

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

I The ancients: early chronologies

Creation, be it of the Universe or the Earth, has been a subject of fascination for centuries. Through the ages, philosophers and latterly scientists have struggled to come up with a logical explanation of how the Earth and the Universe came to be. Allied to this has been the question: when did creation take place?

In many cases early philosophers and thinkers made no distinction between the date of formation of the Earth, the Universe or indeed the appearance of mankind. In many mythologies no actual dates are given. Creation myths, or more correctly beliefs, as one would expect, are frequently closely related to the experiences exerted on the civilisations that propounded them. Thus among peoples of the northern hemisphere great emphasis is placed on ice, frost and cold climatic conditions, whereas the Persians and Egyptians set great store, respectively, by the Tigris and Euphrates, and by the Nile, and their essential life-giving properties. These beliefs allowed man to grasp an understanding of his environment and the planet on which he lived. The annual, seasonal, diurnal cycles were seen to be recurring, and these events were explained through the adoption of higher life-forces or gods.

In some civilisations the Earth and Universe are seen as everlasting, while in others they have a definite time-progression from birth to eventual death. Nearly 2,000 years ago the Roman poet, writer and philosopher Carus Titus Lucretius (c. 95–55 BC) published *De rerum natura* just two years before his suicide. In this important poem he made several observations about the Earth and natural history, including suggesting that clouds formed from moisture, that volcanoes developed as winds inside the Earth heated up rock and produced magma, and that earthquakes were also triggered by these internal winds. He also pondered the planet's history, saying: 'the

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

2 THE CHRONOLOGERS' QUEST

question troubles the mind with doubts, whether there was ever a birth-time of the world and whether likewise there is to be any end.'

Creation and the processes by which it happened were often explained through the incarnation of deities. The Egyptians had a whole pantheon, paralleled to some degree by the Greek and Roman gods. Even the Celts had their own line-up of gods, many of whom were related to the natural elements and astronomical bodies. Various peoples used these ideas to rationalise their existence – to understand their position within the environment, and the various elements (air, land and water) that constituted that environment. They also used beliefs to derive a cosmology or history of their planet that they themselves could understand.

Creation and the early history of the Earth have been the subject of mythological stories derived from many cultures. Certainly these ideas would have developed independently of each other. Today when we refer to 'myths' the general understanding is that these were ideas that are now discredited or wholly incorrect. A search on the Internet under 'creation myths' certainly leaves this impression. Here I prefer to use the term 'beliefs' instead of 'myths', reflecting the older but now largely superseded concept of the latter term. There is no doubt that the beliefs outlined below were of huge significance to the various civilisations in which they evolved. There is no evidence to suggest that these peoples considered these ideas fallacies. While modern scientists are confident that our understanding of the Earth's creation and its progression are broadly understood and explained in a logical manner, there is of course a possibility that we, like our predecessors, are incorrect. I, for one, believe that the Earth has a very long history and that geologists and astronomers have got the story correct. Others, perhaps, do not feel as confident.

EGYPTIAN BELIEFS

The oldest documented creation beliefs are those of the Egyptians, and can be traced back to around 2,700 BC. There are several strands or traditions and they have become somewhat interwoven, but all have a

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

common thread in that the creation schemes proceeded in stages. Those stories from the cities of Heliopolis, Hermopolis and Memphis are the most important. Heliopolis lay north of Cairo on the confluence of a major divide of the Nile as it begins to widen into its delta, and its population was held in the grip of a Sun cult. At the beginning, Nun, the god of the primordial waters and father of the gods, caused a mound of dry land to emerge from the primordial chaotic water. On the land stood Atum, who created himself, and then the twins, Tefnut the goddess of moisture, and Shu the god of air, who became the parents of Geb the god of the Earth and his sister Nut the goddess of the Sky. When Shu discovered that the siblings had secretly married, he became angry and with great force separated them. With the assistance of two ram-headed gods, Shu raised Nut into the sky, and subjugated Geb beneath his feet, where he lay with his limbs bent – these symbolised the mountainous undulations of the Earth's crust. Atum was later considered to be the god of the setting Sun, and Ra, one of the most important of all Egyptian gods, to be the god of the risen Sun.

From Hermopolis, a city south of Cairo on the western bank of the Nile now called Matarea, came two creation stories. The first starts, like that of Heliopolis, with the emergence of land from chaotic waters. But it then tells of the appearance of an egg that hatched and yielded the Sun whose rise into the heavens was followed by the creation of all living matter. The second tradition saw the replacement of the egg with a lotus bud that floated on the surface of the waters. Horus the Sun god emerged from the opened petals of the lotus, and his rays radiated throughout the world. The story from Memphis, which is just southwest of Cairo on the left bank of the Nile, is rather different, and simpler than those from Heliopolis and Hermopolis. Creation was effected by the creator god Ptah (Figure 1.1) who in his heart thought up the concept, and having spoken of it brought the Earth into being.

CHALDEAN AND BABYLONIAN BELIEFS

Chaldea was the ancient name for the area of what is now southern Iraq, an area enclosed by the great rivers Tigris and Euphrates

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

4 THE CHRONOLOGERS' QUEST

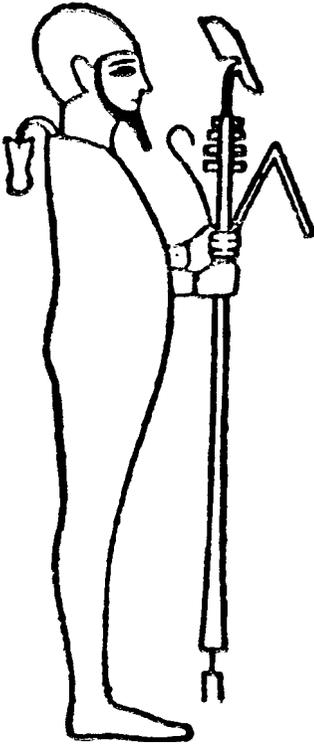


Figure 1.1 Ptah, the Creator God from the mythology of Memphis. He is shown holding a sceptre the head of which combines the *was* and *djet-pillar* symbols – the former had a forked base and was topped with the head of a dog, while the latter possibly represented a tree from which the leaves had fallen. From Ptah's neck a menat hangs down his back (from Anon., *Helps to the Study of the Bible*. (Oxford University Press, 1896), Plate 25).

northwest of their confluence, before they empty into the Persian Gulf. Later it was incorporated into a slightly wider region that became known as Babylonia; the term 'Chaldeans' in the Old Testament was often applied to astrologers and astronomers, and in general elsewhere to magicians. The notion that the Universe, and by inference also the Earth, had a cyclical history, originated in Chaldea. Each cycle was known as a Great Year (although it was certainly longer than a year as we understand it to be) which began and ended in either flood or fire. The later Babylonian myth of creation was encapsulated in the *Epic of Creation* inscribed in cuneiform lettering on six tablets that were found in the ruins of the Library of Assur-bani-pal (668–626 BC), King of Assyria, in the city of Nineveh (Figure 1.2). A seventh tablet was added in AD 142. The Epic recalls the actions of the god Marduk who was the only god capable of defeating Tiamat, the

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

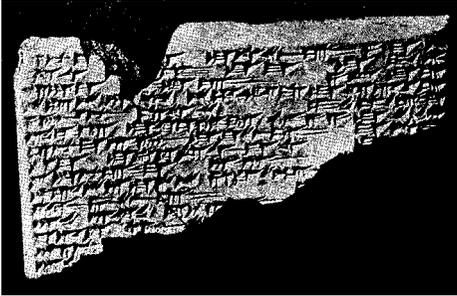
[More information](#)

Figure 1.2 Tablet with cuneiform inscriptions from the library of Assur-bani-pal, King of Assyria, telling part of the creation story of the Universe (from Anon., *Helps to the Study of the Bible*, Plate 57).

dragon of Chaos. In the beginning the god Apsu and Tiamat came together and bore the gods of Earth and Heaven. These offspring attempted to bring some order to their parents' chaotic lives, but conflict followed and numerous deities were killed and replaced with others. Marduk, who was the son of Ea, the god of water, armed himself with thunderbolts and lightning and, with the assistance of the winds, went into battle against the eleven monsters created by Tiamat who were under the command of her husband Kingu. Eventually Marduk prevailed, killing the dragon and dividing her body into two. One half became the heavens while the other became the Earth and the oceans. Plants and animals were then created, and followed by Man who was formed by Ea from clay and the blood of the god Kingu. It is not clear when creation occurred, but man, according to the Babylonians, appeared half a million years ago.

INDIAN OR VEDIC CREATION BELIEFS

Vedic faiths are those that arose on the Indian subcontinent, the oldest of which is Hinduism, followed by the later Buddhism and Jainism. Essentially all three faiths regard the Universe as having no beginning nor end.

In Hindu belief the Universe developed from the Hiranyagarbha or golden egg, which brought into existence the supreme god, the Brahman ('spirit' in Sanskrit). The egg contained the continents, oceans, mountains, the planets, the Universe and humanity itself. After a thousand years, the egg was said to have opened, releasing

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

6 THE CHRONOLOGERS' QUEST

Brahman, who began the work of creation. He found that the Earth was submerged under primordial waters, so he dived into the waters, and having assumed the form of a wild boar, he used his tusks and dragged the land up so that it lay above the surface of the water.

Time in the Universe comprises a series of ever-repeating cycles from birth, to growth, decline and death, followed by rebirth and the commencement of a new cycle. But how long is this cycle? Certainly millions of years. In order to indicate this immensity of time to the general populace, the storytellers told of a man who once every hundred years went to the top of the mountain and rubbed it with a cloth. The time that he would take to wear the complete mountain away was shorter than one universal cycle from birth to death.

Hindu duration of the Universe

In Hindu tradition the beginning of each cycle is announced by Shiva the Lord of the Dance, who bangs a drum held in his right hand. The ageing cycle ends in the flames held in his left hand, when all is absorbed into Brahma, and a new cycle commences. Each of the four ages of the world is called a Yuga and the four combined are termed Mahayuga or 'Great' Yuga. Each cosmic cycle comprises one day and night in the life of Brahma. The day lasts a Kalpa or 4,320,000,000 years and the night an equivalent time. In a Kalpa there are fourteen periods called Manvantaras each presided over by a special cosmic deity. The lifespan of Brahma is thought to be 100,000 daily cycles, and so to Hindus, the Universe and Earth are many billions of years old.

Buddhist beliefs

Buddhism was founded in the sixth century BC in northeast India by Siddhartha Gautama (563–483 BC) who was given the title 'Buddha'. Although Buddhists believe that the cosmic cycles continue unabated, there is possible release from them if 'Nirvana', a state of happiness or peace, is reached.

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

CHINESE AND JAPANESE BELIEFS

Some Chinese philosophers argued that Earth history was cyclical, and that each cycle took 24 million years to complete. It is not clear, however, how many cycles were involved. According to Chinese legend the first man on Earth was called P'an-ku. Later various parts of his body became mountains at the cardinal points of the compass; his arms became the north and south mountains, head was at the east, while the mountains of the west were formed from his feet. His eyes became the Sun and the Moon, and mankind developed from vermin that covered his body.

Early Chinese thinkers considered the Earth was square, some 233,575 steps in length and width. Later, in about AD 723, the mathematician I-Hsing measured its diameter and clearly understood that the Earth was a sphere.

Japanese mythology tells that at the creation of the Earth and the sky, three gods were self-formed, but immediately hid themselves from view. The young Earth, which had a jelly-like consistency, floated on water and from it grew a plant similar to a bullrush which produced two further gods. These, like their earlier counterparts, hid themselves. Following this a series of gods emerged in several generations, and the last two, Izanagi and Izanami, were given the job of consolidating the mobile Earth, and ensuring that its soil was suitable to grow crops. They took a stick and stirred the waters. When the stick was withdrawn, a drop of congealed matter fell back into the water and formed the island of Onokoro, where the two gods made their home. They became attracted to each other but before they could form new islands they had a disagreement because Izanami had spoken first, and being female she should not have done so. Nevertheless they had a child and this became the island of Awa. The couple asked the gods to mediate in their dispute, and following reconciliation they had more children who became either further islands that now make up Japan, or more gods, such as those of wind, the mountains and trees. Their last child became the god of fire. His birth was difficult and resulted

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

8 THE CHRONOLOGERS' QUEST

in the death of his mother. Izanagi was livid and beheaded the child, whose blood became eight more gods.

GREEK BELIEFS

Greek culture and thinking has a long history that stretches back to the sixth century BC. The earliest writings about the Earth and its chronology were by Hesiodus, the father of Greek didactic poetry, who was born at Ascra near to Mount Helicon in about 850 BC. After an early career as a farmhand he began to write poetry, having been commissioned to do so by the muses. Following the death of his father he fell out with his brother and emigrated. His most famous works are *The Works and the Days*, a poem with an agricultural theme running through it, which contains a section entitled 'Five ages of the world', and *Theogony*, in the first portion of which he describes the emergence of Earth (Gaea) from Chaos. Hesiodus' life ended violently with his murder and his body was thrown into the sea, only to be returned to the shore by dolphins. His dogs found the murderers of their master and threw the two guilty men into the sea where they drowned.

Later thoughts on the chronology of the Earth can be attributed to the Ionian natural philosopher Anaximander (610–547 BC). He was born in the town of Miletus which is situated south of Ephesus in what is now Turkey. Apart from writing about the nature of time and the Universe, and introducing the sundial into Greece, he devised a system of cartography and so is styled by some commentators as the 'inventor of maps'. Anaximander considered that time was endless, but that the Earth's history was cyclical – it and the Universe were being continually destroyed and subsequently reborn. The Universe and Earth were derived from an endless mass of matter, from which evolved a ring of fire comprising the stars, Sun and Moon that enclosed the Earth in its centre. Anaximander was perhaps the first commentator on evolution, nearly two and a half millennia before Charles Darwin. He said that all terrestrial animals had arisen from amphibians, but that humans had evolved from fish. It was natural, in an area prone to earthquakes, that the early Greek philosophers should

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

have an opinion about the structure of the Earth, although there was some confusion and difference of opinion as to where matter had come from. Heraclitus (540–475 BC), a philosopher of Ephesus, who was happy in his own company and shunned others, and who built his home on a dung-heap which provided underfloor heating, argued that all matter originated in fire and that it was never destroyed but simply reorganised. His contemporary Anaximenes (d. 504 BC) held that matter originated in air, and he believed that the Earth was a flat disc around which rotated the stars and planets. Later still Xenophanes (560–478 BC) regarded fossils as being proof that land had once been submerged, and Empedocles (490–430 BC) said that the Earth had developed in stages, that its core was molten – a fact not confirmed until the middle of the nineteenth century – and that the Earth and all on it was constantly in a state of change. These fifth-century BC philosophers together with Pythagoras (580–500 BC), best remembered for his laws of trigonometry, resurrected the theory of a cyclical Great Year that had been formulated by the Chaldeans. Herodotus (484–408 BC) is best known for his nine-volume history of the known world. However, he also made some geological observations and was aware that land was produced by sedimentation, and calculated that it would take 5,000 years for the Red Sea to silt up completely.

SCANDINAVIAN BELIEFS

In the northern latitudes of Scandinavia and Iceland, creation beliefs drew on the physical characteristics of the land. Initially there was no Earth, nothing but a large abyss. The first worldly place was a land of mists and clouds called Niflheim which was situated in the north, and in which spouted a great fountain that was the source of the Twelve Rivers. These carried very cold water towards the south, where Muspellsheim, the land of fire, was situated. Through this land flowed rivers in which a strange material slowly hardened and set. When it came into contact with the northern rivers a frost covered this material, and slowly the frost began to fill the abyss. However, warm southerly winds caused some of the ice to melt and from the

Cambridge University Press

0521813328 - The Chronologers' Quest: Episodes in the Search for the Age of the Earth

Patrick Wyse Jackson

Excerpt

[More information](#)

10 THE CHRONOLOGERS' QUEST

meltwaters Ymir, the first human, formed. When he was asleep two more giants formed and these were fed from the milk of Audumla, a cow also metamorphosed from the meltwaters. The offspring of the giants included Odin who rebelled against Ymir and killed him. His body became the landmass known as the middle Earth. One can clearly see the geological influences on this story. The cold northern rivers are most probably the cold Arctic current that when it reaches the warmer waters of the Atlantic produces thick fog banks, particularly around Newfoundland. The warm rivers with the solidifying matter are most probably lava flows which would have been known about from Iceland.

EARLY CREATION BELIEFS FROM THE AMERICAS

The Mayans, who occupied the northern portion of the Central American Peninsula area around Guatemala and southern Mexico, considered that the Universe was cyclical and that it could be destroyed and recreated. It formed initially from an ancient sea. Later the gods of the Sea and Earth who occupied this early ocean were joined by the gods of Newborn Thunderbolt, Sudden Thunderbolt and Hurricane and they decided to create land from the waters, after which the Sun, Moon and stars were formed. Difficulties with man soon occurred, and the gods attempted at least another four times to perfect Creation. The date of the last Creation has been given as 5 February 3112 BC.

CREATION BELIEFS FROM THE PACIFIC

Various island groups in the Pacific have their own individualistic creation stories, and frequently more than one story is associated with each island. Naturally enough given the strong geographical influences on the islands, many of the stories have a common thread. In Polynesia the Earth was born out of surrounding water. Maui, a major folkhero, reeled up New Zealand, Hawaii and Tonga. Some of the island chains were produced by his fishing, at different times, or when (as in the case of Hawaii) one large piece of land broke up as it