusioned with his discovery of the seamier side of the bullfighting industry; he dies after being gored by an artificial bull, a chair with knives fixed as horns. Two additional American novels help explain the spectacle to English-speaking readers: Tom Lea's *The Brave Bulls* (1949) and Barnaby Conrad's *Matador* (1952), the former about a Mexican matador and the latter about a doomed Spaniard.

Most Hollywood films, such as Eddie Cantor's *The Kid from Spain* (1932) and Walt Disney's short subject *Ferdinand the Bull* (1938), portray matadors as ego-centric and comic figures instead of practitioners of what is perhaps the most demanding and dangerous profession in the world. One of the best bullfighting films ever made is Budd Boetticher's *Bullfighter and the Lady* (1951), which sparked great interest in bullfighting in the United States. Boetticher himself was an amateur torero and produced several other bullfighting films. Award-winning director Pedro Almodóvar has also made films involving bullfighting, including *Matador* (1986), which was roundly criticized in Spain for its negative portrayal of the corrida, and *Hable con ella* (2002; *Talk to Her*), which deals with, among other things, the relationship between a female bullfighter and her lover. In art as in society, bullfighting's "dance with death" sparks commentary, controversy, and endless interpretation.

CHRIS EVERT ON *The U.S. Open*

The winner of 18 Grand Slam titles and former No. 1 tennis player in the world, Christine Marie "Chrissie" Evert made her mark as one of the premier women athletes of all time at a very young age. Her Grand Slam titles include a record seven French Open wins and a record six championships at the U.S. Open, the tournament she wrote on for Britannica. Evert's career win-loss record in singles matches (1,309-146) was the best winning percentage (.900) of any professional player (male or female) in history.



U.S. Open, formally the United States Open Tennis Championships, is an international tennis tournament, and the fourth and final of the major events that make up the annual Grand Slam of tennis (the other tournaments are the Australian Open, the French Open, and the Wimbledon Championships).

The U.S. Open is held each year over a two-week period in late August and early September. Since 1978 all the U.S. Open championships have been played on the acrylic hard courts of the U.S. Tennis Association (USTA) National Tennis Center (renamed the USTA Billie Jean King National Tennis Center in 2006) in Flushing Meadows, Queens, N.Y. The U.S. Open consists of championships in five main categories: men's singles and doubles, women's singles and doubles, and mixed doubles. The tournament is unique among the Grand Slam events in that tiebreakers are played in the deciding sets (the fifth set for men and the third set for women), instead of continuing play in the final set until a player has won by two games.

The U.S. Open developed from one of the oldest tennis championships in the world: the U.S. National Championship, which was established in 1881 as a national men's singles and doubles competition. The tournament was open only to clubs that were members of the U.S. National Lawn Tennis Association (USLTA; now the USTA). The event expanded to include women's singles in 1887, women's doubles in 1889, and mixed doubles in 1892. The five championships were contested at different locales until 1968, when all five tournaments were finally hosted at a common site (the West Side Tennis Club in Forest Hills, Queens, N.Y.), whereupon the championships became known as the U.S. Open. The tournament moved to Flushing Meadows in 1978. As a unique result of this decentralized history, the tournament has been played on a variety of surfaces: from 1881 to 1974, it was played on grass; from 1975 to 1977, on clay; and since 1978, on DecoTurf, a fast hard-court surface comprising an acrylic layer over an asphalt or concrete base.

The main court at the U.S. Open (and the National Tennis Center's largest venue) is the 22,000-seat Arthur Ashe Stadium, which is followed in capacity by the 10,000-seat Louis Armstrong Stadium, the 6,000-seat Grandstand Stadium, and smaller side courts. All courts are lit and therefore conducive to night play, and the inner courts are painted blue to facilitate the tracking of the ball. Like most major championships tied to professional sports, the U.S. Open is as much a media extravaganza and tourist attraction as a sporting event, with special musical acts and family activities scheduled throughout the two-week period.

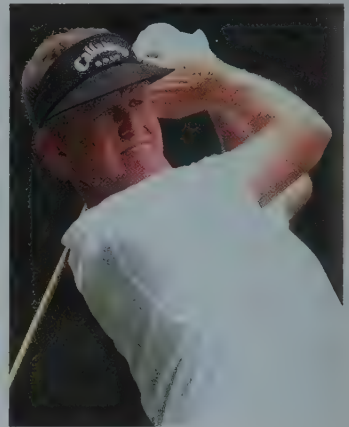
One of the most notable moments in U.S. Open history took place in the 1992 semifinal match between American Michael Chang and Stefan Edberg of Sweden. Edberg emerged victorious, but only after a grueling five hours and 26 minutes, defeating Chang 6–7, 7–5, 7–6, 5–7, 6–4. That is believed to be the longest match in U.S. Open history. The longest women's match in the competition's history—in terms of number of games—occurred in 1898 (before the institution of tiebreakers), when the five-set match between Juliette Atkinson (the winner) and Marion Jones extended to 51 games. Arthur Ashe won the U.S. Open in 1968, but because of his amateur status (he was a lieutenant in the U.S. Army at the time) he was unable to accept the prize money. Another interesting side note in U.S. Open history is that Jimmy Connors is the only male to have won Open singles titles on all three of the Open's surfaces, while I am the only woman to have won on two surfaces, winning a record six U.S. Open titles in all (1975–78, 1980, 1982).

My first experience playing a Grand Slam tournament was as a 16-year-old at the U.S. Open (in Forest Hills), and my last Grand Slam appearance (18 years later) was also at the U.S. Open (in Flushing Meadows). In the years between I won 18 singles Grand Slam championships, but those won at home, at the U.S. Open, will always be very special.

COLIN MONTGOMERIE ON *The British Open*

Scottish golfer Colin Montgomerie registered more victories (31) on the European Tour than any other British golfer. He was made OBE (Officer of the Order of the British Empire) in 2005 and was inducted into the World Golf Hall of Fame in 2013. What he wrote on for Britannica was the hallowed Open Championship, widely called the British Open, one of the four “majors” of professional golf. He had the frustrating honor of coming in second to Tiger Woods at the 2005 Open Championship.

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The British Open, officially the Open Championship or the Open, is one of the world's four major golf tournaments—with the Masters Tournament, the U.S. Open, and the Professional Golfers' Association (PGA) Championship—and the oldest continually run championship in the sport. Best known outside the United States as the Open Championship or, simply, the Open, it has been held annually (with a few exceptions) on various courses in Scotland, England, and—on one occasion—Northern Ireland since 1860.

History

The first Open Championship was played on October 17, 1860, at Prestwick Golf Club in Scotland. A field of eight professionals played three rounds of Prestwick's 12-hole course in one day. Willie Park, Sr., won the inaugural tournament and was presented with the Challenge Belt, a silver-buckled leather belt that each champion was to keep until the following Open. The tournament was opened to amateurs in 1861. In 1863 a purse of £10—which was to be shared among the professionals who finished in second, third, and fourth place—was introduced, and a first-place cash prize of £6 was added in 1864. In 1870 Tom Morris, Jr., won the

Open for the third consecutive time and was thus allowed to keep the Challenge Belt permanently. As there was no award to present to the winner, the Open was not held again until 1872, when it was determined that the winning golfer would receive the Golf Champion Trophy, now commonly known as the Claret Jug. In 1892 the Open became a 72-hole event (four rounds of 18 holes), and in 1898 a cut (reduction of the field) was introduced after the first two rounds of play.

The Open has always been dominated by professionals, with only six victories by amateurs, all before 1930. The last of those was Bobby Jones's third Open, which was part of his celebrated Grand Slam (four major tournament victories in one calendar year). The popularization of golf in the mid-20th century produced a string of noteworthy Open champions, including England's Sir Henry Cotton (winner in 1934, 1937, and 1948), South Africa's Bobby Locke (1949–50, 1952, 1957), Australia's Peter W. Thomson (1954–56, 1958, 1965), and the United States' Arnold Palmer (1961–62) and Tom Watson (1975, 1977, 1980, 1982–83). Watson's final win in 1983 ended an era of U.S. domination, during which American golfers won 12 times in 14 years. For the next 11 years there was only one American winner, with the Claret Jug going to Spain's Seve Ballesteros, Australia's Greg Norman, and England's Nick Faldo, among others.

In 1995 the Open became part of the PGA Tour's official schedule. American John Daly won that year after a play-off with Italy's Costantino Rocca, beginning another period of American supremacy at the Open in which 10 of the next 13 winners hailed from the United States, including Tiger Woods, who won three championships (2000, 2005–06). Subsequent years saw a number of victories by golfers for whom the Open was their first major tournament triumph, including Paul Lawrie in 1999, David Duval in 2001, Ben Curtis in 2003, and Padraig Harrington in 2007.

Another notable Open champion is Jack Nicklaus, who won in 1966, 1970, and 1978 and placed in the top five 16 times, including seven second-place finishes. Harry Vardon won the Open six times—more than any other player—and four golfers, including Thomson and Watson, won five championships. South African Gary Player, who won the title in 1968 and 1974, holds the record for the most appearances in the Open, with 46.

Courses

The Open Championship has always been played on links courses (mostly treeless golf courses that are built along a coast and retain the natural uneven terrain of their locations). From 1860 to 1870 the Open was played exclusively at Prestwick Golf Club. Since 1872 it has been played at a number of courses in rotation. Initially the three courses were Prestwick, St. Andrews, and Musselburgh, all located

in Scotland. The nine courses in the current rotation are the Old Course at St. Andrews; Carnoustie Golf Links in Carnoustie, Scotland; Muirfield in Gullane, Scotland; the Ailsa Course at the Westin Turnberry Resort, outside Girvan, Scotland; Royal Troon Golf Club in Troon, Scotland; Royal St. George's Golf Club in Sandwich, England; Royal Birkdale Golf Club in Southport, England; Royal Lytham & St. Annes Golf Club in Lytham St. Annes, England; and Royal Liverpool Golf Club in Hoylake, England.

The Open is a unique event and is of great importance to professionals and amateur golfers alike, as well as to fans of golf. Unlike the play of other majors—which are typically contested in sunny locales in the United States—the outcome of the Open is often influenced by the weather. On a links course, morning and afternoon tee times can produce vastly different playing conditions, depending on the breeze that comes in off the sea. The weather is just one of the many unique features of the Open that combine with its long history and prestigious reputation to make it an event unparalleled in golf.

This author, who experienced a warm reception from his home crowd when he finished second to Tiger Woods at St. Andrews in 2005, looked forward to competing in the Open every year. To him, the Open is pure romance and theatre, and it truly is a special event that every golfer dreams of winning.

ELIOT ASINOF ON

Shoeless Joe Jackson

*Eliot Asinof was an acclaimed author of numerous works of nonfiction and fiction, mostly dealing with sports. He played professional baseball briefly in the minor leagues before joining the army and serving in World War II. His most famous book, *Eight Men Out* (1963), an analysis of the Black Sox Scandal that followed in the wake of the 1919 World Series, was made into a successful film of the same name in 1988. A man of encyclopedic talents, Asinof was also an accomplished amateur pianist, sculptor, and carpenter.*

Shoeless Joe Jackson, byname of Joseph Jefferson Jackson (born July 16, 1888, Greenville, S.C., U.S.—died Dec. 5, 1951, Greenville), was an American professional baseball player, by many accounts one of the greatest, who was ultimately banned from the game because of his involvement in the 1919 Black Sox Scandal.

Born into extreme poverty, Jackson began work in a cotton mill when he was barely six and never went to school. He survived a sickly childhood caused by the lint-filled air in the mill, then grew tall and gangly, with exceptionally long, strong arms. At age 13 he was an extraordinary ballplayer, the youngest ever to play on a mill team. He acquired his nickname when nursing blistered feet from a new pair of spikes (baseball shoes). Playing without them, he hit a base-clearing triple that provoked an opposing fan to cry out, "You shoeless bastard, you!" Even his bat became part of his growing legend—Black Betsy, a locally hewn piece of hickory 36 inches (91 cm) long, weighing 48 ounces (1.4 kg), 12 ounces (340 grams) heavier than modern bats, and stained by countless splatters of tobacco juice.

In 1908 Connie Mack, owner of the Philadelphia Athletics (A's), bought Jackson's contract with the Greenville Spinners for \$325, but the 19-year-old Shoeless Joe, homesick for his 15-year-old wife, Katie, and embarrassed by his hayseed illiteracy, got off the train at Richmond, Virginia, to catch the first train back to Greenville.

The following season Mack sent Jackson to Savannah, Georgia, where he hit a league-leading .358. When recalled to the A's in Philadelphia, he was humiliated by the relentless hazing of veteran teammates. Mack offered to hire a tutor to teach



him to read and write, but Shoeless Joe wanted none of it. In 1910 he was traded to the Cleveland Naps (later the Indians), where he hit an astonishing .407 in his first full season as a big league player. He liked the city, developing a taste for fine food and nice clothes. In an amusing irony, he loved expensive shoes. Fans liked his pleasant, easygoing personality and his friendliness to children. They learned of his superstitious collection of hairpins in his back pocket; of his practice of strengthening his arms, one at a time, by extending Black Betsy out as far as he could and holding it there; and of his exercising his eye muscles by staring at a lit candle with one eye until his vision began to blur, then shifting to the other eye. Meanwhile, his legend grew with his prowess. Star pitcher Walter Johnson called him "the greatest natural ballplayer I've ever seen." Ty Cobb, American League batting champion, acknowledged Jackson's superior abilities. Babe Ruth copied his feet-together batting stance and his power stride into the pitch.

In 1915 Charles Comiskey, owner of the Chicago White Sox, bought Jackson for \$65,000; he thus became the star of the pennant-winning club. When the United States entered World War I, Jackson was not eligible for the draft, because he was the sole support of his wife and his mother. When he went to work in the shipyards for his war effort, he was labeled a coward and a slacker.

The United States was different after the war, tainted by a growing cynicism. In baseball, gamblers and fixers openly operated in big league cities with impunity, while club owners swept all rumours of corrupted games under the rug, lest the public lose faith in the national pastime.

The White Sox, though runaway pennant winners in 1919, were a team of disgruntled underpaid players who were embittered by Comiskey's penuriousness, his

failure to pay promised bonuses, and his high-handed refusal to discuss their grievances. It was also a team riddled with hostile cliques and dissension. The outcome was that eight of its ballplayers conspired with gamblers—including former boxer Abe Attell—to throw the World Series to the Cincinnati Reds.

The Black Sox Scandal, as the fix came to be called, was a fiasco for the players. The gamblers reneged on promised payments, leaving the disorganized and demoralized eight caught in a morass of lies and betrayals. Jackson, who was promised \$20,000 for throwing the series (more than three times his \$6,000 annual salary), in the end received only \$5,000. The degree of his complicity in the scandal, however, has always been puzzling. Although he never returned the bribe, he went on to hit an outstanding .375 for the series while playing errorless ball in the field.

Jackson tried to meet with Comiskey after the series to tell him about the fix, but Comiskey refused to see him. Back home, Jackson had Katie write explanatory letters but received no reply. Typically, all reports concerning the fix were buried until a year later when the bubble finally burst. At the convening of the grand jury, Jackson confessed, attempting to make sense of what had made no sense to him. It was there, outside the grand jury room, that a young boy is claimed to have delivered the plaintive words that became part of American language: "Say it ain't so, Joe."

The eight ballplayers stood trial and were acquitted, but Judge Kenesaw Mountain Landis, newly appointed commissioner of baseball, banned them from ever playing professional baseball again.

Throughout the 1920s and '30s, Jackson played "outlaw" ball around the country under an assumed name, and all efforts at reinstatement were denied him. Retiring to Greenville with Katie, he owned a dry-cleaning shop, a pool parlour, and then a liquor store. Ty Cobb claimed that he drove through Greenville as an old man and stopped at Jackson's liquor store to buy a quart of bourbon, but Jackson failed to greet him. Cobb asked him, "What's the matter, Joe? Don't you remember me?" Jackson replied, "Sure I do, Ty; I just didn't think you wanted me to."

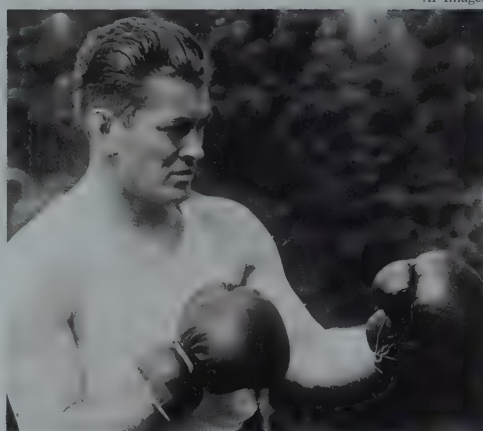
Jackson died of a heart attack shortly before he was to appear on Ed Sullivan's variety show, *The Toast of the Town*, as part of another attempt at his reinstatement. In subsequent decades his name continued to resonate fondly among the fans. Jackson's bat, Black Betsy, was exhibited for a time at Cooperstown, New York, in the Baseball Hall of Fame. Despite his lifetime batting average of .356 and the numerous fans who have called for his induction, there is, as yet, no plaque commemorating his admission to the hall.

GENE TUNNEY ON

Boxing

Boxing champion Gene Tunney, who won the heavyweight title with his defeat of Jack Dempsey in 1926, was a highly intelligent and literate man, penning for the initial printing of Britannica's new 14th Edition (1929–73) the encyclopedia's coverage of American boxing. In fact, there is probably no boxer alive today who could write an article about his profession approaching Tunney's in style or insight. Tunney ended his 1929 entry with some sage advice applicable to modern sports stars the world

over. When he warns athletes to remain "mentally equipped," free "from all outside interest, and worry of every nature," especially after "they acquire money" and great wealth, it is hard not to think of the many contemporary athletes whose "extracurricular activities" have derailed if not destroyed their amazing careers in their prime.



AP Images

Boxing, pugilism, prize-fighting and ruffianism were synonymous in the public mind from the earliest days of prize-fighting in the United States down to the World War, when boxing was prescribed as a means of quickly fitting untrained men for action at the front. Boxing up to this time had a most dreadful inheritance in the way of reputation, due to the practices of the persons connected with prize-fighting in its early stages in America, and to the type of men who took active part in these prize-fights. As a rule, they were, both fighters and associates, sinister people with few scruples, vulgar and brutal to a marked degree. The populace realized this and branded as outcasts all persons who were in any way connected with this "sport." Almost every State in the Union passed laws prohibiting prize-fights. Occasionally, however, in spite of the laws, important contests would be held secretly in out of the way places. But they usually were terminated by the police, who would get the

information that such a fight was being held and after stopping the match would place the principals under arrest. This kind of contest attracted few people, first because they were slow, uninteresting mauling affairs in which one man was trying to outlast his opponent, and, therefore, making few efforts to end matters for fear he would over-exert himself and be at the mercy of the other; and secondly the fear of being arrested, or possibly injured, in the free-for-all that usually accompanied the termination of these, made attendance at them quite a risky matter. The possibilities of arrest or injury naturally kept the self-respecting and prudent people away.

Despite the old laws prohibiting fighting having been modified, and new laws called Boxing laws permitting boxing contests in certain States, boxing was still regarded as an outlaw "sport," and a brutalizing and degrading form of amusement, until the government, in 1917, through its directors of training camp activities, adopted it as an important means for quickly fitting untrained men for rigorous soldier-life. It was then that modern boxing was brought to the attention of its greatest calumniators, viz., the ministers of the gospel, religious and lay woman organizations and societies and those who did not know the difference between brutal prize-fighting and legalized, regulated, modern boxing. This was the moment of rebirth for boxing. The interest in boxing has grown rapidly and steadily ever since. As a sport for young boys during their impressionable and developing years, there is no equal to it; it develops self-reliance, self-control, self-confidence, individual and quick thinking, physical courage and sportsmanship. There is no other game or sport that can boast of these attributes.

That fighting or boxing has an appeal to the elemental and primitive in man boxing's bitterest foes cannot deny. There is something terrifically fascinating about it to both man and woman. Its grip on man is probably due to his fundamental urge—self-preservation. In boxing contests the spectators' imagination sees a test for physical supremacy, a struggle to preserve oneself; and for the right to live. There is no other source of amusement or entertainment, sport or game, that contains quite as much real drama as can be found in a contest between two evenly matched, well trained boxers.

After the World War as boxing gained the recognition and interest of the general public; and those who took it up as a profession, just as a young man does law or medicine, were no longer looked upon as pariahs; many serious-minded and ambitious young men adopted it as a means of livelihood and profession. This brought an altogether new element into the sport, a thinking element; men who believed mental preparedness as important as physical preparedness; men who studied their game just as a surgeon does his anatomy. Naturally, this made for a marked increase in the knowledge of the "science" and raised the standard of the boxer proportionately, so that boxing methods must have improved just as sprinting and other athletic performances have bettered all records during the past decade. We have ad-

vanced in every other branch of athletic endeavour, so it seems only logical to assume that boxing has kept pace with the progress of its sister sports. Styles in boxing have variegated and changed considerably. New methods of attack and defence have been introduced and improved upon. Foot-work takes an important place in the repertoire of the modern boxer. The Classic style; i.e., the upright stance, with the left hand and left foot extended, and the right arm crooked across the chest ready to parry an opponent's lead to the head or body, has been almost entirely discarded as obsolete. It has been found more efficient to learn to avoid leads by either slipping the head to one side or the other, depending on how you expect to counter, or, by ducking, pulling away or slipping inside the lead. This gives a boxer the free use of his two hands for hitting, being a great improvement over the older style of using one or both arms to parry, which effectually warded off the blows, but by doing so prevented the use of the hands to counter. It has been discovered it is tremendously more effective to use the hands to strike the opponent than to keep them busy parrying and blocking blows. So that now we have the "bobbing and weaving" style of attack with the hands poised in a hitting position ready to strike out at the first opening as the advance toward the opponent is made. Jack Dempsey, heavyweight champion 1919-26, has been the greatest exponent of this style up to date. Benny Leonard, lightweight champion 1916-25, was one of the greatest exponents of the splendid combination of rhythmic foot work and hard, accurate, straight hitting. Jack Britton, welterweight champion 1919-1922, though lacking a heavy blow, was, undoubtedly, the greatest exponent of pure boxing skill of his time. The three men mentioned were the outstanding boxing figures of their time, and while their "styles" differed somewhat outwardly, basically they were the same, in that they learnt to avoid blows by slipping and ducking the head so that they would at all times have the free use of both hands. This factor is, undoubtedly, the mainspring in the improvement of the modern boxer.

Mental fitness has as much to do with success as has physical. This is true not only in boxing but in every endeavour of life. The modern boxer realizes that unless he is mentally equipped his chances for success are very slim. He therefore cuts himself free from all other business interests, believing he cannot have diversified interests and find success as a professional boxer. Boxing being a highly specialized sport, none can remain successfully in it unless he becomes a specialist. All successful boxers have done this, and it is not until they acquire money and make investments, in which they are compelled to take an active interest, that they meet reverses in the ring. This has been the case in four out of every five of the great champions, and goes to prove the point in question. Freedom from all outside interest, and worry of every nature; with a complete knowledge of the "science" of the game; a quick, active brain, with perfect co-ordination; and sound physical condition are necessary qualifications for a successful boxer of to-day.

HAROLD MAURICE ABRAHAMSON

The Olympics

*Harold Maurice Abrahams (1899–1978) was an Olympic gold medalist, winning the 100-meter dash at the 1924 Olympic Games in Paris. He went on to become a broadcaster, a journalist, chairman of the British Amateur Athletic's Board, the author of *The Olympic Games, 1896–1952*, and a contributor to *Britannica's* coverage of Olympic history. He was one of the two heroic characters portrayed in the Academy Award-winning movie *Chariots of Fire* (1981), which emphasized his Judaism and portrayed his victory as a personal triumph over anti-Semitism.*

Mirrorpix/Newscom



Just how far back in history organized athletic contests were first held remains a matter of doubt, but it is reasonably certain that they occurred in Greece, at least, some 3,500 years ago.

However ancient in origin, by the end of the 6th century BC at least four of the Greek sporting festivals, sometimes known as classical games, had achieved major importance. They were the Olympic Games, held at Olympia; the Pythian Games at Delphi; the Nemean Games at Nemea; and the Isthmian Games at Corinth. Later, similar festivals were held in nearly 150 cities as far afield as Rome, Naples, Odessus, Antioch, and Alexandria.

The Olympic Games in particular were to become famous throughout the Greek world. There are records of the champions at Olympia from 776 BC to AD 217. The Games, held every four years, were abolished in AD 393 by the Roman

emperor Theodosius I, probably because of their pagan associations. For the first 100 or 200 years, Olympic champions came from a dozen or more Greek cities, the majority from Sparta and Athens, but in the next three centuries, athletes were drawn from 100 cities in the Greek empire. And in the final 100 years or so before the games were discontinued, champions came from as far from Olympus as Antioch, Alexandria, and Sidon.

In 1887 the 24-year-old Baron Pierre de Coubertin conceived the idea of reviving the Olympic Games and spent seven years preparing public opinion in France, England, and the United States to support his plan. At an international congress in 1894, his plan was accepted and the International Olympic Committee was founded. The first modern Olympic Games were held in Athens in April 1896, with 13 nations sending nearly 300 representatives to take part in 42 events and 10 different sports. The revival of the Olympic Games led to the formation of many international bodies controlling their own amateur sports and to the creation of National Olympic Committees in countries throughout the world. . . . Boxing was introduced in 688 BC, and in 680 a chariot race. In 648 the pancratium (Greek *pankration*), a kind of all-strength, or no-holds-barred, wrestling, was included. Kicking and hitting were allowed; only biting and gouging (thrusting a finger or thumb into an opponent's eye) were forbidden. . . .

Sources generally agree that women were not allowed as competitors or, except for the priestess of Demeter, as spectators. In most events, the athletes participated in the nude. . . .

The Opening Ceremony

The form of the opening ceremony is laid down by the IOC in great detail, from the moment when the chief of state of the host country is received by the president of the IOC and the organizing committee at the entrance to the stadium, to the end of the proceedings when the last team files out. The rules provide that participants are not permitted to carry cameras into the arena, but this provision is always ignored.

When the head of state has reached his place in the tribune, he is greeted with the national anthem of his country, and the parade of competitors begins. The Greek team is always the first to enter the stadium, and, except for the host team, which is always last, the other nations follow in alphabetical order as determined by the language of the organizing country. Each contingent, dressed in its official uniform, is preceded by a shield with the name of its country, while an athlete carries its national flag. At the 1980 games, some of the countries protesting the Soviet Union's involvement in Afghanistan carried the Olympic flag in place of

their national flag. The competitors march around the stadium and then form up in the centre of the ground facing the tribune.

The president of the organizing committee then delivers a brief speech of welcome, followed by another brief speech from the president of the IOC, who asks the chief of state to proclaim the Games open.

A fanfare of trumpets is sounded as the Olympic flag is slowly raised; pigeons are released, symbolically to fly to the countries of the world with the news that the Games are open.

The Olympic flame is then carried into the stadium by the last of the runners who have brought it from Olympia, Greece. The runner circles the track, mounts the steps, and lights the Olympic fire that burns night and day during the Games. In 1968 a woman carried the flame into the stadium, and in 1976 the flame was borne jointly by a male and a female athlete. In 1984, at the Games in Los Angeles, a female runner brought the flame into the stadium but passed it to a male, who ran up the steps to light the Olympic fire.

IRENE CASTLE ON *Ballroom Dancing*

*Televised ballroom dance competitions are all the rage today, and the art form owes much of its development to one of its greatest practitioners, Britannica contributor Irene Castle (1893–1969). She and her husband, Vernon (1887–1918), became internationally famous for their fancy footwork on Broadway, appearing in such shows as Irving Berlin's *Watch Your Step* (1914), and in silent film; Irene even became a fashion idol. They originated such dances as the one-step and the turkey trot and popularized such others as the foxtrot, glide, castle polka, castle walk, hesitation waltz, maxixe, tango, and bunny hug. Irene contributed the "Modern" section of Britannica's "Dance" article in the inaugural printing of its 14th Edition (1929). As if presaging their future careers, Irene and Vernon's original names ("Castle" was their stage name) were "Foote" and "Blythe," respectively.*

Library of Congress, Washington, D.C. (LC-USZ62-54635)



Vernon and Irene Castle in dance pose, 1914.

The first three decades of the 20th century have been remarkable in the development of ballroom dancing, as well as the ballet and other forms of stage dancing. This may be attributed to a number of things, but more especially to a certain freedom in "steps" and a greater variety of dance music.

The Steps

Ballroom dancing has, for the most part, become less complicated and more dignified. The best dancers are those who apparently dance with no effort. Dance

floors are more crowded, and to-day there is no room for the grotesque antics displayed by the Grizzly Bear, Bunny Hug and Texas Tommy, popular in the first decade of the 20th century. The exaggerated swaying of shoulders, the complicated steps, the violent exercise and noticeable efforts put forth in dancing, all are out of place to-day. The feet are kept close to the floor, the shoulders maintain their natural position, the extended arm is not pushed forward and back, or "pump-handled" up and down, and, with a graceful ease of manner, very few "steps" are necessary. With a group of couples on the ballroom floor, there is no longer that unison of action, that necessity of conforming with the other dancers in a particular "step" that is determined by the music. There may be just as many variations in these few simple steps as there are couples dancing, but rhythm is maintained throughout. For example, present-day orchestras seldom play the waltz, because it is poorly supported, but when it is played, many of the dancers fox-trot.

The One-step and the Fox-trot are the most popular dances, the latter being used far in excess of any other dance, but a remarkably wide variation is practised in these simple steps. Such a tendency toward less athletic steps has meant a greater attraction for the ballroom and consequently a steady growth of interest in modern dancing. The second decade of the 20th century saw a more complicated programme, such as the Hesitation Waltz, the Maxixe (which never should have been done except as an exhibition dance) and the Tango. The latter seemed ideally suited to the ballroom, but never gained a firm footing in America. Originating in Argentina, it seems dependent upon the Latin temperament for success. Dancers in the United States were intrigued by it and tried in every way to master it, but somehow never caught the rhythm and proper swing.

The Charleston created more of a furore than any dance brought out in recent years, but again did not prove suitable to the ballroom floor and consequently died out almost as suddenly as it appeared. The dance was not new, having been performed among the negroes of the Southern States for years, and being brought to the front by an enthusiast who saw in it great possibilities as a stage attraction. It was never graceful, and decidedly too energetic to be included in modern ballroom dances. The same may be said of the Black Bottom. Even as an attraction suited only for the stage, it created considerable adverse criticism because of its suggestive qualities when executed according to the original dance. Both these dances were really more talked about than danced, but for a short while they gained world-wide fame. Like most fads, they were more harmful than constructive, and have little to do with the history of the dance.

The Fox-trot, an outgrowth of negro music, and earlier connected with such names as Ragtime, Blues and Jazz, has been danced since about 1913 and is firmly established in the programme of modern dances. It is typically American in

rhythm, is danced in 4/4 time and played in two distinct tempos—slow fox-trot, perhaps the more popular, and fast fox-trot. . . .

The Castle Walk is sometimes danced to a one-step. It is to the one-step what the Boston is to a fox-trot, depending on the change of weight or the accent of the beat. From 1913 to 1915 it was the most popular form of the one-step. It looked ridiculous at first, but was such fun to do that it spread like magic throughout the dancing world. Walking was its main feature, but one walked on one's toes, lifting up (as if starting to skip) instead of coming down on the beat, giving a childish, carefree swing that was irresistible. The lady partner went backwards most of the time, and the square step was not needed, dancers rounding the corners like an aeroplane banking a turn. It required considerable room, but was of such a joyous motion that it produced no end of merriment. It was originated by Vernon and Irene Castle.

In 1928 many of the old dances were revived in London, and during the course of an evening such old-timers as the *Polka*, the *Galop* and various forms of the barn-dance were performed. The revival met with considerable enthusiasm in London, the ensemble dance producing an act that was both novel and amusing.

The Music

The traditional dance band of strings and piano has been supplanted by the "jazz" band to a great extent, especially in the United States. This consists of various combinations, the most common of which is piano, violin, saxophone, banjo and trap drum. The drummer uses a side-drum, a bass drum and cymbals played with the feet and various other instruments on which he beats a tattoo with his drumsticks in alternation with the side-drum, adding considerably to the rhythm of the ensemble. The radio has created added impetus in dance orchestras, resulting in unusual cleverness on the part of the different players in extemporizing variations on the tune. Broadcasting stations assign certain hours for dance music and the radio orchestra is especially effective in furnishing a great variety of music for dancing in the home.

JACK NICKLAUS ON

The U.S. Open

Jack Nicklaus is one of the greatest (and arguably “the” greatest) professional golfer in history. A dominating figure in the sport from the 1960s to the ’80s, he was named the PGA Player of the Year five times (1967, 1972, 1973, 1975, 1976), was elected to the World Golf Hall of Fame in 1974, and holds the most coveted record in the sport: 18 victories in the sport’s four “major” tournaments. His subject for Britannica was the U.S. Open, one of those four majors, which he won four times over three decades (winning in 1962, 1967, 1972, and 1980).

Jim Mandeville/The Nicklaus Companies



The U.S. Open, byname of the United States Open Championship, is one of the world’s major golf tournaments, open to both amateur and professional golfers (hence the name). It has been held annually since 1895 under supervision of the United States Golf Association (USGA).

History

Since 1898 the competition has been 72 holes of stroke play (the player with the lowest total number of strokes is the winner). Regional qualifying tournaments have been held since 1924 to keep the number of players manageable, although golfers also become eligible to compete in the U.S. Open by winning specified tournaments. The U.S. Open is the second of the four major championships (after the Masters in April) on the Professional Golfers’ Association of America (PGA) Tour each year, and it is a key event of the European and Asian professional tours as well. The event is scheduled for June, with the U.S. Open’s fourth and final round usually played on Father’s Day (the third Sunday in June). In case of a tie after 72 holes and the need for a play-off, an additional 18-hole round is played the next day. The

U.S. Open is the only one of the four majors that demands a full round of golf to determine its winner after a tie, followed by a sudden-death play-off if the players are still even after the fifth round. The U.S. Open is as stern a test of golf as there is in the game, and several champions have won with over-par scores. Baltusrol Golf Club in Springfield, New Jersey, Pebble Beach Golf Links in California, and Oakmont Country Club and Merion Golf Club, near Pittsburgh and Philadelphia, respectively, are among the famous sites that have hosted several U.S. Opens.

The first U.S. Open was played in 1895. Only 11 competitors contended for the gold medal on the nine-hole course at the Newport (Rhode Island) Golf and Country Club, and the first prize for this 36-hole tournament was \$150. (By comparison, in the early 21st century thousands of entrants competed for a first prize of more than \$1 million.) The U.S. Open was originally dominated by Britons who had settled in the United States; the first American-born champion, John J. McDermott, won in 1911 at age 19 and is still the youngest winner in the Open's history. After Scotsman Willie MacFarlane triumphed in 1925, all U.S. Open champions were American citizens until South African Gary Player won in 1965. Since 1994 non-Americans have won the tournament with increasing frequency, including four consecutive Opens between 2004 and 2007.

Personal Reflections

I have always had a special appreciation for USGA championships, especially the U.S. Open. As an American, I view the U.S. Open as our national championship, and the tournament is a complete examination of a golfer. The competition always presented the kind of challenges I really enjoyed in tournament golf, and the venues and the way the courses were set up let you know quickly where you stood as a golfer. Because it was always such a demanding, stern test of one's golfing and mental abilities, I am very proud of the four championships I have won and of the fact that I had the good fortune of winning the championship four times in three different decades (1962, 1967, 1972, 1980). To be associated with several U.S. Open records, such as 11 top-5 finishes (tied with Willie Anderson), 18 top-10 finishes, and 22 top-25 finishes adds a further sense of pride to my accomplishments.

My first year in contention at a U.S. Open was 1960. At age 20, I was still playing as an amateur. My final score of 282 is still the record for the lowest score posted by an amateur in the U.S. Open, but it earned me only a runner-up finish because Arnold Palmer, who later became a good friend and rival, won the championship with a score of 280. I had the dubious distinction after the tournament of hearing four-time U.S. Open winner Ben Hogan reportedly claim, "I played thirty-six holes today with a kid who should have won this Open by ten strokes."

Two years later at Oakmont, Arnold and I finished tied at 283 after four rounds.

© Jack Nicklaus & the Nicklaus Companies



Jack Nicklaus celebrating a shot during his fourth U.S. Open win, at Baltusrol in Springfield, New Jersey, June 1980.

For the 18-hole play-off, I shot 71 to Arnold's 74 to win my first U.S. Open and claim my first victory as a professional. While much was made of the head-to-head battle between Arnold and me, I was much more satisfied that I played well down the stretch at a major championship and that I maintained my focus and poise during the play-off—factors that contributed to future major championship victories.

By the time of the 1967 U.S. Open at Baltusrol, I had added a British Open (Open Championship), a PGA Championship, and three Masters Tournament victories to my list of major championship titles. Between 1962 and 1967 I was disappointed with my performance in the U.S. Open, but when I got to Baltusrol in '67, I seemed to have a renewed perspective. For the Open at Baltusrol, I was using a white-painted Bulls Eye putter nicknamed "White Fang," borrowed for the event from a friend. After I opened at Baltusrol with a 71, my putting improved, and I shot 67 in the second round. After a third-round 72, I was tied with Arnold for second place. On Sunday I shot 65—closing with a birdie on the par-five 18th hole, set up by a 1-iron from 238 yards (218 metres)—for a tournament total of 275 to edge Hogan's 1948 championship scoring record by a shot.

Pebble Beach has always been one of my favourite courses. In fact, I have commented many times that if I had just one round of golf to play, it would likely be at Pebble Beach. I fell in love with the seaside layout in 1961 when I won my

second U.S. Amateur Championship tournament there. Pebble Beach's first year to host the U.S. Open was 1972, and after the first two days of the tournament, I was tied with five other golfers for the lead, despite some poor putting. By the end of the third round, although I shot a 72, I had the lead to myself. In the final round, I walked to the 17th hole, a picturesque par three guarded by the ocean on the left, with the lead. With 218 yards (200 metres) to the hole, and an angry wind in my face, blowing left to right, I chose the 1-iron—a club that has become a relic for many of today's players and a representation of a different era in golf. My shot hit the flagpole and stopped 6 inches (15 cm) from the hole, and the resulting birdie contributed to a three-stroke margin of victory over runner-up Bruce Crampton.

It would be eight years before I won another U.S. Open, in 1980. In fact, when the U.S. Open returned to Baltusrol in 1980, it had been 23 months since I had won any tournament. A difficult season in 1979 led to a revamping of my swing in early 1980, and at 40 years old, I no doubt had my skeptics. But my 63 in the opening round tied Tom Weiskopf for the lead and set the Open 18-hole scoring record. In the second round a 71 kept me in the lead by two shots, and my 134 established a new record for 36 holes. My 70 in the third round and Isao Aoki's 68 left us tied for the lead going into the final round. A 68 in the final round helped me lower my own Open 72-hole scoring record, and I remember the warm embrace of the fans that day, who kept chanting, "Jack's back! Jack's back!" Yet the day and my fourth U.S. Open title were not sealed until the 17th hole. Aoki had pushed me all day, and I was clinging to a two-stroke lead going into the 17th. Aoki's pitch to 5 feet (1.5 metres) set up a certain birdie on 17. I then hit a sand wedge to 20 feet (6 metres) from the hole and made the critical birdie—critical because Aoki and I both birdied the final two holes. I will never forget the rush of emotions that overwhelmed me on the 17th green. The look of joy on my face after I rolled in that putt remains one of my wife Barbara's favourite images.

The U.S. Open continues to provide exhilaration and drama. It will always be deservedly coveted as one of the most-significant championships in golf.

JAMES NAISMITH ON *Basketball*

Throwing a ball into half-bushel peach baskets was what Canadian-American educator James Naismith, at the YMCA Training School in Springfield, Massachusetts, suggested in December 1891 when asked to devise an indoor game that could keep men physically fit during the winter. His invention, basketball, was the subject he addressed in the inaugural printing of Britannica's 14th Edition (1929). Excerpts from his article follow.

UPI/Bettmann Archive



Basketball is a game played by two teams of five men or women each, in a gymnasium or other large room. Its essential characteristic is the effort of each of the teams to pass the ball through a hoop or goal at the end of the court behind the opposing team. The game of basketball was invented in 1891 by James Naismith, at that time an instructor in the Y.M.C.A. college at Springfield, Mass., and had its inception as a part of the research work of that institution. It differs from all games that preceded it in that they were evolved from simpler forms, while basketball was the result of a deliberate attempt to invent a game that would fill the same place during the winter season that football and baseball fill in autumn and summer. A first requirement to be met was that the game could be played indoors. Second, it must be attractive enough to hold the interest of the players. Third, it could have little or none of the reputed roughness of football. Accordingly, tackling, body interference and holding with arms and hands were prohibited, and no player was allowed to kick the ball or strike it with his fist. The first ball used was a regulation association football, round, and resembling the present ball but somewhat smaller.

Popularity.—Basketball has spread throughout the world. The Y.M.C.A. secretaries took it as a phase of their athletic work to many foreign countries, including Turkey and India. Missionaries, as Gailey and Exner in China and Goodhue in Syria,

also aided in its spread abroad. It reached Panama through the builders of the canal, while American soldiers carried it to the Philippines, Germany and France. . . .

Philosophy.—Basketball is a team game demanding a high degree of accuracy, judgment, individual skill, initiative, self-control and the spirit of co-operation. It demands that each player be skilled in all phases of the game, thus developing all-round rather than highly specialized ability. Since the object of the game is to have the players of one team put the ball into their own basket and to prevent the opponents from putting it into the other basket, it is frequently necessary for one player to pass the ball to another in order to keep possession of it until a favourable opportunity to make a goal occurs. This necessitates co-operation on the part of the members of the team and skill on the part of each man to score.

Strategy.—All games are divided into attack and defence. In basketball the offence is the more important because so long as the players of one team are able to retain the ball it is impossible for the other team to score. In the offence there are two main objects: first, to put the ball into the basket; second, to play the ball in such a way that it may be caged by some other person or again passed to one who is in a still better position. The watchword for a player on the offence is to keep away as far as possible from his opponent so as to give his team-mates an opportunity to make a clean pass to him, or to get into a position from which he will be able to shoot for a goal. The ball may be passed in any one of several ways: (1) The underhand pass; (2) the overhead pass; (3) the side pass; (4) the push pass, with one or both hands; (5) the bounce; (6) the curve.

The choice of these depends upon the position of the passer's team-mates and of his opponents.

As every man is entitled to his position on the floor, the one who is behind must necessarily circle around his opponent, and is thus at a disadvantage in obtaining the ball, as it comes down the field. The straight pass is used when one's team-mate is nearer than the opponent, and the curve pass is used when the opponent is nearer than the team-mate.

The ball may be passed after a feint, which means that the passer leads his opponent to think that the ball is going in one direction while he plans to put it in another. This feint may be made by the passer's looking in one direction and passing in another, by his making a motion in one direction and passing in another, or in any way to make the opponent think the ball is going in one direction while it is actually going in another.

In dribbling, the ball may be hit with either hand but never with both hands at the same time, nor must it come to rest in one or both hands. In either of these cases the dribble must immediately cease.

The dribble is especially useful where there is no opponent near at hand, where the shot for goal is too far for accuracy, or while the holder's team-mates are plan-

ning an opening where the ball may be passed safely. The dribble may be by a few long bounds or by a rapid succession of short ones, thus making progress without having the ball in complete possession, since the opponent can secure the ball without making personal contact. In the dribble, the dribbler is not obliged to continue in a straight line, but may go in any direction on the floor, and may even turn around or pivot as long as he keeps the ball in motion.

The players are divided into three groups—forwards, centres and guards. The duty of the forwards is primarily to make goals; of the guards, to prevent the opponents from making goals to advance the ball toward their own basket; and of the centres, to put the ball into play and to assist the forwards or guards as necessity arises. Since each player has an opportunity to do the work of the others, a player to be of the greatest service should be expert in all phases of the game.

Forms of Basketball.—Basketball has assumed several forms, adapting itself to different conditions. The girls' game differs from that of the boys' in having the floor divided into two or three courts and in each of the players confining her activities to one space. Another difference is that in the girls' game a player is not permitted, for three seconds, to take the ball away from an opponent who has both hands on the ball. The dribble is limited to one bounce.

The professional game differs from the amateur in three particulars. The court is separated from the spectators by a woven wire enclosure 45ft. by 65ft. in which the game is played. The dribble is unlimited and may be made with one or both hands. The goals are set out 12in. from the backboard instead of 6in. as in the amateur game.

Tournaments.—There are seven national tournaments in which national championships are decided: the inter-scholastic held at Chicago; the amateur national, at Kansas City; the Y.M.C.A., at Buffalo; the Y.M.H.A., at New York; the Catholic, at Chicago; the girls' inter-scholastic at Wichita, Kan.; and the American Professional League, at Cleveland.

There are four international championships: The American Y.M.C.A., competing against the Canadian; the Far East, including China, Japan and the Philippines, held at Shanghai; the girls' international held at Cleveland; and the South American international.

KAREEM ABDUL-JABBAR ON *The New York Rens*

Basketball Hall of Famer Kareem Abdul-Jabbar, the 7-foot 2-inch center who dominated the game in the late 1970s and early '80s, is the National Basketball Association's all-time leading scorer with 38,387 points. Upon his retirement in 1989, after 20 professional seasons, Abdul-Jabbar became a noted actor, basketball coach, and a New York Times best-selling author; in 2016 he was honored with the Presidential Medal of Freedom. Black history is one of his specialties, and the New York Rens, a highly successful African American-owned all-black team based in Harlem, New York, during the period of segregated professional basketball in the United States, was the subject he wrote on for Britannica. An excerpt follows.



The New York Rens, in full New York Renaissance Big Five, was an American professional basketball team that ranks among the most accomplished and storied teams in the history of the game. The Rens, an African American-owned all-black team based in the Harlem section of New York City during the era of segregated basketball teams, won the first world championship of basketball in 1939.

In the United States during the first half of 20th century, when a long list of Jim Crow laws meant to subjugate and humiliate African Americans was still in place in large parts of the country, sports were much the same as any other aspect of life for African Americans. Blacks could compete against each other for “coloured” championships and occasionally against whites when the intent was to stimulate ticket sales by titillating audiences with black versus white contests, but blacks were never permitted to compete against whites for national championships, which put both more money and white pride at stake. That system kept black athletes on one side of the divide barnstorming for limited compensation while whites, on the other side, collected high salaries and big payoffs.

Although the wall of segregation in sports seemed insurmountable, it failed to deter Bob Douglas, a West Indian who moved to New York in 1901 at age 19, taking with him an entrepreneurial spirit that seemed to be more common among black Caribbean immigrants than it was among those African Americans who had gone north as part of the Great Migration. Indeed, the ambition and success of West Indian businesspeople bred its own brand of discrimination and resentment from Harlem neighbours who refused to patronize their businesses, forcing Douglas to overcome the biases of both white America and black Harlem.

In 1905 in a gym on 10th Avenue, a coworker introduced Douglas to basketball, the game that became his passion and that he called simply “the greatest thing in the world.” Hooked from the moment of his first exposure, Douglas went on in 1908 to cofound the Spartan Field Club, where black children could compete in amateur sports, including basketball. Douglas also organized an amateur adult team, the Spartan Braves, for which he starred until he retired as a player at age 36 in 1918 to devote himself full-time to managing the team. Under his leadership, the Braves easily won the 1921 Eastern (amateur) Championship.

Professional basketball became an inevitable result of the game’s growing popularity in the country as a whole and especially in Harlem. As players began jumping from one team to another, the line between professional and amateur players blurred, prompting the organization that regulated amateur basketball in New York City to sanction teams that brought in professional players. Crowds expanded, and the games, often played at casinos and nightclubs, became social events. Jazz bands and orchestras performed before, during, and after the games, when dancing took over. As the profits of club owners and teams increased, professionalism pushed amateurism aside. . . .

When the Great Depression hit in the 1930s—with economic consequences that were especially devastating for Harlem, where unemployment eventually reached 50 percent—Douglas made adjustments that were necessary to keep his team afloat during hard times. Most notably, he sent the Rens out on the road for months at a time and to areas such as the South where they had never played before. On the

road, the team was the target of much greater racism than it had ever experienced at home. The bias of many officials and bigoted spectators were just a part of the working circumstances that the Rens had to accept, and there was always the possibility of a riot. The Rens often slept at boarding houses, black colleges, or even local jails, because segregated hotels and restaurants were off-limits to them. There were incidents of armed gas-station owners turning the team's bus (the Old Blue Goose) away from their pumps. Still, the Rens managed to complete their tours and make money. Moreover, despite those obstacles, they played a brilliant game that was such a template for excellence that, wherever the Rens competed, local coaches attended to see firsthand how to execute the game at the highest level. . . .

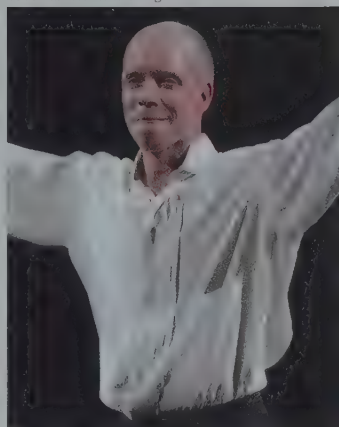
Although the Rens would not survive long into the 1950s as a team, the perseverance of Douglas and his players made it impossible for the National Basketball Association (NBA)—formed in 1949 by the merger of the NBL and the Basketball Association of America—to maintain its initial whites-only policy. Too many people had become aware that not all of the best American basketball players were signed to play in the NBA. In the fall of 1950, the NBA lifted all restrictions based on race. The league became a showcase for players from all over the world, with more than three-fourths of its players African Americans by the second decade of the 21st century. The Rens as a team, along with Gates, Cooper, and Douglas, are enshrined in the Basketball Hall of Fame.

SCOTT HAMILTON ON

Figure Skating

American figure skater Scott Hamilton, who was a four-time world champion and the 1984 Olympic gold medal winner in men's figure skating, has been credited with infusing an air of athleticism into his sport. For example, at the 1983 World Championships he took to the ice in a black speed-skating suit instead of the customary beaded and sequined costumes worn by fellow skaters. His detailed history of the sport, excerpted below from his longer Britannica article on figure skating, was especially useful in explaining the origins of some of skating's most common moves and jumps.

Luke Palmisano/AP Images



A *Treatise on Skating* (1772) by Robert Jones, an Englishman, is apparently the first account of figure skating. The sport had a cramped and formal style until American Jackson Haines introduced his free and expressive techniques based on dance movement in the mid-1860s. Although popular in Europe, Haines's style (called the International style) did not catch on in the United States until long after he had died at the age of 35.

In the early 20th century, Americans Irving Brokaw and George H. Browne helped formalize the style created by Haines by demonstrating it to American audiences. Brokaw, the first American to represent the country at international competitions, participated in the 1908 Olympics, where he finished sixth. Browne, who organized the first U.S. championships in 1914 for men, women, and pairs, wrote two important books on skating and was involved in the establishment of a national skating organization.

Canadian Louis Rubenstein, a former student of Jackson Haines, was also instrumental in the development of figure skating. He led the effort to formalize competitions and tests by establishing governing bodies for skating in the United States and Canada. He helped organize the Amateur Skating Association of Canada

(now called Skate Canada) and the National Amateur Skating Association of the United States. The latter organization and the International Skating Union of America (founded in 1914), which had American and Canadian members, were the predecessors of the United States Figure Skating Association (USFSA), founded in 1921. Established with only seven skating clubs across the nation, by the 21st century it oversaw more than 400 clubs with some 100,000 members.

The International Skating Union (ISU), founded in the Netherlands in 1892, was created to oversee skating internationally. It sanctions speed skating as well as figure skating and sponsors the world championships held annually since 1896. With more than 50 member nations, the ISU establishes rules about the conduct of skating and skating competitions.

Also notable for their important contributions to the sport of figure skating are Axel Paulsen, Ulrich Salchow, and Alois Lutz. Each man created a jump that is now named after him. Paulsen, a Norwegian equally expert in figure and speed skating, introduced his jump in Vienna in 1882 at what is generally regarded as the first international championship. The “axel” was later perfected by Swedish figure skater Gillis Grafström. Salchow of Sweden first performed his trademark jump (the “salchow”) in competition in 1909. In London in 1908 he also won the first Olympic gold medal given for figure skating. Lutz, an Austrian, invented his jump (the “lutz”) in 1913.

While the English diarist Samuel Pepys claimed to have danced on the ice during London’s hard winter of 1662, modern ice dancing most likely developed out of the Vienna Skating Club’s adaptation of the waltz in the 1880s. The sport grew rapidly in popularity during and after the 1930s. Although the first U.S. national championship for ice dancing was held in 1914, it did not become an Olympic sport until 1976.

20th-Century Champions

Figure skating currently contains more female than male participants, but this has not always been the case. At the first world championships, held in St. Petersburg in 1896, only a men’s event was skated. Pairs were not introduced until 1908 and ice dancing not until 1952. The first woman to participate in a world championship event, Madge Syers of Great Britain, did so in 1902. Because the rules did not specify the sex of participants, Syers entered the world championships held in London, and she finished second only to Salchow, who offered her his gold medal because he thought she should have won the event. The next year the ISU rules were changed to specify that women could not enter the event, but a separate women’s category, which Syers won for the first two years, was finally created three years later.

Twenty-one years later Sonja Henie emerged as the first major female skating star. She reigned as world champion from 1927 to 1936 and parlayed her fame into a Hollywood career. Winning her first world title at the age of 14, she was the youngest champion until Tara Lipinski won the world championship in 1997 at an age two months younger than Henie. Lipinski also dethroned Henie as the youngest female Olympic champion by winning the gold medal in 1998 when she was 15. Canadian Barbara Ann Scott, the first non-European to win a world championship, became a professional skater, as did both Henie and Lipinski, after she won an Olympic gold medal in 1948.

Dick Button was the first great American male star of the 20th century. Now regarded as the “voice of figure skating,” he won five world titles (from 1948 through 1952) and two Olympic gold medals (1948 and 1952) along with seven U.S. national championships (from 1947 through 1953). Button also completed a double axel at the 1948 Winter Olympics in St. Moritz, Switzerland, the first skater to land such a jump in competition. While Button’s success paved the way for the emergence of more multirevolution jumps in figure skating, other male skaters developed different aspects of the sport. Karl Schäfer, for example, introduced new elements into spinning by creating a “blur spin,” or scratch spin, where the skater rapidly spins on one foot in an upright position.

The U.S. figure-skating community was devastated in 1961 by a plane crash that killed the entire U.S. team. The team was on its way to Prague for the world championships when the plane crashed on approach to Brussels. The championships were canceled. Although the United States had lost such potential world champions as Laurence Owen, American skating returned to world prominence in 1966 when Peggy Fleming, renowned for her elegance and grace, won the women’s world title in Davos, Switzerland, and an Olympic gold medal two years later in Grenoble, France. Fleming followed in the footsteps of such great American Olympic champions as Tenley Albright (1956) and Carol Heiss (1960). Janet Lynn, an Olympic bronze medalist in 1972 in Sapporo, Japan, and Dorothy Hamill, an Olympic gold medalist in 1976 at Innsbruck, Austria, were also part of the ascension of women’s skating in the United States. New coaches who went to the United States included Carlo Fassi, an Italian singles champion in the 1940s and ’50s. He coached Americans Fleming and Hamill as well as British Olympic champions John Curry and Robin Cousins.

Katarina Witt of East Germany, dominating women’s singles in a manner that had not been seen since Henie, won Olympic gold medals at both the 1984 (Sarajevo, Yugoslavia) and 1988 (Calgary, Alberta) Winter Games. Representing the United States, I won four world championships (1981–84) as well as an Olympic gold medal in 1984. Earlier, American brothers Hayes and David Jenkins had won successive Olympic gold medals at the 1956 and 1960 Games. Brian

Boitano continued the American Olympic dominance by winning the gold medal in 1988.

While the United States continued to produce singles champions, the Soviet Union was the master of pairs. French pairs skaters Andrée and Pierre Brunet won Olympic gold medals in both 1928 and 1932, but the dominance of the Soviet Union became apparent in the 1960s and lasted into the 21st century. Lyudmila Belousova and Oleg Protopopov won Olympic gold medals at the 1964 (Innsbruck) and 1968 (Grenoble) Games. Irina Rodnina won three Olympic gold medals (from 1972 through 1980) with two different partners, Aleksey Ulanov and Aleksandr Zaytsev. This dominance continued into the 1980s when Yelena Valova and Oleg Vassilyev won the gold in 1984 (Sarajevo). Yekaterina Gordeeva and Sergey Grinkov won the gold twice (1988 and 1994), as did Artur Dmitriyev (1992 and 1998) with two different partners, Natalya Mishkutenok and Oksana Kazakova. The 2002 Olympic gold medal was shared by two pairs because of a judging controversy—Yelena Berezhnaya and Anton Sikharulidze of Russia and Jamie Salé and David Pelletier of Canada.

Ice dancing was introduced as an Olympic event in 1976, and Soviet teams dominated the sport. Teams from that country won an Olympic gold medal in 1976 (Lyudmila Pakhomova and Aleksandr Gorshkov), 1980 (Natalia Linichuk and Genady Karponosov), 1988 (Natalia Bestemianova and Andrey Bukin), 1992 (Marina Klimova and Sergey Ponomarenko), and 1994 and 1998 (Oksana Grichuk and Yevgeny Platov). However, Great Britain's Jayne Torvill and Christopher Dean took the gold in 1984, and Marina Anissina and Gwendal Peizerat of France placed first in 2002, winning France's first gold medal in figure skating since 1932.

Theories vary on the reason for the dominance of the former Soviet Union. One school of thought says the political and cultural forces in the country emphasized group accomplishments over individual achievement. The cultural emphasis on dance and ballet may also have been a factor, as well as the inclination of pairs and dance teams to stay together, since athletes were rewarded handsomely under the Soviet regime. Furthermore, the top singles coaches resided not in Russia but in western Europe and the United States. With the breakup of the Soviet Union in 1991, however, many Russian coaches and their skaters moved to the United States to take advantage of its superior training facilities. European and American pairs and dance teams benefited from Russian coaching, and the gap between Russia and the rest of the world began to close. At the same time, the Russians began to produce better singles skaters, partially because of access to American facilities and coaching and partially because they used different training techniques, which set them apart. Russians began to dominate men's figure skating in 1992 when Viktor Petrenko won the Olympic gold medal. In 1994 Aleksey Urmanov won the Olympic gold medal, while Ilya Kulik won it in 1998 and Aleksey Yagudin in 2002.

Recent Trends and Changes

During the Cold War (1947–89), judges tended to vote in East-West blocs, a practice that influenced the outcomes of some close competitions. The Soviet Union, East Germany, Czechoslovakia, Hungary, and Austria often voted as a unit, while the United States, Canada, Japan, Great Britain, and Italy often showed support for athletes from their countries. However, not all the judging that was alleged to have been politically motivated was necessarily so; some preferences were simply a matter of taste. For instance, judges from the eastern bloc countries have long displayed a preference for classical music and balletic choreography over music and dance that contained more pop-cultural themes. Although this situation has moderated since the early 1990s, some voting along political and cultural lines continues.

The evolution of increasingly difficult jumps continues to be a hallmark of the sport. Triple jumps, for example, became significant for men and women in the 1980s, and quadruple jumps became increasingly more important for men in the 1990s. The triple axel, the most difficult triple jump, was first landed in competition by Canadian Vern Taylor at the 1978 World Championships in Ottawa. Eleven years later, at the world championships in Paris, Midori Ito of Japan became the first woman to complete the jump. Canadian Kurt Browning, the first person to complete a quadruple jump, landed a quad toe loop at the 1988 World Championships in Budapest. Elvis Stojko, also a Canadian, holds two records with respect to the quad; he was the first to land a quad in combination with a double toe loop (at the 1991 World Championships in Munich) and with a triple toe loop (at the 1997 Champions Series final in Munich). Timothy Goebel, an American, completed the first quad salchow in 1998 at the Junior Grand Prix finals. He also was the first to land three quads in one program, two quad salchows and one quad toe loop at the 2001 U.S. Figure Skating Championships in Boston.

The 1990s were a tumultuous decade for figure skating. The elimination of compulsory figures from competition in 1991 gave an advantage to the more athletic freestyle skaters. Until the late 1980s, skaters who were good at figures could win competitions without having strong freestyle-skating techniques, since compulsory figures were the most important part of the sport. They constituted 60 percent of the total score at national and international championships held in the 1960s but had been reduced to 50 percent by 1968. The short program was introduced in 1973, and at that time figures were reduced to 40 percent of the score. Over the next 17 years, the ISU continued to reduce the weight of figures until they were eliminated completely from international competitions after the 1990 World Championships in Halifax, Nova Scotia. Proponents of figures said they developed fine edge control, balance, and footwork, while critics thought them boring and mundane, compared with the athleticism and beauty of freestyle skating.

Another change occurred in the 1990s with the rules dividing professionals and amateurs. Since then the ISU has allowed amateurs, even at the lower levels of novice and junior, to earn money from endorsements and in ISU-sanctioned events. The ISU created a new system of eligibility: skaters who were "eligible" for ISU-sanctioned events, including worlds and the Olympics, and those who were not ("ineligible"). Ineligible skaters, buoyed by high television ratings, entered professional competitions with prize money and starred in their own professional ice shows.

Television became very significant for skating. Nowhere was that more evident than in 1994 when skater Nancy Kerrigan was clubbed on the kneecap by an advocate of Kerrigan's competitor Tonya Harding at the U.S. nationals in Detroit. International interest in the situation translated into high television ratings at the 1994 Winter Olympics in Lillehammer, Norway. The women's short program was watched by millions of spectators as Harding competed against Kerrigan, the eventual Olympic silver-medal winner.

As figure skating entered the 21st century, the level of athleticism continued to rise, with more men performing quad jumps in both the short and long programs. Increasingly, the world-level women's champions were expected to have triple-triple jump combinations (two consecutive triple jumps) in their long programs. However, the top skaters achieved success only by combining difficult jumps with artistic and elegant skating.

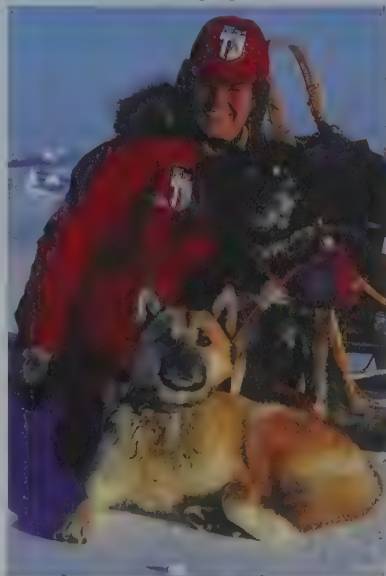
Some believe that, with the growing emphasis on jumps, good skating is declining. Compulsory figures provided excellent training in edge work and balance, and the difficulty of figures made it hard for skaters to move up quickly through the levels of skating. Today, very few skaters practice figures; a typical eligible skater can look awkward compared with the best ineligible performers, even though he or she may have superior jumping skills.

Although there have always been young competitors, the rule changes encouraged younger females to move up the ranks faster, since little girls can achieve triples quickly, thanks to their narrow hips and lightweight bodies. Lipinski, the youngest ever to win an Olympic gold medal, was only the beginning of this trend, which 16-year-old American Sarah Hughes continued by winning the Olympic gold medal at the 2002 Winter Games in Salt Lake City. Although American Michelle Kwan moved up to the senior level at age 12, she did not win her first world championship until 1996, when she was 16. "Older" skaters such as Kwan and Maria Butyrskaya (who at age 27 won a gold medal at the 1999 World Championships in Helsinki) now compete against younger skaters because the great equalizer, compulsory figures, is gone. Wider hips and heavier bodies are harder to control in the air, but what the older women may lack in athleticism they can often make up in elegance and overall skating and competitive experience.

SUSAN BUTCHER ON *The Iditarod Trail Sled Dog Race*

Revered American dog trainer and musher Susan Butcher (1954–2006), four-time winner of the famed Iditarod Trail Sled Dog Race, was considered one of the strongest and most-disciplined female athletes of the 20th century for her drive to the top of a physically grueling sport that was dominated by men. After losing the 1985 race in tragic fashion—a moose charged into her path, killing 2 of her dogs and wounding 13 others—she returned to the sport with a vengeance. She won the race the following year with a record-breaking time of 11 days 15 hours 6 minutes, and with her victories at the Iditarod in 1987 and 1988, she became the first musher in history to win the famed race in three consecutive years. She registered her fourth victory in 1990. Her Britannica entry on the Iditarod follows.

Jeff Schultz—Alaska Stock Images/age fotostock



Iditarod Trail Sled Dog Race is an annual dogsled race run in March between Anchorage and Nome, Alaska, U.S. The race can attract more than 100 participants and their teams of dogs, and both male and female mushers (drivers) compete together. A short race of about 25 miles (40 km) was organized in 1967 as part of the centennial celebration of the Alaska Purchase and evolved in 1973 into the current race. The architects of the race were Dorothy G. Page, chairman of one of Alaska's centennial committees, and Joe Redington, Sr., a musher and kennel owner; they are known as the mother and father of the Iditarod. Enthusiasts call it the "last great race on Earth."



Musher Ken Anderson and his dogsled team making their way to the Nome finish line while competing in the 2015 Iditarod.

The course of the race, roughly 1,100 miles (1,770 km) long, partially follows the old Iditarod Trail dogsled mail route blazed from the coastal towns of Seward and Knik to the goldfields and mining camps of northwestern Alaska in the early 1900s. Sled teams delivered mail and supplies to such towns as Nome and Iditarod and carried out gold. The trail declined in use in the 1920s, when the airplane began to replace the dogsled as the primary means of crossing the difficult terrain. But when no capable pilot was available during Alaska's diphtheria epidemic of 1925, a team of mushers battled blizzard conditions and rushed serum to icebound Nome. This heroic action, called the "Great Race of Mercy," brought renewed international fame to the trail and the dog teams, particularly to Balto, the lead dog of the team that finally reached Nome. In memory of the serum run's principal musher, Leonhard Seppala, the Iditarod was originally called the Iditarod Trail Seppala Memorial Race. Today's race commemorates both the serum run and Alaska's frontier past, and it is patterned after the famed All Alaska Sweepstakes Race between Nome and Candle that began in 1908.

The Iditarod crosses two mountain ranges (the Alaska and the Kuskokwim ranges), runs along the Yukon River for 150 miles (241 km), and crosses frozen waterways, including the pack ice of Norton Sound. The course length and route

vary slightly from year to year, and the middle third takes alternate routes in odd and even years. [Beginning with the 2008 race, the ceremonial start in Anchorage was shortened by 7 miles (11 km), and the competitive starting point was officially moved 30 miles (48 km) north from Wasilla to Willow because of the effects of global warming on the Alaskan snow cover. In 2015, because of the lack of snow south of the Alaska Range, the competitive starting point was moved north to Fairbanks, which changed the course and shortened its length by more than 100 miles (160 km).] The original Iditarod Trail was designated a national historic trail in 1978.

The race has been criticized by animal-rights activists and others concerned about fatalities and injuries to the dogs. These critics claim that at least 114 dogs died during the first three decades of the race. But no top teams have ever lost a dog, and superior performance by a dogsled team is a reflection of superior day-to-day care on the trail. The Iditarod has increased mandatory rest stops, the amount of dog food at race checkpoints, and the authority of race veterinarians and officials to protect dogs.

The Iditarod is the premier event in dogsled racing. The greatest challenge of the Iditarod is putting together a team of 12–16 dogs and a musher capable of overcoming all the obstacles and unexpected problems that present themselves along the course. In its early years the race was a 20-day event, but today most teams finish in less than 10 days. The increased speed can be attributed to enhanced nutrition for the dogs and the run/rest strategy that mushers employ. There have been some changes to the equipment, but the basics of sleds and harnesses are the same as they were years ago. Among the race's greatest mushers are Rick Swenson, Susan Butcher, and Doug Swingley.

The Iditarod has grown in fame and media attention over the years, and many of the mushers today enjoy corporate sponsorship. But, for participants like me, the romance of the race remains firmly rooted in the haunting beauty of the frozen and inhospitable landscape experienced with just a dog team for company.

TENZING NORGAY & STEPHEN VENABLES ON *Climbing Mount Everest*

AP Images

Tenzing Norgay (1914–86) was the Tibetan mountaineer who in 1953 became, with Edmund (later Sir Edmund) Hillary of New Zealand, the first person to set foot on the summit of Mount Everest, the world's highest peak (29,035 feet [8,850 metres]). After his feat he was regarded as a legendary hero by many Nepalese and Indians, and his many honors included Britain's George Medal and the Star of Nepal (Nepal Tara). He then published his autobiography (Man of Everest, 1955) and wrote for Britannica, contributing several sections to the encyclopedia's extensive coverage of Mount Everest. In recent years the acclaimed British climber Stephen Venables—the first Briton to climb Everest without supplemental oxygen—along with Britannica editors, updated these sections, and excerpts from their joint work follow.



The climate of Everest is always hostile to living things. The warmest average daytime temperature (in July) is only about -2°F (-19°C) on the summit; in January, the coldest month, summit temperatures average -33°F (-36°C) and can drop as low as -76°F (-60°C). Storms can come up suddenly, and temperatures can plummet unexpectedly. The peak of Everest is so high that it reaches the lower limit of the jet stream, and it can be buffeted by sustained winds of more than 100 miles (160 km) per hour. Precipitation falls as snow during the summer monsoon (late May to mid-September). The risk of frostbite to climbers on Everest is extremely high.

The Height of Everest

Controversy over the exact elevation of the summit developed because of variations in snow level, gravity deviation, and light refraction. The figure 29,028 feet (8,848 metres), plus or minus a fraction, was established by the Survey of India between 1952 and 1954 and became widely accepted. This value was used by most researchers, mapping agencies, and publishers until 1999.

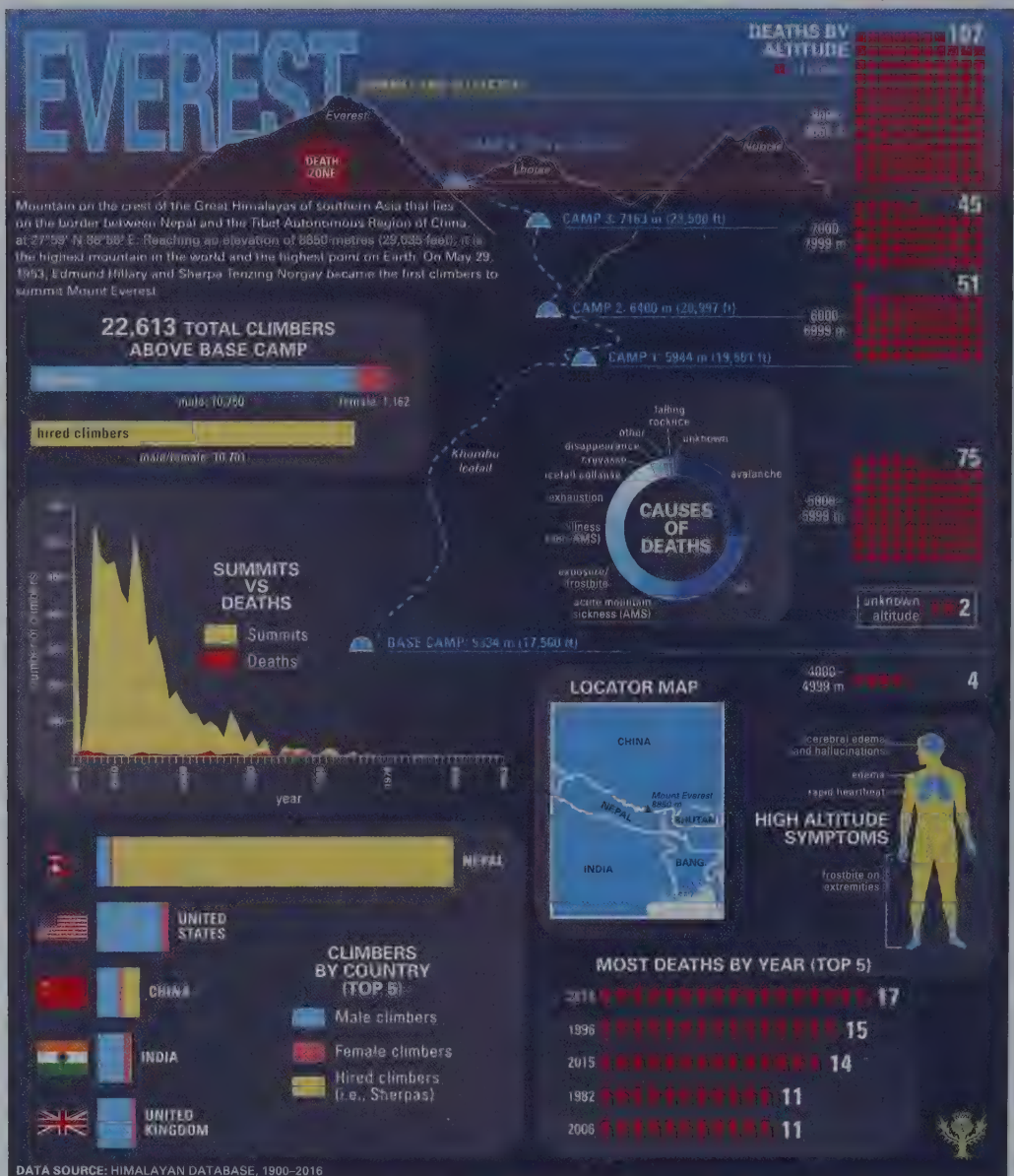
Attempts were subsequently made to remeasure the mountain's height. A Chinese survey in 1975 obtained the figure of 29,029.24 feet (8,848.11 metres), and an Italian survey, using satellite surveying techniques, obtained a value of 29,108 feet (8,872 metres) in 1987, but questions arose about the methods used. In 1992 another Italian survey, using the Global Positioning System (GPS) and laser measurement technology, yielded the figure 29,023 feet (8,846 metres) by subtracting from the measured height 6.5 feet (2 metres) of ice and snow on the summit, but the methodology used was again called into question.

In 1999 an American survey, sponsored by the (U.S.) National Geographic Society and others, took precise measurements using GPS equipment. Their finding of 29,035 feet (8,850 metres), plus or minus 6.5 feet (2 metres), was accepted by the society and by various specialists in the fields of geodesy and cartography. The Chinese mounted another expedition in 2005 that utilized ice-penetrating radar in conjunction with GPS equipment. The result of this was what the Chinese called a "rock height" of 29,017.12 feet (8,844.43 metres), which, though widely reported in the media, was recognized only by China for the next several years. Nepal in particular disputed the Chinese figure, preferring what was termed the "snow height" of 29,028 feet. In April 2010 China and Nepal agreed to recognize the validity of both figures.

Habitation

Everest is so tall and its climate so severe that it is incapable of supporting sustained human occupation, but the valleys below the mountain are inhabited by Tibetan-speaking peoples. Notable among these are the Sherpas, who live in villages at elevations up to about 14,000 feet (4,270 metres) in the Khumbu valley of Nepal and other locations. Traditionally an agricultural people with little cultivable land at their disposal, the Sherpas for years were traders and led a seminomadic lifestyle in their search for pastureland. In summer, livestock was grazed as high as 16,000 feet (4,880 metres), while winter refuge was taken at lower elevations on sheltered ledges and along riverbanks.

Living in close proximity to the world's highest mountains, the Sherpas traditionally treated the Himalayas as sacred—building Buddhist monasteries at their



Infographic with details about climbers of Mount Everest and associated deaths.

base, placing prayer flags on the slopes, and establishing sanctuaries for the wildlife of the valleys that included musk deer, monal pheasant, and Himalayan partridge. Gods and demons were believed to live in the high peaks, and the Yeti (the so-called Abominable Snowman) was said to roam the lower slopes. For these reasons, the Sherpas traditionally did not climb the mountains.

However, beginning with the British expeditions of the early 20th century, surveying and portering work became available. Eventually, the respect and pay

earned in mountaineering made it attractive to the Sherpas, who, being so well adapted to the high altitudes, were capable of carrying large loads of cargo over long distances. Though Sherpas and other hill people (the name Sherpa came to be applied—erroneously—to all porters) tend to outperform their foreign clients, they typically have played a subordinate role in expeditions; rarely, for example, has one of their names been associated with a pioneering route on Everest. The influx of foreign climbers—and, in far greater numbers, trekkers—has dramatically changed Sherpa life, as their livelihood increasingly has come to depend on these climbing expeditions.

Environmental Issues

On the Nepalese side of the international boundary, the mountain and its surrounding valleys lie within Sagarmatha National Park, a 480-square-mile (1,243-square-km) zone established in 1976. In 1979 the park was designated a UNESCO World Heritage site. The valleys contain stands of rhododendron and forests of birch and pine, while above the tree line alpine vegetation extends to the feet of the glaciers. Over the years, carelessness and excessive consumption of resources by mountaineers, as well as overgrazing by livestock, have damaged the habitats of snow leopards, lesser pandas, Tibetan bears, and scores of bird species. To counteract past abuses, various reforestation programs have been carried out by local communities and the Nepalese government.

Expeditions have removed supplies and equipment left by climbers on Everest's slopes, including hundreds of oxygen containers. A large quantity of the litter of past climbers—tons of items such as tents, cans, crampons, and human waste—has been hauled down from the mountain and recycled or discarded. However, the bodies of most of the more than 280 climbers who have died on Everest (notably on its upper slopes) have not been removed, as they are unreachable or—for those that are accessible—their weight makes carrying them down extremely difficult. Notable in the cleanup endeavour have been the efforts of the Eco Everest Expeditions, the first of which was organized in 2008 to commemorate the death that January of Everest-climbing pioneer Sir Edmund Hillary. Those expeditions also have publicized ecological issues (in particular, concerns about the effects of climate change in the region through observations that the Khumbu Icefall has been melting). . . .

Finding Mallory and Commemorating Historic Ascents

Two notable Everest events bracketed the turn of the 21st century. In the spring of 1999, 75 years after George Mallory and Andrew Irvine had disappeared climbing Everest, an expedition led by American Eric Simonson set out to learn their

fate. On May 1 members of the team found Mallory's body lying on a scree terrace below the Yellow Band at about 26,700 feet (8,140 metres). It was determined that Mallory had died during or immediately after a bad fall: he had skull and compound leg fractures, and bruising was still visible on the preserved torso—probably caused by a rope that was still tied around his waist. The team could not determine if the body was the same one found by a Chinese climber in 1975 or if that one had been the body of Irvine. It was clear, however, that both Mallory and Irvine had been involved in a serious fall that broke the rope which undoubtedly joined them. Personal effects found on Mallory included his goggles, altimeter, and a pocketknife, but not the camera he is thought to have taken with him when he left for the summit. It had been hoped that the film from it (if it could be developed) might have revealed more about the climb, especially if the pair had reached the summit.

The 50th anniversary of Tenzing and Hillary's historic ascent was widely observed in 2003. Commemoration of the event had actually begun the previous May, when second-generation summiteers—Hillary's son Peter and Barry Bishop's son Brent—scaled the peak (the younger Hillary speaking to his father in New Zealand from the top via satellite phone); Tenzing's son, Jamling Norgay, also participated in the expedition but did not make the final summit climb. In the spring of 2003 scores of climbers were able to reach the top of Everest before the May 29 anniversary date. Celebrations were held in several locations worldwide on the day itself, including one in Kathmandu where hundreds of past summit climbers joined Hillary and other members of the 1953 expedition.

Several milestone anniversaries were observed in 2013. A variety of events were tied to remembering the 60th anniversary of Tenzing and Hillary's climb, including summiting of Everest by hundreds of climbers and treks by others on and around its lower slopes. The Royal Geographical Society (RGS) hosted a special lecture on May 29 that included Peter Hillary, Jamling Tenzing, and Jan Morris—the latter being the last surviving member of the 1953 expedition. In March the RGS also hosted a 25th-anniversary reunion of members from the 1988 East Face expedition. Several members of the first U.S. ascent (1963), including James Whittaker and Norman Dyhrenfurth, gathered in San Francisco in February for an observance of the 50th anniversary of that expedition. In addition, the 80th anniversary of the first airplane flight over the mountain was remembered during the year.



Stephen Venables on the expedition that climbed Mount Everest from its East Face, 1988.

TONY HAWK ON *Skateboarding*

Pioneering American skateboarder Tony Hawk—through his technical innovations, tireless promotional work, dominance in competitions in the 1980s and '90s, and successful equipment and apparel lines and spin-off commercial ventures—did more than anyone else to mainstream the popular pastime of skateboarding and to develop it into a lucrative professional sport. Hawk traced for Britannica, in the article excerpted below, this development of the sport and its long association with a distinctive youth subculture.

Duomo/Corbis



Skateboarding is a form of recreation and sport, popular among youths, in which a person rides standing balanced on a small board mounted on wheels. Considered one of the so-called extreme sports, skateboarding as a professional sport boasts a range of competitions, including vertical and street-style events. Vertical skating (also called “vert”) features aerial acrobatics performed in half-pipes that were originally built to emulate empty swimming pools. Street style features tricks performed in a real or simulated urban environment with stairs, rails, ledges, and other obstacles. Skateboarding has developed as a youth subculture that emphasizes creativity and individuality. It is an alternative to mainstream team sports, which are more formally organized and largely controlled by adults.

The first commercial skateboards appeared in 1959, but crude homemade versions of skateboards, often consisting of nothing more than old roller-skate wheels attached to a board, were first built after the turn of the 20th century. In the early

1960s, skateboard manufacturers such as Makaha and Hobie attempted to capitalize on the rising popularity of surfing by promoting skateboarding, then known as “sidewalk surfing,” as an alternative diversion when no rideable waves were available. In 1963 Makaha formed the first professional skateboard team, and that same year the first skateboard competition was held in Hermosa, California. It included events in freestyle and downhill slalom skateboarding. The initial popularity of skateboarding waned over the next couple of years because of the limitations of the skateboard’s maneuverability and because of warnings from safety professionals that the activity was dangerous.

Skateboards were revived in the mid-1970s after the development of the faster and more-maneuverable polyurethane wheel and the introduction of the kicktail, the raised back end of the board that makes kickturns possible. The craze spread worldwide, and skateboard magazines helped promote both the sport and young innovative riders such as Tony Alva and Stacey Peralta. The first skate park was built in Florida in 1976, and many others began to appear throughout North and South America, Europe, and Asia, all providing a variety of slopes and banked surfaces for sudden turns and stunts. It was at this time that riders started skating in empty pools and exploring the “vertical” potential of the sport. The empty pools soon gave way to half-pipes, U-shaped riding surfaces used to perform aerial stunts. Though protective gear such as helmets and knee pads was commonplace, safety concerns and escalating insurance premiums for skate parks played a major role in the sport’s second fall from widespread popularity.

In the 1980s skateboarding enjoyed an underground following. Skateboarders built their own ramps and half-pipes and began skating the urban environments, creating what became known as street style. Increased board size and improved truck constructions helped the new style thrive. It was during this time that a distinctive youth subculture began to develop around the sport. Punk rock and baggy clothes became closely associated with young skaters. The daring and individualistic nature of street and vert skateboarding was spread through straight-to-video documentary films that found a large youth audience. The videos made stars of vert skaters like me and Steve Caballero and street skaters Natas Kaupas and Mark Gonzalez, among many others. But it was the advent of large competitions, such as the X Games, an alternative sports festival sponsored by the cable television network ESPN and first held in 1995, that gave the sport mainstream exposure and a certain commercial legitimacy. Skateboarding has established itself as a professional sport while still maintaining its independence from traditional team sports. Snowboarding and in-line roller-skating have been heavily influenced by skateboarding techniques and culture. . . .

Much of the excitement of skateboarding rests in the riders’ creativity. Skaters compete to invent new tricks or new combinations of tricks. Three of the most

fundamental skateboarding moves are the kickturn, the ollie, and the grind. A kickturn is accomplished when the rider pushes down on the kicktail, lifting the front wheels off the ground and spinning on the rear wheels. The hands-free aerial known as the ollie is one of the most important tricks in contemporary skateboarding. It was invented in 1978 by Alan ("Ollie") Gelfand, who discovered that slamming his foot down on the kicktail and simultaneously sliding his front foot forward caused the board and himself to jump into the air together. A grind involves riding with the trucks against the edge or top of an object.

World Cup Skateboarding, founded in 1994, oversees the biggest street and vert skateboarding competitions, including events in Australia, Brazil, Canada, and the United States and throughout Europe and Asia.

TORAH BRIGHT ON *Snowboarding*

Born in Australia to a family of snow lovers and athletes, professional snowboarder Torah Bright was skiing at age 2, snowboarding at 11, and had turned professional by 14. She boasts one of the highest records for wins among female snowboarders, and her accomplishments include a gold medal at the 2010 Winter Olympics in Vancouver and a silver medal at the 2014 Winter Olympics in Sochi. Bright splits her time between her home in Salt Lake City, her training ground in New Zealand, and her homeland of Australia, and amid commercial endorsement campaigns and assorted celebrity appearances—like competing on Dancing with the Stars—she found time to compose Britannica’s coverage of snowboarding, excerpted below.

Courtesy of Roxy and Torah Bright



Snowboarding is a winter sport with roots in skiing, surfing, and skateboarding where the primary activity is riding down any snow-covered surface while standing on a snowboard with feet positioned roughly perpendicular to the board and its direction, further differentiating it from skiing, in which riders face forward. Moreover, no poles are used as in skiing, and the majority of participants wear not hard but soft- to mid-flexing boots for support. The sport developed in the 1960s and '70s, grew in popularity in the 1980s, and became an Olympic sport in 1998. To die-hard riders and enthusiasts worldwide, including this author, snowboarding is a special kind of “medicine for the soul,” combining the beauty of nature, the thrill of competition, and the opportunity for self-expression. There is no single way to snowboard.

History of Snowboarding

Snowboarding is believed to have originated in the United States. Though its origins are sketchy, and plenty of children and adults can claim to have stood up on a flat surface of some sort and slid down their local sled hill, there are several names, dates, and inventions that are agreed-upon highlights in the most common histories of the sport.

The precursor of the modern snowboard came about in 1965, when engineer Sherman Poppen of Muskegon, Michigan—the widely acknowledged “father of the snowboard”—invented the prototype that paved the way for the modern board. The “Snurfer” got its snappy name from Poppen’s wife, who neatly combined the two words that described the contraption’s purpose: surfing on snow. Poppen’s initial model was just two snow skis bolted together—he later attached a rope to the front for steering. No specialized boots or bindings were required.

Poppen built the primitive toy for his daughters, and the Snurfer’s popularity quickly spread beyond the inventor’s backyard, attracting the attention of the Brunswick Corporation, a sports equipment manufacturer, which licensed the Snurfer and began producing and distributing it nationwide. Local Michigan Snurfer competitions followed in the late 1960s and spread out to national competitions in the 1970s. The Snurfer’s success—approximately one million of them had been sold by the end of the ’70s—brought the idea of sliding sideways on snow to a whole new crop of inventors and pioneers, who took the concept and ran with it. The next big turning point came in 1975, when surfer Dimitrije Milovich’s new snowboard, the “Winterstick,” attracted the attention of *Newsweek* magazine.

The fanfare that accompanied these boards spawned still more refinements as well as many of the first snowboard companies. On the East Coast there was Burton Snowboards (founded by Jake Burton Carpenter); in California, Sims Snowboards (founded by skateboarder Tom Sims) and Barfoot Snobboards (founded by surfer Chuck Barfoot); and in Washington, Gnu Snowboards (founded by Mike Olson). These manufacturing pioneers organized the first official snowboard competitions, such as the first National Snow Surfing Championships (held at the historic Suicide Six ski resort in South Pomfret, Vermont, in 1982 and won by Burton’s team) and the first world championship halfpipe competition (held in Soda Springs, California, in 1983, which Tom Sims organized).

There was, however, no mainstream participation in or fan base for the sport at this time, and early competitors and manufacturers honed their skills and boards in relative isolation. Resembling ad hoc gatherings more than professional sporting events, these original competitions served as the breeding ground for the development of tricks and maneuvers that further refined the sport. Two years after the Soda Springs world championship, Sims stood in as Roger Moore’s stunt double for

the snowboarding scenes in the James Bond movie *A View to a Kill* (1985). It was a breakthrough moment in the history of the sport that both reflected and, in turn, helped fuel snowboarding's growing popularity.

At that time in the mid-1980s, however, few U.S. ski resorts allowed snowboarders on their hills (snowboarders, notably, were widely welcomed in France). This ban reflected the then widespread disdain that traditional skiers and the country-club class exhibited toward snowboarders. At the few resorts that did allow snowboarding, special competency tests were required of riders before allowing them on the slopes.

At the same time, snowboarding was attracting a whole new world of fans from the nonconformist skateboarding community. The grunge- and hip-hop-inspired style of dress of the typical snowboarder could hardly have been more different from the garb of the traditional ski resort, which only deepened the divide between skiers and the newcomers. The nontraditional aspect of the sport was clearly reflected in the title of snowboarding's first magazine, *Absolutely Radical*, founded in 1985. Despite the blowback from the skiing community, the sport surged in popularity and acceptance, especially after insurance companies began allowing ski resorts to cover snowboarding under their existing liability policies.

While the sport battled for acceptance, major mainstream brands were investing in contest events, and the skiing community gradually acknowledged snowboarding's critical contribution to the revival of the snow resort industry. Snow-

Australian professional snowboarder Torah Bright traversing the slopes.



Courtesy of Roxy and Torah Bright

boarding was finally recognized by the International Olympic Committee (IOC) in 1994 and debuted at the Winter Games in Nagano, Japan, in 1998. This breakthrough with the Olympics was greeted with mixed emotions by snowboarders; in fact, three-time world champion snowboarder Terje Håkonsen of Norway boycotted the Olympic Games because of a disagreement with the IOC.

At the 1998 Games, four events (two for men and two for women) were held in two specialties: the giant slalom, a downhill event similar to giant slalom skiing; and the halfpipe, in which competitors performed tricks while going from one side of a semicircular pipe to the other. Overall, the sport's debut was lacklustre, with the halfpipe contest airing during the middle of the night in the United States and with the disqualification of giant slalom winner Ross Rebagliati of Canada, whose victory was negated when he later tested positive for marijuana (a disqualification that was subsequently overturned).

Snowboarding's reception at the 2002 Winter Olympics in Salt Lake City was quite different. The halfpipe event was broadcast as a prime-time event in the U.S., and Americans dominated the winner's podium. At the 2006 Winter Olympics in Turin, Italy, the halfpipe was again the centrepiece of the Games, along with the debut of a new event, the "snowboard cross" (originally and still frequently called boardercross), in which competitors race against each other down a course with jumps, berms, and other obstacles. Then, at the 2010 Winter Olympic Games in Vancouver, mainstream interest in the halfpipe reached fever pitch. American snowboarding superstar Shaun White captivated the crowd by landing the first ever double McTwist 1260 (two flips while completing three-and-a-half twists) in competition, while this author enjoyed the thrill of winning the women's gold medal in this event.

WALTER CAMP ON *Football*

Walter Camp (1859–1925) virtually invented American football, splitting it off from British rugby by such changes as devising the position and signal-calling role of quarterback, cutting team size to 11 from 15, and replacing the somewhat more boisterous free-for-all of the scrum with the scrimmage. Camp, a Yale graduate and briefly a medical student there, was Yale's first football head coach, and for many years he and one associate alone selected All-American college players. He brought his unique authority to Britannica's description of the game in its 10th Edition (1902–03). By the time of the 11th Edition (1910–11), little remained to be added but the forward pass. An excerpt from his article follows.

Library of Congress, Washington, D.C. (LC-DIG-ggbain-00838)



Football in America has had a peculiar history, and one showing the great tenacity of life possessed by this sport. At first such football as was played consisted merely in kicking the ball, and the play was without system. In the years 1871–72 certain rules were formulated, but they did not correspond to those in any other country, and were not on the whole satisfactory. Some of the colleges (to which the sport, until recently, was largely confined) formed an association, and adopted these rules. In 1875 Harvard and Yale met under rules taken partly from the Rugby Union and partly from the American game. These proved unsatisfactory, and the next year Harvard and Yale adopted the Rugby Union rules in their entirety. This was the foundation of the present American game. The players found that the Rugby Union rules, while much more satisfactory than anything that had been used, depended in a great measure upon traditional understanding and interpretations. American players were unwilling to be guided by anything except written regulations, and hence it was necessary to add to and explain the

rules. Annual conventions were therefore held, and the rules were amplified and from time to time altered. Other colleges joined the Association, and the game became well established in the college world. The roughness and brutality displayed in playing were strongly commented upon in the newspapers, and at that time it was difficult to say whether the game would survive or not; but in another ten years it had made great progress, and then again it became the object of further newspaper assaults, and the Harvard team, through the action of the University authorities, was withdrawn from participation. This withdrawal lasted, however, for only a year. From that time the game has been characterized by lessening tendencies to roughness, by increasing skill, and by greater satisfaction to players and spectators. For some time past it has been, perhaps, the most popular sport in the college calendar, and has drawn crowds of from 35,000 to 40,000 people at the principal games. The Association disbanded some years ago, but a Rules Committee, invited by the University Athletic Club of New York, has made the necessary changes in the rules from time to time, and these have been accepted by the country at large. In the West associations have been formed, and still exist; but the game in the East is played principally under separate agreements between the contesting universities, all playing, however, under one code of rules.

The rules provide for a field 330 feet long by 160 feet wide, upon which teams composed of eleven men each contend for a period of two thirty-five minute halves, the total score at the end of the second half determining the victor. The scoring is by goals, touch-downs, and safety touchdowns. A goal is scored when the ball is kicked through the upright goal-posts and above the cross-bar connecting the posts at a distance of 10 feet above the ground; a touch-down when the ball is carried and touched to the ground behind the goal line; a safety touch-down when the opponent is forced to carry the ball across his own goal line. The points and their values are: Goal from touch-down, 6 points; goal from field-kick, 5 points; touch-down from which no goal is kicked, 5 points; safety by opponents, 2 points. Any player when on-side can run with the ball, and his opponent may tackle him; if stopped, he must put the ball down, and a line-up or scrimmage is then formed. The ball may also be advanced by kicking. Infringement of the rules constitutes a foul, and various penalties are imposed.

Upon the above simple framework there has been built a most intricate system of play. The principle of the game is absolutely clear to the spectator, and therein lies its especial charm. There stands out boldly one cardinal object, namely, to advance the ball towards the opponent's goal. When this advance is attempted by means of kicking, the ball is usually sent as far as possible down into the opponent's territory, two or three men of the kicking side following it, and, in case it is muffed, endeavouring to secure it, or, if it be caught, to prevent the catcher from carrying it back on a run or returning the kick. The kicking game is most



Early football game, c. 1920–30.

employed when the wind favours. It is also used to relieve the running game. A rule of the sport makes it obligatory upon the side which has failed to advance the ball five yards in three running attempts to surrender it. Hence it is usually to the advantage of the side in possession of the ball, when they have failed in two running attempts, and it looks unlikely that they would succeed in a third, to kick the ball as far as possible into the opponent's territory rather than to surrender it within a yard or so of its immediate position. The running game is more involved than the kicking game, it being the object of the captain to use all possible means to assault the opponents at points of weakness, to enable his runner to encircle the ends of the opponent's line, or to pierce that line at points where the attack can gather the most force, and the defence exhibits the least resistance. Certain signals are used which, presumably unknown to the opponents, indicate to the assaulting side just what the method of assault is to be, and thus enable the men to concentrate suddenly at the one point. This concentration is not finally brought about until after the ball has been put in play, so that the opponents have little chance to anticipate it.

The ball is handled with great accuracy, one man being selected to place the ball on the ground in a scrumage and to snap it back with his hand to another player who delivers it, usually by a hand-pass or a short throw, to such individual as has been selected for the particular play. No man can pass the ball towards his

opponent's goal, and any man is off-side and out of the play if he gets between the ball and his opponent's goal. He cannot then touch the ball until it touches an opponent, or until the man of his own side who has kicked it runs up ahead of him.

In order to measure properly the distance gained or lost the field is marked with white lines every five yards.

The officials consist of an umpire, whose principal duty it is to decide regarding fouls; a referee, who decides questions relating to the progress of the ball and the play; timekeepers and linesmen, who keep the time of the play and mark the exact progress of the ball for the benefit of the referee. The American game is far more involved and intricate than the Rugby, but offers correspondingly greater field for skilful play. Amateur athletic clubs have taken up the sport, and it is now the principal fall game throughout the United States.

People-Centered (Not Tech-Driven) Design

By Don Norman

How did we reach the point where our technology is more important than people? And most importantly, how can we reverse this trend in order to ensure that our technologies are designed with people in mind, more humane, more collaborative, and more beneficial to the needs of people, societies, and humanity? To me, these are some of the foremost issues facing the world.

We are in a period of major changes in technology, impacting almost all areas of human lives. Increases in computational and communication power, the advent of small, tiny sensors, new ways of making physical parts, new materials, and powerful new software tools (including, of course, artificial intelligence) are changing education, work, health care, transportation, industry, manufacturing, and entertainment.

The impact of these changes upon people and society is both positive and negative. Although the positive impacts are celebrated, the negative impacts are often treated as unfortunate but unavoidable side effects. Suppose instead we adopt the view that these negative side effects are so severe that we need a different framework for designing our world.

Today, much of our technology is designed through a technology-centered approach. Basically, the technologists—and technology companies—invent and design what they can but then leave many tasks that could be done by machines to people instead, thereby forcing us to work on the technology's terms. As a result, workers often are required to do things people are known to be bad at. And then, when

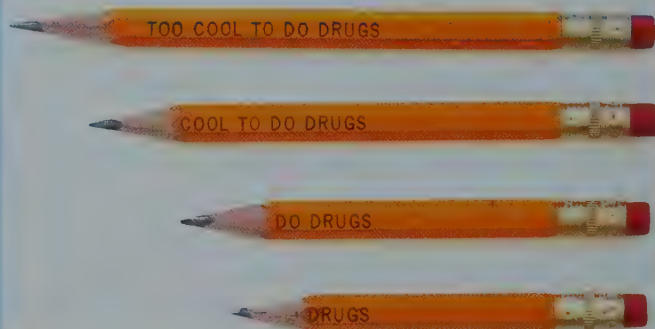
they do these jobs badly, they are blamed—"human error" is the verdict. No, this is not human error; *it is inappropriate design.*

Want some examples? Consider any boring, repetitive task such as working on an assembly line, entering numbers into a table, or driving a motor vehicle for long periods. Each of these activities requires continual attention to detail, high accuracy, and precision—all things that people are particularly poor at. Machines are well equipped for these activities. Alas, these tasks are required of us because of the way technology has been designed. People are forced to make up for the deficiencies in the technology, which forces people to serve the requirements of machines.

The result? Human error is blamed for over 90 percent of industrial and automobile accidents. It is the leading cause of aviation accidents, and medical error is reported to be the third-largest cause of death in the entire United States. Horrifying? Yes, but why do we label it "human error"? It is *design* error.

If human error were responsible for five percent of fatalities, I would believe it. But when it is said to be 90 percent, clearly something else must be wrong. Accident review committees often stop prematurely when

Amardeep Singh, amardeeps.com



they find that someone did some inappropriate action. The review stops there, satisfied that the cause has been discovered. Unfortunately, that misses the *real* cause: Why did the person make the error in the first place? Invariably, if the investigation continues, there are multiple underlying causes, almost always a result of poor design of either the equipment, the training, or the procedures.

There has to be a better way. And there is: We must stop being so technology-centered and become human-centered. Alas, this is easier said than done. Technology so dominates our lives that it is very difficult to reverse this deeply ingrained, historical outlook.

I practice what is called people-centered design, where the work starts with understanding people's needs and capabilities. The goal is to devise solutions for those needs, making sure that the end results are understandable, affordable, and, most of all, effective. The design process involves continual interaction with the people who will use the results, making sure their true needs are being addressed, and then continually testing through multiple iterations, starting with crude but informative prototypes, refining them, and eventually ending up with a satisfactory solution.

Human-centered design has enhanced the ability of people to understand and use many complex devices. Early airplane cockpits had numerous displays and controls, often so poorly thought out that they contributed to error—and in some cases, deaths. Through the application of human-centered design approaches, today's cockpits now do an excellent job of matching the display of critical information and the positioning and choice of controls to human capabilities. In addition, the procedures followed by pilots and crew, air-traffic controllers, and ground staff have also been revised to better match human requirements. As a result, the accident rate has decreased to the point where commercial aviation incidents are rare. In similar fashion, early computers were controlled through complex command languages that required considerable training to use, and when errors occurred, they were blamed on the operators.

Today's computer systems are designed with much greater appreciation of human

needs and capabilities. The results are graphical displays and control through simple mouse clicks, hand gestures, or voice commands that match the way people think and behave, so that learning is easy and direct.

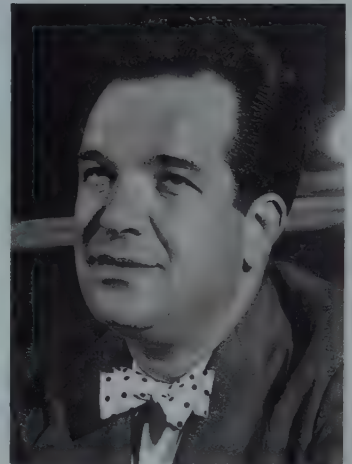
The goal is to change the way we consider our technology. Instead of having people do the parts of a task that machines are bad at, let's reverse the process and have machines do the parts that people are bad at. Instead of requiring people to work on technology's terms, require the machines to work on human terms. People and technology would then become partners. This approach could result in systems where the combination of people plus technology can be smarter, better, and more creative than either people or technology alone. A person plus a calculator is a good example of a perfect, complementary match.

What do I hope for in the future? A symbiotic relationship between people and technology, where design starts by understanding human needs and capabilities, only using the technologies that are appropriate to empower people. One goal is collaboration, where teams composed of people and technology do even better than they could do unaided, with more pleasure and satisfaction. There are many situations where autonomous, intelligent technology should be deployed, often in areas characterized by the "three D's": dull, dirty, and dangerous. For in most situations, collaboration over long periods without distraction or deviance—where people guide the overall goals and activities with technology executing the lower-level requirements of the task for consistency, accuracy, and precision—leads to better, more enjoyable results for everyone. To get there, however, we need to replace the technology-centered design approach with a human-centered one, where we start by building upon human skills, with the latter then enhanced through the capabilities of technology.

Don Norman, a frequent speaker, author, and corporate advisor, is a professor at and the director of the Design Lab at the University of California, San Diego, and cofounder and principal of the Nielsen Norman group.

AL CAPP ON *Wartime Comics*

No cartoonist ever enjoyed a greater celebrity than Al Capp, whose popular satiric comic strip, "Li'l Abner," ran for an astounding 43 years (1934–77). Praised by such literary heavyweights as John Steinbeck, John Updike, and Marshall McLuhan, Capp's work was deemed the first comic strip, given its wide cultural influence, worthy of academic study. For Britannica he wrote on how comic strips changed in the 1930s and then skyrocketed in popularity during World War II, when even the military adopted the art form for training purposes. His piece, excerpted below, appeared in 10 Eventful Years: A Record of Events of the Years Preceding, Including and Following World War II (1937 Through 1946), published by Britannica in 1947. Unknown to many people were Capp's frequent trips to wartime hospitals to visit wounded soldiers, especially those who had suffered amputations. Capp could relate: he lost one of his legs to a trolley accident in his youth. He continued these visits throughout the Korean and Vietnam wars that followed.



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The humour of the U.S. comic strip in 1937 was hard to find. Beginning as a simple series of panels, usually four, running lengthwise, telling a simple episode in the life of (usually) some well-meaning, ludicrous-looking simpleton and ending with a "Bam!!!" or "Zowie!!!" denoting violent, painful or comic frustration, the comic strip by 1937 had undergone a drastic change. The clowns had been pushed off the comic page by the misery-vendors, the horror-vendors, the blood-merchants. The hilarious "Bam!!!" or "Zowie!!!" ending of the comic simpleton overcome by the brutality, misunderstanding, avariciousness or bad temper of his fellowman, had been supplanted by the "Help!! The rattlesnake is strangling me, Mother, dear!!!"—or—"Take dat, you copper—right t'roo de head!!!" type of ending

wherein the comic simpleton was supplanted by a pathetic, golden-haired little girl simpleton or a blue-eyed, white-lipped, red-blooded detective simpleton, whose perils never ended—in fact, increased each day in violence and intricacy.

This was called the suspense ending, a trick borrowed from the oldtime serial movie of the *Perils of Pauline* school. However, whereas in the serial movie, the threats to the life or purity of the hero or heroine were in the final episode happily overcome, the honour of Dick Tracy and Jane Arden of the comic strips was in as much danger in 1946 as it was in 1937. By that time the comic strips, with a few die-hard, hard-fighting exceptions, were no longer comic.

A few years before, the discovery had been made by Sidney Smith in “The Gumps” and by Vic Forsythe in “Joe Jinks,” that if the cartoonist worried a reader half to death about the fate of his favourite comic-strip character, he’d be sure to buy that newspaper the next day to find out what happened. This made for much greater circulation figures than did the comic strip in which the reader left his favourite comic-strip character with a happy carefree laugh and no worries. The word went out from circulation departments that anxiety about the fate of Orphan Annie’s dog sold far more papers than did joy over the foolishness of Boob McNutt. Therefore, out of newspapers went the great masters of comedy—Rube Goldberg (“Boob McNutt”), Milt Gross (“Nize Baby”), Maurice Ketten (“Can You Beat It”), Hoban (“Jerry on the Job”), Fred Opper (“Happy Hooligan”). Editors demanded blood, horror, violence, tear-jerking. In came the masters of the suspense comic strip—Harold Gray (“Orphan Annie”), Chester Gould (“Dick Tracy”), Milton Caniff (“Terry” and “Steve Canyon”), Alex Raymond (“Flash Gordon”), Zack Mosely (“Smilin’ Jack”), Barrett and Ross (“Jane Arden”), Seigal and Shuster (“Superman”), Darrell Maclure (“Annie Rooney”), Lee Falk (“The Phantom”).

A handful of the really comic, comic artists survived, even strengthened their places in public favour, by combining the old humour with the new suspense. Most spectacularly successful was Segar, whose “Thimble Theatre,” a joke-a-day strip, became “Popeye,” a masterly combination of rough-and-ready gag humour and tongue-in-cheek melodrama, and was during its creator’s lifetime the most popular comic strip in the world. On the other hand, Bud Fisher, whose “Mutt and Jeff” was rated as one of the top comic strips for many years, refused to alter his joke-a-day formula and was partially, but not entirely, eclipsed by the blood-and-thunder boys. Chic Young, whose “Blondie” was, in its beginnings, a joke a day about a pretty girl and her beaux, saw the handwriting on the wall and created his own inimitable combination of gags and continued story. “Blondie” still had a joke a day, and very good jokes they were, but there was added a strong background story line—in the day-to-day growth of the children in the strip; the day-to-day change in the type of perplexing domestic, social and financial problems confronting its adult characters; in the continuity of its family and community relationships.

George MacManus ("Bringing Up Father"), like Bud Fisher, refused to change his formula but survived. With these few exceptions, however, the trend away from happy-go-lucky comedy had by 1937 completely changed the appearance and the flavour of the comic page. The charming if sometimes crude and simple comic drawings of Rube Goldberg and Maurice Ketten were supplanted by realistic illustration, some of it excellent, such as the magnificent pen drawings of Frank Godwin ("Connie"); the brutal power of Chester Gould's drawings for his "Dick Tracy"; the warm realism of Raeburn Van Buren's "Abbie an' Slat"; the superb smashing draftsmanship and lush colour of Milton Caniff.

The increasing importance of the comic strip and the increasing publicity given to its financial rewards began, in the late '30s and early '40s, to attract America's top illustrators and writers. Polls began to indicate that comic strips were not read exclusively by children, that at least half of U.S. adults by 1940 were comic-strip devotees. Advertisers began to discover that comic-strip advertising was more effective than any other type. The U.S. Army War college discovered that the comic strip was a most effective medium of educating soldiers in such various subjects as the perils of venereal disease, the traditions behind and reasons for the military salute, the advantages of voluntary branches of service (such as in the army-distributed "Private Li'l Abner, U.S.A." series issued by the visual-aids section of the Army War college). Newspaper polls indicated that an increasing majority of newspaper readers' selection of newspapers was determined by comic strips. A *Boston Globe* poll taken of a Boston college early in 1947 showed that the comic page was the deciding factor in the choice of a local newspaper for 93% of those interviewed.

During World War II, and in the postwar period of 1945–46, comic-strip creators began to realize the power and influence of the comic strip. The daily devotion of 30,000,000–40,000,000 readers which could make a catchphrase in any of the popular comic strips a part of the American language overnight began to be used by comic-strip creators for more socially-conscious purposes. Harold Gray ("Orphan Annie") frequently expressed the political views of his employer, the *Chicago Tribune* syndicate, via his more attractive characters and the opposing points of view via his more repulsive, unsanitary characters; Milt Caniff had sharp comments on army brass, army red tape, in his wartime strips; Raeburn Van Buren's "Abbie an' Slat" frequently made strong story-pleas for goodwill among men of all faiths; H. T. Webster's cartoons launched a relentless and effective campaign against the overcommercialism of radio and were influential in forcing changes; Seigal and Shuster's hero, "Superman," constantly fought the real-life villain's bigotry, intolerance, race-hatred; Crockett Johnson's "Barnaby" poked literate fun at extreme reaction. The comic strip during the decade 1937–46 became, in terms of the constancy of the devotion of its followers, the most popular U.S. entertainment, surpassing radio and the motion picture.

BRUNO BETTELHEIM ON *Nazi Concentration Camps*

The excerpted article below on Nazi concentration camps by psychologist Bruno Bettelheim was based on his famous 1943 essay, published in a scientific journal, called "Individual and Mass Behavior in Extreme Situations." His article on the camps appeared in 10 Eventful Years: A Record of Events of the Years Preceding, Including and Following World War II (1937 Through 1946), published by Britannica in 1947, and it stemmed from firsthand knowledge: Bettelheim had been imprisoned at both Dachau and Buchenwald in 1938 and then released the following year, when he immigrated to the United States, where he began his controversial studies in childhood development. One of his most famous books, The Uses of Enchantment (1976), laid out the author's belief in the salutary effects of fairy tales on children.

dpa picture alliance/Alamy



Prior to 1933 concentration camps had never been deliberately employed by a government to intimidate its own subjects. National socialism was the first totalitarian regime to use them as a major instrument for establishing control and for insuring its continuation in power. Because the camps were new inventions of the regime, no rules or regulations inherited from the German republic interfered with their organization. Moreover, they were relatively separated from the rest of German life and hence no interference from the population at large exercised its mitigating influence.

As central institutions of the government, their history followed closely that of the national socialistic state, and the changes they underwent reflected developments in the dictatorship itself. Whenever the regime felt threatened, the tool safeguarding it was used more viciously. As the regime expanded and encompassed all of Germany's life, the concentration camps increased also in size and purpose.

They were then used for purposes not contemplated when first established. As time passed, the old types of concentration camps could no longer fulfil the various purposes assigned to them, and new types were developed. During the regime's decline, the camps reflected the disintegration and chaos of a regime which was no longer able to control even its central institutions of power. . . .

Legally, the creation of the concentration camps was indirectly based on the German constitution, which in its article 48, sub 2, gave the president far-reaching emergency powers. These were used by Paul von Hindenburg in 1933 to promulgate a law whose purpose supposedly was to protect the state's security. On the basis of this law, legal grounds for the camps were introduced into the rules governing protective custody in a circular from the ministry of the interior of April 12, 1934. This circular decreed that persons sent to a concentration camp came under the jurisdiction of the gestapo and that their release was at its discretion. Later, courts decided that such prisoners had no access to courts.

The administration of the law for protecting people and state was entrusted to the secret state police, *Geheime Staats Polizei*, whose name was shortened to the use of the first two letters of each word and became known as the gestapo. The gestapo was not obliged to give public account of its activities, nor even to inform prisoners' relations as to whether their kin were still alive. It was staffed by the most trusted and fanatic followers of Hitler, the SS troops. Later, when the size of the SS expanded only its elite formations, the deathhead units (so called because of their insignia, a skull) administered the concentration camps.

At first only the political enemies of the regime were brought into the camps, and from among them only those who could not be prosecuted successfully in the courts of law. But soon others were included whose histories made it dangerous and therefore impossible, for the government to make public the grounds of their imprisonment.

As soon as the party was securely entrenched in power the situation changed, because then former leftwing radicals were no longer the most dangerous foes of the government. In 1934, the radical element within the party, including followers of Ernst Roehm, became the first party members to enter the concentration camps which some of them had helped to create.

The next group considered troublesome included those who opposed what was then the party's main task—the preparation for war. Therefore, pacifists, conscientious objectors and a so-called "work-shy" category of persons were sent to the concentration camps.

The ideology of the Germans as *the* superior race which became a central concept of the party, was soon reflected in the constituency of the camps. Persons who had sexual relations with members of the so-called non-Aryan race were either prosecuted in the courts or sent to the concentration camps. Later, when the party

decided to prosecute them, homosexual prisoners were added since these persons had all committed so-called racial crimes, and were considered race-polluters.

In addition, defection and disobedience among the SS and within the party was even more dangerous to the regime than opposition outside of it. Therefore, the concentration camp came into use against restive party members themselves.

In the spring of 1938, there were hardly more than 50,000 prisoners in all German concentration camps; their number was probably smaller. At that time, the main camps were: Sachsenhausen (c. 8,000), Dachau (c. 6,000), Buchenwald (just started, c. 2,000), Esterwegen (c. 3,000) and small numbers in each of the several smaller camps such as Flossenberg. These figures did not represent the total number of political prisoners, because there probably were an additional 50,000 to 100,000 or more in the regular penal institutions, where they were treated pretty much as prisoners were treated in other jails. This was also true for Ravensbrueck, one of the rare concentration camps for women at that time. Most of the inmates

Prisoners of Buchenwald concentration camp, near Weimar, Germany, April 16, 1945, days after the camp was liberated by American troops.



National Archives, Washington, D.C.

in 1938 were political prisoners; the rest consisted of several hundred “work-shy” prisoners; a few hundred conscientious objectors, most of them Jehovah’s Witnesses; not even 500 Jewish prisoners, many of them “race polluters”; a few so called “incorrigible criminals”; and not even 100 prisoners who did not fall into any of those categories, such as former members of the French foreign legion who had returned to Germany and who were considered traitors because they had accepted service for a foreign power.

Within three months after the annexation of Austria, in 1938, the population of the concentration camp at Dachau, for example, increased from not quite 6,000 to more than 9,000. From then on, the population grew steadily at an ever-increasing rate. In obvious preparation for war, the gestapo tried to incarcerate or intimidate all those inhabitants of Germany who might become dangerous to the war efforts, which may explain why more and more Jews were brought into the camps or persecuted outside of them. Between Jan. 1938 and the beginning of World War II the population of the three biggest concentration camps, those at Dachau, Sachsenhausen and Buchenwald, increased from less than 20,000 to more than 60,000. At the same time the character of their population changed; the number of the asocial and criminal prisoners increased faster than that of political prisoners. The increase in the number of camps and their population was indicated by the fact that in 1944 it was estimated that there were approximately 100 concentration camps in Germany with a population of from 200,000 to 350,000.

After the war began and particularly during the war, other types of concentration camps were established. First the slave-labour camps were added, with a purpose different from that of the original camps. They had to control slave labour and retain the benefit of its labour power, with the least possible expense for food, maintenance and pay.

Later, when the war was no longer going in Germany’s favour, a last main type of concentration camp was created, the extermination camp. Its purpose was to dispose of prisoners in ways which would not necessarily come to the attention of the rest of the population and thus not be too upsetting to it, although such extermination on a small scale had been practised for some time.

The racial and eugenic notions of the national socialistic ideology exercised their influence on the camps as early as 1937. At that time, a few prisoners, not more than a dozen, mostly sex offenders and homosexuals, were sterilized. Later, beginning in 1940, prisoners who were incurably sick, particularly insane prisoners, were killed. Slowly then, the policy intended to improve the race was implemented in the camps by exterminating persons who were supposed to carry undesirable genes. While all exterminations were the result of racial dogmas, the use of the extermination camps on a big scale was probably not premeditated when such ideologies were first developed.

The first racial problem attacked on a large scale was that of the Jews, culminating in the large scale pogroms of 1938 and the sending of tens of thousands of Jews into the existing concentration camps. During the war, both the desire to execute the racial policy and the fear of the danger of having Jews living relatively uncontrolled in German cities spread. In preparation for the invasion of Russia, the German government was confronted with the problem of making sure that the large masses of Jews living in the annexed part of Poland and in those Russian areas which Germany planned to occupy (as well as Poles and Russians in those areas) would not constitute a possible danger to the communications between Germany and the Russian front.

Therefore, from Sept. 1939 on, a policy of decimation was inaugurated for the Jews as the enemies of the German people, for the Poles as the nation who might possibly threaten Germany's hegemony in the future, and for Russians on conquered ground. The tools used were inadequate food, hard labour, inadequate medical services and so on, but during these years actual violence was the exception.

This last step was inaugurated with the establishment of the extermination camps in 1942, starting at the time when Germany's power seemed greatest. Experiments with the gas chamber had started at the camp at Oswiecim near Cracow in Sept. 1941. Extermination was in full swing in July 1942; it was finally stopped in Sept. 1944 on orders from Berlin in the hope of thus gaining more favourable peace terms.

Each of the camps had its separate history, with better and worse periods, with emphasis on one rather than the other of the manifold purposes for which the camps were created and used by the gestapo. Thus, for instance, Buchenwald, from its founding late in 1937 until 1939, was the worst of all camps. But from 1942 until its total disintegration during 1944–45, it was one of the best. Therefore, all statements made below are only generally valid, but do not necessarily apply to each concentration camp at any particular moment of its existence.

Purposes of the Camps.—The concentration camps were established and the acts of terror were committed in them as a means for obtaining varied results. Through their medium, the gestapo tried to change former opponents of the regime into docile subjects who would be unable to start, or to participate in, acts of resistance and would become willing to further the nazis' goals. At the same time the camps were used as experimental laboratories in which to determine how human beings might be transformed into slaves. Moreover, they could be used to ascertain what the minimal requirements were in regard to food, shelter, clothing, hygiene and so on, required for keeping slave labourers alive and able to perform hard labour when the fear of punishment and death took the place of rewards. They were used to determine the maximum working hours per day which could



A German concentration camp at the time of liberation by the U.S. Army, April 1945.

be extracted, when no time was allowed for relaxation or family life. The gestapo used the camps to intimidate and to terrorize the rest of the population by letting it be known, in veiled form, what happened to those who opposed the nazi rulers. The prisoners were used as hostages for the good behaviour of their families and friends.

The camps also provided training places for the gestapo. There, the future gestapo man was to be educated to lose human feeling and kindness and become a "machine" ready to obey any orders, including the order to destroy human beings without mercy. At the same time, he could be convinced how dangerous it was to oppose the regime.

The camps were laboratories which permitted other types of experimentation with human beings which none had ever before dared to attempt. Finally, the camps were used for the destruction of at least many hundreds of thousands, if not millions of persons in line with the racial ideology of the national socialist party. This destruction was to ensure as far as possible, that even after defeat the Germans would remain the most powerful nation in what German geopolitics called the "Heartland of Europe." . . .

It should be stressed, in conclusion, that the camps' purpose of providing training in inhumanity was less important than their purpose of influencing behaviour and even personality structure among the rest of the German population.

The concentration camps were experimental laboratories for the gestapo, in which human beings served as guinea pigs. The nature of some of this experimentation has already been indicated. It should be particularly stressed that, according to the best authorities, the scientific values of these experiments were nil. It might be added that this had to be expected, because experimental efforts based on erroneous premises only rarely produce valid results.

Some of these experiments differed from other biological and medical research only in the fact that human beings took the place of experimental animals. This was true, for instance, of many experiments in grafting muscles and bones and of malaria; cancer and typhus research.

Other experimentation concentrated on findings which might be useful during the war. Experiments along these lines were those in which prisoners were exposed to low pressure as it exists in the stratosphere, or were immersed in ice cold water in order to study the best methods for reviving or protecting fliers who had to descend in such waters. But most of the so-called research efforts in the concentration camps concerned themselves with eugenics. Thus a great deal of "research" was done in the sterilization of members of the "lower" races, culminating in the extermination camps.

A few last words may seem in order about the world's reaction to the concentration camps. The terrors committed in them were experienced as uncanny by most civilized persons. It came as a shock to their pride that supposedly civilized nations could stoop so low as to commit such inhumane acts. Three psychological mechanisms were most frequently used for dealing with the phenomenon of the concentration camp. (a) Its applicability to man in general was denied by asserting (contrary to available evidence) that the acts of torture were committed by a small group of insane or perverted persons, thus having no applicability to man in general. (b) The veracity of the reports were denied and they were ascribed to deliberate propaganda. This method incidentally was most frequently used by the German government, which called all reports on terror in the camps horror propaganda (*Greuelpropaganda*). (c) The reports were believed, but the knowledge of the terror was repressed as soon as possible.

All three mechanisms were observable after the defeat of Germany in 1945. After the "discovery" of the camps, a wave of extreme outrage swept the Allied nations. It was soon followed by a general repression of the discovery. Possibly, this was an indication of how dangerous to one's self-respect was the acceptance of power of another's will, even that of the state, to change one's personality; an admission that must be dealt with by action—or by repression.

Killer Robots: The Future of War?

By Toby Walsh

Artificial intelligence (AI) will transform our lives. It will touch almost every aspect of society: business, education, transportation, medicine, even politics. In most places, this will be a good thing, removing drudgery and improving productivity. But there is one place that I fear its arrival, and that is in the military.

The world will be a much worse place if, in 20 years' time, the military are using lethal autonomous weapons systems (LAWS), for there are no laws about LAWS. The media like to call them "killer robots." The problem with calling them "killer robots" is that this conjures up a picture of *The Terminator*. But it is not *The Terminator* that worries me or thousands of my colleagues working in AI. It is much simpler technologies that are, at best, a decade or

so away. Take an existing Predator drone and replace the human pilot with a computer—this is technically possible today.

The attractiveness of such technologies is obvious. The weakest link in a drone is the radio link back to base. Drones have been sabotaged by jamming their radio link. Have the drone fly, track, and target for itself, and you have the perfect weapon from a technological perspective. It will never sleep. It will fight 24/7. It will have super-human accuracy and reflexes.

There are, however, many reasons why this will be a terrible development in warfare. This will be a revolution in warfare. The first revolution in warfare was the invention of gun powder. The second was the invention of nuclear weapons. And this will be the third. Each was a step change in the

Mass Communication Specialist 2nd Gary Granger Jr./U.S. Navy

A U.S. Navy technician operating a Remote Ordnance Neutralization System, a bomb-neutralizing robot, in 2011.



speed and efficiency with which we could kill our opponents.

These will be weapons of mass destruction. Previously, if you wanted to do harm, you had to have an army of soldiers to wage war. Now, you would need just one programmer. Like every other weapon of mass destruction before it, like chemical, biological, and nuclear weapons, we will need to ban such weaponry.

These will be weapons of terror. They will fall into the hands of terrorists and rogue states that will have no qualms about turning them on civilian populations. They will be an ideal weapon with which to suppress a civilian population. Unlike humans, they will not hesitate to commit atrocities, even genocide.

These will not be more ethical than human soldiers. We don't know today how to build autonomous weapons that will follow international humanitarian law and don't know of any computer systems that can't be hacked. And there are plenty of bad actors out there who will override any safeguards that might be put in place.

These weapons will destabilize an already shaky geopolitical order. It will only take a modest bank balance to have a powerful army. They will lower the barriers to war. We may even have "flash" wars when opposing robots get into unexpected feedback loops.

These will be the Kalashnikovs of the future. Unlike nuclear weapons, they will be cheap and easy to produce. This doesn't mean they can't be banned. Chemical weapons are cheap and easy to produce but have been banned. And we don't need to develop autonomous weapons as a deterrent against those who might ignore a ban—we don't develop chemical weapons to deter those who might sometimes use chemical weapons. We already have plenty of deterrents, military, economic, and diplomatic, with which to deter those who choose to ignore international treaties.

Above all, there is a deep moral argument that we give up an essential part of our humanity if we hand over to machines the decision of whether someone lives or dies.

Let's *not* go down this road.

Toby Walsh is a professor of artificial intelligence at the University of New South Wales, in Sydney, Australia. He is a fellow of the Australian Academy of Science. He was behind two open letters, one signed by thousands of AI researchers in 2015 and the other by more than 100 founders of AI and robotics companies in 2017, calling upon the UN to take action on lethal autonomous weapons, and he has spoken about the issue at the UN in New York and Geneva. Walsh is the author of It's Alive: Artificial Intelligence from the Logic Piano to Killer Robots (2017).

ELEANOR ROOSEVELT ON *Franklin Delano Roosevelt*

Eleanor Roosevelt (1884–1962) was many things: an American first lady, a United Nations diplomat, a globe-trotting humanitarian, and one of the most recognizable women in the world of her day. She was also a wife, and it was in this more private and personal capacity that she wrote for Britannica on the prewar and wartime years of her famous husband, Pres. Franklin Delano Roosevelt, and their effect on his health. Her reflections, written in a detached manner (with references to “President Roosevelt” and “the author,” meaning herself), appeared in 10 Eventful Years: A Record of Events of the Years Preceding, Including and Following World War II (1937 Through 1946), published by Britannica in 1947.



World History Archive/Newscom

Eleanor Roosevelt (left) in front of the White House with Soong Mei-ling (Madame Chiang Kai-shek), first lady of the Republic of China, February 1943.

As one looks over the decade 1937–46, one realizes that 1937 was the year during which much of President Roosevelt’s time and thought was spent on financial conditions within the United States. He suffered what was considered one of the worst reverses in congress when the court reform bill was defeated.

But in spite of anxiety over domestic affairs, he was never unaware of the international situation, which was becoming more and more serious. He tried to prepare the thinking of the people of the United States for the war which he saw approaching, and which he was desperately afraid might end by engulfing the United States as well as the rest of the world.

As historians read his “Quarantine Speech” delivered in Chicago on Oct. 8, 1937, they will probably realize that, harking back to the League of Nations, he was trying to apply some of the benefits which he felt could be obtained by some type of world organization for peace, even though none existed.

In spite of the reverses which he suffered in congress and in spite of the fact that those who had opposed him had felt safe to do so because the country was suffering an economic recession, the newspaper reporters were surprised to find that President Roosevelt's personal popularity seemed to hold during the 6,500 mi. trip to the Pacific coast which he started on Sept. 22.

President Roosevelt took these trips in spite of the physical effort which they entailed, because he felt the need of contact with the people, and this was the only way of observing the effect which government policies were having on the individual lives of the people.

President Roosevelt observed more from a train window than most people. He could look at the countryside, gauge what was happening to the land, to the forests and to the people. He returned from every trip not only refreshed by the human contacts, but with new security in his own judgment. . . .

The European situation was increasingly black, and it was evident that Hitler's mad career was soon going to plunge the European continent into another war. If Great Britain opposed Germany, as it probably would, most people thought that a pattern similar to that of World War I would develop. No one at that time foresaw the complete collapse of France.

The visit of the king and queen of England to the United States in early June of 1939 was an occasion which had a deeper meaning than the usual visit of the head of a great nation, making a polite call upon the head of another great nation.

During the summer of 1939, President Roosevelt made a final appeal for world peace in a message to Chancellor Hitler and President Ignacy Mościcki of Poland, and King Victor Emmanuel of Italy, and the next day he sent another vain appeal to Hitler.

On Sept. 1, Germany invaded Poland and on Sept. 3, Great Britain declared war. Foreseeing the seriousness of the next few months, President Roosevelt called congress into extra session, on Sept. 13, to revise the Neutrality act.

As 1940 progressed, the third term became a burning question. It seemed probable that President Roosevelt would be drafted, and this happened on July 17, at the Democratic National convention in Chicago.

The author knows that he had thought very seriously about this issue, first because he did not think that in ordinary times a president should have more than two consecutive terms, and next because he doubted very much whether many men could stand the strain of the presidency for more than eight years. This led him, after much hesitation, to ask the leaders to give him Henry Wallace as a running mate, for he felt that Wallace more nearly understood the complex problems that might be facing the administration in case of war than any other man at that time. . . .

In 1944, President Roosevelt had to make the decision of whether he would run again for the presidency. He accepted the nomination in a radio broadcast

while on a trip to confer with General Douglas MacArthur and Admiral Chester Nimitz in the Pacific.

In Sept. he again met with Prime Minister Churchill in Quebec. This was purely a military conference, but President Roosevelt was beginning to think more and more of postwar organization, and a meeting was called in June at Dumbarton Oaks to lay the basis for that postwar organization.

It was after the trip to Tehran that President Roosevelt had a bout with a low fever which took him some time to shake off, but after a stay with Mr. Baruch at "Hobcaw," he returned in fairly good health.

In Feb. 1945 he took his last long trip, to Yalta to meet with Mr. Churchill and Marshal Stalin. On his return he was evidently tired but felt that he had made measurable progress in winning the confidence of Marshal Stalin, and his hopes were high that the three great allied powers would be able to work together to create a permanent peace as they had worked together toward the war victory which was now quite evidently in sight.

On the trip home he was under a great strain because his friend and adviser, Harry Hopkins, was evidently far from well, and his friend and military aide, Maj. Gen. Edwin M. Watson, had suffered a stroke and died on the way home.

For the first time in reporting to congress, President Roosevelt sat to give his speech, but when he left for Warm Springs, Georgia, in April for a holiday, all the doctors felt sure that with rest and care he could go on through the four years of his fourth term. It was, therefore, a shock to everyone when the news came on April 12, 1945, that he had died in the Warm Springs cottage. For him, the anxieties and the long effort to serve his country and humanity had come to an end.

Prime Minister Winston Churchill, Pres. Franklin D. Roosevelt, and Premier Joseph Stalin meeting at the Yalta Conference, 1945.



U.S. Army Photo

GEORGE C. MARSHALL ON *The True Cost of World War II*

George C. Marshall was U.S. Army chief of staff during World War II (1939–45), U.S. secretary of state (1947–49), U.S. secretary of defense (1950–51), and architect of the European Recovery Program that famously bore his name. The highly successful “Marshall Plan” (1948–51) not only rehabilitated the war-torn countries of western and southern Europe and prevented their fall to the Soviet Union but helped earn him the Nobel Prize for Peace in 1953. To this impressive résumé he added “Britannica contributor,” for he composed the “Conclusion” section, excerpted below, to the encyclopedia’s 1953 article on World War II.

George C. Marshall, photo by Harry Warnecke, 1944, color carbonyl print; National Portrait Gallery, Smithsonian Institution



The costs of war could not be measured alone in such mathematical terms as battle casualties, dollar expenditures and similar data. Such figures were but partial and inadequate yardsticks. The data regarding casualties among civilians were only partially available. They were known to be very great, often exceeding the military losses. The loss of life because of the privations, cruel treatment and mass murders which were a feature of the axis concentration camps had to be included in any comprehensive record of costs in terms of human lives. A more difficult problem was to appraise the losses occasioned by the displacement and dislocation of populations. Recognition had to be given to the long-term effects of devoting the major portion of the world's over-all capabilities for a period of years to the objective of destruction.

Costs, computed in terms of dollars, of raising and supporting armed forces, lost their significance as the conflicts of war extended from high in the air to the depths of the oceans and over most of the earth's surface. The destruction of homes, industries and means of livelihood of millions of people probably represented a greater monetary cost factor than the support of armed forces. The

destruction common to World War II could not be measured in terms of the replacement cost alone.

The figures in the succeeding paragraphs must be considered in light of the foregoing factors.

Fifty-seven nations, Allied and axis, were belligerents in World War II. In the final compilation of figures as to casualties and expenditures of resources, the data for each nation should be viewed in the light of that nation's total manpower and national wealth. The major portion of the cost was borne by the United States, the British commonwealth, the Union of Soviet Socialist Republics, China and France and by the three major axis powers, Germany, Italy and Japan. The battle dead gave a partial picture of that cost. . . .

Turning to the political results of World War II, the world was left with two great political forces: soviet communism and western democracy in its various forms. Germany had been eliminated as a great power. France, recognized as a major power in the 1930s, one of the victorious allies of 1918, was weaker than before the war. Italy, a cobelligerent at the end of the war, was definitely a minor power. Thus the four great powers on the European continent in 1939 had been reduced to one—soviet Russia.

The destruction of Germany and the impact of the war on other European countries left a weak western Europe overshadowed by the military power of the U.S.S.R. The Soviet Union emerged as one of the two greatest world powers, although with temporary weakness to overcome resulting from its enormous expenditures and losses during the war. All Europe suffered from the economic ills

The spires of the cathedral standing amid the ruins of Cologne, Germany, 1945.



Department of Defense/National Archives, Washington, D.C.

New Times Paris Bureau Collection/USIA/NARA



The dome of St. Paul's Cathedral in London, visible through smoke generated by German incendiary bombs, December 29, 1940.

of dislocation and scarcity and from the artificial barrier separating eastern and western Europe as established by the occupation forces.

Great Britain had been weakened, not only directly by the cost of the war but also relatively by the shifts in the power potential of other nations and the impact of the war on the controls through which it had long made its influence felt throughout the world.

World War II gave a great impetus to the awakening of backward and colonial peoples, and the generation of a feeling of nationalism and some cohesion in such peoples. This was true in the far east and in the middle east and even in Africa.

It was U.S. industrial and military power which provided the additional strength necessary to stem the high tide of initial axis successes and finally to bring the war to a victorious conclusion. The direct military cost to the U.S. for the mobilization of more than 12,000,000 men and the supply of war matériel to its allies was approximately \$350,000,000,000 between 1939 and 1946. It required three to five years for the United States to bring the various components of its power actually to bear against the axis. It was U.S. industry which was called upon to equip and support not only U.S. forces, but considerable portions of allied forces, and earned the title of "the arsenal of democracy." But all this required time, since the total mobilization of a nation's force is dependent on mobilization of its industry.

An important economic result of World War II was the tremendous expenditure of resources, either through destruction or through absorption in the manufacture of implements of war.

During the struggle there was developed to a high degree of efficiency a form of psychological warfare, or the war of nerves. Extensive use was made of propaganda in all its forms, both during the war and after cessation of hostilities. This war of words had an unhappy aftereffect seriously complicating and retarding the negotiations concerning the terms for peace settlements.

JAMES M. MCPHERSON ON *The Civil War Soldier*

On April 12, 2011, the 150th anniversary of the Battle of Fort Sumter, which started the American Civil War, the Pulitzer Prize-winning historian James M. McPherson presented in Charleston, South Carolina, the last speech in a series called "Why They Fought: Reflections on the 150th Anniversary of the American Civil War." A modified version of this speech, excerpted below, ran in Britannica's Book of the Year for 2011.

Courtesy of Princeton University



The motivation of soldiers in the Civil War is a subject that has long intrigued me. Most of the fighting men in that war were neither professional soldiers nor draftees—they were volunteers. The dominant themes in their wartime letters were homesickness and a longing for peace. The pay was poor; the large enlistment bounties received by some Union soldiers late in the war were exceptional; most volunteers made economic sacrifices to join the army. What motivated them to give up several of the best years of their lives—indeed, to give up life itself in a war that killed almost as many American soldiers as all the rest of the wars this country has fought combined? What enabled them to overcome that most basic of instincts, self-preservation, and risk their lives in combat?

This is a vital question in all wars, for without such sacrificial behaviour by soldiers, armies could not fight. For the American Civil War, the question is perhaps more baffling than for most wars, because some traditional answers have little if any relevance. Religious fanaticism and ethnic hatreds do not apply; discipline was notoriously lax in Civil War armies; training was minimal; the coercive power of the state was relatively weak; subordination and unquestioning obedience to orders were alien to this most democratic and individualistic of 19th-century societies. Yet the Union and Confederate armies mobilized three million men. What made these men tick? What motivated them to fight and if necessary to die—a fate suffered by more than 600,000 of them?

To answer this question, the best place to go is the writings of these soldiers themselves, in their letters to families and friends during the war or the diaries they kept during their experience. Civil War armies were the most literate in history to that time. Their letters and diaries constitute a rich and almost unique source—almost unique in the sense that there was no censorship of the letters of Civil War soldiers, no prohibition or discouragement of diary keeping, as there has been in many other wars. Thus, many of these letters—and diaries—were remarkably candid and detailed about important matters that would not get into censored letters: morale, relations between officers and men, details of marches and battles, politics and ideology and war aims, and so on.

There is a large literature on combat motivation in modern armies—especially in World War II armies and more recent wars. When I began my research in Civil War soldiers' letters and diaries, I was guided in what to look for by this literature. It investigated the traditional assumptions about what motivates soldiers to fight: patriotism, ideology, religion, ideals of duty and honour and manhood; glory and adventure; training and discipline; and coercion. These studies found that while some or all of these factors in combination may have been important for some soldiers, for most of them the key factor was what the social psychologists called "primary group cohesion."

What is that? The soldier's primary group consists of his comrades in the squad or platoon or gun crew. Bonded by the common danger they face in battle, they become a band of brothers whose mutual dependence and mutual support in combat create the cohesion necessary to function as a fighting unit. The survival of each member of the group depends on the others' doing their jobs; the survival of the group depends on the steadiness of each individual. So does their individual and collective self-respect. If any of them falters or is paralyzed by fear—skedaddles or skulks, to use Civil War terminology—that individual not only endangers his own and the others' survival but also courts their contempt and ostracism, loses face, and loses self-respect as a man. The compulsion of the peer group is a greater force than coercion by officers or by the state. As one of the leading writers on combat motivation in World War II, S.L.A. Marshall, put it in his book *Men Against Fire*: "No man wants to die; what induces him to risk his life bravely?" It is not "belief in a cause"; "when the chips are down, a man fights to help the man next to him. . . . Men do not fight for a cause but because they do not want to let their comrades down."

Given the prominence of this theme in studies of 20th-century soldiers, it was one of the most important things I was sensitive to in my research. And I found a great deal of evidence for it in the writings of Civil War soldiers. An Ohio colonel felt forever bonded to the men with whom he endured the horrible carnage of Shiloh: "Those who had stood shoulder to shoulder during the

two terrible days of that bloody battle, were hooped with steel, with bands stronger than steel."

The fear of giving way to fear, the shame of cowardice in the eyes of one's peers, was also a powerful motivator in Civil War armies. The greatness of Stephen Crane's novel about a young Civil War soldier, *Red Badge of Courage*, is that it brilliantly portrays this sentiment. And so do many of the soldiers' letters I have read. A Connecticut private wrote just before his first battle: "I am so afraid I shall prove a coward. I can hardly think of anything else." Afterward he uttered a sigh of relief that he had passed the test: "A little shaky at first but soon got used to the music. I know no one will say that I behaved cowardly in the least." An Ohio soldier confessed in his diary that he was shaking like a leaf before he went into his first action, but he was determined nevertheless to "stand up to my duties like a man, let the consequences be as they might. I had rather die like a brave man, than have a coward's ignominy cling around my name and live. . . . Of all names most terrible and to be dreaded is *coward*."

One important factor that made this motivation so important was that most Civil War companies were recruited from the same community or region. Many of the men in a regimental company had been friends and neighbours back home. Their families knew each other. Thus, any reports of cowardice or other nonperformance in battle not only ruined a man's reputation among his comrades but also brought disgrace to his family and community. He could never hold up his head again in the army or at home. An Ohio officer wrote to his wife about another officer from their town who had "proved himself a coward on the battlefield . . . what a stigma for men to transmit to their posterity—your father a coward!" A North Carolina sergeant said that if any man in his regiment showed "the white feather, he should never return to live in N. Carolina." . . .

Religion is another complex factor in combat behaviour that was important for Civil War soldiers. Prayer to God for protection from danger is a common theme in letters and diaries. It probably helped many of them to face that danger more readily. A powerful theme in the letters is a kind of fatalism, a belief that if one's time had come, God would take him no matter what; if not, God would protect him even in the midst of bullets—and this too helped soldiers face those bullets. As a captain in the 4th Alabama Infantry expressed it in a letter to his wife: "I might as well die at home as in battle, [for] we are feeble instruments in the hands of the Supreme Power [and] no man can die before the day appointed by God, or live after that hour."

Civil War soldiers belonged to a generation powerfully affected by the Second Great Awakening in the history of American Protestantism. Many soldiers believed literally in salvation, in a life after death. The travail of life on Earth was merely preparation for a better existence hereafter. Thus, they could confront the

possibility of death with greater equanimity than could a nonbeliever, for whom death was the end of existence. A South Carolina artillery officer confessed that the prospect of death terrified him because “I am not a christian—a christian can afford to be a philosopher because he believes in a certain reunion hereafter but a poor devil who cant believe it hasn’t that support.” For those who did have that support, it played a part in nerving them to face the prospect of death in battle, to act with courage in the belief that even a terrible death was not the end of life. A Massachusetts soldier told his wife that “if I shall fall in this contest it is but going home to my *savior* whom I love . . . if we meet not again on earth prepare to meet me in Heaven.” This religious conviction was not a motive for fighting, but a way of overcoming the greatest inhibition to combat, the fear of death.

One of the more controversial findings in my research on Civil War soldiers’ motivation is the role of ideology. In much of the literature on this subject, one might get the impression that such a role did not exist. In some quarters there has been a belief that most Civil War soldiers had little or no idea what they were fighting for. Some years ago the commander of the New York branch of the Sons of Union Veterans said that “it wasn’t because our fathers knew what they were fighting for that they were heroes. They didn’t know what they were fighting for, exactly, and they fought on anyway. That’s what made them heroes.”

But, to the contrary, the prevalence of ideological themes in the letters and diaries of many soldiers jumps out at the reader. Many, many soldiers were intensely aware of the issues at stake in the war and passionately concerned about them. Their expressions on these issues ranged from simple but heartfelt avowals of patriotism to well-informed and often quite sophisticated discussions of the Constitution, state’s rights, nationalism, majority rule, self-government, democracy, liberty, and slavery.

To provide some background and context for understanding this, remember that these were the most literate armies in history to that time. They also came from the world’s most democratic and highly politicized society. They had grown up in the highly charged political culture of the 1850s with its polarization between slavery and antislavery, South and North, the Southern Rights Democratic Party and the new antislavery Republican Party. Their median age at the time of enlistment was 23½, which meant that most of them had voted in the election of 1860, the most heated and momentous election in American history, which brought out almost 85% of eligible voters. These citizen soldiers continued to vote during the war, not only electing some of their officers in these volunteer regiments but also voting in state and national elections by absentee ballot. Americans were the world’s preeminent newspaper-reading people in the 19th century. Soldiers continued this habit during the war, when they eagerly snapped up newspapers available in camp a few days after publication. . . .



A man examining the grave of a Federal soldier next to the body of a fallen Confederate soldier at the Battle of Antietam, 1862.

This last debate topic suggests one of the dominant themes of Civil War ideology: the self-conscious awareness of parallels with the generation that fought the Revolution and gave birth to the nation. Americans in both the Union and the Confederacy believed themselves custodians of the legacy of the founding fathers. The crisis of 1861 to 1865 was the great test of their worthiness of that heritage. Soldiers on both sides felt intensely this honourable burden: on their shoulders rode the fate of that great experiment of republican self-government launched in 1776.

The tragic irony of the Civil War was that Confederate and Union soldiers interpreted this heritage in opposite ways. In the image of the founders, Confederates professed to fight for liberty and independence from what they considered a tyrannical government; Unionists fought to preserve the nation created by the founders from dismemberment and destruction. A Virginia officer filled letters to his mother with comparisons of the North's "war of subjugation against the South" to "England's war upon the [American] colonies." He was certain the Confederacy would win this "second War for American Independence" because "Tyranny cannot prosper in the nineteenth century" against "a people fighting for their liberties." An Alabama corporal referred in his diary to the Confederacy's struggle for "the same principles which fired the hearts of our ancestors in the revolutionary struggle." . . .

Union convictions often tended to focus on somewhat abstract principles: national unity, constitutional liberty, survival of the republican experiment, the principle of majority rule. Principles of liberty and self-government were, of course,

important in Confederate ideology as well. But many Southern soldiers tied these principles to the more visceral, concrete motives of defending their land and homes against the hated invader they believed had come south to despoil and enslave them. Hatred and revenge were a dominant motif. A Texas officer told his wife to teach their children “a bitter and unrelenting hatred to the Yankee race” that had “invaded our country . . . [and] murdered our best citizens.” Many Confederate soldiers tied this motive to the theme of slavery—but not in the way one might expect. A Mississippian said he was fighting to help “drive from our soil the ruthless invader who is seeking to reduce us to abject slavery. . . . Let our last entrenchments be our graves before we will be conquered.” He got his wish—at Chickamauga. A Georgia soldier met the same fate at Spotsylvania less than three months after he had written to a friend that “the Deep still quiet peace of the grave is more desirable than Vassalage or Slavery.”

These soldiers were using the word *slavery* in the same sense that American revolutionists of 1776 had used it to refer to their subordination to Britain. Some Confederates could go on in the next breath to affirm the protection of property rights in black slaves as a reason for fighting. If the Confederacy lost the war, said a Texas officer in 1864, the South would “lose slaves, liberty, and all that makes life dear.” A Georgia captain who owned 40 slaves wrote to his wife in 1863 from the front in Virginia of “the arch of liberty we are trying to build”—and several sentences later advised her to sell a troublesome slave. Three weeks later he reassured his wife, who had expressed doubts about the survival of slavery as an institution, that if the Confederacy won the war, slavery “is established for centuries.” A Georgia officer fighting in the Atlanta campaign during 1864 wrote his wife that “in two months more we will perhaps be an independent nation or a nation of slaves.” If we lose, “not only will the negroes be free but . . . we will all be on a common level.” But a Texas private remained confident even in 1864 that Confederate victory would prevent this from happening, because “we are fighting for matters real and tangible . . . our property and our homes . . . they for matters abstract and intangible . . . for the flimsy and abstract idea that a negro is equal to an Anglo American.”

Few Yankees professed to fight for racial equality, however. Nor did many white Union soldiers claim to fight solely or even primarily for emancipation. But from the beginning of the war, there were some soldiers whose nationalism fused with antislavery conviction to produce an ideological mix of Liberty and Union, one and inseparable. A Massachusetts private told his parents that he considered “the object of our government as one worth dying to attain—the maintenance of our free institutions which must of necessity result in the freedom of every human being over whom the stars and stripes wave. Who desires peace while such an institution as slavery exists among us?”

But this question badly divided Union soldiers, especially during the six or eight months surrounding Lincoln's issuance of the Emancipation Proclamation. It contributed to a severe morale crisis in Union armies during the winter of 1862–63. A New York artillery officer wrote in 1862 that the war must be “for the preservation of the Union, the putting down of armed rebellion, and for that purpose only.” If Lincoln gave in to radical pressure to make it “an abolition war . . . I for one shall be sorry that I ever lent a hand to it.” An Indiana private told his parents that “if emancipation is to be the policy of this war . . . I do not care how quick the country goes to pot.” In the officers’ mess of a New York regiment, a lieutenant in January 1863 reported “several pretty spirited, I may call them *hot*, controversies about slavery, the Emancipation Edict and kindred subjects. It is not a very acceptable idea to me that we are Negro Crusaders. Anything, however, as I have often said, to crush the rebellion and give us back the Union with all its stars.”

This lieutenant's last sentence provides the key to understanding a significant change that occurred in the Union Army after mid-1863. Many soldiers previously opposed to or skeptical about emancipation came to accept it, not as an ideological war aim but as a means to weaken the Confederacy and win the war. Some of these soldiers eventually became full-fledged abolitionists. My favourite example of this transformation of attitude toward slavery is a young private in the 103rd Ohio, who wrote several letters home in the early months of 1863 after the issuance of the Emancipation Proclamation. “I enlisted to fight for and vindicate the supremacy of the constitution,” he wrote, but “we did not enlist to fight for the negro and I can tell you that *we never shall*. . . sacrafise [our] lives for the liberty of a miserable black race of beings.” By the fall of 1863, however, he was changing his tune. He now wrote to his horrified father that he believed the abolition of slavery would be “a means of haistening the speedy Restoration of the Union and the termination of the war.” Having denounced the Emancipation Proclamation in January 1863, he was praising it a year later. “It was intended to weaken the rebellion and I can asssure you it was a great blow to them.” By January 1865, another year later, he had made the pilgrimage all the way to genuine abolitionism when he wrote in joyous anticipation of a restored nation “*free free free* yes free from that blighting curs *Slavery* the cause of four years of Bloody Warfare.” . . .

These persisting convictions were the glue that held both the Confederate and Union armies together through four bloody years and enabled them to endure far higher casualties than any other armies in American history and keep fighting.

JOHN KEEGAN ON

The Normandy Invasion

When the great military historian Sir John Keegan died in 2012, The Guardian, in its obituary, credited him with the “rare ability to describe warfare from the standpoint of the frontline soldier.” But if the micro level was Keegan’s forte, capturing the larger picture, as he did for Britannica in his masterful overview of the Normandy Invasion of World War II, was hardly beyond his grasp. What follows are his sections on the planning and buildup to that momentous D-Day of June 6, 1944—the greatest amphibian invasion in history.

The decision taken at Tehrān was a final indication of American determination to stage the cross-Channel invasion; it was also a defeat for Alan Brooke, Churchill’s chief of staff and the principal opponent of premature action. Yet despite Brooke’s procrastination, the British had in fact been proceeding with structural plans, coordinated by Lieutenant General Frederick Morgan, who had been appointed COSSAC (chief of staff to the supreme Allied commander [designate]) at the Anglo-American Casablanca Conference in January 1943. His staff’s first plan for Operation Overlord (as the invasion was henceforth to be known) was for a landing in Normandy between Caen and the Cotentin Peninsula in a strength of three divisions, with two brigades to be air-dropped. Another 11 divisions were to be landed within the first two weeks through two artificial harbours that would be towed across the Channel. Once a foothold had been established, a force of a hundred divisions, the majority shipped directly from the United States, were to be assembled in France for a final assault on Germany. In January 1944 Eisenhower became supreme Allied commander, and the COSSAC staff was redesignated SHAEF (Supreme Headquarters Allied Expeditionary Force).

Fortress Europe

Hitler had long been aware that the Anglo-American allies would eventually mount a cross-Channel invasion, but, as long as they dissipated their forces in the



Allied troops advance on a beach during the invasion of Normandy, France, June 6, 1944.

Mediterranean and as long as the campaign in the east demanded the commitment of all available German forces, he downplayed the threat. By November 1943, however, he accepted that it could be ignored no longer, and in his Directive Number 51 he announced that France would be reinforced. To oversee defensive preparations, Hitler appointed Field Marshal Erwin Rommel, former commander of the Afrika Korps, as inspector of coastal defenses and then as commander of Army Group B, occupying the threatened Channel coast. As army group commander, Rommel officially reported to the longer-serving Commander in Chief West Gerd von Rundstedt, though the entire structure was locked into a rigid chain of command that deferred many operational decisions to the Führer himself.

Buildup, 1943–44: The Allied Commanders

In January 1944 the Allies appointed an invasion commander, Dwight D. Eisenhower, and placed him within a flexible, fully binational Anglo-American chain of command. Bernard Law Montgomery, Rommel's desert opponent in North Africa, was nominated, under Eisenhower, as commander of the ground invasion forces. Walter Bedell Smith, an American, continued as Eisenhower's chief of staff, but his other principal subordinates were British: Air Chief Marshal

Arthur Tedder as his deputy, Admiral Bertram Ramsay as naval commander, and Air Chief Marshal Trafford Leigh-Mallory as head of the expeditionary air forces. A Free French delegate, Marie-Pierre Koenig, served as liaison between SHAEF and the president of the French Committee of National Liberation, Charles de Gaulle.

Montgomery's first acts were (1) to demand and get five divisions to make the initial landing and (2) to widen the landing area to include the Orne River estuary and the base of the Cotentin Peninsula. As finally constituted in the so-called Montgomery plan, the invasion force was to consist of five infantry divisions—two U.S., two British, and one Canadian—assigned to beaches code-named (from west to east) Utah, Omaha, Gold, Juno, and Sword. On D-Day (the projected first day of the invasion), two American airborne divisions were to land behind the western end of the assault area and one British at the eastern, while amphibious armour was to swim ashore with the leading waves. The Americans constituted the U.S. First Army under Major General Omar Bradley, the British and Canadians the British Second Army under General Miles Dempsey. The British divisions had been under intensive training since 1942, the U.S. since 1943. Meanwhile, intensive logistics preparations organized by Lieutenant General J.C.H. Lee provided, by May 1944, almost 6,500 ships and landing craft, which would land nearly 200,000 vehicles and 600,000 tons of supplies in the first three weeks of the operation.

The Air Campaign

The invasion would be supported by more than 13,000 fighter, bomber, and transport aircraft, against which the Luftwaffe (the German air force) was able to deploy fewer than 400 on D-Day. Between April 1 and June 5, 1944, the British and American strategic air forces deployed 11,000 aircraft, flew 200,000 sorties, and dropped 195,000 tons of bombs on French rail centres and road networks as well as German airfields, radar installations, military bases, and coastal artillery batteries. Two thousand Allied aircraft were lost in these preliminaries, but the air campaign succeeded in breaking all the bridges across the Seine and Loire rivers and thus isolating the invasion area from the rest of France. The Luftwaffe staff was forced to concede that "the outstanding factor both before and during the invasion was the overwhelming air superiority of the enemy."

Decryption and Deception

The air campaign was designed not only to disrupt German anti-invasion preparations but also to serve as a deception operation. Two-thirds of the bombs were

dropped outside the invasion area in an attempt to persuade the enemy that the landings would be made northeast of the Seine—in particular, the Pas-de-Calais area, directly opposite Dover, England—rather than in Normandy. At the same time, through the top-secret Ultra operation, the Allies were able to decode encrypted German transmissions, thus providing the Overlord forces with a clear picture of where the German counterattack forces were deployed. By spurious radio transmissions, the Allies created an entire phantom army, “based” in southeast England (opposite Pas-de-Calais) and alleged to be commanded by the American general George S. Patton. (Patton would later materialize on the Normandy battlefield to lead the armoured breakout into Brittany.) In addition, on the night of the invasion itself, airborne radar deception presented to German radar stations a “phantom” picture of an invasion fleet crossing the Channel narrows, while a radar blackout disguised the real transit to Normandy.

Mines at the Beach, Tanks in Reserve

The Germans were not altogether deluded. Hitler himself declared a last-minute premonition of a Normandy landing. By then, however, the dispositions had been made. Rommel, in his brief period of responsibility for the Atlantic Wall, had been able to decuple mine laying, so that by June 5 some four million more mines had been laid on the beaches. He had not, however, been able to position the German tank divisions as he wanted. Rundstedt wished to hold them back from the coast as a reserve. Rommel, warning that Allied aircraft would destroy them as they advanced, wished to place them near the beaches. Hitler, adjudicating in the dispute, worsened the situation by allotting some divisions to Rommel and some to Rundstedt, keeping others under his own command. The rest of Rommel’s Army Group B was made up of the infantry divisions of the Seventh Army (under Friedrich Dollmann) in Normandy and Brittany and of the Fifteenth Army (under Hans von Salmuth) in Pas-de-Calais and eastward. The reserve tank forces, given the name Panzer Group West and commanded by Leo Geyr von Schweppenburg, came nominally under Rundstedt’s direct command.

D-Day, June 6, 1944: The Decision to Go

May 1944 had been chosen at the conference in Washington in May 1943 as the time for the invasion. Difficulties in assembling landing craft forced a postponement until June, but June 5 was fixed as the unalterable date by Eisenhower on May 17. As the day approached and troops began to embark for the crossing, bad weather set in, threatening dangerous landing conditions. After tense debate, Eisenhower and his subordinates decided on a 24-hour delay, requiring the recall

of some ships already at sea. Eventually, on the morning of June 5, Eisenhower, assured by chief meteorologist James Martin Stagg of a break in the weather, announced, "O.K. We'll go." Within hours an armada of 3,000 landing craft, 2,500 other ships, and 500 naval vessels—escorts and bombardment ships—began to leave English ports. That night 822 aircraft, carrying parachutists or towing gliders, roared overhead to the Normandy landing zones. They were a fraction of the air armada of 13,000 aircraft that would support D-Day.

MADAME CHIANG KAI-SHEK ON *Chiang Kai-shek*

Madame Chiang Kai-shek (Soong Mei-ling) was a well-known Chinese political figure of the 20th century, who hailed from a prominent family. She was the second wife of Chinese President Chiang Kai-shek, head of the Nationalist government in China from 1928 to 1949; her sister Soong Ch'ing-ling was the wife of Sun Yat-sen, first provisional president of the Republic of China (1911–12); and her brother T.V. Soong was a significant industrialist and official of the Nationalist Chinese government. She wrote the following piece, about the wartime years of her husband, for a Bri-

tannica work, 10 Eventful Years: A Record of Events of the Years Preceding, Including and Following World War II (1937 Through 1946), published in 1947.



Eleanor Roosevelt (left) in front of the White House with Soong Mei-ling (Madame Chiang Kai-shek), first lady of the Republic of China, February 1943.

Responsible Chinese civilian and military authorities were fully aware that China could not hope for victory in positional warfare. They deduced, however, from the trend of the world's political currents that a total world war could not long be delayed and that China would have a better chance of success when like-minded nations were forced, by the logic of events, to perceive at last that China's cause was their own. China could, meanwhile, make a valuable 'contribution to what it had long sensed would be another world war by keeping the Japanese at bay through guerrilla methods and, aided by time, space and the scorched earth policy, give the western powers time to prepare for what it felt to be inevitable. To make this contribution, nevertheless, entailed a terrible strain. The equipment

AP Images



Chiang Kai-shek, left in cape, talking to some of his troops at the American-staffed infantry training center in Guangxi province during a visit on April 28, 1944.

of most of China's troops was inadequate and semiobsolete, and the country was not organized to meet the demands of protracted hostilities. China had no navy, and only an embryo air force. It had practically no heavy industries, and such light industries as China possessed were in coastal regions that were bound to fall to the Japanese soon after war started. These industries were, moreover, mainly under foreign control. In effect, China had to make preparation for war after war had already begun and perform, metaphorically, the feat of making bricks without straw.

Nevertheless the morale and fighting qualities of the Chinese soldier as exemplified in the battles of Shanghai, Taierchwang, Changsha, Changteh and Kunlunkwan, and the battles in Burma came as a surprise to most western observers, who at first were almost unanimous in the belief that China would speedily be vanquished. China, however, had faith that its two priceless assets, the character and number of its people and the vast extent of its territory, would be decisive in a prolonged struggle, and that China would eventually emerge victorious. This inspired the national leader, Chiang Kai-shek, and the Chinese people to enter upon a struggle which, they were repeatedly told by friends and foes, was hopeless from

the beginning. The miracle was that from 1937–41, China fought alone against the world's third most powerful nation. Even after Pearl Harbor China received comparatively little military aid from the outside world. Soviet Russia, before waging war with Germany, did send some pilots, planes and other war matériel, but owing to the difficulties of transportation over the Old Silk route, no appreciable amount trickled in. The United States, through lend-lease arrangements, provided China with the equipment for the Flying Tigers, known as the American Volunteer group, organized under General Claire Chennault on Aug. 1, 1941. This famous group, which possessed only 75 semiobsolete planes, was of the greatest assistance in uplifting Chinese morale; for after having fought alone for four years, the Chinese army and people were physically, mentally and spiritually weary. The Flying Tigers patrolled the Burma road, protected Chinese cities from indiscriminate bombing and inflicted heavy losses on Japanese shipping.

After the joint declaration of the United Nations was signed on Jan. 1, 1942, Generalissimo Chiang Kai-shek became supreme commander of the Allied forces in the China theatre. Contrary to China's hopes and expectations, Japan, instead of being checked, continued for some months to make incredible gains and advances in the Pacific. Three months after Pearl Harbor, Japan had severed China's last good supply route—the Burma road. All ports and other roads leading to the outside world had long been lost. There remained only the highly hazardous and inadequate air route through Assam over the Himalayan mountains. War also dislocated seriously China's internal communications. Of some 9,150 mi. of railway in China proper, sections of which had been feverishly constructed during the early phases of the war, all but one-tenth eventually fell into Japanese hands. This also held true of the interprovincial highways.

China's contribution to the war effort which led to Japan's surrender in 1945, can be summed up as follows: First, China held Japan's military might at bay while giving the western powers time to prepare for the inevitable struggle. By 1945 China was holding 50 Japanese divisions in China proper, or two-fifths of the entire Japanese army, and 22 divisions in Manchuria. Second, although lacking even the elemental machinery and mechanized conveniences in everyday use in Europe and the United States, China built by human labour enormous airfields from which U.S. planes could take off to bomb Japanese installations and navy.

MÁIREAD MAGUIRE ON

The Peace People

Máiread Maguire—corecipient of the 1976 Nobel Prize for Peace—cofounded the Peace People, headquartered in Belfast, Northern Ireland. The peace organization was a response to Northern Ireland's "Troubles," described by Maguire in her Britannica article below. The organization was spawned in particular by the killing on August 10, 1976, of two of her nephews and one of her nieces by a careening car whose driver had been shot dead at the wheel by British soldiers.

Courtesy of Máiread Maguire



The Peace People movement was a response to Northern Ireland's "Troubles"—a period of violent conflict between Protestants and Roman Catholics, a religious division that often paralleled the political divide between those who supported rule by the predominantly Protestant United Kingdom (Loyalists) and those who favoured a union with the predominantly Catholic republic of Ireland (Republicans). By the early 1970s the unrest had led to an increased presence of British troops in Northern Ireland, which in turn incited a campaign of bombings and shootings by the anti-British Irish Republican Army (IRA).

One tragic incident in particular sparked the formation of the movement: on Aug. 10, 1976, three of my sister Ann's children were killed by a careening car after its driver, an IRA fugitive, had been shot dead at the wheel by British soldiers. The accident not only personally affected me and Betty Williams—a local mother who arrived at the scene shortly after the accident occurred—but it also touched an entire community fed up with violence. As the public reacted to the killings with prayer vigils and protests, Williams and I spoke to the local media and became voices for the aggrieved community. We, along with Ciaran McKeown—a journalist and nonviolent activist—met on the day of the children's funeral, and a few days later we founded the Peace People.

McKeown named the movement and wrote its declaration, which read:

We have a simple message to the world from this movement for Peace.
We want to live and love and build a just and peaceful society.
We want for our children, as we want for ourselves, our lives at home, at work, and at play to be lives of joy and Peace.
We recognise that to build such a society demands dedication, hard work, and courage.
We recognise that there are many problems in our society which are a source of conflict and violence.
We recognise that every bullet fired and every exploding bomb make that work more difficult.
We reject the use of the bomb and the bullet and all the techniques of violence.
We dedicate ourselves to working with our neighbours, near and far, day in and day out, to build that peaceful society in which the tragedies we have known are a bad memory and a continuing warning.

More than 100,000 people signed copies of the declaration, and antiviolenence rallies and protests throughout Ireland and the United Kingdom followed in the six months after the movement's founding. The rate of violence in Northern Ireland during this period, as measured by number of fatalities, fell by 70 percent, and it continued to diminish over the succeeding decades. After the initial rally phase, the movement's organizers concentrated at the local level, encouraging individuals to form peace groups, to address issues affecting their neighbourhoods, to engage in cross-community dialogue, and to work with other locales on joint projects.

In subsequent years the Peace People fought for a repeal of the Northern Ireland (Emergency Provisions) Act, which, among other things, had increased the British army's powers to arrest and question suspects. In 1981 the group helped establish the Committee on the Administration of Justice, a human rights organization, to expose and counter what it saw as the draconian nature of the Emergency Provisions. The Peace People also campaigned for the rights of both loyalist and republican prisoners and arranged a bus service to transport visitors to prisons. (The prison program ceased with the release of political prisoners as part of the Good Friday Agreement of April 10, 1998.) Another program helped members of paramilitary groups to leave their organizations and, in some cases, to emigrate for their own safety. In other areas, the Peace People supported the Integrated Education Movement, which aimed to bridge Northern Ireland's religious and cultural divisions by establishing interfaith schools. In addition, the group established a youth program that featured annual peace camps held in various countries, which allowed young people of different backgrounds to travel abroad and share their thoughts and ideas in a neutral setting.

The organization ultimately expanded its activities beyond Northern Ireland. It lobbied internationally on behalf of nuclear disarmament and nonviolent approaches to conflict resolution, and it sent peace delegations to a number of countries experiencing conflict—including Iraq, Israel and Palestine, the United States, Australia, India, and assorted countries in Africa—in order to support those who advocated nonviolent solutions. The organization also was an instrumental force behind the United Nations' declaration of the International Decade for a Culture of Peace and Nonviolence for the Children of the World (2001–10).

Drones, War, and Peace

By George Gittoes

I have spent much of my life creating art for peace in the face of war. As an artist, filmmaker, and photojournalist, I have witnessed more than three decades of wars from the front line, in Nicaragua, Cambodia, Philippines, Somalia, Western Sahara, Palestine, South Africa, Northern Ireland, Mozambique, Rwanda, East Timor, Congo, Iraq, and Afghanistan. I have also witnessed triumphs of the human spirit, in Pretoria, for example, when Nelson Mandela delivered his “Rainbow Nation” speech, ending apartheid, at his inauguration as South Africa’s first black president; in Cambodia when the Khmer Rouge lost power; in Northern Ireland when the Troubles ended; and I have seen the ancient bridge of Mostar restored in Bosnia.

During my many times on the front line, I have traveled inside military vehicles and wandered into many war rooms. This has enabled me to observe how artificial intelligence is being integrated into the military war machine. The defense industry is rapidly developing robotic killing machines with artificial intelligence to replace or supplement human police and armies, a troubling displacement of the human element that is mirrored in the civilian sector.

As people are increasingly made redundant, they will increasingly feel useless and angry, emotions that are easily channeled into violence. This will lead to wars on a scale the world has never seen. People need opportunities to create, or there is the risk of them becoming destructive. Moreover, with larger populations having fewer paid jobs, my fear is that the wealthy few will want to share less and less with the billions who will live without.

Those in power have anticipated this, and their solution is the rapid development of militarized robots with artificial intelligence.

Just as industrial robots are replacing humans in the workplace, militarized robots will take over from law-and-order officers. Monitoring of all communications on

phones and the Internet, as well as the ability to watch and track people using surveillance cameras and via the individuals’ own personal devices, will mean protest can be forcibly prevented before people take it to the streets. (People delight so much in their smartphones that these and similar new tech gadgets have become Trojan horses by which their defenses can be breached.) Mass protests of the future, when they do occur, will likely face robots and armed drones.

I was at the Occupy Wall Street protests in New York City and wondered how long poorly paid police officers would remain committed to doing the will of the bankers, brokers, and wealthy politicians against fellow workers. If I was thinking this, then the super-rich looking down from their office towers must have been thinking the same. The general fear of terrorist attacks has been a perfect excuse to take away our rights for personal privacy. It also is an excuse to use public funds to pay for more and more effective tools for surveillance and militarized robotic law enforcement.

Courtesy of George Gittoes, photo by Hellen Rose

Australian artist George Gittoes (right) working on a portrait of WikiLeaks founder Julian Assange at the Ecuadoran embassy, London, February 2017.



Imagine a massive rally similar to a Black Lives Matter protest in the U.S. coming face to face with a buzzing swarm of militarized flying drones, not human police with batons and shields but flying guns operated from a control room that, when triggered, will have pinpoint accuracy.

At our Yellow House in Jalalabad, Afghanistan, we are already witnessing the future as unmanned drones fly over every 15 minutes, loaded with laser-guided bombs. Those controlling the drones are half a world away, watching on computer screens, untouched by grief as their missiles detonate inside communities of flesh and blood. In the next phase similar drones will be autonomous, with a license to kill at their own mechanical discretion. Human soldiers and police have always been trained to obey authority, but they do have a conscience and can refuse callous and unreasonable orders.

At Kibeho in Rwanda I saw innocent women and children hacked to death with machetes. It is hard to understand how a species that has produced creative geniuses like Mozart and Rembrandt can continue to develop weapons that are more and more effective, especially with the aid of artificial intelligence, at killing its own kind. Human freedom will be lost as everything we think and do is monitored, and every action against authority is crushed by robots. The news and other media are being used to manipulate us into ignoring the threat, but more warning signs are needed as we rush toward this ominous future.

At our Yellow House in Jalalabad, we have proven that art and creativity can work better in places of war to bring about positive social change and happiness. Human creativity has built a great civilization, but to survive the future we need to move beyond war and the greed of the few who want to control the many.

There is still hope for a better future wherever good people strive for creative solutions. We *can* evolve beyond war, but if we keep killing and destroying with increased

Courtesy of George Gittoes, photo by Hellen Rose



Australian artist George Gittoes (center) at the Yellow House art center in Jalalabad, Afghanistan.

efficiency, exhausting in the process precious money that could have been channeled toward addressing social ills, we are little more than rogue apes.

*George Gittoes is an Australian painter, photographer, and filmmaker committed to creating art in the face of war. He established the Yellow House (an homage to Vincent van Gogh's unrealized dream of creating a haven for artists at his home in Arles, France) in Jalalabad, Afghanistan, in 2008 with partner Hellen Rose as a creative sanctuary and media training center. Encouraged to travel to New York by Clement Greenberg in 1968, Gittoes shot casting reels for Andy Warhol at the latter's studio, The Factory, and collaborated with African American activist Joseph Delaney in making art in support of the civil rights movement. His paintings have twice won the Blake Prize for Religious Art; his films and documentaries have aired throughout the world; in 1997 he was honored with an Order of Australia for "service to art and international relations"; in 2015 he was awarded the Sydney Peace Prize. His autobiography, *Blood Mystic*, was published in 2016; and he is currently shooting *White Light*, a film in support of the Black Lives Matter movement in the United States, and working to expand the Yellow House in Jalalabad.*

T. E. LAWRENCE ON *Guerrilla Warfare*

For its new 14th Edition (1929–73) Britannica must have considered it a small triumph to persuade the famed British archaeologist-warrior-writer “Lawrence of Arabia” (T.E. Lawrence, 1888–1935) to write its entry “Guerrilla Warfare.” Based on his firsthand experience as a guerrilla fighter in the Middle East during World War I, his long Britannica entry (excerpted below) proved just as dashing as he was.



This study of the science of guerrilla, or irregular, warfare is based on concrete experience of the Arab Revolt against the Turks 1916–1918. But the historical example in turn gains value from the fact that its course was guided by the practical application of the theories here set forth.

The Arab Revolt began in June, 1916, with an attack by the half-armed inexperienced tribesmen upon the Turkish garrisons in Medina and about Mecca. They met with no success, and after a few days' effort withdrew out of range and began a blockade. This method forced the early surrender of Mecca, the more remote of the two centres. Medina, however, was linked by railway to the Turkish main army in Syria, and the Turks were able to reinforce the garrison there. The Arab forces which had attacked it then fell back gradually and took up a position across the main road to Mecca.

At this point the campaign stood still for many weeks. The Turks prepared to send an expeditionary force to Mecca, to crush the revolt at its source, and accordingly moved an army corps to Medina by rail. Thence they began to advance down the main western road from Medina to Mecca, a distance of about 250 miles. The first 50 miles were easy, then came a belt of hills 20 miles wide, in which were Feisal's Arab tribesmen standing on the defensive: next a level stretch, for 70 miles along the coastal plain to Rabegh, rather more than half-way. Rabegh is a little port on the Red Sea, with good anchorage for ships, and because of its

situation was regarded as the key to Mecca. Here lay Sherif Ali, Feisal's eldest brother, with more tribal forces, and the beginning of an Arab regular army, formed from officers and men of Arab blood who had served in the Turkish Army. As was almost inevitable in view of the general course of military thinking since Napoleon, the soldiers of all countries looked only to the regulars to win the war. Military opinion was obsessed by the dictum of Foch that the ethic of modern war is to seek for the enemy's army, his centre of power, and destroy it in battle. Irregulars would not attack positions and so they were regarded as incapable of forcing a decision.

While these Arab regulars were still being trained, the Turks suddenly began their advance on Mecca. They broke through the hills in 24 hours, and so proved the second theorem of irregular war—namely, that irregular troops are as unable to defend a point or line as they are to attack it. This lesson was received without gratitude, for the Turkish success put the Rabegh force in a critical position, and it was not capable of repelling the attack of a single battalion, much less of a corps.

In the emergency it occurred to the author that perhaps the virtue of irregulars lay in depth, not in face, and that it had been the threat of attack by them upon the Turkish northern flank which had made the enemy hesitate for so long. The actual Turkish flank ran from their front line to Medina, a distance of some 50 miles: but, if the Arab force moved towards the Hejaz railway behind Medina, it might stretch its threat (and, accordingly, the enemy's flank) as far, potentially, as Damascus, 800 miles away to the north. Such a move would force the Turks to the defensive, and the Arab force might regain the initiative. Anyhow, it seemed the only chance, and so, in Jan. 1917, Feisal's tribesmen turned their backs on Mecca, Rabegh and the Turks, and marched away north 200 miles to Wejh.

This eccentric movement acted like a charm. The Arabs did nothing concrete, but their march recalled the Turks (who were almost into Rabegh) all the way back to Medina. There, one half of the Turkish force took up the entrenched position about the city, which it held until after the Armistice. The other half was distributed along the railway to defend it against the Arab threat. For the rest of the war the Turks stood on the defensive and the Arab tribesmen won advantage over advantage till, when peace came, they had taken 35,000 prisoners, killed and wounded and worn out about as many, and occupied 100,000 square miles of the enemy's territory, at little loss to themselves. However, although Wejh was the turning point its significance was not yet realized. For the moment the move thither was regarded merely as a preliminary to cutting the railway in order to take Medina, the Turkish headquarters and main garrison.

Strategy and tactics. However, the author was unfortunately as much in charge of the campaign as he pleased, and lacking a training in command sought to find an immediate equation between past study of military theory and the

present movements—as a guide to, and an intellectual basis for, future action. The text books gave the aim in war as “the destruction of the organized forces of the enemy” by “the one process battle.” Victory could only be purchased by blood. This was a hard saying, as the Arabs had no organized forces, and so a Turkish Foch would have no aim: and the Arabs would not endure casualties, so that an Arab Clausewitz could not buy his victory. These wise men must be talking metaphors, for the Arabs were indubitably winning their war . . . and further reflection pointed to the deduction that they had actually won it. They were in occupation of 99% of the Hejaz. The Turks were welcome to the other fraction till peace or doomsday showed them the futility of clinging to the window pane. This part of the war was over, so why bother about Medina? The Turks sat in it on the defensive, immobile, eating for food the transport animals which were to have moved them to Mecca, but for which there was no pasture in their now restricted lines. They were harmless sitting there; if taken prisoner, they would entail the cost of food and guards in Egypt: if driven out northward into Syria, they would join the main army blocking the British in Sinai. On all counts they were best where they were, and they valued Medina and wanted to keep it. Let them!

This seemed unlike the ritual of war of which Foch had been priest, and so it seemed that there was a difference of kind. Foch called his modern war “absolute.” In it two nations professing incompatible philosophies set out to try them in the light of force. A struggle of two immaterial principles could only end when the supporters of one had no more means of resistance. An opinion can be argued with: a conviction is best shot. The logical end of a war of creeds is the final destruction of one, and Salammbo the classical textbook-instance. These were the lines of the struggle between France and Germany, but not, perhaps, between Germany and England, for all efforts to make the British soldier hate the enemy simply made him hate war. Thus the “absolute war” seemed only a variety of war; and beside it other sorts could be discerned, as Clausewitz had numbered them, personal wars for dynastic reasons, expulsive wars for party reasons, commercial wars for trading reasons.

Now the Arab aim was unmistakably geographical, to occupy all Arabic-speaking lands in Asia. In the doing of it Turks might be killed, yet “killing Turks” would never be an excuse or aim. If they would go quietly, the war would end. If not, they must be driven out: but at the cheapest possible price, since the Arabs were fighting for freedom, a pleasure only to be tasted by a man alive. The next task was to analyse the process, both from the point of view of strategy, the aim in war, the synoptic regard which sees everything by the standard of the whole, and from the point of view called tactics, the means towards the strategic end, the steps of its staircase. In each were found the same elements, one algebraical, one biological, a third psychological. The first seemed a pure science, subject to the

laws of mathematics, without humanity. It dealt with known invariables, fixed conditions, space and time, inorganic things like hills and climates and railways, with mankind in type-masses too great for individual variety, with all artificial aids, and the extensions given our faculties by mechanical invention. It was essentially formulable.

In the Arab case the algebraic factor would take first account of the area to be conquered. A casual calculation indicated perhaps 140,000 square miles. How would the Turks defend all that—no doubt by a trench line across the bottom, if the Arabs were an army attacking with banners displayed . . . but suppose they were an influence, a thing invulnerable, intangible, without front or back, drifting about like a gas? Armies were like plants, immobile as a whole, firm-rooted, nourished through long stems to the head. The Arabs might be a vapour, blowing where they listed. It seemed that a regular soldier might be helpless without a target. He would own the ground he sat on, and what he could poke his rifle at. The next step was to estimate how many posts they would need to contain this attack in depth, sedition putting up her head in every unoccupied one of these 100,000 square miles. They would have need of a fortified post every four square miles, and a post could not be less than 20 men. The Turks would need 600,000 men to meet the combined ill wills of all the local Arab people. They had 100,000 men available. It seemed that the assets in this sphere were with the Arabs, and climate, railways, deserts, technical weapons could also be attached to their interests. The Turk was stupid and would believe that rebellion was absolute, like war, and deal with it on the analogy of absolute warfare.

Humanity in battle. So much for the mathematical element; the second factor was biological, the breaking-point, life and death, or better, wear and tear. *Bionomics* seemed a good name for it. The war-philosophers had properly made it an art, and had elevated one item in it, “effusion of blood,” to the height of a principle. It became humanity in battle, an art touching every side of our corporal being. There was a line of variability (man) running through all its estimates. Its components were sensitive and illogical, and generals guarded themselves by the device of a reserve, the significant medium of their art. Goltz had said that when you know the enemy’s strength, and he is fully deployed, then you know enough to dispense with a reserve. But this is never. There is always the possibility of accident, of some flaw in materials, present in the general’s mind: and the reserve is unconsciously held to meet it. There is a “felt” element in troops, not expressible in figures, and the greatest commander is he whose intuitions most nearly happen. Nine-tenths of tactics are certain, and taught in books: but the irrational tenth is like the kingfisher flashing across the pool and that is the test of generals. It can only be ensued by instinct, sharpened by thought practising the stroke so often that at the crisis it is as natural as a reflex.

Yet to limit the art to humanity seemed an undue narrowing down. It must apply to materials as much as to organisms. In the Turkish Army materials were scarce and precious, men more plentiful than equipment. Consequently the cue should be to destroy not the army but the materials. The death of a Turkish bridge or rail, machine or gun, or high explosive was more profitable than the death of a Turk. The Arab army just then was equally chary of men and materials: of men because they being irregulars were not units, but individuals, and an individual casualty is like a pebble dropped in water; each may make only a brief hole, but rings of sorrow widen out from them. The Arab army could not afford casualties. Materials were easier to deal with. Hence its obvious duty to make itself superior in some one branch, guncotton or machine guns, or whatever could be most decisive. Foch had laid down the maxim, applying it to men, of being superior at the critical point and moment of attack. The Arab army might apply it to materials, and be superior in equipment in one dominant moment or respect.

For both men and things it might try to give Foch's doctrine a negative twisted side, for cheapness' sake, and be weaker than the enemy everywhere except in one point or matter. Most wars are wars of contact, both forces striving to keep in touch to avoid tactical surprise. The Arab war should be a war of detachment: to contain the enemy by the silent threat of a vast unknown desert, not disclosing themselves till the moment of attack. This attack need be only nominal, directed not against his men, but against his materials: so it should not seek for his main strength or his weaknesses, but for his most accessible material. In railway cutting this would be usually an empty stretch of rail. This was a tactical success. From this theory came to be developed ultimately an unconscious habit of never engaging the enemy at all. This chimed with the numerical plea of never giving the enemy's soldier a target. Many Turks on the Arab front had no chance all the war to fire a shot, and correspondingly the Arabs were never on the defensive, except by rare accident. The corollary of such a rule was perfect "intelligence," so that plans could be made in complete certainty. The chief agent had to be the general's head (de Feuquière said this first), and his knowledge had to be faultless, leaving no room for chance. The headquarters of the Arab army probably took more pains in this service than any other staff.

The crowd in action. The third factor in command seemed to be the psychological, that science (Xenophon called it diathetic) of which our propaganda is a stained and ignoble part. It concerns the crowd, the adjustment of spirit to the point where it becomes fit to exploit in action. It considers the capacity for mood of the men, their complexities and mutability, and the cultivation of what in them profits the intention. The command of the Arab army had to arrange their men's minds in order of battle, just as carefully and as formally as other officers arranged their bodies: and not only their own men's minds, though them first: the minds of

the enemy, so far as it could reach them: and thirdly, the mind of the nation supporting it behind the firing-line, and the mind of the hostile nation waiting the verdict, and the neutrals looking on.

It was the ethical in war, and the process on which the command mainly depended for victory on the Arab front. The printing press is the greatest weapon in the armoury of the modern commander, and the commanders of the Arab army being amateurs in the art, began their war in the atmosphere of the 20th century, and thought of their weapons without prejudice, not distinguishing one from another socially. The regular officer has the tradition of 40 generations of serving soldiers behind him, and to him the old weapons are the most honoured. The Arab command had seldom to concern itself with what its men did, but much with what they thought, and to it the diathetic was more than half command. In Europe it was set a little aside and entrusted to men outside the General Staff. But the Arab army was so weak physically that it could not let the metaphysical weapon rust unused. It had won a province when the civilians in it had been taught to die for the ideal of freedom: the presence or absence of the enemy was a secondary matter. . . .

Guerrillas must be allowed liberal work-room. In irregular war if two men are together one is being wasted. The moral strain of isolated action makes this simple form of war very hard on the individual soldier, and exacts from him special initiative, endurance and enthusiasm. Here the ideal was to make action a series of single combats to make the ranks a happy alliance of commanders-in-chief. The value of the Arab army depended entirely on quality, not on quantity. The members had to keep always cool, for the excitement of a blood-lust would impair their science, and their victory depended on a just use of speed, concealment, accuracy of fire. Guerrilla war is far more intellectual than a bayonet charge.

The exact science of guerrilla warfare. By careful persistence, kept strictly within its strength and following the spirit of these theories, the Arab army was able eventually to reduce the Turks to helplessness, and complete victory seemed to be almost within sight when General Allenby by his immense stroke in Palestine threw the enemy's main forces into hopeless confusion and put an immediate end to the Turkish war. His too-greatness deprived the Arab revolt of the opportunity of following to the end the dictum of Saxe that a war might be won without fighting battles. But it can at least be said that its leaders worked by his light for two years, and the work stood. This is a pragmatic argument that cannot be wholly derided. The experiment, although not complete, strengthened the belief that irregular war or rebellion could be proved to be an exact science, and an inevitable success, granted certain factors and if pursued along certain lines.

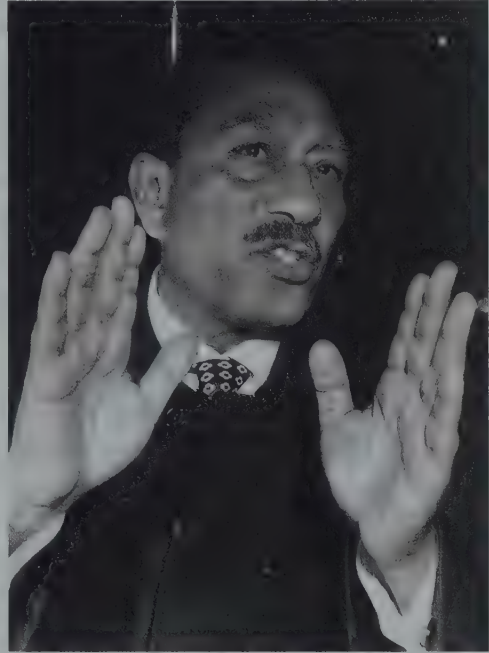
Here is the thesis: Rebellion must have an unassailable base, something guarded not merely from attack, but from the fear of it: such a base as the Arab revolt had in the Red Sea ports, the desert, or in the minds of men converted to

its creed. It must have a sophisticated alien enemy, in the form of a disciplined army of occupation too small to fulfil the doctrine of acreage: too few to adjust number to space, in order to dominate the whole area effectively from fortified posts. It must have a friendly population, not actively friendly, but sympathetic to the point of not betraying rebel movements to the enemy. Rebellions can be made by 2% active in a striking force, and 98% passively sympathetic. The few active rebels must have the qualities of speed and endurance, ubiquity and independence of arteries of supply. They must have the technical equipment to destroy or paralyze the enemy's organized communications, for irregular war is fairly Willisen's definition of strategy, "the study of communication," in its extreme degree, of attack where the enemy is not. In 50 words: Granted mobility, security (in the form of denying targets to the enemy), time, and doctrine (the idea to convert every subject to friendliness), victory will rest with the insurgents, for the algebraical factors are in the end decisive, and against them perfections of means and spirit struggle quite in vain.

ANWAR SADAT ON *Egypt and Middle East Peace*

Anwar Sadat was the president of Egypt from 1970 until his assassination by Muslim extremists in 1981. In the year before his death, he had a wide-ranging conversation with Frank Gibney, then the vice-chairman of the Britannica Board of Editors. The result was this article, excerpted below and published under Sadat's name in the 1981 Britannica Book of the Year. In it Sadat comments (often combatively) on the state of international affairs, provides an account of the Yom Kippur War, and makes suggestions about what he thinks must be done in order to improve economic conditions and sustain world peace. In a sidebar, Gibney described Sadat vividly, as a man "gifted with an innate sense of theatre" for whom "almost every conversation is a performance."

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Since the time I was very young, my great interest was in politics. Even as a boy in secondary school in Cairo and on vacation at home, in my own village of Mit Abul-Kum, in the heart of the Nile Delta, I started reading newspapers and books on current affairs and recording what I read. In fact, my hobby was politics. At that time Mussolini was in Italy. I saw his pictures and read about how he would change his facial expressions when he made public addresses, variously taking a pose of strength, or aggression, so that people might look at him and read power and strength in his very features. I was fascinated by this. I stood before the mirror at home and tried to imitate this commanding expression, but for me

the results were very disappointing. All that happened was that the muscles of my face got very tired. It hurt.

Later on, I was reading Machiavelli. I suppose everyone who has any interest in politics has read him and what he says about the art of political maneuvering. It is a classic source of teaching for diplomats and statesmen. Of course, I was fascinated by parts of this book. But when I thought of putting his teaching into practice, I felt that I would only be cheating myself. I felt awkward inside, just the way my face had hurt when I tried to project the soul of the "new Roman Empire" by imitating Mussolini's gestures.

Politics is only one aspect of life. It is just like everything else we do. For the politician, as with the lawyer, the doctor, or the farmer, there are certain ethics which must be upheld, ethics which impose limits on any efforts to make a success or to have influence in this life. To have any real influence one must be true to his inner self—at work, at home, at school, or in the Ministry of Foreign Affairs. When I reach peace with myself, I find that I am strongest. But at those moments when I have not found this inner peace, I am very weak. At those times I try to avoid doing anything until this sense of inner peace returns.

I first felt that inner peace in my village of Mit Abul-Kum, where I still have my living roots, deep in the soil of that Nile community. But I really found this peace in Cell 54, a bare damp room in Cairo Central Prison, where I spent 18 months for revolutionary activity. I was in solitary, where I could not read or write or listen to the radio. Suffering builds up a human being and gives him self-knowledge. It made me know God and his love. Thus I learned in Cell 54 to value that inner success which helps a man to be true to himself.

Democracy is not merely laws and provisions; it is a mode of daily life. Democracy is essentially a matter of ethics, and in a democracy we must stand ready for a daily test of ethics. When we call now for measures to ensure ethical democratic practice, this is not a cunning device to impose ties and restrictions or a relinquishing of democracy. Rather our call comes from a profound and sincere belief that a free society bears the responsibility of protecting itself. I will fight for democracy and ethics whatever position I hold, so that on the day ordained by God I can give an account of my performance with an easy conscience, at peace with myself.

The Role of Faith and Science in Politics

I have often said that the new Egypt, indeed any country, should be a state founded on faith and science. I did not intend this as a slogan whose glitter would attract the masses but as a genuine appeal linked to the roots of democracy and freedom. Science is the emancipation of the human mind to accomplish

good and achieve progress for the sake of man, free of bonds and chains. Faith is a commitment to principles, values, and ethics upheld by religions which before and after the advent of divine religions have unceasingly toiled to liberate human dignity.

Religion was never a bond. God in his glory favoured man by enabling him to think, released his capacities and created him in his own image. The U.S. Declaration of Independence, which followed the British Bill of Rights, states that the natural rights of man bestowed on him by God are the rights to life, to freedom, and to the pursuit of happiness. Hence, freedom is a natural right, but its practice depends on the consent and agreement of the community. Otherwise chaos prevails.

Let me illustrate this point about faith. I have been asked about it many times. I remember a reporter in London in 1975, who questioned most intently on this. Go back for a moment to 1972 and the early part of 1973, when everyone in the world thought that the Arabs were of low significance, either militarily or politically or in any other way. The fabulous victory of Israel in 1967 and the dimensions of the Arab defeat had confirmed that impression. At that time in Egypt I was planning the October war against Israel. I had turned to war only after my peace initiative had failed. That was in February 1971, when I offered to conclude a peace treaty with Israel. After that there was no alternative to war. Sometimes one has to swallow a bitter pill so that he may regain his health. After my 1971 initiative failed, it was clear to me that Egypt was a hopeless case unless we proved that we were fit to live, that we could fight, that we were not a dead body.

In October 1973 Henry Kissinger was in the State Department [as U.S. secretary of state]. Henry told me later that he had called Abba Eban, the foreign minister of Israel, who was roving about the United States collecting money. Kissinger at that time was the diplomatic star of the whole world. He had realized détente between the two superpowers, he had made the first of his mysterious voyages to China. Now he wanted to do something in the Middle East. So he called Eban and said, "Why don't you be generous? You are the victorious side. Why don't you take some initiatives on your side to get peace?" That was on Thursday, the fourth of October.

Eban answered him: "Why don't you recognize the fact that you know nothing about the Arabs. We know everything about the Arabs. Ours is the only way to teach them and deal with them—let me tell you that. Why should we make peace now, when the Arabs will not be important for 50 years."

Forty-eight hours later the war started. When Kissinger woke Nixon to tell him, they both believed that the Israelis would crush our bones. Most of the world believed it. Most of the Arabs believed it. Of course the Israelis believed it. So

when they telephoned Kissinger after war broke out, they told him: "It's only a matter of 48 hours." Two days later they talked to Kissinger again and told him: "Give us another 48 hours. We need time because it was Yom Kippur and we didn't completely mobilize, but we don't need any armaments or munitions."

Another 48 hours passed. Then it was Moshe Dayan who called Kissinger on the telephone. He said, "S.O.S. Please, Mr. Kissinger, send us 400 tanks." Kissinger called Golda Meir to confirm this and she said, "Yes, it was a decision by the Cabinet."

Remember that scenario. They had lost 400 tanks on the Egyptian front and one-third of their Air Force. And do you know what Kissinger told me he said? "Mrs. Meir," he told her, "we shall send you the 400 tanks. But whatever happens after that, you have lost the war. Be prepared for that." And this was at a time when everyone in the world was convinced that any Arab force starting a war would be crushed. I answer by recalling the reporter's question in London about faith and science. For my actions in 1973 came from a conviction given me by faith. I knew at the beginning what the computers would tell me, if I relied on science only. If I were to feed the computers with the information on the balance of power between us, the characteristics of the Israeli armament and the characteristics of our armament, the computer would tell me: "Don't even think of starting any action against Israel or you will be crushed." I knew that, but I took my decision because I had faith in our course of action. The computer alone would have advised me either to stalemate or commit suicide. But I knew both the limits and the possibilities of what God gives us in our life. So I took this action. I took it out of my inner conviction that it was the only thing to do. And before taking this course I discussed it with all our commanders—not just the chief of staff but all of them, including many low-ranking officers, so they would know what was to happen. For we had a problem there. Not only did the lower commanders not know what was about to happen, but they all had a complex about the Israelis, rather like the complex about Vietnam in America. And this complex I had to attack.

Peace and Self-determination in the Middle East

The October war of 1973 was for us in Egypt a historic transformation—from despair to hope, from complete lack of self-confidence to the regaining of that confidence. After the cease-fire we initiated an ambitious program of building and reconstruction despite the economic crises which beset us. Our economy at that time was below zero because of the burdens and responsibilities of constant military preparation. Despite these obstacles we succeeded in restoring our economic path from total isolation to an open-door policy.

And since that time we have worked wholeheartedly for peace. My peace initiative when I visited Jerusalem in 1977 was not a television show or an offer of surrender, as some adolescents in the Arab world alleged. It was a unique and historic event that challenged in one confident plunge a fearful block of spite, bitterness, and bad feelings which had piled up and multiplied over a period of 30 years. Let that October war be the last of the wars.

Without that initiative the Camp David summit would never have materialized. And without the persistence and wisdom of President Carter we would never have found a path leading to a real and lasting peace.

Yet other Arabs came out with statements saying: "Alas, the Camp David agreements have not restored Jerusalem to us nor have they established a Palestinian state." They attacked the agreements and tried to boycott us.

To them I say: Should not the people concerned sit down to talk at issue with someone, do you just let it go—or do you sit down and discuss it with the side concerned? Regrettably many of our Arab brothers can never face up to responsibility. They weep over Arab solidarity, but Moscow Radio draws up their slogans for them. Their uncompromising position is a splendid thing for Israel's hawks.

Ninety percent of the Israeli people are for peace. I told the Israeli people when I visited there that the exercise by the Palestinians of their right to self-determination poses no threat to Israel or its security. Indeed it is the only sure way to peaceful and harmonious coexistence. By contrast, the policy of building Israeli settlements in Arab-occupied territories is a serious obstacle to peace. It is unfounded, ill-conceived, and illegal. In the Egyptian-Israeli peace treaty we set a model for security arrangements that protect the legitimate interests of all parties concerned. Such measures are applicable to other fronts as well.

Here, in fact, was a radical difference between Menachem Begin [prime minister of Israel] and myself. Begin believed that signing a peace agreement concluded the whole affair. I replied that this was only the premise of the arduous stage of entrenching and assuring peace.

We do not accept Israeli sovereignty over Arab Jerusalem. When I spoke to the Knesset in the heart of Israel in 1977, I said that Arab Jerusalem must become Arab again. Eight hundred million Muslims do not accept Israeli sovereignty over Arab Jerusalem. This is a fact. Yet to those dwarfs who criticize us in Arab countries, I say again: I will continue to sit down with the Israelis and talk to these issues and work to reduce our disagreements, in the interests of peace.

There are those, like the insane Khomeini in Iran, who want to say that Islam is opposed to peace. Is Islam against peace, when the very greetings exchanged among Muslims are those of peace? God Almighty is Faith and omnipotent Peace. Life hereafter is peace. Believers should choose peace. This is Islam. This is the faith of our Egyptian people.

Toward a Land Mine-Free World

By Jody Williams

As those in the movement to ban antipersonnel land mines celebrated the 20th anniversary of the Mine Ban Treaty of 1997, we recognized the fact that the accomplishments fueled by this “people’s movement”—the International Campaign to Ban Landmines (ICBL)—were still a “success in progress.”

When we consider the events of 1997, we are humbled by having kick-started an unprecedented diplomatic process, which required courage and vision and the political will to put human lives first in making the decision to eliminate a conventional weapon that had been used by many fighting forces around the world for decades. This process led to the Mine Ban Treaty’s negotiation in Oslo in September 1997 and then to its signing by 122 countries in Ottawa in December 1997. Just a few days after the signing, the ICBL and I, as the ICBL’s then coordinator, were awarded the Nobel Peace Prize for promoting and achieving the treaty.

Accomplishments Since 1997

In these 20 years, there have been undeniable advances. Today 162 states—more than three-quarters of the world’s countries—are party to the Mine Ban Treaty. There has been virtually no trade in these indiscriminate weapons since the mid-1990s. The number of producing states has dropped from 54 to 11, and not all of those are actively producing mines today. Only the state of Burma has consistently used land mines during these 20 years.

The signatory states (states parties) collectively have destroyed more than 50 million antipersonnel mines. Ninety states parties have completed destruction, and another 65 have never possessed mines. This “preventative mine action” ensures that these weapons will never take a life or a limb. States have also been working to demine and return to productive use large

tracts of land, educate mine-affected communities about the dangers of land mines, and provide support to and protect the rights of land-mine victims. Mine action activities are ongoing in dozens of countries while 26 states parties have completed the clearance of all mined areas on their territory under the Mine Ban Treaty.

None of this would have occurred without a powerful, comprehensive treaty guiding the way. On the other hand, the success of the treaty was by no means assured. In the land-mine movement, most of us believe that the near universal implementation and compliance with the treaty would not have been achieved without the continued commitment and activity of the ICBL. At the same time, states parties have the responsibility to ensure other states parties’ compliance with treaty provisions and to set up the appropriate mechanisms to this end, including the operationalization of Article 8 on compliance—which they have been actively reluctant to do.

The Challenges Ahead

Two of the biggest challenges facing the mine ban community in the next 10 years are meeting the treaty obligation of mine clearance and, harder still, addressing the lifelong needs of land-mine survivors. Land mines remain in more than 60 countries and territories. Several states parties to the treaty are not on course to fulfill their obligation to clear all mines from all known mined areas “as soon as possible” and no later than 10 years after joining the treaty. While they can seek deadline extensions to continue the clearance, such extensions must not be a shield for states that do not make the best possible effort to meet their obligations.

The international community has been much more willing to contribute to mine action than to survivor assistance, perhaps

because the destruction of a land mine is an immediate and lasting “success.” The needs of survivors, on the other hand, are complex and lifelong; wheelchairs or prosthetic devices alone will not solve their problems, and it is not simple to declare success. There are wonderful individuals helping land-mine victims, such as Australian Chris Minko, who has worked since 1996 with disability groups in Cambodia; but programs for survivors are inadequate in most of the countries which still record new mine casualties. Clearly, more resources must be devoted to the survivors, yet the funding for global mine action will also need to increase if states are to complete mine clearance in time.

The ban movement must keep up the pressure on states that remain outside the treaty. Even though many nonsignatories have de facto followed the obligations of the Mine Ban Treaty, being part of it would be the best way to ensure that the world becomes free of land mines. Thirty-five countries remain outside the treaty, including major stockpilers, producers, or users such as Burma, China, India, Pakistan, Russia, and the United States. Signatory the Marshall Islands remains the last country yet to ratify the treaty. While efforts to engage armed nonstate actors have been fruitful, they must be broadened and deepened to ensure that these groups give up the production and use of land mines, including victim-activated improvised explosive devices.

Many challenges remain, and we cannot afford to rest. Although the success of the ban movement and the Mine Ban Treaty have continued to inspire the world, committed political leadership, financial and technical cooperation and assistance, and full and timely compliance with the treaty are crucial to ensure that the Mine Ban Treaty can truly make a difference in the lives of all individuals and communities affected by mines. We’ve come a long way to-

Gemunu Amarasinghe/AP Images



A land mine victim walking past a sign that warns of other mines in the war-ravaged town of Chavakachcheri, in northern Sri Lanka, July 4, 2004.

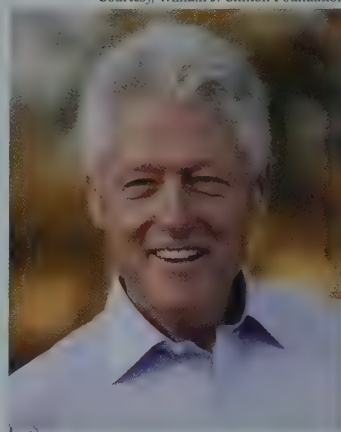
ward achieving our goals, but there is still a long way to go.

*Jody Williams is an American activist who helped found the International Campaign to Ban Landmines (ICBL). In 1997 she and the campaign were named co-recipients of the Nobel Prize for Peace. Williams lectures widely on the dangers of land mines and is the author or coauthor of *After the Guns Fall Silent: The Enduring Legacy of Landmines* (1995), *Banning Landmines: Disarmament, Citizen Diplomacy, and Human Security* (2008), and *My Name Is Jody Williams: A Vermont Girl's Winding Path to the Nobel Peace Prize* (2013). Williams was named one of the 100 most powerful women in the world by *Forbes* magazine in 2004.*

BILL CLINTON ON *The Dayton Accords*

Bill Clinton (U.S. president from 1993 to 2001) considered the 1995 Dayton Accords—which ended the war in Bosnia that had killed more than 100,000 people, displaced millions, involved the first incident of European genocide since World War II, and occasioned NATO's first-ever use of force—one of the crowning achievements of his presidency. Not surprisingly, that was the topic he wanted to address for Britannica. His article follows.

Courtesy, William J. Clinton Foundation



Dayton Accords, the peace agreement reached on Nov. 21, 1995, by the presidents of Bosnia, Croatia, and Serbia, ended the war in Bosnia and outlined a General Framework Agreement for Peace in Bosnia and Herzegovina. It preserved Bosnia as a single state made up of two parts, the Bosniak-Croat federation and the Bosnian Serb Republic, with Sarajevo remaining as the undivided capital city.

The agreement is known as the Dayton Accords because the negotiations took place at the Wright-Patterson Air Force Base outside Dayton, Ohio. The process was led by Richard Holbrooke, who was the chief U.S. peace negotiator, and Secretary of State Warren Christopher.

The Outbreak of War

War broke out in the former Yugoslavia in the early 1990s following the dissolution of the Yugoslav federation, comprising Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia, and Slovenia. After Croatia and Bosnia and Herzegovina declared their independence from Yugoslavia, ethnic Serbs, who opposed the breakup of Serb-dominated Yugoslavia, launched armed struggles to carve out separate Serb-controlled territories in both areas. Around the same time,

Croats and Bosniaks (Bosnian Muslims) also began fighting each other, largely over territory.

The Serb separatists were given military support by Slobodan Milošević, leader of the Republic of Serbia, as they systematically attacked other ethnic communities and subjected civilians to murder, rape, and imprisonment in camps reminiscent of the concentration camps used by the Nazis during the Holocaust.

The war in Croatia lasted until January 1992, when an unconditional cease-fire established an uneasy peace between the Croatian government and ethnic Serbs. The war between Croats and Bosniaks halted with the signing of the Washington agreement in March 1994, establishing an uncomfortable alliance known as the Bosniak-Croat federation. Meanwhile, fighting between Croat-Bosniak forces and the Serbs continued, despite international efforts to establish a lasting cease-fire, including a no-fly zone, a fire-free zone around Sarajevo, and humanitarian operations. In February 1994, in NATO's first-ever use of force, NATO fighters shot down four Serb aircraft that were violating the no-fly zone. Later, in May 1995, NATO conducted air strikes on the Serb stronghold of Pale.

In the summer of 1995, the tide began to turn against the Serbs, as Bosniak and Croat forces recaptured some of the Serb-held territory in Bosnia through a large-scale military operation code-named Operation Storm, the largest European land offensive since World War II. I had authorized a private company to use retired U.S. military personnel to improve and train the Croatian army. Croatian forces took Krajina with little resistance. It was the first defeat for the Serbs in four years, and it changed both the balance of power on the ground and the psychology of all the parties.

The Road Toward Peace

In an effort to capitalize on the shift in momentum, I sent National Security Adviser Anthony Lake and Undersecretary of State Peter Tarnoff to Europe to present a framework for peace. The United States also made a key shift in policy to conduct air strikes against the Serbs if they continued to threaten the Bosnian safe areas or refused to negotiate a settlement.

In late August 1995, following an attack by Bosnian Serbs in Sarajevo, NATO conducted air strikes on Serb positions. On September 1 Holbrooke announced that all the parties would meet in Geneva for talks. When the Bosnian Serbs did not comply with all of NATO's conditions, NATO air strikes resumed. On September 14, Holbrooke succeeded in getting an agreement signed by Radovan Karadžić and Ratko Mladić, leaders of the Bosnian Serbs, to end the siege of Sarajevo, laying the framework for final peace talks set to begin in Dayton, Ohio.

On Nov. 1, 1995, the conference began. Bosnian President Alija Izetbegović, Serbian President Milošević, Croatian President Franjo Tudjman, and representatives from the United States, the United Kingdom, France, Germany, Italy, Russia, and the European Union (EU) met at the Wright-Patterson Air Force Base on the outskirts of Dayton, Ohio, a site chosen to reduce the ability of participants to negotiate via the media rather than the bargaining table. The peace conference was led by Holbrooke and cochaired by EU Special Representative Carl Bildt and First Deputy Foreign Minister of Russia Igor Ivanov.

Twenty-one days later, the talks concluded and the General Framework Agreement for Peace in Bosnia and Herzegovina was initialed by Izetbegović for the Republic of Bosnia and Herzegovina, Tudjman for the Republic of Croatia, and Milošević for the Federal Republic of Yugoslavia.

The Bosnian peace plan was hard-won, but it would bring an end to four bloody years that claimed more than 250,000 lives and caused more than two million people to flee their homes. The final agreement was a tribute to the skills of Holbrooke and his negotiating team; to Secretary of State Christopher, who at critical points was decisive in keeping the Bosnians on board and in closing the deal;

Slobodan Milošević (third from left), Alija Izetbegović (fourth from left), and Franjo Tudjman (sixth from left) initialing the Dayton Accords at Wright-Patterson Air Force Base, outside Dayton, Ohio, November 21, 1995.



Staff Sgt. Brian Schlumbohm/U.S. Air Force

to Anthony Lake, who helped to sell the peace initiative to the parties involved and who, with Holbrooke, pushed for the final talks to be held in the United States; to Deputy National Security Adviser Samuel Berger, who chaired the deputies' committee meetings, which kept people in the national security operations of other nations informed of what was going on without allowing too much interference; and to UN Ambassador Madeleine Albright, who effectively advocated the United States' strong position in the world body.

For the peace agreement to work, it had to be implemented. That required the support of other countries. Six days after the agreement was initialed, I presented the case for U.S. involvement in Bosnia to the American people. Speaking from the Oval Office, I said that U.S. diplomacy had produced the Dayton Accords and that U.S. troops had been requested to help the parties implement the peace plan. I said peace in the Balkans was in America's interest and assured the American people that, since 25 other nations had already agreed to participate in a force of 60,000, only a third of the troops would be Americans.

The General Framework Agreement, including 11 annexes, was signed formally in Paris on December 14. . . . The agreement called for Bosnia and Herzegovina, Croatia, and the Federal Republic of Yugoslavia to agree to fully respect the sovereign equality of one another and to settle disputes by peaceful means. In addition, the parties agreed to fully respect human rights and the rights of refugees and displaced persons. Lastly, the parties agreed to cooperate fully with all entities, including those authorized by the United Nations Security Council, in implementing the peace settlement and investigating and prosecuting war crimes and other violations of international humanitarian law.

Peace has endured since the signing of the Dayton Accords. Annex 4 of the General Framework Agreement still stands as the constitution for Bosnia and Herzegovina and continues to be the basis for the present political divisions of Bosnia and Herzegovina and its structure of government. The agreement also laid the groundwork for NATO military action in Kosovo in 1999, which has since led to the province's independence. Serb leader Milošević was arrested for war crimes and died in 2006 of natural causes during his trial.

SPC Kyle Davis/U.S. Department of Defense



Pres. Bill Clinton visiting U.S. troops at Tuzla Air Base in Bosnia and Herzegovina, 1996.

DESMOND TUTU ON *The Truth and Reconciliation Commission*

Desmond Tutu received the Nobel Prize for Peace in 1984 for his role in the opposition to apartheid in South Africa. He became Johannesburg's first black Anglican bishop in 1985, and he retired as archbishop of Cape Town in 1996, whereupon he became archbishop emeritus. In 2010 he effectively withdrew from public life and continued his work with the Elders, a group of international leaders he co-founded in 2007 for the promotion of conflict resolution and problem solving throughout the world. His topic for Britannica was the Truth and Reconciliation Commission, which South African Pres. Nelson Mandela assigned Tutu to lead in 1995 to investigate the depth of human rights abuses during the country's period of apartheid.



The Truth and Reconciliation Commission (TRC) was a courtlike body established by the new South African government in 1995 to help heal the country and bring about a reconciliation of its people by uncovering the truth about human rights violations that had occurred during the period of apartheid. Its emphasis was on gathering evidence and uncovering information—from both victims and perpetrators—and not on prosecuting individuals for past crimes, which is how the commission mainly differed from the Nürnberg trials that prosecuted Nazis after World War II. The commission released the first five volumes of its final report on Oct. 29, 1998, and the remaining two volumes of the report on March 21, 2003.

Background

The unbanning of the liberation movements and opposition political parties in 1990 by Pres. F.W. de Klerk, the release from prison of Nelson Mandela, and the lifting of the state of emergency in South Africa paved the way for a negotiated peace settlement between the apartheid regime and those who fought against it and brought an end to the struggle against colonialism and apartheid that had lasted in South Africa for more than 300 years. The negotiations resulted in the establishment of a date for the country's first democratic elections and for an interim constitution to be enacted. A major obstacle to finalizing the interim constitution was the question of accountability for those guilty of gross human rights violations during the years of apartheid. It became clear during the negotiations that the political right and many in the security forces were not loyal to President de Klerk and posed a major threat to stability in the country. They demanded that President de Klerk issue them a blanket amnesty for past actions. The dominant view among the liberation movements at the time, however, was that there should be accountability for past crimes, along the lines of the Nürnberg trials.

Those negotiating for the apartheid regime insisted that a guarantee of general amnesty be written into the interim constitution. Without it, it is unlikely that the apartheid government would have given up power. The strength of the amnesty deal was that it was part of a package of initiatives contained in the interim constitution that set the country on the road to becoming a democratic, constitutional state. This included a strong and justiciable bill of rights. The terms of the amnesty were to be decided on by the country's first democratically elected government once elected in 1994.

Establishment and Mandate of the Commission

The Truth and Reconciliation Commission (TRC) was born of a spirit of public participation, as the new government solicited the opinions of South Africans and the international community regarding the issue of granting amnesty as well as the issue of accountability in respect to past violations and reparations for victims. Civil society, including human rights lawyers, the religious community, and victims, formed a coalition of more than 50 organizations that participated in a public dialogue on the merits of a truth commission. This consultative process lasted a year and culminated in the legislation, the Promotion of National Unity and Reconciliation Act 34 of 1995 (the Act), that established the TRC.

The Act provided for the establishment of a TRC made up of 17 commissioners. The commission was tasked with investigating human rights abuses committed



Black protesters at the whites-only Addington Beach in Durban, South Africa, September 1989.

from 1960 to 1994, including the circumstances, factors, and context of such violations; allowing victims the opportunity to tell their story; granting amnesty; constructing an impartial historical record of the past; and drafting a reparations policy. Finally, the TRC would compile a final report, providing comprehensive accounts of the activities and findings of the commission together with recommendations of measures to prevent future violations of human rights.

In order to achieve these objectives, the Act established three committees: the Human Rights Violations Committee, the Reparations and Rehabilitation Committee, and the Amnesty Committee. The commissioners were selected through an open countrywide nomination process and publicly interviewed by an independent selection panel comprising representatives of all the political parties, civil society, and the religious bodies in the country. Nelson Mandela, then president of South Africa, appointed this author as the chair of the commission and Alex Boraine as the deputy chair.

The primary focus of the commission was on victims. It received more than 22,000 statements from victims and held public hearings at which victims gave testimony about gross violations of human rights, defined in the Act as torture, killings, disappearances and abductions, and severe ill treatment suffered at the hands of the apartheid state. Those who had suffered violations at the hands of the liberation movements—by members and leaders of such groups as the African National Congress, the Inkatha Freedom Party, and the Pan-Africanist Congress—also appeared before the commission. The commission received more than 7,000

amnesty applications, held more than 2,500 amnesty hearings, and granted 1,500 amnesties for thousands of crimes committed during the apartheid years.

An important feature of the TRC was its openness and transparency. The public hearings held by the TRC ensured that South Africans became aware of the atrocities that had been committed during the apartheid years.

Challenges and Limitations

The TRC was confronted by a number of challenges, as it was not accepted by all parties to the conflict. The top echelons of the military did not cooperate with the commission. It was mainly the foot soldiers in the security forces and those who were already imprisoned or were facing charges who applied for amnesty. Senior politicians in the former government and senior leaders in the security forces did not apply. In the case of the liberation movements, the members argued that as they had conducted a “just war,” they were not required to apply for amnesty because their actions did not constitute gross violations of human rights. It took considerable effort to persuade them to participate in the amnesty process.

A key weakness of the commission was that it did not focus sufficiently on the policies or political economy of apartheid. The failure to examine the effect and impact of apartheid’s policies resulted in the need for the perpetrators, or the “trigger-pullers,” to bear the collective shame of the nation and let those who benefited from apartheid to escape responsibility. The link between racialized power and racialized privilege became obscured.

The legacy of the commission was also compromised as the post-Mandela government was slow to implement the TRC’s recommendations, including the reparations program. By the end of the first decade of the 21st century, few of the commission’s recommendations had been implemented, and there had been few prosecutions of individuals who failed to apply for amnesty or who were refused amnesty by the TRC. Furthermore, a number of high-ranking officials from the security forces, including former minister of law and order Adriaan Vlok, were given suspended sentences through a plea-bargain process under new prosecutorial guidelines ostensibly meant to facilitate prosecutions. The failure to prosecute disillusioned many victims and encouraged the view that the government had strengthened impunity and that the beneficiaries of apartheid had escaped accountability for their actions.

Assessment

Despite these challenges and limitations, the TRC was internationally regarded as successful and showed the importance of public participation in such processes,

including the initial decision-making process leading up to the establishment of a truth commission. The hearings of the TRC attracted global attention, as it was the first commission to hold public hearings in which both victims and perpetrators were heard. While amnesties are generally considered inconsistent with international law, the South African TRC provided some basis for considering conditional amnesties as a useful compromise, particularly if they help to secure perpetrator confessions.

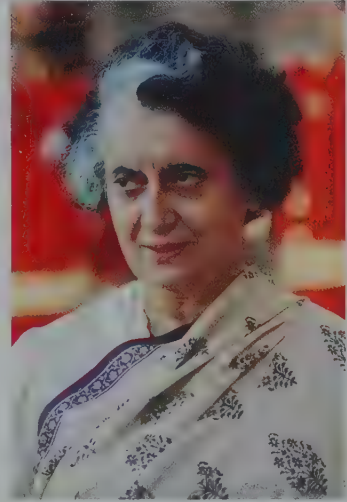
The South African TRC represented a major departure from the approach taken at the Nürnberg trials. It was hailed as an innovative model for building peace and justice and for holding accountable those guilty of human rights violations. At the same time, it laid the foundation for building reconciliation among all South Africans. Many other countries dealing with postconflict issues have instituted similar methodologies for such commissions, although not always with the same mandate. The South African TRC has provided the world with another tool in the struggle against impunity and the search for justice and peace.

INDIRA GANDHI ON

Global Understanding

Renowned and feared for her political ruthlessness, Indira Gandhi began the first of her four terms as prime minister of India (1966–77, 1980–84) two years after the death of her father, Jawaharlal Nehru, India's first prime minister. She left behind a mixed legacy after her assassination in 1984. In addition to sanctioning a mass-sterilization campaign, Gandhi ruled by decree between 1975 and 1977, a time when the government suspended civil liberties, censored the press, and arrested dissenters. Nonetheless, she is remembered as the leader that spearheaded social reform and industrial development in India, setting the nation on a path toward global prominence and willing it toward a truly postcolonial future. In her essay "A World Without Want," published in the 1975 edition of the Britannica Book of the Year, she cast a critical eye on the closely related issues of poverty and globalization from the perspective of developing nations.

Tim Graham—robertharding/age fotostock



Two-thirds of the world's peoples are underprivileged, and this despite such breathtaking achievements of science as space travel, instant communication, and the unraveling of the very building blocks of life. Technology has given us the knowledge to supplement or to substitute what has been provided in nature. Yet many hundreds of millions remain undernourished and are denied the minimum clothing, shelter, medical care, and education.

Why does this paradox exist? Natural resources are unevenly distributed, and some countries have acquired tremendous economic power because of their advanced technology. Individual and national self-centredness is to the fore, and there is no feeling of collective responsibility. The world is still at the stage of economic nationalism.

I belong to a generation that spent its childhood and youth (the so-called years of careless rapture!) fighting every inch of the way for our basic human rights as citizens of an ancient and honourable land. It was a hard life, of sacrifice and insecurity, of anger and impatience. Yet the hope in our eyes and our hearts never dimmed, for we were beckoned by the star of freedom, by the bright promise of a world without want and exploitation. Can it be only 27 years ago? Science, the key to the new world for which we longed, has not been allowed to serve those whose need is greatest but has been made to pander to the desire for profits and to narrow national objectives. Far from having provided more, today we face a world beset by dire forecasts of global food inadequacies, where even the richest countries are experiencing shortages of one article or other.

Many countries that are labeled as developing are the very lands where civilization began. Poor today, though rich in their contribution to the story of man, Iraq, Egypt, India, Iran, and China were among the early cradles of intellect and endeavour. Here man first became farmer, plant breeder, and metallurgist. Here he fathomed the mysteries of mathematics and medicine, the movement of stars in the sky and of thoughts in his own mind. The first seers in India arose from among farmers, singing praise of the earth, water, and the sun and celebrating the energy of growing things. From the sun comes rain, they said, and from rain food, and from food all living beings.

Until two hundred years ago, India was regarded as the world's most prosperous country, a magnet for traders, seafarers, and military adventurers. The wealth of Akbar the Mughal is computed at several score times that of the Holy Roman emperor Charles V or Louis XIV of France. Yet in his reign—as in those of the others—the common people lived in poverty. The multitude starved, while nobles lived in splendour. Even in those times there were large irrigation works in countries like China and India, but famines were not unusual. Among countries as within countries, there have always been rich and poor. Military power and looting led to the impoverishment of the vanquished and the enrichment of the victor.

Until the modern idea arose of social engineering for equality, only small and compact societies could avoid unseemly disparities. In earlier times, the larger the extent and efficiency of government, the wider the gap between a small number of rich and the masses of the poor. The Industrial Revolution and the rise of colonialism sharpened international disparities. Even the difference in the life span of people in Western Europe and South Asia is the sequel of Europe's earlier lead in science, for until the beginning of the 19th century, mortality rates were roughly the same in all countries. But the present affluence of the advanced countries is due as much to colonial exploitation as to their mastery over science and modern technology.

The pace of a country's technological advance depends upon the stock of technology it has already accumulated. Any survey of elementary human needs and the means to fulfill them brings out the incongruous coexistence of overabundance and deprivation. In Western Europe and North America, people's chief worry is to restrict their intake of calories, for their average consumption is 22% higher than the energy requirements of the body. Elsewhere, entire nations suffer from malnutrition. For us in India, scarcity is only a missed monsoon away. . . .

Whether one thinks in terms of geography, historical perspective, or cultural patterns, it seems as though Europe and North America have long regarded their two continents as the hub of the world. Formerly, as far as they were concerned, Africa and Asia existed to be used for their purposes—and indeed this was the case for many long years. Colonialism has gone, but their attitude of self-importance continues. Interest is taken in our development, but the criteria they use to assess our progress are those of contemporary trends in the affluent countries; their angle of vision is still based on their interest and global strategy. They ignore the relevance of climate, of geographical compulsion and the forces of history, of centuries of national experience and civilization.

When foreigners visit India, they profess shock at our poverty. They have no idea of the stupendous effort required for a nation of 560 million (with such wide diversity and such different levels of development among regions) just to survive in this fast-changing and highly competitive world—to say nothing of traveling from one age to another as we are trying to do. The living conditions of the people of India and other developing countries should be compared not with conditions in the rich countries but with the state of affairs prevailing at the time of our liberation from colonial rule.

It is easy for rich nations to forget that they too had poverty not so long ago and that pockets of poverty still exist in the heart of their plenty and extravagance. I write this with no thought of complaint or accusation, for I am only too conscious of the fact that a similar situation exists in my own country—and perhaps in other developing countries as well—between town and village. Those who live in cities tend to think that they are India and that the rural areas, where the vast majority of our people live, are on the periphery.

The pattern of growth that we have copied from the advanced countries itself generates dissatisfaction. And disquiet is most marked in those sections whose expectations are the highest, such as the urban, educated middle classes and skilled workers in the more sophisticated industries. In a way, the outlook of such groups is similar to that of the people of rich countries: a feeling that they alone matter and a disinterestedness in the welfare of the huge numbers who live in villages. Unless the minds of people are remolded, infused with comprehension of and compassion for the suffering of the many, progress itself will be unreal.

In the Western world, the political revolution followed the economic revolution, but here they are taking place simultaneously. When a giant heaves itself awake after centuries of sleep, much dust will be raised. When a country is aroused after generations of apathy, many types of evil will come to the surface. Today, our countries are in ferment. We must try to understand the primary forces behind the changes that are shaking our societies, instead of finding fault with the efforts governments are making to solve age-old problems, made vastly more complex by the new problems of growth and by the interaction of global crosscurrents.

I have written mostly about India, for that is where my own experience lies. By and large, similar situations exist in other developing countries although, because of India's greater size and population, every problem here assumes gigantic proportions. Developing countries do need assistance at various levels and in varying degrees, but equally they need deeper understanding of their aspirations and difficulties.

JIMMY CARTER ON

The Camp David Accords

Like Bill Clinton and his contribution to Britannica, Jimmy Carter (U.S. president from 1977 to 1981) wrote on a foreign policy achievement he considered most dear to his presidency: the Camp David Accords of 1978. Most intriguing is how President Carter gleaned insight into the character and respective flexibility of his distinguished guests—Pres. Anwar Sadat of Egypt and Prime Minister Menachem Begin of Israel—from (1) how they dressed for the retreat and negotiations at Camp David and (2) a seemingly innocuous incident involving Sadat and Begin approaching the door to a cabin at exactly the same time. Who would walk through the doorway first? Which one would defer to the other—president or prime minister? President Carter provided the answers in his Britannica article below.

Jimmy Carter Library



The Camp David Accords were the agreements between Israel and Egypt signed on September 17, 1978, that led in the following year to a peace treaty between those two countries, the first such treaty between Israel and any of its Arab neighbours. Brokered by U.S. Pres. Jimmy Carter [this author] between Israeli Prime Minister Menachem Begin and Egyptian Pres. Anwar el-Sādāt and officially titled the “Framework for Peace in the Middle East,” the agreements became known as the Camp David Accords because the negotiations took place at the U.S. presidential retreat at Camp David, Maryland. Sādāt and Begin were awarded the Nobel Prize for Peace in 1978 for their contributions to the agreements.

Background

The United Nations (UN) voted in 1947 to partition Great Britain’s Palestine mandate—to be established were a Jewish state, an Arab state, and an independent

Jerusalem under a UN trusteeship. Arabs opposed partition. When the mandate ended on May 15, 1948, and Israel proclaimed its independence, the first Arab-Israeli war erupted. No separate state for Arab Palestinians (i.e., Palestinians) was established. Egypt took control of the Gaza Strip along the Mediterranean Sea, and Jordan assumed sovereignty over the territory between Israel's eastern border and the Jordan River (the West Bank), including East Jerusalem. During the Six-Day War of June 1967, Israel occupied those territories as well as the Golan Heights—a patch of Syrian land on Israel's northeastern border—and Egypt's Sinai Peninsula. Following his election as U.S. president, Carter committed himself to working toward a comprehensive Middle East peace settlement based on UN Resolution 242 (November 1967), which called for the withdrawal of Israel from the occupied territories, Arab recognition of and peace with Israel (stipulations that the Arab states had refused to agree to), and a just settlement to the problem of Palestinian refugees displaced by the establishment of Israel and the 1967 war.

U.S. Pres. Jimmy Carter joining hands with Egyptian leader Anwar Sadat and Israeli Prime Minister Menachem Begin in celebration of the signing of the Treaty of Peace Between the Arab Republic of Egypt and the State of Israel, March 26, 1979.



Jimmy Carter Presidential Library/MCT/Newscom

Early in his presidency, Carter met with leaders of the Middle East and was especially encouraged by President Sādāt. Sādāt wanted the Israeli-occupied Sinai returned to Egypt, as well as peace for his people and a stronger relationship with the United States. The U.S. president also met with Begin, who had only recently become prime minister, and found him willing to consider the measures that Carter had discussed with Sādāt.

In November 1977 Sādāt initiated direct contacts with Israel and made a dramatic visit to Jerusalem, where he spoke to the Israeli Knesset (parliament). However, a reciprocal visit by Begin was unsuccessful, and no progress was made toward peace. Rosalynn Carter, the U.S. first lady, then suggested to her husband that he invite Sādāt and Begin to Camp David, in rural Maryland, where the relative privacy and seclusion might provide a setting for a breakthrough.

The Summit

The two leaders accepted Carter's invitation, and the summit began on September 5, 1978, and lasted for 13 days. It was extremely unusual for heads of state to engage in a summit meeting at which the outcome was so much in doubt. Not only had Egypt and Israel been at war for decades, but the personality differences of the leaders promised to complicate the dialogue. Begin, always formal in dress and manner, was extremely detail-oriented and careful about the possible ramifications of any agreements. He was pessimistic about what he believed could be achieved at Camp David and insisted that the objective be limited to developing an agenda for future meetings. By contrast, Sādāt wore fashionable sports clothes, was relaxed and forthcoming, and was willing to join in comprehensive negotiations aimed at settling all controversial issues during the few days of the summit.

All three men were accompanied by their leading foreign policy advisers, but Carter preferred that the three men work together in private sessions in a small office at Aspen, his cabin at Camp David. He also insisted that there be no direct press coverage of the meetings, fearing it would have a negative effect on negotiations. A humorous situation arose right before the first meeting, an awkward moment that nonetheless shed light on the personalities involved. After President Carter and the first lady entered the cabin, Begin and Sādāt hesitated over who should follow through the doorway. Both men laughed, and Begin insisted that Sādāt proceed first. As the first lady noted later, "Jimmy said to me that Begin would never go ahead of Sādāt, being perfectly proper according to protocol—president above prime minister."

After three days of negotiations, the heated discussions reached an impasse, and direct discourse between Sādāt and Begin became impossible. Carter then compiled a single document that encompassed a resolution of the major issues,

presented the proposals to each leader in separate meetings, assessed their comments, and redrafted the manuscript some two dozen times, shuttling the manuscript back and forth for their review. (This single document method became a mainstay of Carter's post-presidency work at the Carter Center to resolve international disputes.)

As the days passed, prospects for a settlement at Camp David appeared so bleak that Sādāt threatened to leave, and Carter began planning to return to the White House and suffer the likely political consequences of failure. An agreement was reached on the final day, however, when, at the last minute, Begin agreed to allow the Knesset to decide the fate of the settlements Israelis had established on the Sinai Peninsula (which Sādāt had required dismantled and Begin had sworn not to abandon).

A Framework for Peace

The eventual outcome of these talks, the "Framework for Peace in the Middle East," had three parts: (1) a process for Palestinian self-government in the West Bank and Gaza, (2) a framework for the conclusion of a peace treaty between Egypt and Israel, and (3) a similar framework for peace treaties between Israel and its other neighbours. The prime minister and the Israeli Knesset agreed that a transitional self-governing Palestinian authority was to be elected to replace Israeli political and military forces in the occupied territories.

The peace treaty that Israel and Egypt signed in March 1979 closely reflected President Carter's proposals at Camp David and formally ended the state of war that had existed between the two countries. Israel agreed to withdraw from Sinai, and Egypt promised to establish normal diplomatic relations between the two countries and open the Suez Canal to Israeli ships (which until then had been banned from the waterway). These provisions were duly carried out. However, most Arab countries, rather than following Egypt's lead, ostracized Egypt and expelled it from the Arab League. The Palestine Liberation Organization (PLO), professing to speak for the Palestinian people, also rejected the accords. Nonetheless, the next major advance in Middle East peace negotiations, the Oslo Accords signed by Israel and the PLO in 1993, included provisions with regard to the West Bank and Gaza that were similar to those in the Camp David Accords. These included a transitional period, an elected self-governing Palestinian authority, withdrawal of the Israeli military government and redeployment of Israeli troops, the establishment of a local police force, and a plan to move ahead with negotiations on the final status of the occupied territories.

TED TURNER ON *The UN Foundation*

Throughout his career, media pioneer Ted Turner has received recognition for his entrepreneurial acumen, sharp business skills, leadership qualities, and unsparing philanthropy. Whether in billboard advertisement, cable television, sports team ownership, sailing, environmental initiatives, or philanthropy, Turner's forthrightness has consistently given the world reason to take notice. This was especially true in 1997, when he pledged a staggering \$1 billion to establish the UN Foundation, whose mission he explained in detail in his Britannica article below.

UN Photo



United Nations Foundation, also called UN Foundation, is a public charity created in 1998 to assist the United Nations (UN) and its humanitarian efforts through advocacy, partnerships, community building, and fund-raising. It strives to connect people, ideas, and resources (from governments, businesses, and international philanthropic organizations) and to facilitate collaboration on large-scale global issues. It is headquartered in Washington, D.C., and maintains an office in New York City.

The UN Foundation was created in response to a pledge I made in 1997 of \$1 billion to assist UN programs and activities. Because the UN is unable to accept private donations, the UN Foundation was established to receive the pledge; in turn, the UN Fund for International Partnerships (UNFIP) was created within the UN to coordinate activities between itself and the UN Foundation. The latter was established as a public charity with a governing board, not as a private foundation, and the greater transparency of its governance and operations has helped to ensure a measure of independence for the institution. Board members have included internationally renowned leaders such as Kofi Annan, former secretary-general of the UN; Gro Harlem Brundtland, former prime minister of Norway and



Ted Turner (center), with UN Secretary-General Kofi Annan (right) and John D. Negroponte, representative of the United States to the United Nations, presenting a \$31 million check, part of the \$1 billion he pledged for the formation of the UN Foundation, New York City, September 2001.

former director-general of the World Health Organization (WHO); and Andrew Young, former U.S. ambassador to the UN.

The UN Foundation works closely with the UN secretary-general, though it does not receive any UN funding. It focuses its activities in six main areas: children's health, energy and climate change, women and population, technology, sustainable development, and advocacy on behalf of the UN. Each area is managed by a foundation expert, who solicits partners and support internationally, coordinates resources, and promotes new and existing global initiatives aimed at assisting UN causes.

Children's Health

The objective of the UN Foundation in this area is to help the UN reduce childhood mortality, strengthen public health systems (especially in the developing world), and eliminate or prevent infectious diseases. The foundation has been an active participant in partnerships with the American Red Cross, the U.S. Centers for Disease Control and Prevention, UNICEF (the United Nations Children's Fund), and the World Health Organization (WHO) to eliminate polio worldwide (the Global

Polio Eradication Initiative, launched in 1988) and to reduce childhood deaths from measles (the Measles Initiative, launched in 2001). In the first decade of its existence, the Measles Initiative helped to immunize some 700 million children against the disease. The foundation's Nothing But Nets campaign has distributed throughout Africa millions of Long-Lasting Insecticide Treated Nets (LLITNs), which are arguably the most cost-effective method of preventing malaria. The foundation also works to raise awareness of the importance of childhood immunizations.

Energy and Climate Change

The UN Foundation works with national governments, the UN, nongovernmental organizations (NGOs), and private-sector institutions to develop and implement clean, renewable alternatives to fossil fuels—such as solar energy, wind power, and biofuels. In addition, the foundation provides financial and strategic support to the Energy Future Coalition, an initiative that unites businesses, labour organizations, and environmental groups in a search for broad-based nonpartisan strategies to address climate change. The foundation also leads the Global Alliance for Clean Cookstoves, an initiative that supports the large-scale adoption of clean and safe household cooking technology as a way to prevent premature deaths from exposure to smoke, increase standards of living, empower women, and reduce greenhouse-gas emissions. The foundation is a key supporter of programs promoting greater energy efficiency, which it sees as the cheapest, fastest, and smartest way to save energy resources and to decrease greenhouse-gas pollution.

Women and Population

The UN Foundation strives to make education and reproductive health care accessible to all women by 2015. Adolescent girls are a special focus of the foundation, which works with the UN and NGOs to protect them from violence and HIV/AIDS and to discourage child marriage and early pregnancy. The foundation's Girl Up campaign gives American girls the opportunity to support UN programs that assist adolescent girls in some of the remotest regions of the world. The foundation highlights the problem of obstetric fistula, a debilitating childbirth injury nearly eliminated in the West in the early 20th century but still prevalent in the developing world.

Technology

In partnership with the Vodafone Foundation and NGOs such as Télécoms Sans Frontières ("Telecoms Without Borders"), the UN Foundation helps to provide emergency communications networks and mobile and satellite technology for UN

disaster-relief missions. The foundation was also a founding member in 2009 of the mHealth (mobile health) Alliance, which funds and helps to train mobile-health workers in countries of sub-Saharan Africa, providing them with technology for capturing vital health data.

Sustainable Development

The UN Foundation promotes sustainable tourism and economic development in communities near World Heritage sites. It was one of the initiating members of the Partnership for Global Sustainable Tourism Criteria, which in 2008 created a set of universal voluntary standards for sustainable-tourism practices.

UN Advocacy

In partnership with the Better World Campaign, the UN Foundation advocates for a strong, fully-funded UN system. The foundation has led numerous campaigns—such as “Don’t Shut Down the UN,” “Price of Peace,” “Don’t Go It Alone,” and “On Day One”—designed to build public support for the UN and its role in solving global and international problems such as climate change, terrorism, nuclear proliferation, and assaults on human rights. In 2010 the foundation announced a strategic alliance with the UN Association of the USA (UNA-USA). The alliance combined more than 100 UNA-USA chapters with the UN Foundation’s various advocacy initiatives to form the largest network of American supporters of the UN.

WILLIAM BLAKEMORE ON

St. John Paul II

Veteran foreign and domestic correspondent Bill Blakemore joined ABC News in 1970. He has covered scores of wars, conflicts, and terrorist attacks including the Black September war in Jordan, the Indo-Pakistani war, the Turkish invasion of Cyprus, two Arab-Israeli wars, the Palestinian intifada, the Iranian Revolution, the Lebanese Civil War, the Persian Gulf War of 1991 and the Iraq War of 2003 (reporting on both from Baghdad), and the ongoing Afghan/Taliban war. On 9/11 he reached Ground Zero before the towers fell. He was also ABC's Rome bureau chief from 1978 to 1984 and traveled on the pope's plane during his 100-plus trips abroad. St. John Paul II was the topic he wrote on for Britannica, and several sections from his long biography follow.

Vatican Photography, courtesy of William Blakemore



In 1986 John Paul invited the leaders of all major religions to Assisi, Italy, for a universal prayer service for world peace. The meeting was scorned by the ultraconservatives of several religions, including his own. The traditionalist archbishop Lefebvre called the pope's action a "scandal" and a betrayal of "the one true faith." Lefebvre also cited it as one of the reasons he consecrated his own bishops (without papal approval) in 1988—the first significant schism in reaction to the reforms of the Second Vatican Council and an act Lefebvre knew would result in his excommunication. Nevertheless, by the mid-1990s John Paul had orchestrated some dramatic acts of interfaith reconciliation, especially with the two other religions that stem from Abraham—Judaism and Islam. He worked to improve relations with these two faiths through frequent meetings that often garnered little public attention. Crucial to John Paul's approach to other religions was his unprecedented campaign to involve Catholics in general apologies for the sins of

Catholics against others throughout history, including those committed during the Crusades and against indigenous peoples, women, suspected heretics, non-Catholic Christians, Muslims, and Jews.

From the start of his pontificate, John Paul cultivated personal contacts with Jewish leaders and continued to assert, as he had in Poland, that the Jews are, for Christians, "our elder brothers in faith." In 1986 he became the first pontiff known to have entered a synagogue, when he embraced the chief rabbi at the Great Synagogue of Rome. In 1990 he declared anti-Semitism a sin against God and humanity, and throughout his papacy he used his influence in efforts to help end nearly 2,000 years of oppression and violence inflicted on Jews by Christians. By the end of 1993 he had pushed the Vatican to recognize the State of Israel, overriding the objections of Vatican officials who worried about the consequences for Christian minorities in Arab countries, and on Holocaust Remembrance Day in 1994 he hosted Jews and Christians at an unprecedented memorial concert inside the Vatican. On the controversial question of Pope Pius XII's policy of neutrality during World War II, John Paul did not criticize his silence but asserted that Pius had acted with deep conscience in a terrible situation. The Vatican document *We Remember: A Reflection on the Shoah* (1998) reviewed various aspects of Catholic anti-Jewish prejudice that contributed to the Holocaust.

A few reconciliation efforts failed. John Paul's canonization of Jewish convert Edith Stein, a nun killed at Auschwitz because she was Jewish, offended many Jews who felt it usurped a Jewish tragedy for Catholic purposes. For them, John Paul only added to this offense by saying her new saint's day should be a Catholic remembrance of the Holocaust's Jewish victims. In March 2000 in Jerusalem, Israeli Prime Minister Ehud Barak welcomed John Paul to Yad Vashem, a memorial to Holocaust victims, with the words "Blessed are you in Israel." Three days later the pope prayed alone at the Western Wall, into which he placed a printed prayer requesting forgiveness and citing a desire for "genuine brotherhood with the People of the Covenant." These gestures were favourably received by most Israelis.

One month earlier, in Cairo, John Paul had become the first head of his church to meet with the Sheikh al-Azhar, one of Sunnī Islam's highest religious authorities. The next year, in May 2001, John Paul became the first pope ever to enter a mosque, the Great Mosque of Damascus (also known as the Umayyad Mosque), where, in the company of Muslim clerics, he prayed at the shrine of St. John the Baptist. From the beginning of his pontificate, he held nearly 50 substantive meetings with Muslim leaders—far more than those of all previous popes combined.

Christian ecumenism. John Paul's highly personalized encyclical *Ut unum sint* (1995; "That They May Be One") reviewed 30 years of ecumenical relations, including his visits—the first by any pope—to Canterbury Cathedral and to

AP Images



Pope John Paul II in St. Peter's Square greeting the crowds during a weekly general audience, September 13, 1979.

Lutheran churches in Germany and Sweden. Its invitation to non-Catholic churches to join John Paul in rethinking the role of the papacy in world Christianity sparked new ecumenical discussions.

Although his hopes of mending the 1,000-year rift with the Eastern Orthodox Church were advanced with his visits to a few nations of the former Soviet Union, the Russian Orthodox Church remained suspicious and did not invite him to visit the country.

Ecclesiastical and Theological Contributions

During his long pontificate, John Paul directed the rewriting of several major church texts. The revisions included the new *Codex Juris Canonici* (1983), the first update of the Code of Canon Law since 1917; *Pastor Bonus* (1988; "Good Shepherd"), the first reform of the Roman Curia since 1967; and the new *Codex Canonum Ecclesiarum Orientalium* (1990; "Code of Canons for the Eastern Churches"). In 1992 he promulgated the new *Catechism of the Catholic Church*, its first revision in more than four centuries.

John Paul admired and encouraged the scientific search for truth but warned against the misuse of science in ways that undermine human dignity. He saw no

basic contradiction between the findings of modern science and biblical accounts of the Creation, stating in a series of brief homilies (published as *Original Unity of Man and Woman*, 1981) that some stories in Genesis, including the story of Adam and Eve, should be understood as inspired metaphor. In 1984 the Vatican declared that the church's condemnation of Galileo in 1633 had been in error; John Paul subsequently stated that Galileo had been "imprudently opposed" by the church. In his encyclical *Fides et ratio* (1998; "Faith and Reason"), he argued for the importance of reason in the development of any meaningful faith. He was also the first pope to link the protection of the natural environment firmly to Catholic theology, declaring in 1999 that destruction of the environment "can be a grave sin" and "a sign of real contempt for man."

Final Years

Beginning in the early 1990s, the once-robust John Paul was increasingly slowed by Parkinson disease and by a series of operations. Nonetheless, he maintained a rigorous schedule, insisting that his visible suffering was part of his ministry. To aides urging him to slow down, he reportedly said simply, "Si crollo, crollo" ("If I collapse, I collapse"). Although he may have considered the possibility of resignation, he remained silent on the subject (few popes had resigned, the last being Gregory XII in 1415). Even in old age he continued to attract enormous crowds; four million were estimated to have joined him at a mass in Manila in 1995, and two million assembled at a Kraków mass in 2002. After 2003, he appeared in public only when seated. By Easter 2005, following a tracheotomy, he was unable to speak to the people he blessed from his apartment window. His funeral in April 2005 drew to Rome millions of pilgrims, as well as a number of the world's former and current political leaders. In May 2005 his successor, Pope Benedict XVI, waiving the usual five-year waiting period, allowed review to begin in the cause of John Paul II for beatification and canonization. In January 2011 the Vatican recognized the recovery of a French nun from Parkinson disease as a miracle performed by John Paul II. He was beatified on May 1 and canonized with Pope John XXIII on April 27, 2014.

Legacy

John Paul II was, in a real sense, the first globally oriented pope. His election coincided with the arrival of routine, worldwide, instantaneous audiovisual communications, and many of his major efforts were intended to adjust—though not to challenge—the essential tenets of Catholicism for an open, interconnected world in which nations and religions must live in daily contact with one another. By

publishing unprecedented papal meditations about other faiths, he demonstrated how a Catholic may approach them with reverence. He also hoped to strengthen Catholicism in many cultures around the world by canonizing far more saints—drawn from a broader geographical and occupational spectrum—than had any of his predecessors.

In 2000 John Paul centralized ecclesiastical and theological control over Catholic educational institutions around the world, prompting renewed criticism from members of the church hierarchy who believed that the Second Vatican Council had called upon the pope to be less of an autocrat and more of a collegial moderator. John Paul also proscribed the teachings of some dissident Catholic theologians. For example, early in his pontificate he censured Hans Küng for arguing that the Catholic church was wrong to invoke papal infallibility. In the 1980s John Paul's uneasiness with liberation theology (which he regarded as too closely allied with Marxism and Soviet communism) prompted him to withdraw bureaucratic and moral support from ecclesial base communities in parts of Latin America, a move that may have contributed to the defection of large numbers of Catholics in the region to Evangelical Protestantism.

Throughout his pontificate John Paul maintained traditional church positions on gender and sexual issues, denouncing abortion, artificial contraception, premarital sex, and—through Vatican teachings—homosexual practices (though not homosexual orientation). He continually rebuffed pleas for priests to be allowed to marry and denied requests from Catholic nuns who wanted a greater role in the church. And, though he often spoke out for full equality for women outside religious vocations, he rejected even any discussion of the ordination of women as priests—a stance that evoked sharp and continuing criticism from some quarters.

Some critics charged that John Paul's autocratic style of governing greatly discouraged American and European bishops from seeking the Vatican's help in responding to accusations, which began in the late 20th century, of sexual abuse of minors by clergy. Even as revelations of the abuse grew into a worldwide scandal, the church did little to confront the problem, allowing it to fester without intervention or punishment. In April 2002 the U.S. cardinals received an unprecedented papal summons to Rome, during which time John Paul declared that there was "no place in the priesthood" for anyone who would abuse children. In June 2002 all American bishops met in Dallas, Texas, to adopt strict new policies for investigating any charges of clergy abuse of minors and removing proven offenders. Ultimately, however, the church's reputation in the United States and Europe was gravely damaged. By 2005 the church in the United States had spent more than \$1 billion in litigation and legal settlements.

John Paul's emphasis on human rights and national and religious freedom suggested to some a theology that was excessively "human-centred" and insufficiently

"Christ-centred." A related criticism was that his political campaigns involved the church too directly in worldly affairs and thereby threatened to obscure its spiritual mission. His defenders argued that his humanistic Catholicism was based upon the person and inspiration of Christ and that his campaigns could be justified by the Catholic belief that it was his duty as the Vicar of Christ to help alleviate the world's suffering. Moreover, they urged, his activism only helped the church by showing that its essential values, advanced with commitment and courage, could improve the world. Other critics claimed that his pontifical writings were often unfocused, but supporters insisted that his encyclicals and other assertions were simply so numerous, varied, and farsighted that it would take years for their impact on Catholicism to be understood.

From the start of his pontificate, John Paul tried to reassert a sense of religious challenge and discipline by making firm declarations about personal morality and the religious life. This effort generally did not reverse a dramatic decline in vocations to the priesthood and sisterhood, nor did it improve church attendance in many Catholic countries. The cardinals who elected him had asked that he end the sense of confusion among many Catholics that seemed to stem from the reforms of the Second Vatican Council, but there was no consensus that he did. Nevertheless, John Paul is generally seen as having increased the global prestige of the papacy and thus to have laid a foundation for possible future revival within the church.

AFTERWORD

250 Years of Impact

Encyclopædia Britannica, as this 250th anniversary volume demonstrates, occupies a special place in the annals of publishing and the history of the West. Although its full influence, like that of any great work of literature, is ultimately immeasurable in concrete terms (the number of units sold is never the best barometer), its larger social and cultural impact—as a reference work, a spark to learning, a symbol of aspiration, a recorder of evolving knowledge, and a mirror of our changing times—has been extraordinary, as the reader will see in the rich array of anecdotal evidence recounted below.

The Whole-Set Club

Reading an entire Britannica print set has been a goal of bibliophiles and self-learners for centuries, and some of the hearty souls who have accomplished this feat are detailed here.

George Bernard Shaw, recipient of the Nobel Prize for Literature in 1925, was particularly fond of Britannica's 24-volume 9th Edition (1875–89). He claimed to have read the entire set during visits to the British Museum, skipping only Britannica's lengthy science articles.

C.S. Forester (1899–1966) is best known for his popular Horatio Hornblower sea-faring novels (1937–67) and for his 1935 story *The African Queen*, the classic 1951 film version of which was directed by John Huston and starred Humphrey Bogart and Katharine Hepburn. But he also enjoys a special seat in the “whole-set club,” one not many readers have ever occupied: he read his set of Britannica *three times*! This may seem like an impossible feat, but Forester was one of those rare birds with a photographic memory who could read 4,000 words per minute. “He read the *Encyclopædia Britannica* for bedside reading,” remembered his son.

World History Archive/Alamy



Movie poster for *The African Queen* (1951), directed by John Huston.

George Forman Goodyear was a prominent man of many talents in Buffalo, New York, whose obituary in 2002 listed “lawyer, chemist, Buffalo television pioneer, school board president, mayoral candidate, cultural leader and philanthropist.” The article also noted his insatiable thirst for knowledge, which led him to read the entire 24-volume set of Britannica’s 14th Edition (1929–73). He began reading his set while a student at Harvard Law School in 1929 and continued reading at a pace of a thousand pages a year, finally finishing his feat 22 years later.

A.J. Jacobs’s journey to read the entire Britannica print set was recounted in *The Know-*

It-All: One Man's Humble Quest to Become the Smartest Person in the World (2004). The purpose behind his mission was succinctly stated on the back cover of his book:

To fill the ever-widening gaps in his Ivy League education, A.J. Jacobs sets for himself the daunting task of reading all thirty-two volumes of the *Encyclopædia Britannica*. His wife, Julie, tells him it's a waste of time, his friends believe he is losing his mind, and his father, a brilliant attorney who had once attempted the same feat and quit somewhere around *Borneo*, is encouraging but unconvinced.

What Jacobs gained from the experience was telling:

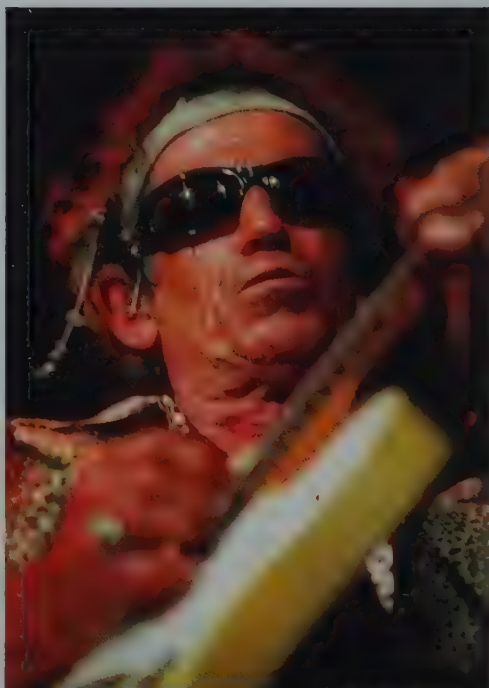
I know that history is simultaneously a bloody mess and a collection of feats so inspiring and amazing they make you proud to share the same DNA structure with the rest of humanity. . . . I know firsthand the oceanic volume of information in the world. I know that I know very little of that ocean. I know that I'm having a baby in two months, and that I'm just the tiniest bit more prepared for having him (I can tell him why the sky is blue—and also the origin of the blue moon, in case he cares). . . . I know that opossums have thirteen nipples. I know I've contradicted myself a hundred times over the last year, and that history has contradicted itself thousands of times. . . . I know that you should always say yes to adventure or you'll lead a very dull life. I know that knowledge and intelligence are not the same thing—but they do live in the same neighborhood. I know once again, firsthand, the joy of learning.

Michael DeBakey (1908–2008), the pioneering heart surgeon who invented the “roller pump” (a critical component of the heart-lung machine that makes open-heart surgery possible) and who is credited with many “firsts” (such as the first successful coronary artery bypass in 1964) also read a complete set of *Britannica*. A.J. Jacobs, during his own reading blitz of *Britannica*, phoned DeBakey to discuss his bibliophilic feat. “When I was a child,” the surgeon told him,

my parents allowed us to take one book out of the library every week. I came home one day and said there was a wonderful book at the library—but they wouldn't lend it to me. My parents said, “What is it?” And I said, “It's the *Encyclopædia Britannica*.” So they bought a set. I was about ten or twelve years old, so it must have been 1919 or so. By the time I went to college, I had finished the whole thing. I had four siblings, and all of us would rush through our lessons so we could get to read the encyclopedia.

Alan Watts was called by the *New York Times* “perhaps the foremost Western interpreter of Eastern thought for the modern world.” The British-born writer and philosopher could not claim membership in the “whole-set club,” but his good friend **Aldous Huxley** could. As Watts recalled in his autobiography, *In My Own Way* (1972), Huxley “had read the entire *Encyclopædia*, but at random. He would, for example, look up the article on the letter P, then go off to a party at which he would gen-

Keith Richards, guitarist of the Rolling Stones, performing in Berlin, September 10, 1998.



Sven Kaestner/AP Images

tly move the conversation to this subject and then give an extremely learned, and invariably witty, discourse on the history of this letter.”

Keith Richards of the Rolling Stones, to the best of our knowledge, is also not a member of this distinguished club, but he does deserve special mention for his unique encounter with a “whole set” one fateful day in 1998. While he reached for a book on anatomy by Leonardo da Vinci, his home bookshelf collapsed, sending the 129-lb. set of *Britannica* volumes cascading down upon him. He was left with three broken ribs, and the Stones had to postpone the opening of their European tour. But Richards took the mishap in stride. “All part of life’s rich pageant,” he laughed.

Employment & Britannica

Employment—through either working for Britannica or sparking employment elsewhere—is yet another way that the encyclopedia has left its cultural mark and influenced countless lives in the process.

Scandal & Redemption

Employment at Britannica came at a propitious time for a special darling of the media: **Charles Van Doren**, one of America’s first national TV stars. Van Doren was a talented and likable young instructor of English at Columbia University and a scion of one of the most distinguished families in American letters: his father (Mark) had won a Pulitzer Prize in poetry; his mother (Dorothy) was a popular novelist and onetime editor of *The Nation*; his uncle (Carl) had won a Pulitzer Prize in biography; and his aunt (Carl’s first wife, Irita) was book editor of the *New York Herald-Tribune*. This pedigree, as well as clean-cut looks, stood Van Doren in good stead for 14 weeks in 1956–57, when he became the darling of the TV airwaves, and a very rich man, with his string of dramatic victories on the popular quiz show *Twenty-One*. He was even celebrated on the cover of *Time* magazine, which said, “Along with [his] charm, he combines the universal erudition of a Renaissance man with the nerve and cunning of a riverboat gambler and the showmanship of the born actor.”

NBC Television—Hulton Archive/Getty Images



Host Jack Barry standing at the podium while contestant Charles Van Doren (right) ponders a question during a broadcast of the television quiz show *Twenty-One*.

But once it was revealed, in 1959, that the show was rigged, that contestants were shown the questions and answers in advance, Van Doren’s star quickly burned. “It completely devastated my life,” he said. “I went from a comfortable, happy, successful celebrity to absolute loss of everything in one day.” Judicial investigations, congressional hearings, and charges and convictions for perjury followed for Van Doren and several others. The scandal (recounted in Robert Redford’s 1994 movie *Quiz Show* and in Van Doren’s own words in an article for *The New Yorker* in 2008) cost Van Doren his teaching post at Columbia and subsequent TV career with NBC and the *Today* show. His life in shambles, he left New York and resettled in Chicago in 1965, and with the help of Mortimer Adler, the polymath philosopher and long-time family friend and member of Britannica’s Board of Editors, began to work for the encyclopedia and to rebuild his life.

Van Doren wrote keenly and passionately on what he saw as the many virtues of *Encyclopædia Britannica*. As he explained in *The Joy of Reading* (1985), the publication is not perfect, but

what is there is so vast and various, so ably chosen and authoritatively presented, that what is missing pales by comparison. . . . This explains why a set of *Encyclopæ-*

dia Britannica has more than mere curiosity value many years after it has been published, when much of its information is no longer correct. As a report of the world of knowledge as perceived by its editors at the time of publication, it retains real value for decades, for generations, even for centuries. It becomes a genuine historical document, worth possessing for that reason alone.

Van Doren stayed with *Britannica* for 17 years, writing and editing books and becoming a vice president of editorial.

Britannica "Answer Girls"

For educated American women between 1930 and 1960 there was likely no better place to work than *Britannica*, especially in its Library Research Service. This all-female department was created in 1936 to spur sales and to keep *Britannica* before the eyes of the reading public during the difficult days of the Depression. The department received queries on every imaginable topic—from sex to the stock market—and in return each reader re-

Scene from Desk Set (1957), directed by Walter Lang and starring Katharine Hepburn and Spencer Tracy.



© 20th Century Fox Film Corporation/courtesy Everett Collection

ceived a personalized report. These reports ran as high as 20,000 words, and they consisted of the latest research from the leading authorities of the day, all painstakingly culled, excerpted, and retyped into a single report and then supplemented with a bibliography to spur further inquiry.

The service was phenomenally popular. Folks took comfort in knowing, especially during the Depression, that there were people "out there" whose sole purpose each day was to serve their needs and answer their questions during those trying times. No question was too small, too silly, or too insignificant not to warrant a thoughtful, personalized report in reply from *Britannica*. The service became so popular, in fact, that the company soon had to limit the number of questions asked by a customer. Each *Britannica* print set subsequently came with a sheet of 50 gummed coupons limiting the reader to that many requested reports over a 10-year period.

At a time when the most challenging work for college-educated women was often clerical and menial in nature, *Britannica's* Library Research Service offered much more—an intellectually stimulating work environment, combined with the opportunity for travel. All of the women of the department were college educated (often Smith College graduates), and many of them had earned graduate degrees. These *Britannica* "Answer Girls," as they came to be known, were eventually located in regions across the United States, where they would travel by rail from city to city, library to library, picking up for their assignment the *Britannica* typewriter deposited at a designated railway locker by a previous *Britannica* "Answer Girl."

By the 1950s the department had grown to 100 women, producing 100,000 reports annually, and it became a public-relations bonanza for the company. The department garnered extraordinary press—often under headlines blaring, "*Britannica*, Brains and Beauty!"—and the department's director, Virginia Stenberg, became the focus of numerous news stories and interviews. "I love it," Stenberg told *Glamour* magazine in 1956. "It keeps me in touch with people and world affairs. Few jobs for women are so stimulating." In fact, it has long been believed that the 1957 movie *Desk Set*, in which Katharine Hepburn

plays the director of a department of female researchers, was inspired by Britannica's Library Research Service, with Hepburn's character of Bunny Watson, played opposite Spencer Tracy, modeled after Britannica's own Virginia Stenberg.

Notable Individuals

For a young **Michael Faraday**, whose later work in electromagnetism would cement his legacy as one of the most significant scientists of the 19th century, Britannica offered an opportunity for learning, as well as a bit of subterfuge. In 1805, at age 14, he was apprenticed to a book dealer, and when customers dropped off pages to be bound, he would take the opportunity to study them before the customer returned. One such book was Britannica's 3rd Edition (1788–97), and its article on electricity fascinated him, spurring him to begin electrical experiments in his shop. A spark of future genius had been lit.

For **Madeleine Albright**—U.S. ambassador to the United Nations (1993–97), the first female U.S. secretary of state (1997–2001), and the highest-ranking woman then to serve in the U.S. government—Britannica meant employment. This was long before she had set her sights on a career in government and foreign affairs. She was hired in 1960, at Britannica's headquarters in Chicago, where her husband, journalist Joe Albright, was working for the *Chicago Sun-Times*. For Britannica she would serve as a picture editor and publicity assistant, but as she quickly discovered during her job interview, it was not her PR or picture acumen that most immediately interested Britannica. When the male executives inquired about when she planned to start a family, a common and perfectly legal interview question at that time, she memorably quipped, according to company lore, "Not at this moment, thank you." As she recalled in *Madam Secretary: A Memoir* (2003), "I can't remember being offended [by the question]; I just said I wasn't in a hurry."

U.S. Founders and the Freebooter

Dueling animosities were not the only things shared by **Alexander Hamilton** and **Aaron Burr**. In fact, what they shared was possessed

as well by **George Washington** and **Thomas Jefferson**: a copy of Britannica's 18-volume 3rd Edition (1788–97) as pirated and republished in 1798 by Philadelphia printer Thomas Dobson. The 1790s were a time when the audience for the Edinburgh-based Britannica was barely reaching London, but the political and literary elite of the new United States were scrambling to get their hands on a learned work like *Encyclopædia Britannica*. The upstart Americans may have won their political independence just a few years earlier, but the Founding Fathers had no interest in cutting their intellectual ties with the Mother Country and Europe that had made their revolution philosophically possible in the first place. With classic American ingenuity, Dobson met this market opportunity and obtained Britannica the time-honored way: he took it, which was legally permissible given the lack of international copyright protection at that time. He amended his unauthorized reprinting with more detailed maps of the United States and with a few articles with less of a British bias; he also, naturally, killed Britannica's dedication page—dedicated to King George III, the Americans' nemesis in the recent American Revolution. Dobson called his set the first American edition, and it was the most ambitious publishing project yet undertaken in the young United States. The printing was accompanied by a massive advertising campaign, the likes of which Americans had never before seen, and Dobson sold the set at a discounted rate, further undercutting any potential market for Britannica's original edition. Britannica had to settle for that most unsatisfying of compliments: imitation as the sincerest form of flattery.

Lifeboat Britannica: The Ernest Shackleton Expedition, 1914–16

Perce Blackborow was only 18 years old when he stowed away on the ship, hoping for a job and a bit of adventure, getting a nightmare instead. He had come through his surgery with extraordinary pluck, even managing a smile as he asked for a smoke. "The poor beggar behaved splendidly," said Lionel Greenstreet, the sweat-drenched First Officer who himself was suffering from rheumatism. The candle-lit "operating room" was nothing more than two

overturned lifeboats resting on blocks, sitting upon ice floes, with sail fabric and tents hanging over the sides in a sorry attempt to block out the elements. They had stoked their small stove with penguin skins, raising the temperature high enough to vaporize their scanty supply of chloroform used as an anesthetic for the young man. Some of the crew had watched intently, others had squeamishly averted their eyes, while most of the men had been herded outside into the freezing cold as Dr. James McIlroy, one of the ship's two surgeons, amputated the black and brittle toes on the gangrenous left foot of their frostbitten shipmate. For Blackborow's cigarette, McIlroy tore a page from one of the volumes of the ship's set of *Encyclopædia Britannica* rescued by the crew before their ice-pinned vessel was finally crushed in the frozen waters off the coast of Antarctica, forcing the men onto ice floes where they would live for more than five months. He filled the paper with tobacco and rolled it into a cigarette. Whether its effect this day was real or imagined, the smoke from this burning admixture of tobacco and paper—the latter a special onionskin, “India paper” used as a novelty for the 11th Edition to reduce the ever increasing weight of the Britannica print set—acted like a narcotic in the cramped quarters, soothing the patient and his stressed-out shipmates alike.

Marooned off the coast of Antarctica for nearly two years, **Sir Ernest Shackleton** and the crew of the apt-named *Endurance* had indeed found many uses for their set of *Encyclopædia Britannica*. That a heavy set of encyclopedias was even included on the voyage will doubtless seem strange to many readers. After all, of all the items to bring on a perilous journey to a dangerous and unknown part of the world, when storage space was at a premium, weight was an issue, and supplies for one's survival were finite and nonrenewable, a clumsy set of encyclopedias might not top everyone's packing list. But to Shackleton, there was nothing at all strange about Britannica's presence on the voyage. For Britannica represented to him and to others of the era the whole of the civilization that the *Endurance* left behind as it pushed out to sea, and as Shackleton and his crew set forth to explore, for king and country, the vast unknown, they would physically and symbolically, by the presence of Britannica's 11th



Ernest Shackleton's ship Endurance, damaged, partially submerged, and pinned in the ice of Antarctica, c. October–November 1915.

Edition, bring that culture and civilization with them.

And it's a good thing they did. For the encyclopedia served as a critical lifeboat of sorts for Shackleton and his crew, keeping them afloat socially and psychologically during the greatest ordeal of their lives. Random reading from the set, which Shackleton called “the greatest treasure in the library,” provided intellectual sustenance for the crew, keeping them mentally sharp; the article on chess taught several men how to play the game, which helped to while away the time; and the set frequently served as the arbiter of debates over issues large and small. Britannica's verdict, however, was not always welcome. For some reason, Britannica's entry on “money” caused quite a row one day, noted Shackleton in his diary, whereupon the men “finally came to the conclusion that the *Encyclopædia*, since it did not coincide with their views, must be wrong.” Captain Frank Worsley confirmed this tendency, noting that “when both

sides [of a debate] were proved to be wrong, they united in declaring that the book was no good." On the other hand, Britannica's coverage of explorers Fridtjof Nansen and Hjalmar Johansen, which explained how the men had survived in the Arctic on a diet of polar bear and walrus meat, "was very reassuring to us," added Worsley.

The encyclopedia had been used for many things during the harrowing voyage of the *Endurance*, but the crew had hardly anticipated smoking the set.

Family Ties that Bind

Britannica has also played an intimate role on the home front, for families the world over, as these brief examples demonstrate.

For actor and comedian **Mike Myers**, Britannica has signified family and fond memories. His father sold *Encyclopædia Britannica* in the Toronto area, earning "Salesman of the Year" honors in 1956. For this achievement, he received a special signet ring from Britannica. When Myers's father died, the ring passed on to Mike, who used it as his wedding ring and reportedly still wears it in memory of his father.

Newton D. Baker (1871–1937), U.S. secretary of war for Pres. Woodrow Wilson during World War I, joined the "whole-set club" as a result of a challenge from his father. "When the Civil War ended," wrote Baker's biographer, "his father began to read the entire *Encyclopædia Britannica* in an attempt to compensate for the college education that had been interrupted by four years with Stuart's cavalry. The country doctor found his practice too preoccupying and lost himself in darkest Africa while working on the As." The father then offered his son the same challenge: "Newton was told that an award of Hume's *History of England* would be given if he read the whole of the *Britannica*; he accepted the challenge and earned the prize."

Richard Feynman (1918–88), one of the most brilliant and influential scientists of the post-World War II era, who shared the 1965 Nobel Prize for Physics, also had fond memories of the role Britannica played in his formative years and family life. As he recalled in "The

Pleasure of Finding Things Out" (an edited transcript of an interview he gave for the BBC show *Horizon* in 1981):

When I was a small boy [my father] used to sit me on his lap and read to me from the *Encyclopædia Britannica*, and we would read, say, about dinosaurs and maybe it would be talking about the brontosaurus or something, or the tyrannosaurus rex, and it would say something like, "This thing is twenty-five feet high and the head is six feet across," . . . That would mean that if he stood in our front yard he would be high enough to put his head through the window. . . . Everything we'd read would be translated as best we could into some reality and so I learned to do that . . . to read the *Encyclopædia* when I was a boy but with translation, . . . it was very exciting and interesting.

Catch Titles & Parlor Games

The memorization of the "catch titles" on the spines of Britannica volumes was long a popular parlor game among Britannica's most dedicated readers and veteran editors. It was one of several parlor games spawned by the Britannica print set.

Richard Feynman's early affection for Britannica is evident in the passage highlighted above, and his love for Britannica never waned. As James Gleick recounted in *Genius: The Life and Science of Richard Feynman* (1992), "When they were old men," Feynman and Schwinger (Julian Schwinger, one of the two other scientists who shared the Nobel Prize with Feynman) "amazed a dinner party by competing to see who could most quickly recite from memory the alphabetical headings on the spines of their half-century-old edition of the *Encyclopædia Britannica*."

Alan Watts, the noted philosopher mentioned above in relation to the "whole-set club," was also a fan of the "catch title" game. As he noted in his autobiography, although he never completely read through his copy of Britannica's 11th Edition (1910–11), "I can tell you from memory the alphabetical indices of all volumes of its great Eleventh Edition from A to AND to VET to ZYM."

Christian fundamentalists, however, were not so enthusiastic about Britannica's catch titles. When "Evolution" became a catch title on a volume in the 1980s, many of them complained vociferously to Britannica's headquarters in Chicago. They loved their prints sets, but they could not bear the word "Evolution" staring at them from their bookshelf.

"Offs and On's" was another Britannica-inspired pastime. In this game, of which there are many variations, the participants would write down all of the world-famous surnames they could think of that ended in "off" and "on," and for every name they listed that could *not* be found in *Encyclopædia Britannica*, they earned a point. In his extensive review of Britannica's 13th Edition (1926) for the *Saturday Review of Literature*, the English polymath and essayist **C.K. Ogden** (1889–1957), famous for inventing Basic English, said his best "score to date, including Rachmaninoff and Carrie Nation, is twenty."

Director Alfred Hitchcock, with actors Veronica Cartwright, Rod Taylor, Tippi Hedren, and Jessica Tandy, on the set of The Birds (1963).



Universal Pictures

Contributor Angst & Payments

When offered a commission from Britannica, many writers have experienced conflicting emotions, ranging from joy and pride to nervousness and angst. One contributor in the early 20th century, whose name is lost to history, let the excitement of the moment get the better of him. Once offered the commission, he immediately inquired about compensation. "It would be \$100," replied Britannica. "That's fine," said the writer, who then promptly mailed to Britannica a check for \$100. From the writer's perspective, paying for the opportunity to write for Britannica seemed perfectly reasonable.

Charles Van Doren said this about a Britannica commission:

The authors of the articles in *Britannica* are, many of them, very good writers who are profoundly cognizant of the challenge presented by being asked to write up their subject for this august publication. Contributors often list articles they have authored for *Britannica* in their curriculum vitae, with good reason. To be asked to contribute a major article to *Encyclopædia Britannica* is, ipso facto, to be world renowned, to be universally recognized as *the* expert, or one of the few experts, in a field.

Some notable contributor experiences follow.

Alfred Hitchcock felt this "challenge" of a Britannica commission in an acute way, when he was asked to write Britannica's coverage of film production in the 1960s (see an excerpt from his work in Part Two of this book). He took the assignment so seriously that he hired a professor at the University of Southern California to help him with the commission. They outlined ideas, discussed related topics for months, tape-recorded their discussions, hired secretaries to transcribe the recordings into manuscripts, and then finally pared them down into a single article for Britannica. At one point during this laborious process, the Britannica editor in charge of this commission received a phone call from someone who sounded just like Hitchcock. "I thought at first that it was some kind of practical joke," the editor recalled, that "some

cherished friend of mine was doing a good imitation of Hitchcock's voice—but fortunately I withheld any wisecracks at the time and listened on." It was not a joke—it was the famed director himself. "Do you know," droned Hitchcock in his deliberate and dramatic way, that "I have been working very hard at this and it's already cost me \$4,000?" Once Hitchcock had completed his manuscript, he submitted it along with the contributor information form required of all Britannica authors. One of the questions on the form asks contributors to list their degrees and academic accomplishments. Hitchcock, who was wracked by insecurities, including a feeling of inferiority concerning his formal education, replied to the query about degrees this way: "98.6."

A **wartime writer** also felt this "challenge" of a Britannica commission but experienced it in a vastly different way. He had conscientiously begun his assignment but then lost his manuscript and even his typewriter—all of it water-damaged—forcing him to complete his commission longhand. He quickly contacted Britannica to beg for mercy. "It may interest you," he said, "to know that one of the files rescued was a water-soaked letter from you and my rough notes for the article." The editors were forgiving. After all, more than 2,300 of the writer's comrades had lost much more in the attack on Pearl Harbor.

To **Sir Walter Scott**, a Britannica commission meant one thing: much needed money. The *Ivanhoe* author was then at the height of his fame as a historical novelist when Britannica's publisher, Archibald Constable, approached him to compose entries on "Chivalry," "Romance," and "Drama" for Britannica's Supplement to its 4th, 5th, and 6th editions (1815–24). The often needy Scott accepted the commission, and the £100 for each lengthy entry, explaining: "I have trees to plant."

Robert Louis Stevenson's commission was not so successful. The future author of *Treasure Island* (1881) was then 25 years old, and though of no great reputation, he was commissioned nonetheless for 5 pounds, 5 shillings to compose Britannica's new biography of his fellow countryman and poet Robert

Burns. His submission, however, was boring and bare-boned, and Britannica rejected it—for "want of enthusiasm." The young writer agreed with the assessment, admitting to Britannica: "To say truth, I had, I fancy, an exaggerated idea of the gravity of an encyclopaedia and wished to give mere bones, and to make no statement that should seem even warm. . . . I believe you are right in saying that I had not said enough of what is highest and best in him."

A Writer's Eldorado

Given the ubiquity of Britannica in Western culture, it is hardly surprising that the publication has been popular with novelists and poets throughout the centuries and made frequent appearances in their work.

Salman Rushdie, for example, in *The Moor's Last Sigh* (1995), had a character describe a dream of "peeling off my skin plantain-fashion, of going forth naked into the world, like an anatomy illustration from *Encyclopædia Britannica*, all ganglions, ligaments, nervous pathways and veins, set free from the otherwise inescapable jails of colour, race and clan."

For **Edgar Allan Poe**, *Encyclopædia Britannica* was a handy source for explaining geographical and scientific phenomena, as seen in this passage from "A Descent into the Maelström," an 1841 short story about a man who survives a shipwreck and a whirlpool:

In regard to the depth of the water, I could not see how this could have been ascertained at all in the immediate vicinity of the vortex. . . . The idea generally received is that this, as well as three smaller vortices among the Feroe islands, "have no other cause than the collision of waves rising and falling, at flux and reflux, against a ridge of rocks and shelves, which confines the water so that it precipitates itself like a cataract; and thus the higher the flood rises, the deeper must the fall be, and the natural result of all is a whirlpool or vortex, the prodigious suction of which is sufficiently known by lesser experiments."—These are the words of the *Encyclopædia Britannica*.

For novelist **James Michener**, Britannica was a daily companion. He consulted the encyclopedia so often that he kept it, in his words, "right at my elbow in a specially built bookcase which I myself fabricated so that I could have all the volumes in one line." In fact, he reportedly traveled with a set of Britannica in his car.

Britannica was at the elbow, too, of **Darrell Figgis**, the Dublin-born but Calcutta-raised poet, novelist, essayist, and political rabble-rouser who helped draft the constitution for the Irish Free State in 1922. As Figgis wrote, "While the Constitution of the Irish Free State was being drafted, the *Encyclopædia Britannica* was always in the same room as that in which the Constitution Committee was sitting. Both while the Committee was in session, and during the long staff-work in preparation for its sessions, the volumes were in frequent—I might say, almost incessant—service. There were occasions when it proved invaluable."

For the ever-versatile **Christopher Morley**, Britannica meant an opportunity for some doggerel called "Epitaph on the Proofreader of the *Encyclopædia Britannica*":

Majestic tomes, you are the tomb
Of Aristides Edward Bloom,
Who labored, from the world aloof,
In reading every page of proof.

From A to And, from Aus to Bis
Enthusiasm still was his;
From Cal to Cha, from Cha to Con
His soft-lead pencil still went on.

But reaching volume Fra to Gib,
He knew at length that he was sib
To Satan; and he sold his soul
To reach the section Pay to Pol.

Then Pol to Ree, and Shu to Sub
He staggered on, and sought a pub.
And just completing Vet to Zym,
The motor hearse came round for him.

He perished, obstinately brave;
They laid the Index on his grave.

For **T.S. Eliot**, on the other hand, the pachyderm of print sets elicited not awe but a sigh, a lament, a remembrance of things lost. As he suggested in "Animula" (1929), Britannica's massive tomes sat hauntingly on the bookshelf, reminding him of the countless facts, proscriptions, and adult concerns that gather over years and smother the unfettered life we enjoyed as a child:

The heavy burden of the growing soul
Perplexes and offends more, day by day;
Week by week, offends and perplexes
more
With the imperatives of "is and seems"
And may and may not, desire and control.
The pain of living and the drug of dreams
Curl up the small soul in the window seat
Behind the *Encyclopædia Britannica*.

Writers in languages other than English have also poignantly felt the impact of Britannica. "If I were asked to name the chief event in my life," wrote **Jorge Luis Borges**, "I should say my father's library. In fact, I sometimes think I have never strayed outside that library. I can still picture it. . . . I vividly remember so many of the steel engravings in *Chambers's Encyclopædia* and in the *Britannica*." Britannica was so special to Borges that after winning a literary award and a "lordly sum" of prize money for a collection of his essays in 1929, the young writer in Buenos Aires used part of his precious winnings to purchase a used set of Britannica's famed 11th Edition.

Killers, Crimes, & Britannica

Britannica has had an interesting connection with crime and criminals over the years, as briefly evidenced below.

Al Capone—a.k.a. Scarface, Public Enemy No. 1—headed off to prison in May 1932. Convicted of income-tax invasion, the Chicago mobster had been sentenced to 11 years, then the stiffest penalty ever given for tax fraud. He was shipped to the federal penitentiary in Atlanta, Georgia, an institution noted as one of the country's toughest prisons. "He might as well make up his mind that he is a marked man among the army of forgotten men who inhabit the institution," wrote the *Atlanta Constitution*. "He will un-

Everett Collection—Historical Highlights Images/age fotostock



Gangster Al Capone leaving Chicago's federal courthouse, October 14, 1931.

dergo inconveniences. He will obey orders instead of issuing them." The newspaper could not have been more wrong. Little time passed before Capone was wielding his influence just as mightily behind bars, buying a wide variety of favors and supplies. His cell was filled with cigars, a rug, a typewriter, and even . . . the 24-volume set of Britannica's 14th Edition (1929–73). Such mockery of the system would not be tolerated for long, and two years later Capone was transferred to Alcatraz, the country's new "escape-proof prison" in San Francisco Bay, where America would now house its most dangerous criminals.

For **Sir Arthur Conan Doyle**, Britannica served as the perfect cover for the not-so-perfect crime. In "The Red-Headed League" (1891), Sherlock Holmes must ascertain why an organization would pay a handsome fee to a red-haired man for doing nothing more than copying pages out of *Encyclopædia Britannica*. "Eight weeks passed away like this," said the copyist,

and I had written about Abbots and Archery and Armour and Architecture and Attica, and hoped with diligence that I might get on to the B's before very long. It cost me something in foolscap and I had pretty nearly filled a shelf with my writings. And then suddenly the whole business came to an end.

To Doyle biographer Charles Higham (*The Adventures of Conan Doyle: The Life of the Creator of Sherlock Holmes*, 1976), this use of the encyclopedia is notable for two reasons. It not only shows a touch of humor in the Sherlock Holmes's tales but also serves as a sociological mirror of the times, confirming "the view of the upper middle class that the working orders were simply dolts."

For mystery writer **Ruth Rendell**, in *Piranha to Scurfy and Other Stories* (2000), *Encyclopædia Britannica* was not the perfect cover for a crime as it was for Doyle but perfect for executing the crime itself—murder, in fact.

His hands moved across the table to rest on *Piranha to Scurfy* [the catch titles on the spine of a volume of Britannica]; he lifted it in both hands and brought it down as hard as he could on her head. Once, twice, again and again. The first time she screamed, but not again after that. She staggered and sank to her knees and he beat her to the ground with volume 8 of the *Encyclopædia Britannica*. She was an old woman; she put up no struggle; she died quickly. He very much wanted not to get blood on the book—she taught him books were sacred—but there was no blood. What was shed was shed inside her.

"Red Britannica"

Britannica's experience with the notorious anticommunist-crusading blunderbuss of the 1950s—**Senator Joseph McCarthy**—could warrant a book in its own right, but a quick summary will have to suffice.

"A mental midget!" snapped McCarthy. "A mental midget!" This outburst from the U.S. senator from Wisconsin was directed at none other than Britannica's longtime publisher (1943–73) and chairman of the board,



Senator Joseph McCarthy (covering microphones) during an investigation into communist infiltration of the U.S. government.

William Benton, the former advertising magnate who had recently served as Pres. Harry Truman's assistant secretary of state for public affairs and later as a U.S. senator from Connecticut. During his tenure in Washington, Benton had brokered a little-known meeting between President Truman and key scientists at the University of Chicago (where Benton had served as vice president before going to Washington in 1945) to discuss the atomic bomb. He had converted for peacetime use the U.S. Information Service, championed the Voice of America, if not gave it its official name, and lobbied through Congress the Fulbright Scholarship Act. Appointed to an open seat in the U.S. Senate from Connecticut in 1949, he then defeated Prescott Bush (father of one U.S. president, grandfather to another) in the general election for the U.S. Senate seat the following year, gaining headlines for such novelties as using a helicopter for campaign travel and for giving free sets of Britannica to students who recommended good ways of using that new medium of communication called television in the political process. He had also arranged to travel, with his wife and son, extensively through the Soviet Union in the 1950s—they were hailed, in fact, as the first Western family allowed to travel through Russia since World War II. His 30,000-word report on his

Russian adventure was published in the 1956 *Britannica Book of the Year*. Benton secretly submitted a 75,000-word report to Allen Dulles, chief of the Central Intelligence Agency, who quickly distributed the report throughout the agency. Benton's personal translator for the trip was a young Robert Tucker, later the distinguished Soviet expert and director of the Russian studies program at Princeton University.

In addition to this flurry of activity, Benton took on McCarthy, becoming one of the first national figures to call on the Wisconsin senator to resign or be expelled from office due to his recklessness and blustering accusations. Not surprisingly, McCarthy retaliated with guns ablaze, calling Benton the "hero of every Communist and crook in and out of Government." He accused Benton of using his position as assistant secretary of state to arrange for State Department purchases of Britannica films. He said Britannica films employed communists, that Benton had sold his influence in exchange for political connections, and that Benton had purchased with public funds and displayed "lewd works of art" while working for the federal government. This last charge resurrected an old controversy that had embarrassed Benton back in 1947. Unbeknownst to him, as assistant secretary of state for public affairs, he had acquired responsibility for the Cultural Relations Division of the State Department, an early Cold War program in which experimental works by American artists were commissioned and then displayed around the world in a show titled "Advancing American Art." As Benton later learned, several of the artists were indeed on the U.S. attorney general's list of communists, something McCarthy would not let anyone forget.

The animosity between Benton and McCarthy grew so intense that even the innocuous matter of Benton's attire became a potentially explosive political issue. The occasion was the much-anticipated unveiling, in April 1952, of Britannica's famed 54-volume set of literary classics called *Great Books of the Western World*. It was a publishing feat organized by Benton, Mortimer Adler, and Robert Maynard Hutchins, all of the University of Chicago, and which had garnered much press, not least because of the staggering cost of the nine-year project. The com-

pletion of the set occasioned a grand black-tie celebration at the Waldorf-Astoria hotel in New York. Benton unveiled at the gala two special sets of the *Great Books*: one blue leather-bound set to be given to Queen Elizabeth II, a statement of appreciation from whom was read at the ceremony, and a second set bound in red to be given to President Truman at a White House ceremony the following week. For the second ceremony, Benton wore a special necktie designed by Meyer Kestnbaum, a prominent Chicago supporter of the *Great Books* and president of the famed suit manufacturer Hart, Schaffner, and Marx. Depicted on the tie were famous authors of classics contained in the *Great Books*—including Karl Marx. As Benton exited the White House after meeting with President Truman, a reporter spotted the necktie, zeroed in on the face of the founder of communism, and exclaimed, “What’s on that tie? Marx!” Sensing the damage that could be done by a simple faux pas like this during those politically charged times, Benton reacted quickly, defusing the situation with a memorable retort. “Yes,” he snapped. “Hart, Schaffner, and Marx.”

Although baseless, McCarthy’s attacks on Benton took their toll. Benton lost his bid for reelection to the Senate in 1952, whereupon he resumed his full-time duties with Britannica and later served as the U.S. ambassador to UNESCO (1963–68). McCarthy, of course, lost far more: he was finally condemned and censured by the U.S. Senate in 1954 and died in disgrace three years later.

Sourcing Britannica

For many scholars, Britannica has served the purpose touched on frequently in this book—as a mirror of our times and the evolution of knowledge. Due to the longevity and regularity of its printing cycles, Britannica can serve as an excellent “historical document” and primary source of sorts, of which several examples follow.

Writer **Simon Winchester** used Britannica in this very fashion in *The Map That Changed the World: William Smith and the Birth of Modern Geology* (2001). For Winchester, Britannica offered a key way of confirming when the field of geology had finally taken root:

The word [geology] is first used in English in its modern sense in 1735, though only rarely—and probably not until 1795 can it be considered a mature and full-fledged concept. There was no mention of geology in the 1797 Third Edition of the *Encyclopædia Britannica*; but the Fourth, which came out in 1810, had a lengthy entry, the science by now fully established.

For **Edwin Shneidman**, a professor of thanatology at UCLA and the founder of the American Association of Suicidology, Britannica was a wonderful way to trace the evolution of our social and moral conceptions of **suicide**. He did so in a 1998 article for the *American Scholar*, one memorably titled, “Suicide on My Mind, Britannica on My Table.” He first noted how special *Encyclopædia Britannica* had been to his family—how their copy of Britannica’s 9th Edition (1875–89) was “the jewel in the Shneidman family’s cultural crown”—and then began his analysis. There was, he pointed out, no entry on suicide in Britannica’s 1st Edition (1768–71), which hardly surprised him, since “the word itself was fairly new.” However, Britannica’s 2nd Edition (1777–84) contains a one-page entry called “Self-Murder,” which pulled no punches, proclaiming suicide a “double-offense”:

One spiritual, in invading the prerogative of the Almighty, and rushing into his immediate presence uncalled for; the other temporal, against the king, who hath an interest in the preservation of all his subjects; the law has therefore ranked this among the highest crimes, making it a peculiar species of felony; a felony committed on one’s self.

He then discussed Britannica’s first entry entitled “Suicide,” from its 3rd Edition (1788–97), and continued his wending through time via the pages of Britannica until reaching the present, when suicide is seen as a matter of mental illness and, at other times, a reasoned choice. “The *Encyclopædia Britannica*—along with our society—has obviously traveled several light-years since 1777,” he noted, “when it excoriated suicide as cowardly, sinful, illegal, and shameful. The emphasis has shifted to the question, ‘How can we help?’ ”

Race relations have also been traced through Britannica. From the 1940s to the 1990s, Britannica was major producer of educational films for the classroom. Its 16-mm productions were distributed widely throughout the English-speaking world, and they and their accompanying Britannica projector were a mainstay of American classrooms in the 1950s and '60s, when the Soviet launching of Sputnik and the so-called "missile gap" led to massive investment by the U.S. government in science education and educational films for the classroom. Writer and historian Geoff Alexander, founder and director of the Academic Film Archive of North America, highlighted one Britannica film in particular for its significance in tracing the evolution of race relations in America. As Alexander pointed out in *Academic Films for the Classroom: A History* (2010), Britannica's 1952 film *People Along the Mississippi* "was perhaps the first classroom film to show children of different races playing interactively."

The first issue of The New Yorker, February 21, 1925, depicting the dandy Eustace Tilley, the mascot of the magazine.



Sakura/Alamy

The Monocle & the Coke Bottle

Two of America's most iconic commercial images sport a common tie to *Encyclopædia Britannica*.

The New Yorker

Eustace Tilley—the top-hatted, butterfly-gazing dandy with monocle who was pictured on the first cover of *The New Yorker* in 1925 and who has been synonymous with the magazine ever since—stems from an 1834 illustration (featuring the Count D'Orsay, a "man of fashion in Early Victorian Period") that the magazine's art director Rea Irvin found reproduced in Britannica's entry on "costume" in its 11th Edition (1910–11). But what does the mascot mean? As even *The New Yorker* queries, "Is the man with the monocle being offered as an image of the *New Yorker* reader, a cultivated observer of life's small beauties, or is he being ridiculed as a foppish anachronism?" Interpretation, like beauty, is in the eye of the beholder.

The Coke Bottle

The very same edition that provided *The New Yorker* with its iconic mascot is the same one that inspired the famous sinuous shape of the contoured Coke bottle. In 1915 the Coca-Cola company issued a challenge to 8–10 glass companies across the country: design a new bottle for the drink that was "so distinct that you would recognize it by feel in the dark or lying broken on the ground." The plant manager of the Root Glass Company of Terre Haute, Indiana, had a bright idea: design the bottle after the shape of either the coca leaf or kola nut, the two ingredients in the drink for which the product and company had of course been named. So the manager sent an employee to the library to research these shapes, but the researcher mistakenly returned not with illustrations of the coca leaf and kola nut but with a sketch of something else: Britannica's illustration of the ribbed, middle-bulging cocoa pod—the main ingredient in chocolate. From this sketch of Britannica's cocoa pod came the famously contoured Coca-Cola bottle, one of the most recognizable shapes in the world. Accident is often the mother of invention.

What's in a Name?

"A rose by any other name would smell as sweet," says Juliet about her Montague boyfriend in Shakespeare's *Romeo and Juliet*. But is this really true? Judge for yourself after reading the following.

Jane Shore, in her poem "Encyclopædia Britannica" (*The New Yorker*, September 7, 2015), remembers the old Britannica print set that used to reside in her parent's family room, "sitting like a judge over our new color TV," and how "even saying its name upped my I.Q." She lamented where the print set resides today, "in a climate-controlled storage unit on River Road, / in the cartons I packed after my parents died: / its bulging knowledge forever leashed together / between covers, warped and moldering, / its defunct contributors bulldozed under / for eternity . . ." Most interestingly, she wonders about the role that Britannica could have played in how her parents named her:

One day, in high school, I looked up
my name
and wrote a report on the "other"
Jane Shore
(1445–1527), the mistress of King
Edward IV (Volume 20).
If my parents had had the *Encyclopædia*
Britannica
when they were deciding what to name
me,
would I have been a Jennifer
instead of the penitent mistress of a king
made to walk the streets of London,
barefoot?

Jane Shore may have shared her name with "the penitent mistress of a king," but this is nothing compared to the mortification felt by the girl described below.

She was born on December 13, 1814, in Cazenovia, New York. Her father, the Reverend Timothy Dewey, was an itinerant preacher whose descendants would include Admiral George Dewey, hero of the Spanish-American War. For whatever reason or flight of fancy, Parson Dewey marked his daughter for distinction, and doubtless derision, by naming her none other than . . . **Encyclopædia Britannica**. Not surprisingly, the girl hated her name, opting instead to call herself "Britannia" for the rest of her life.

Her nine siblings could relate to their sister's torment, for they too had been branded by their father's eccentricity. Her nine siblings included:

Anna Diadama Dewey
Philander Seabury Dewey
Franklin Jefferson Dewey
Armenius Philadelphus Dewey
Almira Melphomenia Dewey
Marcus Bonaparte Dewey
Pleiades Arastarcus Dewey
Victor Millenius Dewey
Octavia Ammonia Dewey

The exact day little Encyclopedia Britannica stopped talking to her father is not known.

Theodore Pappas

