

IGNATIUS DONNELLY:

AND

THE END OF THE WORLD



[Click here for an index and contents
including Mr. Donnelly's latest scientific findings for the year 2000](#)

ILLUSTRATED

*"I was so excited I
couldn't sleep for a week"-
Rev Hal Lindsey, author of
"The Late Great Planet
Earth" on his discovery that
the world was coming to an
end.*

EDITED BY

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Of Special Interest to Those Concerned with Science, the Bible, Apocalypse, and Revelation

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SUMMARY

Ignatius Donnelly, visionary futurist, returns from the past to visit a notable creek in California, finding there evidence of impending [millennial instability](#), including global warming, [AIDS](#), and stock market speculation; setting out to repeat his amazing predictions of the [1880s](#), he probes ancient symbols and modern science; from the [stones of the creek](#) he finds that [remarkable events](#) occurred [5000 years ago](#); from the [oaks](#) and his knowledge of Krakatoa he discovers how asteroid-triggered [volcanism](#) impacts civilization including biblical narratives and the archaeology of the Dead Sea; from a [skull](#) found in the creek and the [impudence of a certain Saint](#) in his treatment of native sacred objects he discovers what nature holds in store for humanity and the environment. The site contains information on Mr. Donnelly's [personal history](#) including his remarkable middle age ability to [recover from adversity](#).

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Richard L. Meehan

Richard Meehan has degrees from M.I.T. and Imperial College, University of London. Following service with the U.S. Army he lived and worked in Southeast Asia in the early 1960s, and then in the Western U.S. and South America. He has maintained a consulting practice in Palo Alto and taught at Stanford University for the past twenty five years. He lives with his family in Menlo Park, California, a short walk from San Francisquito Creek.

[Testimony of the Oaks](#) (Recent Paper presented at Natural Catastrophes during Bronze Age Civilisations: Archaeological, Geological and Astronomical Perspectives. A conference at Fitzwilliam College, Cambridge 11th-13th July 1997)

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- AES 114: Engineering Geology of Quaternary Sediments
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Allow me to begin by asking you this question: do you worry about the stock market? About the growing eccentricity of the weather? About new plagues like AIDS?

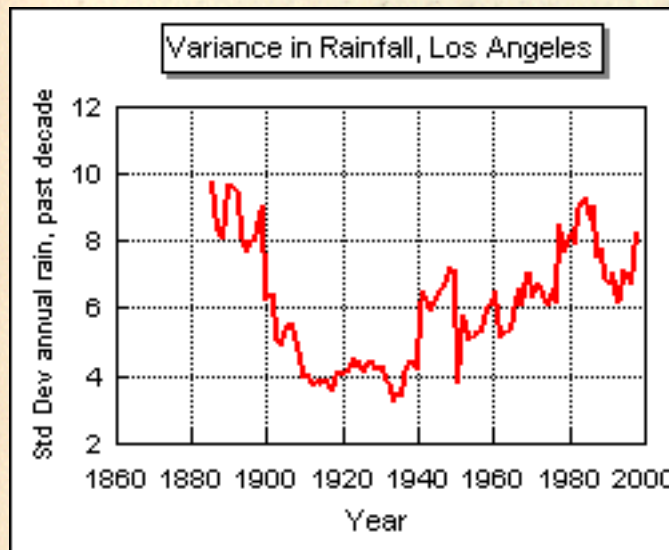
You have come to the right place. Relax your mind of these unbearable tensions and follow what I say. I shall begin by transporting your hearts and minds to a certain wood in the north of fabled California, to a particular creek called San Francisquito, running like a green ribbon through the town of Palo Alto, a place where we may shed the clothing of our public selves, finding there *tongues in trees, books in the running brooks, and good in everything.*[\[1\]](#)



This San Francisquito Creek, (so called by forty six year old Gaspar de Portola when his miserable party of soldiers first came upon it in November, 1769), rises in a bank of white clouds that hangs like a giant unbroken wave of surf, its base pierced by pointed firs and stately redwood groves that cover the mountainous spine of the San Francisco Peninsula between the valley of Santa Clara and the Pacific Ocean. Watered with some 40 inches of rainfall each winter, these modest mountains are like a little piece of Oregon, discharging springs of waters that flow across the floor of the Santa Clara Valley below:

For mountains and high places act like a thick sponge overhanging the earth and make the water drip through and run together in small quantities in many places[\[2\]](#)

And yet of late this creek has shown an erratic and nervous side, discharging, on February 3 of last year, a record seven thousand cubic feet per second of water, leaping from its banks and inundating much of that most learned of towns, Palo Alto.

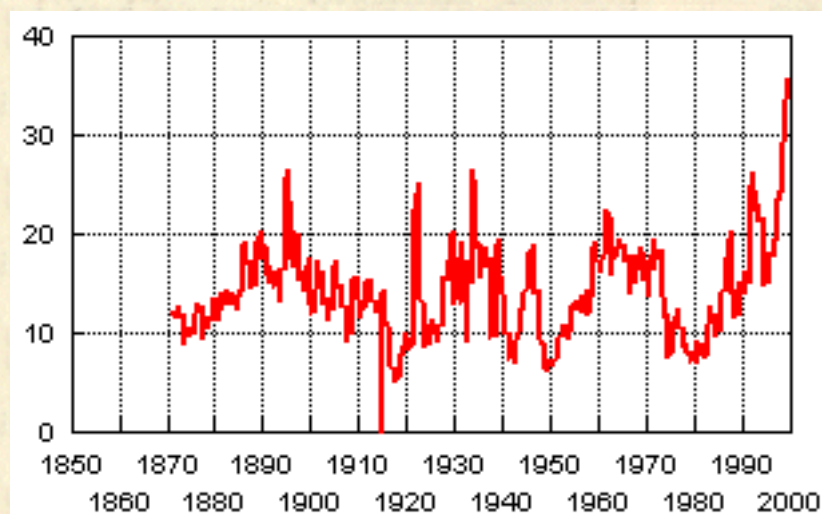


Is this simply a manifestation of normal variability? Consider the variability of rainfall, depicted here in for Los Angeles. Here it is clear that the wobbly regime of the mid 19th century, which I will discuss later in connection with my book Ragnorak, is

returning inexorably; the halcyon days of your twentieth century are dwindling in more ways than one.

And there are those who would claim that this, along with earthquakes and volcanic eruptions and infested fruit (both literal and metaphoric, in the case of California and San Francisco), are part of an increasing trend of natural punishment, an impending collapse of the old order, the rumblings of an angry god.

What too of the increasing instability in other spheres of your lives? Consider for example the recent behavior of the stock market, with a



price-earnings ratio soaring to dizzy and arguably unsustainable heights of speculation? Who can doubt that we in the United States are not subject to the same laws of financial gravity?

FOOTNOTES

[1] Wm. Shakespeare, *Much Ado About Nothing*.

[2]. Aristotle, *Meteorologica* I, xiii, 10

[3] Photograph taken in a neighborhood in Palo Alto the day after the record flood of February 3, 1998. The previous damaging flood had been in 1955. See [this site](#) for many links to the 1998 flood.

[4] Mr Donnelly favors the work on speculative markets by [Professor Robert Shiller](#) of MIT and Yale, from which these data for the S&P500 are drawn.

[5] Donnelly misremembers the 19th century period of instability; it was actually in the last half of the nineteenth century as shown on the graph and discussed by him in his comments on [Krakatoa](#). The basic argument here is that the growing instability of California climate had a precedent in the late 19th century.

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propose to illustrate true cause of AIDs by analyzing one of the several comparable catastrophes that have affected my own age.

For hundreds of years or more the world has been visited by the plague known now as typhus. In my century this scourge had paid a murderous visit to Ireland, affecting thirty percent of the island's population in 1816. I well remember its deadly hand when I was a boy in Philadelphia. My father died of it.

Now the Salish Indians of Montana had among their ancient ways the knowledge that a springtime visit to certain snowbound mountains west of the

Bitterroot

Valley brought

one in contact

with evil spirits

of the most

dangerous

kind. Students

of Celtic

custom will

recognize the

parallel between this theme and the appearance of dangerous

fairies in snowy mountain areas.



European invaders of these native lands seeking pots of gold and cutting trees scoffed at such superstitions. Until, in 1873, one of them, John McDonald, died suddenly of a new and mysterious disease that covered his body with blackened spots. Soon

enough other greedy invaders were affected, and those touched by the scourge were as likely as not to die of it within days.

Now it happened in these days that a new theory of disease was developed, the germ theory, and through a decade of detective work various scientists, culminating with Dr. Ricksett in 1906, established that this typhus-like illness was "caused" by virus-like microorganisms transmitted to humans by the bite of a tick.

Readers will of course see the connection to that modern epidemic - second only to AIDS in its dreadful impact - Lyme Disease.



Now the basic thesis of my 1885 book *Ragnorak* is edenic: the world was once a warm benign habitat supporting harmonious life until a catastrophic comet impact; the memory of which is preserved via myth in most cultures. Lacking modern methods of dating I was of course unable to work out an absolute chronology for the disaster. Much of the geological evidence that I brought to my argument - the source of glacial drift in the northern latitudes was ascribed to impact rather than to continental glaciation - appears naïve - but as I will show my fundamental theme of the 1880's can be restated in close agreement with modern science.

I have noted with warm approval based on my own experiences that the wisdom of ancient peoples has gained a certain currency among you. Sad to say that their source is less available to you today due to a thinning of the ranks of older cultures that are not a part of your nervous global capitalism. In the absence of living spokespeople the bones of the ancients may provide us with counsel.

My readers are doubtless aware that belief in fairies, leprechauns (Old Irish *luchorpan*, "little body") and other forest folk is central to the Celtic tradition. Less appreciated may be the general character of these creatures who in truth have no special love for mankind and who exhibit little of the cartoon synchophancy of your twentieth century Disney World.

The modern tendency to prettify fairies in children's stories represents a bowdlerization of what was once a serious and even sinister folkloric tradition. The fairies of the past were feared as dangerous and powerful beings who were sometimes friendly to humans but could also be cruel or mischievous. --
[Encyclopedia Brittanica](#)



Is it not more morally instructive to think of these beings as protectors of their forest realms, guardians who when disturbed by greedy ruination of their habitats are capable of striking back with merciless effectiveness?

Now the reader is advised to think of these creatures as neither dichotomized "imaginary"

nor
"real"
but as
powerful
agents
in the
Celtic
sense
that
they
are
actors
of



moral capability. Naturally they are fully capable of taking on various disguises. Historically these guises have varied but at present they favor appearing as what you call *microbes*. To state my thesis boldly, the organism that "causes" AIDS or Lymes Disease is what pre-scientific peoples called evil spirits, what the Celts used to call leprechauns.

Let me anticipate your protest. "Very well, " you might say, "irregardless of the deep reality of viruses the apparatus and

variations of post modern scientific discourse that creates them (electron microscopes, epidemiological conferences, glass ceilinged laboratories, DNA sequencing) our "virus" labels at least lead to a beneficial means of control over nature; prescientific "superstitions" did not.

To which I answer this: they are all *memes*, cultural artifacts (as are viruses) of much great antiquity than science, which when given proper due produce even greater benefits as good as those produced by science.

For as my father's hero Francis Bacon once said, *there are those places in the world where both man and nature are driven to extremes, and are therefore forced to yield up certain truths that otherwise might remain hidden.*

And moreover: *you have but to follow and as it were hound nature in her wanderings, and you will be able, when you like, to lead and drive her afterwards to the same place again.*

Hence it is little surprise that the original transmission of AIDS has now been traced to an identical invasion of forest lands by greedy cutters of trees; the butchering of monkeys, who carry the virus without harm to themselves, is now known to be the cause of its rampage into the human community.

In this case the traditional conceptualization of AIDS leads to some combination of reactions - respect, love, or fear may all be strategies - that results in less human invasion of habitat which mitigates the potential for disturbing the forest creatures.

Now it is not my aim to disparage the germ theory of human illness though I cannot but not its impotence in contending with either AIDS or Lymes Disease and suggest that as noted by Professor Kuhn in connection with the disease entity of syphilis the existence and longevity of the disease entity is in large part founded on the efficacy of treatments (Such a thought would not have surprised Bacon!)

But neither should we disparage the rules of the Salish, for their

evil spirits are but a name for the ticks (or whatever other essences will be invented in the future to "explain" the disease) and their practical inference of avoidance in the springtime (when the infected ticks are active) as useful as any drug that has been devised to treat this or related diseases.

Further, if avoidance is the preventive strategy, *then the underlying vice of greed (for gold and timber) is surely the true cause of the problem.*

FOOTNOTES

Bacon's science is a masculine activity requiring that nature be plucked when at a peak of ripeness: "under constraint and vexed; that is to say, when by art and the hand of man she is forced out of her natural state, and squeezed and molded."

[2] Control in the Baconian sense: nature, etc. (--Francis Bacon, the New Organum). "By contrast your foolish cartoon creatures are superstitions which do no good in the world."

[3] Love may not be appropriate. By loving deer and attempting to share their habitat ("county living" especially favored by the gentry) we disturb other forest creatures that cause Lymes Disease.

Donnelly here refers to Thomas Kuhn's famous structure of scientific revolutions. (Kuhn, Thomas S. "The structure of scientific revolutions" University of Chicago Press, 1962.) Kuhn derived much of his thinking from Rudolph Fleck's work on syphilis, see Fleck, Ludwig, 1896-1961. "Entstehung und Entwicklung einer wissenschaftlichen Tatsache" : Einf. in d. Lehre von Denkstil u. Denkkollektiv / Ludwig Fleck ; mit e. Einl. von Lothar Schèafer u. Thomas Schnelle. Edition: 3. Aufl. Imprint: Frankfurt am Main : Suhrkamp, 1994. Your editor attempted to apply this thinking to a geologic "plague" of the 1970's, see Meehan, R. "The Atom and the Fault". MIT Press, 1986.

Donnelly's father was said to have been an avid Baconian, and Donnelly himself spent two years promoting the theory that Bacon was the true author of Shakespeare's plays. Donnelly refers here to Bacon's famous analogy of science to the hunting and entrapment of nature in her forest abode.

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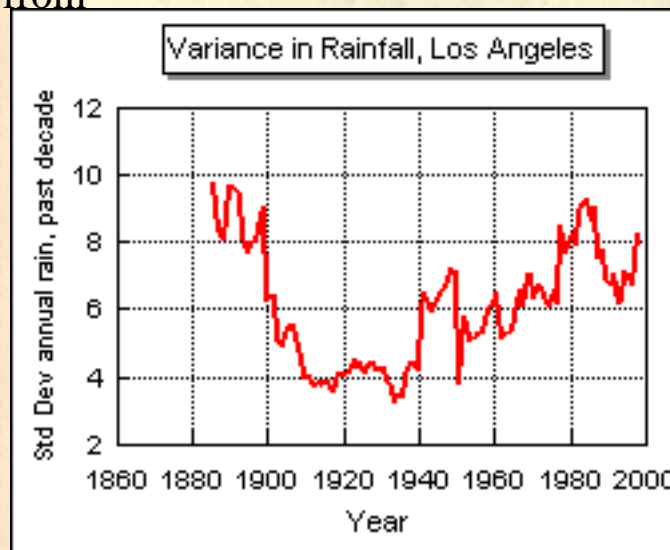
In August of 1883, shortly after my fiftieth birthday, a remarkable event took place. The Indonesian volcano Krakatoa exploded, coughing two hundred and ninety four million tons of sulfuric acid into the atmosphere. This violent paroxysm is now thought by some of your scientists to have been the equal of the 1470 BC Santorini blow near Crete. I do not believe that this event had anything to do with my birthday but in many odd ways my life took on some of the global rhythms that followed.

Now I should say that the relation of volcanic action and the subsequent coldness of the seasons was not a great surprise to us, even in our simple times, for we and our forbearers had the habit of recording our observations of natural events with an attention to detail that might strike some of your contemporaries as finnick in your busy times. The eruption of the Icelandic Laki in June of 1783 had been notable; so severe had been the volcanic haze that spread that summer, across Europe and into the Middle East, that there followed a bitter winter felt even as far as America, where Benjamin Franklin correctly attributed the severity of the season to the loss of sunlight from that same volcanic haze. Careful analysis of the event shows that the temperature fell for several years, even though the haze itself lasted no more than several months. So the record, a century before my time, tells us of the potency of these volcanos. Similarly the great eruption of 1815, a subject on which I heard much as a boy, led to a year in which there was no summer.

The few years following the Krakatoa explosion of 1883 provided a glimpse of the climate disturbances that can result from even moderate volcanism. Heavy rains fell for the next three years -- a

remarkable thirty eight inches in Los Angeles in the following winter alone-- followed by anomalous droughts spreading

from



west to east. Note as a measure of this eccentricity the high variance of rainfall in you Los Angeles record. Floods, too, plagued the world for the next decade. Nor was this calamitous impact confined to the New World; in Baghdad there

was no rain whatsoever those years. Then, as if the skies were recovering, in the manner of a stretched elastic band, a wave of erratic floods swept the world in the late 1880s. In the American western plains cattle had died by the thousands as the plains were seared by drought; soon enough these lands were pounded by blizzards in 1886 and 1887. That same year brought an oddly summery winter to the East, with trees budding in Central Park, a freakish warmth terminating with a mid March blizzard that would go into history as The Great White Hurricane, horses and

U.S. Senators perishing alike in twenty foot drifts that howled through the eastern seaboard. The following Spring weird rains blew out a dam at Johnstone, Pennsylvania, drowning thousands. On the other side of the world the Yellow River spilled its banks violently, drowning nearly a million Chinese.



It should be no surprise that even the financial markets were affected. In 1884 there was a major panic in American stock markets. Only recently has it been shown that in that same year, 1884, there had occurred an El Nino episode of great proportions.

I saw the lasting effects of the eruption even greater degree when I arrived in Ireland five years later, in 1888; it was my only visit to the land of my ancestors. I found it wet and gloomy enough, but was told by the natives that it was even worse than usual. I was fifty seven years old that year and my mood was as low as the weather. My book Ragnorak was selling poorly and I was disappointed at the reception given to my lectures on Shakespeare (though I was pleased to find Oscar Wilde and the Prime Minister in my audience). After chilly London I found myself greatly disheartened by my visit to that poor, oppressed, God-forsaken land of my ancestors. My future, at age fifty eight, looked lost and gloomy, and I felt that I could only grind my teeth and cry to heaven.

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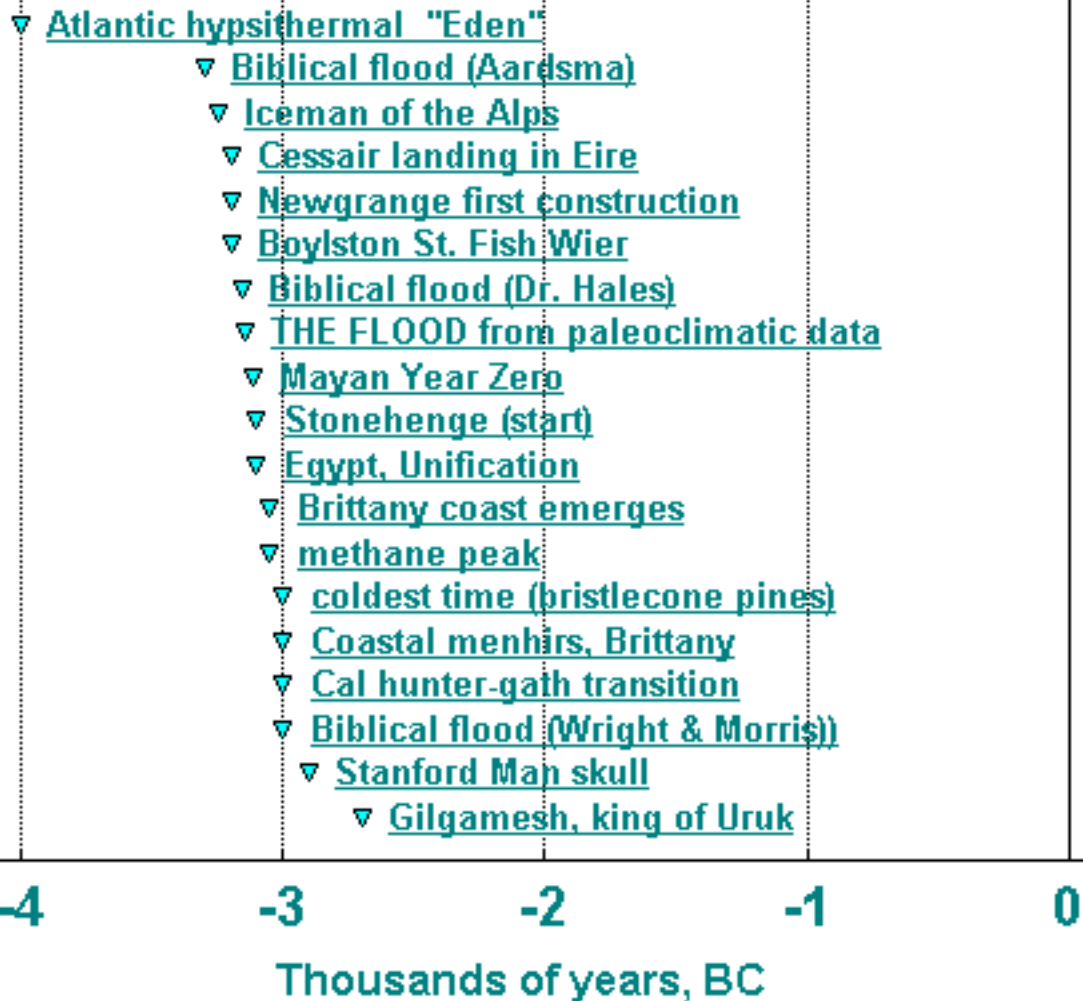
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ou are about to be presented with a graphical display depicting a remarkable coincidence of events that cluster within the brief time of one century - perhaps even one lifetime - at about 3100 years before the common era (or roughly 4500 radiocarbon years ago). Here you will see that events that have long dominated human culture, tradition, even shaping our consciousness and sense of origins and destiny; you will note how these correspond with remarkable faithfulness to a powerful event, probably of extraterrestrial origin, that shut the gates to an idyllic garden of idyllic memory and thrust the world into its current era of pain, agriculture, urban civilization, stress, algebra, political correctness, and writing. Is it not too much to imagine that we can find here at this date the very foundation of human consciousness?

The curious reader will find a full [narrative summary](#) and [index](#) of these events by linking appropriately.

Paleoclimatic "flood" events at about 3200 BC



FOOTNOTES

[1] Donnelly, Atlantis, 1882 (Julius Jaynes, Neal Stephenson, Snow Crash)

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Climate, Culture, and Catastrophe in the Ancient World

This page presents a summary narrative of and links to geological and paleoclimatological data bearing on the remarkable events of 3000 BCE (calendar years BC), when urban/technological society began. Most of our data comes from referenced scientific literature, although some of the studies, such as of the Mesopotamian delta, and certain sea level interpretations, are the author's. You will also find a handy chronological index HERE. A summary graph of events around 3200 BC will be found here.

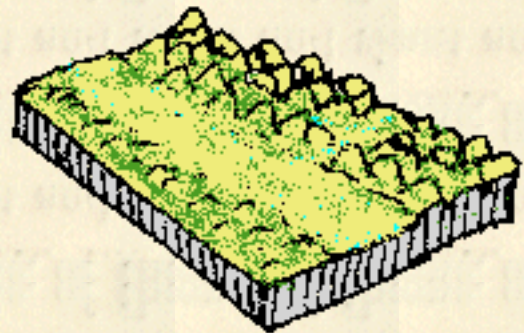
Illustration: Dry glacial climate in Near East, including Egypt and Mesopotamia. Monsoons are far to the south.

(20000 BC)

Comments?

In the beginning, the earth in a fitful sleep, (100000 BC), stirring in a night sweat every five thousand years. Last stands of (30000 BC) Homo erectus and Neanderthal. The end

of the Ice Age; (13000 BC) Slowly the great ice sheets melt away, from Chicago and Boston and Seattle and London, under the influence of an "altithermal" climate several degrees warmer than today. The sea level, which has remained some 350 feet below its present level for 100,000 years, begins to rise at a rate of ten feet a century.



Then, 12000 years before present, when the sea level had reached 100 feet below present level, something happened to interrupt the process; temperatures plunged 7 degrees, the sea level hesitated. This was the beginning of the Younger Dryas, (10500 BC) a millenium in which the circulation system of the North Atlantic went into a kind of planetary fibrillation, the African monsoons migrated southward, drying the desert. After a millenium, the end of the Younger Dryas (9500 BC) came about almost as quickly as it had begun, warmth returned to the North, and water to the deserts of the Near East. Again about 6000 BC, another abrupt cooling in Greenland, (6200 BC) this a short lived cycle, then a warming

for two thousand years the sun shining, a great green spring in the northern lands, the wolves retreating, as the planet entered the the mid Holocene altithermal.

I could not rest until I had written it out and then the great dread of my soul was that some accident would destroy the single copy & the world would lose a revelation.

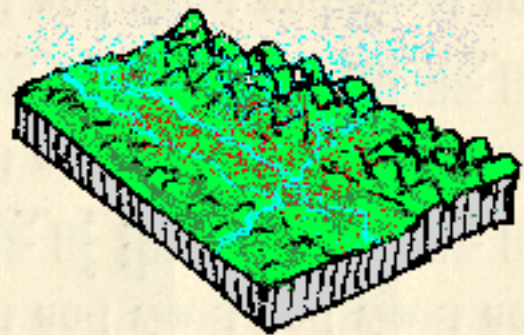
--Ignatius Donnelly, 1882, on the writing of his "Ragnorak, The Age of Fire and Gravel"

Consider Mesopotamia, the land between the rivers: warm and wet, interrupted by the aforementioned severe cold drought (6200 BC) Again, warm conditions returned and the sea rose again, now at about 50 feet below present level.

Illustration: We place the "Garden of Eden" in the lower Tigris-Euphrates (most recently the scene of the Gulf War) at the time of 8000 to 6000 yrs. BP (6000-3500 BC) at which time the temperature is warming culminating in an era warmer than present, when equatorial weather patterns may have reached farther north than at present, and the westerly storms of the north would have been confined to latitudes higher than at present.

(5000 BC)

Comments?



In those warm wet years a kind of Eden in Egypt (7000 BC) , Reported (5500 BC) Mid-Holocene flooding of Baltic Sea. a time of canoes and elephants. (3000 BC) This period the Atlantic or altithermal or hypsithermal, (4000 BC) with temperatures 5 degrees warmer than at present, raining all the time, Lake Chad one hundred feet higher until 3000 BC. The desert now supports game allowing hunting and herding or nomadic pastoralism. Predynastic Nagada (Naqadah) cultures. Evidence for this "Garden of Eden" can oddly enough be found almost everywhere; in California, the rings of bristlecone pines (4850 BC) near the Nevada border grew fat in the wet heat. By 4500 BC the favorable climatic conditions and stabilized lower alluvial plains favoring territorial control and mound building (4500 BC) among native American groups in the lower valleys. Slowing sea level rise at 10-15 below present level,

beginning of meander belts on (4000 BC) Mississippi River. In the San Francisco Bay area we begin to see a transition from hunter-gatherer to sedentary cultures. (3000 BC) In Santa Barbara the Mid Holocene Atlantic wet period features high human population growth (3300 BC) with increasing hunting, sea fishing, residential bases, status ranking, mortar and pestle use for large pulpy seeds, technology in general. This seems to be reflected as well in the central coast (3600 BC) as well as santa barbara basin off the coast (3250 BC) ; some principal evidence locally exhibited in the Stanford man (3020 BC) and Sunnyvale girl (3160 BC) burials in the San Francisco Bay area. Photos of the "Stanford Man" skull can be seen on "the skull". (3020 BC)

Elsewhere in the Mississippi valley we see a proliferation of native american mounds (3000 BC) starting at about 7000 BCE; See also sticks in boston (3100 BC) ; In New England coastal areas we find warmth and plenitude as represented by the great Boylston Street fish wier (3100 BC) discovered in the 1940s some 15 feet below sea level, In Europe, early agriculture (3500 BC) appears.

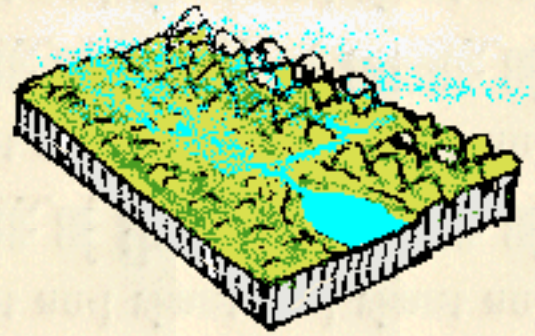
Toward the end of the fourth millenium ominous signs in the North. The upper treeline in alps (3500 BC) drops 100 meters in 3500 BC then rises to 2500 BC indicating a northern cold spell (and corresponding Near Eastern drought) at 3500. See also the startling iceman of the alps (BC) ; In the alps we see an Iceman; (3150 BC) see also iceman of the alps (3150 BC) ; At the same time the irish elm decline (4000 BC) occurs.

In recent years analysis of ice cores has yielded even more precise information. recent studies of the ice cores by the GISP2 team (3200 BC) shows a minglacial feezeup at about 5000 BP.

Illustration: Rain storms, climatic oscillation. Millennial-scale warming terminates with a period of climatic disturbance and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally administered culture based on irrigation.

(3500 BC)

Comments?



Sea Level Changes

Fairbridge cycles.... late Holocene sea level (BC) Holocene delta development worldwide (3500 BC) By 4000 BC sea level rise began to slow and deltas begin to form. The sequence of events along the coast is illustrated graphically in a diagrammatic sequence in "The End of Eden" (4000 BC) San Francisquito geology (BC) More locally view of San Francisquito creek development (BC) Recent data from the Han River delta (3500 BC) indicate a rapid sea level rise (3 meters) from 4000 to 3000 BC. The sea level curve of the Han river delta (3500 BC) does not contain enough data in the 4000-3000 BC period Huang Ho river (2900 BC) also the South Carolina sea level (3500 BC) South Carolina sea level (BC) ; The Fiji sea level (3500 BC) drops; the Fji sea level curves. (BC) show a one meter drop between 3500-3000 BC. For example, data collected by Atwater a few years ago in San Francisquito bay (3300 BC) features sea level stillstands (3000 BC) Also the Mississippi delta (3400 BC) In Iraq sea level, persian gulf (4000 BC) Studies of the Nile and holocene delta development worldwide (4000 BC) shows a similar sequence. At about 6000 BC something odd happened. This is recorded in an erratic sea level response all over the world; when the rise stopped rivers began to discharge their silt onto a constant shoreline. Deltas were built, with their rich loads of fertile silt. A notable example is the mesopotamia delta (3200 BC) in times leading up to the great flood. This is a condition that had not existed for 120,000 years. It is a history that is preserved to this day in most of the delta environments (6000 BC) of the world.

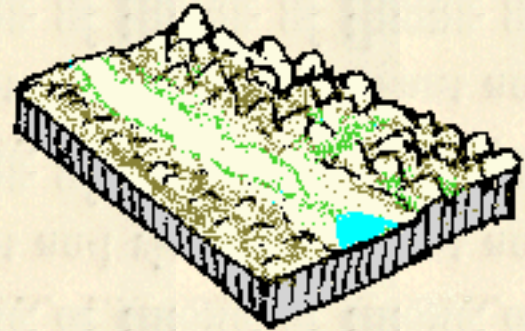
Mesopotamian and Nile Deltas

(3250 BC) In the middle East, Egypt's Nile delta (3250 BC) A core (5-44) taken at the south margin of one of the coastal lagoons at the north end of the Nile delta showed a layer of potsherds 25 ft. below sea level dated at 3,500 to 4,500 CYBP. egypt, nile (3090 BC) Similar evidence permits a reconstruction (by the author) of stratigraphy of the mesopotamia delta (4000 BC) showing the ancient city of Ur at the edge of a 100 mile flood basin.

Illustration: sea level rise and stabilization in Gulf of Persia, and accompanying warm, 4000 BC

(6000 BC)

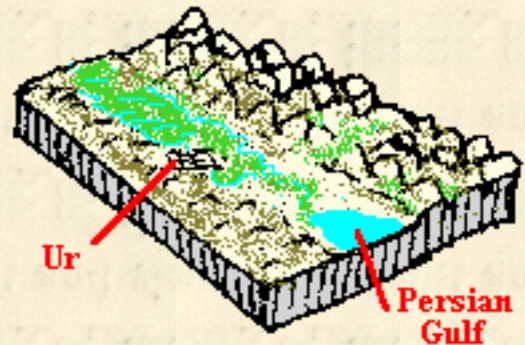
Comments?



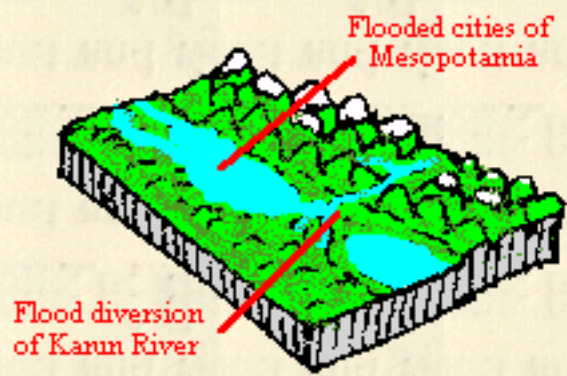
Lake Van oscillation (3150 BC) ; Ironically Ur is at the center of the recent Gulf War and notably very close to the area in which the "Gulf War Syndrome" reportedly originated. chemical gas poisoning (BC) tigris-euphrates (3200 BC) This sequence may be compared with other events in a Tigris and Euphrates comparative chronology (BC) . Beginning of the Sumerian king list culminates with Gilgamesh, king of Uruk. (2700 BC) Between Palestine and Mesopotamia, the lost city of Jawa. (3000 BC) Tigris and Euphrates alluvial plain (3500 BC) Irrigated society, 3500 BC

Sumerians in Mesopotamia (3000 BC)

The story of the great flood was told in the 1930s by Leonard Woolley. (3500 BC) dated later by Father Burrows (3700 BC) His associate the Jesuit epigrapher Father Burrows (3700 BC) presents an early Mesopotamian version of the flood story, Also this is the time of Pharaoh Sneferu at Meydum (3400 BC) ; sumerian influences on egypt (3000 BC) ; unification of Egypt (3100 BC) ; recent reports of ancient egyptians in palestine (3000 BC) . A dramatic rise in Dead Sea level near mt. sedom (3001 BC) occurs at this time. According to Lebor, as inter[erted by O'Rahilly... cessair (3200 BC)



The Flood (3150 BC) 3150 BC(?). Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level shortly before 3000 BC followed by 10-15 ft. alluvial deposition in river valleys.



The Great Shock of 3250 BC

(BC) ; Many other paleoclimatic events are summarized on the [paleoclimate data page](#) (3200 BC) . A period of [stormy weather](#)

(3250 BC) ; The sequence of events is shown in a [San Francisquito Creek history](#) (3250 BC) ; This period corresponds to the so-called palynological [Pora oscillation in Europe](#) (3250 BC) ; Elsewhere we see [natural catastrophes during the bronze age](#) (3000 BC) ; as shown on the [paleoclimate data page](#) (BC) ; [sierra cooling](#) (3100 BC) ; [gisp ice core](#) (3100 BC) ; Globally corresponds [sulfate in gisp2](#) (3250 BC) ; In Greenland [sulphate spike](#) (BC) ; [atmospheric methane](#) (3250 BC) ; [sulphate spike](#) (3150 BC) ; [camp century, greenland](#) (3150 BC) ; [yangtze river](#) (3110 BC) ; [methane peak](#), (3050 BC) ; [methane](#) (BC) ; Heckla eruption [heckla eruption, iceland](#) (3190 BC) ;

In the Americas [devon island](#) (3050 BC) ; [bristlecone pines](#) (3000 BC) ; [hemlock decline new england](#) (3250 BC) ; [elm collapse](#) (3270 BC) ; [july summer cooling, soviet union](#) (3300 BC) ; [wooden tracks](#) (3000 BC) [diamond pond](#), (3000 BC) ; [paleoclimatic flood, global](#) (3150 BC) ;

In the Americas: [a flood peak](#) (3150 BC) ; [huascarán glacier](#) (3250 BC) ; [general wetting western u.s](#) (3000 BC) ; [republican river](#), (3100 BC) ; [floods in netherlands](#) (2970 BC) ; [pine bursts](#) (3250 BC) ; [pomme de terre river](#) (3200 BC) ; [end of alluvial period](#) (3100 BC) ; [new data from peru](#) (BC) ;

Significant archeological finds of this period include: [belgian coastal monuments](#) (3300 BC) ; [brittany coast emerges](#) (3050 BC) ; [newgrange megalithic tomb](#) (3075 BC) [newgrange megalithic tomb](#) (3075 BC) ; [carnac megaliths](#) (3000 BC) ; [mayan recreation](#) (3113 BC) ; [ancient french trapper](#) (3000 BC) ; [french coastal megaliths](#) (3212 BC) ; [stonehenge \(start\)](#) (3100 BC) ; [newgrange start](#) (3250 BC) ; In Europe [irish oaks](#) (3199 BC) ;



mile if you wish at the prophecies advanced so far-- I take no offense at it-- imagining Mr. Donnelly's ancestors with their belief in fairies and pots of gold appearing in the midst of magical snow showers in mountain passes. (But please note for future reference the presence of snow as a lucky omen and the nature of fairies being not necessarily friendly!) Perhaps I will add to your

amusement by recalling that it was long the custom among the wisest of those ancestors, the Druids, to hold whispered consultations with oak trees by which means they determined both the past and divined the future. Druids. *Druidhen*, in the tongue of my ancestors, the ancient Gaels: "knowers of oak trees"



It was Julius Caesar, as we all learned in high school, who befriended one of these Druids and told of their practices, their twenty years of schooling, their uncanny skill in natural philosophy and astronomy. Even in those days the practice of prophecy by that strong-limbed monarch of the forest was ancient; who can doubt that it was again these very same *druidhen* who taught the early Greeks to seek the oracle in the oaks of Dodona, the shrine of Apollo. Indeed are not the ancient wise people, the Merlins and the Gandalfs, (progenitors of many of you learned professors with us this evening!) are they not the Indo-European cousins to the Brahman of India? It is a truth which can be demonstrated quite readily by whistling the first

few bars of an Irish or Scottish or Bretaigne air, in the elevator of a building or some such confined space, within which the passengers of the Indian or Pakistani nationality are confined; for you will see, as likely as not, that on suddenly cessation of your Celtic air, your companions will quite unconsciously take up and complete the tune at the point where you left off.

Ah yes, Talking oak trees! Fairy airs! What else indeed does Mister Donnelly have in store for you this evening! Namely this: I am now going to suggest that the practice of oak tree divination is alive today, and in fact comprises one of the most respectable branches of science. The proof of this is as follows.

There is a certain schoolmaster from Ireland, Professor Baillie by name, of the Queens University in Belfast, who undertook, in the 1970s, a quest of a curious sort but most pertinent to our inquiries.

No doubt you have heard tell of how from time to time the colder, more frigid latitudes of the earth yield up ancient corpses, miraculously preserved. Among the most fertile grounds for such discoveries have been the bogs of Ireland and other countries of the British Isles, and of the Scandinavian countries too, and altogether we can count some 1500 human specimens collectively known as the bog men who have been turned out of the earth and examined over the years. Many of those dating from the iron age or earlier, you may find it curious to hear, were determined by scientific tests to have been drowned in vats of beer and stabbed and garroted; a thrice enacted execution, it having been the custom in druidical sacrifice to kill the victim three times over. Others of these poor creatures seem to have died of causes apparently of an accidental nature, but these too have their messages to us, as we shall see in that most famous instance, the so-called ice

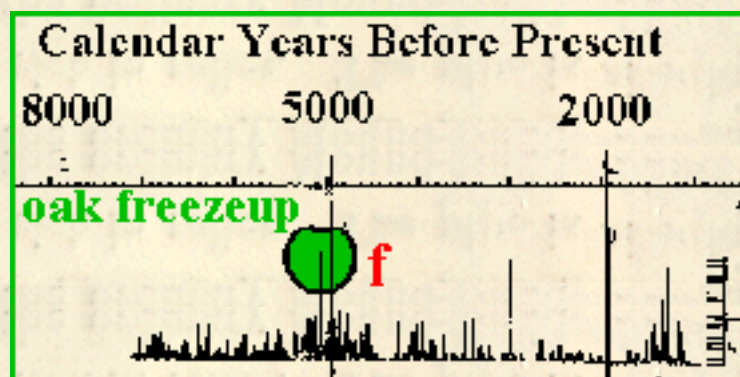


man of the alps. I am told that the remains have even been presented on your television; and there may be many here tonight who have seen photographs of his implements, his fine bronze axe, his clever pouch of herbal remedies, and you may have heard too of certain mysteries that have persisted about the discovery of the body (not the least of which were the poor man's missing genitals, and certain other physiological oddities, that, being unconfirmed at the present, and of possible scandalous character, I shall not here discuss.) But I will note a matter of no little significance to us, that being that the blades of soft green grass found in the shoes of this mountain man, placed there to warm the feet, provided organic substances, the age of which could and was determined by atomic measurement --the carbon dating technique of Professor Libby-- showing indisputably that the death had occurred within a few years of 3150 BC. I shall ask that you keep this remarkable date in mind.

Returning now to Professor Baillie, (whose new book is soon to be published); he had long been fascinated by these bog men. Would you not be similarly attracted to the idea of actually having a conversation with your ancient ancestors? He, as a man of science, accordingly devised a plan of studies to understand the circumstances of the times in which they had lived.

Naturally these human bog specimens were rather rare, and their ownership jealously disputed by various museums and collectors; but the professor, lacking a

sufficiency of these boggish companions, devised an ingenious alternative scheme in which he set out to accomplish the same



divinatory ends; this accomplished by exhuming up pieces of oak wood, which could be found in considerable greater abundance in the bogs of Ireland wherein they had evidently toppled during some ancient storm, or in the Scottish lowlands, and even in gravels of the rivers of Germany, the Rhine and the Main.

Let me proceed directly to summarize one of the more remarkable findings of the Professor, as presented in the recent paper of Baillie and his associate M. A. Munro, in which it is described how they recovered in a certain bog in Ireland some time ago an ancient oak, which when it was exhumed, exhibited rings, 220 of them --not an unlikely age for an oak tree --which fell into a certain pattern that some might describe as a kind of music; and by laboriously comparing the melodic pattern of one such log with a multitude of others, the pattern of an entire oakish symphony could be eventually discerned, which melody could even, with sufficient juxtapositions of specimens, be carried through until the present day. And what was found was that of all of the rings on this particular tree, (which was determined by the carbon dating method method foregoing to have lived and perished during the middle of the second millenium BC.) there were a few rings that were narrow and cramped, showing that the tree had a hard time of it for a few years, in the manner of a bit of life that must weather a storm that never seems to end, years without summer.

Now you no doubt know that we Northern people hold such times of coldness in respect; for much as the peoples of the South fear the seven years of drought that follows times plenty, we of the north fear the years without summers, and this tree, sited next to a bog in the north of Ireland, told a tale of such a time, speaking in the language of its rings, telling of this time of extraordinary harsh winters. And what Professor Baillie was able to show by patiently counting those rings was that the year of this severe winter was none other than 1620 BC, and that it lasted in fact for several years. And what is of great interest here (as some of you of classical bent may know) is that this was the very time that a great eruption occurred on the volcano Thera, the isle of Santorini, in the faraway Meditteranean, a time when

fright and darkness fell over that sunny part of the world, signalling the end of a great civilization, it being the era when the Exodus took place. And is it not a remarkable thing that these momentous events, passed down to us over a hundred generations in our stories and religious writings, were known and even now are retold by a humble oak tree in that distant corner of the world, Ireland!

No doubt this will set your mind to thinking of other dimly remembered events of ancient times, among them the story of Atlantis, or the diverse biblical wanderings of the Hebrews and their friends and enemies.. Then too there is the story of the terrible three winters without summer told by our neighbors to the North in Iceland in their famous legend of the deadly three winters of Ragnorak...

These events are attributed by some scientists to atmospheric dust veils of probable volcanic or extra-terrestrial origin. They will point out corresponding signals in the world wide record, showing that the such eruptions characteristically cause a great fog to envelope the world, lowering the temperature several degrees, leaving their marks on the North Africa and concluded that these oaks tell of the temperature of the sea in the most magical parts of Ireland, the Southwest.

What are we to make of this? That there were climatic aberrations of a severe sort in not only the Meditteranean but the world as a whole in the 1600's echoing an earlier episode of catastrophe in about 3200 BC. The first of these we may associate with the dimmest known biblical events -- migrations, Egyptian and Babylonian captivities, etc (the Bible having been put to writing about 700 BC) and the second, the disaster of 3200 BC, we shall return to later.

FOOTNOTES

[1] Baillie, MG and Munro, M.A. "Irish Tree Rings, Santinori, and volcanic

dust veils." Nature, 332,334 (1988).

[2] The illustration shows the width of tree rings in Irish oaks. Narrow rings indicative of adverse conditions can be seen at 1153 BC, 1628 BC, 3199 BC, and 4377 BC. The 3199 BC value is associated with an acidity peak in Camp Century ice cores dated at 3150 BC, demonstrating unquestionably that adverse weather conditions, probably due either to atmospheric aerosols occurred at this time. Other narrow years are associated with frost rings observed in California bristlecone pines and with eruptions of Icelandic (Hekla 3 in 1159 BC) and Aegean (Santorini in 1628 BC) volcanoes.

[3]Plato:

Phaedrus: Socrates, you easily make up accounts (logos) from Egypt and any countries you wish!

Socrates: Dear boy, the priests in the sacred precinct of Zeus at Dodona say that prophetic words first came from an oak tree. In fact, the men of that time on account of their guilelessness (lacking the wisdom you young people have) were content to listen to an oak tree and a rock, provided they spoke the truth. -- *Plato, Phaedrus*

[4] Pliny: "*Here we must mention the awe felt for this plant by the Gauls. The Druids - for so their magicians are called - held nothing more sacred than the mistletoe and the tree that bears it, always supposing that tree to be the oak. But they choose groves of oaks for the sake of the tree alone, and they never perform any of their rites except in the presence of a branch of it; so that it seems probable that the priests themselves may derive their name from the Greek word for that tree.* In fact, they think that everything that grows on it has been sent from heaven and is a proof that the tree was chosen by the god himself...*"---

Pliny XVI, 249. Other sources indicate that the mistletoe, though commonly found on apple trees, only achieved sacred recognition when it grew on the oak. Analysis of the stomach contents of recently exhumed bodies of people evidently executed in druidical rituals show that their stomachs contained pollen from the mistletoe.

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excerpt from **Ragnorak, the Age of Fire and Gravel**

But gradually the heat begins to dissipate. This is a signal for tremendous electrical action. Condensation commences. Never has the air held such incalculable masses of moisture; never has heaven's artillery so rattled and roared since earth began!

Condensation means clouds. We will find hereafter a whole body of legends about "the stealing of the clouds" and their restoration. The veil thickens. The sun's rays are shut out. It grows colder; more condensation follows. The heavens darken.

Louder and louder bellows the thunder. We shall see the lightning, represented, in myth after myth, as the arrows of the rescuing demi-god who saves the world. The heat has carried up perhaps one fourth of all the water of the world into the air. Now it is condensed into cloud.



We know how an ordinary storm darkens the heavens. In this case it is black night. A pall of dense cloud, many miles in thickness, enfolds the earth. No sun, no moon, no stars, can be seen. "Darkness is on the face of the deep.

Day has ceased to be.

Men stumble against each other. All this we shall find depicted in the legends. The overloaded atmosphere begins to discharge itself. The great work of restoring the waters of the ocean to the ocean begins. It grows colder-colder-colder. The pouring rain turns into snow, and settles on all the uplands and north countries; snow falls onto snow; gigantic snow beds are found, which gradually solidify into ice...glaciers intrude into all the valleys.."

FOOTNOTES

[1] Text and illustrations from Ignatius Donnelly, Ragnorak, The Age of Fire and Gravel. Donnelly goes on to describe a post-cataclysmic era of rain and snow, followed by tremendous floods. Written in seven weeks starting in May, 1882, this 450 page book predicts the end of the world by comet impact. "I could not rest until I had written it out and then the great dread of my soul was that some accident would destroy the single copy & the world would lose a revelation," he wrote of the work.

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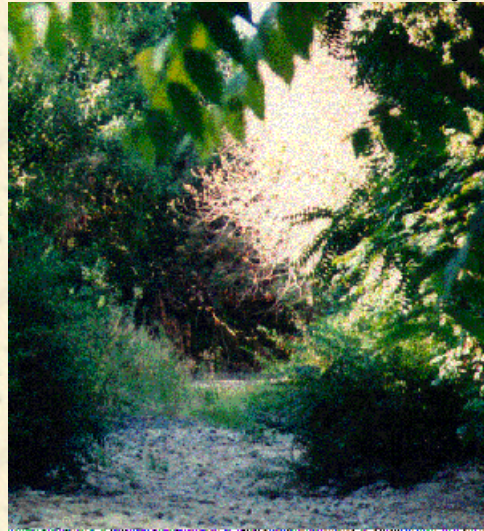
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What do you seek in uncertain times? I believe it is a measure of assurance obtainable only by prognostication. I aim to satisfy this by three means.

First by calling to the stand as witnesses certain bones. The testimony of the bones!

Recently I visited the site of a remarkable find. It was in a shady glen, a grotto carved out into the bank of San Francisquito Creek, about fifteen feet below the street level, not far from the original residence of Senator Stanford (a contemporary of mine who bought much of the land flanking the creek in the 1880s, a time when my great real estate speculation had dissolved into a fiasco and I was recovering from that blow by writing my



famous book on Atlantis[1]) There has subsequently been been at least two skulls found at this same location. The first in early 1922, in April or May, by a student named Bruce Seymore. He



found the skull sticking out of those gravels about 6 feet above the ground. This young man took the skull to Professor Willis of the geology department who after returning to the creek to photograph the skull at the point of its discovery, advised a friend of his, Doctor Alex Hrdlicka, of the National Museum.

My Dear Doctor Hrdlicka: Although it is more than 12 years since you and I rejuvenated an ancient man in South America, you are, I notice, still interested in our older inhabitants and I would, therefore, call your attention to a skull, which we have recently found in the alluvial gravels of this immediate vicinity...

Soon after the doctor wrote back saying that he thought that the skull was probably not much older than ten thousand years, humans of those days being at best very scarce on the continent. Professor Willis had judged that the geological deposits in which the skull was found were more than four thousand years old. Considering the extreme difficulty of absolute dating in those days, these estimates, bracketing it between four and ten thousand years old, are remarkably good, as subsequent events were to show.[2]



In the spring of 1963 part of a human vertebra was exposed on the other side of the creek, nearby, at a depth of sixteen and a half feet. The skeleton was excavated by Stanford University Professor Bert Gerow and some students who discovered it to be a young man who had been buried oriented North seventy degrees east along with three arrowheads of Monterey chert, two rodent incisors, an eccentric pebble of probable marine origin, and a fragment of the milk canine of a large carnivore, probably a bear. There was enough charcoal to date the burial at 4350 and 4400 radiocarbon years before present. Depth of burial was sixteen feet below the level of the present ground.

3000 BC [3]. A thousand six hundred years before the fall of Troy!

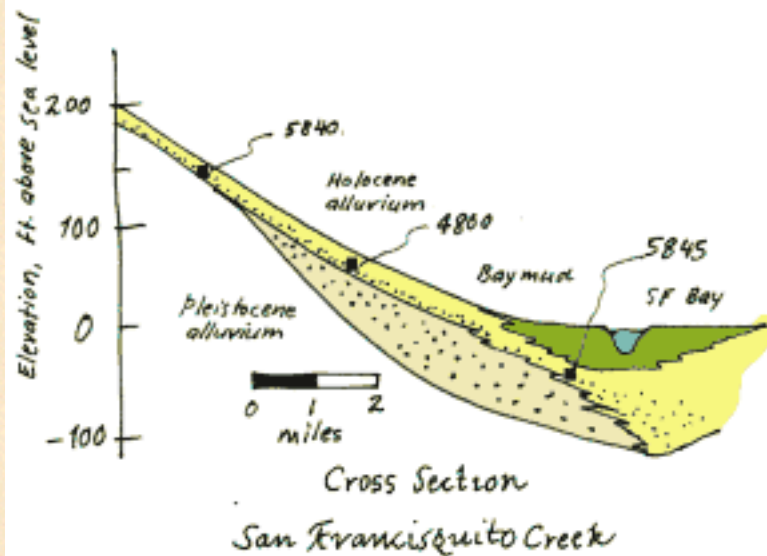
FOOTNOTES

[1] Donnelly, Atlantis, 1882

[2] One senses that an objective of this academic interest was to demonstrate the antiquity of man, thus denying the prospect of special creation. See Gerow for background on these finds.

[3] Radiocarbon years are subject to correction (add 600 years in this age range) to attain our conventional calendar years, which I shall here set forth in the traditional BC/AD form.

[4] Note the stratigraphic position of the skull at the point indicated as being 5840 BP.



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A short life of

Winfrid Boniface

Apostle to the Germans, dispeller of Celtic heresies, Enemy of the Oaks, gloriously martyred at a place later marked by a miraculous spring of fresh water, With direct quotations from his biographers

Willibald (AD 775) and *Greenway (AD 1955)*





was born on November 3, 1831. A chubby boy, I was possessed from the beginning with an imagination on fire. My father, an Irishman from County Tyrone (related, he claimed, to the O'Neils) was a peripatetic scholar and a dabbler, a wit and a freethinker, who read Bacon and studied medicine but perished of typhoid caught from his first patient. My mother



MOTHER

was an Irishwoman as well, tough and hard as the breed can be, but a lover of wit and irony and oratory; she insisted on the highest achievement in Chaucer and Shakespeare, Milton and Spenser. Language was the road to success in my day. Perhaps you no longer believe this to be true.

Once I wrote to Oliver Wendell Holmes, seeking his advice. I received this reply from the great man, and I pass it on to you for its wisdom.

I will give you then a little of the advice which you have courted, with a free tongue but kind spirit. You have the inward adjustments which naturally produce melody of expression and incline you to rhythmical forms, of which you will easily become a master. You are a bright

scholar, who has read a good many books and perhaps have a little too much fondness of ornamenting your own composition with phrases borrowed from what you have read ---very fairly credited to your sources to be true, but perhaps a little too freely interspersed. You have a quick eye and a smart wit of our own dangerous gifts, which like young colts must be bitted and broken before they can become trusted servants. Whether you have the higher requisites which make up the true poetical character or not, I dare not undertake to decide on the strength of a school exercise. .

Seventeen years old! What a blessed reach of future lies before you, with talents and ambition to urge them on to excellence But you must remember that you are in your pupilage now, and that what you write as a boy will be judged of by the public without those allowances which friends and a limited circle of acquaintances know bow to make. No judicious friend would advise you to print this gay production of your boyhood, or youth, if you choose to call it so. . . . No sir, I hope you are man enough to know that if at your age you have done well, in a few years you can do much better; that study, reflection, the natural ripening of the crude juices will do for you what they have done for all the great minds that have born fruit worth gathering, Be patient-do not listen to partial friends, choose subjects worthy of sincere effort, whether grave or gay,--- subdue the rank luxuriance of your infancy and language by studying the pure models and by and by we shall hear of Ignatius L. Donnelly.

Who today writes such letters? Do you find it amusing? Do you believe that the elements of successful endeavor suggested by the great man should today be replaced with "computer skills" and "marketing"?

So typical of Victorian Yankee advice? The belief in regularity, probity, impartiality, to replace the evils of rank luxuriance!

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studied law and was admitted to the bar at age twenty two. It was customary in my time for young men to go out into the world on a kind of quest, and to this end I chose Minnesota as my destination. Arriving there I decided to found a great city on the Mississippi. Such a dream! It was my scheme that Nininger City, 17 miles south of St. Paul, would rival Chicago. I built a fine home there with a library that had a great iron stove and shelves of books.



SON

Unfortunately, following the real estate crash of 1857 I found myself the sole resident of this metropolis. But of course one must rise again at these disappointments. You must consider, of course, that I was still a young man, age thirty two; I am told that this is an age when many young people today are only applying for their first job. I believe that you call them "careers." Under the circumstances of my setback I decided that it would be necessary to learn to farm wheat, subject myself to the contingencies of weather. The vagaries of markets, blown this way and that by winds from Europe, by events in the most remote regions of the world, would teach me a good deal of life!

It seemed to me that politics would be a necessary ingredient in fulfilling my ideas for a better world. In 1863. I ran successfully for lieutenant governor. I accompanied my troops in an expedition against the warring Sioux Indians. I understand that your contemporary treatment of this matter is rather sympathetic to the natives and I shall not dwell on that adventure out of sensitivity to your beliefs. Let me only say that I made lasting friendships with the natives. I much enjoyed politics, was known favorably for my speechmaking, and was elected to congress.

Soon thereafter my political life was beset by difficulties. Trouble began in 1868 where my sometimes querulous nature earned me powerful enemies among those whom I had vigorously denounced as the "the few who seek to grasp all power and wealth". These same men, mainline Republicans, soon saw to the termination of my political career. In 1879, at 49 years of age, I lost a key election to William Washburn, brother of the Secretary of the Treasury who had been my sworn enemy in Washington. I now found my political career at an end, and little to do either supporting my family or keeping my active imagination at work. On November 3, 1880, age 49, I wrote in my diary the future looked bleak indeed:

"This is my forty ninth birthday and a sad day it is...All my hopes are gone, and the future settles down upon me dark and gloomy indeed. My life has been a failure and a mistake. My hopes have so often come to naught that I cease to hope. All I can do is face the music and take my damnable future as it comes."

Returning to my solitary house at Nininger, I involved himself in more settlement schemes, gave lectures and speeches on Shakespeare, and became an active member of the Grange, a new organization that aimed to promote the interests of poor farmers such as myself, whipped and sawed as we were by powerful capitalist institutions, eastern banks and railroads.

My enemies disapproved of my rhetorical style or skill, and even today if you review the description of my life in your biographical dictionary you will find it said that I "possessed in exaggerated degree the talent of his race for public speaking".

Do you doubt that we Irish know nothing of racism? In politics as well as conversation, according to this particularly snide entry by one J.D. Hicks, I am said to have made it my concern "to espouse unusual and unproved theories". Perhaps there is truth to this, but is such a view, that truth is a matter of rhetoric, that the facts are rarely simply the facts as presented, but that those presentations of facts are always interlarded with interpretation, to be condemned? Once in a moment of despair I wrote in my diary "Metaphorically speaking there was nothing left to me but backbone and fists." "We shall fight on," I said on the lastday of the year 1880.

Meanwhile I learned that a Philadelphia upbringing, amply fertilized with training in classical rhetoric, made me ill suited for mending harness and planting. My dear wife -- these were anxious and unhappy years for her, living in the rural west under difficult circumstances -- went so far as to accuse me of being an incompetent at the business of farming. It is true that the winters were dreadful. My principal comfort was the reading matter I obtained on occasional visits to the St. Paul bookseller, D. D. Merrill.

But life was of course not all disappointment. I had two children whom I loved dearly. Nonetheless, recognizing the dangers - especially to those of Celtic temperament - of withdrawn absorption unbalanced by bursts of public action and creativity, I searched for a project. It was in such a frame of mind, in the dead of winter of 1881, that I sat down to consider how the world might end.

FOOTNOTES

[1] Donnelly, Atlantis, 1882

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ood evening, dear
reader.



My name is Ignatius Donnelly; politician, failed but visionary land speculator, attorney, orator, farmer, historian, scientist, idealist, congressman, poet and novelist, affectionate husband and father, a man of generally liberal and sentimental disposition. I was born in the year 1831 and departed this planet in what can only be regarded as prophetic timing on January 1, 1901, the first day of the twentieth century. I have the pleasure and honor of rejoining you here (you will note my rather ghostly form) at the approach of the hundredth anniversary of my passing and the great dawning of a new millennium. I intend to provide you with an evening of religion, history, and prophecy which I believe you will find entertaining and pertinent to your most intimate and contemporary concerns -- many of them I should say are precisely those that filled my mind a century ago. Moreover I propose to embellish these insights of the traditional sort with the best and latest of your marvelous scientific findings on such diverse topics as climatic change, both ancient and modern; emergent and frightening health concerns (including those two great world epidemics of your age, AIDS and Lyme's disease); and physics, both global and astral. What I have to say to you this evening will affect the planning of your careers, the

management of your investments, the creation and reordering of your family and spiritual life.

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READERS' DISCUSSION

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I want to say it is a pleasure to visit you here in your beautiful state of California. During my times, now more than a century ago, many of my countrymen, fleeing a great disaster in their own land, came here to settle on the lands of this fine peninsula, some establishing themselves not more than a few minutes walk from where I stand.



Ireland or California? Both of these western coasts have represented the edge of civilized life for eight centuries.

Many of these Hibernians found rights, privileges, and opportunities denied to them in the eastern United States, enjoying feelings of relief at having reached this distant lovely western land by the sea, so reminiscent of the green valleys of the West of their Ireland, washed as they are by the warm waters of the Gulf stream.

These and countless other similar tales that made their way to us from California in the last century bring to mind the observations of that medieval bishop, Gerald of Wales, on his

visit to Ireland in 1183. Gerald's report *The History and Topography of Ireland* remains one of the fullest descriptions of late medieval times in that island, which alone in Europe had never felt the yoke of Roman conquest. Gerald found in Ireland a land of health and springtime, in which there were countless marvels, fish with teeth of gold, a woman who made love with a goat, birds born of barnacles, a stone cup that flowed over with wine. In many odd respects the Ireland of these days might be taken as the model of California as this land was found by the early American settlers. Indeed even today I am told that many eastern Americans consider California to be a place of exotic and even outrageous character, not too far different perhaps than the way Gerald saw Ireland some eight hundred years ago:



And there, when I had seen many things not found in other countries and entirely unknown, and at the same time worthy of some wonder because of their novelty, I began to examine everything carefully: what was the position of the country, what was its



nature, what was the origin of the race, what were its custom; how often, and by whom, and how, it was conquered and subjugated; what new things, and what secret things not in accordance with her usual course had nature hidden away in the farthest western lands? Just as the countries of the East are remarkable and

distinguished for certain prodigies peculiar and native to themselves, so the boundaries of the West also are made remarkable by their own wonders of nature. For sometimes tired, as it were, of the true and the serious, she draws aside and goes away, and in these remote parts indulges herself in these secret and distant freaks.

It has sometimes been said of the Irish in America that they refused to enjoy their good fortune and success that though many of them settled here and raised families and established their churches there was about them a certain restless fatalism, a tendency to go from shirtsleeves to shirtsleeves within a few generations.[1] There are those who would attribute this misfortune to the unsteadiness of the Celtic spirit.[2] But I am going to suggest to you that there may be other reasons too, having to do more with the ancient Celtic perception of the unsteadiness of the world, the inconstancy of nature's blessings. The Irish, like the Jews and the Armenians and certain Asian peoples, consider themselves as exiles. As Gerald says, quoting the Roman Lucan *the gods easily grant great blessings, but do not easily maintain them*.

It may be said by many that it took the coming of the Protestant, namely Leland Stanford and his wife, to bring order and harmony to this place, to transform the land from a wild and abandoned wilderness into the garden that it is today. And it is true, as you shall see, that nature cooperated marvelously in this transformation, causing the rains to become more steady and gentle as they have been these past hundred years. But there is a fair question to be asked here. Was there not a bit of passing luck to all this? Is it not possible that has time now run out? Are we not sensing a new kind of irregularity returning here, and to the world at large? Are we not seeing once again in the air about us a kind of inconstancy, the suggestion that nature has now withdrawn her favors and is now becoming peevish? This is a great question, one that I know you ask yourselves in many ways, and it is the question that I shall, after a short quotation from my writings and some suitable autobiographical diversions, proceed to address.

FOOTNOTES

[1] It is true enough, to cite a local example, that Dennis Martin of Menlo Park (named after his Irish village) died a poor man, having bitterly quarreled with his daughter and losing his hard-earned wealth and land in litigation.[2] See for example Mathew Arnold: *Sentiment is, however, the word which marks where the Celtic races really touch and are one; sentimental, if the Celtic nature is to be characterised by a single term, is the best term to take. An organisation quick*

to feel impressions, and feeling them very strongly...keenly sensitive to joy and to sorrow...If the downs of life too much outnumber the ups, this temperament, just because it is so quickly and nearly conscious of all impressions, may no doubt be seen shy and wounded....[3] The Irish believe that they came to their island from Egypt where they had been especially favored by Moses.

NEXT

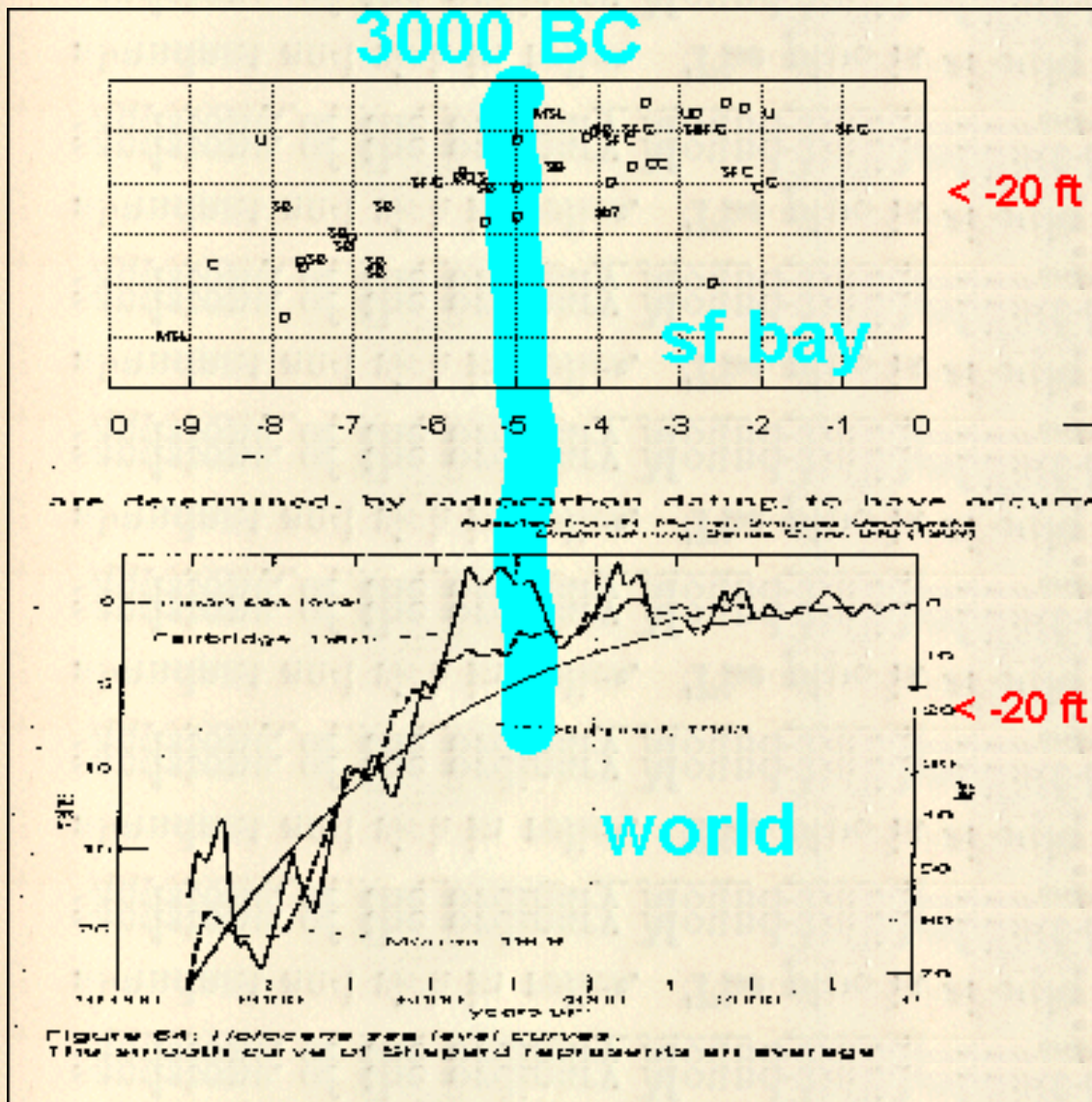
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We are interested here in late Holocene sea levels and their effect on human geogrpahy. A recent survey of 36 world wide Holocene deltas indicates that delta formation began about 8000 (cal) years ago (6000 BC) when sea level was roughly 50 ft. below present level. (1) The isotope and sea level curves indicate a sudden drop in level (values of 5-15 cm/yr) of about 14 meters (more than 40 ft.) at this time. Subsequent smaller (1 to 5 m) catastrophes have occurred since this time and show up on abandoned beach strands in Denmark. (2)

Presumably life in lower river valleys was precarious until the rise in sea level decelerated at about 4000 BC.



Along the Belgian coast, recent work shows that "two rather distinct retardations appear to be present; a more marked one at about 7500-7000 cal yrs. B.P. and a second one at about 5500-5000 yrs. cal B.P."(3)In other words, sea level rise was temporarily reversed at these times.

The idea of irregular sea level rise, introduced by Fairbridge (1961), and

subsequently dismissed by uniformitarian interpretations, has recently been reinforced by analysis of Australian coral reefs(4). Fairbridge's sea level curves are discussed in the Encyclopedia Britannica. They had been suppressed in favor of the more uniform curve of Shepard, though the irregular model is now coming back into vogue with the return to respectability of more catastrophic ways of looking at the data.

The upper graph shows C14 dates for muds and vegetation in the San Francisco Bay and delta; C14 dates have been corrected to give calendar years, and the effects of autocompaction have been removed. Comparison of these data with the world wide data shown in the lower curves provides reasonable latitude for short term sea level regressions without proving them. It also appears that the the data are in close enough vertical agreement to suggest vertical crustal stability in the late Holocene in San Francisco Bay, though this is not the conclusion of Lajoie and the other authors of this USGS study.

FOOTNOTES

- (1) Stanley, D.J. and Warne, D.F. (1994), Science vol. 265, p. 228.
- (2) Tanner, William F. (1995), AAPG Bulletin 79/10, p. 1568.
- (3) Denys, L. and C. Baeteman (1995), Marine Geology vol. 124, p. 16.
- (4) Jarcombe, P., et al (1995), Marine Geology vol. 127, p. 1-44.
- (5) van de Plasshe, O. (1995), Marine Geology vol. 124, p. 117.

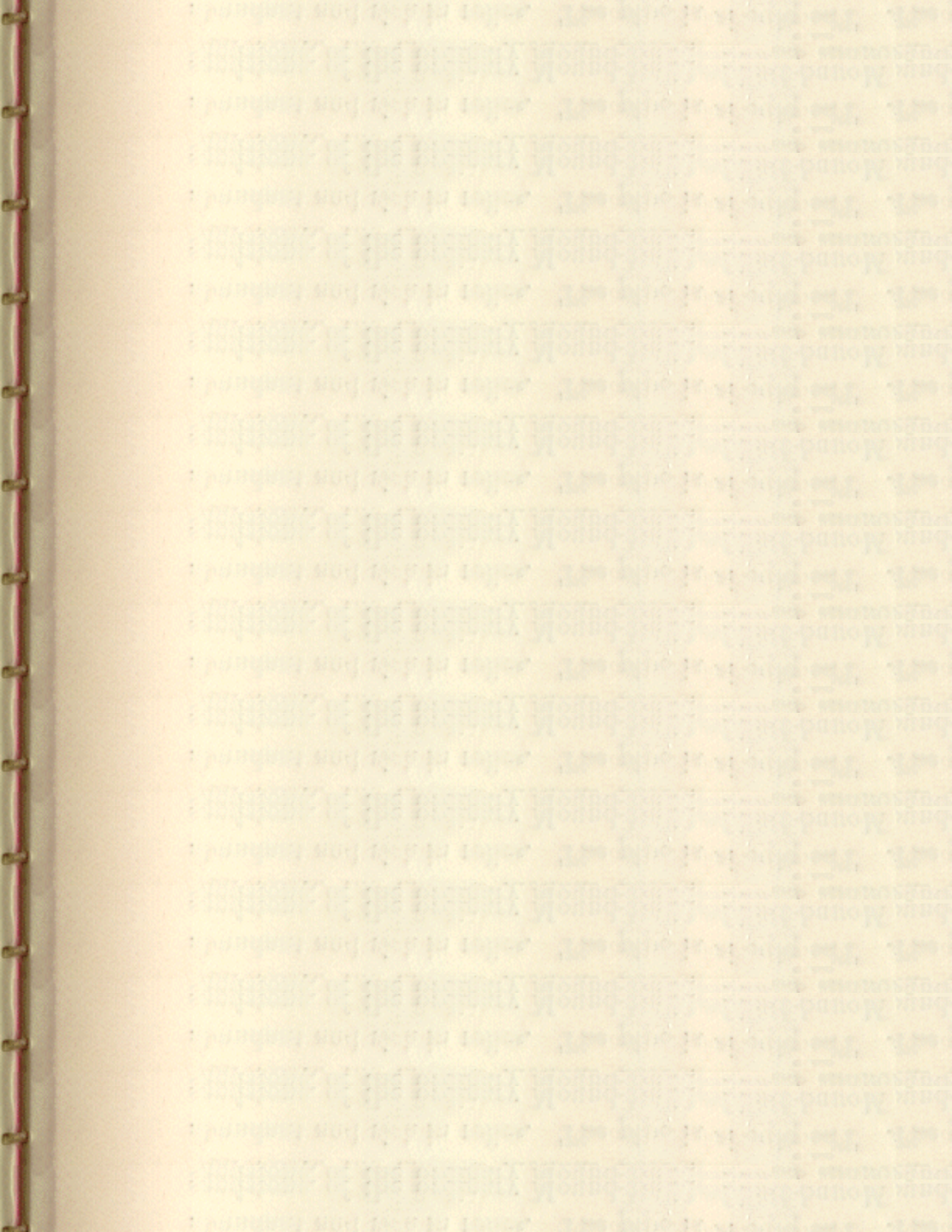
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Appendix: What on Earth Happened in 3200 BC?

What do you think? [Comments?](#)

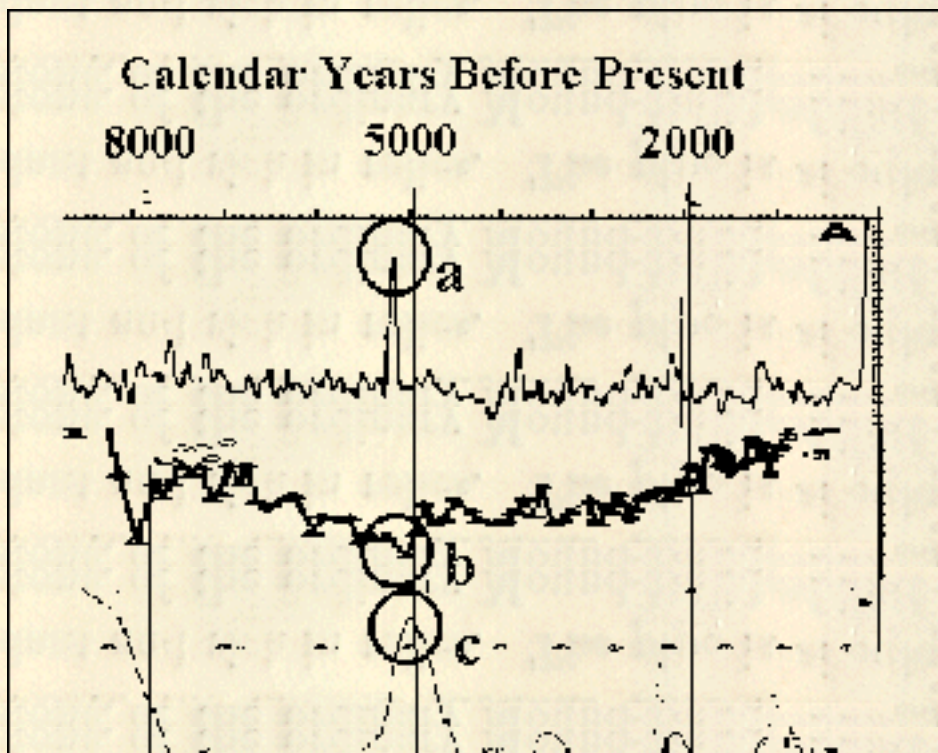
Patience! This takes a minute to load but the information is worth it!

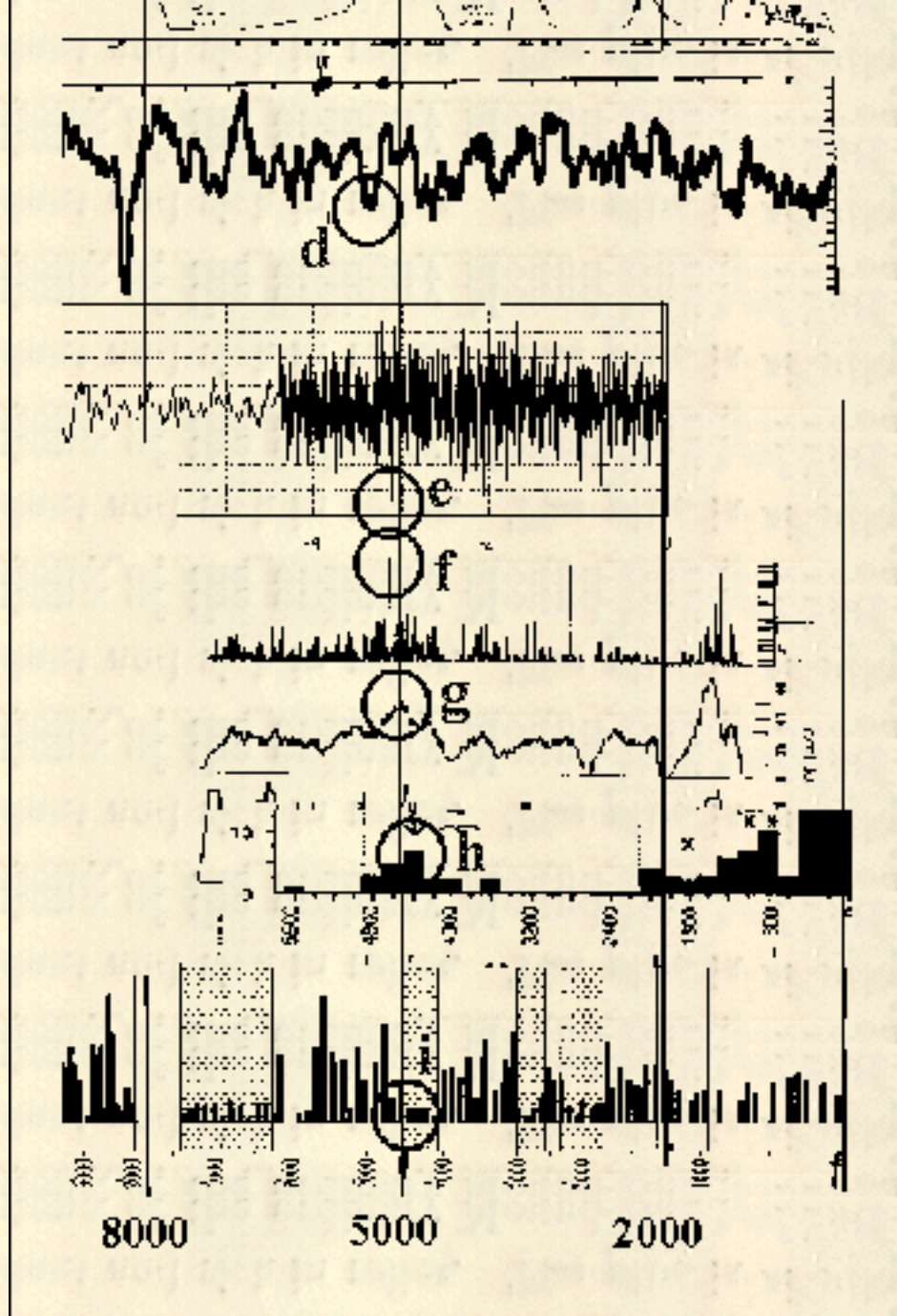
For the latest from the GISP2 team (Jan 96 Science) click [HERE](#) (takes 30 sec to load). For a lighter, less technical version of this page click [HERE](#).

For indices of all 3200 BC scientific data:

Click for [chronological sort](#)

Compilation of recent graphical representations of various paleoclimatic data signals from ice cores and other sources normalized to a common 9000-0 calendar year BP base. Most of the plots are scanned directly from the original sources. Brief technical notes relevant to the 5000 yrs BP period and data sources follow.





a) Sulfate in GISP2 ice core; curve is a low-tension robust spline of sulfate concentrations with average about 30 ppb. The cause of the 150 year peak at 5.2K yrs BP is not known, but the authors suggest the possibility of an anomalous nearby temporary body of open water (polynya) which generated marine biogenic sulfate. Zielinski, GA et al, *Nature*, 264 948 (1994).

b) Atmospheric methane from GRIP ice core with lowest value 580 ppbv at 5.2K yrs. BP followed by rapid increase of 40 ppbv over 200 years; variously attributed to clathrate or permafrost outgassing, decrease in tropospheric oxidation, or abrupt increase in low-latitude wetlands. Blunier, T, et al, *Nature*, 374



c) Dead Sea levels peaking at 300 ft. above present levels at 5.0 and 8.0K gv BP. Frumkin et al, *The Holocene*, 13 191-200 (1991). For further discussions of North African lake behavior and possible relation of century-scale Holocene arid intervals and cooler sea temperatures in the North Atlantic see Lamb, H F et al, *Nature*, 373 134 (1995).

d) GISP2 100-year smoothed oxygen isotope ratio; Meese, D.A> et al *Science*, 266, 680, (1994)

e) Greenland Dye 3 oxygen isotope ratio. Minimum value between 2000 and 8000 cal yrs BP occurs just before 5.0K yrs BP. Data from National Snow and Ice Data Center. A large acid peak at 3150 BC is suggestive of a volcanic event. Fisher et al, *The Holocene* 5, 1, 19, (1995). For additional ice data from the southern hemisphere click [here](#).

f) Data from Belfast 7272 year oak tree ring chronology; (f) is an index of the tree ring narrowness corresponding to cold weather and following growth disturbance in bogs due possibly to flooding with some peaks correlatable to volcanic activity; (g) represents relative availability of oak samples in Northern Ireland. The peak in (g) at about 3150 BC followed by the maximum tree and site sample representation suggest a major climatic event at this time. Baillie, MGL and Munro, MAR, *Nature*, 332 345 (1988). Similar sudden increase in swamp oak (*mooreichen*, still used to make furniture in Germany) shows up at 5100 BP on the Danube. Becher and Schirmer, *Boreas*, d) GISP2 100-year smoothed oxygen isotope ratio; Meese, D.A> et al *Science*, 266, 680, (1994) 6, 300 (1977).

h) Inferred heavy flooding in American Southwest based on paleoflooding studies. The peak at 5K yrs BP represents 8 sites. Baker, Victor, *Science* ???, ?? (199?).

i) Arid interval 5010-4860 (+/- 150) at Tigmamine in montane Morocco. Corresponding decline in oaks (*Quercus rotundifolia* and *canariensis*) in favor of *Gramineae* suggests reduced winter precipitation corresponding to cooler sea temperatures in North Atlantic. Lamb, H. F. et al, *Nature*, **373** p 134 (1995).

Some tentative conclusions: Millennial-scale warming terminates with a period of climatic disturbance (so-called "Piora oscillation") and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally directed and hierarchical culture based on irrigation. Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level at 3000 BC followed by 10-15 ft. alluvial deposition in river valleys.

Illustrations show the lower Tigris-Euphrates valley as it changed from 5500 to 5000 BP.

FOOTNOTES

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Rhine-Meuse Delta

Zandberg

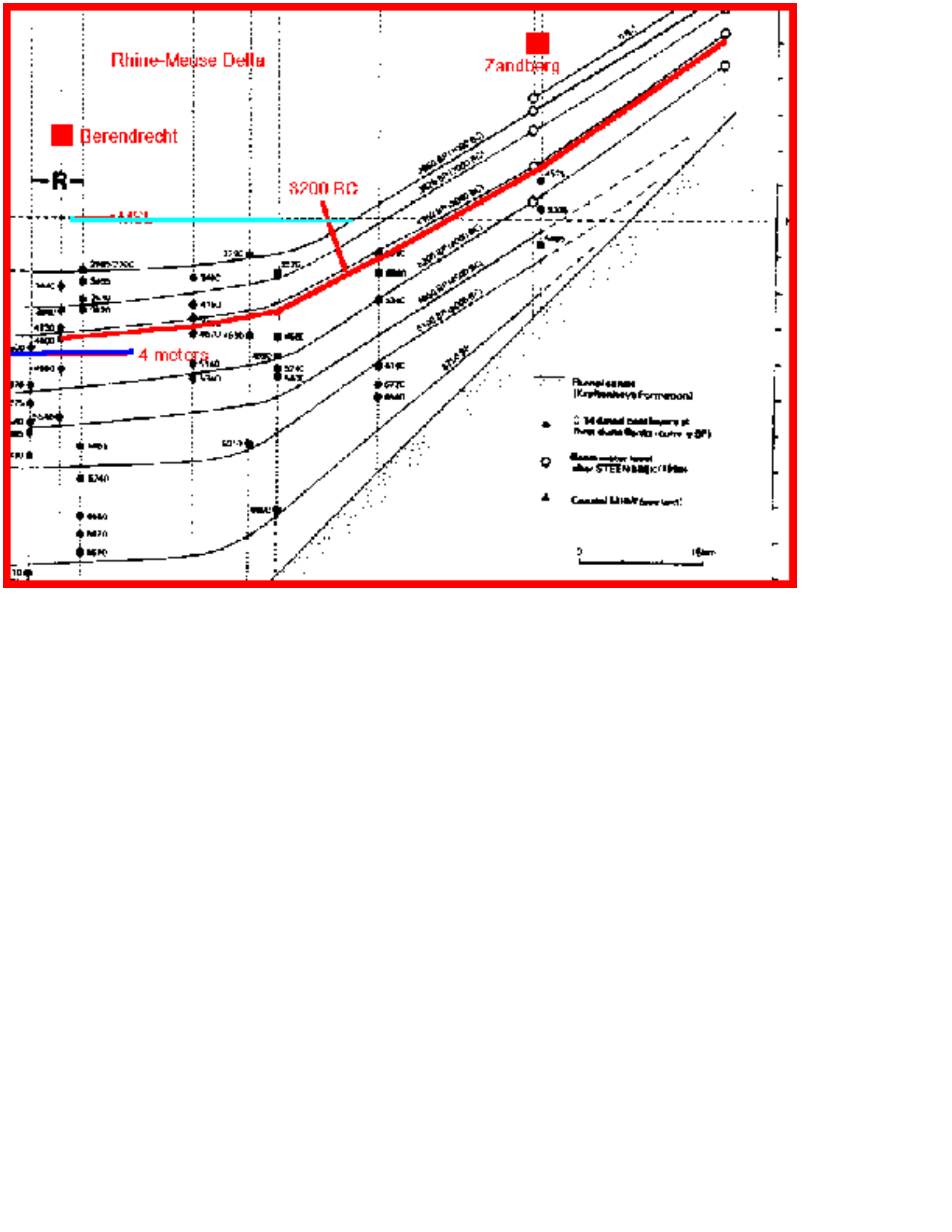
Berendrecht

3200 BC

4 meters

- Runnel system (Kraaienveld Formation)
- 14 dated radiocarbon dates (curve of BP)
- Black water level after STEENBERG (1986)
- Calculated MHW level (m)

0 10km



South Carolina sea level

A recent sea level curve from South Carolina indicates a sudden sea level rise (transgression) beginning about 3500 BC, followed by an equally rapid 2 meter drop a century or two later. *Journal of Coastal Research*, Special Pub. 27, p. 192.



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GISP2 and Other Paleoclimate Oddities

This is the latest from the GISP2 team in *Science*, Dec 22, 1995. It is displayed backwards to match the other presentations in this web site. It clearly shows a mini-glacial age just before 5000 BC. The authors suggest a 2600 yr period for these cold snaps; this has some interesting implications. Are you interested in [the Iceman](#) or the [the Mayan calendar?](#)

Return to [Ignatius Donnelly and the End of the World](#) | [Paleoclimate Data Page, detailed version](#) | [Chronicle of the Late Holocene](#)

GISP2 data:



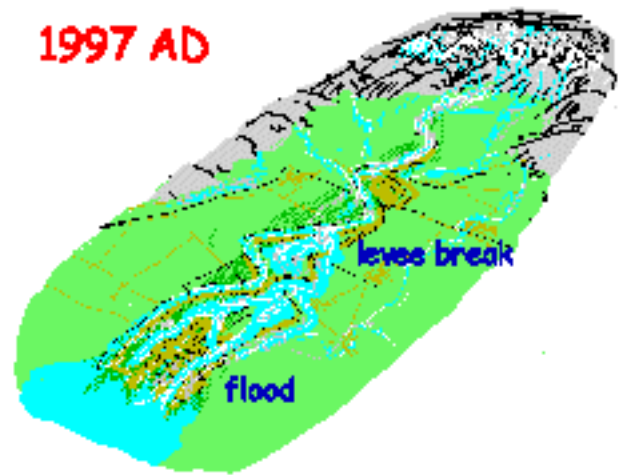
Other holocene data:



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California's Central Valley Levee Failure: Diagnosis, Geology, and Implications for Floodfighting Response.

Stabilization of sea level about 6000 years ago resulted in the formation of deltas and floodplains providing for the first time in 100,000 years conditions suitable for agricultural surplus and highly organized human society. Yet the early years of civilization were marked by unstable behavior of lower river valleys influenced by erratic global climate as well as transition of rivers into their present meandering form. Many human practices and beliefs are rooted in the late fourth millenium (~3200 BC). And many of our most pressing urban and environmental problems today, including floods, arise from these same ancient events. The case is made here that the key to diagnosis and treatment of the levee failure problem is correct understanding of levee foundation geology.



Leave this page up for a minute to see the animation; then click

[Next..\(1 minute to load\)](#)

flood geo vtech:2:an106k.gif:370

Questions or Comments?

meehan@stanford.edu

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[News coverage of the 1997 Arboga failure.](#)

Fiji sea level

A recent sea level curve from Fiji suggest a 1 meter drop between 3500 and 3000 BC. *Journal of Coastal Research*, Special Pub. 27, p. 313. ([fiji.html](#))



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3000 BC: Notes and References

Note: Years given are calendar years BC or BCE. Radiocarbon dates have been corrected based on current correlations between radiocarbon and tree ring dates. We recognize that many scientists prefer to use "Before Present". (The accuracy of radiocarbon dating is affected by the atmosphere's changing concentration of carbon 14, which may in turn be affected by climatic cycles. However, cross correlation of radiocarbon dating and counting of rings on thousands of ancient trees preserved mainly in Irish bogs and German rivers permits the conversion of carbon dates to an absolute chronology. As of 1993 a radiocarbon date of 4500 yrs. converted to 3120 BC. In other words, one should subtract 1380 from the radiocarbon date to determine the BC calendar date.) For an abbreviated chronological index click

100000 BC: Global; Last Ice Age

Ice ages prevail for 90 percent of the time; At 150,000 BC emergence of Homo sapiens (possibly related to conditions during last interglacial?). The last ice age beginning about 100,000 years ago. Signals from Greenland ice cores suggest that the last glacial may have been punctuated with abrupt warm periods, leading to release of "ice armadas" into the Atlantic Ocean; these "Heinrich events" have been variously attributed to precessional components of orbital variation (McIntyre and Molino, *Science* 12/13/96) and periglacial dust (Overpeck et al, *Nature* 12/5/96)

#484.

30000 BC: Java;

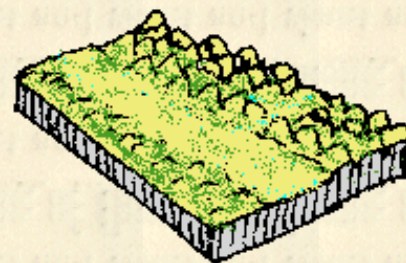
30,000 BC: Last stands of Homo erectus (Java) and Neanderthal (Spain) species, decline in favor of Homo sapiens (NYT, 12/13/96). Paleolithic cave art in Europe.

#493.

20000 BC: Mesopotamia; (Illustration)

Illustration: Dry glacial climate in Near East. Monsoons are far to the south. Also, Younger Dryas cold snap.

#489.



13000 BC: Global; End of Ice Age

About 15000 years ago the last age ended with temperatures raising several degrees C. In the Near East, a corresponding northerly migration of monsoon rains, resulting in a kind of "Garden of Eden" in Jordan, Palestine, Mesopotamia. For an excellent summary of the effects of these and other climatic changes in the Middle East, see Wright, *Current Anthropology* 34, #4 (1993) 458-69.

#319.

10500 BC: Global; Younger Dryas begins

Beginning of Younger Dryas. Abrupt cooling in Europe and North America, return of near glacial conditions; in the Near

East, an abrupt drought, leading to retreat to oases, possibly related to development of agriculture as a coping strategy. For a nice description of this process, see Brian Fagan's *The Time Detectives*; for a more technical discussion, H.E. Wrights "Environmental Determinism in Near Eastern Prehistory", *Current Anthropology* 34, #4 (1993) 458-69.

#318.

9500 BC: Global; Younger Dryas ends

End of Younger Dryas, return of wet warm conditions in Near East, time of plenty.

#86.

7000 BC: Egypt; Eden in Egypt

#124.

6200 BC: Greenland; GRIP ice core

GRIP ice core shows and abrupt cooling at about 8400 years before present.

#320.

6200 BC: Global; Severe cold snap

Severe cold snap; possible short time of hardship in Near east as in Younger Dryas.

#85.

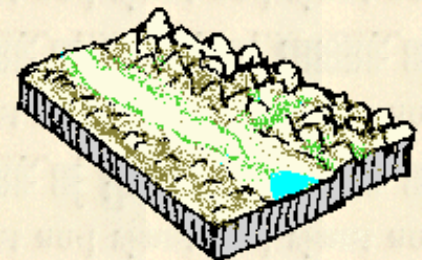
6000 BC: Global; Delta Environments

#149.

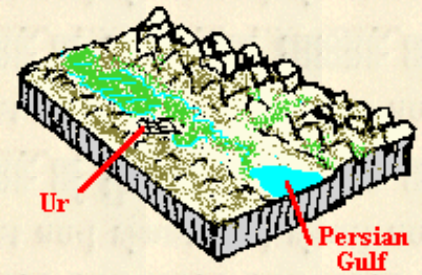
6000 BC: Mesopotamia;

Sea level rise in Gulf of Persia, 4000 BC

Irrigated society, 3500 BC



#488.



5500 BC: Europe;

5500 BC: Reported Mid-Holocene flooding of Baltic Sea by Mediterranean waters. Authors of forthcoming geological report suggest that this may be related to the Sumerian/biblical flood, though this claim is disputed by ancient Near East scholars who believe that the location is too remote from Mesopotamia. Other cultural consequences of the event are said to be spreading of agriculture to Europe.

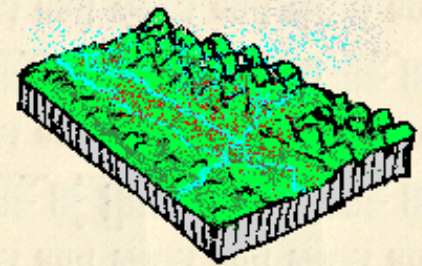
#494.

5000 BC: Mesopotamia;

We place the "Garden of Eden" at the time of 8000 to 6000 yrs. BP (6000-4000 BC) at which time the temperature is warming culminating in an era warmer than present, when equatorial weather patterns may have reached farther north than at present, and the westerly storms of the north would have been confined to latitudes higher than at present.

Here we show the lower Tigris-Euphrates, most recently the scene of the Gulf War, beginning with the "Garden of Eden":

#490.



4850 BC: California; Warmest time, (bristlecone pines,)

Warmest time in Sierra Nevada, (bristlecone pines, California)

#1.

4500 BC: Global; Territorial control and mound building

By 4500 BC the favorable climatic conditions and stabilized lower alluvial plains (the newly stabilized sea level allowed the accumulation of sediment, the beginning of delta formation, in lower river valleys. Flow regimes in lower river valleys change from braided to meandering; marshes and wetlands allow for the accumulation of rich shellfish growth, and among American native communities we see the beginnings of sedentary and territorial life styles, larger tribal or corporate action including the building of mounds in the Mississippi valley.

#330.

4000 BC: Global; Holocene delta development worldwide

Holocene delta development worldwide transgressive sequence of deltaic deposits

#160.

4000 BC: Mesopotamia; Mesopotamia delta

Stratigraphic relations by the author showing the rapid development of a rich, fertile delta in Mesopotamia

#165. [Contents: Late Quaternary Chronology](#)

4000 BC: Europe; Atlantic hypsithermal

Atlantic hypsithermal "Eden"; wet warm conditions in Near East, time of plenty.

#2. [Ice Core Evidence](#)

4000 BC: Ireland; Irish elm decline

Irish elm decline, 4000 to 3250 BC

#88. [Iceman](#)

4000 BC: Global; Valleys in the Holocene

#142.

4000 BC: US;

On Mississippi at 6000 BP, slowing sea level rise at 10-15 below present level, beginning of meander belts. Development of Pine Island Beach trend, a linear sand shoal developed when sea level slowed 10-15 ft. below present level at mouth of Mississippi (currently beneath Lake Pontchartrain). Transition from Middle to Late Archaic period. Alternative view (Penland) that sea level rose to above present level at this time. See Sancier *Geomorphology and Quaternary Geologic History of the Lower Mississippi Valley*, 1994 (1.4525).

#492.

4000 BC: Mesopotamia; Sea level, Persian Gulf

Recent (1996) reviews of Persian Gulf paleosealevel indicates that levels were up to 2 meters higher than at present during the period 6000-4000 BP (*Earth and Plan Sci Letters* 142 (1996) 43-57).

#64.

3700 BC: Mesopotamia; Father Burrows

#125.

3700 BC: Mesopotamia; Burrows' flood,

Jesuit paleographer Burrows, who accompanied Leonard Woolley on his 1930s archeological dig at Ur (and who later figures a the murderer in Agatha Christie's "Murder in Mesopotamia"), dates Mesopotamian/biblical flood at 3700 BC (January 1930 *Dublin Review*)

#3.

3600 BC: California; Central coast

3600 Central California coast investigations show that there had been little laminated sediment deposition on the continental shelf of California after 5000 BP, (Gardner, J.V. *Geology* 14, p 691-694, 1986)

#4.

3500 BC: Mesopotamia; Leonard Woolley's flood

3500 Leonard Woolley, head of the joint British American team excavating Ur, dates the flood layer found at the base of the ruins of Ur at 3500 BC.

#6.

3500 BC: Morocco; Arid interval

Arid interval 5010-4860 (+/- 150) at Tigalmamine in montane Morocco. Corresponding decline in oaks (*Quercus rotundifolia* and *canariensis*) in favor of Gramineae suggests reduced winter precipitation corresponding to cooler sea temperatures in North Atlantic. Lamb, H. F. et al, *Nature*, 373 p 134 (1995).

#70.

3500 BC: Mesopotamia; Tigris and Euphrates alluvial plain

At about 3500 BC the lower Tigris and Euphrates alluvial plain was under extreme pressure from both [rapidly rising sea](#) and buildup of the Karun delta. Under such unstable conditions, a large storm in the Zagros mountains could trigger a diversion of the Karun in an upstream direction, resulting in a flood filling of the lower Tigris-Euphrates alluvial plain, similar to the filling of the Salton Sea in the early part of this century.

#84.

3500 BC: South Carolina; South Carolina sea level

A recent sea level curve from South Carolina indicates a sudden sea level rise (transgression) beginning about 3500 BC, followed by an equally rapid 2 meter drop a century or two later. *Journal of Coastal Research*, Special Pub. 27, p. 192.

#79.

3500 BC: Global; Holocene delta development worldwide

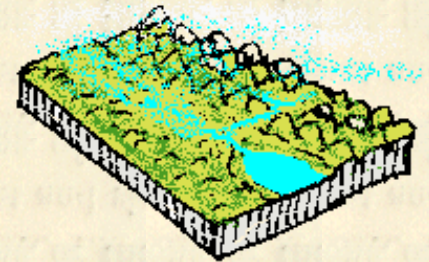
The sequence of Holocene delta development worldwide is indicated as beginning at 6000 BC; by 3000 BC a transgressive sequence of deltaic deposits had developed as shown on the figure. Under conditions of rapid sea level rise these fresh deposits would have been swampy and waterlogged. However, a sudden regression would leave a silty, nutrient-rich floodplain well- drained with a slightly receding (downcutting) river, a condition ideal for irrigated agriculture. *Journal of Coastal Research*, Special Pub. 27, p. 235. (trans.html)

#78. [EF PRO-EUSTASY](#)

3500 BC: Mesopotamia;

Rain storms, climatic oscillation. Millennial-scale warming terminates with a period of climatic disturbance and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally administered culture based on irrigation.

#487.



3500 BC: Fiji; Fiji sea level

A recent sea level curve from Fiji suggest a 1 meter drop between 3500 and 3000 BC. *Journal of Coastal Research*, Special Pub. 27, p. 313. (fiji.html)

#77.

3500 BC: China; Han River delta

Recent graph of sea level data from the Han River delta.

#162.

3500 BC: Europe; Upper treeline in alps

Upper treeline in alps and elsewhere drops 100 meters in 3500 BC then rises to 2500 BC indicating a cold spell at 3500 (Markograf 1974 in *Lamb* p 374)

#5.

3500 BC: China; Han River delta

Recent data from the Han River delta indicate a rapid sea level rise (3 meters) from 4000 to 3000 BC. The data are not detailed enough to permit accurate charting of century scale variations, though the data at 3200 BC suggest the possibility of a major oscillation at that time. (*Journal of Coastal Research*, Special Pub. 27, p. 133.

#80.

3500 BC: Europe; Early agriculture

Introduction of early agriculture in Europe: " The Neolithic Mosaic on the North European Plain" Peter Bogucki Princeton University; web site

#65. [The Neolithic Mosaic on the North European Plain](#)

3400 BC: Egypt; Pharoah Sneferu at Meydum

3400 C14 date (4802) of Cypress beam at temple of Pharoah Sneferu at Meydum. First radiocarbon date by Libbey.

#7. [Nubia: The Land Upriver](#)

3400 BC: Mississippi; Mississippi delta

Carcoal nut dated at 4869 rcybp 6 meters below MSL at Bayou Lafourche at Paincourtville in Mississippi delta represents beginning of delta formation in this area. Other C14 dates indicate regular rise in alluviation thereafter. *Science*

#60.

3300 BC: California; Mid Holocene wet

Mid Holocene Atlantic wet period features high human population growth in Santa Barbara area (4600-4800 BP). This follows an earlier warmer time about 5500 BP with older milling (metate) grinding techniques and is followed by another hot spell about 3500 BP with increasing hunting, sea fishing, residential bases, status ranking, mortar and pestle use for large pulpy seeds, technology in general. From Glassow, UCSB Anthropology Dept, 4/9/93 talk at Asilomar

#9.

3300 BC: Europe; Belgian coast

Along the [Belgian coast](#), recent work shows that "two rather distinct retardations appear to be present; a more marked one at about 7500-7000 cal yrs. B.P. and a second one at about 5500-5000yrs. calB.P."In other words, sea level rise was temporarily reversed at these times.

The idea of irregular sea level rise, introduced by Fairbridge (1961), and subsequently dismissed by uniformitarian interpretations, has recently been reinforced by analysis of Australian coralreefs(4). Fairbridge's sea level curves are discussed in the Encyclopedia Britannica. They had been suppressed in favor of the more uniform curve of Shepard, though the irregular model is now coming back into vogue with the return to respectability of more catastrophic ways of looking at the data.

#75.

3300 BC: Global; July summer cooling, Soviet Union

Maximum Piora July summer cooling according to pollen counts between 60 and 70 degrees latitude in the Soviet Union (4.7 ka assumed to be c14 date)

#8.

3300 BC: California; San Francisquito Bay

The upper graph shows C14 dates for muds and vegetation in the San Francisquito Bay and delta; C14 dates have been corrected to give calendar years, and the effects of autocompaction have been removed. Comparison of these data with the world wide data shown in the lower curves provides reasonable latitude for short term sea level regressions without proving them. It also appears that the data are in close enough vertical agreement to suggest vertical crustal stability in the late Holocene in San Francisco Bay, though this is not the conclusion of Lajoie and the other authors of this USGS study.

#76.

3270 BC: New England; Elm collapse

New England elm collapse: 4650 BP - 1950 + 570 = 3270 BC Cause remains controversial.

#10.

3250 BC: ;

#328.

3250 BC: Florida; Pine bursts

Iceburg-triggered Florida pine bursts events occur every 5709 years, based on a sequence beginning about 35 thousand years ago. The last pine burst was about 4650 years BP, or 3250 BC if we correct carbon dates. The one before that is 12,000 years ago, corresponding to the disastrous Younger Dryas period. That suggests that something may be about to happen. (Science, 7/9/93).

#12.

3250 BC: Global; Atmospheric methane

Atmospheric methane from GRIP ice core with lowest value 580 ppbv at 5.2K yrs. BP followed by rapid increase of 40 ppbv over 200 years; variously attributed to clathrate or permafrost outgassing, decrease in tropospheric oxidation, or abrupt increase in low-latitude wetlands. Blunier, T, et al, Nature, 374 47 (1995).

#69.

3250 BC: Global; Sulfate in GISP2

Sulfate in GISP2 ice core; curve is a low-tension robust spline of sulfate concentrations with average about 30 ppb. The cause of the 150 year peak at 5.2K yrs BP is not known, but the authors suggest the possibility of an anomalous nearby temporary body of open water (polynya) which generated marine biogenic sulfate. Zielinski, GA et al, Nature, 264 948 (1994).

#68.

3250 BC: California; Santa Barbara basin off the coast

paleoclimatic data from sediment cores in the Santa Barbara basin off the coast of California, sediment bioturbation and snail form, also indicating a discontinuity, possibly abrupt cooling, at 5.2k yrs BP.

References

Kennett, JP and Ingram, BL, *A 20,000 yr record of ocean circulation and climate change from the Santa Barbara basin* Nature v 377 p 510 12 Oct 95.

#74.

3250 BC: Europe; Piora oscillation, Europe

Piora oscillation, named after Piora Valley in Europe where climatic irregularities were first noted. A major break in the climatic regime which resulted in a readvance of Alpine glaciers, a retreat of forests. Elms and linden trees declined in Europe and North America. In northern Europe the oak and hazel declined or disappeared. Changes occurred as far away as the Andes, Alaska, and the Kenyan highlands, so the disturbance was evidently of global magnitude extended throughout the world. 3500 to 3000 BC. Lamb p 120 Lamb notes that this is the time of the rapid spread of New Stone Age cultures in Europe; meanwhile there seems to have been a sudden stimulus to the growth of organized civilization, to deliberate cultivation along with development of the tools necessary for such activities. In Mesopotamia, and in the arid areas of the middle east in general, a period of wet years in which oases would have expanded and wild fruits and nuts abounded would have been followed by a growing drier and less hospitable climate in which perhaps organized civilization would have been necessary for continued survival. Flourishing of civilizations in the Indus valley notably at the city of Harappa starting about 3000 BC with lands under cultivation that exceeded the areas of Mesopotamia and Egypt occurred up until about shortly after 2000 BC when drought brought an end of this culture. As the 3rd millennium progressed the flooding became erratic and finally disappeared, giving way to a period of calm in which travel by sea and over high mountain passes encouraged northerly migration and trade and exchange of metallic and monument building technologies that we now know as the Bronze Age. Production of great funerary megaliths in northern Europe and the growth of prestige-oriented Beaker culture spelled the end of thousands of years of hunter-gatherer cultures, and the rise of centralized hierarchical civilization.

#13. http://www.usl.edu/~aa/indus_valley.txt

3250 BC: Egypt; Egypt Nile delta

A core (5-44) taken at the south margin of one of the coastal lagoons at the north end of the Nile delta showed a layer of potsherds 25 ft. below sea level dated at 3,500 to 4,500 CYBP. The layer was underlain by 20 ft. of lagoon mud which would have compressed about 3 feet so the corrected depth would be close to 22 ft. below present sea level. Accounting for deep subsidence (6 ft., according to Stanley et al) would place the "buried civilization" at 16 ft. below sea level. Boring 5-7 drilled south of the coastal Lake Manzala, Egypt, about 40 km from today's shoreline shows a layer of delta front sand from 4 to 5 meters below ground surface deposited at about 4,600 BP (interpolated from lower date of 5,720 RCYBP) (Coutellier and Stanley).

several Neolithic sites in brackish water, one meter below sea level. He dates them by radiocarbon at 4500 BP and believes the sea level stood at -4 m at the time of their habitation He says that there are other "menhirs" and passage graves in the intertidal zone dating from the same period of 5000-4500 BP. Another French paper indicates various sites at 4 to 5 meters below sea level in the Seine and Somme valleys and estuaries. At Abbeville this interface is indicated as corresponding to an "emergence" (which seems to be a temporary lowered sea level) at the end of the Neolithic and beginning of the Bronze Ages, between 4600 and 3500 BP, the temporary lowering bottoming at 8 m below msl. At Montmartin, Calvados, a layer of shells dated at 4700 BP is at -2 m and is thought to have been deposited when msl was -4.7m;(Giresse 1969); at Briere, peats dated a 4630, 4480, and 4260 overlie brackish water clay at -1.3 m implying a sea level below - 4.5 at that time. (Giot, 1968) 4550 BP-1988= 3212 BC

#30.

3200 BC: Global; GISP2 team, the latest from

Most recent studies from the GISP2 team, 1995.

#150.

3200 BC: Ireland; Cessair

3200 BC: Cessair and followers; 2500 BC: Partholan; 2000 BC: first Nemed invasion; 1500 BC: Fir Bolg (possibly the Belgae of NW Gaul, per Julius Caesar); 1000 BC: Tuatha de Danann; 300 BC: Sons of Mil (Celts, from Spain [possibly Helvetians who had migrated from what is now Switzerland to Northern Spain]);

#81.

3200 BC: Mesopotamia; Tigris-Euphrates

Sharp reduction of Tigris-Euphrates streamflow at 5200 cal yrs BP; also Iranian Plateau changes from humid to arid at same time. Johnson and Kay, *Climatic Change*, 3 (1981) p 251

#61.

3200 BC: Mesopotamia; Mesopotamia delta

Stratigraphic relations showing the rapid development of a rich, fertile delta are compared in Mesopotamia with the generic model of delta formation suggested by Stanley, who demonstrates that development of these potting grounds for civilization would have appeared only after 6000 BC. Significantly, no comparable environmental condition existed in any great river valley for more than 100,000 years.

#83.

3200 BC: Missouri; Pomme de Terre River

By 4600 BP Missouri's Pomme de Terre River has undergone a major change in its regime, downcutting a channel about 15 ft deep. This is the largest record of change in the river's behavior since 10000 BP and is interpreted as having been caused by an abrupt climatic change toward wetting. 3200 Temporary French coastal emergence starting at 3200BC

#18.

3200 BC: ; Paleoclimate Data Page

#144.

3199 BC: Europe; Irish oaks

Tree rings in Northern Ireland are narrow in 1153 B,c 1628 B,c 3199 B,c and 4377 BC. The 3199 BC value is associated with an acidity peak in Camp Century ice cores dated at 3150 B,c demonstrating unquestionably that adverse weather conditions, probably due either to volcanic eruption or meteoric impact, occurred at this time. Other narrow years are associated with frost rings observed in California bristlecone pines and with eruptions of Icelandic (Hekla 3 in 1159 BC) and Aegean (Santorini in 1628 BC) volcanoes. Baillie,*Nature*, 3/24/88

#19. [Sacred Woods and the Lore of Trees](#)

3190 BC: Global; Heckla eruption, Iceland

Heckla eruption: 4570 BP-1950+570= 3190 BC

#20.

3160 BC: California; Sunnyvale girl

Skull, Sunnyvale girl: 4500 bp-1950+570=3120 BC; corrected 8/8/96 at Ken Lajoie's office:: 4460-1950+650=3160 BC

#23.

3150 BC: Global; Sulphate spike

Sulphate spike in Greenland GISP2 core.

#87.

3150 BC: Turkey; Lake Van Oscillation

Abrupt change in sedimentation rate of Lake Van in Turkey indicative of rapid climatic fluctuation at (varve) dates of 5200 BP (3150 BC) (*Palaeo*, 122 (1996) p 107)

#58.

3150 BC: Global; Paleoclimatic flood, global

Climatic conditions at time of Mesopotamian flood, from several scientific sources of paleoclimatic data. See [here](#).

#21.

3150 BC: Greenland; Camp Century, Greenland

Camp Century ice core acidity peak 3150 BC

#22.

3150 BC: USA, SW; SW US flood peak

3000 SW US flood peak. According to Victor Baker of the University of Arizona, a period of flooding began in the southwest starting at about 5000 BP and ending at 3600 BP, with a sharp peak at about 4400 BP. (Starts at 3500 BC and peaks at 3150 BC)

#43.

3150 BC: Ireland; Irish elm decline

Decline, 4000 to 3250 BC

#170. [Iceman](#)

3150 BC: Europe; Iceman of the Alps

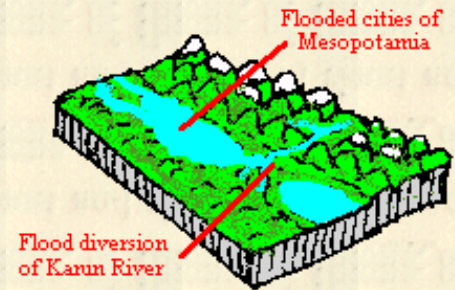
On September 19, 1991, two German hikers, Helmut and Erika Simon, noticed what appeared to be a body sticking out of the glacial ice at an altitude of 3200 meters in the Alps -- just over the border in Italy, as it would later turn out. Within a few days the find had attracted the attention of scientists as well as police authorities and the corpse was hacked from the pocket of ice where it had been frozen, some considerable time before, as it turns out, for among the items the frozen man had been carrying were a copper axe and 14 arrows, and a dagger, all of apparent neolithic style. Radiocarbon dating of bits of tissue and bone yielded dates of 4525 and 4575 BP, or 3150 B,c with subsequent dating of grass from the man's boots dated at another lab within a few years of the body. Among the many mysteries that surrounded the find was the fact that the body was naked and apparently mummified. Clothing was found nearby, and it has been surmised that the man may have died of hypothermia, it being known that those suffering from this condition often remove all their clothing as death approaches. As for the mummification, it was suggested that the man may have been dried by the autumn dry winds, the foehn, that affect the Alps, though rarely at this altitude. A further mystery was the absence of genitals, a fact that once released seemed to give rise to lurid rumors, one of which, perpetrated by some a British magazine aimed at homosexual readership..., was that the corpse's anal passage contained sperm, and that this "fact" was being suppressed by the scientists conducting the investigations. Meanwhile, lawyers, diplomats, scientists, and the media were engaged in a dispute over the ownership of the body and its associated artifacts, with the Italians claiming that the Austrians had kidnapped the body from Italian territory. "Sometimes I think," said the weary rector of Innsbruck University, were the iceman was being kept under refrigeration pending resolution of disputes, "Let's get a shovel, and then we can bury him again. (1992 Horizon/Nova documentary; Nature, 4 March 1993.)

#17.

3150 BC: Mesopotamia; The Flood

The Flood 3150 BC(?). Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level shortly before 3000 BC followed by 10-15 ft. alluvial deposition in river valleys.

#486.



3113 BC: Mexico; Mayan recreation

Last Mayan date of recreation of the world following The Flood , Aug 12, 3113 BC.

#24.

3110 BC: China; Yangtze River

Dating of sediments in the Yangtze river delts suggests a sedimentation rate so high between 5060 and 4460 BP, accompanied by a major change of flow into a new subdelta, and followed by a period of deep water with clay deposition, that the authors are inclined to think that their date of 4460 BP must be mistaken. (Kam-biu Liu, Quat Res 1992)

#25.

3100 BC: Boston; Sticks from fish wier

Sticks from Boston's submerged "fish Weir" carbon dated at 4450, 4860, and 4800 years BP. This fixed the weir construction date at a little earlier than 3000 B.C. . It showed that the wattles from the famous fish weir had been carbon dated at 4800 years BP 4500 BP, altitude -27 MHW when sea level was -19 MHW or 14 ft below present sea level. Other dates 4450, 4860 BP.: "When sound wood is permanently submerged in fresh, brackish, or salt water or is buried at some depth in sand, gravel, clay, mud, or silt, the rate of decomposition is in general relatively slow," First as to sea level, the top of the 3 foot high weir was noted to be at 12 feet 10.9 inches below present sea level. Allowing for subsidence due to the 18 feet of fill that had been placed in Back Bay in the nineteenth century, (18 x 40 = 720 = 12") and assuming that the top of the weir was at mean sea level, mean sea level at the time would have been 17 feet 6 inches below present. (This might be on the high side since rebound of the earth's crust has also occurred in the Boston area). A study of pollen analysis of the organic peat at the site by the great palynologist Arthur Knox show a significant absence of hemlock pollen at the weir level, (only one of 144 specimens of wood extracted from the weir proved to be Tsuga (anadiensis)) and a sequence of botanical changes correlative with pollen profiles in the nearby Wellington Marsh, which in combination suggest that the weir "was in use during a long dry period during which the Wellington Marsh in nearby Medford gradually dried up until shrubs and possibly trees began to grow upon the surface. This period of dryness was apparently terminated rather suddenly by an increase in rainfall and which occurred about the time the Fishweir was abandoned." The balmy period had lasted, the scholars concurred, from about 7000 to 5000 years before the present. At the time the experts concluded that the fishweir had been in use up about 1500 B.C.; though it was later shown that this date was much to recent. Curious too, the conditions that prevailed during the use of the weir, which had been covered with oysters, there prevailed a golden age in which the climate was as mild and balmy as Chesapeake Bay, an era of abundance abruptly terminated by a change in climate to wet, stormy, and colder conditions. The picture that emerged was this - a farflung community of native Americans existing for two thousand balmy years on the edge of a freshly flooded bay of

3100 BC: Nebraska; Republican River,

The Republican River in Nebraska shows a period of rapid downcutting dated at about 4500 BP, attributed to moister conditions.

#31.

3100 BC: USA; End of alluvial period

End of alluvial period; From 6000 to 4500 BP there is a period of active alluviation in many parts of the US. Wetter conditions improved vegetal cover and resulted in less sediment yield and consequent downcutting

#29.

3100 BC: ; Sticks in Boston

#141.

3100 BC: Egypt; Egypt, Unification

Egypt, Unification

#26. [Pharaoh's Heart](#)

3100 BC: Greenland; GISP ice core

3100 BC rapid climatic change shown on [GISP ice core](#). *Science* 12/22/95.

#62.

3100 BC: Europe; Stonehenge (start)

Earliest c14 dates on digging implemts at Stonehenge

#27.

3100 BC: California; Sierra cooling

Cooling 4500 BP. In the California Sierra, warm temperatures from 7350 to 6000 BP are giving way to cooling with lake levels returning to the highs of early Holocene.

#28.

3090 BC: Egypt; Egypt, Nile

Earliest recorded flood recorded on a "Nilometer" in 3090 BC during the reign of King Djer of the Early Dynastid period.

#33.

3075 BC: Ireland; Newgrange Megalithic Tomb

Newgrange Megalithic Tomb 4425± 45 BP; 4415± 40 BP burnt soil from roof caulking of Newgrange; 4480± 60 BP vegetation from turf beneath main monument; 4399± 67 BP from site 16 near Knowth tomb site (O'Kelly, *Early Ireland*). (BP = uncalibrated radiocarbon date.)

#82. [Geniet: Knowth](#)

3075 BC: Ireland; Newgrange Megalithic Tomb

Newgrange Megalithic Tomb radiocarbon dates

#164.

3050 BC: Europe; Brittany coast emerges

Brittany coast emerges

#35.

3050 BC: Canada; Devon Island

3050 Maximum oxygen 18 ratio for ice core taken from Devon Island ice cap in arctic Canada (Science aug 19 1994 p1060)

#34.

3050 BC: Greenland; Methane peak,

Methane peak See [3020 BC](#); The Skull

A human skull found in a California creek may tell us the story of the biblical flood

#127.

3020 BC: California; Stanford Man II

Stanford Man: 4350-1950±570= 2970 BC or

#37.

3001 BC: Israel; Mt. Sedom

Israel's Mt. Sedom is a salt diapir and changes in precipitation on the mountain can be measured by observing the width of caves formed by salt dissolution. The cave widths can in turn be compared with glacial advances (bigger caves = more rain = more glaciers) and with sea levels of the Dead Sea. The largest - by far - increase in cave. Mount Sedom-- otherwise known as Mt. Sodom, said to be the site of the famous biblical event -- is a salt formation (a diapir) bordering on the Dead Sea. Recent studies by Amos Nur at Stanford University suggest that the area was affected by an earthquake in xxx BC. This seems to correspond with the biblical event. Changes in precipitation on the mountain can be measured by observing the width of caves formed by salt dissolution. The cave widths can in turn be compared with glacial advances (bigger caves = more rain = more glaciers) and with sea levels of the Dead Sea. The Wide caves on the face of the "mountain" located some 300 feet above the present sea level indicate an extremely wet period a millenium before this, in the early xxx age. Oak twigs and driftwood found in the caves must have been transported by floodwaters from some other part of the shore many miles away since oak trees do not grow in salt. Evidently the water level was some 300 feet higher at this time, implying heavy flooding on the Jordon River and lower evaporation rates due to cooler weather. No other event in the last ten thousand years matches this. The oak twigs have been dated by radiocarbon technique at 4350 + or - 75 RCYBP. Frumkin, A., The Holocene climatic record...1991 The Holocene 1, 3 pp. 191-200.

#42.

3000 BC: Oregon; Diamond Pond,

3000 climate of the great basin, eastern Oregon. "By 4400 BP the water table was within 10 m of its present level. Rising water table at Diamond Pond suggests that midHolocene drought had given way to effectively moister conditions. Resultant higher regional water tables would enable the Malheur Marshes to expand into areas formerly occupied by greasewood. This, together with the invasion of other saltbush and sagebrush communities into the upper reaches of greasewood-dominated areas, may explain the sudden drop in Sarcobatus pollen values." Peter Wigand, "Diamond Pond, Harney County, Oregon. Vegetation History and Water Table in the Eastern Oregon Desert." Great Basin Naturalist, 47(3):427-458 (1987)

#38. [The Paleolimnology Home Page](#)

3000 BC: Jordon; Jawa: Lost City of the Black Desert

The desert ruins of Jawa, best preserved of the Near Eastern Bronze Age cities, date to about 3000 BC when the rainfall was higher in the region.

#485.

3000 BC: Europe; Carnac Megaliths

Carnac Musee de Prehistoire. Aubrey Burl, archeologist. NYT 7/14/96

#57.

3000 BC: California; Bristlecone pines

Coldest time (bristlecone pines)

#40.

3000 BC: Louisiana; Native American mounds

Native American built mounds at Baton Rouge (Louisiana State University), nearby Mount Sano, and Frenchman's Bend, at Stelly, in South central Louisiana; coastal sites including Banana Bayou and Avery Island, date at 3000 BC to 2500 BC. Joe Saaunders, Jon Gibson, Northeast La State Unive. Roger Kennedy, *Hidden Cities*.

#54.

3000 BC: Global; Radiocarbon base has tripled

Wendland and Bryce report that the radiocarbon base has tripled since their 1974 study. Wendland now places discontinuities in the years 4200 and 4800 rcbp (very close to the 4150, 4500, and 4750 of the original paper). Volcanic eruptions are at 4450 and 4700 BP. Statistical studies of climate and cultural discontinuities show a minor botanical and cultural discontinuity at 4240 and 4230 BP respectively

#44.

3000 BC: USA, W; General wetting Western U.S

Transition at 3000 BC from early to middle Holocene, general wetting and deposition of alluvium in Western U.S.

#46.

3000 BC: Mesopotamia; Natural Catastrophes during Bronze Age

<http://www.knowledge.co.uk/xxx/cat/sis/cambconf.htm> Natural Catastrophes during Bronze Age Civilisations: Archaeological, Geological and Astronomical Perspectives.(Upcoming Conference) See also Exploring the role of catastrophe in the recent history of the solar system and in the formative phases of ncient civilizations PLACE: Red Lion Hotel-Jantzen Beach, Portland, Oregon DATES: January 3-5, 1997

#67. [SIS](#)

3000 BC: Europe; Wooden tracks

3000 In England, wooden tracks are built across marshy areas to maintain communications and travel; 3500-2500 BC

#41.

3000 BC: Israel; Ancient Egyptians in Palestine

Tomb in northern Negev desert reveals skeleton of a young woman indicating presence of ancient Egyptians at Halif Terrace in ancient Palestine around 3000 BC. Thoms Levy UC San Diego. Science 10/18/96 p 349.

#56.

3000 BC: Wyoming; Ancient French Trapper

George Gill of University of Wyoming discovers a 5000 yr old skeleton in Great Plains, exhibiting a skull that has teeth and shape "like a French trapper." (Economist, 10/19/96 p 84)

#55.

3000 BC: Mesopotamia; Sumerians in Mesopotamia

3000 Sumerians in Mesopotamia By late fourthmillenium a network of Sumerian towns has developed in lower Mesopotamia of which perhaps the best known is Uruk, some xx northwest of Ur, though even the detailed excavations by German archeologists of the temple of Anu and the nearby Eanna complex in the xxx did not extend any deeper than 3500 B,c or roughly to the level of the flood. The city of Susa, xxx miles east on the foothills of the Zagros Mountains (now Iran) was the center of the Elamite civilization which was generally at war with the Sumerian valley occupants. The first known written documents appear at Uruk's Level IV along with representations of priestly figures. Absence of ideograms associated with war, king, and palace along with other evidence suggest a democratic and peaceable society engaged in trade to cities in the upper Euphrates, enjoying the pleasures of beer, fish, and sex, advised by sages and teachers and making exquisite pottery and engaging in diplomacy with neighboring cities. Evidently this changed sometime around 3000 BC with the arrival of strong social stratification, kings, and armies. Sumerians have moved from Eastern Anatolia bringing a new language and advanced culture to the existing Ubaidian peoples who have already started developing population centres in the lower Tigris Euphrates.

#39. [Rise and Fall of Ancient Sumer](#)

3000 BC: Global; Sea level stillstands

Stillstands (such as we have experienced for the past millenium)or reversals of [sea level](#) rise produce seaward delta buildup and static cortemporarily lowered groundwater levels, leading to desiccation and subaerial weathering with profiles, often littered with cultural remains, inlower river valleys as shown in the lower Rhine-Meuse delta profiles below. Our late holocene civilization is currently producing such a soil horizon. Many lower river valleys such as the Rhine show a depositional surface at about 15 ft depth corresponding to the probable profile of thelower Rhine valley at about 3000 BC.

#71.

3000 BC: Egypt; Sumerian influences on Egypt

Sumerian influences on Egypt at 3000 BC <http://marlowe.wimsey.com/~rshand/streams/scripts/influence.html>

#66. [Sumerian Influence on EgyptSumerian](#)

3000 BC: China; Tibet, Sumxi Lake

In Tibet, Sumxi Lake rose during a wet period at about 5000 BP then, experiencing an "abrupt disequilibrium," fell into a great drought in 4300 BP (The Holocene, June 1993)

#48.

3000 BC: Peru; Onset of ENSO

5000 yrs B.P. Onset of ENSO in Peru following 3000 yrs of warm stable climate. Science 9/13/96 p 1531. Probable world-wide beginning of climatic irregularity. (e.g. California, Africa, etc.)

#59.

3000 BC: California; California hunter-gath transition

Hunter-gath transition

#45.

3000 BC: Sahara; Canoes and elephants

In prehistory the Sahara was different, raining all the time, full of canoes and elephants, Lake Chad one hundred feet higher. For 12000 years the desert had supported game allowing hunting and herding or nomadic pastoralism but then the land began to dry up. One reference says that between 6000 and 4000 BC the Nile had been subject to flooding and lake levels at Fayum were high until a drier period at about 3500 BC followed by a wet spike at about 3200 BC. This is supposed to be at the time corresponding to the predynastic Nagada (Naqadah?) cultures (Brewer, D.J. The Holocene, 1992) .

#72.

2970 BC: Europe; Floods in Netherlands

Floods in the Southern Netherlands a series of inundations occur 4,350 to 4,075 years BP corresponding to an alteration of wet and dry periods (Beyens 1982)

#47.

2900 BC: Mesopotamia; Mesopotamian flood

2900 Sir Max Mallowan, successor to Leonard Woolley, estimates date of Mesopotamian flood at 2900 BC using Sumerian King list. However many will dismiss the idea of there ever having been a single flood and assign dates hundreds of years apart for various "flood layers" in different tells..

#49.

2900 BC: Global; Huang Ho River

First recorded Huang Ho River flood in 4275 BP Ward, 1978, "Floods, a geographical perspective."

#50.

2800 BC: Mesopotamia; The Flood and Noah's Ark

2800 Andre Parrot in his 1954 book "The Flood and Noah's Ark" indicates significant flood deposits at Kish, Shuurrupak, Uruk, and Lagash centering on about 2800 B.C.

#52.

2800 BC: California; Summer warming,

2800 Sudden summer warming, bristle cone pine tree rings.

#51.

2700 BC: Nevada; Woodrat midden,

2700 Nevada; return of moisture brings first Woodrat midden in 3000 yrs at the mother of all woodrat nests, dated 4070 BP, evidently following great basin drought. Mono lake and juniper expansion between 4000-5000 BP

#63.

2700 BC: Mesopotamia; Gilgamesh, king of Uruk

Gilgamesh, king of Uruk; general agreement among Mesopotamian scholars

#53. [Internet Mesopotamian Resources](#)

BC: ; Sodom

#140.

BC: Mesopotamia; Woolley and the Biblical Flood

#135.

BC: ; Mayan Chronology

#139.

BC: ; Chronology of the Biblical Age

#136.

BC: ; Woolley and the Biblical Flood

#122.

BC: ; The Biblical Noah

They called him Noah in the bible, but around Mesopotamia he was another man

#138.

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BC: ; Dead Sea and the Bronze Age

#143.

BC: Mesopotamia; Tigris and Euphrates alluvial plain

At about 3500 BC the lower Tigris and Euphrates alluvial plain was under extreme pressure

#166.

BC: ; New Data from Peru

#153.

BC: ; Iceman of the Alps

#148.

BC: ; Sulphate spike

Sulphate spike in Greenland GISP2 core.

#169.

BC: ; South Carolina sea level

A recent sea level curve from South Carolina

#161.

BC: ; Fiji sea level

A recent sea level curve from Fiji suggest a 1 meter drop between 3500 and 3000 BC. *Journal of Coastal Research*, Special Pub. 27, p. 313. (fiji.html)

#159.

BC: ; Dodona

#97.

BC: ; Sealevel, late Holocene

#156.

BC: Mesopotamia; Mesopotamia Then and Now

#123.

BC: ; Saddam and Gilgamesh

#94.

BC: ;

#326.

Han River delta

Recent data from the Han River delta indicate a rapid sea level rise (3 meters) from 4000 to 3000 BC. The data are not detailed enough to permit accurate charting of century scale variations, though the data at 3200 BC suggest the possibility of a major oscillation at that time. *Journal of Coastal Research*, Special Pub. 27, p. 133. (china.gif)



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Eden in Egypt

Kansas City



December 26, 1988

Dear Dick:

We had a nice Christmas and I hope that you and your family had the same. I enjoyed reading your letter on the plane.

I read a few weeks ago that it's been so dry in Egypt that Lake Nasser was running dry. Then today the paper said that there were unseasonably heavy rainstorms sweeping across northern Egypt. Houses had collapsed in Cairo and a place called Tanta. Do you know where that is?

I looked up the history of early Egypt. In prehistory the Sahara was different, raining all the time, full of canoes and elephants, Lake Chad one hundred feet higher until [3000 BC](#). For 12000 years the desert had supported game allowing hunting and herding or nomadic pastoralism but then the land began to dry up. One reference says that between 6000 and 4000 BC the Nile had been subject to flooding and lake levels at Fayum were high until a drier period at about 3500 BC followed by a wet spike at about 3200 BC. This is supposed to be at the time corresponding to the predynastic Nagada (Naqadah?) cultures (Brewer, D. J. The Holocene, 1992) .

Now begins the Early Dynastic period, unification of upper and lower Egypt; the first pyramid is at 2980 BC. There is an odd little fragment of pottery that shows unmistakably a man holding a hoe and approaching a levee. There has been a good deal of debate about just what the illustration represents; some claim that it is a king ceremoniously cutting an irrigation ditch, others claiming that he is laying the foundations for a temple. Suggestions of irrigated fields, wavy water lines, at the top of the fragment. The current theory is that the figure is Scorpion King, last of the pre-dynastic kings. The king is about to cut a levee to start irrigating a field. The shortage of water requires irrigation. Of course irrigation requires experts! With irrigation begins the Early Dynastic period, unification of upper and lower Egypt. Significant flooding will not occur again in East Africa for more than 1000 yrs.

Happy New Year!

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IGNATIUS DONNELLY:

AND

THE END OF THE WORLD



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ILLUSTRATED

*"I was so excited I
couldn't sleep for a week"-*
Rev Hal Lindsey, author of
"The Late Great Planet
Earth" on his discovery that
the world was coming to an
end.

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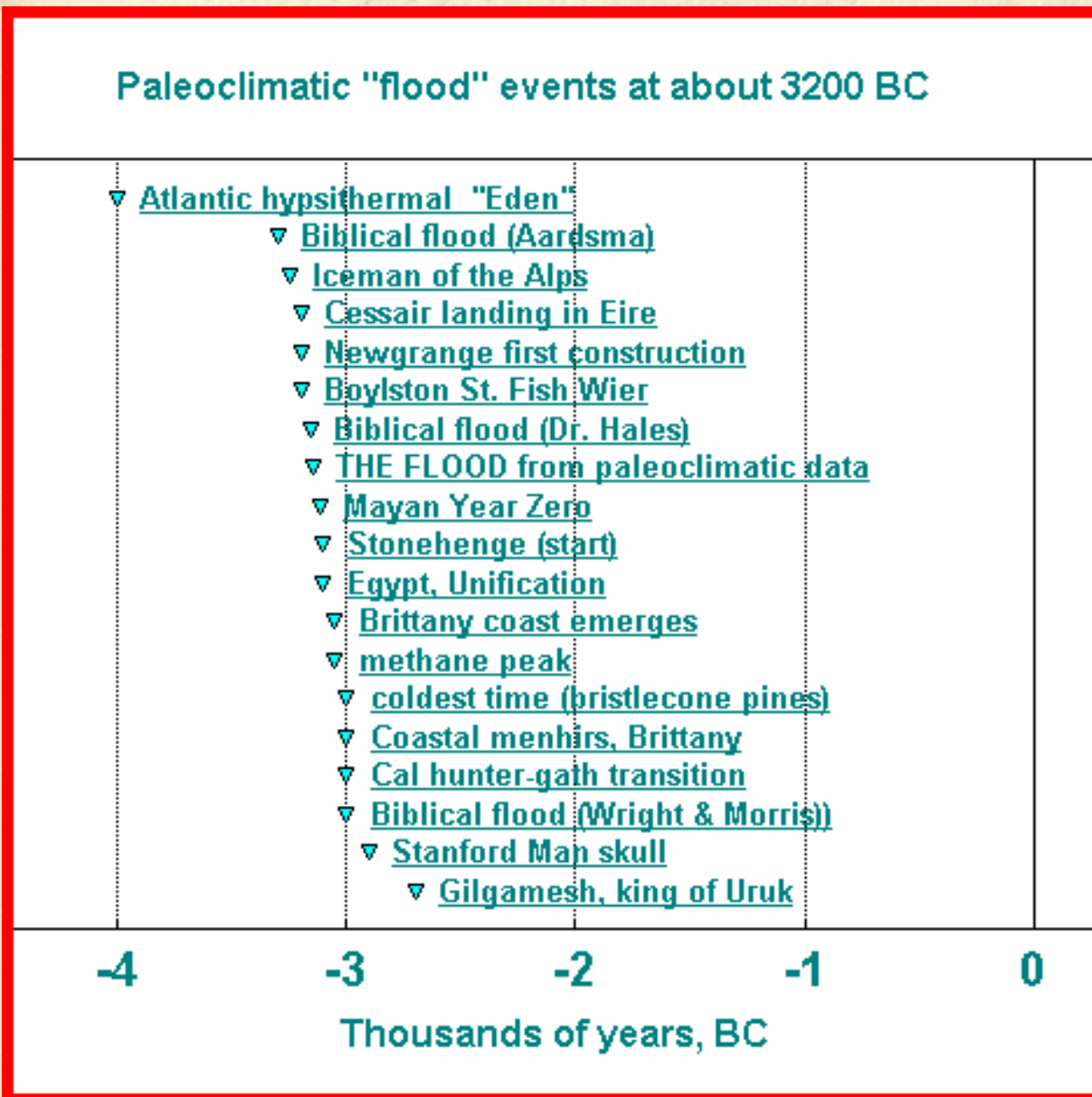
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The Biblical Flood and Science

Scientists have us stirred up about the coming greenhouse apocalypse; more interesting may be what their data show about the biblical flood story:



"The three great tumults of the world -- The Deluge, the Crucifixion, the Day of Judgement".

---Gwion of Wales, Sixth Century, in *The Red Book of Hergest*

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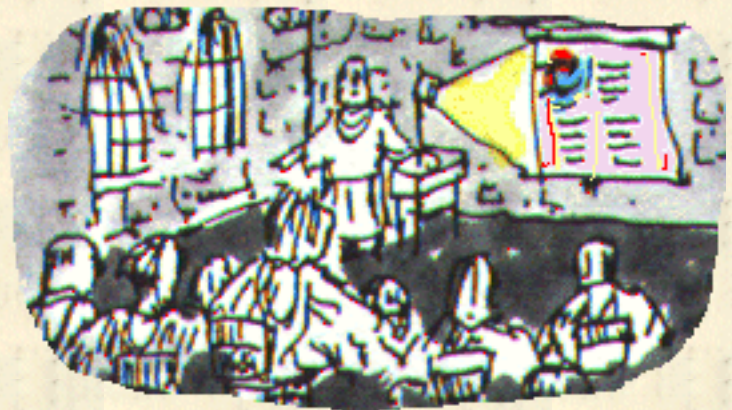
Boniface was known in his youth as Winfrith and had been born in Sussex, formerly a Celtic land, now taken over by the Saxons (the West Saxony of Britain). Winfrith was a conscientious student undistracted by the romances of the day.

After the Synod of Whitby, in which it was decided that the Celtic Church had erred on the date of Easter and the correct style of tonsure, papal envoys were sent to England to correct these evils and remind the British of the dangers of free will and the sordid embraces of women. Stone cups that flowed wine and fish with teeter of gold gave way to strategic planning and office memos.



Young Winfrith was well suited for this life and after receiving Holy Orders in 690 he determined to undertake missionary work among the heathens of the continent.

Against his father's wishes the young man decided on the religious life. At school he studied the Latin (but not Greek) classics, and the church fathers, among them Ambrosia(?) who wrote of the many levels of interpretation of the Great Flood.



Who were the Friesians? Simple, boggish folk who lived in the coastal Netherlands, they had been the laughing stock of the ancient world since Pliny the Elder visited them in the year 47 and reported that they, like the Irish, were not worth conquering. They loved their oak trees and were given to holding religious services beneath them followed by drinking parties in which

they consumed what Mediterranean sophisticates called "mouldy grain."

By far the most successful missionaries in Frisland had been the Irish who quickly went native, talked with angels, and regaled the Frisfolk with tall tales of miracles and oak tree prophecies.



One of them, a certain Aldebert, especially detested by Boniface, was wildly popular among them. Aldebert explained that he had been born following an annunciation by a calf, from his mother's side like the Virgin and he showed them the letter that Jesus Christ

had written to him. He gave them instructions in ancient Celtic practices such as fighting the waves of the invading sea. His ancestors had lived and worshipped in the bogs and woods, he said, and they understood when natural forces must be bravely resisted and when destiny required submissions to the natural world.

Aldebert shows a heathen the story of St. Brendan. These Irishmen *degraded their Christian profession by participation in the idolatrous rites of Thor and Woden*. He made little headway on restoring the *purity of doctrine to men of this character in the dense, primeval forests where Woden, Thor, and the other deities of the Teutonic pantheon might well seem alive and all-powerful to the tribal warrior who inhabited it.*



Serious missionaries like Boniface were eager to tell The Holy Father about the evil doings of their successful Irish competitors. In the year 752 Boniface received permission from Pope Gregory to excommunicate the Irish and return to Germany to save the Friesians from their pagan ways.

His Holiness granted Boniface a letter to the Frankish king Charles Martel. No one knew whether the Saint would ever be seen again.



Boniface returned to Germany. By day the Frisians prayed to the new Christian God.

Nighttime was a different story altogether. Boniface suffered greatly thinking about their pleasurable orgies beneath the oak trees. He could not bear the thought of the pains of hell that these simple folk would suffer in consequence of the fun they were enjoying.



For miles around the Frisians gathered to witness the Christian hack away at their pagan god, for Boniface had taken the bold step of deciding to chop down their God, Thor, embodied in a great oak tree.

Oak

trees fell into the bogs and creeks and rivers and some of them washed down into the Rhine where they can still be found today, buried in the gravel.



It had long been so; for fourteen thousand years oak stumps and trees had fallen into the Rhine and been entombed in gravels, sands, and silts that have accumulated in accordance with the laws of *fluvial geomorphology*, chief among

which is that the rivers are rushing, gravelly, braided flow pattern through most geological time.



The miraculous spring 874.



According to Willibald not long after the saints martyrdom it was decided to erect or church at the spot, on the Boone River, which required that the site be protected from *the vast eruptions of the heap and spring tides* by building of an earthen mound, in other words a dike or levee. A certain Abba, supervisor of the works, was inspecting it on horseback when *suddenly and unexpectedly the steed of the attendant, while merely stamping on the ground, felt it sinking and giving way altogether, and wallowed.* Then at once *a miracle stupendous and worthy to behold was made manifest. a fountain, exceeding clear beyond the manner of that country. came bursting out, and, penetrating through unknown channels, flowed forth, so that it seemed already a very large brook.*

The medieval Irish Book of Invasions, an amalgam of bible and Irish lore, was considered to be the origin story of the Irish people. McAlister's definitive translation was compiled from several manuscripts dating from the 12th to 15th century, but textual analysis suggests dates the stories date earlier. The relevant passage on Nel and Moses describes how Nel and his son Gaedel Glas, having participated in the great Tower of Babel project, are retained by the Pharoah as tutors. Subsequent marvelous events are discussed in the Irish Book of Invasions as follows:

So Nel son of Feinius Farsaid dwelt southward in Egypt.

This is the estate which he received, upon the shores of the Red Sea, and around Phi- Hahiroth: and he was there till the Sons of Israel escaped from Pharao and from the host of Egypt.

Now it fell out that the Sons of Israel, in that flight, came to the estate where Nel was, and his son, Gaedel Glas.



The Sons of Israel took camp at Phi-Hahiroth, on the border of the Red Sea.

Then Nel son of Feinius came to converse with them:

and there Aaron [brother of Abraham (sic)] met Nel; and Aaron told him tidings of the Sons of Israel, and the miracles and marvels of Moses, and how the ten plagues were brought upon the people of Egypt by reason of their enslavement.

And they ratified a friendship there, and Nel gives wine and wheat to the peoples of God for provision.

So Aaron went thereafter to the place where Moses was, and told him of the welcome which he had received at the hands of Nel, and the good

which he promised to the Sons of Israel. Moses was grateful to Nel for that.

Now as for Nel, in that very night a serpent stung the little sone tht had been born to him, to wit Gaedel Glas, and death was near to him.

And the lad was carried to Moses, and Moses made fervent prayer before God, and put the noble rod upon the place where the serpent had stung him, so that the lad was cured. And thereafter Moses said:

I command, by the permission of God, that no serpent harm this lad, or any of his seed for ever; and that no serpent dwell in the homeland of his progeny.

There shall be, he said, kings and lords, saints and righteous, of the seed of this lad; and in the northern island of the world shall be the dwelling of his race.

This, then, is the reason why there are no serpents in Ireland, and why no serpent does harm to any of the seed of Gaedel Glas.

Then it is that Nel said: Pharao shall come to us, said he, and shall enslave us, for the welcome that we have given you, and for the guilt of failing to hinder you.

Come thou with us, said Moses, with all thy people, upon tomorrow's route, and if thou wilt, thou shalt receive an equal share of heritage in the land which God hath promised to the Sons of Israel.

Or, if thou dost perfer, we shall put the pinnaces of Pharao at thy disposal: embark ye therein upon the sea, and stand ye by, to know by what means we shall separate us from Pharao, and thereafter do thy good pleasure.

The company that was in the ships set forth and they stood by to see the transactions of the following day: the division of the Red Sea in the wake of the people, and the drowning of Pharao with his hosts therein-six score thousand footmen and fifty thousand horsemen, that is the tally which went to meet death, of the people of Pharao, in the Red Sea.

It was after this adventure that the tribe of wandering Gaels went to Spain, dwelling in the place now known as the province of Galicia, still to this day a stronghold of Gaelic music.

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Ragnorak, the Age of Fire and Gravel

□ "But gradually the heat begins to dissipate. This is a signal for tremendous electrical action. Condensation commences. Never has the air held such incalculable masses of moisture; never has heaven's artillery so rattled and roared since earth began! Condensation means clouds. We will find hereafter a whole body of legends about "the stealing of the clouds" and their restoration. The veil thickens. The sun's rays are shut out. It grows colder; more condensation follows. The heavens darken. Louder and louder bellows the thunder. We shall see the lightning, represented, in myth after myth, as the arrows of the rescuing demi-god who saves the world. The heat has carried up perhaps one fourth of all the water of the world into the air. Now it is condensed into cloud. We know how an ordinary storm darkens the heavens. In this case it is black night. A pall of dense cloud, many miles in thickness, enfolds the earth. No sun, no moon, no stars, can be seen. "Darkness is on the face of the deep."

Day has ceased to be. □

Men stumble against each other. All this we shall find depicted in the legends. The overloaded atmosphere begins to discharge itself. The great work of restoring the waters of the ocean to the ocean begins. It grows colder-colder -colder. The pouring rain turns into snow, and settles on all the uplands and north countries; snow falls onto snow; gigantic snow beds are found, which gradually solidify into ice...glaciers intrude into all the valleys.."

Footnotes

[1] *Text and illustrations from Ignatius Donnelly, Ragnorak, The Age of Fire and Gravel. Donnelly goes on to describe a post-cataclysmic era of rain and snow, followed by tremendous floods. Written in seven weeks starting in May, 1882, this 450 page book predicts the end of the world by comet impact. "I could not rest until I had written it out and then the great dread of my soul was that some accident would destroy the single copy & the world would lose a revelation," he wrote of the work.*



Fifth Chautauqua: Druids

You may smile -- I take no offense at it-- as you imagine Mr. Donnelly's ancestors with their belief in fairies and pots of gold appearing in the midst of magical snow showers in mountain passes. (Please note for future reference the presence of snow as a lucky omen!) Perhaps I will add to your amusement by recalling that it was long the custom among the wisest of those ancestors, the Druids, to hold whispered consultations with oak trees by which means they determined both the past and divined the future. Druids. *Druidhen*, in the tongue of my ancestors, the ancient Gaels: "knowers of oak trees"

It was Julius Caesar, as we all learned in high school, who befriended one of these Druids and told of their practices, their twenty years of schooling, their uncanny skill in natural philosophy and astronomy. Even in those days the practice of prophecy by that strong-limbed monarch of the forest was ancient; who can doubt that it was again these very same *druidhen* who taught the early Greeks to seek the oracle in the oaks of Dodona, the shrine of Apollo. Indeed are not the ancient wise people, the Merlins and the Gandalfs, (progenitors of many of you learned professors with us this evening!) are they not the Indo-European cousins to the Brahman of India? It is a truth which can be demonstrated quite readily by whistling the first few bars of an Irish or Scottish or Bretagne air, in the elevator of a building or some such confined space, within which the passengers of the Indian or Pakistani nationality are confined; for you will see, as likely as not, that on suddenly cessation of your Celtic air, your companions will quite unconsciously take up and complete the tune at the point where you left off.

Ah yes, Talking oak trees! Fairy airs! What else indeed does Mister Donnelly have in store for you this evening! Namely this: I am now going to suggest that the practice of oak tree divination is alive today, and in fact comprises one of the most respectable branches of science. The proof of this is as follows.

There is a certain schoolmaster from Ireland, Professor Baillie by name, of the Queens University in Belfast, who undertook, in the 1950s, a quest of a curious sort but most pertinent to our inquiries.

No doubt you have heard tell of how from time to time the colder, more frigid latitudes of the earth yield up ancient corpses, miraculously preserved. Among the most fertile grounds for such discoveries have been the bogs of Ireland and other countries of the British Isles, and of the Scandinavian countries too, and altogether we can count some 1500 human specimens collectively known as the *bog men* who have been turned out of the earth and examined over the years. Many of those dating from the iron age or earlier, you may find it curious to hear, were determined by scientific tests to have been drowned in vats of beer and stabbed and garroted; a thrice enacted execution, it having been the custom in druidical sacrifice to kill the victim three times over. Others of these poor creatures seem to have died of causes apparently of an accidental nature, but these too have their messages to us, as we shall see in that most famous instance, the so-called ice man of the alps. I am told that the remains have even been presented on your television; and there may be many here tonight who have seen photographs of his implements, his fine bronze axe, his clever pouch of herbal remedies, and you may have heard too of certain mysteries that have persisted about the

discovery of the body (not the least of which were the poor man's missing genitals, and certain other physiological oddities, that, being unconfirmed at the present, and of possible scandalous character, I shall not here discuss.) But I will note a matter of no little significance to us, that being that the blades of soft green grass found in the shoes of this mountain man, placed there to warm the feet, provided organic substances, the age of which could and was determined by atomic measurement -- the carbon dating technique of Professor Libby-- showing indisputably that the death had occurred within a few years of 3150 BC. I shall ask that you keep this remarkable date in mind.

Returning now to Professor Baillie, (whose new book is soon to be published); he had long been fascinated by these bog men. Would you not be similarly attracted to the idea of actually having a conversation with your ancient ancestors? He, as a man of science, accordingly devised a plan of studies to understand the circumstances of the times in which they had lived. Naturally these human bog specimens were rather rare, and their ownership jealously disputed by various museums and collectors; but the professor, lacking a sufficiency of these boggish companions, devised an ingenious alternative scheme in which he set out to accomplish the same divinatory ends; this accomplished by exhuming up pieces of oak wood, which could be found in considerable greater abundance in the bogs of Ireland wherein they had evidently toppled during some ancient storm, or in the Scottish lowlands, and even in gravels of the rivers of Germany, the Rhine and the Main.

Let me proceed directly to summarize one of the more remarkable findings of the Professor, as presented in the recent paper of Baillie and his associate M. A. Munro, in which it is described how they recovered in a certain bog in Ireland some time ago an ancient oak, which when it was exhumed, exhibited rings, 220 of them --not an unlikely age for an oak tree --which fell into a certain pattern that some might describe as a kind of music; and by laboriously comparing the melodic pattern of one such log with a multitude of others, the pattern of an entire oakish symphony could be eventually discerned, which melody could even, with sufficient juxtapositions of specimens, be carried through until the present day. And what was found was that of all of the rings on this particular tree, (which was determined by the carbon dating method method foregoing to have lived and perished during the middle of the second millenium BC.) there were a few rings that were narrow and cramped, showing that the tree had a hard time of it for a few years, in the manner of a bit of life that must weather a storm that never seems to end, years without summer.

Now you no doubt know that we Northern people hold such times of coldness in respect; for much as the peoples of the South fear the seven years of drought that follows times plenty, we of the north fear the years without summers, and this tree, sited next to a bog in the north of Ireland, told a tale of such a time, speaking in the language of its rings, telling of this time of extraordinary harsh winters. And what Professor Baillie was able to show by patiently counting those rings was that the year of this severe winter was none other than 1620 BC, and that it lasted in fact for several years. And what is of great interest here (as some of you of classical bent may know) is that this was the very time that a great eruption occurred on the volcano Thera, the isle of Santorini, in the faraway Meditteranean, a time when fright and darkness fell over that sunny part of the world, signalling the end of a great civilization, it being the era when the Exodus took place. And is it not a remarkable thing that these momentous events, passed down to us over a hundred generations in our stories and religious writings, were known and even now are retold by a humble oak tree in that distant corner of the world, Ireland!

No doubt this will set your mind to thinking of other dimly remembered events of ancient times, among them the story of Atlantis, or the diverse biblical wanderings of the Hebrews and their friends and enemies.. Then too there is the story of the terrible three winters without summer told by our neighbors to the North in Iceland in their famous legend of the deadly three winters of [Ragnorak...](#)

These events are attributed by some scientists to atmospheric dust veils of probable volcanic or extra-terrestrial origin. They will point out corresponding signals in the world wide record, showing that the such eruptions characteristically cause a great fog to envelope the world, lowering the temperature several degrees, leaving their marks on the [North Africa](#) and concluded that these oaks tell of the temperature of the sea in the most magical parts of Ireland, the Southwest.

What are we to make of this? That there were climatic aberrations of a severe sort in not only the Meditteranean but the world as a whole in the 1600's echoing an earlier episode of catastrophe in about 3200 BC. The first of these we may associate with the dimmest known biblical events -- migrations, Egyptian and Babylonian captivities, etc (the Bible having been put to writing about 700 BC) and the second, the disaster of 3200 BC, we shall return to later.

Footnotes

[1] Baillie, MG and Munro, M.A. "Irish Tree Rings, Santinori, and volcanic dust veils." Nature, 332,334 (1988).

[2] The illustration shows the width of tree rings in Irish oaks. Narrow rings indicative of adverse conditions can be seen at 1153 BC, 1628 BC, 3199 BC, and 4377 BC. The 3199 BC value is associated with an acidity peak in [Camp Century ice cores](#) dated at 3150 BC, demonstrating unquestionably that adverse weather conditions, probably due either to atmospheric aerosols occurred at this time. Other narrow years are associated with frost rings observed in California bristlecone pines and with eruptions of Icelandic (Hekla 3 in 1159 BC) and Aegean (Santorini in 1628 BC) volcanoes.



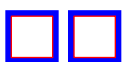
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Confrontation

All you've ever done is try to control my life. I hate it. I hate you. Sometimes I think I'd like to smash you in the face. But you frighten me. You frighten me so much. I want to just walk out on a bridge at night and jump into the ocean. I dont care how cold it is. I cant stand it. Now the one thing that I like around here I care about is the dog and you want to get rid of it. Just because I dont completely abandon my social life and rush home here for one goddamn can of dogfood.

So I didn't get rid of the dog. I didnt get rid of the dog, that week, anyway. Instead I made some phone calls and then I took the dog for a walk to calm myself, my head was pounding and my guts were up in my chest. I made myself walk by the creek because I had the idea that it would be good for me, people had been walking beside creeks for thousand of years to calm down after they had shouting matches with their monstrous daughters, I was thinking that it was April, 1988 and my fiftieth birthday was coming soon I'd better get in shape or calm down before I had a goddamn heart attack. I thought these things as I saw my daughter's tear streaked face (what *was* that hideous stain on her face, some chemical from a magazine ad?). At least she hadn't drilled a bunch of holes in her nose.....

Yet.



The Biblical Flood and Science

Scientists have us stirred up about the coming greenhouse apocalypse; more interesting may be what their data show about the biblical flood story:



"The three great tumults of the world -- The Deluge, the Crucifixion, the Day of Judgement".

---Gwion of Wales, Sixth Century, in *The Red Book of Hergest*

[For a chart showing more data](#)

[For more climate science](#)

[For the biblical flood story](#)

[For the home page of this project](#)

[For new data from *Science* Dec 1995](#)

[On the Iceman of the Alps \(wearing Mr. Donnelly's hat\)](#)

[For a letter from Boston, on the matter of the Mesopotamian flood](#)

What on Earth Happened in 3200 BC?

What do you think? [Comments?](#)

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For a more technical version of this page, with references, click [HERE](#).

For the latest from the GISP2 team (Jan 96 Science) click [HERE](#) (takes 30 sec to load).

What was the climate like at the dawn of organized civilization, 5000 years ago? (3200 BC, or 5200 years BP, Before Present, the age of the unification of [Egypt](#) and [Mesopotamia](#)) This compilation of recent graphical representations of various paleoclimatic data from ice cores and other sources gives some clues.

a) Sulfate concentration in Greenland ice. Notice the huge spike at 3200 years BC. What caused this? A comet? Volcano? Or just a local swamp? Scientists are still debating the question. There are indications that volcanos can cause a great fog to envelop the world, lowering the temperature several degrees, leaving their marks on the ice cores of the north as well as [methane-producing vegetation](#) at 3200 BC, followed by and explosive growth?



c) [Dead Sea levels](#) rose 300 feet at 3200 BC. The Jordan River must have been a tropical paradise.

d) Ice core oxygen isotope ratio; the higher the curve, the warmer the temperature. What was the big freeze-up at 5000 years BP?

e) Greenland Dye 3 oxygen isotope ratio. Minimum value between 2000 and 8000 cal yrs BP occurs just before 5000 yrs BP. Data from National Snow and Ice Data Center. A large acid peak at 3150 BC is suggestive of a volcanic event. For additional ice data from the southern hemisphere click [here](#).

f) Data from Belfast 7272 year [oak tree](#) ring chronology; (f) is an index of the tree ring narrowness, corresponding to cold weather in Ireland. The peak in (g) at about 3150 BC followed by the maximum tree and site sample size suggest a major climatic event at this time. Similar sudden increase in swamp oak (*mooreichen*, still used to make furniture in Germany) shows up at 5100 BP on the Danube. Much of this information comes from the oaks of [Ireland](#).

h) Heavy flooding in Navajo country, the American Southwest, based on paleoflooding studies. The peak at 5K yrs BP represents 8 sites.

i) Arid interval 5010-4860 (+/- 150) Morocco. Corresponding decline in oaks suggests reduced winter precipitation corresponding to cooler sea temperatures in North Atlantic.

Some tentative conclusions: Millennial-scale warming terminates with a period of climatic disturbance (so-called "Piora oscillation") and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally directed and hierarchical culture based on irrigation. Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level at 3200 BC followed by 10-15 ft. [alluvial deposition in river valleys](#).

What do you think? Comments? Ideas? We'd like to hear from you. Click [HERE](#) to start the process going.

Or Click [HERE](#) if you'd like to see comments from others.

Illustrations show the lower Tigris-Euphrates valley as it changed from 5500 to 5000 BP.



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Sodom



There are those places in the world where both man and nature are driven to extremes, and are therefore forced to yield up certain truths that otherwise might remain hidden. For as Francis Bacon (that odd hero for my own odd hero [Ignatius Donnelly](#)) once said, "you have but to follow and as it were hound nature in her wanderings, and you will be able, when you like, to lead and drive her afterwards to the same place again." Such a place is the Dead Sea.

In 1972 a man named Tom Leps, knowing of research work I had published on the invisible but calculable flow of groundwater, approached me with the assignment of determining the manner of movement of water beneath the bottom of the south end of the Dead Sea, not far from the town of Sedom. It happened that the government of Israel had contracted with the California firm of Kaiser Engineers (then basking in public gratitude for ship-building in the war) to build some dikes within which they aimed to capture, concentrate, and dry out valuable salts for which that ancient body of water is so famous. I did not know it at the time but the digging of potash in that grim setting is an enterprise into which many past fortunes had sunk without a trace, it having been long said among shrewd investors that "nothing can sink in the Dead Sea but money." It is therefore no surprise that on completion of this latest construction project it was seen that the dikes were entirely ineffective, the water soon leaking beneath them. This fiasco led to a lawsuit at the International Court at The Hague. Leps, who had once worked with the great engineer dam Karl Terzaghi, was retained as an expert on the case.

It was not of course the first time that outlandish things have happened in this land of salt, wet heat, and earthquake faults; for here we have the closest place to hell, land of extremes of both nature and human behavior, of mad saints and zealous outcasts. Lot had settled there, when the land was said to be lush and fertile. The destruction of Sodom and Gomorrah was already an old story when it had been written into the Bible three thousand years ago. The chronicler Josephus claimed to have seen with his own eyes there the seared and salted remains of Mrs. Lot in the first century; seventeen hundred years later Josephus' translator William Whiston impatiently waited the day when the quarrels of local desert princes would subside so that properly scientific studies of these biblical events could be undertaken. Captured by the Arabs in the 1948 war, the remote town had been retaken only to become a disreputable center of drugs and prostitution when the salt works were reopened. The place had long yielded fertile crops of stories; the mystery play *History of Lot and Abraham* had thrilled the medievals and only a few months ago a colleague of mine, Amos Nur, had announced that the famous biblical fire and brimstone had been produced by an earthquake in that same place in 1900 BC. So we have in this strange land a continuing entanglement of geophysics and morals.

 My consulting assignment was successfully completed when the results of this early effort at groundwater modelling -- I used an electrical analogue of the D'Arcy equations which I had developed as a graduate student at London -- showed that the failure of the Dead Sea dikes was an inevitable design defect (the feasibility of building water tight dikes on soluble material such as salt has to be relearned every few years, as we have subsequently seen in various more recent failures of dams built on salt beds). The failure had arisen in layers of cracked and soluble salt that had accumulated sporadically on the floor of the sea

over the millennia. I was thirty three years old that year, and the success of this project would next lead me to to a profitable and interesting professional life.

Perhaps more interesting for present purposes than these engineering matters was the odd character of the sea bottom which was composed of salt and marly silt layers that could be "read" as a chronology of past climates, of the wet and dry spells that had come and gone with the rest of the desert wanderers over thousands of years. It occurred to me that there may be something to the biblical story description of the place as a land of fertility and delight when Lot had first arrived there (Genesis 13) Such an abrupt local climatic shift was not entirely implausible, given perhaps a radical northward migration of the Saharan monsoon system. Some time in the late seventies I read of the discovery of bits and pieces of vegetable matter discovered in caves along with the famous Dead Sea Scrolls. These twigs would have their own story that would be revealed with the advent of radiocarbon dating in the 1950s.

But it would be twenty years before I discovered the facts and circumstances are as follows.

Not far from the southern end of the Dead Sea is an odd formation of flat-topped salt bluffs -- a diaper in geological terms -- several miles in extent and a thousand or so feet high. The formation is known as Mount Sedom, after the ancient place. Prominently exhibited on a rise above the stinking sea is the a salt spire said to be Lot's wife. The area, being most inhospitable, is not often visited; according to the *Lonely Planet* and *Let's Go* travel guides the 115 degree walk from the bus stop past the "Mrs. Lot" salt pillar, back up into the hills some several kilometers to the great Malham Cave, is enough to make even the resilient readers of those publications feel as dead as the sea that glitters with dull malevolence in the haze below.

It happens that the caves at the 300 foot level are not only the widest of many that perforate the salt hills but also contain, preserved over the millennia, twigs and leaves of *Quercus Calliprinus*. These can hardly be assumed to be of local origin considering that the area is salt, not soil, within a searing desert with an annual rainfall of less than two inches, hardly enough to moisten the parched ground much less support oaks. Now it is geologically certain that it was an ancient pluvial age that created caves in the salt; in fact past climate can be inferred by carefully measuring the width of caves formed by salt dissolution. The cavewidths can in turn be compared with correlative glacial advances in northern Europe (bigger caves = more rain = more glaciers) and the cave elevations with ancient sea levels of the Dead Sea itself. The horizon of wide caves found some 300 feet above the present sea level necessarily indicates an extremely wet period in the early Bronze Age, or about 4200 to 5200 radiocarbon years before present. Oak twigs, driftwood, and marl found in the caves must have been transported by floodwater from some other part of the Judiah Hills. when the water level was some 300 feet higher than present, implying heavy flooding on the Jordan River and coupled probably with lower evaporation rates due to cooler weather. These strands of evidence have been carefully pieced together by Israeli scientists, whose conclusions are indicated graphically in terms of level of the Dead Sea in the figure.

Prominently shown is the fact that the land in the great rift valley was wet and the Dead Sea level high up until about 7000 years ago. This conclusion is in agreement with other paleoclimatic information, it being well established that North Africa was lushly tropical in the early Holocene period. Around 7000 years ago the land became drier, much as it is today.

Of greatest relevance here is the is the great hump in the curve that came later, centering on 3000 BC; no

other event following the great drying 7000 years ago quite matches this spectacular 300 foot rise in sea level. When exactly did this occur? Radiocarbon dating of both the oaks twigs and the marl show a peak at 4350 radiocarbon years before the present. Clearly there had been a time of great flood in North Africa just before 3000 BC.

The evidence suggests a great flood, corresponding no doubt to a radical arrangement of pastoral or civil life, followed by destruction, dessication, and salting of the earth.

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Footnotes

[1] Frumkin, Amos (University of Jerusalem, Israel Cave Research Center, Jerusalem) *Holocene climatic record of the salt caves of Mt. Sodom*, Israel, 1991 *The Holocene*; vol 1, no. 3, p 191-200.

The many stories of this land including the rediscovery of Masada and of the Dead Sea scrolls are skillfully recounted in Barbara Kreiger's fine historio-travelogue, *Living Waters, Myth, History, and Politics of the Dead Sea*.

For a nice site on the Dead Sea Scrolls, see [>>Dead Sea Scrolls](#)

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For indices of all 3200 BC scientific data:

Click for [chronological sort](#)

Compilation of recent graphical representations of various paleoclimatic data signals from ice cores and other sources normalized to a common 9000-0 calendar year BP base. Most of the plots are scanned directly from the original sources. Brief technical notes relevant to the 5000 yrs BP period and data sources follow.

a) Sulfate in GISP2 ice core; curve is a low-tension robust spline of sulfate concentrations with average about 30 ppb. The cause of the 150 year peak at 5.2K yrs BP is not known, but the authors suggest the possibility of an anomalous nearby temporary body of open water (polynya) which generated marine biogenic sulfate. Zielinski, GA et al, *Nature*, 264 948 (1994). □

b) Atmospheric methane from GRIP ice core with lowest value 580 ppbv at 5.2K yrs. BP followed by rapid increase of 40 ppbv over 200 years; variously attributed to clathrate or permafrost outgassing, decrease in tropospheric oxidation, or abrupt increase in low-latitude wetlands. Blunier, T, et al, *Nature*, 374 47 (1995).



c) [Dead Sea levels](#) peaking at 300 ft. above present levels at 5.0 and 8.0K gv BP. Frumkin et al, *The Holocene*, 13 191-200 (1991). For further discussions of North African lake behavior and possible relation of century-scale Holocene arid intervals and cooler sea temperatures in the North Atlantic see Lamb, H F et al, *Nature*, 373 134 (1995).

d) GISP2 100-year smoothed oxygen isotope ratio; Meese, D.A> et al *Science*, 266, 680, (1994)

e) Greenland Dye 3 oxygen isotope ratio. Minimum value between 2000 and 8000 cal yrs BP occurs just before 5.0K yrs BP. Data from National Snow and Ice Data Center. A large acid peak at 3150 BC is suggestive of a volcanic event. Fisher et al, *The Holocene* 5, 1, 19, (1995). For additional ice data from the southern hemisphere click [here](#).

f) Data from Belfast 7272 year [oak tree](#) ring chronology; (f) is an index of the tree ring narrowness corresponding to cold weather and following growth disturbance in bogs due possibly to flooding with some peaks correlatable to volcanic activity; (g) represents relative availability of oak samples in Northern Ireland. The peak in (g) at about

3150 BC followed by the maximum tree and site sample representation suggest a major climatic event at this time. Baillie, MGL and Munro, MAR, *Nature*, 332 345 (1988). Similar sudden increase in swamp oak (*mooreichen*, still used to make furniture in Germany) shows up at 5100 BP on the Danube. Becher and Schirmer, *Boreas*, d) GISP2 100-year smoothed oxygen isotope ratio; Meese, D.A> et al *Science*, 266, 680, (1994) 6, 300 (1977).

h) Inferred heavy flooding in American Southwest based on paleoflooding studies. The peak at 5K yrs BP represents 8 sites. Baker, Victor, *Science* ???, ?? (199?).

i) Arid interval 5010-4860 (+/- 150) at Tigalmamine in montane Morocco. Corresponding decline in oaks (*Quercus rotundifolia and canariensis*) in favor of *Gramineae* suggests reduced winter precipitation corresponding to cooler sea temperatures in North Atlantic. Lamb, H. F. et al, *Nature*, **373** p 134 (1995).

Some tentative conclusions: Millennial-scale warming terminates with a period of climatic disturbance (so-called Piora oscillation") and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally directed and hierarchical culture based on irrigation. Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level at 3000 BC followed by 10-15 ft. alluvial deposition in river valleys.

Illustrations show the lower Tigris-Euphrates valley as it changed from 5500 to 5000 BP.



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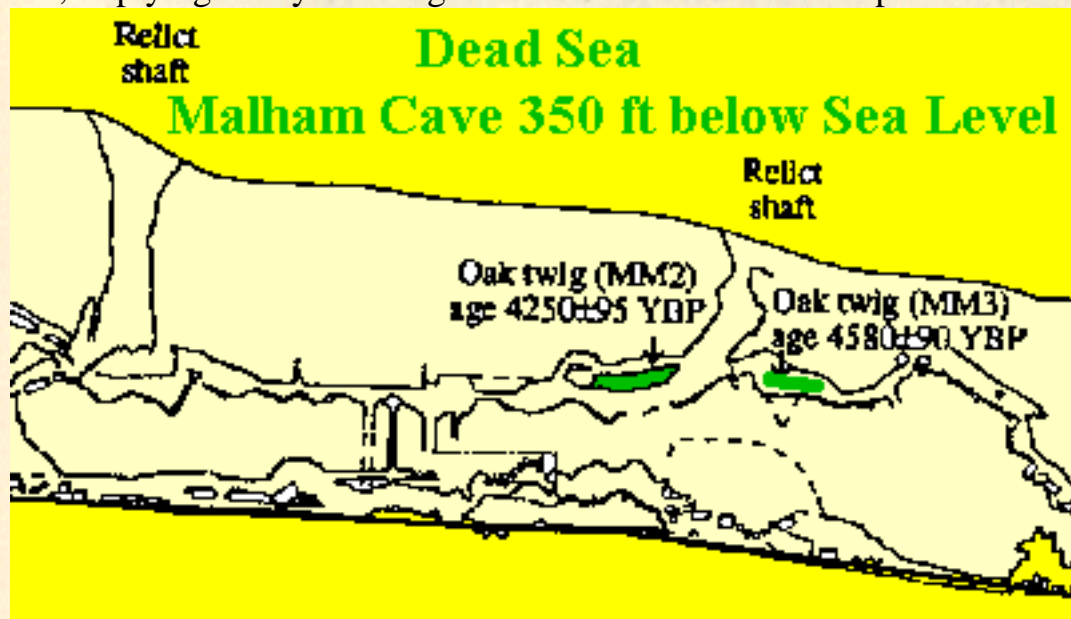
Let us divert quickly to the Dead Sea. It is well known of course that outlandish things have happen in this land of salt, wet heat, and earthquake faults; for here we have the closest place to hell, land of extremes of both nature and human behavior, of mad saints and zealous outcasts. Lot had settled there, when the land was said to be lush and fertile. The destruction of Sodom and Gomorrah was already an old story when it had been written into the Bible three thousand years ago. The chronicler Josephus claimed to have seen with his own eyes there the seared and salted remains of Mrs. Lot in the first century; seventeen hundred years later Josephus' translator William Whiston impatiently waited the day when the quarrels of local desert princes would subside so that properly scientific studies of these biblical events could be undertaken. Captured by the Arabs in the 1948 war, the remote town had been retaken only to become a disreputable center of drugs and prostitution when the salt works were reopened. The place had long yielded fertile crops of stories; the mystery play History of Lot and Abraham had thrilled the medievals and only a few months ago a colleague of mine, Amos Nur, had announced that the famous biblical fire and brimstone had been produced by an earthquake in that same place in 1900 BC. So we have in this strange land a continuing entanglement of geophysics and morals.

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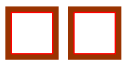
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Iceman



According to Konrad Spindler, leader of the scientific investigation of the Iceman, the best estimate of the time of the death of the poor creature, shown here wearing the hat of Ignatius Donnelly, is between 5200 and 5300 before present.



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"In the Maya conception, the zero day of this era-based calendar fell on 13.0.0.0.0 [note 38] of the Long Count, 4 Ahau 8 Cumku of the Calendar Round, and on a day when the ninth Lord of the Night was ruling. Once these day names had been juxtaposed in this way, the calendar was set for all eternity. All the simultaneous cycles that constituted time would now simply click forward one day at a time. {...} In our calendar, their zero day corresponds to August 11, 3114 B.C. [note 39]

Above we talked of the turning of the millennium as one of our own milestones in time. In the near future Maya time also approaches one of its great benchmarks. December 23, 2012, will be 13.0.0.0.0 4 Ahau 3 Kankin, the day when the thirteen baktuns will end and the Long Count cycles return to the symmetry of the beginning."

1} Linda Schele and David Freidel, *A Forest of Kings: The Untold Story of the Ancient Maya*, William Morrow and Co., Inc., New York, 1990, p. 82.

Boniface

On a warm day in the year of 724 a tall, stern, blue-eyed Englishman walked into a clearing near town of Geismar in Hesse, Germany. The man--Wynfrith was his name -- was a cleric who had only recently returned from Rome and an audience with the holy father in which progress reports on the Christianizing of the northern peoples had been duly reported. Having been appointed a bishop on the grounds of his tireless enthusiasm in *unmasking and discrediting of false prophets, and summoning of public sinners to repentance* Wynfrith was now returning to the north to correct a malady that had crept into those distant swamps during his absence. He was fired by his visit to the Pontiff. So holy was this Wynfrith that his own sins, such as they were, did not suffice to fill his capacity for repentance and he was often compelled to report the sins of others as well, especially those of his fellow missionaries who were of Gaulish or Irish birth.

Wynfrith had spent some years among the barbaric tribes of the lowland countries known as Frisians, a fish-eating people long thought to be of such a low and unimportant state of life that the Roman exploratory expedition of the year 47 (described by the elder [Pliny](#)) considered the territory to be, like Ireland to the West, not worth the trouble of conquest. Now, several hundred years into the attempted Christianizing of these boggish folk the best of the men like the Englishman were suffering considerable frustration, for the Frisian chiefs were cunning and often insincere in their Christian practices. Wynfrith had been in need of some persuasive force, and now, armed with a letter from the Frankish chief Charles Martel (provided by that rough-edged strongman only with the persistent promptings of the holy father) he was in a much better position to correct certain wretched practices that would later be so well described by his assistant Willibald of Eichstatt:

Now at that time many of the Hessians, brought under the Catholic faith and confirmed by the grace of the sevenfold spirit, received the laying on of hands; others indeed, not yet strengthened in soul, refused to accept in their entirety the lessons of the inviolate faith. Moreover some were wont secretly, some openly, to sacrifice to trees and springs; some in secret; others openly practised inspections of victims and divinations, legerdemain and incantations; some turned their attention to auguries and auspices and various sacrificial rites..

Many of these actions and evil habits, it must be said, were attributable less to the native lack of refinement but to the slack and vicious ways of various Celtic clerics, an unreliable lot to say the least of the matter. There was, to pick one egregious example, one Fergal, a man whose false cosmological argumentation would not be revealed to the world by a zealous researcher in the year 1951; another, calling himself Aldebert, was ingenious in his many affectations; he was able to imitate the gait and manner of a poor apostle. This fool had grievously misled the innocent ("*seduxit multitudem rusticorum*"), claiming absurdly to know eight angels on a first name basis, blasphemously announcing that his birth had occurred from his mother's side following preliminary annunciation by a calf (a strange claim even in an age when beasts were known to talk freely); the worst of it was the man's announcement that he possessed a letter sent from heaven and written in the hand of Jesus Christ himself.

No wonder that these simple Frisian folk, still half believing in their ancient pagan gods, were so susceptible to these abuses. If only those root beliefs could be cut out from their spirits!

Crossing the Alps that freezing winter of 7xx, Boniface had thought a good deal about how to effect this, and now on this fine spring day he had an idea. What Wynfrith had now focussed his attention was a particular object in the middle of Geismar that could not help from time to time to raise some nagging doubts. It was a huge oak tree that the natives had formerly called Wotan, but which they now in their Christian state, did sullenly refuse to discuss. Their gloomy denials had become all the more evident when Wynfrith had suggested that the timber from the tree would serve most excellently for the new chapel to be dedicated to Saint Peter...One could well imagine what nightly orgies went on there...

In future centuries this stalwart Englishman would be known to the world as Saint Boniface but on that morning drenched with sweat and fired with passion he advanced toward the gloomy tree solemn tree he could feel all eyes on him much as one feels when entering a convenience store in an unfamiliar and troubled city neighborhood on a hot summer night near the LA airport. Saint Boniface as he would later be known to the world, advanced into the clearing bearing in his hands a great iron axe, and began then to swing with all his power, perhaps more than all his power, at the tree. He advanced into the clearing with an axe and with mighty swings began to hack at the tree, before the hushed crowd of heathens. Again and again he struck as the sweat poured from his body and now the rhythm of it pleased him and the tree began to shiver as he reached the point to f droplets of sap began to ooze from it and as the moment of climax became immanent the tree shivered as the tempo increased

quote p 28

"raining blow after blow of the axe upon the gnarled and massive trunk, till at last with a mighty crash the giant monster fell, its trunk bursting asunder into four parts which, as they fell to the ground, miraculously shaped themselves into the arms of a cross, "

There was a moment of suspense while all, up to now "in their souls were most earnestly cursing. the enemy of their gods" waited to see whether the old gods would roar from the tree but with a great crack it split into four pieces and toppled, light streaming from the sky onto the head of the sweating saint.

"The shuddering pagans," according to Boniface's hagiographer, Father Baring Gould, "at once bowed before the superior might of the Christians"

Life goes on. Peak moments give way to reality. But not forever. There exists within the State Library at Fulda, along with the magnificent sarcophagus bearing the body of Boniface, a gospel, written in an Irish hand, from which the saint would read to the faithful on the morning of Pentecost, June 5, 754. The book is badly damaged, evidently by sword cuts and spattered with dried blood, the blood of the saint himself, who was attacked on that morning by a gang of Frisians...

Thor, it seemed, had taken his revenge.

Church History, 33:235-247 (1964) Willibald, The Life of Saint Boniface (eng trans 1916) Bamberg



She called me on a Saturday morning

I was at my office.



"Hi. This is Cessair Sullivan." The greeting would always be the same, but later when it became regular she would drop the Sullivan. The times of the calls would begin to cluster, certain days of the week, hours of the day. A dense network of self-replication building. Always at the office. Are successful patterns outcomes of rapid adaptation, nature's way, or are we precoded with these remarkable capacities for dissimilation? I have always thought that children already know how to talk. Just give them the word: *Ma ma*. I would call on alternative Saturdays. We never spoke of the arrangement.

"Oh Hi, Cessair. How are you? I've been walking the creek lately. Our conversation had provoked some thoughts." I was delighted at the call, and I wanted her to know it. Reward the behavior. There was a little silence.

"I haven't been down there. I guess I've been preoccupied with other things."

"You're missing important things. Just the other day I was thinking about the padres' coming there, right down to where we were standing. Seventeenth eighty, I think it was. Baptizing the indians. The next morning I read that the Pope is going to beatify Father Serra. That means make a saint of the man."

Oh I know."

"The campaign is being headed by a monk named Noel Francis Moholy. He's raised a million dollars for the cause by selling medallions struck by the U.S. Mint. He got Serra's likeness on an air mail stamp, and he's promoting a tour package which includes a visit to Serra's birthplace in Majorca. Sixteen hundred and fifty dollars for the package."

"I just can't. Maybe next year."

"Student loan payments?"

She laughed. "You've got it."

"Plenty of time for that."

Another pause.

"I was wondering whether you'd like to have lunch. I've been thinking about my career. Graduate school and so forth. I might be interested in engineering." There had been no pause between the invitation to lunch and the career explanation.

"Sure. I'm not known for promoting engineering and I try to avoid giving advice, but who knows,

something interesting might evolve. What do you have in mind?" I had confused myself, attempting to disguise my interest with disinterest, one of those habits that life should teach one can be countereffective.

"Well I could just ask you a few things on the phone."

"No, I like the lunch idea. I just meant that I'm not sure I have all the answers." I noted with irony that there was no normal pause between the "I like the lunch idea" and the weak "I just meant." I was aware of already losing control. Even then I knew that there were going to be complications in both of our lives now. Even now I wonder whether there can be blame assigned. Even now I think that no mind is able to outwit the imperative of it. My father used to call it the war between the sexes.



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Dodona

Phaedrus: Socrates, you easily make up accounts (logos) from Egypt and any countries you wish!

Socrates: Dear boy, the priests in the sacred precinct of Zeus at Dodona say that prophetic words first came from an oak tree. In fact, the men of that time on account of their guilelessness (lacking the wisdom you young people have) were content to listen to an oak tree and a rock, provided they spoke the truth. For you, however, what matters is who is speaking and what country he is from: you don't merely ask whether what he says is true or false." -- Plato, Phaedrus



You will, in your age of high science, no doubt find my claim incredible: both the past and the future can be determined through consultation with the

Fremont's Acorns

In 1770 there had been approximately 10,000 Costanoan natives in the central Californian coast, □
divided into 40 to 200 person tribelets, each of which settled in a watershed such as San Francisquito Creek □
[1]. Each headed by a male chief, assisted by an "orator" who (like the Celtic bards) kept the tribal rules
and stories, the memes that contained the recipe for survival and success when the world was a simpler
place before the Europeans came.

In 1844 the adventurer John Fremont crossed the Sierra Nevada in winter and in April described his guide
Kit Carson's intrepid two-man attack on a band of Indian warriors. Fremont called the natives he
encountered *the Arabs of America*:

The scalps of the fallen (indians) were instantly stripped off; but in the process one of them,
who had two balls through his body, sprung to his feet, the blood streaming from his skinned
head and uttering a hideous howl. An old squaw, possibly his mother, stopped and looked
back from the mountain side she was climbing, threatening and lamenting.

Similar scenes were described in Ireland during the Elizabethan wars when it became necessary for many
of the uncivilized Irish to be put to the sword for their recalcitrance.

Fremont was not, as we might be today, romanced by character of the natives; inspecting their faces he
noted that "I was forcibly struck by an expression of countenance resembling that of a beast of prey; and all
their actions are those of wild animals. Joined to the restless motion of the eye, there is a want of mind - an
absence of thought - and an action wholly be impulse." Fremont would not have been impressed by the
movie *Dances with Wolves*.

One day Fremont and Carson came to a camp of California natives. The natives had come to fear the white
men and had taken to the forest, leaving their camp abandoned. Fremont and Carson discovered several
baskets of acorns, treated to be made edible after the manner of the indians. Helping himself to half a
bushel, the explorers found them "sweet and agreeably flavored." Having taken this food from the native
stores, the adventurers went on their way, leaving in payment for the acorns some articles of clothing.

Footnotes

[1]The natives had been present in the area for almost 5000 years, based on the dating of a skull found in the San
Francisquito Creek creek bank a few hundred feet from what is now the Stanford Shopping Mall at a location where,
only a few weeks ago, the narrator came across the dead body of an elderly man. As it turns out the man was over
ninety years of age and had been a botanist of some standing.



Second Chautauqua: Gerald of Wales

I want to say it is a pleasure to visit you here in your beautiful state of California. During my times, now more than a century ago, many of my countrymen, fleeing a great disaster in their own land, came here to settle on the lands of this fine peninsula, some establishing themselves not more than a few minutes walk from where I stand. Among them was John Greer, an Irish sailor who on a Sunday shore leave landed in a rowboat at the mouth of San Francisquito creek (not far from Greer Road in Palo Alto), poled his way up (his friends having taken *their* shore leave in a lusty quest for gold in the Sierra.) The kind of gold that John Greer found was the warmly human gold of Spanish California; within months he had married the beautiful Mexican daughter of this *rancho* and soon after came into possession of these fine lands now known as Palo Alto.

Many of these Hibernians found rights, privileges, and opportunities denied to them in the eastern United States, and though I myself did not suffer from this kind of prejudice (more characteristic, perhaps, of the narrow New England puritan culture than the gentler Philadelphia where I grew up) I nonetheless understand well their feelings of relief at having reached this distant lovely western land by the sea, so reminiscent of the green valleys of the West of their Ireland, washed as they are by the warm waters of the Gulf stream.

These and countless other similar tales that made their way to us from California in the last century bring to mind the observations of that medieval bishop, Gerald of Wales, on his visit to Ireland in 1183. Gerald's report to the English monarch *History and Topography of Ireland* remains one of the fullest descriptions of late medieval times in that island, which alone in Europe had never felt the yoke of Roman conquest. Gerald found in Ireland a land of health and springtime, in which there were countless marvels, fish with teeth of gold, a woman who made love with a lion, birds born of barnacles, a stone cup that flowed over with wine. In many odd respects the Ireland of these days might be taken as the model of California as this land was found by the early American settlers. Indeed even today I am told that many eastern Americans consider California to be a place of exotic and even outrageous character, not too far different perhaps than the way Gerald saw Ireland some eight hundred years ago:

And there, when I had seen many things not found in other countries and entirely unknown, and at the same time worthy of some wonder because of their novelty, I began to examine everything carefully: what was the position of the country, what was its nature, what was the origin of the race, what were its custom; how often, and by whom, and how, it was conquered and subjugated; what new things, and what secret things not in accordance with her usual course had nature hidden away in the farthest western lands? Just as the countries of the East are remarkable and distinguished for certain prodigies peculiar and native to themselves, so the boundaries of the West also are made remarkable by their own wonders of nature. For sometimes tired, as it were, of the true and the serious, she draws aside and goes away, and in these remote parts indulges herself in these secret and distant freaks.

It has sometimes been said of the Irish in America that they refused to enjoy their good fortune

and success that though many of them settled here and raised families and established their churches there was about them a certain restless fatalism, a tendency to go from shirtsleeves to shirtsleeves within a few generations. It is true enough, to cite a local example, that Dennis Martin of Menlo Park (named after his Irish village) died a poor man, having bitterly quarreled with his daughter and losing his hard-earned wealth and land in litigation. There are those who would attribute this misfortune to the unsteadiness of the Celtic spirit. But I am going to suggest to you that there may be other reasons too, having to do more with the ancient Celtic perception of the unsteadiness of the world, the inconstancy of nature's blessings. As Gerald says, quoting the Roman Lucan *the gods easily grant great blessings, but do not easily maintain them.*

It may be said by many that it took the coming of the Protestant, namely Leland Stanford and his wife, to bring order and harmony to this place, to transform the land from a wild and abandoned wilderness into the garden that it is today. And it is true, as you shall see, that nature cooperated marvelously in this transformation, causing the rains to become more steady and gentle as they have been these past hundred years. But there is a fair question to be asked here. Was there not a bit of passing luck to all this? Is it not possible that has time now run out? Are we not sensing a new kind of irregularity returning here, and to the world at large? Are we not seeing once again in the air about us a kind of inconstancy, the suggestion that nature has now withdrawn her favors and is now becoming peevish? This is a great question, one that I know you ask yourselves in many ways, and it is the question that I shall, after a short quotation from my writings and some suitable autobiographical diversions, proceed to address.

Footnotes

[1] The illustrations are from a medieval edition of Gerald's work.

[2] Another hibernian, Dennis Martin, passed after many an adventure over the Sierra in a shower of snow (the old Irish tales had the worthy young adventurer gaining entrance to the fairy land through just such a mountain snow shower); on arriving in California he joined Sutter in his military adventures to southern California and then established a community next to San Francisquito Creek three miles upstream from here, in what is now the lands of your atomic accelerator.

A few miles south of here his travelling companion Martin Murphy soon found himself presiding over a sea of golden wheat in the little settlement of Mountain View. Murphy's festive parties were so popular that trains were chartered to bring guests from San Francisco.



Mesopotamia delta

Stratigraphic relations showing the rapid development of a rich, fertile delta are compared in Mesopotamia with the generic model of delta formation suggested by Stanley, who demonstrates that development of these potting grounds for civilization would have appeared only after 6000 BC. Significantly, no comparable environmental condition existed in any great river valley for more than 100,000 years.



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Pliny

"Here we must mention the awe felt for this plant by the Gauls. The Druids - for so their magicians are called - held nothing more sacred than the mistletoe and the tree that bears it, always supposing that tree to be the oak. But they choose groves of oaks for the sake of the tree alone, and they never perform any of their rites except in the presence of a branch of it; so that it seems probable that the priests themselves may derive their name from the Greek word for that tree.* In fact, they think that everything that grows on it has been sent from heaven and is a proof that the tree was chosen by the god himself...."

---Pliny XVI, 249. Other sources indicate that the mistletoe, though commonly found on apple trees, only achieved sacred recognition when it grew on the oak. Analysis of the stomach contents of recently exhumed bodies of people evidently executed in druidical rituals show that their stomachs contained pollen from the mistletoe.

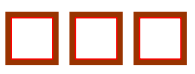
Reply to: ITRDB Dendrochronology Forum

Subject: Re: Query, quercal

Dick Meehan asks:

- > Does anyone out there have any oak tree lore they'd like to share or
- > point to? I am working on a literary matter in which the testimony of
- > the oaks will be featured. Oak>oke>ac>eiche>aig...what's the proto-
- > indoeuropean?

*Wrong etymology. Try drus>drys>dhrys (as in Druid(s) who danced around under same. The IE would probably be *drus. The oldest reference to same that I know of is on a 5th century B.C. lead tablet found in the Zeus sanctuary at Dodona where a petitioner asks the oracle: "When is the best time to cut the evergreen oak?" The oracle's response is not recorded.*




Father Burrows



Dear Dick:

I promised to tell you about a mystery by Agatha Christie that I think will shed some light on the origins and history of your biblical flood. The novel deals with a murder that occurs at an archeological dig in Mesopotamia with the the usual cast of mystery characters, not unlike that more famous story by Dame Agatha, *Murder on the Nile*. Of course everyone -- the more dignified the better -- is a suspect. Like all writers Agatha borrowed from real life, usually surreptitiously. But here she evidently got a little careless on this one, patterning it so closely after certain events and characters that she encounteed in Iraq that she worried for years afterwards whether she had revealed too much about her hosts at the remote archaeological digs at Ur where the action takes place.

Of the various characters one might expect, weel, you might guess  it! The the murderer turns out to be the priest, a Jesuit member of the expedition who in real life was an Irishman named Eric Burrows. I got interested in this guy and looked him up. The historical Father Burrows was a paleographer and his responsibility was the translation of the various tablets of which the enclosed illustration is an example which happens to be the tablet which I have enclosed (Not the real tablet, of course....)

It seems that this father was a certain classcal character type. He spoke Sumerian, Babylonian, Phoenician, Aramaic, and Hebrew, among the ancient languages. But according to Max Mallowan, assistant to the director with whom Dame Agatha, divorced shortly before her visit, had a love affair, and who later married her, Fahter Burrows was unable to bend his mind to the vernacular and remember (according to Dame Agatha) Arabic words like "hot water". *Far removed from the realities of life* Burrows distressed his fellow scholars with his lack of normal social skills, exemplified perhaps by his insistence on doing his morning toilet in full view of visiting dignitaries. Nonetheless he was an interesting character *clever, friendly, and yet aloof: there was something faintly inhuman about him* according to Agatha. She says he once suggested an idea for a story to her, which she later used in one

of her books, I don't know which one.

From what I make of his published work Burrows seems to accept the story of the biblical flood put out by Leonard Woolley, as I wrote to you before. He wrote an article published soon after Woolley found the famous layer of silt that he called the flood layer, in the January 1930 Dublin Review, which is an attempt to reconcile the Genesis and Mesopotamian stories. He describes how the flood obliterated the world of an older pre-Deluge people who live in reed huts and paint pottery in a strikingly beautiful manner.

Burrows' provides a translation of the cuneiform tablets that describe the moments leading up to the flood, when the rebel God Ea, defying the council of gods who have determined to exterminate man because he is noisy and troublesome, decides to warn Noah of the impending disaster. According to other Sumerian versions of the story, this is not the first time disasters have struck; already the state of civilization has been plagued by disease, drought, and other creeping problems, just like in our own times. It turns out that Ea cannot simply warn Noah by addressing him directly -- this is evidently against the divine rules. He circumvents this by using the wall of a reed hut as an intermediary. One night the Noah of this story was sitting by his hut when a breeze sprang up and he thought he heard a kind of whispering. The more he listened the more he thought that it was a voice talking to him. At least that's the way he remembered it years afterwards when he would be trotted out to tell his grandchildren. Here is what he would say he remembered that he heard:

Reed-hut! Reed-hut! Wall! Wall!

Reed hut listen! Wall understand!

Man of Shurrappah,

Tear down the house. Build a ship!

Leave riches! Seek life!

Possessions hate, and life save!

Bring the seed of life, all of it, into a ship!

Interesting advice from the dim past! Sounds like what my freshmen dormmates used to tell their parents when they went home for the big Christmas dinner!

I thought of this as I was lying in bed the other night. I couldn't sleep, jet lagged. Outside I could hear the faint hiss of traffic and blaring of horns way below on the avenues. At 2 am it started to rain and as it pelted the window I translated it all into the sound of wind in the walls of the hut, the listeners, children perhaps, huddled in the dark as the storyteller tells of the sounds of wind rustling in the reeds, and how the "man of Shurrappah," I wondered whether I should give up my career as a management consultant, counting beans for the Sun God. But this Sumerian Noah is able to hear the message that he should abandon his material possessions and build a boat. The story rings true, dont you think? Isnt it almost necessarily true that at some time there must have been soem one soemwhere who for some reason came to think that he escaped the great flood because the wind had warned him in advance. Why wouldn't any man think this if he lived in a place and a time was the world so fresh (or did it seem old and weary event then??) and have this story told of him?

Anyway Father Burrows dates the flood in this article at about 3700 BC., a little earlier than Woolley. All of these dates without benefit of radio carbon. Not so bad for a father!

Well that's about it for now. Look forward to seeing you on the tenth.

Love, Cessair



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River

In the beginning, say 7000 years ago, when sea level is xx and rising rapidly.....



Until finally at about 5500 years before present sea level begins to slow down.....



And then something happens at about 5000 years ago and the next thing we know at 4500 years before present - 2500 BC - there is a fan covering the old river valley and the old culture whatever it may have been is buried...



And then from then on....

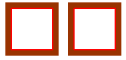


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San Francisquito Geohydro

Recent worldwide studies of delta formation indicate that deltas began about 8000 years ago (i.e. 6000 BC) when [sea level rise](#) began to slow down. In other words the vast fertile plains that were necessary for the beginning of agriculture did not exist before say 6000 BC, and were in the stages of active formation for some time after that. Here is how San Francisquito Creek would have appeared during this era.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6000 BC	4500 BC	3000 BC



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□ The Skull

"Over here," Cessair said. We were in a shady glen, a grotto carved out into the bank of the creek, about fifteen feet below the street level. "There had been at least two skulls found here. The first in early 1922, in April or May, by a student named Bruce Seymore. He found the skull sticking out of those gravels right here" -- she walked across the creek to a bank of gravel and pointed up about 6 feet above the ground. Her hair had a faint carrot color and I found myself gazing at her as she stretched. There was something sad □ and even ironical in her voice, a distance and gentle courtesy; her largish body moved in a way that was almost mechanical, as if on command of that distant voice. It was evident that she was much in a separate world, and I found myself wanting to be part of it.

"He took the skull to Professor Willis of the geology department who advised a friend of his, Doctor Alex Hrdlicka, of the National Museum. It said:

"My Dear Doctor Hrdlicka: Although it is more than 12 years since you and I rejuvenated an ancient man in South America, you are, I notice, still interested in our older inhabitants and I would, therefore, call your attention to a skull, which we have recently found in the alluvial gravels of this immediate vicinity..."

"You memorized the letter." □

"Well it just seemed to be a bit poetical. Don't you think that people wrote beautifully in those days. I mean just about everyday things...." She paused and poked at the gravel in the bank. There were bits of charcoal mixed with it. Carbon datable, I thought.

"Those were the days when your manner of speaking established your credentials to engage in scholarship. It was supposed to sound as if it were translated from latin."

"Anyway the doctor wrote back saying that he thought that the skull was probably not much older than ten thousand years, humans of those days being at best very scarce on the continent. Professor Willis had judged that the geological deposits in which the skull was found werer more than four thousand years old. Considering the scarcity of absolute dating in those days, these estimates, bracketing it between four and ten thousand year old, are really very good, as subsequent events were to show."

"In the spring of 1963 part of a human vertabra was exposed on the other side of the creek, this side, at □ a depth of sixteen and a half feet. The skeleton was excavated by Professor Bert Gerow and some students who discovered it to be a young man who had been buried oriented North seventy degrees east and was buried with three points, arrowheads that is, of Monterey chert, two rodent incisors, an eccentric pebble of probable marine origin, and a fragment of the milk canine of a large carnivore, probably a bear. There was enough charcoal to date the burial at 4350 and 4400 years before present. He was buried sixteen feet below the level of the present ground. Has there been that much new gravel deposited here the last 4400 years?"

"2400 BC. A thousand years before the fall of Troy. Probably the sea level was a little lower, but not much. Sounds about right. So you are here to find some more evidence? Is that what you've been sketching?"

"To think about it some more, I guess. I guess something happened. On the face of it this guy was buried sixteen feet in the ground. I don't believe it though. They certainly didnt dig a grave that deep."

"I'm impressed. It makes one believe in the value of an education."

"Do you really think so?"

She was looking directly into my eyes, and I realized that until now she had been wearing dark sunglasses and now had taken them off. For a vertiginous moment it seemed that a door to another world had opened.

Photographs of the San Francisquito Creek skull discovered in 1922 (and rediscovered by Cessair in the University archives) were the subject of much scholarly correspondence between Bailey Willis of Stanford University and various archaeologists. One senses that an objective of this academic interest was to demonstrate the antiquity of man, thus denying the prospect of special creation. See [Gerow](#) for background on these finds.

We have since learned that applying a dendrology-based correction factor of 650 years to this date yields a calendar date of

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Velikovsky vs. Sagan

Recently -- I speak here of the spring of 1995 --I passed a very pleasant afternoon visiting the varied book merchants that are found in your fine city of Palo Alto (You may be delighted to know that in my day, the the price of \$200)

Among the items that I was seeking were the works of the late Immanuel Velikovsky, futurist, prophet, mythologist, historian, scientific renegade. At the venerable Bell's Bookstore I was told that there was nothing by that author in stock and that indeed in recent times it was rare for any of that controversial seer's works to remain on the shelf for more than a few days on account of the persistent demand for his writings. Mrs. Bell, proprietress of the establishment, said that in fact she was advertising for Velikovsky's works, so assured was she of quick and profitable sale of any used volumes that might come her way.

Needless to say, more orthodox local bookstores, notably that establishment operated by the university, carried nothing at all of Velikovsky, an omission which is as close to a book ban as the academic conscience allows. Thus the sorry fate of the controversial *Worlds in Collision*, now almost fifty years after its publication.

More than a decade has now passed since Velikovsky's death, and there may be some among you who do not know of his work. Velikovsky was a Russian emigrant to Palestine, a medical doctor, practitioner of psychoanalysis, who had practiced for some years in Jerusalem before emigrating to the U.S. in 1939. Once in America he developed a middle-aged enthusiasm for science (understandable to me, of course!). His studies led him to conclude that the biblical exodus commonly dated about 3500 years ago was marked by great catastrophes, caused by a major series of interplanetary events that originated with the planet Venus.

Now it happens that one of Velikovsky's earliest admirers and reviewers was a New York Herald Tribune reporter named John O'Neil. O'Neil was science editor of the New York Herald Tribune, and it was he who introduced Velikovsky's proposals in their as-yet unpublished form in a newspaper article written in 1946, four years before the publication of the famous *Worlds in Collision*.

It would be peevish of me to press a case against Velikovsky, now deceased, for his failure in that book to give due credit to my Ragnorak, a work from which it must be said in truth that he borrowed many of his ideas. The fact that he made only the most dismissive comments on my work ("arbitrary and wrong" was his summary judgement on my assertions on the impact origin of till deposits; geology was not a subject in which the doctor excelled), while borrowing heavily from my work, has been amply recognized by his many critics. The fact is that by the 1880s I myself was impressed by and discussed exactly the biblical quotation in Joshua (falling of stones from heaven, etc.) that is the centerpiece of Velikovsky's *Worlds in Collision*.

Even Velikovsky's early admirer O'Neil apostatically bridled his enthusiasm when he read my

Ragnorak and saw the obvious borrowings; O'Neil even wrote angrily to the publishers of *Worlds in Collision* of Velikovsky's failure to acknowledge his debt to my work.

But having vented myself on that aspect of the work, let me now return to the public reaction to *Worlds in Collision*. It would be not an exaggeration to say that it infuriated orthodox scientists, who lashed out at the author's nonconformity in accord with the spirit of intolerance that prevailed in those sorry times -- keep in mind that the year of the nefarious publication of *Worlds* was 1950, that same year of dangerous triumph for another Irish American midwestern politician, Senator Joseph McCarthy (whose message to the world was, I hasten to point out, quite the opposite in spirit from my own, notwithstanding our common heritage and midwestern upbringing.) It is ironic nonetheless that it was a cadre of Harvard professors, much beleaguered themselves by the witch-hunting McCarthy, who mounted a nefarious campaign against Velikovsky.

I hope I will offend no one here if I suggest that many orthodox academic scientists, several of them from Harvard, made fools of themselves by viciously attacking Velikovsky's intriguing claims, which perhaps were intended more to inspire reverence and thoughtful action than meet the pedantic criteria for scientific acceptability that prevailed in those narrowminded times. I leave it to your contemporary feminists to demolish those outdated narrow positivism! It is nonetheless a remarkable milestone of American intellectual history that MacMillan, the original publisher of *Worlds in Collision*, felt compelled to abandon publication of this wildly successful best-seller on account of threats of boycott from angry scientists.

Among Velikovsky's principal Harvard critics was the young Carl Sagan, who proceeded to dissect Velikovsky's astronomical arguments with all the painstaking and humorless diligence of a Richard Nixon. Sagan was then in his early twenties; since that time, he has made his excessive critique of Velikovsky an ongoing theme in his writings. Interestingly, Sagan's pronouncements grow ever softer over the years as he re-examines his role as the precocious Harvard boy scorning the writings of a patriarchal sage. This is not the first time such things have happened; didn't meteorologist Alfred Wegener's theories of continental drift draw the scorn of geologists in earlier times? I shall not go on to discuss Galileo and other examples. Of the intolerance of those in power.

Later, Sagan and other establishmentarian scientists congratulated themselves on holding an "open forum" on Velikovsky's work. The principal report on this kangaroo court (*Scientists Confront Velikovsky, 1977*) omits Velikovsky's participation and discussion in the proceedings altogether!

As for Velikovsky's invocation of Venus as the principal villain in his catastrophes -- and this is the point that has drawn so much heated criticism -- it may be easily dropped from his argument leaving a remaining body of work, principally of an interpretive nature, standing. Let it be said further, though few scientists have dared make the obvious connection, that evidence of the most striking kind had recently emerged to support Velikovsky's main conclusion, that the biblical events of the mid-second millennium BC were accompanied by a great physical disaster. The evidence comes from (of all places) Northern Ireland where dendrochronological studies of buried oaks show that a great coldness occurred in the years 1652 BC

We may find even in the more recent work of Sagan certain echoes of his old nemesis. Here, for

example, is a swastika exhumed by [Leonard Woolley in his excavations at Ur](#) in the late 1920's. It dates to about 2600 BC. According to Carl Sagan the swastika did not exist before 3000 BC, but appeared more or less simultaneously throughout the world shortly thereafter. Sagan claims that the appearance was too widespread to have resulted from cultural diffusion and suggests that a dramatic appearance of a swastika-shaped meteor may have been the cause, showing examples of illustrations of various celestial bodies that characteristically take on this shape. It is ironic that Sagan invokes a distinctively *catastrophic* explanation considering his rejections of Velikovsky's theories; perhaps the middle aged Sagan in came to admire Velikovsky's talent for dramatic mythologizing. It often happens that men learn best from those that they criticize in their youth. Certainly the poetic and even moralizing television style ("billions and billions") for which Sagan became later famous was a departure from the cloistered and anonymous clericism of science.

We may now see a distinctive movement toward neocatastrophism. Consider only the writings of British astronomers Victor Clube, and William Napier who describe the growing contrarian view of catastrophism:

We seem to have found, then, the vital element missing from the works of the early Biblical catastrophists - Whiston, Radlof, Donnelly, Velikovsky and the rest - namely, a scientific rationale, a relatively secure astronomical framework. Biblical and geological catastrophism are, after all, inextricably linked. While this clearly justifies an urgent reappraisal of the ancient tales of celestial catastrophe, the new information is extremely awkward for a generation of astronomers who insisted that Velikovsky was no more than an erudite charlatan. Astronomers, indeed scientists generally, like to think of themselves as tolerant judges and very adaptable to fresh discoveries. The evidence in this instance is however mostly the other way. One may therefore expect that in some circles the data now emerging from the Taurid meteor stream will be ignored in the hope that something reassuring will turn up. While this is a time-honoured scholarly ploy for the handling of discordant new facts, there is a moral dimension in this instance: the swarm has teeth. As to how sharp these teeth can be, we shall now see by looking at two impacts which have taken place during the present millennium.

The illustration of the comet Enke is taken from Donnelly's [Ragnorak](#) which warns of the potential dangers of this asteroid complex nearly a century ago.

xxx Footnotes

[1] The price of real estate was a matter of continuing interest to Mr. Donnelly, who had staked his early success on the founding of a new city that he called Nininger, Minnesota. Many of these speculative ventures of the nineteenth century were of course spectacular busts; the bayside suburb of San Jose, California known as Alviso, was once billed as the "New Chicago" of California. Leland Stanford's Palo Alto has fared better; the lots selling for \$200 in Donnelly's time now cost \$400,000, an appreciation factor of 2000, equivalent of an annual appreciation rate of 7.8 percent.

[2] Here I might note that we have one of many instances of Irish-Jewish collaboration that appears in diverse fields;

architecture (Louis Sullivan and Alfred Adler) entertainment (Jack Benny and Fred Allen), sociology (Charles Murray and Robert Hernstein), even demagoguery (Joseph McCarthy and Roy Cohn). These symbiotic relations are often attributed to the culture and politics of New York in the early part of the century (Irish politicians, Jewish gangsters, etc) but I should point out that the collaborative relationship is far more ancient having been mentioned as a founding myth in the Irish [Lebor Gabala](#).



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You may smile -- I take no offense at it-- as you imagine Mr. Donnelly's ancestors with their belief in fairies and pots of gold appearing in the midst of magical snow showers in mountain passes. (Please note for future reference the presence of snow as a lucky omen and the nature of fairies being not necessarily friendly!) Perhaps I will add to your amusement by recalling that it was long the custom among the wisest of those ancestors, the Druids, to hold whispered consultations with oak trees by which means they determined both the past and divined the future. Druids. *Druidhen*, in the tongue of my ancestors, the ancient Gaels: "knowers of oak trees"

It was Julius Caesar, as we all learned in high school, who befriended one of these Druids and told of their practices, their twenty years of schooling, their uncanny skill in natural philosophy and astronomy. Even in those days the practice of prophecy by that strong-limbed monarch of the forest was ancient; who can doubt that it was again these very same *druidhen* who taught the early Greeks to seek the oracle in the oaks of Dodona, the shrine of Apollo. Indeed are not the ancient wise people, the Merlins and the Gandalfs, (progenitors of many of you learned professors with us this evening!) are they not the Indo-European cousins to the Brahman of India? It is a truth which can be demonstrated quite readily by whistling the first few bars of an Irish or Scottish or Bretagne air, in the elevator of a building or some such confined space, within which the passengers of the Indian or Pakistani nationality are confined; for you will see, as likely as not, that on suddenly cessation of your Celtic air, your companions will quite unconsciously take up and complete the tune at the point where you left off.

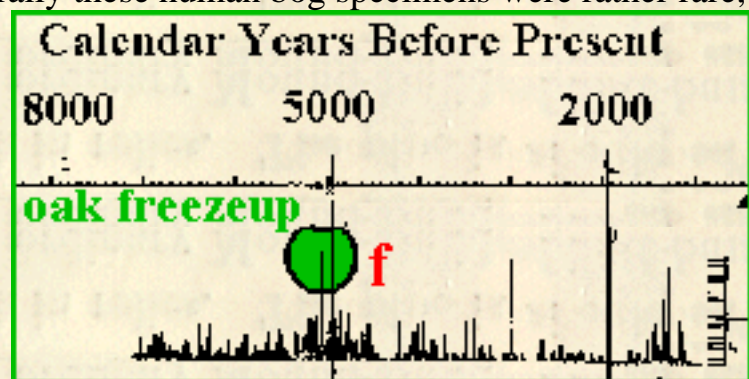
Ah yes, Talking oak trees! Fairy airs! What else indeed does Mister Donnelly have in store for you this evening! Namely this: I am now going to suggest that the practice of oak tree divination is alive today, and in fact comprises one of the most respectable branches of science. The proof of this is as follows.

There is a certain schoolmaster from Ireland, Professor Baillie by name, of the Queens University in Belfast, who undertook, in the 1970s, a quest of a curious sort but most pertinent to our inquiries.

No doubt you have heard tell of how from time to time the colder, more frigid latitudes of the earth yield up ancient corpses, miraculously preserved. Among the most fertile grounds for such discoveries have been the bogs of Ireland and other countries of the British Isles, and of the Scandinavian countries too, and altogether we can count some 1500 human specimens collectively known as the bog men who have been turned out of the earth and examined over the years. Many of those dating from the iron age or earlier, you may find it curious to hear, were determined by scientific

tests to have been drowned in vats of beer and stabbed and garroted; a thrice enacted execution, it having been the custom in druidical sacrifice to kill the victim three times over. Others of these poor creatures seem to have died of causes apparently of an accidental nature, but these too have their messages to us, as we shall see in that most famous instance, the so-called ice man of the alps. I am told that the remains have even been presented on your television; and there may be many here tonight who have seen photographs of his implements, his fine bronze axe, his clever pouch of herbal remedies, and you may have heard too of certain mysteries that have persisted about the discovery of the body (not the least of which were the poor man's missing genitals, and certain other physiological oddities, that, being unconfirmed at the present, and of possible scandalous character, I shall not here discuss.) But I will note a matter of no little significance to us, that being that the blades of soft green grass found in the shoes of this mountain man, placed there to warm the feet, provided organic substances, the age of which could and was determined by atomic measurement --the carbon dating technique of Professor Libby-- showing indisputably that the death had occurred within a few years of 3150 BC. I shall ask that you keep this remarkable date in mind.

Returning now to Professor Baillie, (whose new book is soon to be published); he had long been fascinated by these bog men. Would you not be similarly attracted to the idea of actually having a conversation with your ancient ancestors? He, as a man of science, accordingly devised a plan of studies to understand the circumstances of the times in which they had lived. Naturally these human bog specimens were rather rare, and their ownership jealously disputed by various museums and collectors; but the professor, lacking a sufficiency of these boggish companions, devised an ingenious alternative scheme in which he set out to accomplish the same divinatory ends; this accomplished by exhuming up pieces of oak wood, which could be found in considerable greater abundance in the bogs of Ireland wherein they had evidently toppled during some ancient storm, or in the Scottish lowlands, and even in gravels of the rivers of Germany, the Rhine and the Main.



Let me proceed directly to summarize one of the more remarkable findings of the Professor, as presented in the recent paper of Baillie and his associate M. A. Munro, in which it is described how they recovered in a certain bog in Ireland some time ago an ancient oak, which when it was exhumed, exhibited rings, 220 of them --not an unlikely age for an oak tree --which fell into a certain pattern that some might describe as a kind of music; and by laboriously comparing the melodic pattern of one such log with a multitude of others, the pattern of an entire oakish symphony could be eventually discerned, which melody could even, with sufficient juxtapositions of specimens, be carried through until the present day. And what was found was that of

all of the rings on this particular tree, (which was determined by the carbon dating method method foregoing to have lived and perished during the middle of the second millenium BC.) there were a few rings that were narrow and cramped, showing that the tree had a hard time of it for a few years, in the manner of a bit of life that must weather a storm that never seems to end, years without summer.

Now you no doubt know that we Northern people hold such times of coldness in respect; for much as the peoples of the South fear the seven years of drought that follows times plenty, we of the north fear the years without summers, and this tree, sited next to a bog in the north of Ireland, told a tale of such a time, speaking in the language of its rings, telling of this time of extraordinary harsh winters. And what Professor Baillie was able to show by patiently counting those rings was that the year of this severe winter was none other than 1620 BC, and that it lasted in fact for several years. And what is of great interest here (as some of you of classical bent may know) is that this was the very time that a great eruption occurred on the volcano Thera, the isle of Santorini, in the faraway Meditteranean, a time when fright and darkness fell over that sunny part of the world, signalling the end of a great civilization, it being the era when the Exodus took place. And is it not a remarkable thing that these momentous events, passed down to us over a hundred generations in our stories and religious writings, were known and even now are retold by a humble oak tree in that distant corner of the world, Ireland!

No doubt this will set your mind to thinking of other dimly remembered events of ancient times, among them the story of Atlantis, or the diverse biblical wanderings of the Hebrews and their friends and enemies.. Then too there is the story of the terrible three winters without summer told by our neighbors to the North in Iceland in their famous legend of the deadly three winters of Ragnorak...

These events are attributed by some scientists to atmospheric dust veils of probable volcanic or extra-terrestrial origin. They will point out corresponding signals in the world wide record, showing that the such eruptions characteristically cause a great fog to envelope the world, lowering the temperature several degrees, leaving their marks on the North Africa and concluded that these oaks tell of the temperature of the sea in the most magical parts of Ireland, the Southwest.

What are we to make of this? That there were climatic aberrations of a severe sort in not only the Meditteranean but the world as a whole in the 1600's echoing an earlier episode of catastrophe in about 3200 BC. The first of these we may associate with the dimmest known biblical events -- migrations, Egyptian and Babylonian captivities, etc (the Bible having been put to writing about 700 BC) and the second, the disaster of 3200 BC, we shall return to later.

FOOTNOTES

[1] Baillie, MG and Munro, M.A. "Irish Tree Rings, Santinori, and volcanic dust veils." *Nature*, 332,334 (1988). [2] The illustration shows the width of tree rings in Irish oaks. Narrow rings indicative of adverse conditions can be seen at 1153 BC, 1628 BC, 3199 BC, and 4377 BC. The 3199 BC value is associated with an acidity peak in Camp Century ice cores dated at 3150 BC, demonstrating unquestionably that adverse weather conditions, probably due either to atmospheric aerosols occurred at this time. Other narrow years are associated with frost rings observed in California bristlecone pines and with eruptions of Icelandic (Hekla 3 in 1159 BC) and Aegean (Santorini in 1628 BC) volcanoes.

[3]Plato:

Phaedrus: Socrates, you easily make up accounts (logos) from Egypt and any countries you wish!

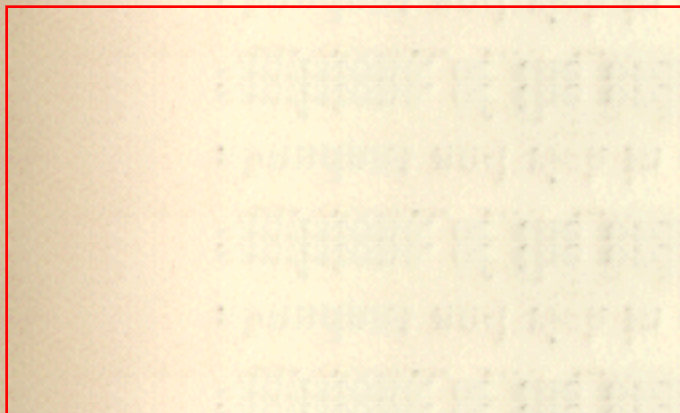
Socrates: Dear boy, the priests in the sacred precinct of Zeus at Dodona say that prophetic words first came from an oak tree. In fact, the men of that time on account of their guilelessness (lacking the wisdom you young people have) were content to listen to an oak tree and a rock, provided they spoke the truth. -- *Plato, Phaedrus*

[4] Pliny: "*Here we must mention the awe felt for this plant by the Gauls. The Druids - for so their magicians are called - held nothing more sacred than the mistletoe and the tree that bears it, always supposing that tree to be the oak. But they choose groves of oaks for the sake of the tree alone, and they never perform any of their rites except in the presence of a branch of it; so that it seems probable that the priests themselves may derive their name from the Greek word for that tree.* In fact, they think that everything that grows on it has been sent from heaven and is a proof that the tree was chosen by the god himself....*"---Pliny XVI, 249. Other sources indicate that the mistletoe, though commonly found on apple trees, only achieved sacred recognition when it grew on the oak. Analysis of the stomach contents of recently exhumed bodies of people evidently executed in druidical rituals show that their stomachs contained pollen from the mistletoe.

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Boniface was known in his youth as Winfrith and had been born in Sussex, formerly a Celtic land, now taken over by the Saxons (the West Saxony of Britain). Winfrith was a conscientious student undistracted by the romance of the day.

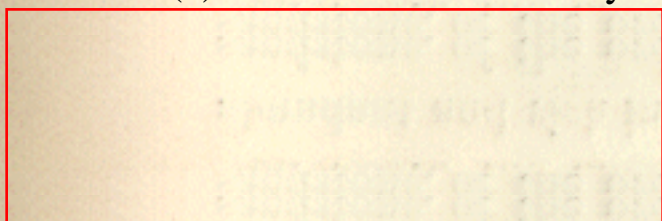


After the Synod of Whitby, in which it was decided that the Celtic Church had erred on the date of Easter and the correct style of tonsure, papal envoys were sent to England to correct these evils and remind the British of the

dangers of free will and the sordid embraces of women. Stone cups that flowed wine and fish with teeter of gold gave way to strategic planning and office memos.

Young Winfrith was well suited for this life and after receiving Holy Orders in 690 he determined to undertake missionary work among the heathens of the continent.

Against his father's wishes the young man decided on the religious life. At school he studied the Latin (but not Greek) classics, and the church fathers, among them Ambrosia(?) who wrote of the many levels of interpretation of the Great Flood.



Who were the Friesians? Simple, boggish folk who lived in the coastal Netherlands, they had been the laughing stock of the

ancient world since Pliny the Elder visited them in the year 47 and reported that they, like the Irish, were not worth conquering. They loved their oak trees and were given to holding religious services beneath them followed by drinking parties in which they consumed what Mediterranean sophisticates called "mouldy grain."

By far the most successful missionaries in Frisland had been the Irish who quickly went native, talked with angels, and regaled the Frisfolk with tall tales of miracles and oak tree prophecies.

One of them, a certain Aldebert, especially detested by Boniface, was wildly popular among them. Aldebert explained that he had been born following an annunciation by a calf, from his mother's side like the Virgin and he showed them the letter that Jesus Christ

had written to him. He gave them instructions in ancient Celtic practices such as fighting the waves of the invading sea. His ancestors had lived and worshipped in the bogs and woods, he said, and they understood when natural forces must be bravely resisted and when destiny required submissions to the natural world.

Aldebert shows a heathen the story of St. Brendan. These Irishmen *degraded their Christian profession by participation in the idolatrous rites of Thor and Woden*. He made little headway on restoring the *purity of doctrine to men of this character in the dense, primeval forests where Woden, Thor, and the other deities of the Teutonic pantheon might well seem alive and all-powerful to the tribal warrior who inhabited it.*

Serious missionaries like Boniface were eager to tell The Holy Father about the evil doings of their successful Irish competitors. In the year 752 Boniface received permission from Pope Gregory to excommunicate the Irish and return to Germany to save the Friesians from their pagan ways.

His Holiness granted Boniface a letter to the Frankish king Charles Martel. No one knew whether the Saint would ever be seen again.

Boniface returned to Germany. By day the Frisians prayed to the new Christian God.

Nighttime was a different story altogether. Boniface suffered greatly thinking about their pleasurable orgies beneath the oak trees. He could not bear the thought of the pains of hell that these simple folk would suffer in consequence of the fun they were enjoying.



For miles around the Frisians gathered to witness the Christian hack away at their pagan god, for Boniface had taken the bold step of deciding to chop down their God, Thor, embodied in a great oak tree.

Oak trees fell into the bogs and creeks and rivers and some of them washed down into the Rhine where they can still be found today, buried in the gravel.

It had long been so; for fourteen thousand years oak stumps and trees had fallen into the Rhine and been entombed in gravels, sands, and silts that have accumulated in accordance with the laws of *fluvial geomorphology*, chief among which is that the rivers are rushing, gravelly, braided flow pattern through most geological time.

The miraculous spring 874. According to Willibald not long after the saint's martyrdom it was decided to erect a church at the spot, on the Boone River, which required that the site be protected from *the vast eruptions of the heap and spring tides* by building of an earthen mound, in other words a dike or levee. A certain Abba, supervisor of the works, was inspecting it on horseback when *suddenly and unexpectedly the steed of the attendant, while merely stamping on the ground, felt it sinking and giving way altogether, and wallowed.* Then at once *a miracle stupendous and worthy to behold was made manifest. a fountain, exceeding clear beyond the manner of that country, came bursting out, and, penetrating through unknown channels, flowed forth, so that it seemed already a very large brook.*

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3000 BC: Notes and References

Note: Years given are calendar years BC or BCE. Radiocarbon dates have been corrected based on current correlations between radiocarbon and tree ring dates. We recognize that many scientists prefer to use "Before Present". (The accuracy of radiocarbon dating is affected by the atmosphere's changing concentration of carbon 14, which may in turn be affected by climatic cycles. However, cross correlation of radiocarbon dating and counting of rings on thousands of ancient trees preserved mainly in Irish bogs and German rivers permits the conversion of carbon dates to an absolute chronology. As of 1993 a radiocarbon date of 4500 yrs. converted to 3120 BC. In other words, one should subtract 1380 from the radiocarbon date to determine the BC calendar date.) For an abbreviated chronological index click

100000 BC: Global; Last Ice Age

Ice ages prevail for 90 percent of the time; At 150,000 BC emergence of Homo sapiens (possibly related to conditions during last interglacial?). The last ice age beginning about 100,000 years ago. Signals from Greenland ice cores suggest that the last glacial may have been punctuated with abrupt warm periods, leading to release of "ice armadas" into the Atlantic Ocean; these "Heinrich events" have been variously attributed to precessional components of orbital variation (McIntyre and Molino, *Science* 12/13/96) and periglacial dust (Overpeck et al, *Nature* 12/5/96)

#484.

30000 BC: Java;

30,000 BC: Last stands of Homo erectus (Java) and Neanderthal (Spain) species, decline in favor of Homo sapiens (NYT, 12/13/96). Paleolithic cave art in Europe.

#493.

20000 BC: Mesopotamia; (Illustration)

Illustration: Dry glacial climate in Near East. Monsoons are far to the south. Also, Younger Dryas cold snap.

#489.



13000 BC: Global; End of Ice Age

About 15000 years ago the last age ended with temperatures raising several degrees C. In the Near East, a corresponding northerly migration of mosoon rains, resulting in a kind of "Garden of Eden" in Jordan, Palestine, Mesopotamia. For an excellent summary of the effects of these and other climatic changes in the Middle East, see Wright, *Current Anthropology*34,#4 (1993) 458-69.

#319.

10500 BC: Global; Younger Dryas begins

Beginning of Younger Dryas. Abrupt cooling in Europe and North America, return of near glacial conditions; in the Near East, an abrupt drought, leading to retreat to oases, possibly related to development of agriculture as a coping strategy. For a nice description of this process, see Brian Fagan's *The Time Detectives*; for a more technical discussion, H.E. Wrights "Environmental Determinism in Near Eastern Prehistory", *Current Anthropology*34,#4 (1993) 458-69.

#318.

9500 BC: Global; Younger Dryas ends

End of Younger Dryas, return of wet warm conditions in Near East, time of plenty.

#86.

7000 BC: Egypt; Eden in Egypt

#124.

6200 BC: Greenland; GRIP ice core

GRIP ice core shows and abrupt cooling at about 8400 years before present.

#320.

6200 BC: Global; Severe cold snap

Severe cold snap; possible short time of hardship in Near east as in Younger Dryas.

#85.

6000 BC: Global; Delta Environments

#149.

6000 BC: Mesopotamia;

Sea level rise in Gulf of Persia, 4000 BC

Irrigated society, 3500 BC

#488.

5500 BC: Europe;

5500 BC: Reported Mid-Holocene flooding of Baltic Sea by Mediterranean waters. Authors of forthcoming geological report suggest that this may be related to the Sumerian/biblical flood, though this claim is disputed by ancient Near East scholars who believe that the location is too remote from Mesopotamia. Other cultural consequences of the event are said to be spreading of agriculture to Europe.

#494.

5000 BC: Mesopotamia;

We place the "Garden of Eden" at the time of 8000 to 6000 yrs. BP (6000-4000 BC) at which time the temperature is warming culminating in an era warmer than present, when equatorial weather patterns may have reached farther north than at present, and the westerly storms of the north would have been confined to latitudes higher than at present.

Here we show the lower Tigris-Euphrates, most recently the scene of the Gulf War, beginning with the "Garden of Eden":



#490.

4850 BC: California; Warmest time, (bristlecone pines,)

Warmest time in Sierra Nevada, (bristlecone pines, California)

#1.

4500 BC: Global; Territorial control and mound building

By 4500 BC the favorable climatic conditions and stabilized lower alluvial plains (the newly stabilized sea level allowed the accumulation of sediment, the beginning of delta formation, in lower river valleys. Flow regimes in lower river valleys change from braided to meandering; marshes and wetlands allow for the accumulation of rich shellfish growth, and among American native communities we see the beginnings of sedentary and territorial life styles, larger tribal or corporate action including the building of mounds in the Mississippi valley.

#330.

4000 BC: Global; Holocene delta development worldwide

Holocene delta development worldwide transgressive sequence of deltaic deposits

#160.

4000 BC: Mesopotamia; Mesopotamia delta

Stratigraphic relations by the author showing the rapid development of a rich, fertile delta in Mesopotamia

#165. [Contents: Late Quaternary Chronology](#)

4000 BC: Europe; Atlantic hypsithermal

Atlantic hypsithermal "Eden"; wet warm conditions in Near East, time of plenty.

#2. [Ice Core Evidence](#)

4000 BC: Ireland; Irish elm decline

Irish elm decline, 4000 to 3250 BC

#88. [Iceman](#)

4000 BC: Global; Valleys in the Holocene

#142.

4000 BC: US;

On Mississippi at 6000 BP, slowing sea level rise at 10-15 below present level, beginning of meander belts. Development of Pine Island Beach trend, a linear sand shoal developed when sea level slowed 10-15 ft. below present level at mouth of Mississippi (currently beneath Lake Pontchartrain). Transition from Middle to Late Archaic period. Alternative view (Penland) that sea level rose to above present level at this time. See Sancier *Geomorphology and Quaternary Geologic History of the Lower Mississippi Valley*, 1994 (1.4525).

#492.

4000 BC: Mesopotamia; Sea level, Persian Gulf

Recent (1996) reviews of Persian Gulf paleosealevel indicates that levels were up to 2 meters higher than at present during the period 6000-4000 BP (*Earth and Plan Sci Letters* 142 (1996) 43-57).

#64.

3700 BC: Mesopotamia; Father Burrows

#125.

3700 BC: Mesopotamia; Burrows' flood,

Jesuit paleographer Burrows, who accompanied Leonard Woolley on his 1930s archeological dig at Ur (and who later figures a the murderer in Agatha Christie's "Murder in Mesopotamia"), dates Mesopotamian/biblical flood at 3700 BC (January 1930 *Dublin Review*)

#3.

3600 BC: California; Central coast

3600 Central California coast investigations show that there had been little laminated sediment deposition on the continental shelf of California after 5000 BP, (Gardner, J.V. *Geology* 14, p 691-694, 1986)

#4.

3500 BC: Mesopotamia; Leonard Woolley's flood

3500 Leonard Woolley, head of the joint British American team excavating Ur, dates the flood layer found at the base of the ruins of Ur at 3500 BC.

#6.

3500 BC: Morocco; Arid interval

Arid interval 5010-4860 (+/- 150) at Tigalmamine in montane Morocco. Corresponding decline in oaks (*Quercus rotundifolia* and *canariensis*) in favor of Gramineae suggests reduced winter precipitation corresponding to cooler sea temperatures in North Atlantic. Lamb, H. F. et al, *Nature*, 373 p 134 (1995).

#70.

3500 BC: Mesopotamia; Tigris and Euphrates alluvial plain

At about 3500 BC the lower Tigris and Euphrates alluvial plain was under extreme pressure from both [rapidly rising sea](#) and buildup of the Karun delta. Under such unstable conditions, a large storm in the Zagros mountains could trigger a diversion of the Karun in an upstream direction, resulting in a flood filling of the lower Tigris-Euphrates alluvial plain, similar to the filling of the Salton Sea in the early part of this century.

#84.

3500 BC: South Carolina; South Carolina sea level

A recent sea level curve from South Carolina indicates a sudden sea level rise (transgression) beginning about 3500 BC, followed by an equally rapid 2 meter drop a century or two later. *Journal of Coastal Research*, Special Pub. 27, p. 192.

#79.

3500 BC: Global; Holocene delta development worldwide

The sequence of Holocene delta development worldwide is indicated as beginning at 6000 BC; by 3000 BC a transgressive sequence of deltaic deposits had developed as shown on the figure. Under conditions of rapid sea level rise these fresh deposits would have been swampy and waterlogged. However, a sudden regression would leave a silty, nutrient-rich floodplain well- drained with a slightly receding (downcutting) river, a condition ideal for irrigated agriculture. *Journal of Coastal Research*, Special Pub. 27, p. 235. (trans.html)

#78. [EF PRO-EUSTASY](#)

3500 BC: Mesopotamia;

Rain storms, climatic oscillation. Millennial-scale warming terminates with a period of climatic disturbance and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally administered culture based on irrigation.

#487.



3500 BC: Fiji; Fiji sea level

A recent sea level curve from Fiji suggest a 1 meter drop between 3500 and 3000 BC. *Journal of Coastal Research*, Special Pub. 27, p. 313. (fiji.html)

#77.

3500 BC: China; Han River delta

Recent graph of sea level data from the Han River delta.

#162.

3500 BC: Europe; Upper treeline in alps

Upper treeline in alps and elsewhere drops 100 meters in 3500 BC then rises to 2500 BC indicating a cold spell at 3500 (Markograp 1974 in *Lamb* p 374)

#5.

3500 BC: China; Han River delta

Recent data from the Han River delta indicate a rapid sea level rise (3 meters) from 4000 to 3000 BC. The data are not detailed enough to permit accurate charting of century scale variations, though the data at 3200 BC suggest the possibility of a major oscillation at that time. (*Journal of Coastal Research*, Special Pub. 27, p. 133.

#80.

3500 BC: Europe; Early agriculture

Introduction of early agriculture in Europe: " The Neolithic Mosaic on the North European Plain" Peter Bogucki Princeton University; web site

#65. [The Neolithic Mosaic on the North European Plain](#)

3400 BC: Egypt; Pharoah Sneferu at Meydum

3400 C14 date (4802) of Cypress beam at temple of Pharoah Sneferu at Meydum. First radiocarbon date by Libbey.

#7. [Nubia: The Land Upriver](#)

3400 BC: Mississippi; Mississippi delta

Carcoal nut dated at 4869 rcybp 6 meters below MSL at Bayou Lafourche at Paincourtville in Mississippi delta represents beginning of delta formation in this area. Other C14 dates indicate regular rise in alluviation thereafter. *Science*

#60.

3300 BC: California; Mid Holocene wet

Mid Holocene Atlantic wet period features high human population growth in Santa Barbara area (4600-4800 BP). This follows an earlier warmer time about 5500 BP with older milling (metate) grinding techniques and is followed by another hot spell about 3500 BP with increasing hunting, sea fishing, residential bases, status ranking, mortar and pestle use for large pulpy seeds, technology in general. From Glassow, UCSB Anthropology Dept, 4/9/93 talk at Asilomar

#9.

3300 BC: Europe; Belgian coast

Along the [Belgian coast](#), recent work shows that "two rather distinct retardations appear to be present; a more marked one at about 7500-7000 cal yrs. B.P. and a second one at about 5500-5000yrs. calB.P." In other words, sea level rise was temporarily reversed at these times.

The idea of irregular sea level rise, introduced by Fairbridge (1961), and subsequently dismissed by uniformitarian interpretations, has recently been reinforced by analysis of Australian coralreefs(4). Fairbridge's sea level curves are discussed in the Encyclopedia Britannica. They had been suppressed in

favor of the more uniform curve of Shepard, thought the irregular model is now coming back into vogue with the return to respectability of more catastrophic ways of looking at the data.

#75.

3300 BC: Global; July summer cooling, Soviet Union

Maximum Piora July summer cooling according to pollen counts between 60 and 70 degrees latitude in the Soviet Union (4.7 ka assumed to be C14 date)

#8.

3300 BC: California; San Francisquito Bay

The [upper graph](#) shows C14 dates for muds and vegetation in the San Francisquito Bay and delta; C14 dates have been corrected to give calendar years, and the effects of autocompaction have been removed. Comparison of these data with the world wide data shown in the lower curves provides reasonable latitude for short term sea level regressions without proving them. It also appears that the data are in close enough vertical agreement to suggest vertical crustal stability in the late Holocene in San Francisco Bay, though this is not the conclusion of Lajoie and the other authors of this USGS study.

#76.

3270 BC: New England; Elm collapse

New England elm collapse: $4650 \text{ BP} - 1950 + 570 = 3270 \text{ BC}$ Cause remains controversial.

#10.

3250 BC: ;

#328.

3250 BC: Florida; Pine bursts

Iceberg-triggered Florida pine bursts events occur every 5709 years, based on a sequence beginning about 35 thousand years ago. The last pine burst was about 4650 years BP, or 3250 BC if we correct carbon dates. The one before that is 12,000 years ago, corresponding to the disastrous Younger Dryas period. That suggests that something may be about to happen. (Science, 7/9/93).

#12.

3250 BC: Global; Atmospheric methane

Atmospheric methane from GRIP ice core with lowest value 580 ppbv at 5.2K yrs. BP followed by rapid increase of 40 ppbv over 200 years; variously attributed to clathrate or permafrost outgassing, decrease in tropospheric oxidation, or abrupt increase in low-latitude wetlands. Blunier, T, et al, Nature, 374 47 (1995).

#69.

3250 BC: Global; Sulfate in GISP2

Sulfate in GISP2 ice core; curve is a low-tension robust spline of sulfate concentrations with average about 30 ppb. The cause of the 150 year peak at 5.2K yrs BP is not known, but the authors suggest the possibility of an anomalous nearby temporary body of open water (polynya) which generated marine biogenic sulfate. Zielinski, GA et al, Nature, 264 948 (1994).

#68.

3250 BC: California; Santa Barbara basin off the coast

paleoclimatic data from sediment cores in the Santa Barbara basin off the coast of California, sediment bioturbation and snail form, also indicating a discontinuity, possibly abrupt cooling, at 5.2k yrs BP.

References

Kennett, JP and Ingram, BL, *A 20,000 yr record of ocean circulation and climate change from the Santa Barbara basin* Nature v 377 p 510 12 Oct 95.

#74.

3250 BC: Europe; Piora oscillation, Europe

Piora oscillation, named after Piora Valley in Europe where climatic irregularities were first noted. A major break in the climatic regime which resulted in a readvance of Alpine glaciers, a retreat of forests. Elms and linden trees declined in Europe and North America. In northern Europe the oak and hazel declined or disappeared. Changes occurred as far away as the Andes, Alaska, and the Kenyan highlands, so the disturbance was evidently of global magnitude extended throughout the world. 3500 to 3000 BC. Lamb p 120 Lamb notes that this is the time of the rapid spread of New Stone Age cultures in Europe; meanwhile there seems to have been a sudden stimulus to the growth of organized civilization, to deliberate cultivation along with development of the tools necessary for such activities. In Mesopotamia, and in the arid areas of the middle east in general, a period of wet years in which oases would have expanded and wild fruits and nuts abounded would have been followed by a growing drier and less hospitable climate in which perhaps organized civilization would have been necessary for continued survival. Flourishing of civilizations in the Indus valley notably at the city of Harappa starting about 3000 BC with lands under cultivation that exceeded the areas of Mesopotamia and Egypt occurred up until about shortly after 2000 BC when drought brought an end of this culture. As the 3rd millennium progressed the flooding became erratic and finally disappeared, giving way to a period of calm in which travel by sea and over high mountain passes encouraged northerly migration and trade and exchange of metallic and monument building technologies that we now know as the Bronze Age. Production of great funerary megaliths in northern Europe and the growth of prestige-oriented Beaker culture spelled the end of thousands of years of hunter-gatherer cultures, and the rise of centralized hierarchical civilization.

#13. http://www.usl.edu/~aa/indus_valley.txt

3250 BC: Egypt; Egypt Nile delta

A core (5-44) taken at the south margin of one of the coastal lagoons at the north end of the Nile delta showed a layer of potsherds 25 ft. below sea level dated at 3,500 to 4,500 CYBP. The layer was underlain by 20 ft. of lagoon mud which would have compressed about 3 feet so the corrected depth would be close to 22 ft. below present sea level. Accounting for deep subsidence (6 ft., according to Stanley et al) would place the "buried civilization" at 16 ft. below sea level. Boring 5-7 drilled south of the coastal Lake Manzala, Egypt, about 40 km from today's shoreline shows a layer of delta front sand from 4 to 5 meters below ground surface deposited at about 4,600 BP (interpolated from lower date of 5,720 RCYBP) (Coutellier and Stanley).

#15.

3250 BC: California; San Francisquito history

Historical geomorphology of San Francisquito Creek at [here](#)

#157.

3250 BC: Global; Stormy weather

Beginning of 1000 yrs wet, stormy weather. A neoglacial period characterized by wetter, stormier conditions; starting between 5000 and 4000 years BP and extending to about 3500 yrs BP (Enzel, *Quat R* 1992)

#16.

3250 BC: Europe; Newgrange start

Occupation of Irish tomb sites. Charcoal from the Newgrange and Knowth tombs in Ireland yield dates ranging from 2800 to 3250 B.C.

#11.

3250 BC: New England; Hemlock decline New England

Decline in hemlock pollen in 45 New England lakes. The date of the disappearance is 4650 yrs BP with a standard deviation of 300 years.

#14.

3250 BC: Peru; Huascarán glacier

Peru Ice. We have seen elsewhere (see [methane](#)) how atmospheric concentrations of methane (swamp gas) during the Holocene (last 10,000 years) are related to the extent of wetlands especially at low (tropical) latitudes.

Here in the lowermost [graph](#) we see oxygen isotope ratios and nitrate for the Huascarán glacier in Peru, showing an abrupt cooling at about 5200 BP. Compare this with the graph of methane; the two are mirror images. For other climatic indicators see the paleoclimatic page. Thompson et al *Late Glacial Stage and Holocene Tropical Ice Core Records from Huascarán, Peru* Science v 269 7 July 1995.

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#73.

3212 BC: Europe; French coastal megaliths

French coastal sites. In 1971 at Pointe aux Oies, France, near Wimereux, the French geologist Mariette (1971) discovered several Neolithic sites in brackish water, one meter below sea level. He dates them by radiocarbon at 4500 BP and believes the sea level stood at -4 m at the time of their habitation. He says that there are other "menhirs" and passage graves in the intertidal zone dating from the same period of 5000-4500 BP. Another French paper indicates various sites at 4 to 5 meters below sea level in the Seine and Somme valleys and estuaries. At Abbeville this interface is indicated as corresponding to an "emergence" (which seems to be a temporary lowered sea level) at the end of the Neolithic and beginning of the Bronze Ages, between 4600 and 3500 BP, the temporary lowering bottoming at 8 m below msl. At Montmartin, Calvados, a layer of shells dated at 4700 BP is at -2 m and is thought to have been deposited when msl was -4.7m;(Giresse 1969); at Briere, peats dated at 4630, 4480, and 4260 overlie brackish water clay at -1.3 m implying a sea level below - 4.5 at that time. (Giot, 1968) 4550 BP-1988= 3212 BC

#30.

3200 BC: Global; GISP2 team, the latest from

Most recent studies from the GISP2 team, 1995.

#150.

3200 BC: Ireland; Cessair

3200 BC: Cessair and followers; 2500 BC: Partholan; 2000 BC: first Nemed invasion; 1500 BC: Fir Bolg (possibly the Belgae of NW Gaul, per Julius Caesar); 1000 BC: Tuatha de Danann; 300 BC: Sons of Mil (Celts, from Spain [possibly Helvetians who had migrated from what is now Switzerland to Northern Spain]);

#81.

3200 BC: Mesopotamia; Tigris-Euphrates

Sharp reduction of Tigris-Euphrates streamflow at 5200 cal yrs BP; also Iranian Plateau changes from humid to arid at same time. Johnson and Kay, *Climatic Change*, 3 (1981) p 251

#61.

3200 BC: Mesopotamia; Mesopotamia delta

Stratigraphic relations showing the rapid development of a rich, fertile delta are compared in Mesopotamia with the generic model of delta formation suggested by Stanley, who demonstrates that development of these potting grounds for civilization would have appeared only after 6000 BC. Significantly, no comparable environmental condition existed in any great river valley for more than 100,000 years.

#83.

3200 BC: Missouri; Pomme de Terre River

By 4600 BP Missouri's Pomme de Terre River has undergone a major change in its regime, downcutting a channel about 15 ft deep. This is the largest record of change in the river's behavior since 10000 BP and is interpreted as having been caused by an abrupt climatic change toward wetting. 3200 Temporary French coastal emergence starting at 3200BC

#18.

3200 BC: ; Paleoclimate Data Page

#144.

3199 BC: Europe; Irish oaks

Tree rings in Northern Ireland are narrow in 1153 B,c 1628 B,c 3199 B,c and 4377 BC. The 3199 BC value is associated with an acidity peak in Camp Century ice cores dated at 3150 B,c demonstrating unquestionably that adverse weather conditions, probably due either to volcanic eruption or meteoric impact, occurred at this time. Other narrow years are associated with frost rings observed in California bristlecone pines and with eruptions of Icelandic (Hekla 3 in 1159 BC) and Aegean (Santorini in 1628 BC) volcanoes. Baillie,*Nature*, 3/24/88

#19. [Sacred Woods and the Lore of Trees](#)

3190 BC: Global; Heckla eruption, Iceland

Heckla eruption: $4570 \text{ BP} - 1950 + 570 = 3190 \text{ BC}$

#20.

3160 BC: California; Sunnyvale girl

Skull, Sunnyvale girl: $4500 \text{ bp} - 1950 + 570 = 3120 \text{ BC}$; corrected 8/8/96 at Ken Lajoie's office:: $4460 - 1950 + 650 = 3160 \text{ BC}$

#23.

3150 BC: Global; Sulphate spike

Sulphate spike in Greenland GISP2 core.

#87.

3150 BC: Turkey; Lake Van Oscillation

Abrupt change in sedimentation rate of Lake Van in Turkey indicative of rapid climatic fluctuation at (varve) dates of 5200 BP (3150 BC) (*Palaeo*, 122 (1996) p 107)

#58.

3150 BC: Global; Paleoclimatic flood, global

Climatic conditions at time of Mesopotamian flood, from several scientific sources of paleoclimatic data. See [here](#).

#21.

3150 BC: Greenland; Camp Century, Greenland

Camp Century ice core acidity peak 3150 BC

#22.

3150 BC: USA, SW; SW US flood peak

3000 SW US flood peak. According to Victor Baker of the University of Arizona, a period of flooding began in the southwest starting at about 5000 BP and ending at 3600 BP, with a sharp peak at about 4400 BP. (Starts at 3500 BC and peaks at 3150 BC)

#43.

3150 BC: Ireland; Irish elm decline

Decline, 4000 to 3250 BC

#170. [Iceman](#)

3150 BC: Europe; Iceman of the Alps

On September 19, 1991, two German hikers, Helmut and Erika Simon, noticed what appeared to be a body sticking out of the glacial ice at an altitude of 3200 meters in the Alps -- just over the border in Italy, as it would later turn out. Within a few days the find had attracted the attention of scientists as well as police authorities and the corpse was hacked from the pocket of ice where it had been frozen, some considerable time before, as it turns out, for among the items the frozen man had been carrying were a copper axe and 14 arrows, and a dagger, all of apparent neolithic style. Radiocarbon dating of bits of tissue and bone yielded dates of 4525 and 4575 BP, or 3150 B,c with subsequent dating of grass from the man,s boots dated at another lab within a few years of the body. Among the many mysteries that surrounded the find was the fact taht the body was naked and apparently mummified. Clothing was found nearby, and it has been surmised taht the man may have have died of hypothermia, it being known that those suffering from this condition often remove all their clothing as death approaches. As for the mummification, it was suggested taht the man may have been dried by the autumn dry winds, the foehn, that affect the Alps, though rarely at this altitude. A further mystery was the absense of genitals, a fact that once released seemed to give rise to lurid rumors, one of which, perpetrated by some a British magazine aimed at homosexual readership..., was that the corpse's anl passage contained sperm, and that this "fact" was being suppressed by the scientists conducting the investigations. Mean while, lawyers, diplomats, scientiests, and the media were engaged in

a dispute over the ownership of the body and its associated artifacts, with the Italians claiming that the Austrians had kidnapped the body from Italian territory. "Sometimes I think," said the weary rector of Innsbruck University, where the iceman was being kept under refrigeration pending resolution of disputes, "Let's get a shovel, and then we can bury him again. (1992 Horizon/Nova documentary; Nature, 4 March 1993.)

#17.

3150 BC: Mesopotamia; The Flood

The Flood 3150 BC(?). Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level shortly before 3000 BC followed by 10-15 ft. alluvial deposition in river valleys.



#486.

3113 BC: Mexico; Mayan recreation

Last Mayan date of recreation of the world following The Flood, Aug 12, 3113 BC.

#24.

3110 BC: China; Yangtze River

Dating of sediments in the Yangtze river deltas suggests a sedimentation rate so high between 5060 and 4460 BP, accompanied by a major change of flow into a new subdelta, and followed by a period of deep water with clay deposition, that the authors are inclined to think that their date of 4460 BP must be mistaken. (Kam-biu Liu, Quat Res 1992)

#25.

3100 BC: Boston; Sticks from fish weir

Sticks from Boston's submerged "fish Weir" carbon dated at 4450, 4860, and 4800 years BP. This fixed the weir construction date at a little earlier than 3000 B.C. . It showed that the wattles from the famous fish weir had been carbon dated at 4800 years BP 4500 BP, altitude -27 MHW when sea level was -19 MHW or

14 ft below present sea level. Other dates 4450, 4860 BP.: "When sound wood is permanently submerged in fresh, brackish, or salt water or is buried at some depth in sand, gravel, clay, mud, or silt, the rate of decomposition is in general relatively slow," First as to sea level, the top of the 3 foot high weir was noted to be at 12 feet 10.9 inches below present sea level. Allowing for subsidence due to the 18 feet of fill that had been placed in Back Bay in the nineteenth century, (18 x 40 = 720 = 12") and assuming that the top of the weir was at mean sea level, mean sea level at the time would have been 17 feet 6 inches below present. (This might be on the high side since rebound of the earth's crust has also occurred in the Boston area). A study of pollen analysis of the organic peat at the site by the great palynologist Arthur Knox show a significant absence of hemlock pollen at the weir level, (only one of 144 specimens of wood extracted from the weir proved to be *Tsuga (anadiensis)*) and a sequence of botanical changes correlative with pollen profiles in the nearby Wellington Marsh, which in combination suggest that the weir "was in use during a long dry period during which the Wellington Marsh in nearby Medford gradually dried up until shrubs and possibly trees began to grow upon the surface. This period of dryness was apparently terminated rather suddenly by an increase in rainfall and which occurred about the time the Fishweir was abandoned." The balmy period had lasted, the scholars concurred, from about 7000 to 5000 years before the present. At the time the experts concluded that the fishweir had been in use up about 1500 B.C.; though it was later shown that this date was much to recent. Curious too, the conditions that prevailed during the use of the weir, which had been covered with oysters, there prevailed a golden age in which the climate was as mild and balmy as Chesapeake Bay, an era of abundance abruptly terminated by a change in climate to wet, stormy, and colder conditions. The picture that emerged was this - a farflung community of native Americans existing for two thousand balmy years on the edge of a freshly flooded bay of

3100 BC: Nebraska; Republican River,

The Republican River in Nebraska shows a period of rapid downcutting dated at about 4500 BP, attributed to moister conditions.

#31.

3100 BC: USA; End of alluvial period

End of alluvial period; From 6000 to 4500 BP there is a period of active alluviation in many parts of the US. Wetter conditions improved vegetal cover and resulted in less sediment yield and consequent downcutting

#29.

3100 BC: ; Sticks in Boston

#141.

3100 BC: Egypt; Egypt, Unification

Egypt, Unification

#26. [Pharaoh's Heart](#)

3100 BC: Greenland; GISP ice core

3100 BC rapid climatic change shown on [GISP ice core](#). *Science* 12/22/95.

#62.

3100 BC: Europe; Stonehenge (start)

Earliest c14 dates on digging implemts at Stonehenge

#27.

3100 BC: California; Sierra cooling

Cooling 4500 BP. In the California Sierra, warm temperatures from 7350 to 6000 BP are giving way to cooling with lake levels returning to the highs of early Holocene.

#28.

3090 BC: Egypt; Egypt, Nile

Earliest recorded flood recorded on a "Nilometer" in 3090 BC during the reign of King Djer of the Early Dynastid period.

#33.

3075 BC: Ireland; Newgrange Megalithic Tomb

Newgrange Megalithic Tomb 4425+/- 45 BP; 4415+/- 40 BP burnt soil from roof caulking of Newgrange; 4480+/- 60 BP vegetation from turf beneath main monument; 4399+/- 67 BP from site 16 near Knowth tomb site (O'Kelly, *Early Ireland*). (BP = uncalibrated radiocarbon date.)

#82. [Geniet: Knowth](#)

3075 BC: Ireland; Newgrange Megalithic Tomb

Newgrange Megalithic Tomb radiocarbon dates

#164.

3050 BC: Europe; Brittany coast emerges

Brittany coast emerges

#35.

3050 BC: Canada; Devon Island

3050 Maximum oxygen 18 ratio for ice core taken from Devon Island ice cap in arctic Canada (Science aug 19 1994 p1060)

#34.

3050 BC: Greenland; Methane peak,

Methane peak See [3020 BC](#); ; The Skull

A human skull found in a California creek may tell us the story of the biblical flood

#127.

3020 BC: California; Stanford Man II

Stanford Man: $4350 - 1950 + 570 = 2970$ BC or

#37.

3001 BC: Israel; Mt. Sedom

Israel's Mt. Sedom is a salt diapir and changes in precipitation on the mountain can be measured by observing the width of caves formed by salt dissolution. The cave widths can in turn be compared with glacial advances (bigger caves = more rain = more glaciers) and with sea levels of the Dead Sea. The largest - by far - increase in cave. Mount Sedom-- otherwise known as Mt. Sodom, said to be the site of the famous biblical event -- is a salt formation (a diapir) bordering on the Dead Sea. Recent studies by Amos Nur at Stanford University suggest that the area was affected by an earthquake in xxx BC. This seems to correspond with the biblical event. Changes in precipitation on the mountain can be measured by observing the width of caves formed by salt dissolution. The cave widths can in turn be compared with glacial advances (bigger caves = more rain = more glaciers) and with sea levels of the Dead Sea. The Wide caves on the face of the "mountain" located some 300 feet above the present sea level indicate an extremely wet period a millenium before this, in the early xxx age. Oak twigs and driftwood found in the caves must have been transported by floodwaters from some other part of the shore many miles away since oak trees do not grow in salt. Evidently the water level was some 300 feet higher at this time, implying heavy flooding on the Jordon River and lower evaporation rates due to cooler weather. No other event in the last ten thousand years matches this. The oak twigs have been dated by radiocarbon technique at 4350 + or - 75 RCYBP. Frumkin, A., The Holocene climatic record...1991 The Holocene 1, 3 pp. 191-200.

#42.

3000 BC: Oregon; Diamond Pond,

3000 climate of the great basin, eastern Oregon. "By 4400 BP the water table was within 10 m of its present level. Rising water table at Diamond Pond suggests that midHolocene drought had given way to effectively moister conditions. Resultant higher regional water tables would enable the Malheur Marshes to expand into areas formerly occupied by greasewood. This, together with the invasion of other saltbush and sagebrush communities into the upper reaches of greasewood-dominated areas, may explain the sudden drop in Sarcobatus pollen values." Peter Wigand, "Diamond Pond, Harney County, Oregon. Vegetation History and Water Table in the Eastern Oregon Desert." Great Basin Naturalist, 47(3):427-458 (1987)

#38. [The Paleolimnology Home Page](#)

3000 BC: Jordon; Jawa: Lost City of the Black Desert

The desert ruins of Jawa, best preserved of the Near Eastern Bronze Age cities, date to about 3000 BC when the rainfall was higher in the region.

#485.

3000 BC: Europe; Carnac Megaliths

Carnac Musee de Prehistoire. Aubrey Burl, archeologist. NYT 7/14/96

#57.

3000 BC: California; Bristlecone pines

Coldest time (bristlecone pines)

#40.

3000 BC: Louisiana; Native American mounds

Native American built mounds at Baton Rouge (Louisiana State University), nearby Mount Sano, and Frenchman's Bend, at Stelly, in South central Louisiana; coastal sites including Banana Bayou and Avery Island, date at 3000 BC to 2500 BC. Joe Saaunders, Jon Gibson, Northeast La State Unive. Roger Kennedy, *Hidden Cities*.

#54.

3000 BC: Global; Radiocarbon base has tripled

Wendland and Bryce report that the radiocarbon base has tripled since their 1974 study. Wendland now places discontinuities in the years 4200 and 4800 rcbp (very close to the 4150, 4500, and 4750 of the original paper). Volcanic eruptions are at 4450 and 4700 BP. Statistical studies of climate and cultural

discontinuities show a minor botanical and cultural discontinuity at 4240 and 4230 BP respectively

#44.

3000 BC: USA, W; General wetting Western U.S

Transition at 3000 BC from early to middle Holocene, general wetting and deposition of alluvium in Western U.S.

#46.

3000 BC: Mesopotamia; Natural Catastrophes during Bronze Age

<http://www.knowledge.co.uk/xxx/cat/sis/cambconf.htm> Natural Catastrophes during Bronze Age Civilisations: Archaeological, Geological and Astronomical Perspectives.(Upcoming Conference) See also Exploring the role of catastrophe in the recent history of the solar system and in the formative phases of ancient civilizations PLACE: Red Lion Hotel-Jantzen Beach, Portland, Oregon DATES: January 3-5, 1997

#67. [SIS](#)

3000 BC: Europe; Wooden tracks

3000 In England, wooden tracks are built across marshy areas to maintain communications and travel; 3500-2500 BC

#41.

3000 BC: Israel; Ancient Egyptians in Palestine

Tomb in northern Negev desert reveals skeleton of a young woman indicating presence of ancient Egyptians at Halif Terrace in ancient Palestine around 3000 BC. Thoms Levy UC San Diego. Science 10/18/96 p 349.

#56.

3000 BC: Wyoming; Ancient French Trapper

George Gill of University of Wyoming discovers a 5000 yr old skeleton in Great Plains, exhibiting a skull that has teeth and shape "like a French trapper." (Economist, 10/19/96 p 84)

#55.

3000 BC: Mesopotamia; Sumerians in Mesopotamia

3000 Sumerians in Mesopotamia By late fourthmillenium a network of Sumerian towns has developed in lower Mesopotamia of which perhaps the best known is Uruk, some xx northwest of Ur, though even the detailed excavations by German archeologists of the temple of Anu and the nearby Eanna complex in the xxx did not extend any deeper than 3500 B,c or roughly to the level of the flood. The city of Susa, xxx miles east on the foothills of the Zagros Mountains (now Iran) was the center of the Elamite civilization which was generally at war with the Sumerian valley occupants. The first known written documents appear at Uruk's Level IV along with representations of priestly figures. Absence of ideograms associated with war, king, and palace along with other evidence suggest a democratic and peaceable society engaged in trade to cities in the upper Euphrates, enjoying the pleasures of beer, fish, and sex, advised by sages and teachers and making exquisite pottery and engaging in diplomacy with neighboring cities. Evidently this changed sometime around 3000 BC with the arrival of strong social stratification, kings, and armies. Sumerians have moved from Eastern Anatolia bringing a new language and advanced culture to the existing Ubaidian peoples who have already started developing population centres in the lower Tigris Euphrates.

#39. [Rise and Fall of Ancient Sumer](#)

3000 BC: Global; Sea level stillstands

Stillstands (such as we have experienced for the past millenium)or reversals of [sea level](#) rise produce seaward delta buildup and static cortemporarily lowered groundwater levels, leading to desiccation and subaerial weathering with profiles, often littered with cultural remains, inlower river valleys as shown in the lower Rhine-Meuse delta profiles below. Our late holocene civilization is currently producing such a soil horizon. Many lower river valleys such as the Rhine show a depositional surface at about 15 ft depth corresponding to the probable profile of thelower Rhine valley at about 3000 BC.

#71.

3000 BC: Egypt; Sumerian influences on Egypt

Sumerian influences on Egypt at 3000 BC <http://marlowe.wimsey.com/~rshand/streams/scripts/influence.html>

#66. [Sumerian Influence on Egypt](#)[Sumerian](#)

3000 BC: China; Tibet, Sumxi Lake

In Tibet, Sumxi Lake rose during a wet period at about 5000 BP then, experiencing an "abrupt disequilibrium," fell into a great drought in 4300 BP (The Holocene, June 1993)

#48.

3000 BC: Peru; Onset of ENSO

5000 yrs B.P. Onset of ENSO in Peru following 3000 yrs of warm stable climate. Science 9/13/96 p 1531. Probable world-wide beginning of climatic irregularity. (e.g. california, Africa, etc.)

#59.

3000 BC: California; California hunter-gath transition

Hunter-gath transition

#45.

3000 BC: Sahara; Canoes and elephants

In prehistory the Sahara was different, raining all the time, full of canoes and elephants, Lake Chad one hundred feet higher. For 12000 years the desert had supported game allowing hunting and herding or nomadic pastoralism but then the land began to dry up. One reference says that between 6000 and 4000 BC the Nile had been subject to flooding and lake levels at Fayum were high until a drier period at about 3500 BC followed by a wet spike at about 3200 BC. This is supposed to be at the time corresponding to the predynastic Nagada (Naqadah?) cultures (Brewer, D.J. The Holocene, 1992) .

#72.

2970 BC: Europe; Floods in Netherlands

Floods in the Southern Netherlands a series of inundations occur 4,350 to 4,075 years BP corresponding an alteration of wet and dry periods (Beyens 1982)

#47.

2900 BC: Mesopotamia; Mesopotamian flood

2900 Sir Max Mallowan, successor to Leonard Woolley, estimates date of Mesopotamian flood at 2900 BC using Sumerian King list. However many will dismiss the idea of there ever having been a single flood and assign dates hundreds of years apart for various "flood layers" in different tells..

#49.

2900 BC: Global; Huang Ho River

First recorded Huang Ho River flood in 4275 BP Ward, 1978, "Floods, a geographical perspective."

#50.

2800 BC: Mesopotamia; The Flood and Noah's Ark

2800 Andre Parrot in his 1954 book "The Flood and Noah's Ark" indicates significant flood deposits at Kish, Shuруппak, Uruk, and Lagash centering on about 2800 B.C.

#52.

2800 BC: California; Summer warming,

2800 Sudden summer warming, bristle cone pine tree rings.

#51.

2700 BC: Nevada; Woodrat midden,

2700 Nevada; return of moisture brings first Woodrat midden in 3000 yrs at the mother of all woodrat nests, dated 4070 BP, evidently following great basin drought. Mono lake and juniper expansion between 4000-5000 BP

#63.

2700 BC: Mesopotamia; Gilgamesh, king of Uruk

Gilgamesh, king of Uruk; general agreement among Mesopotamian scholars

#53. [Internet Mesopotamian Resources](#)

BC: ; Sodom

#140.

BC: Mesopotamia; Woolley and the Biblical Flood

#135.

BC: ; Mayan Chronology

#139.

BC: ; Chronology of the Biblical Age

#136.

BC: ; Woolley and the Biblical Flood

#122.

BC: ; The Biblical Noah

They called him Noah in the bible, but around Mesopotamia he was another man

#138.

BC: ; Pliny

#91.

BC: ; Flood, Creationism, and Historiography

#137.

BC: ; Methane

#145.

BC: ; Paleoclimate Data Page

#146.

BC: ; San Francisquito Geology

#151.

BC: ; River development

#155.

BC: ; Dead Sea and the Bronze Age

#143.

BC: Mesopotamia; Tigris and Euphrates alluvial plain

At about 3500 BC the lower Tigris and Euphrates alluvial plain was under extreme pressure

#166.

BC: ; New Data from Peru

#153.

BC: ; Iceman of the Alps

#148.

BC: ; Sulphate spike

Sulphate spike in Greenland GISP2 core.

#169.

BC: ; South Carolina sea level

A recent sea level curve from South Carolina

#161.

BC: ; Fiji sea level

A recent sea level curve from Fiji suggest a 1 meter drop between 3500 and 3000 BC. *Journal of Coastal Research*, Special Pub. 27, p. 313. (fiji.html)

#159.

BC: ; Dodona

#97.

BC: ; Sealevel, late Holocene

#156.

BC: Mesopotamia; Mesopotamia Then and Now

#123.

BC: ; Saddam and Gilgamesh

#94.

BC: ;

#326.

IGNATIUS DONNELLY:

AND

THE END OF THE WORLD



[Click here for an index and contents
including Mr. Donnelly's latest scientific findings for the year 2000](#)

ILLUSTRATED

*"I was so excited I
couldn't sleep for a week"-
Rev Hal Lindsey, author of
"The Late Great Planet
Earth" on his discovery that
the world was coming to an
end.*

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[NEXT](#)

Holocene delta development worldwide

The sequence of Holocene delta development worldwide is indicated as beginning at 6000 BC; by 3000 BC a transgressive sequence of deltaic deposits had developed as shown on the figure. Under conditions of rapid sea level rise these fresh deposits would have been swampy and waterlogged. However, a sudden regression would leave a silty, nutrient-rich floodplain well- drained with a slightly receding (downcutting) river, a condition ideal for irrigated agriculture. *Journal of Coastal Research*, Special Pub. 27, p. 235. (trans.html)



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Newgrange Megalithic Tomb

Newgrange Megalithic Tomb 4425± 45 BP; 4415± 40 BP burnt soil from roof caulking of Newgrange; 4480± 60 BP vegetation from turf beneath main monument; 4399± 67 BP from site 16 near Knowth tomb site (O'Kelly, *Early Ireland*). (BP = uncalibrated radiocarbon date.)



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Creekwalk, 1988

Hypnerotomachia Polyphili



IN WHICH THE NARRATOR, FOLLOWING AN ANCIENT PATH, PASSES
THROUGH THE FOREST OF CONFUSION TO ARRIVE AT
THE SWEET STREAM OF KNOWLEDGE, WHERE,
THIRSTING, HE PAUSES
TO DRINK

**

*



hat April of 1988 was a kindly month, the waters of San Francsiquito creek, having shrunken to a jewelled string of ponds, became a gladed Eden. I walked above the bank on a dappled path beneath valley oaks and sycamores flanked with fields of fresh spring grass, knee high and kissed by perfect slanting sunbeams filtered through unraveling old blue gum trees. It was the nineteenth of that month; it had rained in the night but now in the fresh morning the gauzy clouds had begun to lift; the sun was making its way from winter vacation, in Chile, travelling north at six miles an hour, warming the spine of our Pacific state a degree centigrade each month. Though the air and though the grass were fresh and sweet it would be dry by mid morning and the greenness would within days begin its month's quiet extinction. Then the creek would dry into a string of scummy pools and in the big field the grass would get a parched tired look and there would be a tawny haze in the lower sky in the afternoon. Water officials were predicting are turn to rationing in the summer, a drought was tightening like a dry cough on the green valleys of our state. Thinking of this, I felt thirsty, and imagining the creek to be as yet clean, I knelt and cupped a small drink. The sun was warm on my head, and relaxed now from my troubles, I sat beneath a large oak tree. I must have fallen asleep, for a moment or a few minutes, I don't know which.

Footnotes

[1] The illustration and layout of this page, indeed the general course of the narrators journey that will follow, can be seen to parallel the fourteenth century manuscript *Hypnerotomachia Polyphili*. The sixteenth century english translation opens:

And at this infant thus terrified and afflycted, and yet without any receiued hurt, being vpon my

knees bowed downe, and inclofing the hollowneffe of my hand, therewith determined to make me a neceffary drinking veffel: I had no fooner put the fame into the water, offring to my mouth the long defired moyfture, thereby to refrygerate and coole the extreame heate of my burning heart, which at that time would haue beene more acceptable vnto me, then eyther Hypanis and Ganges be to the Indians, Tigris or Euphrates to the Armenians, or Xeylus to the Aethiopian nation, or to the Egyptians his inundation, inbybing theyr burnt and rofted mould, or yet the riuer Po to the Ligurians.

[2] An excellent web presentation including itlaian and english translations and many of the remarkable woodcuts that illustrate the work can be found at the Rutgers University [Colonna Project](#) The arrival of the hero at the stream is on [page 5](#). Having quenched his thirst he lies beneath a great oak (nota bene) and falls asleep. What follows is evidently a dream, though the reader, and perhaps the narrator, seem confused on that point. As in the present case.



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Cessair, from a New York Hotel Room



Dear Dick:

I have your note of the 19th. Thanks for the encouragement! I needed that. Sometimes I get annoyed with my whiny attitude and wonder why you bother. But I'm grateful nonetheless.

I went by the Metropolitan museum when I was in New York. They had a special exhibit on Sumeria. It was interesting. Tiny stone stamps for making wax seals, and great sculpted lions. Fine green pottery, better than I could ever make with my college degree! It gave me some ideas on how to research the Mesopotamian flood. I had most of the day off Thursday so I went to the NYC public library and looked up some background material for you. On the way back I stopped at a bookstore called the Strand -- have you heard of it? You'd like it I'm sure. I found a book on the excavations at Ur, by Sir Leonard Woolley. Anyway, right now I'm back in my hotel room and I'll summarize my notes on what I found.

Both the history itself but perhaps more so, the history of discovering the history (or should we say creating it?) are interesting. So I'm not sure when to start, with Sir Leonard in 1929 or with Upnapishtem in 3500 B.C.!

Maybe a couple of comments on 3500 B.C. to start. Good Judeo Christians that we are, we all remember from high school that when the curtain of history rises we are in the fertile crescent, specifically in Mesopotamia ("between the rivers") in the floodplains of the Tigris-Euphrates, in what is now southern [Iraq](#). According to the archaeologists earliest signs of settlement on the floodplain are around 5000 B.C. though there were towns to the north, up past Bagdad, much earlier. It seems that some interesting things were happening in the lower valley at least by 4000 B.C., a few little villages, some of them coalescing into towns where they made

exquisitely beautiful painted pottery of the exquisite Ubaid style; outside the towns a culture of nomads and cattle raiding; the burials are interesting in the light of the grave on San Francisquito Creek; one archeologist, a Sir Leonard Woolley (more on him later) described them this way:

They buried their dead in the earth lying on one side with the knees bent, and as they placed with them offerings of food, personal ornaments, tools, etc., we may suppose that they had some kind of belief in the continuation of life after death" (fnC. Leonard Woolley, The Sumerians.)

Then something happens. Somewhere around 2700 B.C. we have substantial Sumerian walled cities, writing, the rise of earthly rulers (in Sumerian, "lugar", literally translated "big man"!) Obviously the beginning of male oppression!

Between the two active rivers we find that the villages have grown, so we have ancient cities of Uruk, Shurru-pah, Jemdet Nasr, Kish, upstream on the rivers, 100 miles from the present shoreline. But as I mentioned to you when we talked, the old way of looking at history was that while this early Sumerian civilization was mildly interesting nothing *really* interesting came out of this culturally until later, with the Bible and the Greeks. Now at the typical university "Western Civ" course they have the curtain go up at Sumer. This is disturbing a lot of people, rich alums and conservative parents, but the disturbance is more than a century old now, as I will try to show.

Now to the Flood. You will be happy to hear that there may actually have been such an historical event. For a long time of course the "original" flood story was taken to be the [Genesis flood](#) but this idea received a serious blow on the evening of December 3, 1872. On that evening a young banker's clerk and archeology enthusiast named George Smith lectured to an audience of members of London's Biblical Archaeological Society. Prime Minister Gladstone sat in the audience. Smith had translated a tablet that he had found in a great pile of

debris that had been delivered from Iraq to the British Museum in which the seer Upnapishtim survives a flood sent by the gods to punish mankind by building an ark onto which he put his family along with all "the beasts of the field." According to the story, six days and nights of rain "destroyed all life from the face of the earth." Smith was said to be an excitable man and there was a rumor that when he first discovered the fragment, he took off his clothes and ran around the room. I have been unable to find a published explanation of this particular response. The Victorians did odd things. Perhaps he felt that he had somehow regained a glimpse of the Garden of Eden.

Now this early flood story dating from at least 1900 BC and probably much earlier is supposed to be a myth. According to the out-of-date NYPL shelf version of the Cambridge Ancient History says, "from what reality this famous story derives it is vain to enquire" though the same book says thatt an exceptional flood is noted to have occurred at the end of Dynasty I.

Now the scene shifts to the 1920's when the British archeologist Sir Leonard Woolley was in charge of a joint U. S. - British team that was excavating at Ur, or what remained of that ancient city, that being a huge forlorn mound of dried up adobe bricks and "rubbish" (surely Sir Leonard's favorite word) remaining from ancient occupation and now baking in the sun and "infested" (as the Brits would say) with lions and scorpions, more than ten miles from the nearest navigable river. The place is said now to be occupied by an Iraq military airfield. Woolley's expedition had been mostly funded by the Americans but Woolley was a dashing adventurer and an excellent publicist and was selected as the leader. Woolley dug down into the bottom of Sumerian civilization, through the ruins of the so-called Early Dynasty (2900 - 2800 B.C.) In 1929, he amazed the world with his discovery of a gold- filled royal cemetery that had been overlooked by past grave robbers. It was a discovery comparable to Carter's discovery of undisturbed tombs in the Nile.

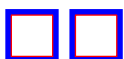
A few words on Woolley himself. Dashing in the Victorian style, given to colorful pronouncements. He had been a spy and a war prisoner in Turkey. He could tell stories of getting out of jams by pointing his pistol at the temple of difficult officials. He could write and speak in an entertaining way to a popular audience. He believed that archeology was relevant to the twentieth century because he thought people thought and acted fundamentally the same in 3000 B.C. as they do now. He had spent time with Lawrence of Arabia and Agatha Christie, ending up as a character in one of her novels. Interestingly these qualities were mixed with a tendency toward shyness. In many ways Woolley was a loner. He didn't care for honors and he hated cars! His wife was a difficult woman, a snob, a "walking catalogue of obscure ailments."

I've enclosed a photo of her. Why do I think that you would like her? Would you have enjoyed meeting her at the creek instead of me? (And why am I asking these ridiculous questions?)

Though Woolley was a severe and domineering classical scholar, he had a talent for interpreting his shards and runes in a vivid way. He could look at a small clay shard and feel the fading humid heat of an ancient summer afternoon, hear an underpaid schoolmaster criticizing his quaking students' progress in learning the difficult art of writing; see outside in the crowded alley the patriarch Abraham jostled by a braying ass carrying sticks of firewood.

Well, I think I'm beginning to go on here more than I should! Anyway, I've got some more material but I'll write again.

Best, Cessair



Peru Ice



We have seen elsewhere (see [methane](#)) how atmospheric concentrations of methane (swamp gas) during the Holocene (last 10,000 years) are related to the extent of wetlands especially at low (tropical) latitudes.

Here in the lowermost graph we see oxygen isotope ratios and nitrate for the Huascarán glacier in Peru, showing an abrupt cooling at about 5200 BP. Compare this with the graph of methane; the two are mirror images. For other climatic indicators see the paleoclimatic page.

Also shown on the upper graph are proxy paleoclimatic data from sediment cores in the Santa Barbara basin off the coast of California, sediment bioturbation and snail form, also indicating a discontinuity, possibly abrupt cooling, at 5.2k yrs BP.

References

Kennett, JP and Ingram, BL, *A 20,000 yr record of ocean circulation and climate change from the Santa Barbara basin* Nature v 377 p 510 12 Oct 95.

Thompson et al *Late Glacial Stage and Holocene Tropical Ice Core Records from Huascarán, Peru* Science v 269 7 July 1995.



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Oaks

Dodona: Barefoot girls sought answers by listening to the *Quercus* leaves and feeling earth vibes with their toes. But the questions are still there.

Sodom: The town wasn't big enough for Abraham and Lot. Lot got the sweet end of the deal until trouble came to paradise.

Fremont: You wouldn't trade a good meal for Kit Carson's dirty T-shirt.

Methane: Cow flatus isn't the only thing that floats around the dairy states. But something even stranger happened in 3100 BC.

Boniface: The saint won the second round with Wotan but you don't want to count on a knocked down German staying down.

Druids: In Ireland the oaks are still telling stories about the old days. And the future too, for those who can stand it.

Pliny: Wandering around Gaul he discovered what Christmas trees really are.

Spenser: Why use Agent Orange when the stuff is good for building ships?



The End of Eden

We place the "Garden of Eden" at the time of 8000 to 6000 yrs. BP (6000-4000 BC) at which time the temperature is warming culminating in an era warmer than present, when equatorial weather patterns may have reached farther north than at present, and the westerly storms of the north would have been confined to latitudes higher than at present.

Here we show the lower Tigris-Euphrates, most recently the scene of the Gulf War, beginning with the "Garden of Eden":



Drying climate, 4000 BC



Sea level rise in Gulf of Persia, 4000 BC



Irrigated society, 3500 BC



Rain storms, climatic oscillation. Millennial-scale warming terminates with a period of climatic disturbance and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally administered culture based on irrigation.



The Flood 3150 BC. Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level at 3000 BC followed by 10-15 ft. alluvial deposition in river valleys.



The area today:





Ignatius Donnelly

and the

End of the World has moved...please click [here](#).

Richard Berleth in his book *The Twilight Lords* describes the end of Gaelic culture in Ireland in the 1580s, characterizing pre-Elizabethan Irish as bucolic primitives, tribalists who lived with their cattle, reciting snatches of Latin and Hippocrates in their wattle and straw classrooms, fighting amongst each other in their ancient ways:

If they had not even approached the threshold of modern civilization by 1580, they were still secure in the changeless patterns of tribal life. They took more than sustenance from their herds; they drew solace and meaning from the perennial wanderings of their cattle. Their language was rich in images of earth and sky, and their songs celebrated nature with an immediacy seldom met in Elizabethan verse. No matter how degenerate they might appear to English travellers, a noble vision of man impelled these people. Through their legends of kings and cattle raids pass the warriors of a heroic age: Cuchulain, Conchobar, Fergus, Ferdiad. Their pride was all in individual prowess and valor, in the exploits of wandering heroes..."

Ireland had once been heavily forested but by the late 1500s Irish oak had been entirely cleared to reduce cover for rebel guerillas and to provide timber for English ships. At that time the poet William Spenser arrived in Ireland as a settler, part of an Elizabethan program to rescue the country from wasteful wilds and populate the land with English "planters." Spenser had witnessed the mopping up phase of English colonization of the western part of the country.

One day shortly after his arrival the poet was visiting a market town when he encountered a remarkable sight. A certain rebel, O'Brien, had been captured by the English and had only moments before been executed by drawing and quartering; that is to say, the man's intestines had been pulled out of him while he was still alive, and then horses had been hitched to his limbs and he had thus been pulled apart into four pieces in the middle of the town square. The rebel's foster mother had witnessed the execution; she had broken from the crowd and run up to the grisly remains. Spenser noted the scene in his diary:

"I saw an old woman who was his foster mother take up his head whilst he was quartered and suck up all the blood running out thereout, saying that the earth was not worthy to drink it and therewith also steeping her face, and breast, and torn hair, crying and shrieking out most terribly."

Themes

Bible More scientific than you'd think.

Oaks Buff and honest for five thousand years.

Meteorologica Did Aristotle have it right after all?

Icemen Their stories are not what we want to hear.

Gilgamesh He confessed his fears to a barmaid.

Creeks The future is fifteen feet down.

Cessair She wouldn't invite her father to graduation.

Chatauquau Ignatius Donnelly tells past and future.

Bible

Cessair

Chat

Creeks

Gilg

Intro

Krakatoa

Met

Oaks

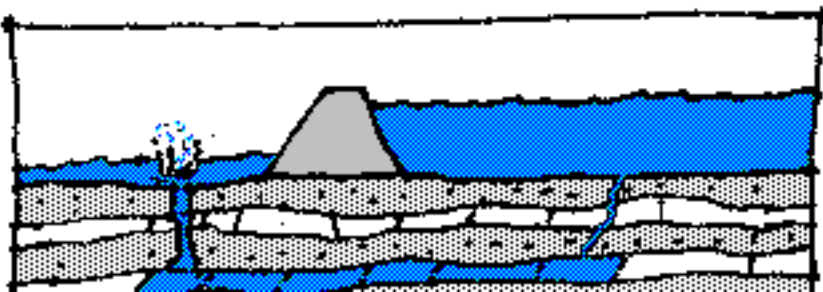
Sodom




There are those places in the world where both man and nature are driven to extremes, and are therefore forced to yield up certain truths that otherwise might remain hidden. For as Francis Bacon (that odd hero for my own odd hero [Ignatius Donnelly](#)) once said, "you have but to follow and as it were hound nature in her wanderings, and you will be able, when you like, to lead and drive her afterwards to the same place again." Such a place is the Dead Sea.

In 1972 a man named Tom Leps, knowing of research work I had published on the invisible but calculable flow of groundwater, approached me with the assignment of determining the manner of movement of water beneath the bottom of the south end of the Dead Sea, not far from the town of Sedom. It happened that the government of Israel had contracted with the California firm of Kaiser Engineers (then basking in public gratitude for ship-building in the war) to build some dikes within which they aimed to capture, concentrate, and dry out valuable salts for which that ancient body of water is so famous. I did not know it at the time but the digging of potash in that grim setting is an enterprise into which many past fortunes had sunk without a trace, it having been long said among shrewd investors that "nothing can sink in the Dead Sea but money." It is therefore no surprise that on completion of this latest construction project it was seen that the dikes were entirely ineffective, the water soon leaking beneath them. This fiasco led to a lawsuit at the International Court at The Hague. Leps, who had once worked with the great engineer dam Karl Terzaghi, was retained as an expert on the case.

It was not of course the first time that outlandish things have happened in this land of salt, wet heat, and earthquake faults; for here we have the closest place to hell, land of extremes of both nature and human behavior, of mad saints and zealous outcasts. Lot had settled there, when the land was said to be lush and fertile. The destruction of Sodom and Gomorrah was already an old story when it had been written into the Bible three thousand years ago. The chronicler Josephus claimed to have seen with his own eyes there the seared and salted remains of Mrs. Lot in the first century; seventeen hundred years later Josephus' translator William Whiston impatiently waited the day when the quarrels of local desert princes would subside so that properly scientific studies of these biblical events could be undertaken. Captured by the Arabs in the 1948 war, the remote town had been retaken only to become a disreputable center of drugs and prostitution when the salt works were reopened. The place had long yielded fertile crops of stories; the mystery play *History of Lot and Abraham* had thrilled the medievals and only a few months ago a colleague of mine, Amos Nur, had announced that the famous biblical fire and brimstone had been produced by an earthquake in that same place in 1900 BC. So we have in this strange land a continuing entanglement of geophysics and morals.



My consulting assignment was successfully completed when the results of this early effort at groundwater modelling -- I used an electrical analogue of the D'Arcy equations which I had developed as a graduate student at London -- showed that the failure of the



Dead Sea Dikes foundation with leaky salt layers

Dead Sea dikes was an inevitable design defect (the feasibility of building water tight dikes on soluble material such as salt has to be relearned every few years, as we have

subsequently seen in various more recent failures of dams built on salt beds). The failure had arisen in layers of cracked and soluble salt that had accumulated sporadically on the floor of the sea over the millennia. I was thirty three years old that year, and the success of this project would next lead me to to a profitable and interesting professional life.

Perhaps more interesting for present purposes than these engineering matters was the odd character of the sea bottom which was composed of salt and marly silt layers that could be "read" as a chronology of past climates, of the wet and dry spells that had come and gone with the rest of the desert wanderers over thousands of years. It occurred to me that there may been something to the biblical story description of the place as a land of fertility and delight when Lot had first arrived there (Genesis 13) Such an abrupt local climatic shift was not entirely implausible, given perhaps a radical northward migration of the [Saharan monsoon system](#). Some time in the late seventies I read of the discovery of bits and pieces of vegetable matter discovered in caves along with the famous Dead Sea Scrolls. These twigs would have their own story that would be revealed with the advent of radiocarbon dating in the 1950s.

But it would be twenty years before I discovered the facts and circumstances are as follows.

Not far from the southern end of the Dead Sea is an odd formation of flat-topped salt bluffs -- a diaper in geological terms -- several miles in extent and a thousand or so feet high. The formation is known as Mount Sedom, after the ancient place. Prominently exhibited on a rise above the stinking sea is the a salt spire said to be Lot's wife. The area, being most inhospitable, is not often visited; according to the *Lonely Planet* and *Let's Go* travel guides the 115 degree walk from the bus stop past the "Mrs. Lot" salt pillar, back up into the hills some several kilometers to the great Malham Cave, is enough to make even the resilient readers of those publications feel as dead as the sea that glitters with dull malevolence in the haze below.

It happens that the caves at the 300 foot level are not only the widest of many that perforate the salt hills but also contain, preserved over the millennia, twigs and leaves of *Quercus Calliprinus*. These can hardly be assumed to be of local origin considering that the area is salt, not soil, within a searing desert with an annual rainfall of less than two inches, hardly enough to moisten the parched ground much less support oaks. Now it is geologically certain that it was an ancient pluvial age that created caves in the salt; in fact past climate can be inferred by carefully measuring the width of caves formed by salt dissolution. The cavewidths can in turn be compared with correlative glacial advances in northern Europe (bigger caves = more rain = more glaciers) and the cave elevations with ancient sea levels of the Dead Sea itself. The horizon of wide caves found some 300 feet above the present sea level necessarily indicates an extremely [wet period in the early Bronze Age, or about 4200 to 5200 radiocarbon years before present](#). Oak twigs, driftwood, and marl found in the caves must have been transported by floodwater from some other part of the Judiah Hills. when the water level was some 300 feet higher than present, implying heavy flooding on the Jordan River and coupled probably with lower evaporation rates due to cooler weather. These strands of evidence have been carefully pieced together by Israeli scientists, whose conclusions are indicated graphically in terms of level of the Dead Sea in the figure.

Prominently shown is the fact that the land in the great rift valley was wet and the Dead Sea level high up

until about 7000 years ago. This conclusion is in agreement with other paleoclimatic information, it being well established that North Africa was lushly tropical in the early Holocene period. Around 7000 years ago the land became drier, much as it is today.

Of greatest relevance here is the is the great hump in the curve that came later, centering on 3000 BC; no other event following the great drying 7000 years ago quite matches this spectacular 300 foot rise in sea level. When exactly did this occur? Radiocarbon dating of both the oaks twigs and the marl show a peak at 4350 radiocarbon years before the present. Clearly there had been a time of great flood in North Africa just before 3000 BC.

The evidence suggests a great flood, corresponding no doubt to a radical arrangement of pastoral or civil life, followed by destruction, dessication, and salting of the earth.

On these events it appears that the bible and the oaks speak in one voice.

Footnotes

[1] Frumkin, Amos (University of Jerusalem, Israel Cave Research Center, Jerusalem) *Holocene climatic record of the salt caves of Mt. Sodom*, Israel, 1991 *The Holocene*; vol 1, no. 3, p 191-200.

The many stories of this land including the rediscovery of Masada and of the Dead Sea scrolls are skillfully recounted in Barbara Kreiger's fine historio-travelogue, *Living Waters, Myth, History, and Politics of the Dead Sea*.

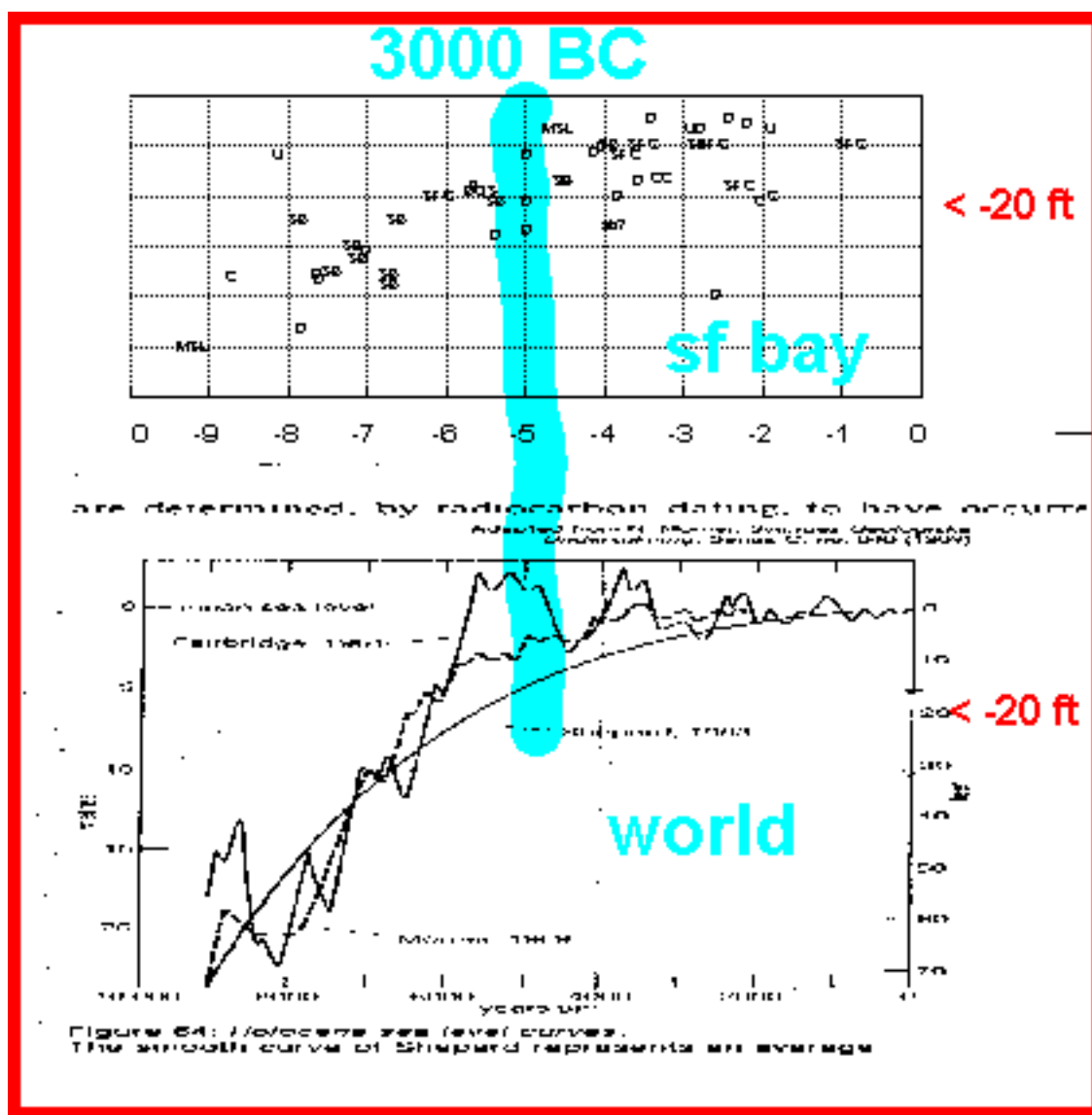
For a nice site on the Dead Sea Scrolls, see [>>Dead Sea Scrolls](#)

[2] See [Late Quaternary Chronology and Paleoclimates of the Eastern Mediterranean](#) edited by Ofer Bae- Yosef and Renee S. Kra, published by RADIOCARBON, Univ Arizona, 1994. For grass pollen and oak indicators of Holocene summer rains in the Arabo-Persian Gulf, see El-Moslimany; for early bronze age wet periods, notable the spectacular rise in the Dea Sea at 4500 c14 years bp, see Frumkin and Bruins.

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We are interested here in late Holocene sea levels and their effect on human geography. A recent survey of 36 world wide Holocene deltas indicates that delta formation began about 8000 (cal) years ago (6000 BC) when sea level was roughly 50 ft. below present level. (1) The isotope and sea level curves indicate a sudden drop in level (values of 5-15 cm/yr) of about 14 meters (more than 40 ft.) at this time. Subsequent smaller (1 to 5 m) catastrophes have occurred since this time and show up on abandoned beach strands in Denmark. (2)

Presumably life in lower river valleys was precarious until the rise in sea level decelerated at about 4000 BC.



Along the Belgian coast, recent work shows that "two rather distinct retardations appear to be present; a more marked one at about 7500-7000 cal yrs. B.P. and a second one at about 5500-5000 yrs. cal B.P."(3) In other words, sea level rise was temporarily reversed at these times.

The idea of irregular sea level rise, introduced by Fairbridge (1961), and subsequently dismissed by uniformitarian interpretations, has recently been reinforced by analysis of Australian coral reefs(4). Fairbridge's sea level curves are discussed in the Encyclopedia Britannica. They had been suppressed in favor of the more uniform curve of Shepard, though the irregular model is now coming back into vogue with the return to respectability of more catastrophic ways of looking at the data.

The upper graph shows C14 dates for muds and vegetation in the San Francisquito Bay and delta; C14 dates have been corrected to give calendar years, and the effects of autocompaction have been removed. Comparison of these data with the world wide data shown in the lower curves provides reasonable latitude for short term sea level regressions without proving them. It also appears that the the data are in close enough vertical agreement to suggest vertical crustal stability in the late Holocene in San Francisco Bay, though this is not the conclusion of Lajoie and the other authors of this USGS study.

- (1) Stanley, D.J. and Warne, D.F. (1994), *Science* vol. 265, p. 228.
 - (2) Tanner, William F. (1995), *AAAPG Bulletin* 79/10, p. 1568.
 - (3) Denys, L. and C. Baeteman (1995), *Marine Geology* vol. 124, p. 16.
 - (4) Jarcombe, P., et al (1995), *Marine Geology* vol. 127, p. 1-44.
 - (5) van de Plasshe, O. (1995), *Marine Geology* vol. 124, p. 117.
-

What on Earth Happened in 3200 BC?

What do you think? Comments to:

meehan@blume.stanford.edu

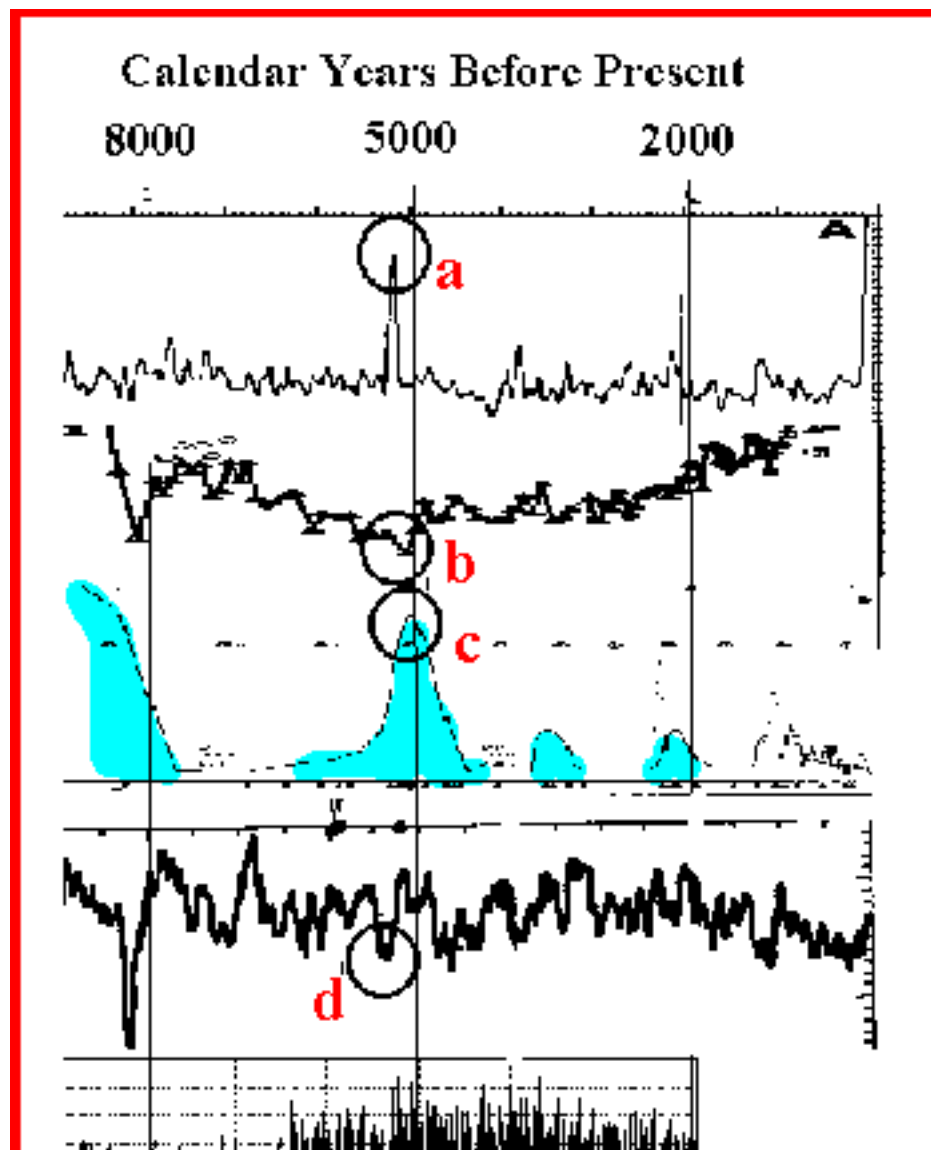
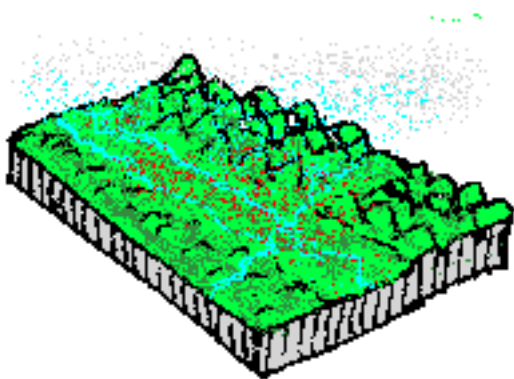
Patience! This takes a minute to load but the information is worth it!

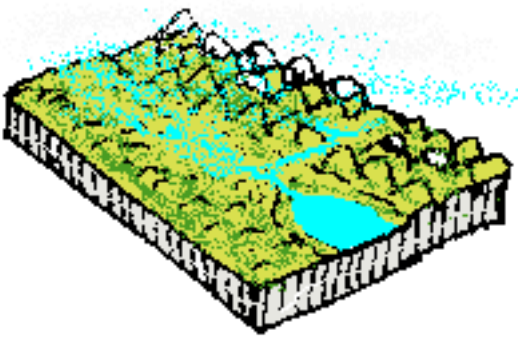
For a more technical version of this page, with references, click [HERE](#).

For the latest from the GISP2 team (Jan 96 Science) click [HERE](#) (takes 30 sec to load).

What was the climate like at the dawn of organized civilization, 5000 years ago? (3200 BC, or 5200 years BP, Before Present, the age of the unification of [Egypt](#) and [Mesopotamia](#)) This compilation of recent graphical representations of various paleoclimatic data from ice cores and other sources gives some clues.

a) Sulfate concentration in Greenland ice. Notice the huge spike at 3200 years BC. What caused this? A comet? Volcano? Or just a local swamp? Scientists are still debating the question. There are indications that volcanos can cause a great fog to envelop the world, lowering the temperature several degrees, leaving their marks on the ice cores of the north as well as [methane-producing vegetation](#) at 3200 BC, followed by an explosive growth?

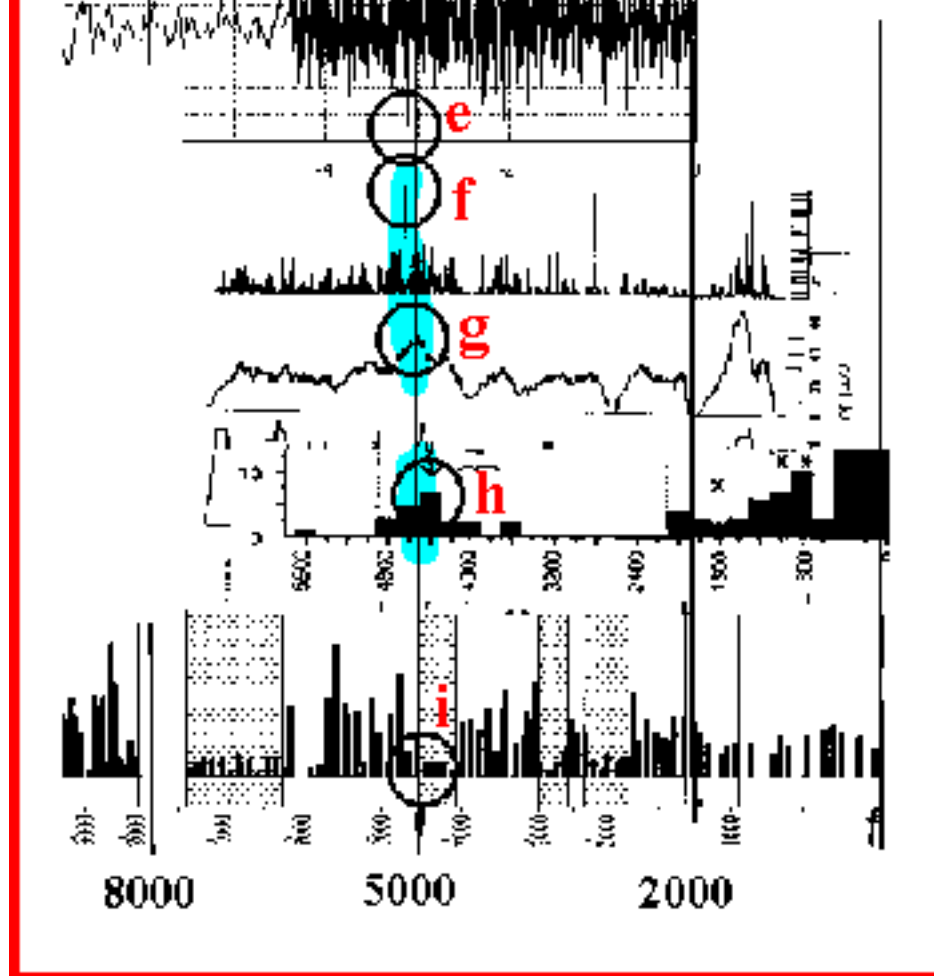




c) [Dead Sea levels](#) rose 300 feet at 3200 BC. The Jordan River must have been a tropical paradise.

d) Ice core oxygen isotope ratio; the higher the curve, the warmer the temperature. What was the big freeze-up at 5000 years BP?

e) Greenland Dye 3 oxygen isotope ratio. Minimum value between 2000 and 8000 cal yrs BP occurs just before 5000 yrs BP. Data from National Snow and Ice Data Center. A large acid peak at 3150 BC is suggestive of a volcanic event. For additional ice data from the southern hemisphere click [here](#).



f) Data from Belfast 7272 year [oak tree](#) ring chronology; (f) is an index of the tree ring narrowness, corresponding to cold weather in Ireland. The peak in (g) at about 3150 BC followed by the maximum tree and site sample size suggest a major climatic event at this time. Similar sudden increase in swamp oak (*mooreichen*, still used to make furniture in Germany) shows up at 5100 BP on the Danube. Much of this information comes from the oaks of [Ireland](#).

h) Heavy flooding in Navajo country, the American Southwest, based on paleoflooding studies. The peak at 5K yrs BP represents 8 sites.

i) Arid interval 5010-4860 (+/- 150) Morocco. Corresponding decline in oaks suggests reduced winter precipitation corresponding to cooler sea temperatures in North Atlantic.

Some tentative conclusions: Millennial-scale warming terminates with a period of climatic disturbance (so-called "Piora oscillation") and flooding in the lower latitudes (Nile, Arizona, Morocco, Israel, Mesopotamia), followed by a drought; general, worldwide, climate-driven shock to early societies living in "edenic" geography of plenty with "fertile crescent" survivors organizing into more centrally directed and hierarchical culture based on irrigation. Abrupt cooling at higher latitudes, possibly related to oceanic effects, especially in Northern Europe, corresponding to peak of megalith cultures. Probable oscillation in sea level at 3200

BC followed by 10-15 ft. [alluvial deposition in river valleys.](#)

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Ground Rupture in the Baldwin Hills

Injection of Fluids into the Ground for Oil Recovery and Waste Disposal Triggers Surface Faulting.

by Douglas H. Hamilton and Richard L. Meehan



On the Saturday afternoon of 14 December 1963, water burst through the foundation and earth dam of the Baldwin Hills Reservoir, a hilltop water storage facility located in metropolitan Los Angeles. The contents of the reservoir, some 250 million gallons of treated water that had filled the artificial, 20-acre clay- and asphalt-lined basin to a depth of 70 feet, emptied within hours onto the communities below the Baldwin Hills, inundated a square mile of residences with mud and debris, and damaged or destroyed 277 homes. Fortunately for those in the path of the flood wave, indications of imminent failure had been observed by a reservoir caretaker several hours before the final breach occurred: even so, police evacuation teams had barely sufficient time to clear the area. Consequences of the disaster were minimal compared with what would have occurred if no warning had been provided, but they included five lives lost, \$12 million in property damage, and loss of the reservoir itself.

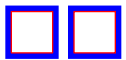
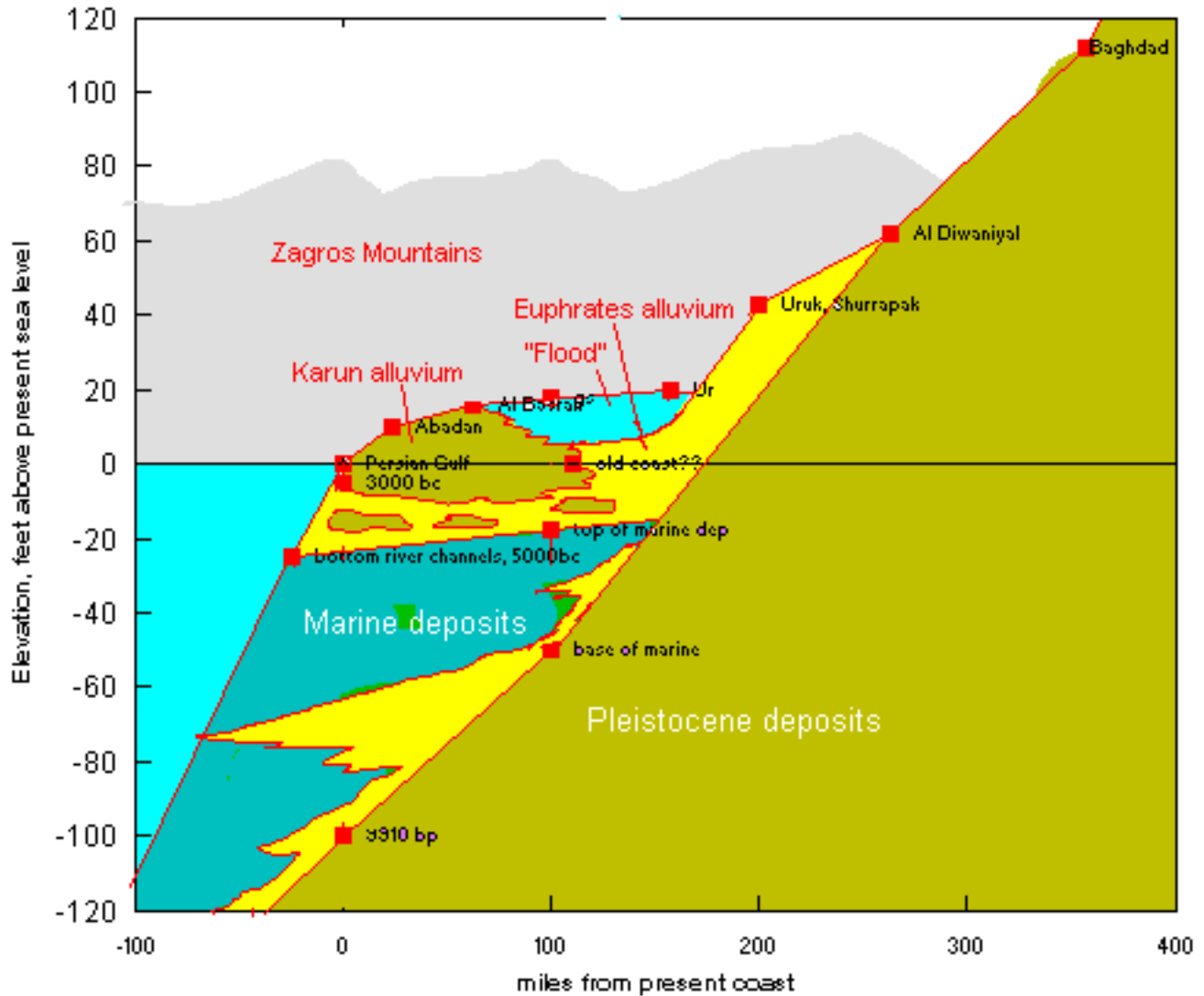
The remains of the Baldwin Hills Reservoir stand empty today, the northern rim of the bowl-like structure having been gashed from crest to foundation by the escaping water. A linear crack issuing from the base of this gap can be traced across the asphalt floor of the reservoir. It reappears as a slight buckling of road pavement on the far side of the reservoir basin and thence becomes a faint, discontinuous break in the ground surface, which trails off south of the reservoir into the brush-covered and excavation-scarred terrain of the Inglewood oil field.

Excerpt from: *SCIENCE*, April 23, 1971, Vol. 172, pp. 333-344.

Richard L. Meehan Associates, 701 Welch Road, Suite 1120, Palo Alto, CA 94304

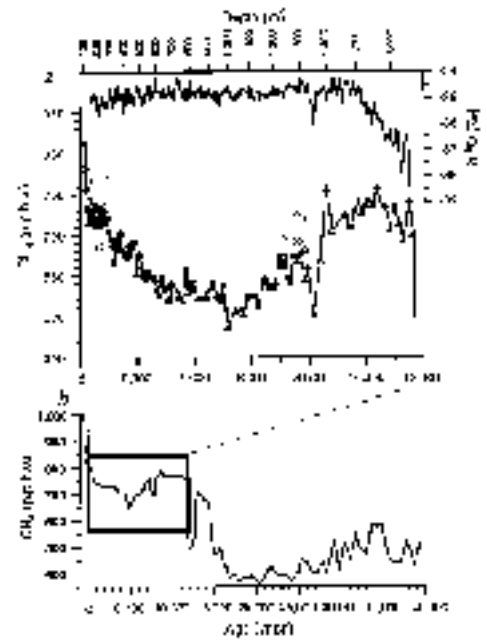
Mesopotamia delta

Stratigraphic relations showing the rapid development of a rich, fertile delta are compared in Mesopotamia with the generic model of delta formation suggested by Stanley, who demonstrates that development of these potting grounds for civilization would have appeared only after 6000 BC. Significantly, no comparable environmental condition existed in any great river valley for more than 100,000 years.



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Methane

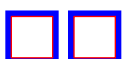


Methane: 40,000 BC to 1995

Atmospheric concentrations of methane (swamp gas) during the Holocene (last 10,000 years) are related to the extent of wetlands especially at low (tropical) latitudes. The lowest methane concentration in the Holocene is at 5200 yrs BP, with values of a little less than 600 ppbv (parts per billion, volume) apparently corresponding to a great drought in which previously abundant tropical wetlands mostly disappeared from such areas as North Africa and Tibet. Some time within a century of this drought (i.e. at about 3150 BC) there was a sudden jump in atmospheric of 40 ppbv, corresponding to either an abrupt increase in extent of wetlands or perhaps sudden outgassing due to rapid melting of ice in permafrost regions. Either theory suggests a sudden climatic event comparable to other sudden shifts such as at 8200 yrs BP or at 12000 years ago, the time of the "Younger Dryas" climatic shift.

It appears that the era of extensive rich tropical wetlands gave way to a severe drought in the late sixth millennium BC, followed by an abrupt event that involved sudden melting of large areas of permafrost, or flooding of arid lands, or both. All of this is in accord with the ideas of ancient thinkers including the Greeks (especially Aristotle), the Sumerians (eg the epic of Gilgamesh) and of course the Bible.

Blunier, et al, "Variations in atmospheric methane concentration during the Holocene epoch" Nature v 374 2 March 1995



- Flood of 1986 -

“Boil Observations ”

Summary of interview of Eddie Bolton by Richard von Geldern, March 14, March 16 and May 27, 1986:

Eddie Bolton had been on patrol with his father the day before the flood. He knew, from the description given to him by his father what a boil would approximately look like. At 5:10 p.m. on February 20, 1986, Eddie was riding his bicycle along the top of the Linda levee. He noticed a pond of muddy water along the landside toe of the levee. He had been told that boils that carry mud are more dangerous than boils that carry clear water so he looked more carefully and discovered the boil carried muddy water. It was from ten inches to one foot in diameter and about six inches high. Very muddy water was boiling through the surface of the pond. He noticed that within perhaps six inches of the muddy boil two or three smaller boils (about 1-1/2 inches in diameter and 1/2 inch high) were carrying clear water.

Eddie realized he that he might have discovered a dangerous condition, so he went home and told his mother about the boil; after listening to his story, Eddie's mother drove him to his father's place of work. After listening to the boil description, his father sent Eddie to the Linda Fire District Firehouse No. 1 to report the discovery to Captain Walt Woods. By the time Woods at the site of the reported boil shortly after 6 p.m., he saw a white section in the otherwise green levee slope (he was on the opposite side). He thought (correctly) that he was seeing a levee break. He proceeded to drive onto the levee, easterly along the levee to the break. Water was flowing over a lowered section of the levee or through a missing section of the levee. The water had made a cut about 40 feet wide and was fanning out over the land. Woods broadcast a warning call on his transceiver and then left the levee to organize the warning operation.

----END----

INTERVIEW

on Friday March 28, 1997

with Fred and Denise Haddix at 7720 Claypool Citrus Heights, CA 95610

In 1989, Fred and Denise Haddix moved into their house at 157 Country Club Road along the Feather River in Marysville. In 1991, the Yuba County Water Agency (Keith Lamb) debated whether they should allow the Haddixes to keep their property adjacent to the levee because they knew it might be subject to flooding. The Army Corps considered buying the Haddix property from their use but decided instead to obtain a right-of-way easement which expired on December 31, 1996.

On New Year's eve, while Denise was on the telephone she counted 16 heavy trucks going across the levee (apparently going to access Pump House 3, an irrigation station) in less than an hour. Fred and Denise asked the levee people whether they should leave and were told "No, the levees are safe."

On January 2, the Haddixes noticed what appeared to be "a lake" in neighbor Walter Cook's where water had pooled across the entire 15 acres to about two or three feet deep. Part of the Haddixes' land also had some water on it, but most of it was on Cook's property. They asked levee authorities about the boil located 200 feet north of their house on Cook's land and the response was "it's just the groundwater table coming up, nothing to worry about." Also, Cooke's property as well as the Haddixes' property had a history of boils during flood conditions; one boil just east of the Haddixes' house was sandbagged on New Year's Day. They noticed Country Club Rd. was covered with thousands of earthworms. At this point, Fred had several stakes in the ground on the river side of the house to track the rising water levels; at this point, Fred noted levels rising at about one inch an hour. Denise noticed the dogs digging at the bottom of their driveway and when she went over she heard running water underneath and around the house. She noticed a large sinkhole (see attached photos) and an exposed toe drain. She and Fred saw their wells "gushing clear water" about three hoses' worth of flow (about 40-50 gpm). Cooke's well is right next to their property and his had even larger flows, also clear. The levee authorities said that the levee would fail on the other (west) side, not the Haddixes' side.

Fred went out and noticed a leak about 200 feet north of their garage on Cook's property, at the base of the levee near the toe drain; it was 2 inches by 6 inches in size and muddy water was running out. However, when they asked, they were told that the water level had "crested" and that the worst was over. At 7:45 p. m., Fred and Denise spoke with their children who were, fortunately, staying with relatives because of the high river levels.

The levee patrols were in cars, not on foot. "We're in good shape, we've had problems like this before." A California Department of Forestry (CDF) truck was in their driveway at 7:30 p.m. and the Haddixes videotaped the men as they went to perform sandbagging of the boil on Cook's property. About twenty to thirty minutes later (approximately 8 p.m.), Fred and Denise heard and then saw the men running from the boil area back to their truck full-force screaming "Go! Go! Go!" The miner's lights on their hard hats broke

through the darkness in an array of directions as they jumped in their truck and sped away. Fred said that he knew by the terror in the men's stride and tone that the toe drain had "blown out" and they had better leave right away. Fred and Denise started to leave the house, grabbing a few things like photos and a strongbox on their way out, when the telephone rang. When Denise answered, it was their neighbor Jan Thompson (whose dog was later helicoptered from her roof) and Denise said, "We've got to leave, tell everyone to go!" Denise said that she made several other phone calls (she was on the cordless phone) in the few minutes before leaving and that these calls were the only notice of evacuation received by her neighbors. No authorities were around to give an evacuation order. Denise said that despite the panic she felt that she remembered wondering whether she should lock the door and turn out the lights. By the time Denise, the water was rising fast and she could hear the tires moving through water on the road. She also heard a "Pop, pop, pop!" sound, what they thought was from transformers hitting water as power lines fell. By the time Fred left the house (with a brother-in-law), he had to drive up the levee since Country Club Road was quickly becoming blocked by water ("it was coming up the driveway fast").

On January 11 or 12, they used boats to get their valuables out (Department of Water Resources instructed them to do so). On January 14, the Army Corps told them they were taking over the house (through eminent domain) to build a berm to help rebuild part of the levee although they never built the berm. The Haddixes never signed anything releasing their house and didn't know at the time what they would be paid for the house (since then they've heard that DWR determined that their property was valued at \$47,000 after the flood).

Several weeks after the flood, the Haddixes attended a meeting held by Senator Diane Feinstein where the Army Corps recommended installation of a toe drain; to their embarrassment, they were informed that Reclamation District 784 had already put it in several years back (and that may have been what failed).

Levee officials can't explain Country Club break.

Harold Kruger

Appeal-Democrat

Jan 7 1997

Phil Lee probably knows more about Yuba-Sutter levees than anybody, but he doesn't know what caused the levee failure at Country Club Road.

"We're not sure what kind of failure (occurred) and what was the mechanism for failure," Lee said Monday. "We're still waiting for the forensic information. We're going to be looking at reviewing the Marysville-Yuba City reconstruction project."

Until recently Lee was the Army Corps of Engineers' project manager for levee repair work in Yuba and Sutter counties stemming from the 1986 flood.

The Army Corps had completed scheduled repairs in District 10 and Marysville.

A contract was awarded a few months ago for work in Reclamation District 784, but an unsuccessful bidder protested, halting work until the complaint is resolved. Lee said the contract controversy may be decided in a few months, allowing work to begin in the spring.

Studies of levees in RD 784 showed they offer less than a 100-year level of flood protection in many areas.

A 100-year level means there's one chance in 100 on the average of a flood in a year.

"The levees here are less than 100 years," Lee said. "It's public knowledge that with any kind of event like this you will have a potential flooding situation."

This storm was big, dumping even more water than the 1986 event, according to Don Wilson, Yuba County Water Agency engineer-administrator.

Inflows to Bullards Bar Reservoir peaked at 107,000 cubic feet per second, Wilson said. In 1986, they were 94,000 cfs.

Inflows to Englebright Reservoir were 104,000 cfs, compared to just 60,000 cfs in '86. "It's very difficult to know what Mother Nature is going to do with the system here," Lee said. "The only thing we're going to say is the Corps stands ready to work with the locals to make sure the levees hold."

But local officials again voiced frustration Monday about dealing with the Army Corps.

"They put all their faith that they could make the levees work, and they haven't made the levees work" Wilson said.

Water Agency officials for years have pushed for another dam to control the Yuba River, but the Army Corps was opposed.

"It was considered and the high cost made it economically infeasible," Lee said.

But Wilson blamed environmentalists who "have got the feds so scared they're not looking at the real solutions. They won't even look at upstream storage."

With no new dams in sight, it's up to the levees to hold back the inland sea. "There's a risk living in this area. That's all I can say," Lee said. "The locals would have to accept it. The Corps is trying its best to locate every weak link in the system.

Lee said it's hard to know "what Mother Nature is going to do on the levee system, especially if it's a levee that undergoes days of saturation."

Lee denied a claim made Saturday by Steve Jones, the attorney for RD 784, who said a pond just upstream of the Country Club Road break had allowed water to undermine the levee.

The pond was part of an 80-acre environmental mitigation area created to make up for the loss of elderberry bushes and other wildlife habitat that will occur when the '86 levee repair work is done.

Jones said RD 784 officials had protested the pond's construction in late 1995.

"We had a number of meetings with RD 784's president and the operations chief in the last year. We addressed that issue," Lee said. "We did some geotechnical borings and analysis, and we made the determination that the pond itself is located sufficiently far enough from the levee that it would not have any detrimental effect to the levee."

Lee said the local officials agreed with the Corps' conclusions.

"As far as we know, the issue has been resolved with RD 784," Lee said.

Local officials criticized the Army Corps for creating the mitigation area before starting the levee repairs.

"The federal regulations show where their priorities are," Wilson said.
"They'd rather take care of a few elderberry beetles that nobody has seen than fix the levees that protect people."

Lee said the federal Water Resources Development Act of 1986 requires the Army Corps to do environmental mitigation prior to or concurrent with any levee repair work.

Lee said levee reconstruction work in Yuba-Sutter will proceed, although perhaps under some different assumptions.

"We're going to be looking at the levee reconstruction work in view of the levee break to make sure the new design and construction will make the levee beefed up so it can withstand the high flow conditions along the Feather," he said.

Wilson said the Army Corps may have a bigger job than when it started after the '86 flood.

"Half the stuff they were going to restore isn't there now," he said.

- Flood of 1997 -

Articles from Appeal-Democrat

“Bring some common sense into our environmental laws in the future so this does not happen again.”

Summary of article in the Appeal-Democrat on January 6, 1997, p. A1:

As Representative Wally Herger (R-Marysville) surveyed the damage from the Country Club Road levee break, he said, “It’s overwhelming...it makes you sick to your stomach.” Herger believes the disaster didn’t have to happen and blames burdensome environmental regulations for slowing levee repairs. A pond dug upstream of Country Club Road is believed to possibly have undermined the levee. This pond was part of an environmental mitigation area required in the \$30 million worth of Yuba-Sutter levee repairs from the 1986 flood. The repairs haven’t been completed yet. The Army Corps of Engineers estimated it will cost \$10 million to fix the 1,600-foot-long breach in the Country Club Road levee.

Herger said a contract to repair levees along Country Club Road was supposed to be awarded this spring but should have been completed five years ago. The congressman said he hoped the 1997 flood “will bring some common sense into our environmental laws in the future so this does not happen again.”

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- Flood of 1997 -

“Most of our failures have been from boils - water seeping beneath the levees, not overtopping.”

Summary of article in the Appeal-Democrat on January 7, 1997, p. C4:

The levee failures since the New Year’s storm have been caused by water leaking beneath the structures or flowing over them, not by an initial failure of the levee structure itself, state water officials said. “It’s not that we haven’t built levees high enough,” said John Hooper, an engineer and hydrologist with the state Department of Water Resources. “Most of our failures have been from boils - water seeping beneath the levees, not overtopping.”

Water can also seep through tunnels created by burrowing animals such as ground squirrels or muskrats. As the water pressure increases, it percolates to the surface on the dry side of the levee as a boil. If boils are not quickly plugged, they can erode material from within the levee, causing the sections above to sink, which allows floodwaters to flow over the levee crest and erode the surface on the land side.

Construction of major federal flood control projects on the Sacramento River system took place in the 1920s and 1930s when hundreds of miles of levees were built and huge bypasses were constructed parallel to the river as safety valves to relieve floodwater pressure on the main channels.

“It’s fairly easy to make a levee relatively impervious to water seeping through,” Hooper said. “the biggest

problem is the material you build the levee on is not as impervious as the levee itself.”

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- Flood of 1997 -

“It was like somebody took an 8-inch water cannon and it just opened up.”

Summary of article in the Appeal-Democrat on January 11, 1997, p. C1:

Linda Fire Department volunteer Gary McCoubrey recalled arriving at the levee at Country Club Road just before 8 p.m. Thursday January 2, probably 15 or 20 minutes before the Feather River broke through. Two inmate crews in four rows, about 25 to 30 in all, were stacking sandbags around a boil at the levee bottom. After the generator in the pickup failed, the men worked under the headlights of the few trucks parked near the levee. As McCoubrey worked on the generator, about 15 feet from the boil, he saw water explode from the base of the levee, spraying water into an orchard 20 feet away. The inmates scattered and McCoubrey recalled hearing their panicked screams. Then he shined a halogen light in the direction of the break. “Probably the scariest moment of my life,” he said. “All I could hear was guys saying get out of here. It was like somebody took an 8-inch water cannon and it just opened up. The sound, I can still hear it today. The sound was just horrendous.”

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- Flood of 1997 -

“It’s public knowledge that with any kind of event like this you will have a potential flooding situation.”

Summary of article in the Appeal-Democrat on January 7, 1997, p. D1:

Phil Lee probably knows more about Yuba-Sutter levees than anybody, but he doesn’t know what caused the levee failure at Country Club Road. “We’re not sure what kind of failure (occurred) and what the mechanism was for failure,” Lee said. “We’re still waiting for the forensic information. We’re going to be looking at reviewing the Marysville-Yuba City reconstruction project.”

Until recently, Lee was the Army Corps of Engineers’ project manager for levee repair work in Yuba and Sutter counties stemming from the 1986 flood. A contract was awarded a few months ago for work in Reclamation District 784, but an unsuccessful bidder protested, halting work until the complaint is resolved.

Studies of levees in RD 784 showed they offer less than a 100-year level of flood protection in many areas. “The levees here are less than 100 years,” Lee said. “It’s public knowledge that with any kind of event like this you will have a potential flooding situation.”

Water Agency officials for years have pushed for another dam to control the Yuba River, but the Army

Corps was opposed. "It was considered and the high cost made it economically infeasible," Lee said. But Donn Wilson, Yuba County Water Agency engineer-administrator blamed environmentalists who "have got the feds so scared they're not looking at the real solutions. They won't even look at upstream storage." So with no new dams in sight, it's up to levees to hold back the inland sea.

"There's a risk living in this area. That's all I can say," Lee said. "The locals have to accept it. The Corps is trying its best to locate every weak link in the system."

Lee denied a claim that a pond just upstream of the Country Club Road break had allowed water to undermine the levee. The pond was part of an 80-acre environmental mitigation area created to make up for the loss of elderberry bushes and other wildlife habitat that will occur when the '86 levee repair work is done. "We addressed that issue," Lee said. "We did some geotechnical borings and analysis, and we made the determination that the pond itself is located sufficiently far enough from the levee that it would not have any detrimental effect to the levee."

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- Flood of 1997 -

"It always takes a major disaster to get something done."

Summary of article in the Appeal-Democrat on January 7, 1997, p. A4:

With a lawsuit from the 1986 flood still pending, Danna and Danna Inc. may file a new suit over the latest flooding. The suit likely would include at least Reclamation District 784, which is responsible for the levee that broke at Country Club Road, and the Army Corps of Engineers. Angelo Danna said both knew there were problems with the levees separating Arboga from the Feather River, but failed to take action on time. "There's things the levee district knew about and the Army Corps of Engineers knew about. I think they drug their feet too long," he said.

While long-awaited work on the levees was scheduled for the spring, "that's just one year too long in my opinion," Danna said. Danna said he and other people helping patrol the levee had seen seepage and believed there was a problem at the spot the levee broke hours before it gave out, but nothing was done. Danna also said it was foolish for the district to run heavy equipment on the levee.

While the levee system was weak, however, other problems contributed to the levee failure, according to Danna. The riverbed, he said, is higher than it was ten years ago because it's so difficult to remove silt and gravel from the river.

"It always takes a major disaster to get something done," he said. "I hope it does something this time."

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The First Sight of Her

Something had drawn the dogs attention away from the field and I saw the muzzle turn in the direction of a solitary young woman perched on a log overlooking the water like the White Rock girl, beneath a feathery aromatic Eucalyptus. She was bent in earnest effort over a clipboard - a student artist, I imagined, trying to catch the texture of an aristocratic redwood spire roote ina dark ferny glen on the other side of the creek.

Seeing the advancing animal she moved with a quaint lack of grace to her feet, looking up, greenish eyes and the slightest brown tint to her untanned skin. Rushing at her, the dog jumped and pawed with mindless love, while I noted in the merest fleeting moment from the aversion of head and absence of any sign of that gush of maternal affection that sometimes followed, that there had been unwanted trespass and invasion, that the young woman -- her face seemed familiar -- was offended and that some apology was going to be required. I was embarrassed at the mistake... Well, that is not quite nothing but the truth, for the fact is that there was something that I had taken in even at a distance. Perhaps it was the particular thrust of her jaw, the grey-green cast of her eye, the eyebrow oddly plucked in a face that otherwise had no sign of makeup, the cut of hair that suggesting a low awareness of or indifference to style, conservatism, and budget consciousness... I waited to see whether the slight blush that was spreading appealingly upward into her face and the sardonic smile that was working across her mouth was more the annoyance of one sensitive to rude interruption that a sign of fixed program of ideological hostility.

"I'm sorry. I usually keep him leashed but by the time I saw him head for you it was too late. He's young. Uncivilized."

"Well," she said, looking down at some pebbles coated with drying salts next to the bubbling creek. As if there were more to be sai but it wasn't worth saying to a stranger.

"I hope it didn't ruin your sketch." She looked down at the clipboard. It was a penciled diagram of some sort, on blue graph paper with dimensions. There was a paw full of mud smeared across it.

"No." She looked at me directly. The anger had bled away but there was still plenty of reserve, but then she said, looking up at me "I don't think it was working anyway." My heart flooded at this inadvertant invitation.

"Can I help? I know this part of the creek pretty well. We're standing about 100 feet from the old Stanford house. Young Leland used to look for arrow heads down in the creek." She seemed to consider this.

"No. I don't think so. Thanks anyway." She started to put the clipboard and pencil into her book pack, a ritual of cessation and departure. I tried to read her feelings; was she angry? I said, "I'm sorry for the trouble."

At that moment the dog stopped at her feet, lowered his head, and dropped an object on the grass. I leaned down, catching a glimpse of ankle, picked it up and turned it in my hand. It was a bone.

Cessair, Her Name

"Cessair. That's a good name."



"My father's idea of a name."

"But you use it. You don't call yourself C. Alison Smith, or whatever."

"It's not so bad."

"You know who she was, don't you? Cessair."

"Not exactly. Celtic, I guess. My father was in his Celtic phase when I was born. Or so I hear."

"Are your parents divorced?"

A slight blush. "Did I just tell you that?"

"Just a guess. You should know about your name though. Cessair was the granddaughter of Noah, in the [Irish creation story](#). Irish creation story. *The Book of Invasions*, they called it. She escaped the flood by sailing to Ireland with three men and fifty women. Decided she didn't want anything to do with a God who was going to drown everyone, even the poor animals, just because he disapproved of their behavior. She was the leader of the escapees."

"That's wonderful. He never told me."

"Is that what you did? Escape?"

She dropped her eyes.

"There's a poem. It goes like this:

Ireland-whatever is asked of me
I know pleasantly,
Every taking that took her
From the beginning of the tuneful world.

"The tuneful world. That's what brought on the flood in Mesopotamia. People were making too much noise. We read it in civ, freshman year. God hated noise. What happened to Cessair?"

"When they got to Ireland the men divided up the women. She ended up with one called Fintan. He was a poet. But he left her. Decided he didn't like women after all. At least sixteen of them, which was his share. Then she was drowned in the flood, along with the rest of them. Only her husband survived to tell the tale."

"Are you divorced?" She looked directly at me, in the eyes. I liked her for it and I knew that I had to be completely honest with her, now and always. I also knew that when I told her that I had been married before that she would never completely trust me. I knew this but I didnt care, it would be one more thing that would keep a check on this... was it a love affair of sorts?



Footnotes

[1] The relevant passage from the Irish *Lebor Gabala* is as follows:

Wouldst thou know of the adventure of Cessair into the land of Ireland?

Prophets of God and His messenger had said unto Noe son of Lamech: Make thee an ark, of light timbers, for the Flood shall come, and every living thing shall be submerged by reason of the great kin-murder which Cain son of Adam wrought upon his own brother, Abel son of Adam. And not a man of the seed of Adam shall escape without falling in that catastrophe, save only thou and thy wife and thy three sons and thy three daughters, the wives of thy sons; for ye did not company with the children of Cain, inasmuch as it is thy sister whom thyself hast, and thy daughters are with thy sons.

At this point Fintan, the flood survivor poet who narrates the story, pauses, looking expectantly at his audience, like a priest at mass, and from the dark a chorus -- perhaps the older members of the audience, perhaps a chorus of acolytes, would respond in verse:

Ireland-whatever is asked of me

I know pleasantly,

Every taking that took her

From the beginning of the tuneful world.

To which the narrator would respond with the plight of one of Noah's sons:

"I," said Bith son of Noe, "what shall I do?"

"I know not," said Noe, "for it is not permitted to me to suffer thee into the ark, for the greatness of thy sinfulness. "

"I," said Fintan son of Lamech, "what shall I do?"

"We would not stoop to the Powers," said Noe, "to suffer thee into the Ark. "

"I," said Ladra, the pilot, son of Bith, "what shall I do?"

"I know not," said Noe, "for it is not permitted to let thee into the Ark."

"I," said Cessair daughter of Bith, "what shall I do?" "I know not," said Noe, "for I have no permission to let thee into the Ark."

Noe was wroth with them then, and said: "For me, this ship is no ship of thieves, no den of robbers."

Thereafter Bith came into counsel with Fintan and Ladra and Cessair, and they said: "What shall we do for this counsel? For it is final that the Flood shall come over the earth, and how shall we make us ready?"

But now the Irish story presents a new twist:

"Easy!" said Cessair daughter of Bith. "Give submission to me, and I shall give you a manner of counsel."

"Thou shalt have that," said they.

"Take then to yourself an idol," said she. "Worship it, and sunder you from the God of Noe."

So they took a god unto themselves, and this is the counsel that it gave them: "Make ye a voyage and embark upon the sea." But they knew not, nor did their god know, when the Flood should come. Accordingly what they did was to make their Ark, and to go into it, seven years and three months before the coming of the Flood. So the flood came, drowning all creatures great and small, excepting Noah and his ark, and Cessair and her party which consisted of fifty women, Cessair's father Bith, the poet Fintan, and the pilot Ladra.

They sought out Egypt (and so forth) till they reached Spain. Storm and tempest drove them to Ireland in a space of nine days, till they landed at Dun na mBarc, behind Ireland, and they came with their women to Miledach. At that time Bun Suainme was its name, from the confluence of the Suir, the Nore and the Barrow. That is the Meeting of the Three Waters, from the mingling of the three rivers.

Again, the chorus:

Cessair came from the East, the woman was daughter of Bith; with her fifty maidens, with her three men.

However, it was not long after Cessair and her companions' daring escape from the paternal constraints of the Old Testament before they fell to quarreling among themselves. The subject was the allocation of women among the men, for though fifty women seemed to be enough to satisfy the needs of only three men, the number fifty cannot, alas, be evenly divided by three. An uneven allocation must result! Before long one of them is dead; the manner of death is a mystery; Fintan must speculate: "Ladra the pilot, the first dead man of Ireland before the flood. He died of an excess of women -- or is it the shaft of an oar up his arse?"

But these quarrels are soon cut short by the universal flood; the island is inundated, Bith attempting to escape the waters on a mountain, Cessair in a nook in the rocks. But all but for the poet Fintan, who alone survives to tell the story, are drowned. Ireland will wait for many years before new settlers arrive.

Now it seems strange and interesting, given the traditionally paternalistic character of Irish society, that the story of the first taking of Ireland should call on the assertiveness of a woman to defy the words of the patriarch Noah, that it should be a woman who gathers a band of apostate followers, strikes out and find her own land of promise. In fact

most scholars who have interpreted the story and the context of its preservation -- embodiment of a pagan myth in a proper bible story -- that the death of Cessair was only a necessity of Christian convention (just as the villain has to die in the end of a western) and that the story in its original form enthrones Cessair as the mother goddess of Ireland (the Virgin Mary if you like), whose spirit lives on among and about the Irish. And perhaps even their American descendants! And if one were to locate a time in which the goddess actively ruled Ireland, one might turn back to that time in Irish prehistory when the native people were conquered by the Beaker folk, who, according to Maria Gimbutas, would be those Indo Europeans who rode out of Asia in about 5000 BC, arriving in the British Isles in 3000 BC.

If we want to stretch this further, drawing on Maria Gimbutas' carefully worked out archaeological chronology, we can imagine a remote connection even with the events in Mesopotamia. A luxuriantly tropical world (horses galloping on the Sahara, salmon leaping in the streams of the wooded paradise of Ireland) a life of fruit and honey, egalitarian plenty, extending in both lands up to the beginning of the third millennium, followed by a worldwide climatic shock, from which mankind emerges as an imperial civilization building (all within a century) the imperial monuments of Newgrange, the pyramids, and the Zuggerrants of Ur

[2] Readers who have followed the scientific side of this narrative will not be surprised to learn that the best assigned date to the mythical landing of Cessair and party on the shores of Ireland is 3200 BC. See "A Chronology of Ancient Irish Gods and the Invasions" prepared by the Neil Armstrong in connection with his interpretations of the Knowth and Newgrange archaeological sites. (Armstrong, N. L., "Irish Symbols" Mercier Press, Cork, 1989)



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Creekwalk, Revelations of Disaster, 1988

□ San Francisquito Creek, (so called by forty six year old Gaspar de Portola when his miserable party of soldiers first came upon it in November, 1769), rises in a bank of grayish white clouds that hangs like a giant unbroken wave of surf, its base pierced by pointed firs and stately redwood groves that cover the mountainous spine of the San Francisco Peninsula between the valley of Santa Clara and the Pacific Ocean. In the climatic atlas these modest mountains is a little piece of Oregon, with its 40 inches of rainfall, source of the waters that flow across the floor of the valley:

For mountains and high places act like a thick sponge overhanging the earth and make the water drip through and run together in small quantities in many places. [Aristotle](#),
Meteorologica I, xiii, 10

□ Two years had passed now since the last big storm, February of eighty six, when a ten inch gush that raised the San Francisquito creek nine feet, three thousand five hundred cubic feet per second. This was still four feet short of the flood of December 22, 1955, when a record flow of five thousand five hundred cubic feet per second had gushed over the tree fringed banks into the lowlands near the bay. I remembered the details of storm of 1986; it had occurred in the midst of a drought and it had rained hard for ten days on the northern part of the state. The town of Guerneville up on the Russian River had been a disaster.

□ Even then the gays (as we later came to know them), led by a rich and fancy bridge player and an Air Force officer who declared that he was queer and got himself on the cover of TIME, were making Guerneville into another Fire Island or Provincetown; people were wondering whether God had sent the flood to wash away this wickedness, Yahweh making the skies burst and the fountains of the deep open so that the waters crested and the gentrified houses were plastered with mud and debris and torn off their foundations and the silverware and china tumbled into the brown cataract. A levee blew on the Yuba River in that same flood of February, 1986, washing out half the county. You wondered what the farmers up there had done to deserve it.

□ Already that spring the California temperature, both winter and summer, had warmed about one degree centigrade since the turn of the century. Now such a small change, two degrees fahrenheit, hardly seems like much, though it is undeniable in a balmy climate where the monthly rise in temperature in the spring is of the same magnitude, that is, two degrees fahrenheit a month, that the effect of such a change is to cut off the coldest month of the year, that being December (which month in the calendar year of 1987 had produced four and a half inches, or thirty percent, of the year's rainfall.) Compared to today the cooler weather of the late nineteenth century had added a December and subtracted a July, producing a decade of floods in Northern California, showers and fruit orchards and vineyards in Los Angeles. California, if not the world, was evidently getting a little warmer and a little drier.

But it was not the warming and drying, as I have explained it here, but rather those erratic character in weather (which in fact had obscured the overall trend) that seemed even more significant to me in the 20

years that I had lived in California. It seemed that there was a kind of bad tempered bitchiness that had grown into the California weather over the past few years.

We talk of the weather, we talk of the markets. A few months before the stock market had lost a third of its value in a day and now it was wiggling drunkenly again, brazenly upward. Conversely real estate along the creek had risen twenty four percent in a year. Money pured from stocks to real estate, back again. Frantic lawyer buyers streamed out of San Francisco to write offers on the hoods of their wives Volvos. Meanwhile drought singed the midwest, the worst since the dust bowl.

I made graphs. There was talk of an increase in earthquakes, more each decade; with the exception of the sixties, the number of damaging earthquakes in the state had increased ominously; of vague changes in the air itself. Throughout the filmy bubble of the biosphere global oxygen concentrations of carbon dioxide had now approached the unprecedented 350 ppm.

People had begun to suspect computer trading and Mexico smog and the radon that was causing 13000 deaths a year from lung cancer. Unsteadiness was on the land; in Texas John Connelly auctioned off his household goods to pay his bills; a million africans would die of AIDS in the next decade and a new book by a Yale historian said that that the United States was plunging into decline, which was perhaps not unexpected considerereng the crack epidemic that was sweeping the cities. In the nation's capitol the president's wife consulted astrologers. By June it was evident that the year was going to be the hottest year on record, and perhaps the worst drought in fifty years.

If it weren't the jet stream slithering south it was the threat of global warming. New revelations were coming monthly now, of the past and of the future, some said the dinosaurs had been quick fried, others quick frozen, but it was agreed by all that a giant asteroid had knocked Gaia senseless and now a scientist named Michael Rampino was aying that it all had to do with one-celled ocean plants, *calcareous nannoplankton*.

It was with these thoughts I walked along the creek, thinking of the crack of time we had between peaceful oblivion and peaceful oblivion. I was about to turn a corner, seeking to know why the dog had begun to run.

The next few moments would change my life forever.

