[**Who Built the Moon? - Christopher Knight & Alan Butler 2005**](http://www.amazon.com/HistoryBooks) **(1988)**

**www.watkinspublishing.com**

**Christopher Knight** has worked in

advertising and marketing for over

thirty years, specialising in consumer

psychology and market research.

His writing career began almost by

accident after he had invested seven

years conducting research into the

origins of Freemasonic rituals and he

has written four books to date, coauthored

with Robert Lomas. His first

book, *The Hiram Key,* was published in

1996 and it immediately went into the

UK top ten bestseller list and remained

in the chart for eight consecutive weeks.

It has since been translated into thirtyseven

languages and sold over a million

copies worldwide, becoming a bestseller

in several countries. He now divides his

time between marketing consultancy

and historical research for writing

books.

**Alan Butler** qualified as an engineer,

but was always fascinated by history,

and made himself into something of an

expert in astrology and astronomy.

Since 1990, he has been researching

ancient cultures, pagan beliefs and

comparative religion and has published

four successful books on such topics as

the Knights Templar and the Grail

legend. He is also a published

playwright and a very successful radio

dramatist.

**By the same authors**

Previous books by Christopher Knight

(co-authored with Robert Lomas)

*The Hiram Key*

*The Second Messiah*

*Uriel’s Machine*

*The Book of Hiram*

Previous books by Alan Butler

*The Bronze Age Computer Disc*

*The Warriors and the Bankers*

*The Templar Continuum*

*The Goddess, the Grail and the Lodge*

By Christopher Knight and Alan Butler

*Civilization One*

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Introduction

The Dawn of Awareness

The Science Of The Ancients

The Origin Of The Moon

Walking On The Moon

The Bringer of Life

The Living Earth

The Incubator of Intelligence

External Intelligence

The Potential Message

The Impossible Accident

Childhood’s End

Extra Terrestrials

The Möbius Principle

The Möbius Mission

Using the Megalithic Pendulum

Using the Sumerian Pendulum

The Message in Detail

The Mechanics of Eclipses

The World From a Barley Seed

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Plates

The publisher would like to thank the

following people, museums, and

photographic libraries for permission to

reproduce their material. Every care has

been taken to trace copyright holders.

However, if we have omitted anyone we

apologize and will, if informed, make

corrections to any future edition.

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**Dedication**

For my Mother, my brother Peter

and in loving memory of my Father.

CK.

For my good friends Henry and

Michelle. AB.

**Acknowledgments**

Kate Butler, for her usual invaluable

assistance with proofs and index.

Penny Stopa and the editorial team.

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wonderful as always.

Hilary Newbigen, for her customary

apposite comments and advice.

Michael Mann, who continues to

encourage, advise, and assist.

For most people the suggestion that the

Moon could be artificial is about as

sensible as saying that it is made of

green cheese. This is a perfectly

reasonable response based on everything

that we know about the world we live in,

where there are just two kinds of objects:

those that are here because the random

forces of the Universe – that we call

‘nature’ – caused them to exist; or

because they were manufactured by

human hand.

However super-rational our

scientific community considers itself to

be, there are still huge numbers of

people who believe things that are not

proven by empiric means. In a recent

poll it was found that no less than

ninety-two per cent of Americans say

they believe in God1 – and other surveys

indicate that many millions of people

are equally convinced that aliens have

visited our planet.

God may well exist, and so too

might aliens for all we know, but this

book will only concern itself with hard,

scientific facts. And, unlike so many of

those trapped in the politically correct

world of academia, our published

findings will not be constrained by the

demands of current convention. The

information we put forward here is

clear, testable and, we believe,

irrefutable.

Despite the fact that the Moon is

almost certainly 4.6 billion years old, we

will demonstrate beyond all reasonable

doubt that Earth’s Moon cannot be a

natural object. And then we shall

explain in detail how the agency that

manufactured the Moon left a series of

detailed messages of what had been

done and for whom it had been

undertaken.

So, here is our challenge. Put aside

your natural incredulity and read this

book with an open mind, check out the

evidence then ask yourself ‘Who built

the Moon?’

We have cited three possibilities

but maybe you can think of more.

However, the last of our suggestions

appears to us to be increasingly likely. It

is a worrying, staggering, exciting and

completely awesome concept. And, if

there is even an outside chance that this

could be the answer, the world has a

major new challenge ahead of it.

The entire population appeared to have

simultaneously decided to evacuate

every building, and the streets and car

parks were quickly filling with people

standing almost shoulder-to-shoulder.

Traffic began to grind to a halt as

drivers leaned out of their windows, and

even the birds abandoned the sky to

assemble in rows along guttering and

telephone wires, chattering like some

misplaced dawn chorus.

The large grey clouds obligingly

parted to reveal a muted late- morning

Sun that had a small bite out of its

right-hand edge. As the dark spot grew,

the birds fell silent and a sea of

expectant faces became transfixed

upwards. Three welders from a nearby

garage became instantly popular as they

passed around their dark-lensed masks,

allowing the smiling onlookers a direct

view of the diminishing solar disc.

Then it happened; the moment of

totality arrived. The Sun disappeared

for several seconds, allowing the

darkness of night to wholly consume

the day. Then slowly a bright sparkle

materialized that soon looked like a

diamond set on the band of some

heavenly ring.

The last total solar eclipse of the

twentieth century had just occurred on

the morning of August 11th 1999. It

had begun when the Moon passed

between the Earth and Sun, throwing an

umbral shadow, forty-nine kilometres

wide, on the North Atlantic just south

of Nova Scotia. The inky black circle

then swept across the ocean surface

until it passed over the Isles of Scilly, off

the south-west coast of England, some

forty minutes later. Here the path width

had expanded to 103 kilometres and

was now covering the ground at a speed

approaching 1,000 metres per second.

The circular shadow then curved its way

over Europe and on to the Middle East

before crossing India and finally

disappearing over the Bay of Bengal.

Such events do not happen often

in the lifetime of an individual but once

seen, a total solar eclipse is never

forgotten. Solar eclipses occur around

two to five times per year but the area

on the ground covered by the totality is

very small, so in any given location on

Earth a total eclipse will only happen

once every 360 years.

One can only imagine how

primitive peoples may have feared for

their lives as the Sun was apparently

extinguished before their eyes. No doubt

the astronomer priests of ancient time

held sway over their people by having

the apparently magical power of

predicting such terrifying events.

But even today the magic and

mystery of the eclipse is very real.

It is a very strange quirk of fate indeed

that the disc of the Moon should seem,

from an earthly perspective, to be

exactly the same size as the Sun. Whilst

we casually take it for granted that the

two main bodies seen in Earth’s skies

look the same size, it is actually

something of a miracle. Most people are

fully aware that the Moon is tiny

compared to the Sun but that it is

much closer to us causing them to

appear as equal discs. To be precise, the

Moon is 400 times smaller than the star

at the centre of our solar system, yet it is

also just 1/400th of the distance between

the Earth and the Sun.

Whilst the surprisingly neat

number of 400 for relative size and

distance is apparently an amusing

coincidence of the decimal counting

system, the odds against this optical

illusion happening at all are huge.

Experts are deeply puzzled by the

phenomenon. Isaac Asimov, the

respected scientist and science-fiction

guru, described this perfect visual

alignment as being ‘the most unlikely

coincidence imaginable’.

This perfect fit of the lunar and

solar discs is a very human perspective

because it only works from the

viewpoint of someone standing on the

Earth’s surface. But the magic of the

Moon’s movements above our heads

goes to even more astonishing levels. By

some absolutely incomprehensible

quirk of nature, the Moon also manages

to precisely imitate the perceived annual

movements of the Sun each month.

So, when the Sun is at its lowest

and weakest in midwinter, the full

Moon is at its highest and brightest, and

in midsummer, when the Sun is at its

highest and brightest, the Moon is at its

weakest.

If you want to understand how

extraordinary this doppelgänger effect

is, stand on a hilltop or an open plain

and film the Sun at midwinter sunset

(its most southerly point on the

horizon), at the spring equinox, again at

midsummer and again at the autumn

equinox. Then on those same dates film

the Moon setting and you will see that

they both go down at the same point on

the horizon at the equinoxes (March

21st and September 21st) but the Moon

will have the opposite setting point to

the Sun at solstices in December and

June. 2

Figure 1

This drawing shows the peculiar relationship of the

Sun and Moon throughout the year as seen from

Earth. At midsummer in the northern hemisphere the

Sun sets north of west, whereas the full Moon sets

south of west. At midwinter the situation is reversed,

with the Sun setting south of west and the Moon

setting north of west.

Figure 2

At the time of the spring and autumn equinox sunset

happens at a due west position, whilst the full Moon

also sets in this part of the sky.

It would be easy to dismiss these

Sun-mimicking performances by saying

that it is simply a consequence of the

Moon’s distance from Earth and its

orbital characteristics. And that is what

most scientifically trained people will

say because it is self-evidently true. But

what they are really saying is ‘It is so

because it is so’ – which takes us

nowhere. Of course, it could, and

logically has to be, one big coincidence.

What else could it be? Even most of the

ninety-two per cent of the American

population who state that they believe

in God would probably assume

coincidence and only a minority might

claim that it is the grand plan of the

Almighty.

The Moon’s dance around the

Earth that produces these startling

performances is extremely complex and

it is a consequence of the relative

movements of the Earth and the Sun as

well of the Moon itself.

The path of the Moon’s orbit is

inclined at 5°9´ to the line of Earth’s

path around the Sun, known as the

plane of the ecliptic. The Earth is also

tilted at an angle of just over 23°27´,

although this is slowly decreasing so

that in several million years it will reach

22°54´, after which it will again increase.

Figure 3

It follows that solar eclipses can

only occur when the Moon passes

through the plane of the ecliptic and the

Sun’s light is blocked by the Moon.

These points of intersection happen

twice for each lunar orbit and are

known as ‘nodes’. These nodes appear

to move slowly around the background

stars giving the impression of moving

backwards through the calendar

occurring 19.618 days earlier per year.

The cycle completes every 18.618 years,

which amounts to a surprisingly neat

6,800 days.

Closely allied to this node cycle is

the so-called ‘Saros cycle’, which

governs the periodicity and recurrence

of eclipses, where each eclipse sequence

has a duration of approximately

6,585.32 days (eighteen years, eleven

days, seven hours, forty minutes and

forty-eight seconds). The people of

Ancient Mesopotamia knew of this

astronomical principle and it is quite

possible that earlier observers, long

before written records began, were also

aware of it.

However, one has to wait for three

Saros cycles in order for a solar eclipse

to repeat at the same spot on Earth

because successive eclipses in the Saros

cycle happen one-third of the way

around the world from each other. You

would therefore have to wait over fiftyfour

years to see an eclipse return to the

same geographic area. There are twelve

different Grand Saros eclipse series at

the present time.

Human knowledge about the

movements of the Moon is far older

than most people might imagine. More

than 25,000 years ago an early

astronomer created a lunar calendar

that is still intact. The bone he engraved

was excavated nearly a hundred years

ago at Abri Blanchard, not far from

Lascaux in France. Experts agree that

the markings accurately correspond

with a two-month lunar calendar.

Around 250 generations later another

astronomer also recorded this already

ancient knowledge, using various

natural minerals daubed onto a cave

wall to leave the image of an empty

rectangle followed by a series of fourteen

sooty dots. It was realized that these

marks might also be a lunar calendar.

The fourteen dots, it was argued,

represented the face of the Moon from

full to new, after which the empty

rectangle would symbolize the

disappearance of the Moon’s face on the

fifteenth day.

If anyone doubted that the marks

on the cave walls at Lascaux really was a

lunar calendar, or even continued to

believe counting was something that did

not appear until the arrival of the

written word some 5,000 years ago,

another picture close by might cause

them to think again. On this part of the

cave wall there were twenty-nine dots,

snaking around the bottom of a

beautifully executed painting of a wild

horse. Twenty-nine days is the period

from new Moon through full Moon to

new Moon again. And yet another

artefact known as the Isturitz Baton,

displays an even more advanced fourmonth

and five- month lunar calendar.

It is humbling to realize that these

records were created more than ten

thousand years before the Ice Age ended

and the woolly mammoth disappeared.

These kinds of lunar observations

are not restricted to southern France.

The Ishango Bone, which was found in

the Congo, Africa, also carries markings

that seem to represent a lunar calendar.

What is more, it is of an almost

identical age to the Isturitz Baton,

though it originated many hundreds of

kilometres to the south and on a

different continent.

The existence of lunar calendars

from such an early date is of great

importance to our understanding of our

own development. They demonstrate a

clear awareness of the passing of time

and the cycles of the natural world. The

discovery of an archaeological artefact is

a matter of chance and is dependent on

the number of objects of any particular

sort that once existed. The fact that so

many of these bones, antlers and

paintings have been discovered is a good

indication that they were not unique

and that Moon knowledge was

important to the Palaeolithic people of

Europe and Africa, though this does

give us cause to wonder why such an

early lunar fascination developed.

A recent discovery has shown why

such intricate observations ‘suddenly’

became possible for our distant

forebears around 32,000 years ago. In

July 2004, Rachel Caspari of the

University of Michigan and Sang-Hee

Lee of the University of California

published a paper in the *Proceedings of*

*the National Academy of Sciences*,

concerning comparisons of 768

different human fossils from a huge

span of human development. They

then divided the fossils into two groups

– adults of reproductive age, which they

settled on as fifteen years, and adults

that lived to be twice as old, based on

tooth wear.

In primitive societies, people were

often grandparents by the age of thirty,

if they were lucky enough to live that

long.

Dr Caspari said, ‘We found this

proportion of older to young adults in

the fossil record increased over time and

in the Upper Paleolithic that proportion

just skyrocketed.’

By calculating the ratio of old to

young individuals in the samples, the

researchers found that their numbers

soared up to fivefold in the Upper

Palaeolithic group, a leap that was so

surprising that the team at first

questioned its own results.

This dramatic leap in average

lifespan allowed individuals to grow

older and wiser and afforded each of

these new elders time to pass on their

knowledge to the next generation of

adults. The wear on the teeth suggests

that this leap in longevity must have

given rise to a true form of education

that could build up a body of ‘species

intelligence’ where the entire social

group knows far more than any one

individual. This would allow for the

first specialization in which talented

men and women were fed and

protected by the group to allow them to

add value to their early society.

This sudden transition from a

society of children to one of ‘greybeards’

must have been a watershed that laid

the foundations for what would

eventually become true civilization. The

period of history, known as the Upper

Palaeolithic Period, marks a time when

modern man was becoming established

in Europe and there was an expansion

of population, creating social pressures

that led to the growth of trade networks,

increased mobility, and more complex

systems of co-operation and

competition.

We could now understand why

observational astronomy became the

first real science for humankind. All

science is based upon observation of

patterns that stand out from the ‘noise’

of simple random chance and then,

through understanding, we can make

predictions of future events and

outcomes. In this way the tides, the

seasons and the movements of the

heavens could be seen as being parts of

a single engine driving the variations in

the immediate environment of the early

thinkers.

These early observational scientists

would also note where patterns from

completely different events appeared to

be related. Why should high tide

happen twice a day and rise higher

when the Moon was full or when there

was no Moon at all? Did the Moon have

some kind of control over something as

massive as the oceans? Even stranger,

why did women of childbearing age lose

blood once for every complete cycle of

the Moon?

We can be sure that this particular

fact was not lost upon these people.

Back in 1911 a French physician

by the name of J G Lalanne was

examining caves in Laussel, in the

Dordogne, when he chanced upon

something that turns out to be very

illuminating in terms of the Palaeolithic

mindset. Carved into the wall of a

limestone rock shelter, he found a 33cm

female figure. The artistry involved

from so early a period is quite

remarkable, the more so given that it

was executed with flint tools. The naked

and full-bellied woman has her left

hand on her abdomen and in her right

hand is holding a bison horn, in the

shape of a crescent moon. Upon the

bison horn there are thirteen incised

lines. The Venus of Laussel, as she is

called, is at least 20,000 years old.

This carving is one of many that

strongly suggest there was a very early

recognition that human fertility seemed

to be tied to the phases and period of

the Moon. Human female reproduction

is dependent on the menstrual cycle

which has an average of twenty-eight

days, and approximately halfway

through the cycle a mature cell is

released from a woman’s ovaries and

becomes available for fertilization. If

sexual intercourse does not take place

and the egg is not fertilized, it

disintegrates after a couple of days. At

the end of the cycle, if no conception

has taken place, menstruation begins

and the cycle commences once again.

A series of intriguing studies by

Professor LeRoy McDermott of the

Missouri State University has suggested

that these early ‘Venus’ images of the

female figure were self-portraits. His

analysis showed that the figurines were

made from the point of view of ‘self’

rather than ‘other’ and they could only

represent a women’s view of her own

body both emotionally and physically

as she looks downwards. Using

photographic simulations of what a

modern female sees of herself,

McDermott demonstrates that the

anatomical omissions and proportional

distortions found in various Venus

figurines occur naturally in autogenous,

or self-generated, information. The size,

shape, and articulation of the objects

appear to be determined by their

relationship to the eyes and the relative

effects of foreshortening, distance, and

occlusion rather than by any symbolic

distortion. As self-portraits of women at

different stages of life, McDermott

believes these earliest representations of

the human form embodied obstetric-al

and gynaecological information and

probably signified an advance in

women’s self-conscious control over the

material conditions of their

reproductive lives.

The lunar month symbolism in

the Venus of Laussel strongly suggests

that women 20,000 years ago knew the

length of their menstrual cycles and

already equated them with the phases of

the Moon. The thirteen lines on the

crescent-shaped bison horn could easily

relate to the thirteen menstrual cycles an

average woman could expect in each

year. At the same time, it is not at all

uncommon for a human female to

menstruate on the same Moon phase

each month because twenty-eight days

is merely an average, whilst the period

between one full Moon and the next is

29.53 days.

The historical connection between

human fertility and the Moon even

extends to the word ‘menstrual’. It

derives from the Latin *mensis*, meaning

month, whilst the word ‘month’ is very

ancient and refers to the period of four

weeks as being one ‘moonth’.

The connection between human

fertility and the cycles of the Moon is

considered to be ‘apparent rather than

actual’, but it isn’t in the least surprising

that the possibility of a relationship was

noticed by our ancient ancestors. The

clincher probably came when someone

realized that the average gestation

period of a human female, from

conception to birth, is around 266 days

– or nine full lunar synodic cycles.

In a social and a religious sense,

fertility undoubtedly played a crucial

part in the lives of people at the time

the Venus of Laussel was carved. It is

more or less universally accepted that

female deities were important to

human culture for thousands of years

of prehistory. Statues of pregnant

women with exaggerated genitals and

breasts are common from the

Palaeolithic to the Neolithic periods and

there are strong indications of the

existence of a fertility-based deity who

has come down to us as ‘The Great

Goddess’. The Venus of Laussel could

quite easily be a representation of this

deity, complete with a representation of

the heavenly body with which she was

equated – the Moon.

About 6,000 years ago there was an

outbreak of building in stone across the

western parts of Europe, particularly in

the British Isles, that tells us a great deal

about the Neolithic people’s fascination

with the Moon.

Dr Philip Stooke, of the University

of Western Ontario, Canada had always

been puzzled as to why there were no

maps or drawings of the Moon older

than the one drawn by Leonardo da

Vinci five hundred years ago. He

decided to look at ancient manuscripts

and the records of excavations of the

Neolithic sites on the British Isles.

Amongst other sites, he looked at the

truly amazing prehistoric structures

known as Newgrange and Knowth in

County Meath, Ireland. And it was at

the recently excavated Knowth that he

found a 5,200-year-old carving made

up of a set of lines and dots. Dr Stooke

realized that this was not simply a

Stone-Age doodle but a drawing of the

face of the Moon. He said:

‘I was amazed when

I saw it. Place the

markings over a

picture of the full

Moon and you will

see that they line

up. It is without

doubt a map of the

Moon, the most

ancient one ever

found. It’s all there

in the carving. You

can see the overall

pattern of the lunar

features, from

features such as

Mare Humorun

through to Mare

Crisium. The

people who carved

this Moon map

were the first

scientists – they

knew a great deal

about the motion of

the Moon. They

were not primitive

at all.’

Figure 4

These people were not merely Moon

watchers. Chris, along with Robert

Lomas, had already published his

analysis of the astronomical function of

nearby Newgrange, which was carefully

designed and engineered to allow the

light of Venus to penetrate deep into the

domed structure once every eighth

winter solstice.3 This focused beam of

light gave these early scientists a very

precise tracking of Venus, which

allowed them to maintain a calendar

that would be accurate to a matter of

seconds over each eight-year cycle.

There was no doubt that these builders

were far from primitive, as

archaeological convention once

suggested.

Investigations at Knowth had

already shown that at certain times

moonlight shines down the eastern

passage of the structure. Dr Stooke has

now pointed out that these narrow

moonbeams would also fall right onto

the Neolithic lunar map. He concluded,

‘It was obviously built by men who had

a sophisticated understanding of the

motions of the Sun, Moon and stars.’

The switch from a powerful female

deity, often equated with the Moon, and

solar-based masculine deities seems to

have taken place at about the same time

humanity began to discover writing.

This occurred in Sumer (modern Iraq

and Kuwait) and Egypt just after

structures like Newgrange and Knowth

had been constructed.

One researcher, Dr Leonard

Shlain, Chief of Labroscopic Surgery at

the California-Pacific Medical Center,

has suggested this connection in his

controversial but immensely popular

book, *The Alphabet versus the Goddess*.4

Here Shlain outlines his view that the

evolution of writing specifically involved

the use of the practical left hemisphere

of the brain, as a direct contrast to the

many thousands of years during which

the more intuitive, inspirational right

hemisphere had predominated. He

maintains that this explains the virtual

abandonment of a generally peaceful

feminine-centred society across much of

Europe, the Middle East and Asia. This

transition was staggered but it began

around 3,000 BC, when a more

aggressive, patriarchal social structure

emerged with masculine deities

predominating.

This thesis sounds very reasonable

and, if true, we could expect to find this

legacy of the Moon-associated goddesses

still present at the dawn of writing,

when myths and stories were first being

catalogued. And this is indeed the case.

In Sumer we find Nana, a very early

Moon goddess, whilst in nearby Egypt,

where writing came just a little later,

there is an even better example in terms

of Isis, who rose to become one of the

most important and revered goddesses

across the whole known world for

several thousand years. Isis originated as

a Moon goddess, and the fact is borne

out by one specific part of her story. Isis

had to rebuild the body of her husband,

Osiris, after he had been brutally

murdered and his body chopped into

pieces. She travelled all over the world

to find the dismembered parts of her

husband of which there were fourteen in

total. The story is analogous to the

gradual increase in size of the Moon

across fourteen days from new to full.

Referring to the Egyptians,

Plutarch, the Greek essayist, writing

around 60 AD said:

‘Egyptian priests

called the Moon

“the Mother of the

Universe”, because

the Moon, having

the light which

makes moist and

pregnant, is

promotive of the

generation of living

beings.’

Although to some early cultures the

Moon was associated with a masculine

deity, such as the Babylonian Sin for

example, in by far the majority of cases

the Moon was considered to be female

and carried strong aspects of fertility.

This goddess had many names across

the world. To the Greeks she was

Artemis and the Romans called her

Diana and Selene. Her Finnish name

was Kuu and to the Celts she was

worshipped as Cerridwen. Nor was she

ignored in the New World; in what is

now Mexico the Moon goddess was

called Tlazolteotli and to the Mayans

she was Ixchup. These names represent

only a tiny proportion of those that are

still remembered and there can be no

doubt at all that Earth’s Moon has been

deeply important to humanity across

the whole world and for many

thousands of years.

The Moon was almost certainly the

first heavenly body used to measure the

passage of time for reasons other than

human fertility. In this capacity it is still

enshrined in our own systems by the

use of months to split the solar year.

Looking back at history it is easy to see

the repeated attempts of different

cultures to reconcile lunar time with a

growing recognition of the length of the

year, which is governed by the Sun. A

truly ancient culture, such as that of the

Sumerians, never abandoned its lunar

calendar, beginning each month as the

first crescent of the Moon showed itself

in the dawn sky. However, at the same

time Sumerian Priests adopted a

‘stylized’ month of thirty days in length,

which fitted the solar year in a more

regular way. Lunar reckoning is still

used in Islam, a legacy of the religion’s

origins in the Arabian Peninsula.

In a physical sense this intense

interest in the Moon is not at all

surprising. We tend to forget in our

modern world of electric lights that

there was a time, not so long ago, when

the Moon was a welcome sight on a

dark night, but at the same time it was

recognized to have awesome powers. It

was believed by cultures from across the

world that the Moon could have a

bearing on people’s mental states (see

chapter five). The English word ‘lunatic’

enshrines this belief and, up to very

recent times, it was considered that

those who were mentally unstable could

be triggered into madness and violence

by the appearance of the full Moon. In

addition, our ancient ancestors were

well aware that the Moon was

responsible for one of the most

frightening and awe-inspiring

happenings that periodically ‘stole’ the

Sun from the sky.

Solar eclipses happen when the

new Moon passes directly between the

Sun and the Earth. At such times the

shadow of the Moon is cast upon the

Earth. If the observer is in the right

place on the Earth, it will appear that

the light of the Sun has been blotted out

and day can suddenly become night. A

total eclipse is a truly remarkable event

because in order for it to happen the

size of the Moon and the Sun, as seen

from the Earth, must be identical.

Nevertheless it does happen and it must

have struck absolute terror into the

hearts of early humans. This fear would

have been slightly mitigated when it

became possible to predict eclipses,

something that a number of early

cultures sought to do.

A second sort of eclipse, which is

seen more often because of the

planetary geometry involved, is called a

‘lunar eclipse’ – and in its own way this

must have been just as potent and

frightening. A lunar eclipse happens

when the Moon moves through the

shadow of the Earth, so the full Moon is

seen to slowly disappear in a clear night

sky. (See figure 19, pg 246)

On these occasions the Moon’s face

is not totally blotted out by Earth’s

shadow, often appearing as a ghostly

blood red disc. Even today this is a

chilling sight and one can sympathize

with people who viewed the event with a

sense of foreboding.

Without a good understanding of

the planetary cycles involved, eclipses of

both sorts could easily appear to be

random events and many early cultures

sought to discover the patterns involved,

probably working on the assumption

that understanding inferred a degree of

control. This may well have represented

the first serious attempts at astronomy.

It is known that both the Assyrians and

the Babylonians could predict eclipses.

In both cases many of the astronomical

skills were inherited from the earlier

Sumerians and it is highly likely that

eclipse prediction already existed before

3,000 BC.

Further west there have been

suggestions that some Megalithic

monuments were built as eclipse

predictors, maybe as early as 4,000 BC.

Astronomer Gerald Hawkins in his

b o o k *Stonehenge Decoded* used a

computer model to demonstrate that

Stonehenge in Wiltshire, England,

might have been partly built with

eclipse prediction in mind.5

By at least the second millennium

BC the Chinese could also predict

eclipses. As far back as 2650 BC, Li Shu

was writing about the subject of

astronomy. Three and a half centuries

later, ancient Chinese astrologers had

sophisticated observatory buildings, and

solar eclipses were considered essential

for forecasting the future health and

successes of the emperor. These

astronomers were keen to be accurate as

failure to get the prediction correct was

likely to be lethal for them. In one

documented case referring to the eclipse

of 2136 BC the two astrologers who got

it wrong were beheaded. The following

recorded their fate: ‘Here lie the bodies

of Ho and Hi, Whose fate, though sad,

is risible; Being slain because they could

not spy Th’ eclipse which was invisible.’

– Author unknown

For thousands of years the Moon was a

thing of awe and wonder to human

beings across the entire planet and it

remains so to millions of people today,

despite technological advances and a

good understanding of its physical

characteristics. For example, the Moon

has always been equated with

agriculture. Even in some parts of the

fully developed world there are farmers

and gardeners who would not dream of

either planting or harvesting without

direct reference to the phase of the

Moon or even the part of the zodiac it

occupies at any particular point in time.

The Moon is the fastest moving

astronomical body when viewed from

the Earth and appears to pass through

all the zodiac signs in only 27.322 days.

Generally speaking, crops were

often planted close to the new Moon, so

that they could grow with the face of the

Moon. Whilst there is no known

scientific basis for such ideas, the advice

offered is often very specific and doesn’t

vary much across the world. Nor does

Moon-lore relate only to sowing seeds.

For example, it is suggested that when

picking apples for immediate eating, it

is best to harvest them at the time of the

full Moon, though if they are to be

stored, the new Moon is preferred, since

the apples are believed to be less likely to

rot.

Even today the Moon has always been

important to humanity and it is central

to one of the most important festivals of

the Christian religion. Easter, which falls

in the early spring in the northern

hemisphere, is an ancient celebration of

rebirth that long predates its association

with the death and resurrection of Jesus

Christ.

The New Testament states that

Jesus Christ was crucified on the eve of

Passover before rising again a short time

later. In consequence, the ancient Easter

festival was reassigned to commemorate

this miracle. There was, however,

considerable debate over the date on

which Easter should fall. The early

Christians of Jewish origin celebrated

the Resurrection immediately following

their Passover festival, which, according

to their lunar calendar, fell on the

evening of the full Moon. This was the

fourteenth day in the month of Nisan

(the first month of their year), thereby

causing Easter to fall on different days

of the week. The new breed of non-

Jewish Christians from around the

Roman Empire wished to

commemorate the Resurrection on a

Sunday – their newly defined Sabbath.

In 325 AD the Roman emperor

Constantine I convened the Council of

Nicaea to debate whether or not Jesus

Christ was a man or a god. Having

officially designated Jesus to be God, by

a narrow margin, the council then ruled

that the Easter festival should be

celebrated on the first Sunday after the

full Moon following the vernal equinox;

and that if the full Moon should occur

on a Sunday and thereby coincide with

the Passover festival, Easter should be

commemorated on the Sunday

following.

The origin of the word ‘Easter’ is

thought to come from *Eostre*, the

Anglo-Saxon name of a Teutonic

goddess of spring and fertility. Her

festival was celebrated on the day of the

vernal equinox which now falls around

March 21st when the Sun rises in the

east and sets in the west, and the day

has twelve hours of daylight and twelve

hours of darkness. Traditions associated

with this pagan festival survive in the

idea of the Easter rabbit, a symbol of

fertility, and in brightly decorated Easter

eggs, which were a symbol of rebirth.

*‘The important thing is not to*

*stop questioning.Curiosity has*

*its own reason for existing.’*

**Albert Einstein**

In the early 1930s a young Scottish

engineer noticed that several of the

widely ignored, prehistoric Megalithic

sites near his home appeared to have

lunar alignments. He decided to study

some of the sites and he began a process

of careful surveying that was eventually

to lead him to make a discovery of

staggering importance.

As a young engineer at Glasgow

University, Alexander Thom visited a

number of prehistoric stone structures

near to his home in Scotland during the

early 1930s. He marvelled at the

grandeur and admired the way so many

of the giant stones had survived the

weathering of more than 5,000 years, as

well as proving resistant to the thieving

tendencies of croft and road builders

across dozens of centuries. As he

contemplated the various sites he

mused over their purpose and as he

looked to the horizon he could imagine

how the stones might have been used as

sighting stones for astronomical

purposes. When he checked out the

rising and setting points of the Sun and

the Moon across the year his hunch

appeared to be born out.

His first survey was at a site known

as Callanish, on the Isle of Lewis in the

Hebrides off the west coast of Scotland.

This complex of standing stones

revealed many astronomical alignments

and is today often referred to as a

‘Moon temple’. Thom went on to

spend nearly half a century carefully

surveying the so-called Megalithic (the

word means giant stones) structures

that lay scattered across the countryside

from the islands off northern Scotland

down to the French region of Brittany.

Along the way he became a highly

respected professor of Engineering at

Oxford University until his retirement

in 1961.

Thom had quickly realized that

these prehistoric builders were engineers

like himself and that they had a

surprisingly sophisticated knowledge of

geometry and astronomy. The

approach taken by this talented

engineer was to assess what he believed

the site had been intended to do – and

then redesign it himself. He quickly

gained an empathy with the Stone-Age

builders that gave him a real insight

into the purpose of each site that would

possibly be lost on a conventional

archaeologist. Once he had a picture in

his mind of what he thought their plan

had been, he went away to create his

own solution to the assumed problem.

Having drawn up his own design he

then returned to compare the site layout

to his own blueprint. Through this

process he could predict the location of

missing stones and, on further

inspection, he would usually reveal the

socket hole that confirmed his theory.

Thom developed a new statistical

technique to establish the relative

positions of the stones and, over time,

something spectacularly unusual

emerged from the amassed data. These

prehistoric builders had not been

lugging huge stones willy-nilly; they had

manufactured these structures working

with a standard unit of measurement

across a huge area of thousands of

square miles of what was then dense

forest and barren moorland.

It was amazing that these

supposedly primitive people could have

had an ‘international’ convention for a

unit of length, but the mystery deepens

because Thom was eventually able to

describe the supreme accuracy of a unit

he called the Megalithic Yard. This was

no approximate measure taken from

paces or body parts; it was equal to

2.722 feet +/- 0.002 feet (82.96656cm

+/- 0.061cm). Thom was also able to

demonstrate that the unit was

frequently used in its double and half

form as well as being broken down into

forty sub-units for use in design work

that he designated as ‘Megalithic

Inches’.

Most archaeologists refuted the

finding on the basis that the idea that a

unit of measurement that was more

accurate than a modern measuring tape

was absurd. Thom admitted that he

could not suggest how it could have

been achieved but he stood by his

evidence that simply said it ‘had’ been

done. In our previous book, *Civilization*

*One*, we described how we set out to

investigate the concept of the Megalithic

Yard. Our initial hypothesis was that if

the unit was not an error of Thom’s

data analysis it logically should have

two properties:

1. 1. It should have

an origin in

something

meaningful,

rather than

just being an

abstraction

that was

adopted by

everyone.

2. It should have

a means of

reproduction

that could be

used by

anyone

without

reference to

any sort of

standard

measuring rod,

that would

have been

difficult to

manufacture

and impossible

to keep

accurate across

centuries.

We realized that our assumption could

be wrong on either or both counts but

as it turned out, we were correct on

both. Thom had not made an error.

As we describe in *Civilization One*,

the Megalithic Yard is a geodetic unit, in

that it is integral (has a whole number

relationship) to the polar circumference

of the Earth. We found that these early

Megalithic builders viewed a circle as

having 366 degrees rather than the 360

degrees that we use today. We realized

that there really *should be* 366 degrees in

a circle for the very good reason that

there are 366 rotations of the Earth in

one orbit of the Sun – the most

fundamental of all circles in human

existence.

One solar orbit is, of course, a year

but there is a very slight difference

between the number of rotations of the

planet and the 365 days in a year. This

is because the mean solar day is based

on the time between the Sun being at its

zenith on two consecutive days (86,400

seconds) but an actual rotation or

‘sidereal day’ takes 236 seconds less. All

of those ‘saved’ seconds add up to

exactly one more day over the year. A

sidereal day can be easily appreciated by

observing a star returning to the same

point in the heavens on two consecutive

nights. This is one spin of our planet

because it is unaffected by the secondary

motion of the Earth’s orbit around the

Sun.

**Wheels within wheels**

Early cultures frequently took their lead

from nature and they were fond of

‘wheels within wheels’. If the circle of

the heavens had 366 parts, why should

every circle not follow the same rule?

We were able to confirm this hypothesis

by a variety of means including

evidence from later cultures that appear

to have adopted the 366-degree

principle.

The approach our Megalithic

ancestors took, we argue, was to

hypothetically divide the circle of the

Earth into 366 degrees with sixty

minutes per degree and six seconds per

minute. It was reasonable to assume

that these ancient builders used the

polar circumference of the Earth that

passed through the area around the

British Isles. Our planet is nearly

spherical but it does have a bulge in the

centre between the poles, so the

equatorial circumference is a little

longer that the polar. There are varying

estimations of the Earth’s polar

circumference, with NASA, for

example, quoting an average figure of

39,941km, whilst other sources

regularly quote 40,006km or 40,010km

– but the most frequently used figure

appears to be 40,008km. Undoubtedly

much depends on where the

measurement is taken or if an average

of them all is calculated.

Interestingly, the shortest polar

circumference (one that has least

landmass) is the one that passes

through the British Isles and is now

considered as the zero line of longitude.

But there is also another

possibility.

Just for interest, we looked at the

flattest possible circumference

achievable on the globe, i.e. a line that

equally bisects the planet that has most

sea and least land. We were amazed to

discover that a person standing in the

middle of Salisbury Plain in Wiltshire,

England (where Stonehenge and the

Megalithic circle at Avebury were built)

is in the absolute centre of such a line.

This means that if we consider

Stonehenge to be the ‘top’ of the world,

the imaginary equator from that point

is almost 98per cent sea – more than

any other point on Earth. This line

passes across the South Atlantic, skims

just below Africa, moves up across the

Indian Ocean, clips small pieces of land

at Banda Aceh, Sumatra, Thailand and

Vietnam, over the South China Sea and

then more than 20,000 kilometres

across the Pacific to pass over a section

of South America.

As far as we know such a line has

not been measured, and we cannot

imagine how it could have been

measured without the aid of modern

satellite technology. However, just

because we do not know how it could

have been done does not mean that it

was not done. Without further evidence

we have to assume that it is pure

coincidence that Stonehenge stands on

the only place on Earth to be

equidistant from the optimum and

near perfect sea-level circumference of

the globe.

We can only assume that a polar

circumference was used and taking the

40,008km figure it translates to

48,221,838 Megalithic Yards using

Thom’s central value for the unit. It was

then subdivided as follows:

Polar circumference

= 48,221,838 MY

1 Degree (1/366th)

= 131,754 MY

1 Minute (1/60th)

= 2,196 MY

1 Second (1/6th) =

366 MY

So, this brilliant system of geometry

starts with 366 degrees and finishes with

seconds of arc that are 366 Megalithic

Yards long. Self- evidently, an amazing

set of ‘wheels within wheels’!

We knew that the system must

work this way because we found that the

later Minoan culture, which developed

on the Mediterranean island of Crete

around 2000 BC, also used the

Megalithic second of arc. However, the

Minoans sub-divided it into 1,000 parts

to become their standard unit of

measure that was equal to 30.36cm.

This unit was dubbed the ‘Minoan

Foot’ by the Canadian archaeologist,

Professor Joseph Graham who first

detected its use in the palaces of ancient

Crete.6

We went on to demonstrate how

any person could generate a highly

accurate Megalithic Yard by measuring

the movement of Venus in the evening

sky using a rope, some twine, a blob of

clay, and a few sticks. The secret was to

take one 366th part of the horizon and

time the passage of Venus across it, and

then to cause a piece of twine with a

blob of clay on the end to swing like a

pendulum 366 times during that

period. From fulcrum to the centre of

the blob was a mathematically perfect

1⁄2 Megalithic Yard or twenty

Megalithic Inches. The process was

simple to carry out and works on the

fact that a pendulum is responsive to

only two factors: the length of the

pendulum and the mass of the Earth. If

the pendulum beat 366 times during

the transit of Venus across a 366th part

of the sky – you had your measure! (See

Appendix 1 for a more detailed

explanation of the pendulum method.)

It is doubtful that these ancient

stonemasons realized the fact but the

period of time that they watched Venus

and elected to subdivide into 366 beats,

is equal to the difference between a

mean solar day and a sidereal day.

Our starting point had been to

search for all possible sources of reliable

measurement available from nature.

And we found that there was only one:

the turning of the Earth on its axis as

seen by watching the movement of the

heavens. It was possible to time the

passage of a star, or in this case the

planet Venus, with reliable accuracy

using a pendulum. The pendulum then

turned a unit of time into a unit of

length because the timed beat will

always produce a fixed length – with

tiny variations due to latitude and

altitude.

It was then a simple matter to turn

a unit of length into a measure of

volume and capacity by creating cubes

and filling them with liquid or dry

goods such as barley or wheat. However,

we were not prepared for the shock we

received when we created a cube with

sides of four Megalithic Inches and

found that it held a pint that was

accurate to a staggering one part in

5,000 against the standard laid down in

the year 1601. Doubling the sides to

eight Megalithic Inches produced an

accurate gallon and doubling again

produced the old dry measure known

as a bushel. The mystery was

compounded when we filled the ‘pint’

cube with barley and found that it

weighed exactly one pound!

Things turned from the sublime to

the ridiculous when further

experimentation showed that a sphere

with a diameter of six Megalithic Inches

held virtually one litre and one ten

times the size weighed a metric tonne

when filled with water; all to an

accuracy of better than 99 per cent.

The fact that Thom’s apparently

meaningless Megalithic Yard, extracted

from surveying hundreds of prehistoric

ruins, produces these cubic and

spherical feats is not debatable. No one,

no matter how sceptical they might be,

can deny the simple maths. Neither can

they deny that the odds of such

compounded apparent connections

being coincidence are very high. Yet, the

pound and the pint are thought to be

Medieval and the litre and the tonne

were invented at the end of the

eighteenth century.

A connection seemed impossible.

Then we looked at the Sumerian

people who lived in the region we now

call Iraq some 5,000 years ago. They are

attributed with inventing writing, glass,

the wheel, the hour, minute and second

of time as well as the 360-degree circle

with its subdivisions of 60 minutes and

60 seconds of arc. Quite amazing

people.

As we probed the achievements of

this civilization we found that the unit

of length the Sumerians had used was

virtually a metre at 99.88cm and that

they had also used weights and

capacities that were as equally matched

to the kilo and litre of the French metric

system created thousands of years later.

Quite a coincidence we thought – but it

was nothing of the kind, for when we

applied the principles of the pendulum

to the Sumerian unit of length called

the ‘double kush’ we found that a

pendulum of this length beat at the rate

of one per second. This meant that the

Sumerian’s key unit of length and their

key unit of time were two sides of the

same coin when used as a pendulum. A

double-kush pendulum would always

beat out a second and a pendulum that

beat at the rate of a second would

always be a double kush in length. This

demonstrates beyond all reasonable

doubt that the Sumerians used

pendulums to define their

measurements. The question was, had

they used the same Venus-watching

principle as the Megalithic builders of

the British Isles to reproduce their units?

Sumerian written records tell us

that the planet Venus was considered to

be the goddess Inanna, who was of

central importance to their culture, so it

seemed entirely plausible. If they had

used the same principle it seemed

logical that they would have employed

their own values; essentially keeping the

same ‘software’ but inputting their own

data. Instead of the 366 degrees of the

Megalithic system we would have to use

the more familiar 360 degrees first used

by the Sumerians. And when we

checked out the results for such a

process – it worked perfectly.

When the horizon was divided into

360 parts and Venus was timed across

that part of the sky at the appropriate

time of year the double-kush pendulum

metres out exactly 240 seconds. And the

period of 240 seconds is recorded as

being so important to the Sumerians it

had its own name – a ‘gesh’. It therefore

seems certain that these people followed

the Megalithic idea of creating a unit of

length from timing the movement of

Venus across the evening sky.

**The American connection**

Later in our research we came across a

letter written by the great American

statesman, Thomas Jefferson and sent

to the House of Representatives on July

4th 1776. In this letter Jefferson laid out

a recommendation for a new system of

weights and measures for the new

United States that he had helped to

establish. He gave his reasoning and

described some unusual facts he had

uncovered whilst developing his

intended units.

He explained how he had realized

that there was only one aspect of nature

that gave rise to any reliable unit of

measure – which he named as the

turning of the Earth. So, like ourselves

and the Megalithic builders of five and

six millennia before him, he used the

heavens to provide a basis for all

measurement. In his letter he stated

that he had come to realize that the

imperial system of measurement used

in Britain was not an accumulation of

unrelated units as generally imagined.

On the contrary, he said that their

harmony indicated to him that they

were members of a group of

measurement units ‘from very high

antiquity’.

He gave a number of reasons for

this belief including his astonishment

that the foot, made up of twelve inches,

was directly related to the ounce weight

through the use of cubes. He said: ‘It

has been found by accurate experiments

that a cubic foot of rain water weighs

1000 ounces avoirdupois (Imperial).’

It could be coincidence that a cubic

foot holds 1,000 ounces of rainwater,

not 999 or 1,001, but exactly 1,000 – or

that the cube has sides that are a perfect

10 x 10 x 10 one-tenths of a foot. But

Jefferson did not think so. And nor do

we. However, it was Jefferson’s proposed

units that fascinated us. They were

never adopted but their properties are

amazing.

Jefferson’s logical mind also caused

him to use a pendulum to convert time

into a linear unit. He decided that he

should use a pendulum that had a beat

of one second as the basis for his

measuring system. Of course, Jefferson

had no idea that the second had come

from the Sumerian culture or that it

had been created by the use of a

pendulum in the first place. Jefferson

added one improvement suggested to

him by a certain Mr Graham of

Philadelphia – that he use a rigid

pendulum of very thin metal without a

weight on the end because it is more

accurate than a conventional type of

pendulum. The rules change with such

a pendulum (known as a rod). A rod

has to be exactly 50 per cent longer than

a pendulum to produce the same time

period. Jefferson’s timing piece, that

beat once per second, is known as a

‘seconds rod’, and is 149.158145cm in

length.

The world knew nothing of the

Sumerian culture in Jefferson’s time

and he could not possibly have been

aware that his rod that beat once per

second was essentially three kush in

length – just a whisker less than one and

a half metres (remembering that the

metre had not been invented at that

time).

The three-kush rod behaves exactly

like a double-kush pendulum and

therefore it beats 240 times during one

360th part of a day; observable by

watching Venus move across a 360th

part of the sky. Jefferson was therefore

accidentally re-enacting the ritual used

by Sumerian astronomer priests nearly

5,000 years earlier and connecting with

the principles of prehistoric

measurements.

The units that Jefferson identified

from this ancient process were all based

on the length of this ‘seconds rod’. He

wrote:

‘Let the second rod,

then, as before

described, be the

standard of

measure; and let it

be divided into five

equal parts, each of

which shall be

called a foot; for,

perhaps, it may be

better generally to

retain the name of

the nearest present

measure, where one

is tolerably near. It

will be about one

quarter of an inch

shorter than the

present foot.

Let the foot be

divided into 10

inches;

The inch into 10

lines;

The line into 10

points;

Let 10 feet make a

decad;

10 decads one rood;

10 roods a furlong;

10 furlongs a mile.’

We can see that his proposed ‘decad’

was based on a double-seconds rod. It

was equivalent to six Sumerian kush,

and his furlong was equal to 600 kush.

This brings about an even deeper

connection with the people of ancient

Iraq because they used a system of

counting that was sexagesimal; which

means it used a combination of base ten

and base sixty. They had a system of

notation that worked as follows:

Step multiple Value

1. 1 1

2. x 10 10

3. x 6 60

4. x 10 600

5. x 6 3,600

It can be seen that the figure of 600 is

indeed a Sumerian value for a

Sumerian unit of length.

But not only is the Jefferson

furlong equal to 600 kush – it is also an

almost perfect 360 Megalithic Yards.

Strangely, Jefferson had connected

well with both the Megalithic and the

Sumerian system. But something even

stranger happened when we took

Jefferson’s furlong and multiplied it by

366 and 366 again:

3662 furlongs = 39,961.257km

As we have already mentioned, the

range of assumed lengths of the Earth

circumference varies by a few kilometres

depending on what source one consults,

probably because each cross section will

differ and tides and plate tectonics

involving mountains leave room for

some debate. At the higher end 40,008

kilometres is widely used, however if we

take NASA preferred figures they quote

a polar radius of 6,356.8 kilometres

which equates to a polar circumference

of 39,941.0 kilometres.

That means that 3662 Jefferson

furlongs match Nasa’s estimate of the

Earth’s size to an accuracy of 99.95 per

cent – which is as perfect as it gets!

**Problems with Foucault’s**

**pendulum**

We became more and more fascinated

by everything to do with pendulums.

During one particular telephone

conversation, which had gone on for

over an hour, we had, yet again,

discussed at length the idea that there

might be some unknown law of

astrophysics – that was revealed by

pendulums – at work here. We

considered some highly speculative

thoughts that ranged from standing

electromagnetic sine waves due to a

gyroscopic effect of the Earth’s spin

through to gravitons containing packets

of information about ‘geometrical

shape’. But we agreed that we just did

not know enough to even start to

investigate such ideas. Chris wrote the

following paragraph into a draft of this

chapter as a summary of our mutual

frustration and finished work for the

day.

‘We have to admit

that we still do not

understand why it is

so, but the use of

pendulums in

association with

these ancient values

appears to be

elemental to the

planet Earth – some

physical reality

seems to be at work

here. Every

pendulum reacts to

the mass of the

Earth but there

seems to be some

kind of ‘harmonic’

response at certain

rhythms: points

where the mass and

the spin of the

planet resonate in

some way.’

But at that very point in time everything

changed.

At five o’ clock the following

morning Chris was unable to sleep and

decided to get up and make a cup of

tea. It was then that a ‘library angel’

turned up.7 Looking for something to

read he pulled the delivery sleeve of a

magazine that had arrived in the post

the previous day and flicked it open.

The main feature article in this edition

o f *New Scientist* was entitled: ‘Shadow

over gravity’. It sounded interesting

even early on a dark November

morning.

But he quickly realized it was far

more important than merely

‘interesting’. The opening paragraph

was incredibly similar to that which

opens this book, carrying a description

of how it feels to witness a total eclipse –

and then it transpired that the thrust of

the article was that solar eclipses have a

profound effect on pendulums! A

debate is presently raging as to why this

should be the case, because the

suggestion has been made that

pendulums may well be the key to a

significant hole in Einstein’s theory of

relativity.

The starting point concerns the

work of Jean Bernard Leon Foucault

who demonstrated a special quality of

pendulums at the Great Exhibition,

held in London in 1851. His

pendulum, now always referred to as

‘Foucault’s pendulum’, is simply a very

heavy weight fastened to a very long

wire attached to a ceiling inside a very

tall building, with a universal joint

allowing it to rotate freely around a

fixed point so that it will swing in a slow

arc in any direction. Giant pendulums

of this kind are now routine exhibits at

some of the major museums around

the world including the Smithsonian in

Washington and the Science Museum

in London.

Once set in motion its direction of

swing will appear to rotate at a rate of

about twelve degrees an hour. But this is

actually an illusion because it is the

observer and the rest of the world that is

moving whilst the pendulum is

maintaining a fixed swing back and

forth in relation to the Universe. This

happens because the pendulum is

independent of the movement of the

Earth, which is rotating underneath the

pendulum, making it appear that the

pendulum is changing direction. The

reason a pendulum swings is because

the Earth’s gravity continually tugs

down on it. According to Einstein’s

general theory of relativity this relentless

tugging is due to the fact that every

mass bends the fabric of space-time

around it causing other masses to slide

down into the dimple it creates in

space-time.

The amount of rotation of a

Foucault pendulum is dependent on

latitude. At the North or South Pole the

pendulum appears to rotate through an

entire 360 degrees once every turn of the

Earth (each sidereal day) because the

planet rotates all the way round

underneath it. In the northern

hemisphere at the latitude of the British

Isles the rate of rotation is reduced to

around 280 degrees per day and the rate

of rotation continues to fall the closer

one gets to the equator, where a

Foucault pendulum does not rotate at

all.

For over a hundred years everyone

knew that a Foucault’s pendulum

would swing in an entirely predictable

manner at any specific location. Then

in 1954 a French engineer, economist

and would-be physicist by the name of

Maurice Allais found that this was not

always the case. He was conducting an

experiment at the School of Mining in

Paris to investigate a possible link

between magnetism and gravitation, in

which he released a Foucault pendulum

every fourteen minutes for thirty days

and nights, recording the direction of

rotation in degrees. By chance, a total

solar eclipse occurred on one of those

days.

Each day the pendulum moved

with mechanical precision but on June

30th 1954, when a partial eclipse

occurred, one of Allais’ assistants

realized that the pendulum had gone

haywire. As the eclipse began, the swing

plane of the pendulum suddenly started

to rotate backwards. It veered furthest

off course twenty minutes before

maximum eclipse, when the Moon

covered a large portion of the Sun’s

surface before returning to its normal

swing once the eclipse was over. It

seemed that the pendulum had

somehow been influenced by the

alignment of the Earth, the Moon and

the Sun.

This was totally unexpected and

utterly startling. Allais’ experiment was

being conducted indoors, out of the

sunlight so there was no apparent way

the eclipse could have affected it. Allais

was at a loss to explain what had taken

place but when he conducted an

improved version of his experiment in

June and July 1958 with two

pendulums six kilometres apart he

found the same effect. Then during the

partial solar eclipse of October 22nd

1959, Allais once again witnessed the

same erratic rotation – but this time

similar effects were reported by three

Romanian scientists who knew nothing

of Allais’ work.

Many people have questioned his

results, mainly because science does not

like that which it cannot explain. Many

others have now repeated the

experiment with mixed results: some

found no measurable effect, but most

have confirmed the result at different

locations – including one conducted in

an underground laboratory! 8

It is interesting to note that in 1988

Allais was awarded a Nobel Prize for

economics. Like Alexander Thom (and

many other paradigm busters) a major

discovery had come from someone

working outside their own field. These

are bright people who are driven by

curiosity and who are not the products

of conventional training.

Allais despairs at the standards of

those that oppose without logic or

reasoning: ‘In the history of science,

every revolutionary result meets with

very strong opposition… Relativists say

I’m wrong without providing any

demonstration. Most of them haven’t

even read what I wrote.’

In 1970 Erwin Saxl and Mildred

Allen of Mount Holyoke College,

Massachusetts, studied the behaviour of

a pendulum before, during and after a

total eclipse. The pair took a slightly

different approach to Allais as they used

a torsion pendulum, which is a massive

disc suspended from a wire attached to

its centre. Rotating the disc slightly

causes the wire to twist. When it is

released, the disc continues to twirl first

clockwise, then anticlockwise, with a

fixed period. But during an eclipse, their

pendulum sped up significantly. They

concluded that gravitational theory

needs to be modified.

In India in 1995, D C Mishra and

M B S Rao of the National Geophysical

Research Institute in Hyderabad

observed a small but sudden drop in

the strength of gravity when using an

extremely accurate gravimeter during a

solar eclipse. But results have been

mixed. When the eclipsed Sun rose

above Helsinki on July 22nd 1990,

Finnish geophysicists found no

disturbance to the usual swing, yet in

March 1997 scientists observed

gravimeter anomalies during an eclipse

in a very remote area of north-east

China.

The mystery continues and yet no

academic institution appears willing to

invest time and money to study this

phenomenon in depth. However,

Thomas Goodey, a self-funding

independent researcher from Brentford

in England, has decided that he will

investigate the Allais effect by using

several pendulums during an eclipse.

Because modern equipment is much

more accurate and sensitive than that

available in 1954 – giving twenty to one

hundred times better resolution, he is

confident of a clear result.

Goodey plans to travel the world

over the next few years with twelve

specially constructed pendulums. In

May 2004, he presented his strategy at a

meeting of the Society for Scientific

Exploration in Las Vegas and invited

physicists to join him. As *New Scientist*

reported, several leapt at the chance.

Goodey suspects that the

anomalies occur when an observer is

near the line that connects the centres of

masses of the Sun and the Moon.

During a total solar eclipse, the Sun–

Moon line intersects the surface of the

Earth at two points on roughly opposite

sides of the globe. This theory would

explain why the sunrise eclipse in

Helsinki did not produce a result.

Goodey is quoted as saying that

observations at this ‘anti-eclipse’ point

where no eclipse is visible might carry

much greater weight.

We wait with interest to hear the

final results of Thomas Goodey’s

experiments. At this point it seems as

though we might well have been right to

suspect that pendulums reveal a great

deal about the nature of our planet’s

gravity and its gravitational relationship

with the Moon and the Sun. Could it be

that because the Moon blocks out the

disc of the Sun so perfectly it is acting as

a shield to an ongoing interaction

between the Earth and the Sun? Or

perhaps it is because all three centres of

mass are lined up and something

physical occurs at this time?

We also wonder whether the

unknown individuals who devised the

Megalithic Yard and its inherent

geometry understood much more

about this pendulum effect than we do.

Our previous findings strongly suggest

that they knew a great deal more about

the Earth –Moon–Sun relationship.

**A special relationship**

Our initial findings about Megalithic

geometry, described in *Civilization One*,

had caused us to examine all kinds of

unexpected relationships between the

Earth and ancient measures. This had

further prompted us to wonder whether

the 366 geometry, that produced the

Megalithic Yard, was in some way

planet specific. Was there some

connection between the mass, spin and

solar orbit that made it special to the

Earth?

First we applied the principles of

Megalithic geometry to all of the planets

of the solar system. No discernable

pattern emerged – they appeared to be

completely random results. For

example Mars produced 19.78

Megalithic Yards per second of arc and

Venus an unimpressive 347.8. We also

checked out the major moons of other

planets to no avail.

A good friend of Chris, Dr Hilary

Newbigen, suggested that, for

thoroughness, we try using the number

of days per orbit for each planet to see if

there was a relationship to the

individual dimensions, but again the

results were negative.

Then we looked at Earth’s Moon.

The result here was anything but

meaningless. We took the Moon’s

radius, defined by NASA as being

1,738,100 kilometres, to calculate a

circumference of a meaningless

sounding 10,920,800 metres. We then

converted this distance into Megalithic

Yards, which gave us the equally

apparently arbitrary value of

13,162,900.

We then applied the rules of

Megalithic geometry by dividing this

circumference into 366 degrees, sixty

minutes and six seconds of arc. To our

total amazement there were 100

Megalithic Yards per lunar Megalithic

second of arc. The accuracy of the result

was 99.9 per cent which is well within

the range of error of this kind of

calculation.

How strange that the Megalithic

Yard is so elegantly ‘lunardetic’ as well

as geodetic!

Our next thought was the Sun.

Because we know that the Sun is 400

times the size of the Moon it should

logically have a perfect 40,000

Megalithic Yards per second of arc. For

thoroughness we checked out the sums

and it did indeed work as perfectly as

we expected.

This all seemed very odd. The

Megalithic structures that were built

across western Europe were frequently

used to observe the movements of the

Sun and the Moon, but how could the

unit of measure upon which these

structures were based be so beautifully

integer to the circumference of these

bodies as well as of the Earth?

Is it coincidence? On top of all the

other strange facts regarding the Moon

it becomes rather unrealistic to keep

putting everything down to a random

fluke of nature. Of course, we were well

aware that the numbers we were looking

at were only integer when one uses base

ten – and we will deal with that issue

later.

If it is not coincidence then there

are only two other options. The first is

that there is some unknown law of

astrophysics at work, causing

relationships to emerge that were

spotted in some way by our Stone-Age

forebears. The other is conscious design.

The idea of deliberate design

seemed plum crazy – common sense

tells us it’s wrong. Then we, once again,

considered more wise words from

Albert Einstein: ‘Common sense is the

collection of prejudices acquired by age

eighteen.’

At the age of eighteen we, like

everyone else, ‘knew’ that everything in

the world was natural. But when we put

our prejudices of what can and cannot

be, to one side and thought laterally

about it, the more reasonable it seemed.

It was not unreasonable to believe

that the stonemasons of the Neolithic

period were smart enough to measure

the polar circumference of the Earth

and that they devised a unit of measure

that was integer to the planet. Such a

feat can be achieved with very simple

tools as demonstrated by the Ancient

Greeks. But could they really have

measured the circumference of the

Moon and the Sun?

Or was this mysterious property of

pendulums something to do with it?

Most of all we marvelled at the fact

that, yet again, it was the size and

position of the Moon that revealed that

there is an issue to resolve.

*‘The best explanation for the*

*Moon is observational error –*

*the Moon does not exist!’*

**Attributed to Irwin Shapiro of The Harvard-**

**Smithsonian Center for Astrophysics**

The one inescapable fact about the

Moon is that it orbits the Earth. It is up

there beaming down on us, but

according to everything that science

knows, it shouldn’t be.

As we have seen, it is known that

people have been Moon-gazing for tens

of thousands of years, and our

understanding has grown to a point

where we are now very confused.

The Greeks were great gatherers of

knowledge and investigators of the rules

of nature. In the fifth century BC

Democritus, who originated the theory

that matter was made of indivisible

units he called atoms, went to the other

end of the scale and suggested that the

markings on the Moon could be

mountains. A little later Eudoxus of

Cnidus, who was an astronomer and

mathematician, calculated the Saros

cycle of eclipses and thereby could

predict when they would appear.

Around 260 BC, yet another Greek

by the name of Aristarchus, devised a

method by which he thought he could

measure the size of the Moon and gauge

its distance from Earth. He never

actually achieved it but a

mathematician and astronomer of

major importance known as

Hipparchus of Rhodes achieved the feat

around a hundred years later. He used

an ingenious technique that was

conducted during a solar eclipse. The

eclipse in question was total in Syene

but only partial in Alexandria which was

some 729 kilometres away. Enlisting the

help of like-minded friends,

Hipparchus was able to use the known

distance from Syene to Alexandria,

together with the angular difference of

the total and partial eclipse to establish

the Moon’s true size and distance from

the Earth.

At the end of the first century AD,

Plutarch wrote a short work about the

Moon, entitled *On the Face in the*

*Moon’s Orb* where he suggested that the

markings on the face of the Moon were

caused by deep recesses, too deep to

reflect sunlight. He proposed that the

Moon had mountains and river valleys

and even speculated that people might

live there.

Although a Hindu astronomer,

Aryabbata, repeated and confirmed the

experiment conducted by Hipparchus

as late as 500 AD, Christian authorities

of the time maintained a biblical

approach to the Moon and only

information about our near neighbour

that didn’t contradict the scriptures was

countenanced. With the arrival of

Christianity the world entered a dark

age where scripture rather than science

was the only permitted guide to human

existence.

The grip of the Church slipped

somewhat during the fifteenth and

sixteenth centuries and the Renaissance

(literally meaning ‘rebirth’) emerged

bringing radical and comprehensive

changes to European culture. The

Renaissance brought about the demise

of the Middle Ages and for the first time

the values of the modern world made

an appearance. The consciousness of

cultural rebirth was itself a characteristic

of the Renaissance. Italian scholars and

critics of this period proclaimed that

their age had progressed beyond the

barbarism of the past and had found its

inspiration, and its closest parallel, in

the civilizations of ancient Greece and

Rome. By the end of the sixteenth

century, a genius from the town of Pisa

called Galileo Galilei became one of the

most important scientists of the

Renaissance carrying out experiments

into pendulums, falling weights, the

behaviour of light and many other

subjects that captured his imagination.

Above all, for most of his adult life

Galileo was an avid astronomer.

In May 1609, Galileo received a

letter from Paolo Sarpi telling him

about an ingenious spyglass that a

Dutchman had shown in Venice.

Galileo wrote in April 1610:

‘About ten months

ago a report reached

my ears that a

certain Fleming had

constructed a

spyglass by means

of which visible

objects, though very

distant from the eye

of the observer, were

distinctly seen as if

nearby. Of this truly

remarkable effect

several experiences

were related, to

which some persons

believed while

others denied them.

A few days later the

report was

confirmed by a

letter I received

from a Frenchman

in Paris, Jacques

Badovere, which

caused me to apply

myself

wholeheartedly to

investigate means

by which I might

arrive at the

invention of a

similar instrument.

This I did soon

afterwards, my basis

being the doctrine

of refraction.’

From these reports, and by applying his

skills as a mathematician and a

craftsman, Galileo began to make a

series of telescopes with an optical

performance much better than that of

the Dutch instrument. His first

telescope was made from available

lenses and gave a magnification of

about four times, but to improve on

this Galileo taught himself to grind and

polish his own lenses and by August

1609 he had an instrument with a

magnification of around eight or nine.

He quickly realized the commercial and

military value of his super-telescope

that he called a *perspicillum,* particularly

for seafaring purposes. As the winter of

1609 brought colder, clearer nights

Galileo turned his telescope towards the

night sky and began to make a series of

truly remarkable discoveries.

The astronomical discoveries he

made with his telescopes were described

in a short book called *The Starry*

*Messenger* published in Venice in May

of the following year – and they caused

a sensation! Amongst many other

findings Galileo claimed to have proved

that the Milky Way was made up of

tiny stars, to have seen four small

moons orbiting Jupiter and to have seen

mountains on the Moon.

As with many of his scientific

investigations Galileo could easily have

fallen foul of the Church authorities if

his drawings of the Moon had been

made public. According to Christian

tradition both the Sun and the Moon

were perfect, unblemished spheres.

They simply had to be so because God

had created them – and none of the

Almighty’s creations could be flawed.

Eventually Galileo was put under

perpetual house arrest by the Papacy for

his blasphemous claim that the Sun was

at the centre of the solar system. It is

therefore quite possible that he knew

more about the Moon than he was

willing to admit in public.

In order to explain the markings

on the Moon without treading on the

toes of the Church, a number of ideas

were put forward in Christian countries.

Perhaps the most popular of these, at

least for a while, was the suggestion that

the Moon was a perfect mirror. If this

was the case there were no markings on

the Moon but rather reflections of

surface features on the Earth. It didn’t

seem to occur to anyone that as the

Moon orbited the Earth the markings

should change, since the land beneath it

would not remain constant.

Another suggestion, and one that

was accepted in some circles, was that

there were mysterious vapours between

the Earth and the Moon. The images, it

was suggested, were present in sunlight

and were merely being reflected from

‘the vapours’. But the most popular

theory, probably because it didn’t

impinge on Christian doctrine, was that

there were variations in the density of

the Moon and that these created the

optical illusions we see as markings on

the Moon’s surface. This unlikely

explanation was safe, though it probably

did little to convince early scientists, and

certainly would not have impressed

Galileo.

After Galileo’s time, telescopes

improved markedly and it was obvious

to anyone who studied the Moon that it

was a sphere with a rocky and

undulating surface. As the Church

gradually lost its power to direct

scientific thought, many of the earlier

ideas regarding the Moon became

unthinkable. But no one had any idea

how the Moon had come into being

and why it occupied the orbit it did

around the Earth.

It didn’t take long for the subject

of the Moon to become very important

to astronomers. Empires such as those

created by Britain, France and Spain,

were expanding. This necessitated long

sea voyages and led to that most urgent

of searches – a way to plot ‘longitude’

whilst at sea. It is quite easy to establish

one’s position on the planet in a north–

south line (latitude) but it was

impossible to know where you were in

terms of east–west (longitude). In the

northern hemisphere, for example,

latitude can be quickly gauged by

measuring the angular distance between

the horizon and the Pole Star. This

angle also defines one’s position north

of the equator.

The longitude problem was

eventually solved by having an

extremely accurate clock on board a

ship that was set to the time at one’s

point of departure. It wasn’t difficult to

work out the difference between local

time, say at midday, and the time at the

home port. It was then simply a matter

of adding or subtracting to discover

one’s true position on the Earth’s

surface. This was fine but it took many

decades before a suitably accurate clock

could be created. In the meantime,

astronomers sought for other methods

to determine longitude, not least of all

because there was a fabulous prize on

offer for anyone who could crack the

problem. And the place where many of

them turned to establish longitude was

the Moon.

Astronomers proposed that if

really accurate tables were kept of the

Moon’s position relative to the

background stars it would be possible to

assess the true time of day in one’s

home port. The reason this could work

was that the Moon, being very close to

the Earth and orbiting quickly, moved

across the heavens by around thirteen

degrees of arc per day. Using the Moon

it was a fairly simple matter to establish

‘local time’ and then to do the necessary

computations to discover one’s

position.

The lists of tables necessary to

accomplish the task were not so simple,

however, and as soon as good

chronometers were available the Moon

was abandoned as a means for

longitude assessment. However, the

desire to solve this problem, and the

potential profitability of doing so,

meant that the Moon was receiving a

great deal of attention during the

seventeenth century and very accurate

maps of its surface began to appear.

It wasn’t until the nineteenth

century, however, that probably the first

reasoned explanation as to the Moon’s

origin was put forward. George Darwin,

the son of Charles Darwin, the

controversial Englishman who first

proposed the theory of natural selection,

was a known and respected astronomer

who studied the Moon extensively and

came up with what became known as

the ‘fission theory’ in 1878. George

Darwin may have been the first

astronomer to ascertain that the Moon

was moving away from the Earth.

Working backwards from his

knowledge of the rate the Moon was

receding from the Earth, Darwin

proposed a time that the Earth and the

Moon could have been part of the same

common mass. He suggested that this

molten, viscous sphere had been

rotating extremely rapidly in about five

and a half hours.

Darwin further speculated that the

tidal action of the Sun had caused what

he termed as ‘fission’ – a Moon-sized

dollop of the molten Earth spinning

away from the main mass and

eventually taking up station in orbit. At

the time this seemed very reasonable

and was the favoured theory by the

beginning of the twentieth century. In

fact the fission theory did not come

under serious attack until the 1920s

when a British astronomer called

Harold Jeffries was able to show that the

viscosity of the Earth in its semi-molten

state would have dampened the

motions required to generate the right

sort of vibration necessary to fulfil

Darwin’s fission.

A second theory that once

convinced a number of experts was the

‘coaccretion theory’. This postulates

that the Earth, having already been

formed, accumulated a disc of solid

particles –a little like the rings of

Saturn. It was suggested that, in the case

of the Earth, this disc of particles

ultimately came together to form the

Moon. There are several reasons why

this theory can’t be the answer. Not least

is the problem of the angular

momentum of the Earth–oon system

that could never have been as it is, if the

Moon had formed in this way. There

are also difficulties regarding the

melting of the magma ocean of the

infant Moon.

The third theory regarding the

origin of the Moon that was in

circulation around the time that the

first lunar probes were launched was the

‘intact capture theory’. At one time

seeming to be the most attractive

possibility, the intact capture theory

suggested that the Moon originated far

from the Earth and that the Moon

became a ‘rogue’ body that was simply

captured by the gravitational pull of the

Earth and that it took up orbit around

the Earth.

There are many reasons why the

intact capture theory is now

disregarded. Oxygen isotopes of the

rocks on the Moon and on the Earth

prove conclusively that they originated

at the same distance from the Sun,

which could not be the case if the Moon

had been formed elsewhere. There are

also insurmountable problems in trying

to build a model that would allow a

body as big as the Moon to take up

orbit around the Earth. Such a huge

object could not simply drift neatly into

an Earth orbit at low speed like carefully

docking a super-tanker –it would

almost certainly smash into the Earth at

a massive speed or possibly skim off

and hurtle onward.

By the middle of the 1970s all

previous theories about the way the

Moon had been formed were running

into trouble for one reason or another

and this created a virtually unthinkable

situation in which acclaimed experts

might have to stand up in public and

admit that they simply didn’t know

how or why the Moon was there. As

acclaimed science writer William K

Hartmann, senior scientist at the

Planetary Science Institute, Tucson,

Arizona said in 1986 in his book *Origin*

*of the Moon*:

‘Neither the Apollo

astronauts, the

Luna vehicles, nor

all the king’s horses

and all the king’s

men could

assemble enough

data to explain the

circumstances of

the moon’s birth.’ 9

Out of this miasma came a new theory

and, in fact, the only one that is

presently widely accepted despite some

fundamental problems. It is known as

the ‘Big Whack theory’.

The idea came out of theories that

originated in the Soviet Union in the

1960s – specifically the work of Russian

scientist V S Savronov, who had been

working on the possibility of planetary

origins from literally millions of

different-sized asteroids known as

planetesimals.

As a divergence from the Soviet

ideas, Hartmann, together with a

colleague, D R Davis, suggested that the

Moon had come into being as a result

of the collision of two planetary bodies,

one being the Earth and the other a

rogue planet at least as large as the

planet Mars. Hartmann and Davis

hypothesized that the two planets had

collided in a very specific way that

allowed jets of matter to be ejected from

the mantles of both bodies. This matter

was thrown into orbit, where it

eventually came together to form the

Moon.10

The suggestion seems to have

many merits. First and foremost it

appears to address the greatest puzzle

that the recovery of Moon rock had

thrown up: How was it that the

composition of the Moon was so similar

to that of the Earth, but only in part?

A close analysis of Moon rock has

shown that it is very similar to the rock

that forms the mantle of the Earth, yet

the Moon is nowhere near as massive as

the Earth in proportional terms. (The

Earth is only 3.66 times as big as the

Moon but has eighty-one times the

Moon’s mass.) It was obvious that the

Moon could not contain many of the

heavy elements that are found inside

the Earth and the Big Whack theory

purported to explain why this was the

case. The Earth and the rogue visitor

had come together in a very specific

way. Although they would eventually

form one planet it was reasoned that

they must have impacted, drawn apart

and then come together again.

Computer modelling showed that

under these very special circumstances it

would have been possible for the

material thrown off to have been

mantle material, from close to the

surface of the two bodies.

Although the theory eventually

gained ground, at first it seemed so

improbable that it was generally

rejected. But with the passing of time,

further work showed that such an

unlikely scenario could conceivably have

taken place. In 1983 an international

conference was held at Kona, Hawaii, to

try and solve the problems regarding

the origins of the Moon. It was at this

meeting that the Big Whack theory, also

known as the Giant Impact Hypothesis

of the Collision Ejection theory, began

to gain ground. Hartmann’s own

suggestions, together with those of other

scientists at the conference, formed the

nucleus of the 1986 book, *Origin of the*

*Moon*, which was edited by Hartmann

himself.

In the intervening period several

experts have created computer models

that purport to add weight to the Big

Whack theory and the most convincing

of these are those of Dr Robin Canup,

who is now Assistant Director of the

Department of Space Studies in

Colorado, USA. Canup wrote her PhD

dissertation on the Moon’s origin and

specifically the Big Whack theory. Her

early work led to the conclusion that the

suggested impact would have actually

led to a swarm of moonlets, rather than

the Moon, but by 1997 further

computer modelling resulted in a

model of the impact that would lead to

the Moon’s presence.

Despite the fact that the Big

Whack theory is now generally accepted

by most authorities, it has many

problems. Not least of all is that

recognized by Robin Canup herself as

she admits that there is one key aspect

of the theory that doesn’t make sense.

This stems from the fact that other

researchers have pointed out that such a

massive impact as that proposed could

not have failed to speed up the rotation

of the Earth to a level far beyond today’s

situation. Canup agrees and the only

way that she could deal with this

anomaly is to propose a second major

impact – which was designated ‘Big

Whack II’. This suggests that the second

planetary collision happened perhaps

only a few thousand years after the first

one but, quite incredibly, this incoming

object came from the opposite direction

and so cancelled out the huge spin

imparted to the Earth by the first

cataclysmic event. This balanced double

act sounds unlikely in the extreme. Two

cosmic collisions that just happen to

precisely return the planet to its natural

rhythm? To us, this explanation smacks

of desperation!

Canup herself is not happy with

Big Whack II and is hopeful of

modifying the original theory so that it

can account for the present rate of spin

of the Earth.

There is another big problem to

overcome if the Big Whack theory is to

be taken seriously. When rocks were

brought back from the Moon, both by

American astronauts and Soviet

unmanned Moon missions, they were

subjected to every conceivable test. The

observed fact that put paid to the

captured asteroid theory of the Moon is

also a gigantic stumbling block to the

Big Whack theory. It has been observed

that the oxygen isotope signatures of

Moon rocks are identical with those of

rocks from the Earth – and that fact has

some serious implications: Moon rocks

and Earth rocks can only have the same

oxygen isotope signature if they

originated at the same distance from

the Sun. This would mean that the

Mars-sized body that hit the Earth must

have occupied a similar orbit to that of

the Earth and yet had already managed

to survive for many millions of years

before it hit the Earth.

That does not sound reasonable.

This situation is extremely unlikely

and it throws up other difficulties. The

present obliquity of the Earth (its

twenty-three degree tilt against the plane

of its orbit around the Sun) is usually

deemed to be the result of the giant

impact, but any body of the size of

Mars that was in an orbit similar to that

of the Earth could not have had

sufficient momentum to knock the

Earth’s angle of rotation back so

severely. Either the rogue planet was

Mars-sized, and came from way out in

the solar system and was therefore

travelling extremely fast, or else it had to

be at least three times the size of Mars,

which doesn’t tie in with the computer

models as they stand.

Some of the other problems were

cited by Jack J Lissauer, a well-respected

scientist from NASA’s Ames Research

Center in an article he wrote for *Nature*

in1997.11 Lissauer is said to have joked

to his students about a remark made by

another scientist, Irwin Shapiro from

the Harvard-Smithsonian Center for

Astrophysics: ‘The best explanation for

the Moon is observational error – the

Moon does not exist!’

Lissauer’s article pointed out some

of the problems with the Big Whack

theory. He made it clear that in his

opinion the latest research

demonstrated that much of the

material blown out by the impact (the

ejecta) would have fallen back to the

Earth. He says:

‘The implication

here is that lunar

growth in an

impact-produced

disk is not very

efficient. So, to

form our Moon,

more material must

be placed in orbit at

a greater distance

from Earth than

was previously

believed.’

Lissauer made it clear that as a result,

he too is of the opinion that the rogue

planet must have been substantially

larger than that originally proposed but

noted that it is difficult to see how the

excess angular momentum resulting

from such a large impact could have

been lost.

Three other scientists, Ruzicka,

Snyder and Taylor, approached the

problem from a slightly different

direction by analysing the biochemical

data available against the theoretical Big

Whack. After a detailed examination

they concluded: ‘There is no strong

geochemical support for either the

Giant Impact or Impact-triggered

Fission hypotheses.’12

These words used in the

conclusion to this biochemical analysis

indicate just how hopelessly contrived

the whole Big Whack theory is. They go

on to say: ‘This [hypothesis] has arisen

not so much because of the merits of

[its] theory as because of the apparent

dynamical or geochemical shortcomings

of other theories.’

In other words scientists hang onto

the Big Whack theory, even though it

has more holes than a rusty colander,

simply because no other logical

explanation has been found. It is just

the least impossible explanation for a

celestial body that has no right to be

there.

Not only is the Big Whack theory

discredited on a number of grounds by

the scientific fraternity itself, it also

singularly fails to deal with the

anomalies thrown up by our own

research, as outlined throughout this

book. Big Whack cannot explain the

extraordinary ratio relationship between

the Moon and the Sun or the Moon

and the Earth. The Moon could, by

pure chance, end up being exactly

1/400th the size of the Sun and

occupying an orbit that allows it to

stand 1/400th the distance between the

Earth and the Sun – but the odds are,

quite literally, astronomically against it.

The Moon is proportionally bigger

in relation to its host planet than any

other in the solar system apart from

Charon, Pluto’s moon, which is more

than half the diameter of Pluto. These

two bodies are essentially twin planets or

may be asteroids orbiting each other at

close range although they are believed to

have an unrelated origin.

Mercury has no moons at all and

neither has Venus. Mars does have two

moons but they are tiny in comparison

with our own.

A close examination of the many

samples of Moon rock brought back by

the American Apollo missions and the

Soviet unmanned missions has thrown

up what turned out to be one of the

biggest surprises of all. It has been

observed that the oldest of the rocks

collected from the Moon are

significantly more ancient that any rock

ever found on Earth. The most

venerable rocks to be found on the

Earth date back 3.5 billion years, whilst

some samples from the Moon are

around 4.5 billion years old – which is

very close to the estimated age of our

solar system. When radioactive dating

techniques are applied to meteorites

they are uniformly found to be 4.6

billion years old.

Yet even these rocks have the same

oxygen isotope signature as those on

Earth, another indication that the Moon

has occupied its present distance from

the Sun for an incredibly long time.

There is currently no persuasive

argument for this state of affairs.

Our own, almost accidental,

discoveries regarding the peculiar ratio

relationships between the Earth, Moon

and Sun described in our previous

book, *Civilization One*,13 led us to an indepth

appraisal of the latest theories

regarding the Moon and its origins. We

were stunned by what we discovered.

The Moon is bigger than it should be,

apparently older than it should be and

much lighter in mass than it should be.

It occupies an unlikely orbit and is so

extraordinary that all existing

explanations for its presence are fraught

with difficulties and none of them could

be considered remotely watertight. We

came to realize that many reputable

experts across the world have significant

misgivings about current theories

concerning the Moon’s origins that, as

we have shown in this chapter, they

were quite willing to voice publicly.

No matter how much the

advocates of the Big Whack theory may

claim they have solved the puzzle that is

the Moon, it is quite obvious that this

claim is far from being true. The Moon

remains, to borrow the words of

Winston Churchill, ‘a riddle wrapped in

a mystery inside an enigma’.

*‘We choose to go to the moon.’*

**President John F Kennedy: September 12**th**,**

**1962**

After the end of the Second World War,

rocket scientists from Germany were

‘liberated’ by both the United States and

the Soviet Union, and by the beginning

of the 1950s these experts were put to

work on creating weapons of various

sorts that would fuel the Cold War

between the Eastern communists and

the Western capitalists. On the

American side the most famous of the

German experts was Vernher Von

Braun who had created the V1 and V2

rockets for Nazi Germany and who

eventually went on to design the Saturn

V rocket that would take people to the

Moon.

At the outset the USA focused its

attentions on developing new types of

small but immensely powerful

hydrogen bombs based on nuclear

fusion whilst the USSR continued to

refine the older and much heavier

fission bomb. The Soviets therefore had

to develop more powerful rockets and

the R-7 missile, capable of carrying a

five-tonne warhead, was the result.

Their Chief Designer, Sergei Korolyov,

realized that these rockets would also be

capable of putting a one-and-a-half

tonne satellite into Earth’s orbit and he

put forward his plan for such a mission.

Korolyov’s project was well under

way when news came that the US was

developing its own satellite launch,

known as Project Vanguard. This new

challenge set up a ‘race to space’ and

Korolyov’s main satellite project was

temporarily suspended as all efforts

became focused on the early launch of a

smaller artificial satellite that could be

built far more quickly. Sputnik lifted

into the skies on October 4th 1957.

This first spacecraft was a fortypound

sphere that carried a simple

transmitter so that it could make

meaningless, but technical sounding,

bleeping sounds at which the world

could marvel. The acclaim and sheer

excitement caused by Sputnik’s success

led the Soviet leader, Nikita Khruschev,

to demand more high-profile stunts

rather than a return to serious science.

The team responded immediately by

screwing together the original Sputnik’s

backup spares to create a second

Sputnik. They had only a few weeks as

they were instructed that the next

launch must happen before November

7th – the fortieth anniversary of the

Great October Revolution.

Sputnik 2 was something of a

botched job but it captured the

imagination of the planet because it

took off four days ahead of the

anniversary and, amazingly, it was

carrying a passenger: a dog called Laika.

Unfortunately for this canine hero, her

ticket was strictly one way because this

hastily assembled craft had no

mechanism for a controlled return to

Earth – so the animal was destined to

die in orbit from the outset. It is

thought that she lived for four days in

space before suffering a painful death as

the cabin overheated. The fatality was

part of the plan and the mission was

considered a success as it proved that a

living creature could survive the journey

into orbit. So despite the fact that

Sputnik 2 was initiated as a publicity

stunt it was an important prelude to a

human being making the trip.

The first two Sputniks were

therefore politically inspired projects

carried out by Sergei Korolyov under

orders from the Kremlin and it was not

until May 15th 1958 that his original

spacecraft was launched – now

designated Sputnik 3. This was a serious

piece of equipment that was an

automated scientific laboratory. It

carried twelve instruments providing

data on pressure and composition of

the upper atmosphere; concentration of

charged particles; photons in cosmic

rays; heavy nuclei in cosmic rays;

magnetic and electrostatic fields; and

meteoric particles. And it was Sputnik 3

that first detected the presence of the

outer radiation belts that surround the

Earth.

The United States was highly

embarrassed by the Soviet

achievements, and particularly so

because it was having little success with

its own rocket launchers. So many of

them blew up on the launch pad or

during takeoff that the world’s press

variously dubbed the American space

mission ‘Kaputnik, Flopnik, and

Stayputnik’.

In the summer of 1958 the

Western world was rocking and rolling

to Elvis Presley’s ‘Hound Dog’,

‘Heartbreak Hotel’ and ‘Jailhouse Rock’

whilst the politicians of the ex-Russian

territory of Alaska were lobbying to be

accepted as the 49th State of the Union.

In Washington, however, the US

government’s main focus was on

something much more important – a

new idea that was going to be a grand

solution to a double-edged problem.

Their first concern was Sputnik.

These high-profile launches had very

effectively announced to the world that

Soviet scientists were smarter than

American ones and it was also implicit

that the ‘bad guys’ had the technology

to deliver heavy nuclear weapons

around the planet. America had fallen

well behind in the race for definitive

military advantage and the idea of a

‘first strike’ by the Soviets suddenly

seemed possible and, for some, even

probable given the USA’s current

inability to respond in kind.

The second problem was one of

internal power blocks. The US Army

and Navy were politically untouchable

and each had separate rocketry

programmes causing duplication of

effort that was dramatically slowing

down the rate of overall progress. In the

light of all this, Congress decided to side

step military fiefdoms and set up a new

organization to oversee and coordinate

American space research.

Accordingly the National

Aeronautics and Space Administration

(NASA) was formed on October 1st

1958 and the idea of putting a man into

space was immediately outlined, and

given the title ‘Project Mercury’. But it

was a race they were destined to lose

because on April 12th 1961 cosmonaut

Yuri Gagarin became the first human to

travel into space.

Gagarin’s 108-minute voyage took

him once around the planet, although

he was not allowed to operate the

controls because the effects of

weightlessness had only been tested on

dogs, and scientists were concerned that

he may not be able to function

properly. Consequently, ground crews

controlled the mission with an override

key provided just in case of an

emergency.

NASA responded quickly by

sending the astronaut Alan Shepherd

on a ballistic trajectory sub-orbital flight

to an altitude of 116 miles, returning to

Earth at a landing point just 302 miles

down the Atlantic Missile Range.

America’s first manned space flight was

a fifteen minute sky rocket event that

was nowhere near the same league as

Yuri Gagarin’s 25,000 mile, high-speed

voyage into Earth’s orbit.

The race to get a man into space

had been won by the USSR but there

was a second, more ambitious

competition running in parallel.

Reaching for the Moon!

At first these were half-hearted

attempts to get some metal, any bit of

metal, onto the Moon. It had started

with the first Pioneer rocket launched in

1958 by the United States – which

lasted a full seventy-seven seconds

before disintegrating into a giant

fireball. A few months later the USSR

launched Luna I, which performed

beautifully but unfortunately missed the

Moon and headed into solar orbit. In

September 1959 the USSR managed to

hit the bull’s-eye when Luna 2 became

the first craft to land on another celestial

body, slamming into the Moon’s

surface just east of the Sea of Serenity.

Before the impact Luna 2 was able to

report back that there was something

very odd about the Moon – it did not

seem to have a magnetic field.

The next Soviet craft, Luna 3,

made a great stride forward by swinging

around the Moon, taking photographs

of the ‘dark’ side before heading back to

Earth in April 1960. The Americans

meanwhile had failure after failure.

Nikita Khrushchev was pleased

with the way that his nation was

winning the space race and when Yuri

Gagarin had orbited the Earth his

propaganda machine went into

overdrive to ensure that the world knew

how superior his space engineers were.

America’s newly elected President was

no slouch when it came to inspiring the

public and John F Kennedy decided to

take control of the situation by

announcing that the real battle was to

put men on the Moon. Despite a

history of underperformance in space

technology, he rather bravely publicly

pledged to land a man on the Moon

before the end of the 1960s.

Many American Ranger and Soviet

Luna spacecraft headed for the Moon

during the decade but a large number

missed and others crashed onto the

lunar surface either by accident or

sometimes by design. But it was the

USSR, once again, that made the next

breakthrough when Luna 9 became the

first spacecraft to make a controlled

landing onto the surface of another

celestial body on February 3rd 1966.

A significant part of the problem

was the weird nature of the Moon’s

mass that was not at all what was

expected. Instead of a generally constant

gravitational field such as the Earth

exhibits across its surface, the Moon is

an inconsistent, lumpy ball that has

huge variations in gravity from region

to region.

As we have discussed, a pendulum

swings with fairly regular precision on

the Earth, with only quite small

variations in swing rate because of the

bulging of the planet at the equator.

This is due to the fact that a person

standing at sea level at the equator is a

little further away from Earth’s dense

core than someone closer to one of the

poles. Using a pendulum on the Moon

would not produce any meaningful

result because of what are known as

‘mascons’.

The term mascon is an

abbreviation for ‘mass concentration’ –

regions of the Moon that have hugely

dense material below the surface, rather

than in the core as everyone would

naturally expect. These mascons made

it very difficult for spacecraft to orbit

close to the Moon without continual

adjustments to compensate for the

variations in gravity. Some observers

believe that it was this gravitational

minefield that caused all of the

problems for the early probes that were

directed on the basis of a homogeneous

gravity.

The existence of mascons was

discovered after Lunar Orbiter 1 went

into orbit around the Moon on August

14th 1966 and sent back high-quality

images of over two million square miles

of lunar surface, including the first

detailed images of potential landing

sites for the planned Apollo missions.

This new discovery of gravitational

‘hotspots’ on the Moon had an impact

on a man who is arguably the greatest

science fiction writer of all time and an

acknowledged inspiration to NASA.

Arthur C Clarke combined forces with

film director Stanley Kubrick to write

and shoot the most realistic space

adventure ever. When their film *2001: A*

*Space Odyssey* premiered in April 1968,

it stunned audiences across the world

with its beautifully produced vision of

the future.

The plot of the film starts millions

of years ago when our ancestors were

still apelike creatures without speech or

tools. There is a visitation from some

undisclosed power in the form of a jetblack

and perfectly finished rectangular

monolith that stands upright. When

touched by the probing fingers of the

gang of primates at dawn the monolith

somehow remaps their brains to begin a

process that will take these protohumans

on the evolutionary road to

intellectual development. As the camera

pans up the length of the monolith the

Sun and the Moon appear directly

overhead as though an eclipse is about

to occur. The scene then leaps forward

to the beginning of the twenty-first

century when a powerful magnetic

anomaly is discovered just below the

surface of the Moon in the Tycho crater

and excavations are carried out to

discover what is causing the effect. A

black monolith, some four metres tall is

uncovered and a team of experts sets

out from Earth to investigate the clearly

artificial phenomenon.

The team travel to the Tycho

crater as the Sun rises and wearing

spacesuits they walk down a ramp into

the pit where the monolith stands just a

few metres below the surface. Like the

man-apes millions of years earlier the

team leader, Dr Floyd, is mesmerized

by this alien structure and he touches it

with his gloved hand. A moment later a

ray of sunlight comes over the edge of

the pit and strikes the monolith,

signalling the end of the dark lunar

night that lasts for two Earth weeks.

This time, as we look up the monolith

we see the Sun and Earth hovering

directly above and almost touching.

Then suddenly, the object transmits a

signal in the direction of one of the

moons of Jupiter (in Clarke’s novel

version this was changed to Iapetus, one

of Saturn’s moons).

The ingenious idea that Clarke put

forward here was astonishingly close to

the real-world discovery of the lunar

mascons that had been made around

the time he was writing. The similarity

between Clarke’s magnetic anomaly

and the gravitational anomalies are

obvious. We wonder whether Clarke

was aware of the newly discovered

mascons and whether that gave him the

idea of a kind of trip switch placed on

the Moon in the extreme past by some

alien intelligence to trigger a signal that

told them that creatures from the Earth

had become smart enough to reach the

Moon and spot a serious abnormality.

What a brilliant concept!

If an alien intelligence had indeed

been responsible for the evolution of

humans from ape to technologist, then

what better way would there be of

setting up an alarm system to confirm

our intellectual ‘arrival’.

At the time that Clarke and

Kubrick’s film was first capturing the

imagination of a generation, no human

had yet reached the Moon. But the

following year, with less than six

months to go to the late President

Kennedy’s deadline, Commander Neil

Armstrong stepped out onto the surface

of the Moon on July 20th 1969 with his

famous but slightly misdelivered line:

‘That’s one small

step for man, one

giant leap for

mankind.’

At this point we must mention that

there are some people who seriously

believe that NASA faked the Moon

landings on a film set just like the one

used by Stanley Kubrick. The evidence

they produce looks reasonable at a

casual glance; assuming you know

nothing at all about photography or the

facts relating to lunar conditions. These

ideas suddenly leaped into the public

imagination on February 15th 2001

when Fox television in the USA

broadcast a programme called

*Conspiracy Theory: Did We Land on the*

*Moon?* The thrust of the show was that

NASA technology in the 1960s was

simply too primitive to have taken men

to the Moon, and because they were so

close to President Kennedy’s politically

important deadline they fabricated the

entire mission in a movie studio.

To them the fraud was obvious.

They point out that shots of the

astronauts on the lunar surface show a

completely black sky without any stars.

Had this proved too difficult for the set

constructors to fake they ask? The

answer is actually very simple. As any

proficient photographer knows, it is

difficult to capture something extremely

bright and something else extremely

dim in the same shot. This means that

for the stars to be visible, the lunar

surface and the astronauts would have

been burned out into a white blaze; the

emulsion on a piece of film does not

have enough dynamic range to capture

both ends of the brightness scale

simultaneously.

Amongst the other pieces of

‘evidence’ was the issue of the flapping

flag. The NASA set designers were

apparently so dumb that they allowed a

stiff breeze to waft through the studio

causing the flag that the astronauts

planted to wave about. As the Moon has

no atmosphere this is said to prove that

it was filmed on Earth.

The fact is, the flag waved about so

much precisely because there was no

atmosphere. When astronauts planted

the flagpole they rotated it back and

forth to ensure that it penetrated the

lunar surface causing the flag to wobble

from side to side on its supporting

frame. On Earth the presence of an

atmosphere quickly dampens this

motion as the surrounding air absorbs

the energy from the moving flag,

whereas in an airless environment the

flag has nothing to dampen its motion.

It could therefore keep going for many

hours before the energy finally

dissipated.

So anyone who has seriously

looked into the case for and against the

actuality of the Moon landings cannot

fail to reject every one of the strands of

evidence put forward by the conspiracy

theorists. We do believe that

conspiracies happen, because people

will conspire together for all kinds of

reasons – but the Apollo 11 mission was

certainly not one of them.

We can be certain that twelve

astronauts walked on the Moon between

1969 and 1972 and that they brought

back 842 pounds of the Moon in the

form of rocks, core samples, pebbles,

sand and fine dust from six different

exploration sites.

The last human being to walk on

the Moon was Eugene Cernan in

December 1972 and the information

gathered over those three years, and

later by Russian unmanned craft, has

greatly increased our knowledge of the

Moon. But it has also posed as many

questions as it has answered.

It was expected that the samples of

Moon rock would prove one of the

existing theories about the Earth–Moon

system. If the rock from the samples

had been substantially different from

rocks on Earth, then it was likely that

the Moon had originated in some other

part of the solar system and had been

captured by the young Earth. If the

Moon was identical in every way to the

Earth, then it was likely they had both

come into existence together and at the

same time. However, it soon became

apparent that both theories had to be

wrong and no logical explanation for

the Moon, being what it is and where it

is, exists even now.

The convoluted ‘Left hand/right

hand double big whack’ theory tends to

crudely fill the void, to prevent us

worrying too much about this hole in

our knowledge of our planet and its

neighbour. Whilst most people believe

this rather unlikely hypothesis to be

true, the people involved with

developing it acknowledge that it is

improbable. All existing theories of the

Moon’s origin have problems and the

University of Wisconsin has pointed out

that those for the Big Whack include:

1. It requires that the entire

Moon be initially molten

and accreted from

devolatilized material i.e.

it does not account for

the Moon’s lower

mantle’s apparently

largely undifferentiated

composition.

2. It requires that the

impactor be accreted

from the same oxygen

reservoir as the Earth (a

previous moon of

Earth?).

3. It does not account for a

necessary density reversal

below the upper mantle.

4. It requires that

differentiation of the

Earth and the impactor,

and their impact, occur

within the 5HF/W 55-

million-year model age

for the lunar magma

ocean.

5. It does not account for

the cumulative effect of

many large impactors on

the Moon’s non-parallel

rotational axis.

6. It does not account for

the necessary chronology

of tidal separation of the

Earth and moon origin

of the Moon.

There is also another major problem

with this scenario revealed by the issue

of the ongoing slowing down of Earth.

Very precise astronomical

measurements, some of them dating

back to the observation of eclipses 2,500

years ago, indicate that the day is

increasing in length by about one or two

thousandths of a second per day per

century. It has been thought that this

tiny lengthening of the day was entirely

due to the friction of the tides caused by

the Sun and the Moon. But when

attempts were made to predict changes

in the apparent position of the Moon

on the basis of this effect alone, it was

found that the calculations did not

agree with the observations at all.

Another factor must be at work as well.

That factor was that iron is sinking

to the core of the Earth, changing the

moment of inertia and thereby the

length of the day. When this was taken

into consideration and calculations were

made on the basis of both the tides and

the changing moment of inertia due to

sinking iron, the sums did agree with

the observations. But in order to make

the calculations agree, it was necessary

to postulate a flow of 50,000 tonnes of

iron from the mantle to the core of the

earth every second!

Staggering though this volume of

flow is, it would still take 500 million

years to form the metallic core of the

Earth and some calculations indicate

that it may have taken as long as two

billion years. If this reasoning is correct,

which it appears to be, the Earth was

made initially with large amounts of

iron in its exterior parts. As the Moon

was formed at a very early stage in the

Earth’s existence (and possibly before),

any material knocked off the surface by

a major impact would contain large

amounts of iron – which it does not.

The Big Whack theories are simply

the best of all the impossible

explanations for the existence of the

Moon.

It is widely accepted that despite

the intense investigation that has gone

into understanding the Moon, and for

all we know about its surface and the

composition of its rocks, we are as

much in the dark concerning its origins

as we were before the first projectile left

the Earth’s atmosphere.

As we have discussed, the oxygen

isotope investigation proved that both

Moon rocks and Earth rocks must have

developed at exactly the same distance

from the Sun, so the Moon definitely

wasn’t a captured asteroid. The Moon

has its fair share of the elements found

on Earth but not in the same

proportion. The Moon is substantially

lacking in heavy metals when compared

with the Earth, which accounts for its

large size but small mass.

But it was the Apollo missions that

identified something else that was weird

about the Moon.

**‘Houston, we’ve got a**

**problem’**

The first two Apollo crews had landed

out on the smooth lunar mare, the lava

seas that are relatively young by lunar

standards, and now NASA wanted to

visit a site where they could study the

older parts of the Moon, which meant

the rugged highlands. Although NASA

was not ready to commit a lunar

module (LM) to a landing in highly

rocky terrain, the site selection

committee was very interested in a place

called the Fra Mauro Hills in the

middle of the Ocean of Storms, which

seemed like a fairly smooth section of

the highlands.

Commander Jim Lovell along with

Jack Swigert and Fred Haise were

chosen for the Fra Mauro mission as

the crew of Apollo 13. The launch, on

April 11th 1970, went well, allaying the

worst fears of those who were concerned

about a mission with the unlucky

number thirteen.

Then, fifty-five hours and fifty-five

minutes into the mission (and on the

thirteenth day of the month) all three

astronauts heard and felt what they

described as a ‘pretty large bang’ on

board the spacecraft. The crew and the

ground controllers made a rapid

assessment of the health of the

spacecraft and it was obvious that two

of the three fuel cells in the service

module were dead. No one knew exactly

what had gone wrong but there was no

doubt that the crew were in serious

danger.

To survive they needed enough

power, oxygen, and water for a four-day

trip around the Moon and back to

Earth, and it now looked as if these

commodities were going to be in very

short supply. Oxygen and hydrogen

were normally combined in the fuel

cells to produce electricity and water

and both oxygen tanks were rapidly

losing pressure so even the remaining

fuel cell wouldn’t last long. In addition

to short supplies of these basic

commodities, without power in the

command module, they would have to

rely on the LM environmental control

system to remove excess carbon dioxide

from the cabin. And to add to their

many woes, the main engine now had

no power supply.

However, the flight crew and

ground personnel all realized just how

lucky they had been. As desperate as the

situation was, the accident had come

early in the mission and they still had

their fully stocked lunar module as a

resource. The LM had an engine that

could be used to put the crew back on a

homeward path, and it carried just

enough water, oxygen, and power for

the four days they need to fly around

the Moon and head home.

As the stricken spacecraft swung

behind the Moon, 164 miles above the

surface, contact with the Earth was lost

until it emerged on the other side and

was again picked up by tracking

stations. The following words were

heard: ‘The view out there is fantastic...

You can see where we’re zooming off.’

At 8:09 pm EST on April 14th,

Apollo 13 turned for home and the

third stage of the Saturn V launch

vehicle, weighing fifteen tonnes, was

sent crashing into the Moon. As

planned it struck the Moon with a force

equivalent to 111⁄2 tonnes of TNT. The

impact point was eighty-five miles westnorthwest

of the site where the Apollo

12 astronauts had set up a seismometer.

NASA reports demonstrate the

reaction of scientists on Earth as the

Saturn V hit the lunar surface – ‘The

Moon rang like a bell.’

In November 1969 the Apollo 12

crew had sent their lunar module

crashing into the Moon following their

return to the command craft after their

lunar landing mission. That lunar

module had struck with a force of one

tonne of TNT causing the shock waves

to build up to a peak in eight minutes

and then continue for nearly an hour.

The seismic signals produced by the

impact from Apollo 13 were twenty to

thirty times greater and lasted four

times longer than those resulting from

the earlier LM crash. This time, peak

intensity occurred after seven minutes

and the reverberations lasted for three

hours and twenty minutes, travelling to

a depth of twenty-five miles, leading to

the conclusion that the Moon has an

unusually light core or possibly no core

at all.

At the time Houston remarked to

the Apollo 13 crew: ‘By the way,

Aquarius, we see the results now from

12’s seismometer. Looks like your

booster just hit the Moon, and it’s

rocking a little bit.’

NASA reports how the

information from these two artificial

moonquakes led to a reconsideration of

theories proposed about the lunar

interior. Among the puzzling features,

they say, are the rapid build-up to the

peak and the prolonged reverberations,

because nothing comparable happens

when objects strike Earth.

When Chris was in Seattle a few

years ago he had a meeting with Ken

Johnston who had worked for Brown-

Root and Northrop, which was a

consortium between the Brown-Root

Corporation and the Northrop

Corporation at the Lunar Receiving

Laboratory. The company was one of

the prime contractors for NASA at the

time of the Apollo missions and Ken

was supervisor of the data and photo

control department. Ken told Chris that

at the time of the impact created by the

Apollo 13 launch vehicle the scientists

were not only saying that ‘the Moon

rang like a bell’, they also described how

the whole structure of the Moon

‘wobbled’ in a precise way, ‘almost as

though it had gigantic hydraulic

damper struts inside it.’

This ringing effect caused many

people to pick up on speculation that

had been going on for years that the

Earth’s Moon could be hollow. Back in

1962 Dr Gordon McDonald, a leading

scientist at NASA, published a report in

the Astronautics Magazine where he

stated that analysis of the Moon’s

motion indicated that the Moon is

hollow.

Dr Sean C Solomon, who was

Professor of Geophysics at MIT and is

the Director of the Terrestrial

Magnetism Department, Carnegie

Institution of Washington as well as the

Principal Investigator for Carnegie’s

research as part of the NASA

Astrobiology Institute, has said: ‘The

lunar orbiter experiments vastly

improved our knowledge of the moon’s

gravitational field...indicating the

frightening possibility that the moon

may be hollow.’

Why should this be frightening?

Carl Sagan, Professor of

Astronomy and Space Sciences and

director of the Laboratory for Planetary

Studies at Cornell University hinted at

the answer when he said, whilst

discussing the moons of Mars, that ‘It is

well understood that a natural satellite

cannot be a hollow object.’14

The problem therefore is simple –

if the Moon is hollow, someone or

something manufactured it.

But the debate continues. A team

from the University of Arizona in

Tucson has detailed the results of their

interpretation of data from the Lunar

Prospector magnetometer where they

estimate that the moon does have a tiny

metal core that is roughly 420 miles

(680km) across, plus or minus 112

miles (180km). Their team leader, was

Lon Hood. ‘We knew that the Moon’s

core was small, but we didn’t know it

was this small,’ Hood said. ‘This really

does add weight to the idea that the

Moon’s origin is unique, unlike any

other terrestrial body – Earth, Venus,

Mars or Mercury.’15

So, it is possible that the Moon is

hollow at its centre or has a very small

core. There is also the possibility that it

has voids in its make-up just as it has

the super-dense zones we call mascons.

But it seems that the structure is

unusual whatever the case turns out to

be.

The main argument against the idea of

a hollow Moon that we found repeated

time and again, was that there was no

theory of the Moon’s origin that could

explain such a circumstance. The

argument goes: ‘Because we can’t

explain how a natural satellite can form

with a hollow centre – it cannot have

one QED.’

This standpoint is fair enough – if

you accept its founding premise, that

the Moon is natural. And who would

not make such an assumption?

But as we put aside all of our

preconceptions about what can and

cannot be, we have to accept that solid

objects do not ring like a bell – but

hollow ones do.

Hollow or not, we decided to look

more closely at the mechanics of the

Moon.

We had seen just how peculiar the

Moon is, in so many ways. Our next

step was to look into how our next-door

neighbour in the cosmos actually affects

life on Earth.

First of all we could not ignore the

myth that the full Moon brings out

madness and other evils in the form of

more violence, more suicides, more

accidents and more aggression – ideas

that are possibly as old as history itself.

The belief that the full Moon causes

mental disorders and strange behaviour

was particularly widespread throughout

Europe in the Middle Ages.

But is there any scientific evidence

to support these beliefs?

There have been many

investigations into the subject and some

have produced surprising results.

Research carried out by a medical team

at a hospital in Bradford, England, set

out to test the hypothesis that the

incidence of animal bites increases at

the time of a full Moon. Using

retrospective observational analysis at

their accident and emergency

department they investigated the

pattern of patients who attended from

1997 to 1999 after being bitten by an

animal.

The number of bites in each day

was compared with the lunar phase in

each month and they found that the

incidence of animal bites rose

significantly at the time of a full Moon.

With the period of the full Moon as the

reference point, the incidence rate ratio

of the bites for all other periods of the

lunar cycle was significantly lower. They

concluded that the full Moon is

associated with a significant increase in

animal bites to humans.16

Of course, we must remember that

correlation does not equate to causation.

The pattern they found may be a

strange statistical blip or, even if it is

real, it could be entirely coincidental

with the phases of the Moon. Without

any suggestion of how the Moon could

cause an increase in animal aggression

towards humans, it is not possible to

consider any connection as proven.

Another study looked into human

aggression and the lunar synodic cycle

occurring in Dade County, Florida.

Data on five aggressive and/or violent

human behaviours were examined to

determine whether a relationship existed

between the two. These included

looking at the pattern of homicides,

suicides, fatal traffic accidents,

aggravated assaults and psychiatric

emergency room visits.

The team concluded that

homicides and aggravated assaults

demonstrated a statistically significant

clustering of cases around the full

Moon. Psychiatric emergency room

visits clustered around the first quarter

and showed a significantly decreased

frequency around new and full Moon.

The suicide curve showed correlations

with both aggravated assaults and fatal

traffic accidents suggesting, they say, a

self-destructive component for each of

these behaviours. The existence of a

biological rhythm of human aggression,

which resonates with the lunar synodic

cycle was postulated.17

Whilst these investigations were

carried out carefully and scientifically it

is important to remember that there are

dozens of other studies that have failed

to identify similar correlations. If there

is some substance behind lunar myth it

is yet to be proven. However, we feel

that such a relationship is not beyond

reason as the Moon exerts considerable

gravitational effects on the Earth

creating the tidal movements of the

waters of our oceans, and humans are

made up of nearly eighty per cent water.

Whether or not lunar cycles affect our

lives; solar ones certainly do.

**The Four Seasons**

At the time of writing these words the

leaves on the trees here in Britain are

beginning to be tinged with brown. The

days are growing shorter and the nights

are getting longer. As this happens, the

average temperature each day begins to

fall and much of our flora and fauna

goes into a dormant state.

Of course, the same seasonal

change is happening all across the

northern hemisphere at latitudes

between the Tropic of Cancer and the

Arctic Circle. Meanwhile, countries in

the southern hemisphere are entering

spring and new growth is beginning to

stir as the days lengthen and the average

daily temperature increases. All of us

who do not live on or near to the

equator are familiar with the pattern of

the changing seasons and the effect that

these cycles have on the way we live our

lives. To our ancestors in northern parts

of Europe, Asia and America, the onset

of winter must have been a time of fear

and doubt, whilst the first buds of

spring would have been a merciful relief

with the signal that there would soon be

fresh food to eat.

What most of us don’t stop to

think about is why seasons happen at

all. It is a common misunderstanding

to imagine it has something to do with

how close the Earth is to the Sun. It is

not – it is due to the angle of the planet

in relation to the Sun, which is about

22.5 degrees from what might be

described as a vertical position. The

diagram below shows how the Earth

would look if it was standing upright as

it goes around the Sun, which would

mean that the equator of the Earth

would always point straight at the

equator of the Sun.

Figure 5

If our planet really did stand in

If our planet really did stand in

this position, the bulge of the Sun’s

equator and that of the Earth would be

closer together than the Sun’s poles and

the Earth’s poles. The result of this

would be a super-hot equatorial

temperature on the Earth, whilst the

polar regions of the Earth would be

much colder than they presently are.

Strangely enough it’s not so much a

case of the difference in distance

between the Earth and the Sun that

matters; it is more to do with the

thickness of the atmosphere above any

given part of the Earth in relationship to

the direction of the Sun. In the

imaginary situation above, sunlight has

to travel through far more atmosphere

to get to the poles of the Earth than it

does to reach the equator, thus greatly

reducing the heat.

Figure 6

Another important factor that

reduces the heat at the poles is

diminished power density, where the

Sun’s energy is dissipated across a

greater area as the Earth curves away

from an upright position. For example,

a circle of sunlight with a one-kilometre

diameter will hit the Earth’s surface as a

near perfect circle at the equator, but in

extreme northern or southern latitudes

it will be distorted into a long oval due

to the curvature of the planet. This

means that the heat of the sunlight at

the poles will be spread over several

times the area and therefore be several

times weaker.

The planet Mercury is an excellent

example of a world that is standing

virtually upright, in relation to its orbit

around the Sun. Apart from the fact

that little Mercury is so close to the Sun,

its angle of inclination, or ‘obliquity’ as

it is more properly called, would make

it a very uncomfortable place for

humans. If it were possible to stand on

Mercury during one of its very short

eighty-eight-day years, the Sun would

rise due east every day (which is equal to

fifty-eight Earth days) at the equator

and set due west. Mercury has

equatorial temperatures that would

keep lead boiling, yet probes sent from

Earth have shown that the polar regions

of Mercury are constantly covered in ice.

So, if the Earth were in this upright

mode, life would be almost impossible

across much of the planet, with

extremes of temperature providing only

a narrow band suitable for mammals

such as humans to survive. Even then,

the sea and air currents would move

wildly between the hot and cold zones

causing catastrophic weather conditions

with regions of permanent rainfall and

others with none at all. Hurricanes and

tornadoes would ravage many areas and

overall it seems extremely unlikely that

higher life forms would ever develop on

such a planet.

Now consider another imaginary

scenario in which the Earth is tilted on

its axis a full 90 degrees relative to its

orbit around the Sun so that one pole

faces the Sun at all times.

Figure 7

One of the poles, say the South

Pole, would be permanently in daylight

– stuck for ever in a position equivalent

to noon on midsummer’s day in central

Africa. The Sun would blaze down from

directly overhead every minute of every

day! The North Pole on the other hand,

would be in a state of constant

midnight. Indeed, all of the northern

hemisphere would be in constant night

and the southern in constant day.

The dark side of the planet would

never warm up and it would be frozen

solid with temperatures far below

anything we actually experience. The

region that is currently between our

equator and the Tropic of Capricorn

would see the Sun circling right around,

low on the horizon once each day.

Because of the angle of the sunlight

through the atmosphere, there would be

very little warmth getting through and

the entire region would be covered in

glaciers and swept with snowstorms

driving down from the dark northern

hemisphere.

Antarctica would be utterly

uninhabitable, being far hotter than

anywhere on our planet as we know it

today. Only the southern tip of South

America, Tasmania, New Zealand and

maybe the southern section of Australia

would have temperatures that were

within a tolerable range. But it is hard to

imagine what kinds of terrible weather

anyone living there would have to

endure, with freezing ocean currents

moving from the north and very hot

ones arriving from the south. A state of

permanent fog seems certain; which

would in turn block out the Sun.

If the Earth orbited the Sun in

either of the two modes we have just

described, there would be no seasons at

all – and almost certainly no higher life

forms.

Thankfully we do have seasons,

courtesy of the fact that the Earth is

actually at an angle of around 22.5

degrees relative to the equator of the

Sun. And that angle is maintained by

the Moon, which acts as a gigantic

planetary stabilizer.

Figure 8

Because of this tilt, the northern

hemisphere experiences summer when

the Earth is on that part of its orbit that

angles it more towards, the Sun.

Therefore the Sun rises higher in the sky

and is above the horizon longer, and the

rays of the Sun strike the ground more

directly. Conversely, when the northern

hemisphere is oriented away from the

Sun, the Sun only rises low in the sky, is

above the horizon for a shorter period,

and the rays of the Sun strike the

ground more obliquely.

Figure 9

Whilst it is true that the extreme

polar regions of the Earth are frozen

throughout the year, the tilt angle of

22.5 degrees ensures that most parts of

the Earth’s surface get a fair share of

warmth throughout each year. This in

turn means that by far the vast majority

of water on the surface of the planet

remains in a liquid state. All of life is

utterly dependent on water and cannot

exist without it. The band of

temperatures at which water is liquid is

really very narrow. The oceans of the

Earth would freeze at around 1.91°C,

with boiling point occurring at 100°C.

The Earth is therefore extremely

well balanced. The coldest temperature

ever recorded was -89.2°C (-128.6°F) at

the Vostok Station in Antarctica and the

highest was 58°C (136°F) at El Azizia in

Libya. That is a range of absolute

extremes of less than 148°C, which is

very little indeed in terms of the entire

spectrum. The coldest anything can get

is known as ‘absolute zero’ when all

molecular motion stops. This occurs at

a rather chilly -273.15°C (-459.67°F).

On the other hand there is no

known upper limit for temperature but

the hottest temperature in our solar

system is the Sun’s core, which comes

in at an impressive 15,000,000°C

(27,000,000°F).

The normal temperature range on

Earth is such that there are very few

parts of the globe that cannot support

human life. We have a normal range of

body temperature between 36.1 to

37.8°C (97 to 100°F) and yet the Inuit

people live happily within the Arctic

Circle and the Bedouin travel the deserts

of North Africa.

The world’s average temperature

fluctuates slightly around the 14.5°C

(58°F) mark, which is comfortable for

physical work. Of course, some people

will say that the world ‘is’ that

temperature and that we would not

have evolved as we have if it were any

different – but this is flawed logic. We

could just as well have evolved in a

world where only small sections of the

planet were available to us to inhabit.

No other known planet has such a

narrow temperature band – and a range

of temperature that permits water to be

liquid most of the time.

In fact water is a very curious

substance altogether. On Earth we can

see it at the same time in its three states

– as solid ice, as liquid water and as a

gas in clouds. Each water molecule is

composed of just two atoms of

hydrogen and one of oxygen and yet it

acts as a universal solvent with a high

surface tension.

Perhaps most surprising of all is

how its density changes. Water has its

maximum density at 4°C which means

that it not only gets lighter as it warms

from that point – it also gets lighter as it

cools. As everyone knows, warm water

rises as convection currents but it is also

true that ice floats. Other planets in our

solar system may have ice or steam but

only the Earth is awash with life-giving

liquid water.

Liquid water has been absolutely

crucial in creating the world we know

today and, as far as is known, life

cannot exist without it. As surely as

plate tectonics and the Earth’s hot core

constantly create new mountain ranges,

via volcanoes and the pushing up of

mountains as land masses meet, so

water is mainly responsible for

flattening them again. Constant

weathering crumbles away the rocks as

mountains age and water, in the form

of rain, ice and snow, is primarily

responsible. Liquid water, as streams

and rivers, also disperses the weathered

rock, carrying it down to the plains

where it is distributed across flatter land,

bringing much needed nutrients to

nourish life. Even more nutrients are

carried by the rivers to the oceans where

they offer the necessary food for aquatic

plants that stand at the bottom of the

oceanic food chain.

Of course, none of this would be

possible if the vast majority of water on

the Earth was not in a liquid state. Only

two per cent of Earth’s water is locked

up in glaciers and the icecaps, with

ninety-seven per cent being the water of

our seas and oceans and just one per

cent available for human consumption

as fresh water. With only a small change

in the overall temperature of the Earth,

or an alteration in the seasonal patterns,

the nature of the water on our planet

would change. As we have seen, a more

pronounced planetary tilt could well

lead to a freezing of the oceans. This

would result in an overall loss of

temperature at the surface of the planet,

with even greater freezing.

On the other hand, if the Earth

were not tilted at all, the equatorial

regions would become unbearably hot

and weather patterns across the planet

would be radically changed. In

addition, the biodiversity, that scientists

are now certain has been so important

to our evolution, might never have

developed in a world with more

polarized areas of temperature.

It has therefore been vital for our

existence that the tilt of the Earth has

been maintained at around 22.5 degrees

for an extremely long period of time,

and yet, bearing in mind the

composition of the planet this is a very

unlikely state of affairs. Venus is the

nearest planet to Earth and the most

similar to our own, but it has toppled

over in the past and other planets in the

solar system show signs of having varied

markedly in their tilt angle across time.

The Earth is very active internally and

highly unstable, yet, despite a few

periodic wobbles, it keeps the same

angle relative to the Sun.

Astronomer Jacques Laskar, a

Director of Research at the National

Scientific Research Centre (CNRS) and

head of a team at the Observatory of

Paris is in no doubt that the Earth

would indeed topple over, if it were not

for the presence of the Moon!18

With computer modelling, Laskar

showed in 1993 that all the other Earthlike

planets (Mercury, Venus and Mars)

have highly unstable obliquity, which,

in the case of Mars for example, varies

wildly across time between 0 degrees

and 60 degrees. The same computer

modelling indicates that in the case of

the Earth the obliquity would vary even

more, between 0 degrees and 85 degrees

– but for the stabilizing influence of our

incredibly large Moon.

Nobody knows for certain how

long it would take for the Earth’s

obliquity to change significantly if the

Moon was not exerting such a massive

influence. There is a constant transfer of

energy taking place between the two

bodies, which in addition to stabilizing

Earth’s obliquity has also significantly

slowed our planet’s rate of spin. This

constant obliquity has made the Earth a

perfect crucible for advanced life by

providing many millions of years of

stability for life to develop from its

simplest form to the complex patterns it

adopts today.

Although the Earth is significantly

more massive than the Moon, the

Moon is still a very large body. Tides in

Earth’s oceans, seas and lakes are caused

by the gravitational interaction of the

Earth, the Moon and the Sun. Tides

have an effect on dry land as well as

oceans but this effect can only be

detected by careful measurement. Solar

tides (the point of greatest gravitational

pull by the Sun) are twelve hours apart

but since the Moon is also moving,

lunar tides are slightly more irregular,

occurring every 12.42 hours on average.

The height of tides in any

particular part of the ocean is

dependent on a number of factors such

as the shape of any nearby landmasses

and the depth of the seabed. In some

areas of the world, tides hardly seem to

lift the level of water at all – this is just

as well for some low-lying places such as

the islands of the Maldives in the Indian

Ocean because their average height

above sea level is less than one metre. In

other places, like the British coast, tides

can have a huge range between high and

low water.

Figure 10

The Moon has sufficient gravity to pull a bulge of

water from the oceans of the Earth closest to its

position towards it. It also distorts the Earth, creating

a corresponding bulge in the oceans on the opposite

side of the Earth. Because of the Earth’s rotation the

bulge on the Moon side runs slightly ahead of the

Moon.

Tides would not cease if the Moon

were not present because they are also

created by the Sun. However, they

would be very much lower than they are

now because although the Sun is

massive and the Moon much smaller,

the Moon is extremely close and the

Sun much more distant. It is the

interaction of solar and lunar tides that

makes it rather complicated to predict

when tides will occur and how high or

low they are likely to be.

The highest of the lunar tides

occur when the Moon is either in its full

or new mode, because at such times it is

in line with the Sun and its gravitational

forces are added to those of the Sun.

Much lower tides are on the first and

last quarters of the Moon when the

gravity of the Moon and the Sun are

working against each other.

Life in the tidal margins of the

oceans and seas has evolved to take

advantage of tides, either in a daily or a

monthly sense. Some species of crabs

for example, lay their eggs in the sand at

the high-water mark at the time of the

full or new Moon so that they will be

safe from marine predators during

incubation. There are also many

creatures that leave the ocean on the

high tide at night to scavenge in the

inter-tidal margins, before seeking safety

with the next high tide.

Many shellfish are absolutely

dependent on the ebb and flow of the

tides for the purpose of feeding and it

was shown in the 1960s that oysters are

sensitive enough to be aware of the

Moon’s position, either overhead or at

the opposite side of the planet. Oysters,

which obviously have no eyes, were

taken from the ocean and placed in

tanks in the Rocky Mountains where

they began to open and close, as they

would have done in the ocean, had it

extended so far inland. Because other

stimulus such as current or wave

motion were absent, it suggests that they

are able to feel minute increases and

decreases in the gravitational pull of the

Moon and the Sun.

If molluscs, our very distant

evolutionary cousins, can somehow

sense such astronomical movements –

then there would seem to be no reason

why humans would not be able to do

the same. This just might point the way

forward in investigating a possible

causation for variations in human

behaviour according to the phase of the

Moon.

It probably is not too surprising

that some creatures have learned to

exploit tides, which are tiny these days

in comparison with the remote past

when the Moon was much closer to the

Earth. The tremendous forces created

by a very close Moon would have

generated much heat and might even

have caused parts of the Earth’s surface

to melt. However, this phase did not

last all that long because the very

transfer of energy that promotes tides is

also causing the Moon to drift further

and further away from the Earth. This

happens because the Earth rotates

around its own axis more quickly than

the Moon revolves around the Earth.

The rapid rotation means that the tidal

bulge of the Earth forward of the Moon,

(see figure 11) is always ahead of the

Moon’s position. The tidal bulge exerts

a pull on the Moon and this increases

the Moon’s overall energy. Meanwhile,

friction between the Earth’s surface and

its own oceans is actually slowing the

rate of Earth rotation. It is not much,

but it does amount to around 0.002

seconds in a century.

The end result of this dance will be

that the Moon will continue to move

away from the Earth until a situation of

equilibrium is achieved, which is

expected to happen in about fifteen

billion years. The Moon will then be 1.6

times further out from the Earth than it

is now and the Earth will have a solar

day that is equal to the orbit of the

Moon, which by then will be fifty-five

days. However, we do not have to lose

too much sleep about this eventuality

because the Sun will have become a red

giant about a billion years before that, at

which time the Earth will have ceased to

exist in any case.

Figure 11

As the Earth revolves, it takes the tidal bulges with it,

but because of the gravity of the Moon, the water in

the bulges is trying to travel in the opposite direction.

As a result, waves ground on the bottom of the oceans

and on seashores, causing friction. The friction slows

the Earth and the energy is passed to the Moon, which

responds by speeding up. As it does so, the laws of

physics dictate that its orbit must widen.

Over huge periods of time the

Over huge periods of time the

relationship between the Earth and the

Moon changes, so we find ourselves

living in what amounts to a ‘tiny

snapshot’ of the overall situation. At

present the Moon takes 27.322 days to

go around the Earth and because the

Earth is also going around the Sun, full

and new Moons are ruled by a slightly

longer cycle that takes 29.53 days. Both

these figures have been significantly

different in the past and will be different

again in the future but the changes are

very slow and, according to NASA, the

Moon is becoming more distant from

the Earth by around 3.8cm per year.

Perhaps it is just as well that an

expanding Sun will overtake us before

the Moon does get to its final position

relative to the Earth. By the time the

Moon and the Earth reach their

ultimate stations, the Moon will be too

distant to exert enough influence on our

planet to keep its obliquity steady.

Bearing in mind the Earth’s unstable

core, this would almost certainly mean

rapid and perhaps catastrophic changes

in both obliquity and climate.

Neil F Comins, Professor of

Physics and Astronomy at the

University of Maine, has written about

the consequences if the Moon did not

exist. He explains that the Earth would

be turning so fast that a day would take

just eight hours and complex life would

not exist yet. If higher life forms did

eventually manage to evolve, such

creatures would be very different to us

without, for example, any

communication through speech.19

One thing is certain then: no Moon

would mean no humans!

Humans are incredibly robust creatures

considering we are little more than

animated bags of water hanging on a

mineral frame. We can withstand

difficult conditions and even survive

without food for many weeks, yet we die

quickly without air to breath or with

direct exposure to unusually high or low

temperatures. It is thanks to eons of

Darwinian evolution that we are

perfectly designed for our environment

– but perhaps we should not be too

casual about the extraordinary good

fortune that brought us to this point.

Every human is very special. We

differ from other creatures, so we are

told, because we are able to define

ourselves by our own self-awareness

resulting in a situation where there is a

simple polarity to the Universe. We all

know that: ‘There is *me* and then there

is everything else.’ Each and every one

of us is an emotional-intellectual island

connected to that ‘everything else’ by

the complex interaction of our five

senses.

Two small regions of our skin have

developed the ability to decode energy

reflections in the form of sight, two

more make sense of a cacophony of

colliding compression waves in the gases

around us giving us hearing. Then we

have skin sensitive enough to tell us

about shape and texture, a mouth that

accurately differentiates between

different chemical substances we are

about to consume in the form of taste

and we have an air inlet that can pick

out the presence of a specific molecule

within a million others in the

atmosphere as the sense we call smell.

These five connection modes cause

us to have interaction with the

‘everything else’ – especially other

humans, so we do not exist alone. These

points of stimulus combine to give life

to the most remarkable array of aspects

of self. Love, fear, loathing, compassion,

laughter and countless other emotions

make us special and mark us out as

entities that are utterly different to the

rest of creation.

But how and why have we become

so spectacularly differentiated from

other combinations of recycled stardust?

What makes Neil Armstrong more

special than the 3.5-billion-year-old

rock he first lifted from the lunar

surface?

Those with religious faith turn to

their interpretation of God to explain

the unexplainable and the more

scientific amongst us turns to the

Anthropic Principle. The good old

‘Anthropic Principle’ is less there to help

us answer the BIG question than to

avoid having to deal with it. It accepts

the vanishingly tiny probability of

human existence by stating that the

rules of the Universe that produced us

have to be exactly as they are or we

would not be here to perceive them.

To us, this is rather like defining

moving, emotionally stimulating music

by merely expressing it as ‘music that is

good’. The statement is correct but it

does not compare with the experience!

What the Anthropic Principle does

is to stop us worrying too much about

the fact that we really have no right to

exist. Of the two approaches, anthropic

or divine, at least the God scenario is an

attempt to move the problem on a

notch rather than utilizing a principle

that seems to have been conceived to

ignore it.

Most scientifically minded people

probably subscribe to the theory that

humans, like everything else, are the

product of billions of years of random

chance. However, the most famous

scientist of all time, Albert Einstein, was

very unhappy about nature being based

on randomness. He said about

quantum physics: ‘God does not play

dice.’

The more we looked into how our

planet developed into a paradise for

living creatures the more surprised we

became. The miracle of life on Earth is

due to our narrow temperature band

that provides us with liquid water and,

as we have explained, it is the Moon

that is responsible for maintaining the

perfect tilt that provides our benign

climate. But amazingly, it was the very

act of the Moon’s creation that

produced the first link in the chain of

events that would lead the Universe to

make you!

In 1911 a brilliant young scientist by the

name of Alfred Lothar Wegener was

browsing through the library of his

university in Marburg, Germany, when

he came across a scientific paper that

listed a host of identical plant and

animal species that could be found on

opposite sides of the Atlantic. Although

having obtained a PhD in astronomy at

a very early age, Wegener was

particularly interested in geophysics, a

field of study that was in its infancy at

the time.

Something in the paper caught

Wegener’s imagination and he began to

spend time looking for other examples

of similar plants and creatures

separated by oceans. There was, at the

time, no reasonable explanation as to

how such a state of affairs could have

come about. It had been postulated that

the solution to this puzzle had to be

land bridges that must have existed in

very ancient times and that had allowed

both plants and animals to move

between continents. However, there were

many examples that could not be

explained in this way.

Wegener had also noted, as had

others before him, how many cases

there were in which the coastline of one

continent looked as though it could fit

snugly into that of another, such as the

west coast of Africa and the east coast of

South America. He also found that if

the continental shelf is studied, rather

than the apparent coastline shaped by

current sea level, the fit is often very

much better.

Alfred Wegener began to ask

himself if the answer to these anomalies

might lie not in land bridges but in the

fact that the continents were once joined

together in one large continent, and that

this had somehow broken up and

drifted apart. Later in his life he wrote

about this process of logical deduction.

‘A conviction of the fundamental

soundness of the idea took root in my

mind.’

Wegener spent a considerable

period collecting further examples of

extended flora and fauna and the

available evidence continued to support

his early theory. For example, he found

the fossils of plants and creatures in

places where the climate must have

been significantly different when they

were alive and flourishing, such as

fossilized cycads – ancient tropical

plants found as far away from the

tropics as Spitsbergen in the Arctic.

From the weight of evidence he

had collected, Wegener deduced that all

the continents had once been part of a

single landmass, which he chose to call

‘Pangaea’ – a Greek word meaning ‘all

the Earth’. He suggested that this supercontinent

had broken up and had

begun to drift apart 300 million years

ago. He called the process ‘Continental

Drift’ and although he wasn’t the first

to suggest that there had originally been

a single continent, he was able to

provide substantial evidence to back up

the claim. Wegener first published his

findings and his hypothesis in his book

*The Origin of Continents and Oceans*.20

Although it was brilliantly argued, his

ideas were not widely accepted at the

time.

A flood of scientific indignation

broke over Alfred Wegener. This

happened for a couple of reasons:

firstly, his theory was revolutionary,

which inevitably clashed with the

conservative tendencies of other experts;

and in addition, although Wegener was

certain that continental drift must have

taken place, he had no theory as to how

or why this might have happened. The

best he could suggest was that the

continents, influenced by centrifugal

and tidal forces as the Earth spun on its

axis, were simply ploughing their way

across the surface of the planet.

Dissenters pointed out that, if this

was the case, the coastlines of the

continents could hardly be expected to

have remained so similar to the original

‘fit’ that it could still be observed. On

the contrary, they would have been

distorted beyond recognition. It was also

suggested that tidal and centrifugal

forces would be far too weak to move

entire continents.

Poor Alfred Wegener didn’t have

the chance to look too much further

into the matter; he died in 1930 whilst

taking part in a rescue mission to

deliver food to a party of explorers and

scientists trapped in Greenland.

Wegener did have some notable

supporters but in general his ideas

remained on the shelf until as recently

as the 1950s, by which time greater

exploration and understanding of the

Earth’s geophysical makeup had begun

to catch up with the idea of continental

drift. The truth of the matter is that

Wegener was wrong in terms of his

suggested mechanism, but quite correct

in his basic assumption. Rather than

ploughing their way across the planet’s

surface, the continents ‘float’ on what is

known as the ‘asthenosphere’, the

underlying rock of our planet. This is

under so much pressure and becomes

so incredibly hot that it acts more like

thick treacle than solid rock.

Figure 12

One of the factors that made Wegener’s

ideas more acceptable was the study of

mountain ranges. An earlier position

held by many experts had been the

‘contraction theory’. This suggested that

the Earth had begun its life as a molten

ball and that as it cooled it had cracked

and folded up on itself. This folding,

the theory suggested, was what had

created mountain ranges. The real

problem with the contraction theory

was that all mountain ranges should

therefore be of the same age and it was

rapidly becoming apparent that this

could not be the case. Wegener had

suggested that mountains were

constantly being created as landmasses

came into contact, exerting unbelievable

pressure and pushing up land at or

close to the points of contact.

Just a year before Alfred Wegener’s

death some corroborative evidence had

been forthcoming, but it wasn’t well

accepted at the time. In 1929 Arthur

Holmes, a physicist at the Imperial

College of Science in London suggested

that the mantle of the Earth undergoes

‘thermal convection’. The Earth’s

mantle is that region immediately

below the outer crust. It extends all the

way down to the Earth’s core. Its

composition varies with increased

pressure and temperature but it makes

up the biggest part of the Earth.

Holmes knew that when a

substance is heated, its density

decreases. In the case of the mantle this

would cause material to rise to the

surface where it would gradually cool,

become denser and then sink again. A

similar process takes place with porridge

that is boiling in a saucepan. Holmes

was quite taken with Wegener’s idea of

continental drift and suggested that the

tremendous pressures caused by

thermal convection could act like a

conveyor belt. This might cause the

continents to break apart and to be

‘carried’ across the surface of the planet.

For years these ideas were

dismissed, until knowledge caught up

with the theories. By the 1960s there

was a greater understanding of the

‘oceanic ridges’–regions where, it was

being realized, Holmes’ thermal

convection might actually be taking

place. It was also realized that oceanic

trenches occurred, together with arcs of

islands, close to the continental

margins. All of this meant that

convection was not only probable but

certain. Two other scientists, R Deitz in

1961 and Harry Hess in 1962 separately

published similar hypotheses based on

mantle convection currents, and

continental drift became universally

accepted.

Deitz and Hess between them

modified Holmes’ original theory of

convection and came eventually to their

own mechanism for continental drift,

which is based on what they termed

‘seafloor spreading’. This spreading, it is

suggested, begins in the mid-oceanic

ridges. These are huge mountain ranges

in the middle of the Earth’s largest

oceans. So large are the mid-oceanic

ridges that they are higher than the

Himalayas and are more than 2,000

kilometres wide. Associated with the

ridges are great trenches that bisect the

length of the ridges and which can be as

deep as 2,000 metres. The greatest heat

flow from the ocean floor takes place

near the summit of the mid-oceanic

ridges. There are also far more

earthquakes on and around the ridges

than are experienced elsewhere, showing

these to be geologically active areas.

An increase in understanding of

the Earth’s magnetic field led to the

realization that periodically this reverses.

Such fluctuations can be detected with a

device called a magnetometer. It was

discovered that, either side of the midoceanic

ridges, it was possible to detect

these past reversals in the Earth’s

magnetic field. The conclusion was that

new material was constantly being

thrown up on the ridges and was being

pushed outwards on either side. The

reversals of the magnetic field

demonstrated that this process was

ancient but that it was still taking place.

Also of interest were ‘deep-Sea

trenches’. The trenches are generally

long and narrow and they are often

associated with, and parallel to,

continental mountain ranges. In

addition they run parallel to the ocean

margins. There is great seismic activity

associated with the deep-sea trenches,

indicating that they too are associated

with the process of seafloor spreading

and that they are directly related to the

oceanic-ridges.

What is now thought to be

happening is as follows: underneath the

Earth’s outer crust is the asthenosphere.

This is a malleable layer of heated rock.

It is kept hot because of radioactive

decay in elements such as uranium.

The source for the radioactivity, which

also includes thorium and potassium,

lies deep within the planet. The

asthenosphere, constantly heated, rises

to the surface, pushing new material out

at the mid-oceanic ridges. Magma

escapes along the cracks formed at the

ridges, forcing the new seafloor in

different directions. The new material

spreads outwards until it makes contact

with a continental plate and will then be

‘subducted’ beneath the continent. The

lithosphere at this point sinks back into

the asthenosphere, where it once again

becomes heated.

Few experts disagree with this basic

explanation, partly because it can be

seen at work. India, for example, started

its life on a completely different part of

the planet. It is now being forced up

into the body of Asia and the

Himalayas are the result – a huge

mountain range forced up by the

pressure of the two landmasses meeting.

The whole process is known as

plate tectonics and scientists were keen

to see whether or not a similar process

was taking place on the other terrestrial–

type planets in our solar system –

Mercury, Venus and Mars. Probes sent

to these planets have now shown

conclusively that plate tectonics do not

take place on any of our companion

worlds, making it a strictly Earth-bound

phenomenon, at least as far as our own

solar system is concerned.

This is something of a puzzle.

What is taking place in the Earth system

that is so different from the other Earthlike

planets? What caused plate

tectonics to commence in the first place

and what is the engine that keeps

driving the process? There is a growing

body of evidence to show that in both

cases the answer is almost certainly the

Moon. What is more, it is now being

suggested that without plate tectonics

the Earth may not have proved to be a

suitable haven for life at all.

Dr Nick Hoffman, a geophysicist

at the Department of Earth Sciences,

Melbourne University, Australia, has

recently suggested that the Moon made

plate tectonics happen simply by

coming into existence.

As we have discussed, the origin of

the Moon is still shrouded in mystery,

no matter how much proponents of

any specific theory of its origin may

pretend. However, there are certain facts

that are known for sure. As we have

seen, the Moon is definitely made of the

same stuff as the Earth, but not all of

the Earth. Rather the composition of

the Moon closely resembles the material

in the Earth’s crust, without many of

the heavier components, such as iron,

that make up the Earth’s core.

But how could such a large

amount of the Earth leap from the

planet’s surface into a position tens of

thousands of miles in space?

Scientists were puzzled. And then a

potential explanation was put forward

in the form of the original Big Whack

theory – the suggestion that maybe

some object, about the size of Mars,

collided with the young Earth and that

the Moon was formed from surface

material that was blasted off the face of

the infant Earth. There did not seem to

be any other possibility, so it is now

regularly taught as though it is a fact.

The major problem of the Earth’s

current speed of rotation was tentatively

explained away by proposing a second

impact from the opposite direction

occurring quite soon after the first.

To us this sounds like a rather

desperate scenario to believe in. And as

we have seen, other problems remain

for this would-be explanation; not least

the question of where the material from

the incoming objects went to. If the

Double Whack theory as correct, the

Moon should be made up of three

different sets of material, but it is not. It

is made of Earth rock alone.

Nick Hoffman, as an acclaimed

expert on the terrestrial planets within

our solar system, has suggested that the

removal of the material that went to

make the Moon may have triggered

plate tectonics by creating the space for

the planet’s skin to shift. He points out

that on Venus, for example, the same

sort of forces are at work but the crust of

the planet is so thick, the stresses within

the crust simply cancel each other out,

with the exception of a few wrinkles here

and there. Hoffman has noted that if

the seventy per cent of Earth crust that

was destined to become the Moon was

returned to the Earth, it would ‘fill the

ocean basins with wall-to-wall

continent’.

What would the Earth be like

without plate tectonics?

Hoffman suggests it would be a

water world, covered with oceans and

with only the tips of extremely high

mountain ranges poking out above the

surface of the water. Of course there is

nothing to suggest that life could not

have existed on such a planet and

Hoffman agrees that life is most likely

to develop in a watery environment. It’s

a fact, though, that what we term as

being ‘intelligent life’, such as our own

species, has developed on land. The use

of fire would not be possible in a watery

habitat and the use of tools, one of the

factors that is generally accepted as the

starting point of our advance, is also a

dry land phenomenon.

In any case, as we will see, the

Moon is so important in other ways

that even a watery world may have

proved to be impossible without its

existence.

Nick Hoffman’s suggestion that the

creation of the Moon removed so much

material from the surface of the Earth

that plate tectonics could become a

reality is fascinating. It is estimated that

seventy per cent of the primordial crust

of the Earth would be necessary in order

to create the Moon. Its removal caused

the remainder of the crust to spread,

allowing continental drift to take place.

Whether or not this is the whole

story, plate tectonics are a reality as far

as the Earth is concerned and what is

more, it is a phenomenon that only

occurs on the Earth. In other words, no

other terrestrial- type body in the solar

system had continents travelling about

its surface.

One of the three Earth-like planets

in the solar system, apart from the

Earth itself, is Mars, which is half the

size and a tenth the mass of our planet.

It has an atmosphere that is ninety-five

per cent carbon dioxide and nearly five

per cent nitrogen with a pressure at the

surface that is only 1/200th that of

Earth. Unfortunately for any potential

Martian life form, liquid water cannot

exist at the ambient pressure and at the

temperature of the Martian surface. On

this planet, water goes directly between

solid and vapour phases without

becoming liquid at all.

The puzzle as to why plate

tectonics have either never started or else

never been maintained on Mars has not

been totally explained, but there are

theories.

Mars has no appreciable mountain

ranges, though it does have giant

volcanoes. Some geologists suggest that

the absence of true mountain ranges

gives one clue as to why Mars did not

develop plate tectonics. Like Earth,

Mars has a lithosphere. This is a region

in the crust of the planet that is cooler

than its interior – a little like the skin

that forms on a cup of hot milk. The

centre of the Earth is extremely hot,

probably more so than that of Mars,

but the presence of volcanoes on Mars

must indicate a hot core. One difference

might be that Mars has nowhere near as

much water in its composition as Earth.

It is thought that it is water trapped

within the Earth which acts as a

lubricant allowing different parts of its

rocky surface to slide against each other.

The limited amount of water on Mars

seems to prevent the lithosphere from

allowing fresh material from deep

within the planet to rise to the surface in

the way it is constantly doing on Earth.

As a result the lithosphere has not been

disturbed for aeons and has cooled

gradually, getting thicker and thicker.

When pressure has become so great

within the body of Mars that it is

powerful enough to escape, it has done

so via volcanism and not along features

like the mid-oceanic ridges on Earth.

The other Earth-like body, Venus,

which orbits closer to the Sun than our

own planet, has a surface very different

to that of Mars or the Earth. In some

ways Venus is more like Earth than

Mars. Venus is a similar size and mass

and is also compositionally quite like

Earth – or at least it was once. Experts

such as David Grinspoon, a research

scientist at Southwest Research Institute

in Boulder, Colorado, have studied

Venus closely, aided by a whole series of

orbital and lander space missions.

Grinspoon is not alone in believing

that in its early stages of development

Venus was even more like the Earth.

There is no discernable water on Venus

now but there are traces in the

atmosphere, which most likely indicates

that in its very early stages it had

proportionally as much water as Earth.

This is not too surprising because the

planets formed at the same time and

fairly close together.

Venus is not unlike Mars in many

ways but its surface pressure is ninetytwo

times that of Earth. It is thought

that Venus lost its water because of a

greenhouse effect and it is now covered

in dense swirling clouds of sulphuric

acid. These clouds are so thick that only

a small percentage of the sunlight that

falls on Venus actually gets through to

the planet’s surface, so even if it weren’t

such a hell in other ways, it would be a

very gloomy world. It might be thought

that less sunlight would lead to a lower

temperature but this isn’t the case.

Rather, heat already at or near the

surface is maintained and increased

because it cannot escape through the

dense carbon dioxide. This has caused a

dramatic heating of the surface of

Venus to a present temperature of

730°C.

Like Mars and Earth, Venus has

volcanoes; in fact it has more than any

other planet in the solar system. But

again, like Mars, the volcanoes of Venus

exist as individual entities and not as

part of long mountain ranges as is the

case on Earth. The volcanoes of Venus

are randomly spread about its surface

and many of them look very recent,

even though this may not be the case.

Electrical storms rage constantly

through the clouds of sulphuric acid

but, even so, wind erosion on Venus is

limited compared to the water-rich

Earth. It turns out that erosion is

extremely important in terms of

supplying the right chemical and

nutrient balances that have made the

Earth a haven for life.

The surface of Venus looks broadly

similar wherever one looks and is

thought to be comparatively recent in

origin – something in the order of 600

to 700 million years. Venus has a

generally smooth surface with some rifts

and folds but everything appears to be

the same age. It is generally accepted

that between 600 and 700 million years

ago some cataclysm took place on

Venus that remodelled its whole

surface. Whether this was as a result of

the internal stresses within the planet is

not known, but for some reason the

planet’s surface appears to have literally

melted or more likely was uniformly

covered with volcanic basalt.

Nobody knows for certain whether

a similar thing will happen again on

Venus, in other words whether we are

seeing only one phase of a stop-start

process that is taking place, but it is

considered to be a distinct possibility.

Probably because of its greenhouse

atmosphere Venus is deficient in water

and so once again may have built up a

thick lithosphere. It certainly does not

display any of the characteristics of plate

tectonics.

It is interesting to note that Venus

has no moons, whilst Mars has two,

though both of these are extremely

small and can have little or no effect on

their host planet. As we have seen, it is

now being suggested that the very

creation of such a large moon as that

enjoyed by Earth was directly

responsible for the start of plate

tectonics, which in turn allowed life to

form on the planet in the first place.

In the early stages of its existence,

the Moon was very much closer to the

Earth than it is today. And it is the

existence of the Earth’s oceans that is

primarily responsible for the gradual

lengthening of the distance between the

Earth and the Moon. This is a process

that has been taking place for the last

four billion years and which is still

taking place.

One way of looking at the situation

was presented by Neil F Comins,

Professor of Astronomy at the

University of Maine. Back in 1990 he

had been struck by the comments of a

colleague, to the effect that science

educators are always looking at the

world from the same old perspective.

Comins suggested that it might be

sensible to step aside and look at the

world differently.

As a result of this conversation

Comins decided to turn his attention to

something we all take for granted,

namely the Earth and its relationship to

the Moon – but from an entirely

different perspective. He set out to

consider what the Earth would have

been like today if it had not enjoyed the

benefits of so large a Moon. He called

his hypothetical world ‘Solon’ and over

a period of time he wrote a series of

articles about Solon that appeared in

*Astronomy* magazine. He eventually

published his overall observations in a

book, which was entitled *Voyages to*

*Earth that Might Have Been*.21

Comins examined every aspect of

the Earth and its relationship with the

Moon to build a picture of a similar

planet, at the same distance from the

Sun and which was the same age as

Earth. The only thing that was different

is that the Moon did not exist, but the

alterations this absence would make to

the Earth were dramatic.

Nick Hoffman suggests that the

very nature of the Earth’s surface would

have been entirely different if the

material that makes up the Moon had

not been removed from the Earth’s

crust. However, Comins’ starting point

is to assume that the surface details of

the Earth would be roughly the same as

they are now.

One of the greatest differences in

terms of the early, developing Earth

would have been tides. Comins makes

the point that a Moon ten times as close

would have led to daily lunar tides that

would have been a thousand times

greater than they are today. Bearing in

mind that it is generally accepted that

the infant Earth was spinning about its

centre every six hours, this means that

tsunami-strength tides would have been

hurtling across the Earth every three

hours! Not only were these tides more

frequent, but, being so very much

larger, they would have crashed many

hundreds of kilometres inland – and

with tremendous destructive force.

The mechanism that has slowed

the Earth’s spin is directly related to

tides and the Moon is not the only body

responsible for them because part of the

ocean tides on the Earth are responsive

to the Sun. But the Moon is much

closer and has done far more to slow

the Earth than has the more distant

Sun. Comins estimates that without the

Moon, the Earth day would be only

eight hours in length and solar

generated tides alone would be less than

a third of what they are today.

The immediate implication has

great ramifications on the possibility of

evolving life. At present many scientists

accept that DNA, the fundamental

building block of all life, occurred

spontaneously in Earth’s early oceans.

We will have much more to say about

DNA later, but for the moment we will

accept the general view that it first

appeared in the early oceans of the

Earth, a legacy of what is known as the

‘primeval soup – a specific blend of

water and chemicals upon which life

depends.

The massive tides created by the

infant Moon would have caused erosion

on a scale quite beyond our experience

today. Millions upon millions of tonnes

of land would have been pulverized and

swept out to sea, then widely distributed

and eventually settled on the seabed.

This process liberated vast amounts of

minerals into the oceans – minerals that

emerging life simply could not do

without. Presumably a Moonless world

would still have had weather patterns,

including rain, so erosion would have

taken place but on a tiny scale

compared with what happened when

the Moon was so much closer to the

Earth. This means that life would have

taken much longer to gain a foothold, if

it had managed to do so at all.

We have no problem with the

concept that life first developed and

flourished in the ocean, but there had to

be a time at which it migrated from its

salty environs and learned to survive on

dry land. It is possible that insect life

took the leap first but the fish ancestors

of amphibians and reptiles followed

and between them they eventually gave

way to all land-living animals in the

world today.

Life is always evolving to

harmonize with the prevailing

environment and to capitalize on new

niches that are not already being

exploited. Around 400 million years ago

one such area of potential exploitation

was rock-pools. Fish are accidentally left

behind in rock pools with every

retreating tide, both then and now. In

most cases it doesn’t matter because the

next high tide will free the fish again,

back into the sea. However, if a fish is

isolated in a rock pool during a

particularly high tide, it may have to

survive for weeks before it will be

liberated. Fish that found themselves in

this situation would die unless they

somehow managed to get back to the

ocean by moving over dry land and also

managing to breathe out of the water.

It seems that some fish did find

ways to drag themselves across the sand,

at the same time changing enough

physically to take gulps of air whilst out

of the water. These fish found that dry

land offered some rich pickings and any

animal that learned to live, even

temporarily, on dry land, would be well

rewarded. Gradually, and over a long

period of time, fins that pushed the fish

over sand became stouter until they

became legs and the fish in question

ceased to be fish at all.

Since the Sun also creates tides it

isn’t out of the question that fish would

ultimately have left the oceans, even if

lunar tides had not been present.

However, the waves in question would

have been significantly smaller and their

value in terms of depositing detritus

much more limited. What is quite clear

is that life would also have been very

much slower in developing to a stage

advanced enough to leave the oceans

had it not been for the lunar tides, if it

could ever have happened at all. When

we take on board the prospect of an

Earth with a variable obliquity, no plate

tectonics and such a dizzying spin about

its axis, the prognosis for life of any sort

on Comins’ Solon is not good.

Fortunately for us the Moon was

present and stamped its authority on

the developing Earth in a number of

different but equally crucial ways. It

helped to create many differing

habitats, which in turn engendered

biodiversity. Most experts believe that it

was biodiversity that led to intelligent

life becoming possible. Evolution tries

and retries many different models.

Animals that were ideally suited to their

environment flourished on the Earth,

only to fall by the wayside when

conditions changed and they could not

adapt.

Giant reptiles, that we generically

call ‘dinosaurs’, ruled the Earth for

millions of years until these impressive

and diverse creatures vanished from the

face of the planet. Whether as a result of

some cataclysm, such as a huge

meteorite strike, or thanks to some

other misfortune, species that had

flourished for eons were wiped out

astonishingly quickly, but life itself

remained untouched. Such was the

multiplicity of species already

inhabiting the Earth that some were

bound to overcome the problems that

put paid to thousands of others at a

stroke.

One of the animals that did

survive whatever circumstances put

paid to the dinosaurs was a tiny shrewlike

creature that occupied the vacant

niche left by the demise of the reptiles.

However, it was different to the reptiles

because it gave birth to live young and

suckled its infants with milk created

from its own body. These first

mammals then evolved to diversify and

spread across the planet where they

have been adaptable enough to survive

and flourish.

Tree-dwelling species became

monkeys and some of these creatures

came down from the trees and began to

move across the open savannah, most

likely created by yet more climatic

changes. Down on the ground these

anthropoids were vulnerable. If they

were going to survive they were going to

need something that had not been

specifically necessary to earlier creatures.

They needed bigger brains.

Evolution responded and a whole

family of hominids was the result, of

wh ich *Homo sapiens* is now the only

surviving example. But despite our

general sense of specialness, recent

events point to our solus position as

being surprisingly recent.

One of the greatest breakthroughs

for humans was the control of fire; but

the earliest known evidence of regular

fire using is unequivocally attributed to

our larger-brained cousins, the

Neanderthals, some 200,000 years ago.

We coexisted with these people until

they finally disappeared in southern

Europe around 25,000 years ago.

Science had believed that an earlier

hom inid, *Homo erectus*, had become

extinct hundreds of thousands of years

ago, until the mid-1990s when remains

found on the island of Java in Indonesia

were found to indicate that they too

were around until 25,000 years ago.

Both these alternative humans

disappeared at a time when

midsummer’s day fell around June 21st

in the northern hemisphere – just as it

does today. The dates on which

astronomical events such as the

summer and winter solstices and the

spring and autumn equinoxes fall,

move backwards through the calendar

by one day (around one Megalithic

degree) every seventy-one years. This is

due to the long, slow wobble of the

Earth on its axis, known as ‘the

precession of the equinoxes’ which takes

25,920 years for each cycle.

This movement through the

calendar has no effect on people at all,

but it is interesting to note that a recent

discovery suggests we were not alone as

a species as recently as 13,000 years ago,

when the summer solstice in the

northern hemisphere fell in late

December; the exact opposite of where it

is right now.

The discovery of what is claimed to

be a previously unknown branch of

hominid occurred on the island of

Flores, near Java, and was announced to

the world in 2004. Remains have been

found of a dwarf hominid, named

*Homo floresiensis*, which was only as tall

as a modern three-year-old with a facial

morphology very different to *Homo*

*sapiens*. Strangely, these miniature

people had mini-brains yet they

produced relatively sophisticated tools.

Not only have we recently shared the

planet with other hominids, it now

seems that the ancestors of today’s

Europeans may have interbred with

other types of human in the not too

distant past.

As part of a large-scale genemapping

programme, researchers at

deCODE Genetics in Reykjavik, Iceland,

were looking at the families of nearly

30,000 Icelanders. They found that

women who had an inversion on

chromosome 17 had, on average, 3.5

per cent more children than women

who did not. Kari Stefansson,

deCODE’s chief executive, considered

this to be a very significant impact in

terms of an evolutionary timescale. It is

possible to roughly date the origin of

this phenomenon by counting the

number of genetic differences that have

accumulated in it compared to a

normal DNA sequence. It turns out that

this element has so many differences

that it must have occurred about three

million years ago. Which is long before

modern humans evolved.

Stefansson has suggested that this

element of the DNA might have been

native to some other species of early

human and came to our own species

around 50,000 years ago. He added:

‘There aren’t all that many ways you

can explain it except by the

reintroduction into the modern human

population… That raises the possibility

it was reintroduced by cross-breeding

with earlier species.’22

But as these other humans

disappeared, *Homo sapiens* developed a

growing intelligence that allowed us to

begin to manipulate the environment in

which we live. The great breakthrough

was the development of agriculture – a

move that allowed civilization to

emerge.

With civilization came the ability

to count and ultimately a way of

expressing language in a written form.

Knowledge that had once been

laboriously passed from one generation

to the next could now be stored and

retrieved from places outside the

human brain. Intelligence also created

technology and a great desire to

understand the workings of the world

and the cosmos of which it was part.

But this curiosity began long before we

sent representatives of our species to

walk on the Moon. It had been present

for more than 30,000 years, when the

first lunar calendars were created. It is

almost certain that after the Sun, the

Moon was the most important heavenly

body to captivate our species.

How little those cave dwellers, who

scratched their knowledge of the lunar

cycle onto animal bones and antlers,

were aware that without the presence of

the lunar disc that so captivated them,

the Earth would probably be a lifeless

rock, silently spinning around the Sun,

like the inferno of Venus and the frozen

wastes of Mars.

*‘Rather than transmitting radio*

*messages, extraterrestrial*

*civilizations would find it far*

*more efficient to send us a*

*“message in a bottle”, some*

*kind of physical message*

*inscribed on matter. And it*

*could be waiting for us in our*

*own backyard.’*

**Professor Christopher Rose of Rutgers**

**University, New Jersey & Gregory Wright, a**

**physicist with Antiope Associates, New**

**Jersey**

The idea that intelligent life forms

might exist elsewhere in the cosmos is a

comparatively recent interest for

humanity. For thousands of years and

across countless cultures, it was more or

less accepted that anything dwelling

outside our own immediate

environment inevitably fell into the

classification of a god or a servant of the

gods, such as the saints, angels or

seraphim that inhabit the heaven of the

Judeo-Christian tradition.

Even after the telescope appeared,

around the year 1600, the Catholic

Church in particular was not keen to

have its dogmas regarding the nature of

the Earth and its relationship with space

tampered with in any way. In Christian

doctrine, the Sun and the Moon have

both been directly created by God, as

have the stars and planets. The first

book of the Bible, Genesis, lay down the

order in which God created the

observable cosmos and anyone who

seemed to be throwing a spanner in the

works, for example Galileo (1564–1642)

who suggested that the Sun, and not the

Earth, was the centre of the solar

system, was liable to be severely

censured. Galileo was forced to recant

his heretical views and was condemned

to perpetual house arrest but was

probably lucky to escape with his life.

Even before Galileo’s time,

thinking people were not fooled by the

Church’s account of the solar system.

The Portuguese navigator Ferdinand

Magellan (1480–1521) understood

what he was seeing at the time of a

lunar eclipse: ‘The church says the earth

is flat, but I know it is round for I have

seen its shadow on the moon and I have

more faith in a shadow than the

church.’

Only the effects of the Renaissance

and Church reformations across Europe

broke the hold of old church dogma. By

the late seventeenth century, with

telescopes proliferating and almost

anyone able to take a close-up view of

the Sun, Moon, planets and stars, the

cat was truly out of the bag and the

genuine nature of the solar system in

particular was beginning to become

apparent.

Since Charles Darwin wrote *The*

*Origin of Species* in the mid-nineteenth

century it has become clear that life on

Earth has evolved over billions of years

from the first single-cell entities through

to all of the creatures in the world

today. Darwin’s ideas were argued over

fiercely at the time, but the massing

evidence from palaeontology, genetics,

zoology, molecular biology and many

other fields gradually established

evolution’s truth beyond reasonable

doubt.

It is ironic, therefore, that the most

scientifically advanced nation the world

has ever known, the United States, has

large numbers of ‘Creationists’ – people

who still cling to the teachings of the

mediaeval Church. They are currently

trying to persuade politicians, judges

and the general public that evolution is

an unproven myth cobbled together by

atheists. They lobby for their ideas, such

as ‘intelligent design’, to be taught as

alternatives to evolution in science

classrooms. Their proponents admit

that their aim is to keep the scriptures

of the Christian religion taught in

school as the word of God, rather than a

collection of ancient Jewish texts.

Their arguments against Darwin’s

concept of ‘natural selection’ are not

well reasoned or based on any normal

principle of modern science. These

people appear to be intellectually stuck,

hundreds of years in the past, at a time

before masses of new data became

available. However, it is interesting to

note that academics once thought like

this too. Dr John Lightfoot, the Vicechancellor

of the University of

Cambridge was not frightened of being

precise about the origin of the entire

Universe when he said in 1642:

‘Heaven and earth,

centre and

circumference, were

created together, in

the same instant,

and clouds of

water... This work

took place and man

was created... on the

17th of September

3928 BC at nine

o’clock in the

morning.’

Poor Dr Lightfoot seems to have been

ignorant of even the most basic facts of

science. He clearly did not realize that

there is no such thing as nine o’clock in

the morning because every hour of the

day exists simultaneously on our

revolving planet; it just depends where

you are standing. Happily, the very year

that Lightfoot made this statement, a

baby boy was born in the village of

Woolsthorpe in Leicestershire. The

infant’s name was Isaac Newton and he

went on to become Cambridge

University’s most famous professor and

a man that would create a leap forward

in humankind’s understanding of the

Universe.

Newton however, did not dismiss

the role of God as he wrote on Judaeo-

Christian prophecy, the decipherment

of which he saw as being essential to the

understanding of God. His book on the

subject espoused his view that

Christianity had gone astray in 325 AD,

when the crumbling Roman Empire

declared that Jesus Christ was not a

man but an aspect of the very deity that

had built the Universe.

Today we have the benefit of

masses of data from all kinds of

disciplines that point to the Earth being

nearly five billion years old, but many

creationists frequently quote the

chronology produced by James Ussher

who was Archbishop of Armagh and

Primate of All Ireland in the early

seventeenth century. His analysis, based

on his interpretation of the King James

Bible, allowed him to confidently

declare that the creation of the world

occurred in 4004 BC.

Such a dating raises all kinds of

problems, from fitting in the obvious

existence of dinosaurs, for example, to

the fact that the city of Jericho, near to

the River Jordan, has been continuously

occupied for 10,000 years.

(Interestingly, the origin of the name

‘Jericho’ is Canaanite and means ‘the

Moon’).

There are creationist websites that

put forward ‘evidence’ that their writers

believe demonstrates that people and

dinosaurs lived at the same time –

presumably around the time that the

Megalithic Yard was being introduced!

But these are not fringe ideas as there

are large numbers of people who believe

that geological time is a myth.

According to a survey run by the Gallup

Organization in 1999, the majority of

Americans educated up to high school

level or less, believe that God created

humans in their present form within

the past 10,000 years or so. And a

worrying forty-four per cent of college

graduates believe the same.

An international research team led

by scientists at the University of British

Columbia sees the creation as being a

little earlier than Dr Lightfoot and

Archbishop Ussher. Professor Harvey

Richer, the study’s principal

investigator, confirmed previous

research that sets the age of the Universe

at thirteen to fourteen billion years. The

team measured the brightness and

temperatures of white dwarf stars (the

burned-out remnants of the earliest

stars which formed in our galaxy)

because they are ‘cosmic clocks’ that get

fainter as they cool in a very predictable

way.

More recent calculations, by

Lawrence Krauss of Case Western

Reserve University and Brian Chaboyer

at Dartmouth College, published in the

journal *Science*, put the Universe at

anything up to twenty billion years old.

Creationists often try to invalidate

all of evolution by pointing to science’s

current inability to explain the origin of

life. John Rennie, the editor in chief of

*Scientific American* has countered this by

saying:

‘…even if life on

Earth turned out to

have a nonevolutionary

origin

(for instance, if

alien’s introduced

the first cells billions

of years ago),

evolution since then

would be robustly

confirmed by

countless microevolutionary

and

macro-evolutionary

studies.’23

It is true that, whilst science can explain

how life has evolved on Earth, the way it

all began is a complete mystery. And, as

far as we know, the Earth is the only

location where life exists.

In the nineteenth century some

people speculated that there might be

life, or even people, living on the Moon.

It is now certain that no natural life

could exist on the Moon, which is a

barren world constantly irradiated by

the Sun and lacking in both available

surface water and a sufficiently dense

atmosphere to support life. There was a

more recent time when Venus, the

second planet out from the Sun,

seemed a potential candidate for some

type of life because its dense clouds hid

the surface from view so that, for all we

knew, it might be as green and verdant

as that of the Earth. But as we now

know, it is furnace hot and continually

subjected to sulphuric acid rain. As a

result, the chances for life seem almost

nonexistent.

Mars is certainly cooler and there

may be water existing near its polar

regions. At the time of writing this

book, some people are still clinging to

the possibility that there could be some

sort of primitive life on Mars either

now, or at some time in its remote past.

If it does exist at all, life on Mars is likely

to be extremely simple. Other planets in

the solar system, being gaseous giants in

the main, are even less likely to support

any sort of life as we know it.

By far the majority of experts now

accept that if advanced life of any sort

does exist in places other than the Earth,

we will almost certainly have to look

deep into interstellar space to find it.

Our solar system is only one of many

that undoubtedly exist, even in our own

corner of space. Astronomers have

identified suns that have planets

orbiting them and it is estimated there

are a thousand million stars in our own

galaxy, any one of which could possess a

planetary system where life might have

evolved and flourished. Beyond our

galaxy there are countless others, so it

may be wrong to think that only our

tiny little blue planet, amidst such a

proliferation of planet-bearing suns, has

produced a thinking species such as our

own.

But as far as we know right now,

we are alone.

Once the sheer size of space was

ascertained it also became apparent that

even if there are hundreds or thousands

of intelligent species out there, the

chances of us actually encountering

them in any way is quite small.

Distance is a problem but it isn’t the

only one. One of the greatest stumbling

blocks could be time itself. In order for

us to communicate with another

advanced species, it would have to have

reached at least our level of

sophistication either at the same time as

us or shortly before. Although

humanity has created at least a couple

of probes that are presently leaving the

environs of our own solar system, it will

be decades, or maybe centuries, before

we embark on interstellar space travel to

any significant extent. Even if we do, the

answers we are looking for, in terms of

finding other intelligent beings, are

likely to be protracted.

The thought of any spacecraft

travelling faster than the speed of light

remains in the realms of science fiction.

If, as Einstein proposed, light speed is as

fast as anything can ever travel, it would

take many years merely to reach the

nearest star. To go beyond our own

galaxy, the Milky Way, would seem

impossible because the next nearest

place we could visit is the Sagittarius

Dwarf galaxy which has ‘only’ a few

million stars and is a staggering 80,000

light years away. The next nearest galaxy

is the Large Magellanic Cloud and that

is 170,000 light years distant.

Setting out to actually meet our

intergalactic or extragalactic cousins

seems to be a hopeless idea, even if we

knew where they were located. So does

this mean we can never say hello to any

of them? Not necessarily. If we cannot

greet them face-to-face, it might be

possible to listen to them.

Much of the energy so created

streams out into space as

electromagnetic radiation. There are

many wavelengths of this radiation,

some of which are familiar to us in our

daily lives. The full panoply of this

radiation is known as the

‘electromagnetic spectrum’. The

shortest of the wavelengths are those we

call ‘gamma waves’. At the other end of

the electromagnetic spectrum are

extremely long radio waves, which we

harness every day. Visible light is also a

component of the electromagnetic

spectrum, as are the microwaves used

daily in many cookers.

In fact we are getting radio

messages from all parts of the cosmos

all the time. These are emitted by suns

and other much stranger bodies within

our own galaxy and beyond it, as a

result of the physical processes taking

place within them. Electromagnetic

radiation travels across the near vacuum

of space at the speed of light. Once it

was realized that we could listen in on

the processes taking place in our stellar

backyard and beyond, radio astronomy

was born.

In 1931 an American engineer by

the name of Karl Jansky, who was

working for the Bell Telephone

Laboratories, was conducting

experiments into interference that was

taking place across certain radio

wavelengths. He built a succession of

aerials and managed to isolate three

distinct sources of radio interference or

static. Firstly he could detect local

thunderstorms; and secondly, storms

taking place at a greater distance.

However, there was a third source of

interference that was steady and always

present which he couldn’t, at first,

identify. By moving his aerials, Jansky

was eventually able to isolate the source

of this third form of radio interference.

To his own and many other people’s

great surprise it was coming from

within the Milky Way and in fact it

originated at the very centre of our own

galaxy.

Like many controversial discoveries

Jansky’s were ignored for some years.

But not everyone was sceptical. Reading

about Jansky’s observations, in 1937

another radio engineer, Grote Reber,

built his own aerial, though this one

would have been more familiar to a

modern radio astronomer because it

was a dish. Reber also picked up the

strange ‘messages’ from space.

Interest in the signals from space

gradually increased. In 1942 a British

Army officer, J S Hay, made the first

observations of radio emissions from

our own Sun, whilst working on ways to

jam German radio signals. Once the

Second World War was over, radio

astronomy really took off and within a

few years discrete signals from all parts

of space were being received. Ultimately

a background radio source was

recognized that could not be isolated to

a particular point in space and it was

finally realized, in the 1960s, that this

was the signal left by the Big Bang – the

very birth of the Universe itself.

Of course, all the signals that were

being received were perfectly natural in

origin. But towards the end of the 1950s

it began to occur to a number of those

involved in radio astronomy that if any

species out there in space was already

more advanced than we were, it might

well make use of radio waves in order to

let us know it existed. Most radio signals

received from space can be readily

identified and even those that proved to

be a puzzle at first have been shown to

have a natural origin. But if an

advanced species actively wanted to

send a message, it would not be difficult

for it to use a type of radio signal that

could not be confused with that created

by any natural phenomena – for

example, one containing an obvious

mathematical formula.

In 1961, when the ‘race for space’

had fired the imagination of a

generation, a new organization came

into existence. It was called SETI – ‘the

Search for ExtraTerrestrial Intelligence’.

SETI was primarily the brainchild of an

enthusiastic young electrical engineer

turned radio astronomer by the name

of Frank Drake, a 31-year-old engineer

who had become interested in radio

astronomy whilst at Harvard Graduate

School.

Drake was fascinated by the

prospect of radio astronomy being used

to identify other intelligent species in the

cosmos and thought that we should be

actively listening in for any message that

might be transmitted from deep space.

Together with another interested

scientist, J Peter Pearman, an officer on

the Space Board of the National

Academy of Sciences, Drake arranged

the first SETI conference.

Anxious to show the world just

how likely extraterrestrial life surely was,

Drake came up with what is now

known as the ‘Drake Equation’. This

reached the conclusion that there must

be many thousands of intergalactic

civilizations capable of creating and

sending radio messages across space.

The idea of SETI was immediately

popular with the public and for a while

NASA had some involvement. During

the 1960s and ’70s, NASA’s

contribution was fairly low-key, but in

1992 nasa initiated a much more

formal SETI programme.

Unfortunately, less than a year later, the

United States Congress cancelled the

funding and NASA, reluctantly, pulled

out of the SETI research programme.

This certainly wasn’t the end of the

story because a proportion of the

intended NASA research was taken over

by the non-profit-making SETI

Institute and by an associated body, the

SETI League.

SETI has now enlisted the help

and support of people from around the

globe. Many computer users are

regularly sent packages of information

received by SETI, in order that it can be

analyzed during computer down time.

Millions of individuals are involved in

what is known as the SETI@home

project at the present time.

Exactly where in the

electromagnetic spectrum we should be

listening for deliberately created

messages from the stars was decided in

1959. Phillip Morrison and Giuseppe

Cocconi, two young physicists at

Cornell University in the United States

had co-operated to submit an article to

the prestigious science journal, *Nature*,

which appeared in September 1959. It

was entitled ‘Searching for Interstellar

Communications’. When trying to

ascertain which part of the

electromagnetic spectrum to monitor

for alien signals, Morrison and Cocconi

ultimately opted for a frequency of

1420MHz. Not only does this frequency

fall in a very ‘quiet’ part of the available

spectrum, it also represents the

emission frequency of the most

common element in the Universe,

which is hydrogen. Morrison and

Cocconi believed that any intelligent

species would realize these two facts and

so would therefore be most likely to

transmit a greeting at or around this

frequency.

Some promising messages have

been received across the last three

decades but, in the end, all of them

turned out to be natural phenomena.

Space can supply some surprisingly

‘ordered’ signals. Rapidly spinning

objects in space known as ‘pulsars’ are a

good case in question, so SETI experts

are extremely careful and also deeply

sceptical when any apparent ‘letter from

the stars’ is announced.

One of the greatest problems for

SETI, or indeed anyone trying to pick

up a message from space, is knowing

exactly what to expect. It is certain that

any species sending such a message will

be in advance of us technologically

because if the message received comes

from deep space it must have taken

thousands or even millions of years to

reach us. The culture that sent it might,

by the time it is received, have

disappeared, advanced even further or

simply become bored with the whole

notion. All we can do is to take an

educated guess and suppose that for

any species there will be commonality

in terms of the irrefutable laws of

physics.

We may receive a logically

repeating mathematical sequence such

as pi or a list of prime numbers, it is

simply impossible to know. There are

sceptics around who suggest that the

whole process of looking for such a

message is destined to fail, if only

because other intelligent species out in

space may be so different to us that

there would be no points of contact

recognizable on both sides. In other

words, they may be trying to contact us

right now and we simply cannot

understand the message.

By the summer of 2004 we were already

beginning to reach our own conclusions

about how an intelligent species from

elsewhere might have already contacted

us – humanity simply had not

recognized the fact yet. Serendipity

being what it is, an article appeared in

the August 2004 edition of *New*

*Scientist*. It was written by Paul Davies, a

scientist at The Australian Centre for

Astrobiology at Macquarie University,

Sydney. We found it pleasing that a

respected scientist was publicly

discussing the idea that an alien culture

may have put a message intended for us

in place many millions of years ago: a

message, that Professor Davies also

likens to the plot of the film *2001: A*

*Space Odyssey*.

Whilst congratulating SETI for its

efforts to track down incoming

messages from space, Paul Davies

makes the suggestion that to try and

contact humanity by way of radio

signals might prove to be fairly

unreliable for any alien species far away.

He points out that the problem of

‘timing’ might make radio contact

difficult, if not impossible. No matter

how many such intelligent societies

there might be, the chance of them

transmitting during the short time slot

during which we have been listening is

very remote. Is it not possible, Davies

asks, whether such a culture, probably

immeasurably older than our own, may

have conceived of a much more reliable

way to let us know of its existence?

Might it not have opted for a

method of communication that was not

dependent upon transmitting signals

for many millions of years in the hope

that we, or someone like us, had just

evolved the ability to decipher messages

in the form of radio waves? Would it

not be more likely that our intergalactic

cousins would have chosen something

much more timeless?

This suggestion, when we read it

near the start of Davies’ article, made us

sit upright and pay attention because we

were already asking ourselves the same

question. Davies goes on to suggest that,

rather than radio messages, a far more

reliable way for any alien species to

contact us would be to leave artefacts in

the vicinity of planets likely to spawn

intelligent life that, given sufficient

advancement on the part of such a

developing species, it could not fail to

recognize.

Then we came across yet more

heavyweight scientists with similar,

highly logical, thought.

Professor Christopher Rose of

Rutgers University in New Jersey and

Gregory Wright, a physicist with

Antiope Associates also in New Jersey,

have stated that the transmission of a

radio signal by an extraterrestrial

civilization, that would probably have to

be detected 10,000 light years away,

does not make sense. They suggest that

it would be far more efficient to send us

some kind of physical message

inscribed on physical matter – a kind of

‘message in a bottle’. And, they believe,

such a message could already be waiting

for us in our own backyard.24

Rose observed that: ‘If energy is

what you care about, it’s tremendously

more efficient to toss a rock.’ Once

radio signals pass us by they are gone

for ever, so aliens would have to beam

signals continuously as we have only

had radio for a miniscule fraction of

our existence as an advanced species.

We had to ask ourselves, what if

that physical object was the Moon and

the information is there for us to see –

once we understand the vocabulary?

If the Moon does hold a message,

it would be exactly what Paul Davies

called a ‘set and forget’ technique that

would survive for millions or even

billions of years. Any conventional sort

of physical structure, no matter how

impressive, would eventually crumble

under geological forces, especially on a

very active planet such as our own. It

turns out that the possibilities for a

‘letter from the stars’ that can survive

eons are actually very limited indeed. In

the end such a ‘physical’ message needs

to be either extremely large or extremely

small – and as we were to discover,

perhaps both.

We had already uncovered a

wealth of published academic material

that points to the Moon being the single

most important factor in the

development and nurturing of complex

life forms on the planet Earth. Quite

simply, if the Earth is thought of as an

incubator for life – the Moon is the

carefully programmed machine that

monitors and stabilizes the process. A

real life-support system.

This may be a wonderful

coincidence of epic proportions, or it

could be yet another miracle to ignore

as an inevitable consequence of the

‘Anthropic Principle’.

Whether or not the suggestion put

forward by Davies has any merit, it was

the second time in a month during

which perfectly respectable and serious

scientists had published articles dealing

honestly with the possibility that we are

not alone in the Universe and that other

species may be trying, or might have

tried in the past, to contact us. Whilst

we are delighted with the open-minded

attitude that seems to be developing

with regard to this subject it is our

profound belief that the message, for

which SETI, Paul Davies and Rose and

Wright are seeking, is right in front of

our eyes. It has been there as long as

humanity has existed and what it has to

tell us is breathtaking in its

implications.

**A Potential Message?**

At this point we asked ourselves what

would a message look like that had been

planted on Earth or in its immediate

environs and which was intended to

survive for a huge period of time.

Firstly, we reasoned, it would have to be

recognizable, so it could be clearly

interpreted as a message before its

contents could be deciphered. Secondly,

it would need to be either extremely

large or else very small in order to

survive the destructive power of Earth’s

geology and weather systems.

In Clarke and Kubrick’s *2001: A*

*Space Odyssey*, the technique used by

the unknown aliens was to have a major

anomaly that could only be detected by

a technically competent species. By

placing objects with huge mass under

the surface of the Moon the aliens knew

they would be easy to spot in a place

where there was little else to distract. But

in that story the purpose of the

gravitational anomalies was not to

communicate with the new species – it

was to send a message back to the aliens

that the local creatures had reached a

specific level of intelligence.

So, an anomaly of this sort might

be enough to alert an unknown species,

such as our own, that there is a message

waiting. The next step would be for

those planting the message to ensure

that the target species understood that it

was addressed to them.

It has long been agreed that

numbers are the best way to

communicate with intelligent creatures

from another world. Hieroglyphs or any

kind of marks are unlikely to be

understood without any point of

reference, just as there was no way to

understand ancient Egyptian

hieroglyphs until the Rosetta Stone was

discovered in 1799. This inscribed

artefact from the second century BC

gave the same text in both Greek and

hieroglyphs; thereby providing the key

to understanding a lost language.

If numbers are used in such a

message they need to have a discernable

pattern, however they are

communicated, so that they stand out

against the background ‘noise’ of

number values that surround us

everywhere. Even then, it is extremely

challenging to think of numbers that

are certain to be spotted once they are

planted in our own environment. The

safest method would be to use ratios

that stand out, because ratios are not

dependent on units of measurement or

any chosen base (e.g. base ten in

everyday usage or base two [binary] as

used in computing).

But it occurred to us that we were

examining this process backwards,

because we started out by being alerted

to major anomalies specifically related

to the Moon. Not only does it appear

very unlikely that the Moon could have

occurred naturally in thefirst place, it

also turns out that it has been the

incubation machine that so perfectly

nurtured life.

We now needed to go back to our

starting position and look at the

numbers that had fallen out of the

Earth–Moon–Sun relationship in terms

of ratios and to those measurements

that stood out so well when we applied

Megalithic units to them.

The first and most obviously

strange thing about the Moon is how it

appears to be the same size as the Sun

when viewed from Earth. It is 400 times

smaller and 400 times closer to the

Earth than the Sun. Assuming for a

moment that this might be the first part

of a calling card from an unknown

source rather than just a bizarre

coincidence, we have to note three

factors:

1. 1. It is designed

to be

meaningful

only to

intelligent

creatures living

on the Earth’s

surface.

2. It is designed

to be noticed at

this specific

point in time,

give or take a

million years

or so each way,

because the

Moon only

behaves in the

way it does at

this time.

3. It appears to

be addressed to

a species with

ten fingers,

because the

ratio

relationship of

that between

the Moon and

the Sun is such

a round

number when

expressed in

base ten (e.g.

in base eight

the ratio would

be one to 620).

Now we will speculate that the ratio of

the Moon and the Sun just might be

pointing to a deliberately created

message. In order to do so, we must

suspend all preconceptions of what

seems sensible and consider instead

what under normal circumstances

might be judged unthinkable.

We will therefore temporarily

accept that points 1, 2 and 3 above are

valid and that someone or something is

trying to direct the attention of

Earthlings, sporting ten digits and living

during this particular point in time, to

look at the Moon as a potential

message.

So, here we go!

*In the beginning there was*

*neither existence nor nonexistence;*

*there was no*

*atmosphere, no sky, and no*

*realm beyond the sky. What*

*power was there? Where was*

*that power? Who was that*

*power?*

**Rig Veda 10:129.1-7 (circa 4000 BC)**

At this point we had decided that we

could not continue to gather further

facts without having some plan in place.

The way forward seemed to be to

develop a hypothesis so that we could

see how the component parts of the

puzzle may fit together. We agreed to

suspend all negative comments for a

time, so that we did not miss a point by

rejecting something that challenged our

preconceptions. Only when we had a

complete model for our hypothesis,

would we critically appraise it and

compare it to other possible

explanations.

So, we are now entering the

modelling world by temporarily

accepting the following three concepts

as real:

1. 1. The Moon was

engineered by

an unknown

agency circa

4.6 billion

years ago, to

act as an

incubator to

promote

intelligent life

on Earth.

2. The unknown

agency knew

that

humanoids

would be the

result of the

evolutionary

chain.

3. That unknown

agency wanted

the resulting

humanoids to

know what

had been done

and they left a

message

indicated by

the dynamics

of the Moon.

We were well aware that there were

some issues with these assumptions,

which, if we forced ourselves to reconcile

them simultaneously, would inhibit

lateral thinking. One such problem was

the issue of motivation: Why would any

agency want a grand plan that spanned

a period that was equal to around fifty

per cent of the age of the Universe at

that astronomically distant time? This

would be long-range planning beyond

all comprehension. Even then, how did

such an agency know that the resulting

life form would have ten digits? We

would try and deal with these issues but

it might be necessary to tackle them at a

later stage.

Another problem that had to be

put to one side for the moment, was the

issue of how Stone-Age builders came to

be using units of measurement that are

the key to decoding the message. These

issues, amongst others, will have to be

dealt with in due course, but now we

will review the basis of the message.

At the root of our hypothesis is the

idea that the very dimensions and

movements of the Moon are designed

to alert us to the fact that this is not a

natural body. We therefore need to go

back to the beginning of the solar

system itself.

No one knows for sure how the

solar system came into existence but,

despite all of the ideas about the Moon

being made from the Earth, everyone

agrees that the Sun, Earth and the

Moon were all formed around 4.6

billion years ago. It is thought that the

Earth and the Moon were formed very

soon after the Sun became a star.

Theories come and theories go, but

it is likely that it all began when a vast

cloud of dust and gas in an empty

region of our galaxy became

compressed by starlight and

gravitational forces, thereby causing an

accumulation process. Otto Schmidt

first put the theory of ‘accretion’

forward in 1944 and as more and more

evidence has become available,

competitor theories have withered away.

In some way, that astronomers do

not yet understand, the Sun was formed

and produced light and heat much as it

does today. The cloud of dust and gas

that was wheeling around the new star,

kept on cooling and shrinking and

whirling faster and faster before

separating into rings. Each of these rings

also kept on cooling and shrinking and

is thought to have gradually gathered

together into a sphere of fiery gas, in the

case of the terrestrial planets, before

cooling so much that the main part of it

became liquid and, eventually, solid.

Until quite recently there were two

principle theories to explain the Moon’s

existence. One was that it was an object

that had formed elsewhere and was

somehow taken into Earth’s orbit; and

the other was a theory called ‘coaccretion’

or the ‘double planet’

hypothesis. This second theory

supposed that the Earth and the Moon

simply grew together as twins, born out

of the primordial swarm of small

‘planetesimals’. However, when lunar

rocks were brought back to Earth it was

realized that the Moon has no

substantial metallic iron core and that

its rocks have oxygen isotopic ratios that

are identical to the Earth’s.

The theory that the Moon had

originated elsewhere died instantly

because it was obvious that the rocks

had formed in exactly the same region

of the solar system as those of the Earth.

But the worrying point was that the

only alternative theory was as effectively

debunked as the ‘capture’ hypothesis.

The ‘co-accretion’ could not be correct

because the type and proportion of

materials should be pretty much the

same for both bodies if they were twin

planets.

Suddenly there was no theory of

the Moon’s origin in existence. Scientists

tell us that nature abhors a vacuum –

but scientists abhor a vacuum even

more. Something had to be found to

explain the inexplicable.

It took some years, but in 1984 an

idea that seemed to explain the facts was

put forward. The original Big Whack

theory was an attempt to explain how

the Moon could be made of selected

Earth materials. For reasons already

covered, it is a theory that simply does

not work and we are still in a position

where there is no watertight explanation

for the Moon being where it is.

So let us return to what is generally

held to be true about the early solar

system. The process of making the

Earth was not especially quick, as Stein

B Jacobsen, a professor of geochemistry

at Harvard University says: ‘Within

100,000 years of the formation of the

Sun, the first embryos of the planets

Mercury, Venus, Earth, and Mars had

formed… Some grew more rapidly

than others, and within ten million

years, about sixty-five per cent of Earth

had formed.’ 25

Let us now consider a theory of the

Earth–Moon system that does work.

The thrust is that it is the result of

intelligent design. We do not know who

or what this hypothetical intelligence

was, so we will designate it UCA

(Unknown Creative Agency) for the

time being.

**In the Beginning**

The young star was shining out, and the

clouds of matter that had recently

circled around it in a series of rings had

begun the process of accreting into

spheres at differing ranges from the star.

One of these proto-planets was some

150,000 kilometres distant from the

mother star and the UCA realized that

it had the potential to produce

intelligence.

The UCA may believe that the

Universe is destined to die, maybe by

becoming a smooth and static soup of

incredibly thinly dispersed matter, just a

tiny fraction above absolute zero. A

nothingness that would essentially be

the end of everything – even time.

The goal of the UCA was to seed

life wherever possible, to create

intelligent beings that could flourish

and go out and seed more life

themselves. In this way the very fabric

of the Universe would be turned into

self-aware matter that would slowly halt

and reverse the mindless spiral into

entropy and eternal chaos. They had a

model to use for this location – one that

would produce a specific type of

intelligent creature, based on carbon

and enabled by liquid water.

But it would take several billion

years for the tumbling sphere to

stabilize and go through a process of

evolution of life forms that would result

in a species with the intelligence and,

more importantly, the imagination to

understand their role of striking out

into the cosmos to shape and form

swirling stardust – and then give it the

spark of life.

It was important that when this

fledgling planet spawned its thinking

and technologically able offspring, the

creatures would understand exactly

what had happened to bring them into

existence, so that they could eventually

repeat the process themselves. In this

way, a self-aware Universe would

continue to replicate itself across the

massive span of space and time.

The engineering requirement was

demanding.

The proto-planet was completely

unstable and it was destined to develop

a surface that would be far too rigid to

create the necessary conditions for life to

begin and to thrive. It required a

regulator – a gravitational presence close

by, that would tip it over just enough to

cause the surface to have a tiny

temperature range that would oscillate

gently to evenly distribute the energy

radiated from its mother star. This also

had to be a regulator that would initially

use its gravity to plough the surface so

that essential minerals could be released

for the life-development process to

continue.

It was clear that the planet needed

to have a loosened surface and the

obvious conclusion was to manufacture

the regulator from the surface material.

This would reduce the tendency of the

surface to form one continuous crust

and would allow movement within the

crust itself. Judging the required mass,

size and orbital characteristics of the

regulator was a stupendously complex

calculation, because it not only needed

to have a changing relationship with the

planet over time – it also had to contain

the message addressed to the resulting

intelligent life form.

The equilibrium point was

calculated and it was found that

seventy-four quintillion tonnes would

have to be removed from the planet to

manufacture the regulator. To meet all

requirements it was going to need a

mass that was only 1.234 per cent of the

revised planet yet its physical size had to

be a relatively large, being 27.322 per

cent of its parent. It would therefore

have to be made with the barest

minimum of heavy elements such as

iron and, even then, it would need to

either be partially hollow or have the

consistency of a sponge.

Mechanisms were then put in

place to remove a stream of material

from the young planet, that would be

spun into a new planet in close Earth

orbit. The design was such that the

regulator would slowly increase its

orbital distance until it reached an

average range of around 384,500

kilometres at the expected time of the

arrival of intelligent life. This would

mean that to the creatures on the

planet’s surface, the disc of the regulator

would appear, with the naked eye, to be

the same size as the star at the centre of

the system – which would be the first

line of the message to make the

developing Earth creatures become

curious about the regulator. The

realization that the factor for each was

precisely 400 would also indicate that

the message would be delivered in baseten

arithmetic.

Perhaps the UCA used something

like black-hole technology to carefully

strip only lighter elements from the

infant planet. A black hole is a superdense

entity with so much gravity that

even light is jsucked into it, like dust

into a vacuum cleaner. A black hole

with the mass of Mount Everest would

have a miniscule radius – roughly the

size of an atomic nucleus – and current

thinking is that it would be hard for

such a black hole to swallow anything,

although it would certainly attract

material like a giant magnet. Such an

idea might explain the mascons (the

regions of high gravity) still found on

the Moon.

However the engineering job was

undertaken, the biggest challenge was to

communicate the message that the

intelligent creatures endemic to the

Earth would spot, because the very

familiarity of seeing the regulator in the

night sky would cause them to take it

for granted. And the UCA knew that

intelligence sometimes leads to a dulling

of imagination, resulting in confusion

between ‘describing’ and

‘understanding’. Contrary to what some

intelligent individuals consider, the

ability to describe something does not

equate with understanding it.

The next levels of the message

needed to be more difficult to ignore.

The decision was made to create

number patterns that stand out as very

strange.

The UCA realized that it needed to

draw further attention to the artificial

nature of the regulator by building on a

truly fundamental number that

represented the planet. The number

that was chosen was the planet’s spin

rate per orbit of the star, which would

have to be instantly recognizable as a

value that was unique to the planet – a

natural PIN (personal identification

number) for an entire world. So, in this

case it was a Planetary Identification

Number that was required.

At the required time window, the

planet would be rotating at a rate of 366

revolutions for each orbit around its

mother star, and the use of the number

value 366 would therefore be easily

spotted as the Planetary Identification

Number.

The intelligent creatures would

recognize the PIN number from an

early date as it requires only very basic

astronomy to appreciate that this threedigit

number is the most fundamental

of all numbers that are unique to the

planet.

Surely these Earth-dwelling

creatures would be very surprised when

they calculated the relative size of their

planet to the orbiting regulator and

discovered that the one is 366 per cent

larger than the other.

The regulator was also engineered

with a PIN number that was

meaningful to the intended intelligent

creatures. That number would be the

reciprocal of the planet’s PIN number –

the mirror image of 366.

The mathematics was simplicity

itself. The regulator’s PIN number

would be arrived at by considering its

size as 100 per cent and dividing it by

the relative size of the planet, namely

366 per cent. Working to five decimal

places the result is:

100/366 = 0.27322

The regulator was then carefully

engineered so that at the key point in

time it would be orbiting the planet at a

rate of once every 27.322 planetary

days.

Surely, the creatures would notice

that? And as an extra layer, if they

looked at the issue the other way

around, the size of the regulator

compared to the planet has precisely the

same number value – being 27.322 per

cent of its parent.

Surely the intelligent Earth

creatures could not fail to be alerted by

such an unbelievably improbable

number matching? There is absolutely

no reason why the regulator’s orbital

period in planetary days should

numerically echo the relative size

relationship it also enjoyed with the

Earth.

The consequence of these

arrangements would not be lost on the

new life forms because they would easily

realize that for every 10,000 of their

planetary days, the regulator would

complete exactly 366 orbits of the

planet. Surely they would spot the use

of round base-ten numbers and the PIN

number 366 being echoed by the

regulator?

But then, if they did not recognize

these message patterns it would mean

that they still lacked the intelligence or

imagination to be considered mature.

**Fitting the Moon into the**

**Earth–Sun Model**

It struck us as extremely likely that the

UCA must have had some control over

the Earth’s rate of spin and its orbital

speed, so that they could ensure that it

got to the magic 366 rotations at the

required time. From everything that is

known about the Earth, its orbital speed

has been steadily decreasing for a long

time but to the astonishment of

scientists at the National Institute for

Science and Technology in Boulder,

Colorado, it suddenly stopped this

deceleration in 1999. CNN reported the

story on January 2nd 2004 saying:

‘Experts agree that

the rate at which the

Earth travels

through space has

slowed ever so

slightly for

millennia. To make

the world’s official

time agree with

where the Earth

actually is in space,

scientists in 1972

started adding an

extra ‘leap second’

on the last day of

the year.

For twenty-eight

years, scientists

repeated the

procedure. But in

1999, they

discovered the Earth

was no longer

lagging behind.

At the National

Institute for Science

and Technology in

Boulder,

spokesman Fred

McGehan said most

scientists agree the

Earth’s orbit around

the sun has been

gradually slowing

for millennia. But

he said they don’t

have a good

explanation for why

it’s suddenly on

schedule.’

This caused us to look up the actual

speed that the Earth has settled at in its

circumnavigation of the Sun, and we

were surprised to find that its mean

orbital velocity is almost exactly one ten

thousandth of the speed of light in a

vacuum. At 29,780 metres per second,

the variance is less than two-thirds of

one percent.

We thought that this was probably

a coincidence – but we could not pick

and choose which factors are, and are

not, significant. And we had to

remember that the value 10,000 had

already shown up in the number of

Earth days for every 366 lunar orbits.

We next turned our attention to

the Sun. The diameter of the Sun is

estimated at 1,392,000km and as the

average diameter of the Earth is

12,742km, so it follows that 109.245

Earths could be placed side by side

along the diameter of the Sun. This is

not a number that stands out for any

reason – at least not immediately. But

when we looked at the number of Sun

diameters in the Earth’s aphelion (its

greatest distance to the Sun) we found

that there are 109.267, effectively an

identical value because the estimate of

the Sun’s diameter is within this tiny

margin.

How strange. There are the same

number of Earth diameters in the Sun’s

diameter as there are Sun diameters

between the Earth and the Sun. This is a

near perfect echo that does not work for

any other planet in the solar system.

These numbers are ratios and are

therefore real and independent of units

of measurement. But the number also

stood out because there are 10,920.8km

in the Moon’s equatorial circumference.

At the time we noticed this, we

considered that it really did have to be a

coincidence because the number of

kilometres in anything just could not be

relevant since the metre is a unit that is

an invented human convention.

But then we realized that the Moon

turns at a rate of precisely one kilometre

every second at its equator and that did

strike us as very odd. Maybe we had

been too hasty in rejecting the role of

the metric system.

Our observations about the

patterns inherent in the size and

movement of the Moon, in terms of

ratios, stand out as being beyond mere

accident. Although we accept that the

apparent patterns that rely on units of

measurement, such as kilometres, are

far harder to accept without an

explanation of how this could have

come about. Any ‘reasonable’ person

would immediately reject such factors

as meaningless – but then we think

there is a great deal in the old adage that

‘all progress is dependent on the

unreasonable person’.

And some people would not even

get to the point of recognizing the

patterns in the ratios within the Sun–

Earth–Moon system. A scientifically

trained person looking at any one of

these points would almost certainly

respond by saying that ‘all numbers are

equally valid’. A value such as 100 or

40,000 dropping out of the mix is just

as likely as any other number.

We absolutely agree with this view

and we would ignore such results if they

were only happening once or even twice,

but we are confronting a whole list of

non random-looking values that add

up to create what would otherwise be

the most unlikely series of chance events

in the history of the cosmos. And, in

our view, anyone who dismisses all of

these points as coincidence is being

either very illogical or downright

dishonest.

It is absolutely true that if someone

tosses a coin 100 times and it comes out

heads every time, the chance of the next

toss resulting in another head is exactly

50/50. However, if this ever happens to

you in the real world, we would suggest

that, before you let them toss the coin

again, you check that it is not double

headed. Only a fool would not be

suspicious.

Scientific discovery has always been

a process of identifying patterns that

stand out from the chaos of random

events. For example, identifying areas

where there are more cases of a specific

illness is likely to point to a local factor

such as radioactive bedrock, a leakage of

harmful industrial effluence or a

contaminated food plant. When

something varies markedly from the

norm there is usually a reason.

If we look at the available

information logically, and without

preconceptions of what is and is not

possible, the Moon appears to have

been inserted into the Sun–Earth

relationship with the accuracy of the

proverbial Swiss clockmaker!

**A Recent Interaction**

It appears that no one has previously

spotted this message and we only came

across it because of our findings relating

to Megalithic units. We suspect that the

problem is one of too much knowledge

and a loss of the ability of experts, in

our super-technological world, to think

simply. Perhaps if Galileo or Isaac

Newton had access to the information

that we have today they would have

noticed these issues concerning the

Moon, but, alas, they did not have the

accurate measurements that we have

today and therefore they could not

observe the patterns. Today we have the

necessary information, but astronomers

are understandably more interested in

quasars, pulsars and all kinds of deep

space objects rather than the

fundamentals of the Earth–Moon

relationship.

We now needed to consider a

scenario that would explain how the

Megalithic Yard came to be involved in

this ultra-long-distance message.

Maybe the UCA was aware of the

potential problem of the message

headline being missed due to oversophistication

and took steps to inject

extra information near to the key

moment when the message needed to

be interpreted. Perhaps, we mused, the

UCA had stepped in at a number of key

points throughout the process of

human development.

These thoughts were more

complex than the set-and-forget

scenario of an unknown agency

building a planetary regulator that was,

in effect, an incubator for life. The idea

that some entity, probably an advanced

species from another galaxy, established

a mechanism to foster life and then

moved on seemed reasonable in the face

of such evidence. But to have an agency

that has maintained a periodic

involvement with humankind across

several billions of years is much harder

to reconcile.

However, we decided to stick to

our methodology of viewing the reasons

‘why’ ahead of dealing with the reasons

‘why not’. We needed to review the

material from ancient history and

prehistory that had brought us to look

so hard at the Moon.

Firstly we had to remember that it

was because the stone structures from

the fourth millennium BC were

apparently created to study the Moon,

that Alexander Thom began his lifetime

quest to investigate them. Could these

large standing stones be pointing

deliberately at the Moon and the Sun?

The orientation of the Megalithic

structures certainly led him to identify

the Megalithic Yard as being a unit of

82.96656cm – give or take 0.61cm. And

this in turn led us to the findings laid

out in this book.

As stated earlier, we had discovered

that the Megalithic Yard was merely the

starting point of a holistic measuring

system that dealt with linear distance,

mass, volume and time. It was an

utterly brilliant system and we found

that many modern units had descended

from it, such as the imperial pint and

the pound. We had been unable to

imagine how the pound and the pint

could have survived across so many

millennia but it is a fact of mathematics

that they are directly related, either by

design or by an incredible series of

coincidences.

To recap, the most intriguing fact

about the Megalithic Yard lay in the

way it had been ingeniously devised to

fit accurately into the circumference of

the Earth. Megalithic geometry was

slightly different to the 360-degree

geometry invented by the Sumerians,

which is still in use more than four

thousand years later. It had been based

on 366 degrees, apparently (and very

logically) because the Earth revolves

once on its axis whilst it travels in its

great orbital circle around the Sun.

Under this Stone-Age system of

geometry, each of the 366 degrees was

split into sixty minutes of arc and each

minute of arc into six seconds of arc.

The incredible beauty of the

system is that when the globe of the

Earth was treated as a huge circle, the

polar circumference of the Earth is

exactly the right size to give 366

Megalithic Yards to a polar second of

arc.

We had been very surprised at the

way the Megalithic Yard bisected the

circumference of the Earth, but what we

didn’t expect to discover was any direct

connection between the Megalithic Yard

and other bodies within our solar

system. And there are none – apart

from the Moon and the Sun.

The Moon has a beautifully neat

100 Megalithic Yards to each second of

arc, which could be a very odd

coincidence if it were not for all of the

other facts we discovered which point to

a whole range of round numbers. And

of course the Sun has an incredibly

round 40,000 Megalithic Yards to each

Megalithic second of arc. What a perfect

way to announce an awareness that the

Moon is exactly 400 times smaller than

the Sun.

We also noted that whilst the Sun

has 40,000 Megalithic Yards to a

Megalithic second of arc, the metric

system was designed so that the Earth’s

polar circumference would be 40,000

kilometres.

It had struck us as quite amazing

that anyone more than 5,000 years ago

could have created a unit of measure

that worked as a perfect integer of the

planet within such an elegant system of

geometry – starting and finishing with

the Earth’s PIN number of 366. Whilst

this was impressive, we were perplexed

at the apparent impossibility of creating

a unit and a geometry that produced

beautifully round integers on the Earth,

Moon and Sun. To do so should be as

close to impossible as anything can get.

Units that are integer, within the

same geometry, for two heavenly bodies

would be very difficult – but three?

That’s ridiculous! And yet the sums

spoke for themselves. The fact that the

approach did not work for any other

body in the solar system pointed to a

very special relationship for the Earth,

Moon and Sun.

The apparent impossibility of the

Neolithic inhabitants having had the

skills to develop such a marvellous

system is now resolved when we

introduce the unknown creative agency

because, if it started with knowledge of

the dimensions of the two original

bodies (the Sun and the Earth), it could

have engineered the Moon to made it fit

the same rules. Our hypothesis was,

therefore, to assume that the UCA

somehow instructed the Stone-Age

builders to adopt the system we call

Megalithic geometry.

In our previous book, *Civilization*

*One*, we speculated that the earliest

records of the Sumerians and the

ancient Egyptians were actually correct

when they claimed that their own

civilizations had been instructed in the

arts and sciences by an external agency.

In these records there are references to

people called ‘the watchers’ who taught

geometry, mathematics, astronomy,

agriculture and other sciences. The

indigenous population did not know

where these people had come from and

they described them as having

superhuman powers, although they

were clearly human beings and not

gods.

In around 3100 BC, ancient Egypt

became a united kingdom and its

period of recorded history began. At the

same time, the Sumerians were building

their great cities and developing

sophisticated techniques of

metalworking, glass manufacture and

agriculture. In the Indus valley of the

Indian subcontinent, the Harappa and

Mohenjodaro civilizations were also

constructing huge cities and in the

British Isles, superb megalithic

structures like Newgrange, Maes Howe

and the Ring of Brodgar were being

built. Is it not very strange indeed, that

within such a precise period of time the

whole world suddenly decided to step

up a gear and enter into a period of true

civilization?

We found it more than odd that

these unconnected peoples should all

take such a large step forward at exactly

the same time. And we have recently

come across very new information that

made our suspicions even greater. On

December 23rd 2004, new findings were

published that markedly revise the

dating of the first American

civilizations. It reported that evidence

now shows that the oldest civilization in

the Americas dates back far earlier than

previously thought – in fact right back

to 3100 BC, at which time complex

societies and communal building

suddenly appeared in Peru. This

emerging culture was the first in the

Americas to develop centralized

decision-making, formalized religion,

social hierarchies and a mixed economy

based on agriculture and fishing.

One member of the team that has

reported these findings in the preeminent

scientific journal, *Nature,* is

Jonathan Haas of the Department of

Anthropology at the Field Museum in

Chicago. He said:

‘The scale and

sophistication of

these sites is

unheard of

anywhere in the

New World at this

time, and at almost

any time. These

dates push back the

origins of

civilization in the

Americas to

something more

parallel to those of

the other great early

civilizations.’ 26

Some of the settlements that are

believed to have had at least 3,000

inhabitants included platform mounds,

thought to be pyramids, central plazas,

temples and housing. The largest

pyramid at Caral, known as the

Primade Mayor, is contemporary with

the earlier Egyptian pyramids, dating

from 2627 BC. From this data, the

archaeologists have concluded that there

was large-scale communal construction

and population concentration across the

entire area.

Dr José Oliver, a lecturer in Latin

American archaeology at the Institute of

Archaeology at University College

London, said: ‘This confirms that by

3100 BC monumental buildings were

already under way, not just at an

isolated site but across a whole region.’

As we have already stated, science

is about recognizing patterns. Humans

have not changed physically or

intellectually over the last hundred

thousand years but suddenly, just over

5,000 years ago, unconnected people

around the world began building major

structures and cities; but apart from

some Sumerian–Egyptian interaction,

these groups appear to have developed

quite independently. Archaeology has

not found obvious cross-cultural

artefacts so it is assumed that they all

blossomed at the same time through

sheer coincidence.

But if they appeared worldwide

because they had all benefited from the

instruction of an unknown creative

agency, one shouldn’t necessarily expect

an exact commonality of interpretation

of these ideas. Nevertheless, it is clear

that there are some significant cultural

connections such as the building of

pyramids and Venus worship.

There is, it seems, some very

powerful, albeit circumstantial, evidence

for an intervention by a highly

advanced group more than 5,000 years

ago. We have to admit, however, that

we cannot conceive how any agency

could have maintained contact with the

Earth’s development over several

billions of years. Nevertheless, we do not

see it as our place to reject information

just because we cannot explain it.

Everything depends on the ground rules

of the observer: if someone refuses to

look at obvious patterns because they

consider a pattern should not be there,

then they will see nothing but the

reflection of their own prejudices.

**Reciprocal Numbers**

As we reflected on what we had found,

the number play involved in the Earth–

Moon–Sun system was nothing less

than staggering. We were amused by the

charm of this virtual machine especially

when using the metric system. We

looked at this little equation using

kilometres:

(Moon x Earth)/100

= Sun

This means that if we multiply the

circumference of the Moon by that of

the Earth, the result is 436,669,140km.

If we then divide this figure by 100 we

arrive at 436,669km, which is the

circumference of the Sun, correct to

99.9 per cent.

How weird!

Of course, if we divide the

circumference of the Sun by that of the

Moon and multiply by 100 we get the

polar circumference of the Earth. And,

as we have pointed out, if we divide the

size of the Sun by the size of the Earth

and multiply by 100 we get the size of

the Moon.

None of this is magic or pointless

numerology. It may well be nothing

more than an amusing coincidence but,

given all of the ratio patterning we have

observed, it would be foolish to ignore

it.

However, the idea that kilometres

can be meaningful to issues regarding

the Moon is hard to swallow. Any

reader could be forgiven for doubting

what they read here. Nevertheless if

anyone chooses to check out the

numbers – it all works. And if you are

still not sure about the idea, have a look

at this fact; it certainly astounded us

when we came across it.

The Moon has a sidereal rotation

period of 655.728 hours, which means

it rotates once every 27.322 Earth days.

Given that the Moon has an equatorial

circumference of 10,920.8 kilometres,

this means that the Moon is turning at

400 kilometres per Earth day!

Just consider these unquestionable

facts as a whole:

The Moon is one

400th the size of the

Sun.

The Moon is 400

times closer to the

Earth than the Sun.

The Moon is

rotating at a rate of

400km per Earth

day.

Coincidence? Well, maybe – or maybe

not.

The Earth is rotating at 40,000

kilometres a day and the Moon is

turning at a rather precise 100 times

less. The Moon always faces the Earth as

it travels on its orbit around our planet

and yet the average distance is such that

the equatorial rotational speed is

precisely one per cent of an Earth day.

These figures are entirely checkable and

indisputable. How could all this be

accidental?

Surely, only a fool would not wish

to examine this situation further. Yet we

have to be realistic about how some

people will view our decision to consider

the apparently impossible. We are well

aware that many, and possibly most,

experts will turn a blind eye.

Terence Kealey**,** a clinical

biochemist and the Vice-Chancellor of

the University of Buckingham, wrote an

article in the (London) *Times* on

November 15th 2004 under the title

**‘**Who says science is about facts? They

only get in the way of a good theory’. In

this he recollected as follows:

‘When Charles

Moore was editing

*The Spectator* he

once asked me why,

of his contributors,

it was those trained

in science who were

the least honest…

Charles Moore had

supposed that

scientists would

revere facts, but that

supposition is a

myth: scientists

actually treat facts

the way barristers

treat hostile

witnesses – with

suspicion.

The mythmaker

was Karl Popper.

Popper was not a

scientist but a

political

philosopher who

proposed that

science works by

‘falsifiability’:

scientists discover

facts; they create a

theory to explain

them; and the

theory is accepted

until it is falsified by

the discovery of

incompatible facts

that then inspire a

new theory… Yet it

is a myth that

working scientists

always respect

falsifiability.

Scientists often

ignore inconvenient

findings.’

We could not agree more, and therefore

we will not be surprised if people ignore

the possibility that the metric system

just might be (crazy though it sounds)

fundamental in some way to the Sun

and the Moon as well as to the Earth.

The fact remains that, for some reason,

the kilometre demonstrates the essence

of the Sun–Moon–Earth relationship,

both in terms of size and orbital

characteristics.

As if all of this isn’t incredible

enough we must also address the fact

that the Moon has an orbit that makes

it a ‘mirror of time’. As we observed

earlier, the Moon mimics the Sun at key

points in the year. For example, whilst

the Sun sets in the north at the time of

the summer solstice, the Moon sets in

the south and when the Sun sets in the

south at the time of the winter solstice,

the Moon unerringly sets in the north.

This is an aspect of Sun and Moon

associations that undoubtedly seemed

like magic to our ancient ancestors and

is yet another reflection of the current

position and orbital characteristics of

the Moon.

**The Reasons Why Not**

We have a constructed a scenario that

fits all the facts but has deliberately

ignored some of the challenging

consequences that have arisen. We now

need to deal with the reasons why this

scenario might be wrong. Without the

intellectual tether of having to conform

to ideas that are within the bounds of

what is already accepted, we have

argued that an intelligent agency

constructed the Moon to enable life to

develop upon the planet we call Earth.

We have taken a holistic view and we

have not ignored any facts that we do

not wish to have in our picture of what

might have been.

The first problem that we thought

we confronted – that of motivation, has

been potentially answered in that it

might be part of a grand quest to

convert the Universe into an intelligent,

self-aware single entity at the end of

time. Such an idea would certainly

seem to sit well with the principles of

some Eastern belief systems such as

Hinduism.

The Moon was already

outrageously impossible before we

introduced the issues of the intricate

web of interrelated values, which we

have argued is a deliberate message.

With the number values that exist in the

ratios alone, we fail to understand how

anyone could seriously claim that they

are coincidences. But the biggest

challenge we have to confront is the

issue of how the Megalithic Yard and

the metric system came to be involved

with an artificial Moon constructed as a

life-support system for the Earth.

We cannot hide from the problem

that, if our deductions are accurate, our

unidentified creative agency has had

contact with us at least once over the

last 6,000 years. If this agency wished

humans to know what they had done –

and they (or it) are capable of making

contact so recently – then why don’t

they just turn up right now and tell us

what was done in the distant past,

instead of leaving messages on the

Moon?

We were puzzled. This did not

seem to make sense.

As we debated this tricky point, we

considered an alternative scenario that

would not require direct contact from

the UCA. Perhaps, we mused, the rise

of the Megalithic system and even the

metric system were programmed into

our planet, to the extent that humans

respond to these values quite naturally

and without knowing why. Perhaps the

gravitational effects of the Sun and the

Moon interact with the Earth’s own

gravity and the effects of its spinning

journey through space. It is known that

the spinning orbit of the Earth does

cause a disturbance in time-space, so

maybe the value that we have called the

PIN number, the value 366, is actually

the heartbeat of our planet. Perhaps we

cannot help but follow certain

numerical patterns?

We were raising questions faster

than we were solving problems but there

was a strong logic to this notion. We

knew that the ancient Sumerians had

used a system virtually identical to the

metric system in the middle of the third

millennium BC, with a double kush

that was 99.88 per cent of a metre. This

unit was accompanied by others that

were virtually a litre and a kilo.

We had already noted that the

second of time appeared to be real in

some way, rather than just an abstract

convention. On Earth a pendulum that

swings at a rate of once a second will

have a length of a metre, with tiny

variations dependent on the user’s

precise distance from the planet’s core.

Perhaps the values programmed

into the Earth by the UCA were so

fundamental that any intelligent life

form evolving on the Earth would

respond to them. The relatively recent

discovery that pendulums appear to go

haywire during a total eclipse could

point to brief interruptions of this

Earthly harmony. We were aware that

we were putting speculation upon

speculation but it made sense. And we

have to remember that we are not trying

to displace any well-reasoned theory

already in existence, so these possibilities

have the benefit of being alone in fitting

all of the known facts.

The bottom line to all this is that

some unknown creative agency made

the Moon out of parts of the Earth so

that it would act as an incubator for life.

The next question to confront was this:

What was put into the incubator so that

it would eventually grow into an

intelligent life form? Setting up the

hardware was impressive enough but

what software was used?

*‘A super-intelligence is the only*

*good explanation for the origin*

*of life and the complexity of*

*nature.’*

**Professor Anthony Flew, December 2004**

Not very long ago, religion was the only

guide to the way the world was

perceived. For right or for wrong the

various scriptures of theological

tradition provided a way of making

sense of everything from the miracle of

birth to the movement of the stars in

the sky. But today we have rational

thinking – we have science.

The word ‘science’ is from the

Latin *scire*, meaning ‘to know’ and it is

concerned with the organization of

objectively verifiable sense experience. In

other words, it makes sense of the way

we see the world in a testable and

verifiable way. It seems that there is

nothing that science cannot explain

given enough time and study. From

Anthropology to Zoology, the people of

the twenty-first century have experts

who can explain where almost

everything came from and how it

works.

But science does have its limits.

The Heisenberg uncertainty principle,

for example, means that we cannot

exactly know the position and the

momentum of a particle

simultaneously. We can choose one or

the other – but we cannot have both.

And there is at least one subject that

science appears to be unable to explain.

The origin of life.

In his book, *How to Think Straight,*

Professor Anthony Flew has pointed out

that practical reasoning and clear

thinking are essential for everyone who

wants to make proper sense of the

information we receive each day. He

stresses the importance of being able to

quickly know the difference between

valid and invalid arguments, the

contradictory versus the contrary,

vagueness and ambiguity, contradiction

and self-contradiction, the truthful and

the fallacious. These, he says, are the

qualities that separate clear thinkers

from the crowd.27After sixty-six years as

a leading champion of atheism and

logical thinking, Professor Anthony

Flew has made sense of new

information which has led him to state

that science appears to have proven the

existence of God. Flew’s reason for this

monumental about turn is the

discovery of evidence that shows that

some sort of intelligence must have

created the world we inhabit. He has

particularly pointed to the investigation

of DNA by biologists, which has shown

that an unbelievable complexity of the

arrangements are needed to produce

life; leading to the conclusion that

intelligence must have been involved.

We have bemoaned the lack of

objectivity that often pervades the

academic community but we must

applaud a man who is prepared, at the

age of eighty-one, to throw away the

cornerstone of his life’s work. That takes

guts!

The first the world knew of Flew’s

change of heart was his letter to the

August–September 2004 issue of the

*Philosophy Now* journal where he stated:

‘It has become inordinately difficult

even to begin to think about

constructing a naturalistic theory of the

evolution of that first reproducing

organism.’

Flew is a man of principle and

when he was asked if his startlingly new

ideas would upset some people, he

responded by saying, ‘That’s too bad…

my whole life has been guided by the

principle of Plato’s Socrates: Follow the

evidence, wherever it leads.’

How refreshing. That is exactly

what we are trying to do with the

information we have gathered about the

Moon and the origins of life on our

apparently designed incubator.

We have arrived at a point where

we need to try and understand the

emergence of life. And we find, at this

precise moment, that the old

assumptions about how life originated

have been thrown out of the window.

The first question we asked

ourselves is: What do we mean by ‘life’?

We use the term to cover all kinds

of organisms from cyanobacteria to

plants and animals. The essence of life

is reproduction, the formation of

identical or near identical copies of a

complex structure from simple starting

materials. The increase of complexity

involved in the formation of living

organisms from their precursors

distinguishes the processes of biological

growth and reproduction from physical

processes such as crystallization. This

local increase of complexity can also be

described as a decrease of entropy,

which we have already speculated might

be the motivation of the unknown

creative agency that seeded and

promoted life on Earth.

But where is the boundary of what

is and what is not a life form. Is, for

example, a virus a living entity? The

standard answer is ‘no it is not’, but that

is now seen as a very debatable point.

Viruses cannot replicate on their own

but can do so when they occupy a host.

In the late nineteenth century,

researchers realized that some diseases

were caused by biological objects that

were then thought to be the simplest

and smallest of all living, gene-bearing

life-forms. Throughout most of the

twentieth century, though, viruses have

been designated as non-living material.

All living organisms possess a

genome, which is the set of instructions

for making the body, and this is always

composed of nucleic acid. It is usually

DNA (deoxyribonucleic acid) or in the

case of some viruses, RNA (ribonucleic

acid). The genome consists of a number

of genes, each of which is a segment of

nucleic acid coding for a particular type

of protein molecule. In October 2004,

French researchers announced findings

that blurred the boundary once again.

Didier Raoult and his colleagues at the

University of the Mediterranean in

Marseille announced that they had

sequenced the genome of the largest

known virus, Mimivirus, which had

been discovered in 1992. This virus,

about the size of a small bacterium,

contained numerous genes previously

thought to only exist in cellular

organisms. The virus is therefore a very

smart bit of ‘dead’ matter or it is part of

a unique club of entities only known to

exist upon Earth.

The remarkable nature of living

matter caused astrobiologist Paul Davies

to observe in December 2004:

‘Most people take

the existence of life

for granted, but to a

physicist like me it

seems astounding.

How do stupid

atoms do such

clever things?

Physicists normally

think of matter in

terms of inert, clodlike

particles jostling

each other, so the

elaborate

organization of the

living cell appears

little short of

miraculous.

Evidently, living

organisms represent

a state of matter in

a class apart from

the rest.’

**The Solution that**

**Identified the Problem**

Back in 1953, when Watson and Crick

discovered the helical structure of the

DNA molecule and the general way that

it coded the formation and replication

of proteins in cells, it seemed that a

plausible scientific explanation for the

origin of life was about to be assembled.

The laboratory synthesis of amino acids

from basic chemicals further heightened

the expectations that humankind was

on the verge of creating a living cell.

It was suggested that the early

Earth, through a mixture of volcanic

activity and landmass weathering, had

acquired oceans rich in nutrients and

chemicals – known as ‘the primeval

soup’. It was in the constant mixing and

intermixing of chemicals, and probably

with the aid of lightning strikes, that the

first primitive life had come into

existence – or so the evolutionists

suggested. Experts remained confident

that the primeval soup theory was the

most likely explanation and were

convinced that, given time, someone

would manage to create life in a

laboratory.

Soon after Watson and Crick’s

discovery, Stanley Miller, a graduate

student from Chicago University, cooperated

with Harold Urey, a Nobel

Prize winner, to recreate the exact

circumstances that are believed to have

existed in the primeval soup of the

infant Earth. Their soup contained

water vapour, hydrogen, methane and

ammonia. It was estimated that

lightning had played a part in the

emergence of life, so Miller and Urey

provided an electrical spark to their

chemical soup and eventually succeeded

in creating simple amino acids.

‘Hooray!’, they and everyone else

concerned said, because amino acids are

a major component of organic life.

Unfortunately, more than half a

century later, no one has come any

closer to actually creating life than this.

It has also been pointed out that

the amino acids created by Miller, Urey

and others are but a tiny few of the

constituents required for life. In any

case, the experiment was very selective

in its methods. Amino acids are referred

to as being left- and right-handed, both

of which were present in Miller and

Urey’s soup, whereas life uses only lefthanded

amino acids. What is more, the

very electrical spark that created the

amino acids would also have destroyed

them, so they had to be artificially

isolated in the experiment.

It might be thought reasonable

that if life once formed in the oceans, it

would continue to do so today. In

reality this can’t happen because the

mixture of temperatures, chemicals and

gases present is wrong. It was generally

accepted that life could not

spontaneously appear in an oxygen rich

atmosphere and so the evolutionists

had to suggest a very different sort of

atmosphere on the infant Earth.

(Oxygen, whilst preserving life, destroys

organic molecules that are not alive.)

Generating life in the laboratory

proved to be utterly impossible and

researchers began to realize that new

natural laws would need to be

discovered to explain how the high

degree of order and specificity of even a

single cell could be generated by

random, natural processes.

The DNA molecule is in the form

of a double helix – rather like a ladder

twisted into a spiral. The bases of the

DNA are found in pairs and these make

up the rungs of the ladder that carry the

information to replicate the entity.

When DNA copies itself, the ladder

breaks down the middle of the rungs.

New bases are matched to the bases of

each upright and so the original DNA

molecule then becomes two new

identical molecules of DNA.

Information necessary to build new

proteins, and to perform other

necessary chemical changes, is taken to

various parts of a cell by another

molecule, this one being ribonucleic

acid (RNA). RNA is similar to DNA but

is only a single helix. RNA is therefore

the ‘messenger’ that allows the

information held within DNA to be

distributed and acted upon.

An important question remains,

and it is one that science still cannot

answer. How did DNA come about in

the first place, because as things stand

now, only DNA can create DNA.

Some chromosomes contain

extremely long strings of DNA of more

than a metre in length, which is colossal

considering the microscopic nature of

the DNA molecule itself. However, the

question that has puzzled everyone

concerned is the origin of this process,

because all enzymes are proteins and

protein synthesis must be directed by

DNA. Yet, DNA replication cannot take

place without these proteins. So, what

came first – the protein or the DNA?

The problem goes right back to the

origin of all life. But it is a problem that

appears to have no answer. What is

certain is that amino acids, nucleotides,

lipids and other multi-atom molecules

can be manufactured at random by

heat, for example from lightning strikes.

They can also come about from

sunlight and other sources of energy

that don’t themselves have life. Many

ideas have been put forward to explain

the occurrence of DNA but none of

them can be more than educated

guesses.

But as we were researching this

book a new theory appeared, and it is

one that has gained favour with many

experts. This theory suggests that DNA

exists thanks to the presence of Earth’s

Moon!

Four billion years ago, the orbit of

the Moon was much closer to the Earth

than it is today. At this time, the Earth

was spinning much faster on its axis

and phenomenal tides were being raised

on the Earth, by the constant passing of

the Moon. With the Moon so much

closer to Earth the height of the tides

would have been colossal (see chapter

5).

Richard Lathe, a molecular

biologist at Pieta Research in Edinburgh,

has suggested that within the

primordial oceans, constantly dragged

back and forth by the passing of the

Moon, DNA could have been rapidly

multiplied. 28

One of the most commonly held

theories regarding the origin of DNA is

that it emerged when smaller, precursor

molecules in the waters of the early

oceans – ‘primeval soup’ – came

together or were ‘polymerized’ into long

strands. These long strands, it is

suggested, became the templates for

more molecules to attach themselves

along the templates, which eventually

resulted in double-stranded molecules

like DNA.

Richard Lathe suggests that the

problem lies in the need for some

mechanism that would constantly break

apart the double strands, in order to

keep the process going. He maintains it

would have taken some external force to

dissociate the two strands.

It is at around 50°C that single

DNA strands act as templates for

synthesizing complementary strands,

whereas at the higher temperature of

about 100°C, these double strands break

apart and this doubles the number of

molecules. When the temperature falls,

the process begins again. The number

of replications grows exponentially with

just forty cycles producing a trillion

identical copies.

A billion years after the Moon

came to orbit the Earth, it was extremely

close to its host planet and the Earth

was spinning much faster than it is

now. The tides, as Lathe suggests, must

have extended several hundred

kilometres inland, which meant that

coastal areas were subjected to rapid

changes in salinity and this would have

led to repeated and very frequent

association and dissociation of doublestranded

molecules similar to those of

DNA.

As the huge tides advanced, salt

concentrations would have been very

low. Even modern double-stranded

DNA breaks apart under such

conditions, because electrically charged

phosphate groups on each strand repel

each other. However, when the tides

receded, precursor molecules and

precipitated salt would have been

present in high concentrations. Lathe

claims that this would have encouraged

DNA-like double-stranded molecules to

form, because high salt concentrations

neutralize DNA’s phosphate charges

and this allows strands to stick together.

It is these constant salty cycles and

changes in temperature that, Lathe says,

would have amplified molecules such as

DNA but he points out that the tidal

forces were absolutely vital in the

process. Whilst it is true that the Sun

also creates tides on the Earth, these are

of a very low magnitude compared to

those caused by the much closer Moon.

Three billion years ago it was closer still.

Without DNA there could be no

life because it stands at the very heart of

the replication of living matter. From

the single-celled amoeba to the largest

blue whale on our planet, DNA is the

vital component that began life and

which keeps it going. Perhaps Richard

Lathe is correct and it was the presence

of so large a Moon that began the

chemical process that led to us, but it

does remain a fact that despite all the

theories, no scientist has yet managed to

take the various chemicals that

comprise life and arrange them in such

a way that they become even the very

simplest life form.

Lathe’s theory could explain how

the Moon caused the early replication of

DNA but its origin remains a complete

mystery, and many scientists are quite

unsettled about the theory of how life

came into existence in the first place.

For example, David A Kaufmann PhD,

of the University of Florida said,

‘Evolution lacks a scientifically

acceptable explanation of the source of

the precisely planned codes within cells

without which there can be no specific

proteins and hence, no life.’

Admittedly David Kaufmann is a

creationist, so maybe we can expect him

to come to this conclusion. But then

there is Professor Hubert P Yockey, a

physicist from the University of

California – who is most definitely not

an adherent of creation and is

concerned that discredited ideas

continue to clog up the process of

seeking out the truth. He wrote:

‘Although at the

beginning the

paradigm was

worth

consideration, now

the entire effort in

the primeval soup

paradigm is selfdeception

on the

ideology of its

champions…

The history of

science shows that a

paradigm, once it

has achieved the

status of acceptance

(and is incorporated

in textbooks) and

regardless of its

failures, is declared

invalid only when a

new paradigm is

available to replace

it. Nevertheless, in

order to make

progress in science,

it is necessary to

clear the decks, so

to speak, of failed

paradigms. This

must be done even

if this leaves the

decks entirely clear

and no paradigms

survive. It is a

characteristic of the

true believer in

religion, philosophy

and ideology that

he must have a set

of beliefs, come

what may (Hoffer,

1951). Belief in a

primeval soup on

the grounds that no

other paradigm is

available is an

example of the

logical fallacy of the

false alternative. In

science it is a virtue

to acknowledge

ignorance. This has

been universally the

case in the history

of science as Kuhn

(1970) has

discussed in detail.

There is no reason

that this should be

different in the

research on the

origin of life.’ 29

Yockey makes this statement because,

like many other scientists, he cannot

believe that the question regarding the

emergence of life can be answered at all

well by the primeval soup theory. Like

the Double Whack theory of the

Moon’s birth – it is simply wrong and

obfuscating progress to a workable

explanation.

The main reason there is so much

unrest about this question is because

DNA cannot exist without life, and life

cannot exist without DNA. The two are

totally interdependent and create a

chicken-and- egg situation that seems

impossible to resolve.

It occurs to us that even the

theories of Richard Lathe, on the way

the Moon may have contributed to the

rapid spreading of life through huge

tides and chemical mixing, come no

closer to explaining how life actually

came about.

Some experts still claim that it

must have happened by accident,

presumably because the other

possibilities are too hard to swallow.

However, it would be far more sensible

to claim that fairies from Neverland did

it.

**The Probability Problem**

Nobody doubts that the information

contained in a single gene must be at

least as great as the enzyme it controls.

However, just one average protein

contains over 300 amino acids. In order

to create the protein it would take a

gene of DNA that would have to

contain 1,000 nucleotides in its chain.

Every DNA chain contains four sorts of

nucleotide. This seems complicated but

it results in a possible 4 x 101000 possible

forms. For those who do not realize, 4 x

101000 represents the number 4 followed

by 1,000 zeros.

These are values beyond all

comprehension. To get some

perspective on this, it is interesting to

note that it is estimated that there are

only 10 x 1080 particles in the whole

Universe. One begins to realize how

utterly impossible it would have been

for complex DNA to be accidentally

created in the primeval soup of the

young Earth.

In the world of probability, some

things are very likely to happen, others

might sometimes happen but some can

never happen at all. An expert in

probability, Emile Borel (1871–1956)

claimed that phenomena with very

small probability don’t occur. He

estimated that there would be about one

chance in 10 x 1050 for a small

probability. Minute though these odds

were, they weren’t remote enough for

more modern experts in probability.

William M Dembski, associate research

professor in the conceptual foundations

of science at Baylor University and a

senior fellow with Discovery Institute’s

Center for Science and Culture in

Seattle, decided to go further. He

estimated that there were 10 x 1080

particles in the Universe and wondered

how many times per second an event

might occur. The number he came up

with was 10 x 1045. He then calculated

the number of seconds from the

beginning of the Universe to the present

time and then, to make sure he was

erring on the side of caution, he

multiplied this number by one billion

and arrived at the number 10 x 1025

seconds. He now multiplied all the

figures together achieving a result of 10

x 10150 for his Law of Small

Probability.30

For a minimum living cell there

are 60,000 proteins of 150

c o n f i g u r a t i o n s . 31 Joseph A

Mastropaolo, an expert who has tackled

this problem at length, estimates that

the probability of the evolution of this

first cell would be an absolutely

staggering 1 in 10 x 104,478,296 or 10

followed by 4,478,296 zeros. This

exceeds Dembski’s estimation for Small

Probability by such a great margin that

were it not for the fact that DNA does

clearly exist, no self-respecting scientist

could uphold the possibility of it having

originated by chance.

If every particle in the Universe

had one chance for every second since

the beginning of time – we still would

not have DNA.

In case there are readers who doubt

Mastropaolo’s scepticism regarding the

possibility of DNA creating itself from

scratch, it is interesting to see that he is

far from alone. Peter T Mora of

Macromolecular Biology Section,

Immunology Program, National

Cancer Institute, Bethesda, Maryland

wrote: ‘The presence of a living unit is

exactly opposite to what we would

expect on the basis of pure statistical

and probability considerations.’32

The English scientist J D Bernal

said, way back in 1965: ‘The answer

would seem to me, combined with the

knowledge that life is actually there, to

lead to the conclusion that some

sequences other than chance

occurrences must have led to the

appearance of life as we know it.’33

And to add to the list of dissenters

regarding a theory that clearly doesn’t

hold water, primeval or not, we have

the opinion of the late Professor Sir

Fred Hoyle, one of the most respected

astronomers who has ever lived. ‘Rather

than accept that fantastically small

probability of life having arisen through

the blind forces of nature, it seemed

better to suppose that the origin of life

was a deliberate intellectual act. By

“better” I mean less likely to be

wrong.’34

However, no matter how great and

how many the howls of indignation at

this complete disregard of probability,

one of the fundamental tools of science,

it remains a fact that DNA did occur

somehow. As the saying goes, nature

abhors a vacuum of any sort. No matter

how much Professor Yockey may

suggest that if we have no viable theory

we should exist without it until one is

discovered, it seems that to many

scientists a twisted and broken

paradigm is better than none at all.

After all, the alternative might be

unthinkable to most experts. We might,

for example, have to consider the

possibility of a ‘mind’ behind the

creation of DNA, even if we can accept

evolution as a viable theory once DNA

existed.

The majority of scientists would

prefer to break their own rules rather

than to evoke the deity, but even

Professor Sir Fred Hoyle was left with

the only conclusion that could occur to

him, namely that the Universe was

under some sort of ‘intelligent cosmic

control’.35 Is this the way forward? If we

are going to be truly honest, bearing in

mind the utter impossibility of the

chance occurrence of DNA, might we

have to accept that ‘God spoke and it

was so’?

Who can blame Anthony Flew for

turning a lifetime’s work on its head

and saying: ‘A super-intelligence is the

only good explanation for the origin of

life and the complexity of nature.’

However, Flew’s definition of God

bears little resemblance to the deity of

Judeo-Christian-Islamic tradition,

which he describes as being depicted as

‘omnipotent Oriental despots – cosmic

Saddam Husseins’. He is actually

describing something as open as our

own ‘Unknown Creative Agency’ –

which presumably might mean

virtually anything from a sublime single

entity to a galactic federation of planet

seeders!

**The Seeds of Life**

Some sixty years ago, when quantum

theory first emerged, physicists thought

the mystery of life was about to be

resolved. By looking at the tiniest

building blocks of matter it was starting

to explain how everything worked – so it

surely would also explain the essence

that we call life. They were to be

disappointed, but recent developments

have raised the hopes of some scientists

that the nature of first life might be

explained by new levels of

understanding about sub atomic

behaviour in biology.

In 2004, these new ideas caused

NASA to convene a workshop of

leading scientists to discuss the subject

of ‘quantum life’ at their astrobiology

laboratory in Ames, California, where

discussion covered fields such as

nanotechnology and quantum

computation.

Nanotechnology is concerned with the

manufacture of artefacts or machines

that are assembled on an atom-byatom

basis. A nanometre is an almost

unbelievably small unit of length. A

human hair is typically about one

10,000th of a metre in diameter and a

common cold virus is approximately

one thousandth of this size. A typical

protein unit making up the coating of

such a virus is typically ten nanometres

thick – equivalent to about 100 atomic

diameters, or the size of one of the

amino acid groups making up that

protein molecule.

A whole new world of technology is

envisaged from building self-replicating

machines that could, for instance, carry

out surgery at a cellular level inside the

human body. However, an increasing

number of scientists are suggesting that

nature may have used this idea a long

time ago. As Professor Paul Davies has

pointed out, the living cell is full of

nanomachines designed and refined by

biological evolution. And he posed the

question: ‘Could it be that some of

them acquired their amazing properties

by deploying fancy quantum tricks?’36

He says: ‘One vital part of a cell’s

reproductive machinery is a little

motor, called a polymerase enzyme,

which crawls along unzipped strands of

DNA and forges the links that match

up the unpaired nucleotide bases with

complementary bases floating through

its environment.’

Apoorva Patel of the Indian

Institute of Science, believes that living

cells may use quantum mechanics to

boost their information-processing

efficiency, which could explain why the

genetic code is the way it is, and why it

is found in all organisms. As Davies

points out, quantum theory describes

atoms and molecules as waves, which

can overlap and combine coherently –

known as superposition. This means

that the normal rules of time/space do

not apply and an atom can exist in a

superposition of excited and unexcited

states, or of states corresponding to

several spatial locations at the same

time. These superpositions are expected

to be the basis of quantum computers

that will be able to hunt for a target

among a jumble of data. This is said to

be equivalent to finding a name in a

telephone directory when you know

only the phone number.

The role of quantum theory in the

origin of life is not yet clear. But it

seems that the new technologies that

humankind is now investigating may be

at the root of life itself. Paul Davies

acknowledges that life somehow

emerged from the ferment of the

quantum molecular world, and he

adds:

‘The role of

quantum processes

in living matter is

still unclear. It is

entirely possible

that quantum

mechanics was the

midwife of life, but

has played an

insignificant role

since… All scientists

agree that life

somehow emerged

from the ferment of

the quantum

molecular world.

The key issue is on

which side of the

quantum-classical

divide the transition

to life occurred.

Niels Bohr once

said that anyone

who is not shocked

by quantum

mechanics hasn’t

understood it. I

believe that anyone

who is not shocked

by life hasn’t

understood it. The

question before us is

whether quantum

mechanics is

shocking enough to

explain life.’

It seems to us that whoever seeded life

on our planet, all those billions of years

ago, was using a form of self-replicating

‘technology’ which will eventually come

to be understood. And we might not be

that far from that understanding now.

**Who Built the Moon?**

At this point we are as sure as we

possibly can be that the following

statements are true:

1. The Moon is

approximately 4.6 billion

years old.

2. The Earth is

approximately 4.6 billion

years old.

3. The Moon was

manufactured from

lighter materials taken

from the young Earth.

4. The Moon was made as

an incubator to foster life

on Earth.

5. The manufacturer of the

Moon seeded life on

Earth.

6. Evolution as described by

Darwin is broadly

accurate.

The manufacturer of the Moon left

deliberate messages, intended to be read

by humans at this point in geological

time, to draw attention to what they

have done.

It appears reasonable to assume

that the manufacturer of the Moon (the

UCA) has a good reason for wanting

humans to understand what was done.

The UCA could have seeded life and

moved on, if its motive was pure

altruism. It therefore seems that it is

important to work out who built the

Moon.

It seems certain that we have only

identified the first ‘introduction’ aspect

of the message from the UCA. The

details of the message are likely to hold

the key to the next phase of human

development: information that will

change our destiny forever.

We believe that we have succeeded

in identifying the key numbers that will

be used in deeper layers of the detailed

communication. We trust that others

will take up the challenge of interpreting

other aspects of the message, but our

immediate task is to try and work out

who built the Moon.

And we believe there are only three

possibilities.

*‘And God made two great*

*lights; the greater light to rule*

*the day, and the lesser light to*

*rule the night: he made the*

*stars also.’*

**Genesis 1:16, The King James Bible**

Good things and terrible things have

always happened to mortal man. The

warmth of spring, the survival of

infants, the provision of animals to

hunt, plants to harvest and freedom

from disease must surely be the work of

an unseen force with powers far beyond

than that of mere people. So too, the ills

and woes of failed crops, floods and

death wrought upon whole tribes by war

and desperate want. It must be the will

of the gods.

Thank the gods, fear the gods,

appease the gods.

Religion is as old as the stories that

humans first told. From the early Stone

Age to the Internet Age, humankind

appears to need the power of deities that

inhabit an unseen world and yet have

the power to affect the lives we live. The

greatest love and the greatest hate spill

forth in the name of gods.

Today, the great religions of the

world tend to describe the gods in the

singular as God, even though they all

refer to many aspects under different

names.

The Hindu tradition has ideas that

are increasingly seen as corresponding

with modern science. It perceives the

existence of the cyclical nature of the

Universe and everything within it, where

the cosmos follows one cycle within a

framework of larger cycles. The

Universe has been created and reached

an end, but it represents only one turn

in the perpetual ‘wheel of time’, which

revolves infinitely through successive

cycles of creation and destruction. This

cycle of creation and destruction of the

Universe could be seen as a series of Big

Bangs and Big Crunches, where all

matter explodes outwards from

nowhere and then recedes back again.

Within these gigantic cycles the soul also

undergoes its own cycle, called samsara

– where death and rebirth sees the same

souls repeatedly reincarnated.

Meanwhile, Christianity is a broad

church indeed, covering an incredible

span of beliefs. At one end of the

spectrum there are many scientific

thinkers – including at least two Fellows

of the Royal Society. One of them, John

Polkinghorne, was a mathematical

physicist before resigning his position as

a professor at Cambridge University in

1979 to be ordained as priest in the

Church of England. Polkinghorne has

since devoted his life to exploring the

connections between science and

theology, describing the Universe as

open and flexible – a place where

patterns seem to exist and where he says

the ‘providential aspect’ cannot be ruled

out.

Many Christians fully support

science and have no problem with

evolution, quantum mechanics or the

big bang origin of the Universe. For

them it is simply a question of the

authorship of the blueprint that

obviously exists. The designer of all this

is their God. And yet they also believe in

an event that others would find

incredible. Without wishing to be

disrespectful, we would précis that event

as follows: The initial intellect that

created everything became a man and

died, nailed to a wooden post, some two

thousand years ago, before briefly

returning to human life and then

transferring back to His ethereal state

somewhere outside of the physical

world. This anthropoid interlude for

this creator deity (many billions of years

after the start of the Universe) is

believed to compensate for the bad

behaviour of those people who accept

this story as real, thereby ensuring a

pleasant continuation of consciousness

after their physical body has ceased to

be alive.

At the other end of the Christian

belief are the creationists. They hold

that a collection of ancient Canaanite

and Mesopotamian myths, from at

least three separate traditions and first

written down in the sixth century BC by

Jewish priests, are a literal account of

how the world came into being. They

take an uncomplicated view of life and

consider that all species are unchanging

and derive their forms from an

unchanging, divine blueprint. To a

creationist a rose is a rose is a rose, and

it is foolish to think that a rose bush

could become a daffodil, or an apple

tree. They see God’s plan as timeless

and unchanging, with separate types of

plants and animals that have nothing to

connect them. For them the world and

everything within it was created in six

days of a single week, somewhere

around 4004 BC.

It is of central importance to

creationists that there is an absolute

divide between humans and other

animals. They often use the phrase

‘don’t let them make a monkey out of

you’ in the mistaken belief that

evolutionists claim that humans

developed from monkeys.

Buddhist philosophy is

evolutionary and in many ways agrees

with mainstream scientists. Buddha

taught that all things are impermanent,

constantly arising, becoming, changing

and fading. Buddhist philosophers

consequently rejected the Platonic idea

of production from ‘ideal forms’ as

being the fallacy of ‘production from

inherently existent other’. According to

most schools of Buddhism there is

nothing whatsoever that is inherently or

independently existent.

Buddhist philosophers have always

accepted that the Universe is billions of

years old and they have no

corresponding creation myth to that of

the Judaeo-Christian tradition. Unlike

creationists, Buddhists believe that both

humans and animals possess sentient

minds that survive death.

There are many people today who

are agnostic, meaning that they do not

see any proof of God but neither do

they believe it to be impossible that

there could be a God. Perhaps a small

minority of the world are true atheists

believing that all matter, including their

own self-awareness, is merely the

culmination of multiple accidents

occurring at random within the basic

laws of physics.

The classical argument for God

has been that there must have been a

‘first cause’ but this is considered to be

invalid by relatively modern

philosophers such as David Hume and

Immanuel Kant, because the thesis is

negated by its own premise. If

everything must have a first cause then

what made God? It therefore follows

that the Universe could arrive

spontaneously just as much as God

could.

But, it occurs to us, what if God

and the essence of the Universe were,

and are, the same thing?

**God in Contact**

Human societies have probably always

developed the idea that the world they

see around them must have a conscious

mind behind it. And the Judaeo-

Christian tradition holds that God has

had quite regular contact, particularly

with His chosen people, from Adam

through characters such as Enoch,

Noah, Abraham, Moses, Ezekiel, Isaiah

and John the Baptist (Jesus Christ

cannot count because that would be

God talking to Himself). Following the

crucifixion of Jesus, God, or members

of His ethereal team, are believed to

have had contact with inspired

individuals from St Paul to Joan of Arc,

and there have been many miraculous

appearances at locations such as

Lourdes in France, Fatima in Portugal

and Knock in Ireland.

These visitations are held to be

wonderful by believers and considered

baloney by others. Apart from the

apparent miracle of existence itself, all

other aspects of God require faith. Faith

could be described as intellectual belief

that transcends normal standards of

proof. In other words, the individual

with faith holds things to be true that

are not evidenced in a form that

rational science would accept.

But what would happen if God

suddenly turned up in an unambiguous

way; if the creator of the Universe

appeared, in person, on the Earth with

positive proof of identity?

Logic says it could not happen

because it is likely that only the

agnostics would be happy. Those who

would be most likely to welcome the

coming of God are, by definition, the

people with the most complex belief

systems. And every group (possibly

except one) would be disappointed.

Would Mormons be told they had it

right after all or maybe Roman

Catholics?; or maybe some followers of

Mohammad or Siddhartha Gautama

or any one of the countless prophets

down the ages.

Imagine the Pope and the Dalai

Lama sitting shaking their heads in

disbelief as it turns out that the

Australian Aboriginal people and those

of the Japanese Shinto faith both had it

right when they called God Izanagi.

Surely, it would have to be those with

the most religion who would have the

most to lose.

But then, it is not likely that they

are all correct in some way and that

God is actually non-denominational.

What if He now considers that the

childhood of the human race is over

and we are now grown up enough to be

told the true mysteries of existence – he

might choose to make gentle contact to

let us know that in some way ‘we had

arrived’.

It is our initial thought that the

number patterns built into the Moon

and its relationship with Earth, could be

a first global contact with God Himself.

Such an event would change everything.

If God formally made his presence

known, who would dare wage a war in

His name? The world might listen

carefully instead of proclaiming its right

to speak on His behalf from the

churches, synagogues, mosques and

temples around the globe.

What evidence is there that this

message could be from God?

The first problem is one of

definition. What do we mean when we

speak of God? For recent convert,

Anthony Flew, God is simply the

creative force that does not interact with

people, but for many millions of others

He is a benign father figure who listens

to their prayers.

Upon reflection, the only way to

deal with this point is to ignore it. If the

human species has reached the end of

its ‘childhood’, the nature of God will

be appreciated in a new light anyway.

The most fundamental case for the

God scenario, when it comes to the

message the Moon has to impart to us

about its artificial construction, is that

any entity who created our world is

God, almost by definition. Scriptures

from all around the world attribute the

making of our planet and the heavens

to a creative force that usually has a

special relationship with humankind.

That relationship is so special in

Christianity that it is central to the very

belief system that the creator of our

world actually became a man for thirtythree

years some two millennia ago.

The fact that the numbers used in

the Moon’s message are in base ten,

implies that the UCA knew that the

intelligent species that would evolve on

Earth would have ten fingers. God

would know that. It is also clearly the

case that the UCA knew that it would be

at this particular point in the Earth’s

history that humans would be ready for

the next stage of their relationship with

God.

The story told in the Book of

Genesis in the Old Testament would

turn out to be remarkably correct and

even the Christian creationists would be

right in part.

‘In the beginning

God created the

heaven and the

earth.’

In this scenario, God did create the

Earth and the heavens, and by

regulating its attitude with the Moon

caused it to have liquid water on its

surface:

‘And the earth was

without form, and

void; and darkness

was upon the face

of the deep. And

the Spirit of God

moved upon the

face of the waters.’

In its early years the Moon was orbiting

close to the Earth, gradually slowing

down both its own spin and producing

a spin that gave regular days and nights:

‘And God said, Let

there be light: and

there was light.And

God saw the light,

that it was good:

and God divided

the light from the

darkness. And God

called the light Day,

and the darkness he

called Night. And

the evening and the

morning were the

first day.

And let them be for

lights in the

firmament of the

heaven to give light

upon the earth: and

it was so. And God

made two great

lights; the greater

light to rule the day,

and the lesser light

to rule the night: he

made the stars also.’

The tilt of the Earth was held steady by

the Moon and the Earth enjoyed regular

days, years and changing seasons:

‘And God said, Let

there be lights in the

firmament of the

heaven to divide the

day from the night;

and let them be for

signs, and for

seasons, and for

days, and years.’

The early Moon was huge and powerful

as it orbited close to the Earth raising

colossal tides every time it passed

overhead. If the Moon had not been

created, the seas of the Earth would

cover virtually all of the planet leaving

little dry land:

‘And God said, Let

there be a

firmament in the

midst of the waters,

and let it divide the

waters from the

waters. And God

made the

firmament, and

divided the waters

which were under

the firmament

from the waters

which were above

the firmament: and

it was so.’

Thanks to its close proximity, the

Moon’s tidal surges travelled far inland,

constantly stirring the life-nurturing

soup of the oceans, ready for the

moment life arrived. As more advanced

life developed, plant life came first:

‘And God said, Let

the earth bring forth

grass, the herb

yielding seed, and

the fruit tree

yielding fruit after

his kind, whose seed

is in itself, upon the

earth: and it was so.

And the earth

brought forth grass,

and herb yielding

seed after his kind,

and the tree yielding

fruit, whose seed

was in itself, after

his kind: and God

saw that it was

good.’

The first animal life began in the oceans

before spreading to land and into the

air:

‘And God said, Let

the waters bring

forth abundantly

the moving creature

that hath life, and

fowl that may fly

above the earth in

the open firmament

of heaven. And God

created great

whales, and every

living creature that

moveth, which the

waters brought

forth abundantly,

after their kind, and

every winged fowl

after his kind: and

God saw that it was

good.

And God blessed

them, saying, Be

fruitful, and

multiply, and fill

the waters in the

seas, and let fowl

multiply in the

earth. And God

said, Let the earth

bring forth the

living creature after

his kind, cattle, and

creeping thing, and

beast of the earth

after his kind: and it

was so. And God

made the beast of

the earth after his

kind, and cattle

after their kind, and

every thing that

creepeth upon the

earth after his kind:

and God saw that it

was good.’

Millions and millions of creatures came

and went, slowly changing into more

complex life forms and eventually

gaining intelligence and self-awareness.

One branch of mammals climbed into

the trees and later returned to the plains

as hominids – our ancient, ape-like

ancestors. There were many species of

hominid that learned to use primitive

tools and that survived as huntergatherers.

As recently as 25,000 years

ago there were still three species of

h u m a n : *Homo floresienis*, *Homo*

*neanderthalis* and *Homo sapiens*. The

Neanderthals had larger brains than

ours and we can be sure that they

laughed and talked and cried – their

burial practices even suggest that they

may have had religious belief. But

today, we are alone:

‘And God said, Let

us make man in

our image, after our

likeness: and let

them have

dominion over the

fish of the sea, and

over the fowl of the

air, and over the

cattle, and over all

the earth, and over

every creeping thing

that creepeth upon

the earth. So God

created man in his

own image, in the

image of God

created he him;

male and female

created he them.

And God blessed

them, and God said

unto them, Be

fruitful, and

multiply, and

replenish the earth,

and subdue it: and

have dominion over

the fish of the sea,

and over the fowl of

the air, and over

every living thing

that moveth upon

the earth.’

The period during which we have

learned to walk upright and have

developed such large brains that our

Mothers risk their lives in giving birth to

us, is miniscule in terms of the period

the Earth has existed. It has taken us

only a couple of million years in total.

The amount of time we have been

bright enough to look with knowing

eyes at our world has been much less

than that, merely a few tens of

thousands of years. We learned how to

hunt and to survive from the bounty of

nature and eventually we became

farmers, living fixed lives and

establishing villages that became towns

and eventually cities.

Maybe six or seven thousand years

ago something remarkable may have

happened. Whoever or whatever had

manufactured the Moon returned. In

an operation that possibly involved a

whole series of ‘visits’, the cipher

necessary to crack the code of the

message, that had been so carefully

encapsulated into the Moon, was given

to humanity. This ‘key’ was the

Megalithic system of measurement and

geometry and specifically the Megalithic

Yard. The Moon’s creator must have

been aware that if the Megalithic Yard

was written into the stone circles and

avenues of what is now Britain and

France, someone would eventually

recover the information and rebuild the

entire system in all its splendour.

This was clearly not enough.

Another series of visitations took place,

not long after the first but this time to

another proto-civilization far from the

first, between the rivers Tigress and

Euphrates, in what is today the area

known as Iraq. Here a second system of

mathematics and geometry was seeded,

this one less related to the mathematical

certainties of the Earth and its

relationship with the Moon but more

closely tied to everyday life. It was the

forerunner of much that was to follow

and when the rise of science came

along, humanity invented the metric

system, which almost eerily reflected

what the Sumerians had been so

carefully taught. The astronomer priests

of Sumer were shown that the whole

world, its size, mass and volume, could

be derived from the most humble

source possible – a single seed of barley.

(See Appendix Five.) This plant had

clearly been genetically engineered not

only to be of fantastic use to humanity

but also to lock into the dimensions and

mass of the Earth in an almost

unbelievable way.

Mythology and folklore tells us

time and again that ‘messengers’ were

sent in the remote past to teach

humanity the rudiments of civilization

and we now know why. None of this is

beyond the capabilities of God and it is

likely that a percentage of readers will

already be convinced that this must be

the solution to the message contained in

the Moon.

God could quite easily have created

the Moon and done so well within the

laws of physics He had ordained. It

would have been His deliberate

intention that the life He seeded on the

young Earth would eventually give birth

to a thinking, rational species that was,

in some way, made in His own image.

His interest in humanity, when it

eventually evolved, remained as He had

quite clearly intended. We can see a

situation in which the Deity sent

messengers to lay the foundations of an

eventual recognition of the message

which would lead to the first tangible

proof of the existence of a Creator.

Nothing is beyond the mind or

capability of God. We have endowed

Him with unparalleled power and

timelessness. But for countless

generations the reality of God has

resided in ‘faith’ rather than ‘proof’.

Perhaps those with religion will resent

the suggestion that God has removed

the need for faith.

The humorous and thoughtprovoking

writer, the late Douglas

Adams, played with this notion in his

b o o k *The Hitchhiker’s Guide to the*

*Galaxy*.37 Adams created a remarkable

creature known as the Babel Fish, that

when placed in anyone’s ear could act

as an inter-galactic speech translator. So

remarkable was the existence of this

little fish that people said it must stand

as irrevocable proof of the existence of

God because nothing so amazing could

possibly come about by chance.

However, it was pointed out that since

God existed by faith alone – and not by

proof – the absolute proof of his

existence meant for certain that he

could not exist.

‘I never thought of

that,’ said God, and

disappeared in a

puff of logic.’

It is clear that if we accept that God was

responsible for creating the Moon and

that He specifically incorporated within

it proof of what He had done, we must

begin to look at Him in a very different

light. In a world in which religion has

been diminishing in importance, and

particularly in the technological West,

an acceptance of God’s direct

intervention in our part of the solar

system might see thousands or millions

of people flocking back to Church. The

most fervent creationists may abandon

their insistence that the Earth is only a

few thousand years old and might

accept that God did indeed work his

magic through evolution. The

recognition of God’s special pact with

life, and especially with humanity,

might fund a push towards

ecumenicism and a coming together of

the world’s fractious religions.

Unfortunately it is equally likely

that the reverse would happen because

power-bases, religious or secular, have

always shown a reluctance to diminish

in importance. Clearly, if we are looking

at God’s true covenant with humanity

through his intentional creation of the

Moon, with its attendant and obviously

deliberate messages, no existing belief

pattern can be any more important

than another and the whole basis of

religious dogma is in doubt.

We could not criticize anyone who

wishes to attribute the message to God.

But neither could we argue with anyone

who says that God does not need to

leave messages coded into ancient stone

circles that He already knows will

eventually be recognized by humanity.

If we are ultimately left in no doubt as

to his existence, the whole procedure has

been somewhat unnecessary. God is

capable of showing Himself to

humanity at any time He chooses, with

absolutely no ambiguity or the remotest

uncertainty.

Everything about the Moon and its

addition to the solar system seems to

speak of a message that ‘must’ be

imparted one day and of a series of

deliberate ‘humanlike’ interventions

that would ensure this was the case.

Further to this, we might argue

that the Moon was almost certainly

added to our part of the solar system as

an afterthought. It had to be, because

the very material from which it was

made came from the already existent

Earth. God could quite easily have

made the Earth a haven for life in its

own right. It has to be remembered that

it was the ‘shortcomings’ of the Earth

that necessitated the addition of the

Moon to the planetary system. Surely

the God of the human imagination is

all-powerful and has no shortcomings.

We cannot deny that a world in

which humanity was certain of the

existence of God, and in which there

was no longer any doubt about what He

represented, ‘might’ become a more

cohesive and peaceful place and we did

not turn away from this possibility

lightly. However, we have tried to

approach our research from a genuinely

scientific point of view (we would argue

that our approach is more scientific and

less based on enshrined belief than that

of many so-called scientists.) This being

said, we felt ourselves obliged to look at

other possible solutions to the questions

raised by the evidence we had amassed.

Those who wish to attribute the creation

of the Earth– Moon system to God will

continue do so, though we felt it

impossible to stop searching. We are

cognisant that by His sheer timeless

power God can be used as a cure-all to

answer any question. That has been the

pattern of humanity across the ages and

it is not one we feel constrained to

follow.

In short, there are other

possibilities that might prove to be just

as surprising but considerably more

plausible.

**Postscript to this chapter**

This chapter was completed during the

closing days of 2004. On the morning

of Sunday December 26th an

Earthquake five miles beneath the ocean

floor, west of Sumatra, produced a

tsunami with the power of more than

10,000 atomic bombs. Travelling at

speeds of up to 800 kilometres an hour

it tore into coastal areas all around the

Indian Ocean causing devastation that

was as sudden as it was terrible. Many

tens of thousands of people died within

minutes and millions more were left to

grieve for their lost loved ones and to

struggle against hunger, thirst and the

threat of consequential disease.

The event was so powerful that the

entire Earth moved.

Geologist Kerry Sieh of the

California Institute of Technology said

‘It caused the planet to wobble a little

bit.’ As the Indian Ocean’s heavy

tectonic plate lurched underneath the

Indonesian plate there was a shift of

mass towards the planet’s centre,

causing the globe to rotate faster and

shortening the period of our planet’s

rotation by some three microseconds. A

team of researchers at NASA’s Jet

Propulsion Laboratory in Pasadena,

California also found that the incident

caused the Earth’s tilt to be increased by

2.5cm.

The mobility of the Earth’s crust

was central to the emergence of life and

now the residual shifting of tectonic

plates causes death and destruction to

those too near to the event. If the careful

design of the Earth and its Moon were

the work of God, His life-bringing

mechanisms are, in this instance at

least, working against the interests of

His chosen species.

The events in the Indian Ocean

horrified the world. In Britain the

Archbishop of Canterbury, who leads

the Church of England, was deeply

troubled. Dr Rowan Williams, writing

eight days later in the *Sunday Telegraph*

questioned the nature of God’s

interaction with humans:

‘The question:

“How can you

believe in a God

who permits

suffering on this

scale?” is therefore

very much around

at the moment, and

it would be

surprising if it

weren’t – indeed, it

would be wrong if it

weren’t. The

traditional answers

will get us only so

far. God, we are

told, is not a

puppet-master in

regard either to

human actions or

to the processes of

the world. If we are

to exist in an

environment where

we can live lives of

productive work

and consistent

understanding –

human lives as we

know them – the

world has to have a

regular order and

pattern of its own.

Effects follow causes

in a way that we can

chart, and so can

make some attempt

at coping with. So

there is something

odd about expecting

that God will

constantly step in if

things are getting

dangerous. How

dangerous do they

have to be? How

many deaths would

be acceptable?

So why do religious

believers pray for

God’s help or

healing? They ask

for God’s action to

come in to a

situation and

change it, yes; but if

they are honest,

they don’t see

prayer as a plea for

magical solutions

that will make the

world totally safe

for them and

others.

All this is fair

enough, perhaps

true as far as it goes.

But it doesn’t go

very far in helping

us, one week on,

with the intolerable

grief and

devastation in front

of us. If some

religious genius did

come up with an

explanation of

exactly why all these

deaths made sense,

would we feel

happier or safer or

more confident in

God? Wouldn’t we

feel something of a

chill at the prospect

of a God who

deliberately plans a

programme that

involves a certain

level of casualties?’

If a single entity that we could

reasonably call God did indeed establish

the Earth and its Moon so that we

might evolve, He might be obliged to

work within His own rules of the

Universe. Creating a life-bearing planet

required a ploughing of the surface and

this is a process that cannot be switched

on and off like a light switch. Dr

Williams presumably has a problem

because he believes in a God who is in

on-going contact – a God who can

choose to respond to individual prayers.

But maybe the situation is not like that.

The title we chose for this chapter

is ‘Childhood’s End’. This seemed to be

a fitting summation for the discussion

of the possibility that God had made

the world and had, from the outset,

built into it a message that we would

understand when we were sufficiently

emotionally and intellectually mature.

We were aware that Arthur C Clarke

had written a novel with this title more

than half a century earlier with a very

different but not unconnected theme.

Sir Arthur is an inspired writer and

his ideas expressed in *2001: A Space*

*Odyssey*, have been discussed in this

book. When we realized that the Indian

Ocean tsunami had caused a massive

loss of life in Sri Lanka, we were

concerned for him, because we were

aware that he is wheelchair bound in his

home near the beach in Colombo.

Thankfully Sir Arthur was not hurt and

was able to write an account of what

had happened in his adopted country.

He wrote: ‘I have no idea if God

had any scenario in mind when this

happened. In a way, the disaster was a

random event, but at the same time

nothing in this world is totally random,

there is always cause and effect.’

All of this could very much

describe a God who has a working plan

that appears to be less than perfect.

Tectonic plates were necessary to create

us but their current movements are

simply a small, incidental effect of a far

greater cause. Are we to believe that in

the mind of God the ultimate end

justifies the sometimes very painful

means?

*‘…it’s entirely possible, in my*

*view, that we could retrieve a*

*message from another world*

*within just a few decades…’*

**Seth Shostak – Senior Astronomer, SETI**

The idea that intelligent creatures might

exist somewhere else in the cosmos has

fascinated humanity ever since the

invention of the telescope revealed that

our world is but one amongst countless

others. At first some people wondered if

there were people living around the

supposed seas on the Moon and others

feared invasion from near neighbours,

particularly Mars.

In 1858 an Italian astronomer

called Secchi announced that he had

seen ‘*canali*’ on the surface of Mars, and

in 1877 Giovanni Virginio Schiaparelli,

an astronomer at the Milan

Observatory, produced drawings of

these features. Though the most

accurate translation of the Italian word

‘*canali*’ would have been ‘channels’, it

was translated into English as ‘canals’.

With the completion of the Suez Canal

fresh in people’s minds, the

interpretation was taken to mean that

huge artificial waterways had been

discovered – which amounted to

evidence of intelligent life.

Debate raged over the findings,

with Schiaparelli himself stating that

there was no reason to suppose that the

canals were artificial. The discovery

sparked the imagination of a young

man named Percival Lowell who was at

the beginning of what was to be a

distinguished career in astronomy. He

was one of the first to realize that it was

far more sensible to site observatories in

out-of -the-way places, such as deserts

or on mountaintops, where smoke and

light spillage from cities would not

diminish the astronomers view of the

heavens. He was the driving force

behind the creation of the Lowell

Observatory in Flagstaff, Arizona, in

1894.

Professor Lowell studied linear

features on Mars with his twenty-fourinch

telescope and developed theories

about the habitability of Mars, based on

his estimate that the planet had an

average temperature of 48°F. The

Lowell Observatory made consistent

observations of the Martian canals and

Lowell personally maintained that the

linear features were indeed of artificial

origin.

When spacecraft reached Mars,

scientists expected to discover what the

canals really were but they found that

there were no canals and almost no

straight lines on the planet at all. We

have to conclude that either the

Martians have camouflaged them

rather well over the last century or,

infinitely more likely, a generation of

astronomers were imagining things at

the limits of their optical telescopes.

The idea that there could be real

Martians was a popular worry that was

brilliantly used as the plot by H G Wells

in his novel *War of the Worlds*.

A wave of mass hysteria gripped

thousands of radio listeners in October

1938, when a dramatization of this

book was broadcast and led

unsuspecting listeners to believe that an

interplanetary conflict had started, with

invading Martians spreading death and

destruction across New Jersey and New

York.

The next day the *New York Times*

reported on the scare:

‘A weather report

was given,

prosaically. An

announcer

remarked that the

program would be

continued from a

hotel, with dance

music. For a few

moments a dance

program was given

in the usual

manner. Then there

was a “break-in”

with a “flash” about

a professor at an

observatory noting a

series of gas

explosions on the

planet Mars.

News bulletins and

scene broadcasts

followed, reporting,

with the technique

in which the radio

had reported actual

events, the landing

of a “meteor” near

Princeton N. J.,

“killing” 1,500

persons, the

discovery that the

“meteor” was a

“metal cylinder”

containing strange

creatures from Mars

armed with “death

rays” to open

hostilities against

the inhabitants of

the earth.’

By far the majority of experts now

accept that if advanced life of any sort

does exist in places other than the Earth,

we will almost certainly have to look

towards interstellar space in order to

find it. But our greater knowledge of

outer space has not quelled the public’s

appetite for close-encounter stories.

The famous Roswell incident is

believed by many to be an extraterrestrial

encounter. It is said that a

UFO crashed in the New Mexico desert

in July 1947 and the debris was

removed to an army base in Fort

Worth, Texas.

A US government cover-up is said

to have tried to pass off the event by

stating that the debris was actually part

of a radar unit from a weatherballoon.

Rumours about the existence of

secret alien bases located in various

places, such as the Moon, under the

ocean, or in a tropical rain forest have

persisted. Some people have gone so far

as to claim that they have worked on

secret UFO projects for the government

and seen UFOs at military installations.

According to a recent poll, some

three million Americans believe that

they have encountered bright lights and

incurred strange bodily marks indicative

of a possible encounter with aliens.

Psychological tests confirm that these

‘abductees’ are rarely psychotic or

mentally ill in any usual sense of the

term.

It makes us wonder whether

humans are simply prone to having

some kind of neural dysfunction

involving optical illusions. Maybe the

decline of old-style belief in mythical

creatures like fairies and goblins and in

religious imagery such as angels or the

Virgin Mary, has caused people to have

new kinds of hallucinations. Where

people once thought they saw the ‘little

people’ dancing in a circle of light or a

heavenly messenger with a glowing

halo, the bright lights in their heads are

now translated as alien contact.

Whilst the debate continues about

everything from Roswell to crop circles,

it has to be admitted that there has

never been any proof of alien contact –

and it is, of course, impossible to prove

the negative. However, the probability of

contact does seem extremely small,

given the vast amounts of space and

time involved.

The solar system, of which the

Earth forms a small part, is only one of

many even in our own corner of our

galaxy – the Milky Way. Astronomers

have identified stars that definitely have

planets orbiting them, so the state of

affairs within our own solar system is

certainly not unique. An interesting

finding has been that larger, gaseous

planets in other star systems, much like

Jupiter and Saturn in our own, have

been discovered to have an orbit that is

always very close to their host star.

From these early indications it seems

that our planetary arrangement is

unique, which just might not be

accidental.

It is a fact that if Jupiter were not

just over five times more distant from

the Sun than we are, advanced life on

Earth would not exist. This giant planet

is positioned as a ‘catcher’ of space

objects that would otherwise impact

into the Earth. A dramatic example of

this was seen in July 1994, when twentyone

fragments of the comet

Shoemaker-Levy 9 smashed into Jupiter

at speeds of up to half a million

kilometres and hour, creating fireballs

larger than the planet Earth.

If we are right about the Moon

being constructed to act as an incubator,

the manufacturer would have been

pleased to note that Jupiter and Saturn

were in very unusual and perhaps

unique outer orbits. If it were not so,

they would have to have caused them to

be in this position – which would

suggest that the entire solar system

could have been designed for the benefit

of humankind!

Whether or not our solar system is

a happy accident, it is estimated that

there are a thousand million other stars

in our galaxy alone, any one of which

could possess a planetary system where

life might have evolved and even

flourished. Beyond our galaxy there

must be stars with Earth-like planets

beyond counting. Bearing these facts in

mind, it surely appears unreasonable to

believe that only our tiny little green

planet is alone in producing a self-aware

species.

However as we have previously

noticed, setting out to actually meet our

intergalactic or extragalactic cousins

seems hopeless, even if we knew where

they were located. But this may not be

the end of the story.

Time is not a fixed concept. If a

person could travel close to the speed of

light, they would experience a severe

slowdown in time, relative to a slower

moving object. At light speed, time

stops completely, relative to something

moving at a much lesser speed. Because

of this ‘time stop’, a photon that travels

at the speed of light would not

experience distance and time in the

normal way. So from the photon’s

point of view, it could go from one end

of the Universe to the other instantly,

while from an outside point of view it

would take about thirteen billion years.

Still stranger, scientists have found

the need to speculate about the existence

of a particle called a ‘tachyon’ that can

travel faster than light. But theoretically

at least, travelling faster than light

would result in an individual going

backwards in time. So the tachyon is

something of a mystery at the moment,

with scientists having to calculate the

activity of these particles with time

working in reverse.

So, just maybe, there will be ways

to work around the problem of

travelling at speeds close to, or even

above, the speed of light.

Next, there is the possibility of

intergalactic communication using what

physicists call ‘quantum entanglement’,

that can happen to sub atomic particles.

If quarks with identical spin are paired

and separated, and the spin of one is

changed, the other changes its spin

instantaneously to match that of its

partner – no matter how far apart they

are separated. Einstein called this

phenomenon ‘spooky distance’, and it

suggests that some force, not yet

understood, must be capable of

travelling in folded space in some

manner or may not exist at all in space

as we know it, and therefore not be

restricted to the effects of travel.

It is therefore not inconceivable

that other advanced creatures have

found a way to bridge the chasm of

space-time between their planet and

ours. But we are not able to deal with

such technology yet, even though we

can envisage its existence. Right now, as

far as we know, we cannot greet them

face to face, but as we pointed out in

Chapter Eight it might be possible to

listen to them or even talk to them.

As we have also noted, recent

publications by leading academics such

as Paul Davies, Christopher Rose and

Gregory Wright, are suggesting that

physical artefacts are a far better way of

communicating across the vastness of

space. Paul Davies has stated that a far

more reliable way for any alien species

to contact us would be to leave artefacts

in the vicinity of planets likely to spawn

intelligent life that, given sufficient

advancement on the part of such a

developing species, it could not fail to

recognize.

And so, the question that confronts

us is: Could aliens have built the Moon

from the very substance of the Earth in

order to allow our development, and

then left a physical message of what

they had done in the very dimensions

and movements of the bodies?

We believe that the message we

have detected in the Moon and its

relationship to the Earth is so amazingly

differentiated from the ‘background

noise’ of all other measurements that it

forms a breakthrough for humanity.

Certainly, if a message of such clarity

and consistency was received from

beyond our planet by means of good

old-fashioned electromagnetic

radiation, the personnel at SETI would

be jumping up and down with joy.

If the message from the UCA is

attributable to aliens we have already

speculated that its motive could simply

be a desire to progressively transform

the matter in the Universe from a

chaotic condition to an ordered state of

self-awareness. One can image that,

given enough time, all of the matter in

existence could be united in a single

thinking entity. Astronomer Royal, Sir

Fred Hoyle, wrote a novel called *The*

*Black Cloud*38 in which he speculated

about a cloud of space matter that had

such instantaneous interaction between

its particles it was, effectively, a single

living entity. Could this be the longterm

goal for all intelligence? If so, we

will need to understand what has

happened in the case of our own planet

much more clearly so that we will be

able, in due course, to take part in this

ultimate mission for the Universe.

If we accept alien intervention in

our distant past, we have to ask how

these visitors from elsewhere could have

known that the fruits of their labours

would come to have ten fingers and

therefore work in base ten. A possible

answer is that all successful life forms

come to intellectual maturity with these

characteristics, but the whole notion

does seem odd.

Furthermore, there is the problem

of how the alien Moon builders came to

use Megalithic geometry and kilometres

to incorporate elements of the message.

This too seems unusual. What is more,

as we have observed, there appear to

have been visits to the Earth by the UCA

in much more recent times. This would

suggest that the alien visitors, having

manufactured the Moon, would have

had to return to the Earth over four

billion years later in order to pass the

Megalithic message onto the developing

human culture in Britain and France.

We find it difficult to imagine a culture

or society that could endure for such a

vast period of time. It is much more

likely that such a civilization would have

gone the way of inevitable evolution,

managed somehow to destroy itself, or

simply grown bored with the whole

experiment in only a tiny fraction of the

time involved.

If readers wish to believe that aliens

are responsible for this message, we

would have to say that this is a theory

worthy of further investigation. For our

part, we can see no direct proof that this

has been the case, and there seem to be

factors involved that make the alien

hypothesis unlikely to be the answer we

are seeking. However, there is a third,

and altogether more amazing option yet

to consider and it is one that appears to

fit the bill in every respect.

*‘Let us make man in our*

*image, after our likeness’*

**God: Genesis 1:26**

For those people who call themselves

creationists, the Bible is the word of

God. But which Bible is the authentic

one? There are countless versions of the

books contained in both the Old and

New Testaments and the oldest versions

have been carefully dissected to reveal

the different styles of authorship woven

into the fabric of the stories. Two of the

three main traditions – the Yahwist and

the Elohim (a word meaning gods in

the plural) – talk of a specific sequence

of creation. This deals with the arrival of

plants, then good and evil, then animals

and next women.

The third, priestly tradition has a

sequence of creation that is rather more

in line with modern theories about

evolution. First comes light followed by

heaven, the Earth (land and then sea),

vegetation, then the Sun, Moon and

stars. Next come birds and fishes and

finally man and women together.

An interesting fact is that the first

two traditions use the Hebrew *yàsar* for

the creative act of making man, which

has a simplistic or crude implication of

being shaped, as a potter models clay

objects. Both also use the word *demut*

for likeness, which implies similarity or

looking the same. However, in the

Priestly tradition, (the version that has

God talking to his wider council about

making man in their image) He uses a

very different word. In this case the

word *bàrà* is used for the creation of

man and this is a word that carries a

more complex, creative value. Next we

find *selem* as the chosen word for the

use of the creator’s image, which means

something more like a precise duplicate.

*Selem* is a term directly related to the

Canaanite word for Venus that is

associated with resurrection and

therefore rebirth of the individual.39

We find it strange that a

supposedly singular God is talking to

others around him, even before

humans have been created. He has

already made the Sun, Moon and Earth

and supplied the oceans along with

plant and animal life – but to whom is

he talking? And why do they all,

whoever ‘they’ are (including God

Himself) apparently have heads with

noses, ears and eyes, bodies with arms

and legs and presumably even genitalia?

Why is God, along with his

undisclosed team, human in

appearance?

It is not our place here to try and

make sense of Judaeo-Christian myth,

but we came to find the idea fascinating

and surprisingly plausible. The Bible

has been edited, changed and added to

by a succession of people who wanted it

to support whatever they deemed to be

true. Early Christians even accused the

Jews of having incorrect versions of their

own scriptures when they were found to

differ from the texts the early Christians

had doctored. In terms of Christianity,

it seems unlikely that a passage that

involves God talking to others before he

created humanity would have survived,

had it not been for an important aspect

of the new Christian faith. This was the

‘new’ concept of the trinity – where God

is said to comprise three separate

entities including his living human

mode as Jesus.

We are not attempting to claim

that the Bible provides us with any

evidence for the authorship of the

message we had discovered, but a close

look at the situation did lead us to a

tantalizing thought.

Could the only known intelligent

life force in the Universe be responsible

for the message? To be blunt: Could

modern humans have built the Moon?

There is obviously one very

substantial issue of logic to address here,

which is obviously the time gap of 4.6

billion years between the creation of the

Moon and the present era. Clearly, if

humanity created the Moon, this would

have to be explained. In reality, this

may not be the obstacle it appears to be,

because leading scientists are currently

debating the possibility of travelling

backwards in time. Virtually everyone

speculating about time travel is agreed

that the associated mathematics

indicates it should be possible. We will

come to the problem of travelling in

time shortly, but for the moment let us

put the issue of the time gap aside and

consider the reasons why the Moon’s

message might be from closer to home

than we ever dreamed could be possible.

The hypothesis we originally laid

down was:

1. 1. The Moon was

engineered by

an unknown

agency circa

4.6 billion

years ago to act

as an incubator

to promote

intelligent life

on Earth.

2. The unknown

agency knew

that

humanoids

would be the

result of the

evolutionary

chain.

3. That unknown

agency wanted

the resulting

humanoids to

know what

had been done

and they left a

message

indicated by

the dynamics

of the Moon

and its

relationship

with the Earth.

Firstly, it has to be acknowledged that

there are no other possible candidates

that we know of anywhere in the

Universe. God exists by faith and not as

a result of evidence, and aliens may or

may not exist. It is entirely possible that

we are totally alone, either in our part of

space or in the whole of the Universe. In

any case, who would have more to gain

from a life-producing planet than the

very intelligent creature that has most

benefited from its existence, namely

humanity?

The question of how the UCA

could have known that the intelligent

species on Earth would evolve with ten

fingers and therefore adopt base-ten

arithmetic, at a time when the Moon

was exactly where it is today, is answered

instantly if humanity is the agency we

are seeking. The mystery simply

dissolves if we are that unknown

creative agency.

Another difficult issue to explain

has been how the UCA could possibly

have used Megalithic and metric units

as part of the message. Once again, this

scenario resolves the problem. Indeed, it

adds to the message because it makes it

very clear that the UCA ‘has to be’

humans from our future, travelling

back in time to manufacture the Moon.

The motive for the message

becomes obvious and absolutely

necessary. If humans do not become

alerted to the need to manufacture the

Moon as an incubator for life – we

would not be here.

However, there is the problem we

can’t avoid. Humanity might be

described as having been reasonably

technologically advanced for around

100 years. The Moon came into being

some 4,600,000,000,000 years ago. We

have to admit that this does represent a

bit of a gap.

The answer can only be time

travel.

**Tomorrow’s yesterday**

Time is perceived as flowing like a river

from the past into the future and we are

all riding the wave in one direction. But

what if it were possible to head back

upstream? Not necessarily for humans

themselves, though that cannot be ruled

out, but for pre-programmed supermachines;

equipment so sophisticated

that it could engineer planetary-sized

objects. After all, most spacecraft today

are unmanned units that carry out all

kinds of experiments, take photographs

and even analyse samples of alien rock.

It would not therefore be hard to

imagine a project team from our

relatively near future designing and

deploying ‘chronobots’40 to construct

key elements of the past.

But is time travel a dream or a

possible reality?

For most people such thoughts

cause headaches. The question that

anyone will reasonably focus upon is: If

humans went back in time to build the

Moon so that there would be humans –

where did humans come from?

It seems like an impossible loop –

but is it stranger than the age-old

conundrum about the chicken and the

egg? Logically, it is necessary to have a

chicken to lay an egg, yet one needs an

egg for that chicken to have sprung

from. A creationist would have no

problem as their God manufactured the

first chicken with an ability to lay eggs.

The evolutionists would be a little

sneakier and say that a creature that was

not quite a chicken laid an egg that

produced a mutation that was the first

proper chicken. So, the egg came first.

It really is not worth losing sleep

about such problems, as the only way to

deal with any paradox is to simply

accept it.

Today, we are programmed with a

need for neat, predictable Newtonianstyle

logic. Simple cause and effect – so

that if ‘A’ happens ‘B’ will result. People

everywhere seem willing to accept the

idea that we were either created by God,

or that we exist due to a mega-series of

flabbergastingly beneficial accidents.

Look at these two possibilities again and

then ask yourself if it is any more farfetched

or unreasonable to suggest that,

as a species, we went back to create our

own life-giving planet system and

ultimately ourselves? (For some reason,

to the religiously-minded, the

insurmountable question of ‘Who

made God?’ can be safely ignored, as

can the ridiculous improbability of an

infinitely flowing stream of beneficial

serendipity to non-believers).

Humans throughout history have

generally had a psychological need for a

higher authority, whether it be a

supreme deity or the laws of physics.

Thankfully, that is not necessarily the

whole story at all.

The debate about time travel goes

on amongst the experts as it has done

for many decades. Generally speaking,

philosophers don’t care for the idea, for

a whole host of logical or illogical

reasons, though some of them are

coming round in the face of the latest

evidence. Meanwhile physicists are

becoming increasingly certain that time

travel is possible, and they have the

mathematics to back up what is far

from being a simple hunch.

Whilst the idea of travelling into

the past is so counterintuitive for most

people that they just cannot get their

heads around it, a physics heavyweight

and a philosophy heavyweight from

Oxford University have another view.

They once teamed up to confront the

apparent paradox that seems to forbid

the highly fluid present penetrating the

apparently frozen structure of the past.

David Deutsch and Michael Lockwood

have the problem in context; saying

about the quantum physics of time

travel: ‘Common sense may rule out

such excursions – but the laws of

physics do not.’41

Most people have a real problem

with the idea of time travel, and the socalled

‘grandfather paradox’

encapsulates why the idea appears to

assault common sense so strongly. The

idea is that if a young man was able to

travel back from the present time to,

say, 1950, he might kill, or cause his

grandfather to be killed before his own

father was born. If this were to happen,

it would mean that he could not exist

and therefore could not have killed his

grandfather. The problem just goes

around in apparently impossible circles.

The only solution appears, at first view,

to be to consider all such journeys as

utterly impossible – if for no other

reason than to save us from terminal

confusion!

However, Deutsch and Lockwood

are not so easily fazed and they remain

unconvinced about the need to protect

our sensibilities from issues of reality

just because laypeople tend to become

confused. In an article published in

*Scientific American* they discuss another

apparent time paradox that deals with

the possibility that even knowledge does

not seem to require a beginning.

They refer to the grandfatherkilling

scenario as being an

‘inconsistency paradox’ and then they

discuss another type of apparent timetraveller

violation of logic that they call

a ‘knowledge paradox’. This is an

apparent violation of the principle that

knowledge can only come into existence

as a result of problem-solving processes,

such as biological evolution or human

thought. In the example, they talk

about a hypothetical art critic who goes

back in time to visit a famous artist

from the previous century who, the

critic realizes, is only producing very

mediocre work. The time traveller

shows the painter a book containing

reproductions of his later and greater

works, which he then proceeds to

carefully copy in every detail with oil

paints onto canvas. This means that the

reproductions in the book exist because

they are copied from the paintings and

the paintings exist because they were

copied from the reproductions. So,

where did the inspiration come from?

‘This kind of puzzling paradox,’

say Deutsch and Lockwood, ‘once

caused physicists to invoke a chronology

principle that, by fiat alone, ruled out

travel into the past.’ But they believe

that travelling into the past does not

violate any principle of physics, however

much it seems counterintuitive to the

average person. Furthermore, the

Oxford duo state that quantummechanical

effects actually facilitate

time travel rather than prevent it, as

some scientists once argued.

They explain the basics of the

concept of time by pointing to

Einstein’s special and general theories of

relativity where three-dimensional space

is combined with time to form fourdimensional

space-time. Within this,

everyone’s life forms a kind of fourdimensional

‘worm’ in space-time, with

the tip of the worm’s tail corresponding

to their birth and the top of the head to

the person’s death. The line along

which the ‘worm’ lies is called the

person’s (or object’s) ‘worldline’ and

each moment of time is a cross section

of that worldline.

Einstein’s general theory of

relativity predicts that massive bodies,

such as stars and black holes, distort

space-time and bend worldlines. This is

believed to be the origin of gravity –

and, for example, the Earth’s worldline

spirals around that of the Sun, which in

turn spirals around that of the centre of

our galaxy. Deutsch and Lockwood

propose that if space-time becomes

really distorted by gravity some

worldlines would become closed loops

where they would continue to conform

to all the familiar properties of space

and time in their own locality, yet they

would become corridors to the past.

They state:

‘If we tried to follow

such a Closed

Timelike Curve (or

CTC) exactly, all

the way around, we

would bump into

our former selves

and get pushed

aside. But by

following part of a

CTC, we could

return to the past

and participate in

events there. We

could shake hands

with our younger

selves or, if the loop

were large enough,

visit our ancestors.

To do this, we

should either have

to harness naturally

occurring CTCs or

create CTCs by

distorting and

tearing the fabric of

space-time. So a

time machine,

rather than being a

special kind of

vehicle, would

provide a route to

the past, along

which an ordinary

vehicle, such as a

spacecraft, could

travel.’42

So, world-class physicists like Professor

Deutsch can conceive of potentially

giant spacecraft voyaging backwards in

time. Perhaps such craft could be filled

with chronobots that could even selfreplicate

to take on a task that might

take hundreds of thousands, or even

millions, of years. Building an object the

size of the Moon with pre-programmed

orbital requirements is unlikely to be a

quick exercise. But time would literally

be on their side.

There are various ideas about how

these time-travel enabling CTCs might

be formed. The mathematician Kurt

Gödel found a solution to Einstein’s

equations that describes CTCs within a

rotating Universe and they also appear

in solutions of Einstein’s equations

describing rotating black holes. But

there are many practical problems

including the evidence that naturally

occurring black holes are not spinning

fast enough. Maybe a technique will one

day be found to increase their rotation

rate until safe CTCs appear.

The physicist John A Wheeler

from Princeton University has famously

suggested shortcuts through space-time

that he calls ‘wormholes’, and other

scientists have shown how two ends of a

wormhole could be moved, so as to

form a CTC.

Professor Deutsch has become a

champion of the many-Universes

theory, first put forward by Hugh

Everett III in 1957, where everything

that can happen does happen. For this

reason, the supposed paradoxes of time

travel simply do not exist. In the

scenario where the man kills his

grandfather, he does not exist in the one

single Universe where the murder is

committed, but he does in the ones

where he fails to assassinate his forebear.

Deutsch and Lockwood conclude

that there is no scientific objection to

time travel, saying in their article:

‘The idea that time

travel paradoxes

could be resolved by

“parallel Universes”

has been anticipated

in science fiction

and by some

philosophers. What

we have presented

here is not so much

a new resolution as

a new way of

arriving at it, by

deducing it from

existing physical

theory… These

calculations

definitively dispose

of the inconsistency

paradoxes, which

turn out to be

merely artifacts of

an obsolete, classical

worldview.’

They appear to be suggesting a loop in

time that has a twist in it so that contact

is made with a near identical parallel

existence, through which the time

traveller can arrive at a time and place

that always has them present.

Their thought-provoking article

concludes with the authors pointing out

that science says time travel is

theoretically possible. As a result, the

onus is on those who wish to argue

otherwise to prove their case:

‘We conclude that if

time travel is

impossible, then the

reason has yet to be

discovered. We may

or may not one day

locate or create

navigable CTCs.

But if anything like

the many-Universes

picture is true – and

in quantum

cosmology and the

quantum theory of

computation no

viable alternative is

known – then all

the standard

objections to time

travel depend on

false models of

physical reality. So

it is incumbent on

anyone who still

wants to reject the

idea of time travel

to come up with

some new scientific

or philosophical

argument.’

And many experts agree. Physicist, Matt

Visser of Victoria University of

Wellington, has compiled a short list of

the time travel opportunities that have

turned up since Einstein showed us how

to warp space-time. He has said that

Einstein’s general theory of relativity not

only allows time machines to exist, it is

‘completely infested with them’.

Others fear the concept of time

travel, even though they have not been

able to demonstrate that it cannot be

done. ‘I think most of us would like to

get rid of time machines if we possibly

could,’ says Amanda Peet of the

University of Toronto. ‘They offend our

fundamental sensibilities.’

The only argument that has been

made against time travel comes from

the famous Cambridge phycisist,

Stephen Hawking, in the form of his

‘chronology protection conjecture’. This

suggestion boils down to the notion that

the Universe might have a built-in time

cop, so whenever anyone is on the verge

of constructing a working time machine

the time cop turns up and shuts the

operation down before it has a chance

to damage the past. However, there are

no time cops evident in the laws of

physics, so, at the moment, the

chronology protection conjecture is

simply wishful thinking.

As far as our scenario is concerned,

humans exist because, at some future

point, we will return to the time when

our planet was a young lump of

unstratified matter and then we shall

make the Moon.

Once complete, our Moon worked

its magic and life began, evolving

eventually into an intelligent, tenfingered

species that uses Megalithic

and metric units. The message had to

be built into the very nature of the

structure or else we would miss the cue

to understand what we need to do.

But how can we do it and when

will we do it?

Ronald Mallett, a Professor of

Theoretical Physics at Connecticut

University, already believes he has

found a way to create a CTC or time

machine using light. He has identified

that a circulating beam of light, slowed

right down to a snail’s pace, may well be

the key to the door of time travel

because, although light has no mass it

does bend space. The realization that

time, as well as space, might be twisted

by circulating light beams caused

Mallett to team up with other scientists

at Connecticut University in 2001, with

the intention of building a prototype,

saying, ‘With this device time travel

may become a practical possibility.’

Mallett decided that if he added a

second light beam, circulating in the

opposite direction to the first, it would

increase the intensity of the light enough

to cause space and time to swap roles.

Inside the circulating light beam, time

runs round and round, and, what to an

outsider appears to be time becomes

like an ordinary dimension of space. A

person walking along in the right

direction could actually be walking

backwards in time – as measured

outside the circle. So after walking for a

while, you could leave the circle and

meet yourself before you have entered

it.

However, it turns out that the

energy needed to twist time into a loop

is enormous, and when Mallett

reviewed his progress he realized that

the effect of circulating light depends on

its velocity: the slower the light, the

stronger the distortion in space-time.

By strange good fortune, Lene

Hau, a phycisist at Harvard University,

has slowed light from the usual

300,000km per second to just a few

metres per second, and almost frozen

its progress completely. Mallett was

ecstatic saying, ‘The slow light opens up

a domain we just haven’t had before.

All you need is to have the light

circulate in one of these media.’

Maybe current scientists will crack

the problem of time travel but it seems

logical to expect the necessary

instructions to be contained in the

deeper layer of the Moon’s message.

However, it seems likely that black holes

may be at the root of the technology

required.

The black holes of deep space are

the gravitational remains of dead stars.

They are super-dense, bottomless pits in

both space and time that are capable of

sucking in almost infinite amounts of

material, including light. Everything a

black hole swallows gets compressed

into an unimaginably tiny central

region called a ‘singularity’ in which the

atoms are crushed into an unmoving

whole. If the Earth were to become as

dense as a black hole, it would be

smaller than a golf ball. (And they say

you can’t compress water!)

There seems to be no way to get

any information about what is

happening inside a black hole, as even

light is trapped inside. However,

Cambridge physicist Stephen Hawking

proposed a way in which black holes do

radiate matter and slowly dissipate until

they eventually disappear in a final

mega-burst of radiation.

Amazingly, scientists are becoming

increasingly confident that they will be

able to create black holes on demand

using the new atom-smashers due to

come on line in 2007. It is believed that

the new Large Hadron Collider (LHC)

being built astride the Franco-Swiss

border west of Geneva by the European

Centre for Nuclear Research (CERN)

will be able to create black holes at the

rate of one per second. The LHC is an

accelerator which will bombard protons

and antiprotons together, with such a

force that the collision will create

temperatures and energy densities not

seen since the first trillionth of a second

after the big bang. This should be

enough to pop off numerous tiny black

holes, with masses of just a few hundred

protons. Black holes of this size will

evaporate almost instantly, their

existence detectable only by dying bursts

of Hawking radiation.

This work is at an early stage but it

may well prove to be the beginnings of a

platform that could drive the search for

the technology to enable time travel.

If humans from our future did travel to

the distant past to create the incubator

that would produce our own species, it

does make complete sense of the

message left to us. We have to imagine

that our ability to complete such an

awesome task must be hundreds or

even thousands of years ahead of our

current level of capabilities. However,

what if the instructions of how to

proceed were contained inside the

message itself? If this was the case, the

development time might be cut to a

minimum.

Maybe a question we should be

asking ourselves is why the message was

so carefully timed to reveal itself at this

particular time. Could it be that we

have so far only seen what is little more

than a ‘waving flag’ to alert us to a

greater message that tells us exactly what

must be done in order to fulfill our own

destiny? Maybe the central pattern

revealed by the mutual orbits of the

Earth and its Moon and, quite

separately, by the relative sizes of 366.3

x 27.3 = 10,000 is the most

fundamental key of all.

At this stage there are two entirely

separate questions that need to be

answered:

1. 1. To what are we

to apply the

cipher?

2. If humans

created the

Moon as an

incubator for

life, where did

the seeds for

germination

come from?

The answer to both final elements of

this ultimate riddle may well rest in the

same place: DNA.

**The secrets of the Genome**

The Human Genome Project,

completed in 2003, was a thirteen-year

mission to unravel the secrets of the

minute data store that carries all the

information needed to make a human

being, what we call DNA. The key goals

of the project were to:

1. 1. Identify all the

genes in

human DNA,

of which there

are believed to

be

approximately

20,000–25,000

2. Determine the

sequences of

the three

billion

chemical base

pairs that

make up

human DNA

Professor Paul Davies has published an

idea that strikes a real chord with the

findings laid out in this book. He does

not criticize the people from SETI for

constantly sweeping the skies with radio

telescopes, in the hope of stumbling

across a signal from deep space, but he

is realistic about the chances of success.

He points out that it is inconceivable

that aliens would beam signals at our

planet continuously for untold aeons,

merely in the hope that one day

intelligent beings might evolve and

decide to turn a radio telescope in their

direction. And if the aliens only

transmit messages sporadically, the

chances of us tuning in at just the right

time are infinitesimal.

However, he does not write off the

idea of contact: ‘But what if the truth

isn’t out there at all? What if it lies

somewhere else? Now may be the time

to try a radically different approach.’43

Davies uses the idea we have

already reported of a ‘set-and-forget’

technique of communication, whereby

the information content of the message

may have to survive for hundreds of

millions of years. He acknowledges that

a conventional artefact placed on the

Earth’s surface would be almost

certainly overlooked, even if it did

somehow survive. He then suggests that

an altogether better solution would be*:*

‘…a legion of small, cheap, selfrepairing

and self-replicating machines

that can keep editing and copying

information and perpetuate themselves

over immense durations in the face of

unforeseen environmental hazards.’

This sounds like pure science

fiction but he continues by saying: ‘…

Fortunately, such machines already

exist. They are called living cells.’

What a brilliantly simple idea. We

have already established that large

sections of the scientific community are

openly saying that DNA absolutely

could not have spontaneously arrived –

it must have been designed. So, why

would the manufacturer not use it to

contain a message?

Is it possible? Is there spare space

in there for a message?

As Paul Davies confirms, the cells

in our bodies, and anything else that

lives for that matter, contain messages

set out billions of years ago. He also says

that the idea that aliens have

deliberately hidden messages inside

DNA has been ‘swirling around’ for a

few years, and has been championed in

recent times by the Apollo astronaut

Rusty Schweickart. But, says Davies, on

the face of it, there is a serious problem.

Living cells are not completely

immune to change, and mutations

introduce random errors that become

stored as information, and, over a long

enough time span, they would turn the

original message into ‘molecular

gobbledygook’. Davies then reminds us

that there is so-called ‘junk’ DNA:

sections of the genome that seem to

serve no useful purpose. These areas

could be loaded with messages without

affecting the performance of the cells

and some parts of that junk DNA are in

highly conserved regions that are

therefore relatively safe from

degradation.

When a team of genomic

researchers at the Lawrence Berkeley

National Laboratory in California

presented their own findings in June

2004, the audience gasped in unison.

Those listening, simply could not

believe what they were hearing from

Edward Rubin and team who were

reporting that they had deleted huge

sections of the genome of mice without

it making any discernable difference to

the animals. The result was truly

amazing because the deleted sequences

included what is known as ‘conserved

regions’, which were previously

assumed to have been protected because

they contained vital information about

functions.

To find out the function of some

of these highly conserved non-proteincoding

regions in mammals, Rubin’s

team deleted two huge regions of DNA

from mice, containing nearly 1,000

highly conserved sequences shared

between humans and mice. One of the

removed chunks was 1.6 million DNAbases

long and the other was over

800,000 bases long – which should have

caused the mice to have serious

problems.

All DNA can acquire random

mutations, but if a mutation occurs in a

region that has a key function, the

individual will die before they are able

to reproduce and therefore the damage

to the information will be removed

from the species. This protection

mechanism means that the most vital

sequences of DNA remain virtually

unchanged – even between species. So

by comparing the genomes of mice and

men, geneticists had hoped to pick out

those with the most important

functions by studying the conserved

regions.

The geneticists were utterly

perplexed because the regions they

removed made no difference to the

mice in question, so there seemed to be

no reason why these non-coding

sequences, apparently functionless parts

of the DNA, should be protected from

change. Why should they matter? It is

like having the world’s finest encrypted

security system built into your waste

bin.

Any burglar who observed that

your rubbish had so much apparently

unnecessary protection would

immediately suspect that you were

hiding something of great value in an

unexpected place. And that is the

thought that occurred to Paul Davies.

He believes there could be a message

from extra terrestrials in what has been

referred to as junk DNA.

We suspect he might be right

about the message but not about the

author. He says:

‘Looking for

messages in living

cells has the virtue

that DNA is being

sequenced anyway.

All it needs is a

computer to search

for suspiciouslooking

patterns.

Long strings of the

same nucleotides

are an obvious

attention-grabber.

Peculiar numerical

sequences like

prime numbers

would be a clincher

and patterns that

stand out even

when partially

degraded by

mutational noise

would make the

most sense… if a

sequence of junk

DNA bases were

displayed as an

array of pixels on a

screen (with the

colour depending

on the base: blue for

A, green for G, and

so on…’

He then asks what the message could

contain and notes that one segment of

DNA, chopped out by Rubin and his

team, contained more than a million

base pairs – enough, he says, ‘for a

decent-sized novel or a potted history of

the rise and fall of an alien civilization.’

And this would be from just one

part of the junk DNA.

As we digested Davies’ suggestion

about number sequences making a

screen we were immediately reminded

of how the numbers that we have

identified as the lead key of the message

produce 10,000 – or if the decimal

point is removed from the values we get

the following:

3663 x 273 =

999,999

As close to a million as makes no

difference.

These are the PIN numbers of the

Earth and Moon doubly crossreferenced

by their orbital periods and

relative masses. Without the decimal

point, they describe a screen (possibly a

computer monitor) that has a million

pixels with sides of 3663 and 273.

One of the ‘high security’ sections

of apparently empty genome removed

by Rubin’s team had just over a million

elements. It would be more than

interesting to apply the 3663 x 273

matrix to this data.

**What will it tell us?**

It may well give us vital information

about building equipment that moves

matter backwards in time and it will tell

us where to start the process of planning

to build a Moon! It is likely that it will

also instruct us where to look for further

information.

If we are correct, we are all carrying

this ‘treasure map’ in our hearts, our

brains and even our hair. But so too is

every living creature on God’s Earth.

‘Let us make man in our image,

after our likeness,’ said God.

Could it really be true that a team

of humans will control the creation of

our world and seed it with DNA so that

humans will evolve in our own image?

Will a future president of the United

States of America, or perhaps a Director

General of the United Nations sanction

the launch of a mission to create these

mammoth, but necessary, changes to

the past, whilst quoting the words from

verse 26 of the first chapter of the Book

of Genesis?

This is not a blasphemous

thought. Some Christians and indeed

people of other religions might find this

idea offensive because it appears to

suggest that we humans are God. But

this is not the case. It merely suggests

that we acted and will act on creative

information that was originated

somewhere else by some elemental force

that transcends all Universes – all

parallel realities.

The awe and mystery of existence

remains intact and for those that want

to call that essence ‘God’, He remains

unchallenged.

However, the account we describe

here does sit well with the scriptures of

the great religions. Genesis is

remarkably accurate and, as it turns

out, the creationists may not be entirely

wrong about a grand design in which

humans were existent from the start.

They will have to adjust their dating

assumptions, which do not come from

the Bible anyway. And they will have to

accept that evolution was just a

mechanism within the grand design.

The Hindu perception of the way

the Universe works also remains intact,

and the only adjustment they might

adopt would be to accept that the cycle

of rebirth has twisted into reverse as well

as going forwards. We doubt the

intellectuals within Buddhism will have

a problem with this.

We see this process of selfconception

as something akin to a

Möbius strip, named after August

Ferdinand Möbius, the nineteenthcentury

German mathematician and

astronomer. Möbius was a pioneer in

the field of topology. Along with his

contemporaries, Riemann, Lobachevsky

and Bolyai, Möbius created a non-

Euclidean revolution in geometry.

The simple construct that is a

Möbius strip can be made with a strip

of paper by joining the ends with a 180°

twist. It then only has one surface and

one edge that goes around forever.

Without the half- twist it would have

been impossible to move from one side

to the other without crossing an edge –

but suddenly the barrier does not exist.

If one travelled in a straight line on a

Möbius surface one would return to the

starting point.

Figure 13

The world’s most famous graphic artist Maurits

Cornelis Escher(1898–1972) was fascinated by the

imagery of the Möbius surface.

We see an analogy with humankind

who evolved from DNA, seeded on

Earth some 3.5 billion years ago by

ourselves, just a little in our future.

When we reach the point of being able

to travel back in time we will have

completed a circuit of the single-sided

loop and then move off into a new

trajectory.

Once the idea of time travel is

accepted as a scientific possibility, there

is no problem with the idea that

humans in the future engineered both

DNA and the life-nurturing Earth–

Moon system billions of years ago. We

exist because the right circumstances

were present for life to develop – and so

why does it matter whether a superentity

(God), extraterrestrials or

humans arranged it to be so? Why

should it be wrong to arrange for our

own arrival?

Each of them is extremely unlikely,

but nothing like as unlikely as the

notion of random chance – the endless

mega-string of beneficial good luck.

The idea of the Möbius principle is

that it is a loop that twists back in time

and returns forward again. Imagine a

situation whereby an artefact (say a

black monolith) was manufactured in

the year 2010 and was taken back in

time by four billion years in 2011,

where it was buried in a location of

long-term stability on the Moon. The

artefact could be recovered from the

Moon before it was manufactured and

the atomic matter from which it was

made would exist in two places at the

same time, until it was transported back

to the early Moon.

This seems impossible. But just

about everything about quantum

physics sounds implausible. Quantum

physics tells us that everything from

light to matter is made up of tiny,

indivisible packets called quanta that do

not work as we normally see the world.

Niels Bohr, one of the pioneers of the

subject said: ‘Anyone who can

contemplate quantum mechanics

without getting dizzy hasn’t properly

understood it.’

One of the features of this branch

of science is the recognition that

particles (or wave functions) briefly exist

in several different places

simultaneously. The monolith that had

two concurrent realities would be a

quantum effect on a worldly scale

instead of at a sub atomic level.

Once the 2010 artefact goes back in

time, the duality will be resolved and

the world will continue as normal.

Equally, we could consider all of the

time, from the building of the Moon

through to the point of time travel, as a

Möbius loop where we end up back

where we started. Thereafter we break

out of the loop and move forward in

the normal way.

**Time and again**

We have speculated that chronobots

were sent back to engineer the Moon

and they must have returned again

nearly a billion years later to seed the

ploughed Earth with DNA, to begin the

process of evolution that would result in

the arrival of humans.

But it appears that there must have

been other interventions at specific

times in the past to bring about certain

events.

We have always agreed with

archaeologists who say that the existence

of the Megalithic Yard is inconsistent

with the technology otherwise known to

have been present amongst the people

of western Europe over five millennia

ago. But we heartily disagreed with

them when most chose to ignore

Professor Thom’s findings rather than

attempt to reconcile them. Such people

are obstacles to knowledge.

When we discovered that the

Megalithic system extended to the

Moon, our credulity was stretched to

the limit but our curiosity carried us

forward to try and make sense of that

which looked impossible to reconcile.

When we found that the metric system

had been in place almost perfectly,

four-and-a-half thousand years before a

team of French scientists reinvented it,

we were amazed. Then we discovered

that metric units were perfect integers

for the most crucial aspects of the Moon

as well as the Earth.

We have noted that through

ancient history different civilizations

have recorded that people with super

powers arrived from nowhere to teach

humanity about the sciences. Then we

noted how all the parallel developments

that occurred around the world in

unconnected locations happened at the

same time.

We have to conclude that people

will travel back to points in history, such

as the era around 3100 BC, when

several civilizations, from South

America to North Africa to Asia to

Europe, were suddenly emerging and

building similar structures. It seems

probable that the Megalithic structures

that have lunar alignments, and use the

unit that describes the dimensions of

the Moon, were deliberately designed

and left to point the way forward.

We do not yet know whether the

detailed message is indeed inside the

protected sections of DNA, but

wherever it is, the initial message was

only recognized because of all those

Megalithic structures extending their

weathered and ancient stone fingers into

the night sky.

The fact that the imperial pound

and the pint are mathematically

derivable from the Megalithic Yard was

puzzling and when we found that the

same Stone-Age unit describes metric

spheres we were dumbfounded. How

could such surprising consequences

come about so accurately by chance

alone?

It now seems that the past has

been modelled by the future. A strange

Möbian twist for reality.

Of course this all sounds so

improbable that some people will refuse

to believe it. They will reject the fact that

everything we have put forward is real

and testable and the elements of

unavoidable speculation are

scientifically sound. But many

creationists will still shout that black is

white and many so-called scientists will

return to their deeply flawed paradigms

as though they were real.

But when the message is actually

found. What then?

*‘My own suspicion is that the*

*Universe is not only queerer*

*than we suppose but queerer*

*than we can suppose.’*

**Haldane’s Law put forward by geneticist, J P**

**S Haldane**

We have come on a strange journey

since we first realized the science that lay

behind the stone circles at Stonehenge,

Brodgar, Avebury and thousands of

other Neolithic sites across the British

Isles.

We believe that our determination

not to draw conclusions too early has

paid dividends. We have refused to

ignore those pieces of the puzzle that

seemed outlandish or even downright

impossible, and have retained our

tolerance for unexpected results.

They say all progress is dependent

on the unreasonable person. Alexander

Thom was certainly an unreasonable

person, or else he would have

capitulated in the face of the wave of

rejection he received from the majority

of professional archaeologists. How

irritating of the man, his opponents

thought, to repeatedly insist that his

reams of data, gathered over scores of

years, show that the Megalithic builders

worked to an incredible degree of

engineering accuracy and employed

precise standardized units of length.

Any reasonable person, and

certainly any academic who wanted

future employment within a specific

discipline, would have buried the data

that showed that the Megalithic Yard

and its accompanying geometry were

integer to the Moon and Sun as well as

the Earth. It sounds ridiculous, and

those who are members of the ‘club’

will consider anyone who speaks of it

equally ridiculous.

Yet the Moon unquestionably does

conform to Megalithic geometry and

now, we believe, we are beginning to

understand why.

The SETI institute is still sweeping

the skies looking for incoming

electromagnetic radiation that deviates

even a tiny amount from the

anticipated background noise –

something that could conceivably be an

indication of intelligence elsewhere in

the cosmos. But the message they seek

is already with us because, by the

standards of what SETI considers might

constitute a message, surely the material

we have described here must be the

world’s first prime contact with a

consciousness that existed 4.6 billion

years ago.

The assumption of SETI and its

operatives is that another intelligence

will make contact from far away and so

the searchers are focused on staring into

the far depths of space for a message.

But if any entity were that smart why

would it have to make a long-distance

call?

Four hundred years ago our solar

system was the great mystery – but our

own immediate environs hold less

fascination in the light of incredible

devices such as the Hubble telescope,

which can reach far into space and into

the past. We have ticked the box that is

the solar system and astronomers are

more interested in distant quasars and

nebula. Is it this new leading edge of

attention that has previously blinded us

to the obvious in our own backyard?

The message we have received has

told us about the way that the Moon

was constructed to give life to the Earth,

and there are tantalizing hints that this

design may extend to the rest of the

solar system, and possibly even beyond.

Why is Jupiter in such an untypical

orbit that just happens to be a cosmic

umbrella for Earth? Why does Venus

provide such a perfect clock and

calendar when viewed from Earth?

Modern scientific culture has

evolved from its roots in the ancient

world and has become a complex web

of many highly specialized disciplines.

Gone are the days when one man, such

as the seventeenth-century Robert

Hooke, could be a groundbreaking

inventor, microscopist, physicist,

surveyor, astronomer, biologist and

even artist. Today the sheer enormity of

available information has led to highly

defined specialisms, and academics are

expected to keep to their field – despite

the truism that science has no experts.

No one, for instance, doubted

Alexander Thom’s abilities as a

professor of engineering but he was not

welcome in the world of archaeology.

The gains from modern science are

beyond counting. But the loss, arguably,

is the synthesis of information

generated by the many gentleman

scholars that once existed, before

becoming extinct somewhere around

the late nineteenth century. So few

scholars now have a chance to view the

bigger picture – to seek out patterns that

might unexpectedly exist when

apparently unrelated data is brought

together. It has to be remembered that

the difference between a major

breakthrough and nothing at all can be

just the angle of view rather than

anything else.

Occasionally, two or more

disciplines are brought together to form

a new speciality in science. One of these

turned out to be the subject that was

directly invented by Alexander Thom,

namely archaeoastronomy – a field of

study involved with the use of

astronomy by ancient cultures. Our

previous book, *Civilization One,*

demonstrated the geometry that lies

behind Thom’s proposed Megalithic

Yard. We unambiguously showed how

it is directly related to other

measurement systems (linear,

volumetric and weight) and put

forward a testable theory of how it was

reproduced using Venus and a

pendulum. We therefore decided to

send a copy of our book to a man who

we believe is the world’s only professor

of archaeoastronomy. He received a

précis and the completed book but we

received no response whatsoever.

We knew that the information we

had put forward was not incorrect

because people suitably qualified in

astronomy and mathematics had

carefully checked it. So why no

response? Perhaps the approach was so

counter to the worldview of this

particular expert he could not

understand it. Or maybe he just did not

like the implications of our conclusions.

We also attempted to get a copy of

the book to a world-class physicist.

When he was told of the subject matter

he responded almost angrily by saying

that it was well known that Thom’s

work had been discredited decades ago

and only weirdos clung onto the

romantic hope that Stone-Age man

possessed a rational and unchanging

unit of length.

In actual fact he was repeating a

mantra that has sprung up in academic

circles but is no more than an urban

myth, because no one has proven

Thom to be wrong. We responded by

pointing out that we had done our

research very carefully and that whilst

there are certainly people who have

argued against Thom’s conclusions,

they have not proven his conclusions to

be wrong – nor is it possible for anyone

to prove a negative.

The academic then responded

politely and accepted what we said,

although he explained that he did not

have time to read our book due to

personal problems.

We therefore expect to have a fight

on our hands when it comes to getting

leading academics to review the findings

contained in this book. But fight we

will.

Finally, it is probably helpful to

apply to our whole hypothesis a test

created by the late, great astronomer

Carl Sagan, that he called a ‘Baloney

Detection Kit’. Sagen suggested a set of

tools shown below for testing claims

and detecting fallacious or fraudulent

arguments. We have put our responses

beneath in italics.

Wherever possible

there must be

independent

confirmation of the

facts.

*All of the key*

*elements that we*

*consider constitute a*

*message are*

*checkable using data*

*published by leading*

*authorities.*

Encourage

substantive debate

on the evidence by

knowledgeable

proponents of all

points of view.

*Yes please. We have*

*tried and will*

*continue to do so.*

Arguments from

authority carry little

weight (in science

there are no

authorities).

*At least it should be*

*a level playing field.*

Spin more than one

hypothesis – don’t

simply run with the

first idea that

caught your fancy.

*We have had to*

*dismiss only one*

*possible hypothesis:*

*coincidence, and*

*have investigated*

*every other avenue*

*we can think of.*

Try not to get overly

attached to a

hypothesis just

because it’s yours.

Quantify, wherever

possible.

*We struggled to*

*accept our own*

*results initially and*

*we remain entirely*

*open to any other*

*interpretation that*

*might be brought*

*forward.*

If there is a chain of

argument every link

in the chain must

work.

*Unlike the existing*

*main theories of the*

*Moon’s origin and*

*the origin of DNA,*

*we believe that we*

*have a very strong*

*chain with no weak*

*link.*

Occam’s razor – if

there are two

hypotheses that

explain the data

equally well, choose

the simpler.

*Absolutely. But the*

*simplest is also the*

*weirdest, although it*

*is also the most*

*scientifically robust*.

Ask whether the

hypothesis can, at

least in principle, be

falsified (shown to

be false by some

unambiguous test).

In other words, is it

testable? Can others

duplicate the

experiment and get

the same result?

*The number*

*sequences we have*

*found are checkable*

*by anyone with a*

*book on basic*

*astronomy and a*

*calculator. The*

*question is just how*

*far people are*

*prepared to go in*

*claiming coincidence.*

We believe we have made a case that

deserves to be heard and investigated. It

is hard to imagine how even the most

sceptical, unimaginative academic

could deny the possibility that we are

looking at a message here. Not to

investigate and discuss it further would

be anti-scientific and, we believe, very

foolish.

Everyone who has bothered to

think about it is agreed; any message

from the distant past either has to be

very big or very small. We believe it is

both.

We have good reason to think that

Professor Paul Davies and others who

suspect that there could be a

communication addressed to us in

apparently empty sections of DNA are

correct. If the next layer of the message

is, as seems likely, contained in the cells

of our own bodies – it must be sought

out!

Our suggestion that the group of a

million unused base pairs, found by

geneticist Edward Rubin and his team,

might be a viewable message if laid out

on a format of 3663 x 273 has to be

tested. It might be the answer and, if so,

humankind is on the verge of a new age

– an age of maturity.

But if the message is not detected

in that way, the peculiarities of the

Moon remain and we need all serious

scientists to work together to solve this

riddle – which must be almost in our

grasp.

We call on the world to assemble a

team of leading scientists from all of the

disciplines that could possibly be

involved in deciphering the Moon’s

message and, if our third scenario is

correct, constructing the CTC – the

time transport system. And we may

need observers from the leading

religions.

We suggest that this be called ‘The

Möbius Mission’ – a project to begin all

projects!

Albert Einstein was an incredibly

wise man as well as a scientific genius.

Amongst his many quotable

observations he once said: ‘Imagination

is more important that knowledge.’

How true. We therefore need

people with depth of vision as well as

knowledge and practical ability. So, it is

our intention to first approach scientists

such as Paul Davies, David Deutsch and

Ronald Mallett. We feel sure that their

curiosity will help to change the world.

**About Pendulums**

A pendulum is one of the simplest

devices imaginable. In its most basic

form it is nothing more than a weight

suspended on a piece of twine or sinew.

Since the pendulum has another

function, as a plumb line, it may well be

one of the first devices used by

humanity. If allowed to hang, the

weight of a pendulum will pull its string

into a perfectly vertical position.

Certainly the Megalithic people could

never have constructed any of the major

sites to be found all over Britain, Ireland

and Brittany without the use of this

device. It is therefore reasonable to

suggest that if they possessed a plumb

line, they also possessed a pendulum.

Although the device had been

around for a long time it was the

sixteenth-century genius Galileo who

seems to have been the first person to

look seriously at the attributes of

pendulums (or at least the first of

whom we have a record.) He is reported

to have been bored in Church one day

when his attention was caught by a large

incense burner suspended from above

by a chain or a rope, gently swinging

back and forth and forming a natural

pendulum. Galileo realized that the

swings of the pendulum were equal in

terms of time and he counted them

against the beat of his own pulse.

Only two factors are of importance

in the case of a simple pendulum.

These are the length of the string and

the gravitation of the Earth, which

constantly exerts a pressure that will

eventually bring the pendulum back to

a vertical and resting position. The

height of the swing of a pendulum is, to

all intents and purposes, irrelevant

because its time period from one

extremity to the other will always be the

same. In other words if the pendulum

is excited more vigorously it will swing

higher but its time period will remain

the same.

It was a recognition of this

constant nature of a pendulum that

made it useful in the creation of clocks.

In modern timepieces the pendulum

has been superseded, but for many

centuries it ensured the smooth running

of clocks all over the world. It can still

be found in quality clocks. Clock

pendulums were eventually fitted with

devices to prevent them from swinging

too high, and others to regulate the

nature of their arc of swing, but they are

still, essentially, only animated plumb

lines.

**The Megalithic Yard**

The Megalithic Yard was discovered by

Alexander Thom as part of the

composition of Megalithic sites from

the northernmost part of Scotland,

right down to Brittany in the South.

The main problem with its use, and the

reason archaeologists still doubt its

veracity, lies in the fact that it remained

absolutely accurate across thousands of

square miles and many centuries. This

would appear to be impossible in the

case of a culture that was, at least in its

early stages, devoid of metals to make a

reliable ‘standard’ against which others

could be set. Alexander Thom himself

could think of no reliable way of passing

on the Megalithic Yard without some

variation being inevitable across time.

We eventually reasoned that it

would be possible to turn ‘time’ into

‘distance’ by way of the turning Earth.

The speed of the Earth on its axis is as

accurate a yard stick for the passing of

time as anyone could reasonably require

for most purposes. Of course we can’t

see the Earth turning but we can see its

effects. The Sun, Moon and stars

appear to rise from below the horizon in

the east, to pass over our heads and

then set in the west. In fact, although

the Moon and planets do have

independent movement, the Sun and

the stars are not really moving at all

(actually they are moving slightly but

we need not concern ourselves with this

for our present purposes).

The apparent motion of the stars is

caused by the Earth turning on its axis

and it is this fact that offers us an

accurate clock which, with a little

ingenuity, we can turn into a replicable

linear unit of measurement. In the case

of the Megalithic Yard we eventually

discovered that the pendulum upon

which it is based was set not by viewing

any star but the planet Venus. Venus is,

like the Earth, orbiting the Sun. As a

result, when seen from the Earth, it has

a complex series of movements against

the backdrop of the stars. Sometimes

Venus rises before the Sun, at which

times it is called a morning star, and at

other times it rises after the Sun and is

then known as an evening star. This is

purely a line-of-sight situation, caused

by the fact that both Venus and the

Earth are orbiting the Sun. When Venus

crosses the face of the Sun to become an

evening star, it is moving ‘against’ the

direction followed by the backdrop of

stars. It is within this observable fact

that setting the Megalithic pendulum

becomes possible.

In order to create the Megalithic

Yard one has to follow the simple rules

below:

Venus must be observable as an

evening star, setting after the Sun and

during that period at which it is moving

at its fastest counter to the backdrop of

stars.

The sky is divided into 366 parts.

This can be achieved by trial and error,

as explained in *Uriel’s Machine*44 and

also in *Civilization One*45 but is also

achievable through a neat little

mathematical trick demonstrated

below.

1. 1. Stand in an

unobstructed

position on a

wide open

piece of

ground with a

good view of

the western

horizon.

2. Place a stick in

the ground

(stick A) and

stand facing

west with one

of your heels

touching the

stick.

3. Now take 233

steps, heel to

toe, towards

the west. Upon

completing the

233 steps,

place a second

stick in the

ground (stick

B) in front of

your toe.

4. Turn to the

north and

place your heel

against stick B.

Now take four

heel-to-toe

steps to the

north and then

place a third

stick (stick C)

in the ground

in front of

your toe.

5. The distance

between sticks

B and C, when

viewed from A

will now be

1/366th of the

horizon.

It is now necessary to make a braced

wooden frame of the type shown in

figures 14 and 15, which is as wide as

the gap between B and C. This must be

set on poles in such a way that it gains

significant height and can be altered in

its angle.

The purpose of this exercise is so

that the angle of the braced frame can

be identical to that of the planet Venus

as it falls towards its setting position.

Standing at A it is now necessary to

observe Venus passing through the gap

in the braced frame whilst swinging a

pendulum and noting the number of

swings achieved as Venus passes

through the gap. A pendulum that

swings 366 times during this occurrence

must be 1/2 of a Megalithic Yard in

length (41.48cm). The cord of this

length represents the full Megalithic

Yard of 82.966cm in length.

Figure 14

Figure15

In this way the Megalithic Yard

can be reproduced on any site where

observation of Venus, when at the right

part of its cycle, can be achieved. For the

use of the braced frame we are grateful

to the considerations of Professor Archie

Roy, Emeritus Professor of Astronomy

at Glasgow University.

Although pendulums differ

slightly with latitude and altitude,

because gravity also alters slightly, we

have shown that the Megalithic Yard

achieved using this method will remain

within the tolerances discovered by

Alexander Thom from Orkney in the

north to Brittany in the south, in other

words across the whole area containing

monuments surveyed by Alexander

Thom.

The method used by the Sumerians to

set their own basic unit of length, the

double kush, followed the same general

rules as those employed by the

Megalithic peoples of the far west of

Europe. The only difference lay in the

numbers used.

Sumerians relied on a 360º

geometry, of the type we still use today.

Because of this their starting point was

to divide the horizon into 360 equal

units. The mathematical trick used to

short-circuit this procedure that was

itemised in Appendix One does not

apply in this case. It is possible that the

Sumerians devised their own method of

making the initial procedure quicker,

but in any case theirs was a metal-using

culture and one that would therefore

not have needed to repeat the procedure

of defining the linear unit all that often.

They could have created a fairly

accurate standard rod. Establishing the

necessary 1/360th of the horizon by trial

and error would have taken time, but it

is quite possible to achieve with a high

degree of accuracy.

The procedures used in the

preceding Appendix are now followed.

The braced frame would be equal to a

gap of 1/360th of the horizon but Venus

would be tracked in exactly the same

way. The desired number of swings in

this case is 240, which is the same as

240 seconds, a period of time known to

the Sumerians as a ‘gesh’. A pendulum

that swung 240 times during the

passage of Venus through the braced

frame would be 99.88 cm in length, a

linear length that conforms to that

discovered on the statues of Gudea

from Lagesh in Iraq. This unit of length

was known to the Sumerians as the

double kush.

It has to be noted that the

pendulum in question is not strictly

speaking a seconds pendulum of the

sort that was popularly used from the

seventeenth to the nineteenth century.

Because the object being tracked is

Venus, which is moving independently

against the backdrop of stars, the time

taken for each beat of the pendulum is

slightly longer than a second (1.002

seconds). This stands as part of the

proof that the Sumerians did use this

system to define their linear unit. They

fully understood that there were 43,200

seconds in a day (to us there are twice

this number because we use a twentyfour-

hour day instead of the Sumerian

twelve-hour day) but there is no

absolutely reliable way of defining the

true second of time by observing the sky

and swinging a pendulum. This could

only be achieved by tracking the average

movement of the Sun in the same way

Venus is used in this exercise. However,

because of the Earth’s own orbital

characteristics, the Sun does appear to

move at a constant speed across the sky.

There are only a few days each year on

which the experiment using the Sun

would work perfectly and the

Sumerians could not have known which

days would have been appropriate. In

addition, the Sun is very much more

difficult, and potentially dangerous, to

track in this way.

Similarly, if they had used a star

instead of the planet Venus, the

pendulum would still not have been a

true seconds pendulum. The reason for

this is that the sidereal day (a day that is

measured by a star passing from one

point in the sky back to that point

again) is shorter than a solar day (a day

that is measured by the Sun passing

from one position in the sky back to

that point again). A seconds pendulum

created by tracking a star would actually

give a time reading of 0.997 seconds

and lead to a pendulum length close to

99.3cm.

We remain convinced that both

the Megalithic culture and that of the

Sumerians were simply following

instructions that had been given to

them by another agency. In the case of

the Sumerians the use of Venus for

setting their pendulum, and therefore

their chosen unit of length, resulted in a

series of measurements that were truly

integrated with the Earth. As we have

shown, the Sumerian double mana unit

of mass divides into the mass of the

Earth

6,000,000,000,000,000,000,000,000

times, which would not have been the

case with a shorter pendulum and

therefore a lighter unit of mass. True,

the achieved second of time was slightly

at odds with the genuine second of

time, but the Sumerians, lacking

accurate clocks, could not have been

aware of this fact. In fact the

discrepancy is so small it couldn’t have

been measured until the last century or

so.

The message that we have detected is

present in recurring number sequences

that are, strangely, often round

numbers. We started to realize that

something highly unusual was

happening when we discovered that the

Megalithic system of geometry worked

on the Moon and the Sun as well as the

Earth.

Looking into issues concerning the

Moon we were immediately reminded

of the strange coincidence that the

Moon and the Sun appear to be the

same size in Earth’s skies, leading to the

phenomenon we call a total eclipse. Still

stranger is the fact that the relation is so

numerically neat with the Moon being

400 times smaller than the Sun and 400

times closer to the Earth at the point of

a total eclipse. On its own this could be

a bizarre coincidence, but because of

what follows we believe that it is the

‘headline’ to a message built into the

Moon 4.6 billion years ago.

**The Megalithic system**

The Megalithic system of geometry is

based on 366° to a circle, sixty minutes

to a degree and six seconds to a minute.

This sequence produces a second of arc

on the Earth’s polar circumference that

is 366 Megalithic Yards long, the linear

measure of the Megalithic builders as

identified by Alexander Thom.

As a cross-reference we had also

discovered that the 4,000-year-old

Minoan Foot is precisely equal to a

1,000th part of a Megalithic second of

arc.

We applied the principles of

Megalithic geometry to all of the planets

and moons in the solar system and

found that it only produced round

integer results for the Sun and the

Moon.

The Sun is very close to being a

true sphere, certainly much more so

than the Earth. NASA quote the mean

volumetric circumference as being

4,373,096km, which we converted into

Megalithic Yards and applied the 366

geometry.

Sun’s circumference

= 5,270,913,968

MY

One degree =

14,401,404 MY

One minute =

240,023 MY

One second =

40,003.8 MY

The fit is 99.99per cent accurate to

40,000 and given that this is based on a

best estimate of the mean circumference

it has to be considered bang on.

Like the Sun, the Moon is quite

close to being a sphere. NASA gives the

mean volumetric circumference of

10,914.5km, which produces the

following result:

Moon’s

circumference =

13155300 MY

One degree = 35943

MY

One minute = 599

MY

One second = 99.83

MY

If we use the equatorial radius the result

is 99.9 MY per second of lunar arc.

Either way, this is as close to 100 MY as

makes no difference, given the irregular

surface of the Moon and the small

variation in Thom’s definition of the

Megalithic Yard of +/- 0.061cm.

It could have been possible for

people many thousands of years ago to

create a system of geometry that

produces round integers for two celestial

objects such as the Earth and the Sun,

but it would seem impossible to achieve

such a feat for three bodies. It therefore

appears that the Moon was designed

using units derived from the physical

dimensions of the Sun and the Earth.

**The Earth–Moon**

**relationship**

The duration of the Moon’s orbit

(sidereal – fixed star to fixed star) is

27.322 Earth days (27.396 rotations of

the Earth). This number is

extraordinarily close to the size

relationship of the Moon to the Earth,

being 27.31 per cent of the Earth’s size.

The Earth currently turns on its

axis 366.259 times for each orbit

around the Sun. This number is

extraordinarily close to the size

relationship of the Earth to the Moon,

being 366.175per cent larger than the

Moon.

There is no reason why these

numbers should repeat in this way:

Earth turns

per orbit

per cent size of polar

circumference

Earth 366.259 27.31

Moon 27.396 366.175

It is also a consequence of the above

that the Moon makes 366 orbits of the

Earth in 10,000 Earth days.

The size of the Sun, Earth and

Moon have been fixed for billions of

years so their size ratios have not

changed. But the orbital characteristics

of the Earth and the Moon have

changed constantly.

When the Moon was much closer

to the Earth than it is now, its orbit was

much shorter and the Earth day was

also shorter, leading to perhaps as

much as 600 days to the Earth year.

The Earth’s own orbit around the Sun

remains essentially unchanged. It is

only the time it takes to spin on its own

axis that alters.

The close number association

between the size ratios of the Sun, Moon

and Earth, and the orbital

characteristics of the Moon, together

with the present length of the Earth day,

are only applicable to the time that

humans have been fully formed. These

relationships were not present in the

distant past and they will disappear in

the distant future. The number

sequences which alerted us to the

‘message’ are clearly meant for the

present period.

**The Metric System**

Orbital characteristics and size

relationships are physical factors and

any correlations are real – no matter

what units of measurement are

employed. No one knows the origin of

the Megalithic system but the origin of

the metric system is fully documented.

Whilst it did have a near identical

precursor in the Sumerian system of

more than 4,000 years earlier, the

metric system is known to have been

developed from measuring the polar

circumference of the Earth alone.

It was designed so that there

should be 40,000km in one Earth

circumference. The equator is a little

longer than the polar circumference but

basically the Earth turns through this

distance each day.

The Moon turns through an

unimpressive sounding 10,920.8

kilometres every 27.3217 days. This

converts to 400km per Earth day – to

an accuracy greater than 99.9 per cent.

Again this is a factor that only exists in

the human period of existence.

The number 400 is already central

to human appreciation of the Moon

because it is 400 times closer to us than

the Sun, and it is 400 times smaller.

The use of 400 kilometres per current

Earth day could be a message that the

architect of the Moon knew we would

use kilometres and mean solar days.

Metric units apart, the Moon is

turning at a rate that is almost exactly

one per cent of the Earth’s rotation. Or

to reverse the factor, the Earth is turning

100 times as fast as the Moon. All

curiously round values!

To add to the idea that this is a

deliberate piece of metric design, the

Moon is also travelling on its journey

around the Earth at a steady rate of one

kilometre per second! This speed varies

a little as it travels but does not drop

below 0.964km per second and does

not exceed 1.076km per second.

And there is something else very

special about the kilometre as regards

the Moon. To understand it we need to

realize that there are 109.2 Earth

diameters across the Sun’s diameter.

There are also 109.2 Sun diameters

between the Earth and the Sun at its

furthest point of orbit.

The circumference of the Moon is

109.2 x 100 kilometres.

Is that not odd in the extreme?

One way of looking at the

association between these ratios and

numbers can be seen in the diagram in

figure 16.

There are many factors here that

should bear no relationship with each

other at all. Taken in isolation, any one

of these strange associations might be

considered to be a coincidence but there

comes a time, however, when

coincidences become so frequent that

something else must be at work.

Figure 16

The awesome sight of a black shadow

gradually crossing the face of the Moon

still captivates most people, even

though we now live in an age when we

not only know what causes the

phenomenon but can predict exactly

when it is likely to happen. Early

cultures did not know either and must

have seriously thought, for a few

minutes at least, that the world was

coming to an end.

Back in the 1960s the astronomer

Gerald Hawkins suggested that at least

one of the functions of the structure at

Stonehenge, Salisbury Plain, England,

was to predict the occurrence of eclipses.

Hawkins had carefully studied the

ancient monument, parts of which date

back five thousand years, and subjected

his data to a massive numbercrunching

computer. He came to the

conclusion that the Aubrey Holes, a

series of fifty-six chalk-filled pits around

the standing stones at Stonehenge,

represented a sophisticated device for

predicting both solar and lunar

eclipses.46

Clay tablets discovered in what is

now Iraq and dating back to the

Sumerian period, which commenced

around 3000 BC, indicate that people in

the region were doing their best to

predict eclipses. And there isn’t any

doubt at all that the Babylonians who

followed the Sumerians were competent

at accurately working out when the face

of the Sun or Moon would darken.

The ancient Chinese, Indians,

Egyptians, American cultures and many

other societies worked hard to develop

an understanding of rudimentary

astronomy for the purpose of eclipse

prediction. This single effort certainly

caused humanity to significantly

improve its naked-eye astronomy and

its understanding of mathematics.

There are good reasons why this should

be the case and at the base of most of

them is power. Any would-be ruler,

secular or religious, who could predict

when an eclipse was likely to take place

was in a very strong position to

manipulate the situation to his or her

own ends.

To the average lay person, eclipses

seem to be totally haphazard but this is

not the case. However, such is the

complicated nature of the interplay of

the Earth and the Sun that

understanding eclipse patterns is far

from easy. Once the pattern is cracked,

its secrets could be passed from one

ruler to another and a whole society

could be alerted to a possible eclipse.

The prediction itself would have seemed

to most people to be the most

sophisticated sort of magic and when

the king or holy man drove away the

dark dragon that was trying to swallow

the Sun or causing the Moon to bleed,

his power would be ensured for a

considerable period ahead.

What the ancients gradually

discovered was that there were very

definite patterns to the occurrence of all

eclipses and that they were governed

overall by a specific period of time that

is known as the ‘saros cycle’. The word

saros was first used by the astronomer

Edmond Halley (1656–1742) and is

supposed to have been derived from a

Babylonian word. The saros cycle is

6,585.3 days in length (18 years, 11

days, 8 hours). It represents the coming

together of three distinct patterns. The

first of these is the Synodic Month (new

Moon to new Moon,) the second is the

Draconian Month (node to node [see

below for information on Moon’s

nodes]) and the third is the Anomalistic

Month (perigee to perigee [see below for

information on Moon’s perigee]).

To within about two hours, 223

synodic months, 242 draconian months

and 239 anomalistic months come out

to the same period of time and it is at

this point that any eclipse will repeat

itself. The reason for this is that the

solar system runs pretty much like a

gearbox and, as with a gearbox, any

pattern created now will sooner or later

be repeated.

Although the saros cycle is very

accurate, there are many such cycles

running at the same time. All that can

be deduced from the saros cycle is that

if an eclipse occurs today, it will occur

again in 6,585.3 days and will have a

quite similar geometry. The system

does fall down somewhat in that it splits

a day and so future eclipses in any given

cycle may not be fully visible from the

same part of the globe. Each saros cycle

runs for around 1,200 years (around

sixty-six repeat eclipses) until it expends

itself. If the saros cycle commences near

the South Pole it will extend itself

gradually further north with each

eclipse until it finally disappears at the

North Pole. The same is true in reverse.

It would appear that the

Babylonians understood the saros cycle,

as did the Ancient Greeks. So, according

to Gerald Hawkins, did the builders of

Stonehenge. Something akin to the

saros cycle would have been useful to

ancient peoples because if the next

eclipse in any given series was less

impressive than the last, it would still

have been predicted, and it was just as

likely to be more impressive as less so.

(Better by far to turn the tribes out for a

less-than-spectacular display than to

miss what could be a super show!)

Our own previous research

demonstrates that following the saros

cycle was actually very easy for the

Megalithic people, who were the

builders of Stonehenge and thousands

of other such monuments. The ritual

year of the Megalithic cultures was 366

days in length. This meant that the

saros cycle to them was just two days

short of eighteen years in length. The

two days didn’t really matter because

solar eclipses can only occur at the new

Moon and lunar eclipses at the full

Moon. In other words, just a couple of

days short of eighteen years after a

particular eclipse, the next full or new

Moon would be certain to bring

another.

Even today we don’t take solar

eclipses for granted. A major eclipse,

such as the one that was visible in

northern Europe on August 11th 1999 is

treated as a time of celebration and is

now revered for its sheer beauty, rather

than being feared as was surely the case

even not so long ago. The face of the

Sun gradually begins to blacken as the

Moon passes between it and the Earth.

If it is a full eclipse the Sun’s disc will be

covered at what is known as totality. At

totality, all that is perceptible is the faint

glow from the corona of the Sun. Soon

after, the shadow begins to move away

and a spectacular shaft of light breaks

out, forming what is known as the

diamond ring effect. The phenomenon

is just as impressive now as it must have

looked from Babylon or Stonehenge.

It might surprise readers to learn

that no matter where our astronauts or

cosmonauts travel in the future within

our solar system, they will never stand

on the surface of any other planet and

watch a total eclipse. They are simply

not possible anywhere else and only

occur as a legacy of a series of

breathtaking, apparent coincidences.

The fit of the Moon’s disc across the

face of the Sun during a total eclipse is

not ‘near’ – it is ‘exact ’– and this fact

should be the greatest sense of wonder

to anyone viewing such an event

because it is very unlikely. No other

planet has a moon anywhere near big

enough or orbiting at the right distance

to fully, but not too fully, eclipse the

Sun.

There are two basic sorts of eclipse,

and then subcategories within the two

types. The most impressive form of

eclipse is known as a solar eclipse. The

drawing below shows what is actually

happening when a solar eclipse takes

place.

Figure 17

When the Moon stands directly between the Earth

and the Sun, a total eclipse is possible but totality

only occurs across a relatively small area of the

Earth’s surface and follows a curve known as the Path

of Totality.

In this example, which is a ‘total

eclipse’, to a proportion of those people

living along the path of totality, the disc

of the Sun will be blotted out

completely. Whilst totality is achieved,

all that can be seen is the sun’s corona

(the halo of bright matter that is

constantly being thrown off by the

Sun). The larger shadow is called the

penumbra and people beneath this will

see a partial eclipse. There is another

form of solar eclipse that can never be

total and this is known as an annular

eclipse. The Moon is 1/400th part the

size of the Sun and it stands at 1/400th

the distance between the Earth and the

Sun, but not always exactly.

The Moon’s orbit around the

Earth is not circular but elliptical. This

means that sometimes the Moon is

slightly closer to the Earth than it is at

other times. If a solar eclipse takes place

when the Moon is furthest from the

Earth, the Moon’s disc looks smaller

and can never totally blot out the Sun.

Total eclipses of the Sun therefore

happen when the Moon is on the part

of its orbit that brings it closest to the

Earth. When the Moon is closest to

Earth it is said to be at *perigee* and when

it is furthest away it is at *apogee.*

Solar eclipses can only take place

when the Moon stands between the

Earth and the Sun and this is the short

period on each lunar cycle known as

‘new Moon’. (The time of the lunar

month when no part of the Moon is

visible from Earth.)

It might be thought that because

there is a new Moon each month, there

should therefore be a solar eclipse each

month but this is not the case. The orbit

of the Moon around the Earth does not

follow the same angle as the orbit of the

Earth around the Sun. If it did, every

new Moon would indeed bring a solar

eclipse. Rather it is tilted to the Earth’s

orbit (known as the ecliptic) by five

degrees. Only when new Moon occurs at

a point when the orbit of the Moon

around the Earth crosses that of the

Earth around the Sun, can a solar

eclipse take place. These points north

and south of the ecliptic are called the

Moon’s nodes. This happens ‘at least’

twice each year and can produce a solar

eclipse observable from somewhere on

the Earth.

The second type of eclipse is not

quite so impressive as a solar eclipse but

it would have been fascinating to our

ancient ancestors all the same. It is

more common than a solar eclipse and

is known as a lunar eclipse. A lunar

eclipse takes place when the shadow of

the Earth comes between the Sun and

the Moon. A lunar eclipse can only take

place at the exact opposite time to a

solar eclipse, at the time of the full

Moon when the entire disc of the Moon

is visible from Earth.

During a lunar eclipse the face of

the Moon does not disappear

altogether. Rather it is darkened and,

under some circumstances, it appears to

turn a deep red. Such lunar eclipses

were seen by many ancient cultures as

terrible harbingers of disaster and were

probably feared as much as solar

eclipses.

Figure 18

The path taken by the Earth around the Sun is not

the same as that taken by the Moon around the Earth.

There is a 5° difference. Because of this, total eclipses

can only happen when new Moons fall on what is

known as the node – that point at which the two

orbits cross.

Figure 19

A lunar eclipse takes place when the Earth’s shadow

crosses the face of the Moon at the time of full Moon.

Once again the fact that the plane of the Earth’s orbit

around the Sun and that of the Moon around the

Earth are not the same prevents every full Moon from

being eclipsed.

Until we did some in-depth

research we never realized just how

unlikely or extraordinary a total eclipse

actually was. It’s all a matter of ‘line of

sight’ as the diagrams below should

make clear. Isaac Asimov, the famed

science-fiction guru, described this

perfect visual alignment as being: ‘The

most unlikely coincidence imaginable’.

Figure 20

In this example the eye on the right looks past a small

sphere to a much larger sphere. The size of the spheres

and the distance between them is such that because of

the perspective to the viewer the small sphere will

exactly cover the large sphere.

Figure 21

Now the small sphere is even smaller, but is at the

same distance from the eye of the observer. Under

these circumstances the eye will also see part of the

larger sphere. Finally, if we keep the spheres the same

as in the last example, but move the smaller one

nearer to the eye of the observer we once again create

a situation in which the small sphere appears to

exactly cover the large one.

Figure 22

The sphere of the Sun is almost exactly 400 times

larger than that of the Moon. This in itself might be

considered nothing more than a strange but

meaningless coincidence but we must stretch

coincidence almost to breaking point when we realize

that when the Moon is as close to the Earth as its orbit

will bring it, it stands at 1/400th the distance between

the Earth and the Sun. Under these circumstances

when it stands precisely between the observer and the

Sun, the Moon ‘must’ exactly cover the disc of the Sun

– it is a simple matter of perspective.

In the case of total eclipses we

really are living in a tiny snapshot of the

history of the Earth and the Moon. The

Moon was very much closer to Earth at

the beginning of the relationship, and

by the time the two reach a situation of

perfect stasis the Moon will be 1.6 times

further away from the Earth than it

presently is. If we estimate the Moon to

be 4 billion years in age and then accept

the most common assessment that it

will reach its furthest position from the

Earth in 15 billion years (excluding the

fact that the Sun will most certainly

have gobbled up both Earth and Moon

by then) the sum total of the Moon’s

journey from closest to furthest from

the Earth is 19 billion years. The Moon

is a finite size, as to all intents and

purposes is the Sun. There can only be a

very short window of opportunity

during which the disc of the Moon can

cover that of the Sun, as seen from

Earth, in the truly perfect way that it

does right now. That it has done so just

at the time we have evolved into a

sophisticated enough species to

recognize and study the fact seems

almost incredible. It doesn’t matter how

much experts say ‘It’s just one of those

things’, it is still an example of one of

the most unlikely coincidences

imaginable.

It stands to reason that if the

Moon were any larger or smaller than it

is, total solar eclipses would not be

possible at this time. A smaller Moon

would have brought such phenomena

in the very distant past, when the Moon

was much closer to the Earth than it is

now.

This brings us to a discussion of

the dimensions of the Moon. In

comparison with the size of its host

planet the Moon is huge. Its

circumference would only fit into that

of the Earth 3.66 times. Another of the

terrestrial type planets, Mars, has two

moons, but they are tiny when set

against Earth’s Moon, which in terms of

size might reasonably be termed a

planetoid. Even bearing in mind the

vast size of the planetary super-giants,

with their proliferation of moons,

Earth’s Moon is still the fifth largest in

the whole solar system.

A close examination of Moon rock,

brought back by both American

astronauts and Soviet unmanned

missions, shows that they are very

similar to specific rocks on the Earth.

Analysis of the rocks proves that they

were created at the same distance from

the Sun, so there is no longer any real

doubt that the Earth and the Moon

have a common origin. Yet there is

something very strange about the Moon

that isn’t easy to explain. Although it is

1/3rd as big as the Earth it has only

1/81st of the Earth’s mass.

Had the Moon been composed of

a representative sample of ‘all’ Earth’s

rocks and still been the size it is, it

would have been much more massive.

Conversely, if the Moon had exactly the

same composition as the Earth and had

exerted the gravitational pull it presently

does, it would have been very much

smaller in size.

These facts are discussed in greater

detail elsewhere, but it is the weird

composition of the Moon, which is

comprised of very light, Earth-type

rocks, that means it can be large enough

to create a total solar eclipse and yet not

rip the surface of the Earth to pieces

with its gravitational pull every time it

passes overhead.

In a Universe filled with incredible

wonders, and one so big that it might as

well be infinite as far as we are

concerned, we are certain to stumble

across what looks to us like outrageous

coincidences. Even conservative

astronomers admit that total eclipses

are very unlikely but still maintain such

happenings must be a random chance

event. We beg to differ!

The previous work we had undertaken

for our book *Civilization One* had

featured a number of ancient

measuring systems. None of these

surprised us more than that created by

the Sumerians, a culture that originated

in what is presently known as Iraq at

about the same time as the Megalithic

culture was flourishing in Britain and

France. Our ongoing work for the

present book made us look again at

some aspects of the Sumerian

measuring system. It could be that yet

another part of the message left to us,

indicating a deliberate intervention into

the origin and progress of humanity, is

encapsulated within the methods the

Sumerians used to measure their world.

Out of a plethora of different linear

lengths, weights and measures, it was

possible for us to reconstruct the entire

Sumerian system as we are sure it was

originally meant to be. We have

demonstrated how the Sumerians used

a pendulum and the planet Venus in

order to establish the basic unit of linear

length, which was known as the double

kush. Existent statues of the Sumerian

King Gudea demonstrate that the

double kush was intended to measure

99.88cm. Units of volume and weight

were derived from the double kush by

creating a cube with sides of 1/10th of a

double kush. The amount of pure water

held by such a cube represented the *sila*,

which was the Sumerian unit for

measuring volume. The weight of this

water was known as the *mana* or *mina*

and was the Sumerian unit for

measuring mass. How we untangled all

of this from the Sumerian records is

explained in detail in our book

*Civilization One*.47

There seemed to be no doubt that

the double kush had indeed been

created by way of a pendulum and

observations of the planet Venus but it

was not the only way the Sumerian

system could be recreated. Everything in

the system also relied on the size, shape

and weight of a humble barley seed.

To the Sumerians a barley seed

was known as a *se*. Until our own

investigations, many experts had

believed that the use of the barley seed

by the Sumerians for measuring

purposes was probably an abstraction. It

was generally considered that the

Sumerians might originally have used

such seeds (as was the case in ancient

western Europe), but that as in the case

of Europe the seeds ultimately came to

be words representing sizes and weights

that no longer related to barley seeds at

all.

The Sumerians claimed that 360

barley seeds was the measure of the

double kush, something that experts on

the Sumerian culture actively deny or at

best have totally ignored.

Our extensive investigations

showed conclusively why this state of

affairs had come about. Experts had

undoubtedly assumed that if the

Sumerians had used barley seeds as tiny

units of length, they must have laid the

seeds end to end. It is likely to be for

this reason that it is now generally

considered that the seeds themselves

eventually lost all contact with units of

measure, because when they are laid

end to end they make no sense at all.

However, we discovered that if the seeds

were laid on their sides and front to

back (as they may have been carefully

strung on a necklace) they conformed

absolutely to the Sumerian system.

We then went on to demonstrate,

by practical experiment, that the

Sumerians had also been quite correct

in their estimation of the ‘weight’ of an

average barley seed and we were

staggered to discover that even modern

barley seeds have almost exactly the

same dimensions and weight as their

Sumerian counterparts.

It has been possible to show that in

terms of mass measurement the whole

Sumerian system was irrevocably and

seemingly quite deliberately tied to the

overall mass of the Earth itself. We

appreciate that this sounds absolutely

absurd for such an early culture but

when one sees the figures involved, there

is no doubt about it.

According to Sumerian texts it was

considered that there were 10,800 barley

seeds to the unit of weight known as the

‘mana’. The weight of water held in the

double mana, assuming a double kush

of 99.88cm and a cube with sides of

1/10th of this, would have been 996.4

grams.

The mass of the Earth is held to be

5.976 x 1024 kg. If we divide this by

.9964 in order to establish how many

double mana there are to the mass of

the Earth, we arrive at 5.99759 x 1024

double mana. This number is so close

to 6 x 1024 (99.99per cent) that this

must surely have been the number

intended. Since there are 10.800 barley

seeds to the mana and therefore 21,600

to the double mana it is possible to

show that the mass of the Earth is equal

to that of 1.296 x 1029 barley seeds. This

might not seem to be a particularly

impressive number but it has some very

important properties.

If we were to segment the Earth, as

we might an orange, we would discover

that each 1/360th segment of the Earth

has a mass equal to 3.6 x 1026 barley

seeds. A further split of sixty brings us to

6 x 1024 barley seeds and yet another

split of sixty results in 1 x 1023 barley

seeds, which can be expressed fully as

100,000,000,000,000,000, 000,000.

The starting point of this exercise

was an Earth mass of 6 x 1024 double

mana for the mass of the Earth, which

would have been highly significant in

Sumerian terms since there’s was a

sexagesimal (sixty base) system.

For all the reasons explained in

*Civilization One*, we cannot accept that

this state of affairs is a coincidence.

What we have with the Sumerian

system is a fully integrated way of

measuring length, volume, mass, area

and time, using the same number bases

in each case. The whole system can be

constructed from a pendulum set by

the movements of Venus across one

degree of arc of the horizon or else from

the bottom up with nothing more

complicated than barley seeds.

The real question has to be

whether or not the Sumerians

themselves could have possibly known

just how incredible their measuring

systems were? We are left with the

impression that the system would have

been very useful in the marketplace and

on the farm in order to ensure equity of

measurement throughout Sumerian

society but that it is highly unlikely that

the Sumerian Priests could have known

the dimensions of the Earth, let alone its

mass. It is most likely that both

concepts would have been absolutely

alien to them.

This appears to be yet another

example of direct and deliberate

intervention into the development of

humanity. In other words, as their own

mythology demonstrates, someone

‘taught’ the Sumerians about weights

and measures and told them the

numbers to use. By so doing they

supplied the Sumerians with one of the

hallmarks of true civilization, namely

an integrated and replicable measuring

system. At the same time, the use of the

barley seeds added to a significant series

of messages about these events in

prehistory that were intended for our

consumption. Since it seems unlikely

that a cereal grain as widespread and

useful as barley could, by chance,

behave in the way that it does in terms

of its size and weight, it seems very

likely to us that the crop was genetically

engineered. It was used by the

Sumerians for bread but also brewed

into a beer that was drunk for many

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Plate 1 The Earth.

Plate 2 The Moon.

Plate 3 The Sun. If you divide the circumference of the

Sun by that of the Moon and multiply by 100 you get

the polar circumference of the Earth. And that is just

the beginning: the number play involved in the

Earth-Moon-Sun system is nothing less than

staggering.

Plates 4 & 5 The Lascaux caves. Around 250

generations after the Abri Blanchard bone was

carved, another astronomer recorded this already

ancient knowledge onto a cave wall at Lascaux in

France. These photographs show reconstructions of

the paintings.

Plate 6 The Abri Blanchard bone. Experts agree that

the markings carved onto the 25,000-year-old Abri

Blanchard bone accurately correspond with a twomonth

lunar calendar.

Plate 7 The Willendorf Venus c. 24000–22000 BCE.

Studies have suggested that these early ‘Venus’ images

of the female figure were self-portraits.

Plate 8 Craters on the surface of the Moon.

Plate 9 A drawing of the Moon surface map found at

Knowth, Ireland, superimposed onto the face of the

Moon.

Plate 10 Active volcanoes indicate the molten nature

of the Earth’s core.

Plate 11 Mountain ranges are the proof of plate

tectonics at work. But why is Earth the only planet to

show evidence of this? The answer, it would seem, lies

with the Moon.

Plate 12 Newgrange Passage Tomb, Ireland, and Plate

13 the Ring of Brodgar, Scotland. Structures like

these tell us a great deal about the Neolithic people’s

fascination with the Moon.

Plate 14 The view from the Moon: Earthrise.

Plate 15 The first human footprint left on the Moon.

Between 1969 and 1972 twelve astronauts walked on

the Moon. The information gathered during those

expeditions has greatly increased our knowledge of the

Moon. But it has also posed as many questions as it

has answered.

Plate 16 The Apollo 17 Insignia, the last manned

voyage to the Moon.

Plate 17 The Lunar Module (LEM), the first manned

vehicle to land on the Moon.

Plate 18 Could electrical storms on earth have

contributed to the appearance of DNA?

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