

# IN THE BEGINNING

by

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*Come, weigh me the weight  
of the fire  
or measure me the  
measure of the wind  
or recall me the day that is  
past.*

*IV Ezra*

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## A Technical Note

I have been asked by the compilers of the Velikovsky archive to briefly describe the present condition of Velikovsky's unpublished manuscript entitled *In the Beginning*. As Velikovsky explains, parts of this volume were already complete in the 1940s and originally formed part of *Worlds in Collision*. The present manuscript also incorporates material written for a volume entitled *The Test of Time*, which dealt with the new information on the planets coming from the space probes, and contained frequent allusions to the earlier catastrophes; this work will probably never see publication. Other material included in this manuscript comes from Velikovsky's lectures and other scattered writings. During the time that I worked for Velikovsky (1976-1978) one of my tasks was to complete the cataloguing of his library notes, mostly from the 1940s. The headings of the catalogue generally corresponded to the section headings in *Worlds in Collision* and *In the Beginning*. The completion of *In the Beginning* was a cooperative effort between Velikovsky and myself. After Velikovsky's passing, when I returned to Princeton to work on his archive, I systematically moved the parts contributed by me into the notes apparatus and this is how this material appears in the unpublished manuscript.

*Jan Sammer*

In this edition Jan Sammer's annotations are distinguished from Velikovsky's text by being placed in square brackets and displayed in red letters. For the reader's interest we reproduce here the title page of Velikovsky's manuscript.



## The Hebrew Cosmogony

This world came into existence out of a chaos of fluid driven by a divine blast: this is the epic beginning of the Book of Genesis: "The earth was chaotic and void; and darkness was upon the face of the deep; and God's wind moved upon the face of the fluid." From this primeval matter, in a process of subsequent creations, was born the home of the living.

Already before the birth of our Earth, worlds were shaped and brought into existence, only to be destroyed in the course of time: "Nor is this world inhabited by man the first of things earthly created by God. He made several worlds before ours, but he destroyed them all."<sup>[1]</sup> The Earth underwent re-shaping: six consecutive remouldings. Heaven and Earth were changed in every catastrophe. Six times the Earth was rebuilt—without entire extirpation of life on it, but with major catastrophes. Six ages have passed into the great beyond; this is the seventh creation, the time in which we live.

According to another tradition, several heavens were created, seven in fact. Also seven earths were created: the most removed being the seventh Erez, followed by the sixth Adamah, the fifth Arka, the fourth Harabbah, the third Yabshalah, the second Tebet and our own land called Heled, and like the others, it is separated from the foregoing by abyss, chaos, and waters.<sup>[2]</sup>

The description permits an interpretation that all the seven earths exist simultaneously; but a deeper insight will allow us to recognize that the original idea did not admit seven concurrent but separate firmaments and worlds in space, but only consecutive in time, and built one out of another: "The seven heavens form a unity, the seven kinds of earth form a unity, and the heavens and the earth together also form a unity."<sup>[3]</sup> The Hebrew cosmogony in its true sense is a conception of worlds built and reshaped with the purpose of bringing creation closer to perfection. The separation of one world from another by abyss and chaos evidently refers to the cataclysms that separated the ages.<sup>[4]</sup>

### References

1. L. Ginzberg, *The Legends of the Jews*, (Philadelphia, 1925), vol. I, p. 4.
2. Ginzberg, *Legends*, I, 10f.
3. Ginzberg, *Legends*, I, 11.
4. [The notion of a succession of worlds created and destroyed is common to many nations of antiquity. Vicentius Sangermano (*Cosmographia Burmaea*, quoted by F. Buchanan, "On the Religion and Literature of the Burmas," *Asiatick Researches* VI [1799], p. 174, 180) wrote: "The Universe is called by the Burmas *Legha*, which signifies successive destruction and reproduction... The Burma writings do not conceive of one world, but of an infinite number, one constantly succeeding another; so that when one is destroyed, another of the same form and structure arises...".]

## Planet Ages

The ages of the past, between the successive catastrophes, are called in many diverse sources "sun ages." I have tried to show why this designation is meaningful.<sup>[1]</sup> But the ancients also maintained that the successive ages were initiated by planets: Moon, Saturn, Mercury, Jupiter, Venus, Mars. Therefore the sun-ages could also have been called planet ages.

Hesiod ascribed the Golden age to the time when the planet Saturn was ruling, and the Silver and Iron ages to the time of the planet Jupiter.<sup>[2]</sup> The same concept is found in Vergil, who says that "before Jove's day [i.e., in the Golden age when Saturn reigned] no tillers subdued the land—even to mark the field or divide it with bounds was unlawful."<sup>[3]</sup>

The idea that the Earth was under the sway of different planets at different ages is also the teaching of the Pythagoreans, the Magi, Gnostic sects and other secret societies.

In numerous astrological texts the same concept is repeated, that seven millennia were dominated by seven planets, one after the other.<sup>[4]</sup>

The worshippers of the devil, the Syrian sect of the Yezidis, believed that seven thousand years had passed since the Deluge: at the end of every millennium one of the seven planet-gods descends on the earth, establishes a new order and new laws, and then retreats to his place.<sup>[5]</sup>

An identical tradition is found in the writings of Julius Africanus: the ages of the ancestors passed under the government of the planets, each in its turn.<sup>[6]</sup> Also according to the Ethiopian text of the *First Book of Enoch*, the seven world-ages were each dominated by one planet.<sup>[7]</sup>

The gnostic sect of the Mandaeans taught in its holy book *Sidra Rabba* that the history of mankind is composed of seven epochs, that these epochs were terminated by catastrophes, and that one of the planets ruled in each epoch.<sup>[8]</sup>

The length of the ages in the *Sidra Rabba* is made very long, but the concept is, nevertheless, common to many ancient creeds.

### References

1. *Worlds in Collision*, sections "The World Ages," "The Sun Ages."
2. *Works and Days*, transl. by H. Evelyn-White (Loeb Classical Library: London, 1914), lines 109-201.
3. *Georgics* I, 125, transl. by H. R. Fairclough (Loeb Classical Library: London, 1920).
4. ["L'idée de sept périodes soumises aux sept planètes est commune à plusieurs religions," (Cumont, *La Fin du monde selon les mages occidentaux*," *Revue de l'Histoire des Religions* [1931], p. 48). See also W. Bousset, "Die Himmelfahrt der Seele," *Archiv für Religionswissenschaft* vol. IV (1901), pp. 240-244. Similarly writes F. Boll, *Sternglaube und Sterndeutung*, fourth ed. by W. Gundel (Berlin, 1931), p. 158: "Die sibirische chaldäische Lehre unterscheidet sieben Weltalter; jeder Planet, darunter also auch Sonne und Mond, herrscht als Chronokrator über eine Periode von tausend Jahren." ]
5. Cumont, "La Fin du monde selon les mages occidentaux," p. 49.
6. H. Gelzer, *Sextus Julius Africanus* (Leipzig, 1898), pp. ??; see also E. Hommel in *Journal of the Society of Oriental Research* (1927), p. 183.
7. R. H. Charles transl. and ed., *The Book of Enoch, or I Enoch* (Oxford, 1912), LII 2-9 (pp. 102ff.); cf. Bousset, "Die Himmelfahrt der Seele," p. 244.
8. *Ginza: Codex Nasareus, Liber Adami Apellatus*, M. Norberg transl. and ed., vol. III (London, 1815), pp. 69-73; K. Kessler, "Mandäer," *Realencyclopädie für protestantische Theologie*, Herzog-Nauck, 3rd ed. (1903), vol. 12, pp. 170ff.

## Sabbath

The idea of naming the days of the week in honor of the seven planets was, according to Eusebius, introduced by the Persians at the time of the war of Xerxes against Greece.<sup>[1]</sup> Dio Cassius, the Roman author of the fourth century, wrote that the division of the week into seven days in honor of the seven planets originated with the Egyptians, and then spread to other peoples.<sup>[2]</sup>

Even today the names of the days of the week in European languages can be traced to the names of the planets. Thus the Roman *dies Solis* (Sun), or Sunday, is *Sonntag* in German; *dies Lunae* (Moon), or Monday, is *lundi* in French and *Montag* in German; *dies Martis* (Mars), or Tuesday, is *marti* in French and *martes* in Spanish; *dies Jovis* (Jupiter), or Thursday, is *jeudi* in French and *Donnerstag* in German;<sup>[3]</sup> Friday is *dies Veneris* (Venus), or *vendredi* in French, while Saturday is *dies Saturnis*, the day of Saturn.<sup>[4]</sup>

The naming of the seven days of the week in honor of the seven planets is not only an act of reverence apportioned to these gods, but also a memorial to the seven ages that were governed by each of the seven planets in succession. This idea can be traced in the establishment of the Jewish week with its Sabbath. Although the social significance of the Sabbath as the universal day of rest for man, his servant, and the domestic animal working for him is so apparent from many passages in the Scriptures and especially from the beneficent application of a weekly day of rest by all civilized nations that took this precept from the Hebrew Bible, the cosmological meaning of the Sabbath must not remain overlooked.

In six ages the world and mankind went through the pangs of genesis or creation with its metamorphoses. It is not by mistake that the ages which were brought to their end in the catastrophes of the Deluge, of the Confusion of Languages or of the Overturning of the Plain, are described in the book of Genesis: the time of Genesis or creation was not over until the Sabbath of the Universe arrived. With the end of the world age simultaneous with the end of the Middle Kingdom and the Exodus, the Sabbath of the Universe should have begun.

The destruction of the world in the days of the Exodus closed, in the conception of the Hebrews, the age of creation. It was to signify the end of the time when the Earth and men were to be shaped and reshaped. The traditional and very old Hebrew prayer at the beginning of the Sabbath opens with these words: "The sixth day. And the heavens and the earth were established. And the Lord finished in the seventh day the entire work that He did and rested from all the work that He did."

The meaning of this passage is that in six world ages the heavens and the earth were finally established, and that now, in the seventh age, no further changes in the cosmic order should be expected. The Lord is actually implored to refrain from further reshaping the Earth.

The idea that God's day is a millennium is often met in Talmudic literature; the apostle Peter also says: "One day is with the Lord as a thousand years." <sup>[5]</sup> Thus the seven days of the week represent seven world ages; and the day of the Sabbath represents the seventh world age, which is our age. According to the rabbis of the Tractate Shabbat of the *Babylonian Talmud*, "Sabbath" is to be interpreted as *shabbatu* - cessation of the divine wrath.<sup>[6]</sup> This fits exactly our idea of the Sabbath as the age of rest when the heavens and the earth are established and are not to be disturbed again.

Many exegetes have wondered as to why the prayer of benediction to the Sabbath starts with the words: "The sixth day," expecting to find there the words "The seventh day." The words "the sixth day" are not necessarily wrong here: the meaning may be that with the expiration of the sixth age the heaven and the earth become unchangeable. But it may be that the prayer originated in pre-Exodus days when only six ages were counted. The prayer next refers to the Sabbath as "the day of rest, the memorial to the act of genesis, because this day is the beginning of the reckoning of days, memory of the Exodus from Egypt." The assembling of three different causes for the establishment of the Sabbath would appear confusing were it not for the fact that the three occurrences were simultaneous: the last act of creation, the new flow of time, the Exodus from Egypt.

Although after the beginning of the seventh age new world catastrophes disrupted the established order—in the eighth and seventh centuries before the present era—the idea of the Sabbath of the Universe was already so deeply rooted that the new world catastrophes were not counted, so as not to discredit the establishment of the Sabbath. But the return of the sun's shadow ten degrees in the days of Hezekiah and Isaiah was registered as "the seventh world wonder," <sup>[7]</sup> and thus actually the eighth world age started. The difference in the magnitude of the catastrophes caused also some nations of antiquity to count six, seven (as most nations), or eight, or nine, or even ten ages;<sup>[8]</sup> one and the same people, like the Mayas, had traditions of five and seven ages in diverse books of theirs. Also, catastrophes recurring at short intervals, as those which took place in the eighth and beginning of the seventh century before the present era, could be regarded as the closing of one age, or a few short additional ages could be conceived. Catastrophes, variable as they were in their magnitude and consequences, could have had a subjective appraisal. Even the encounter of the earth with a lesser comet, which appeared very bright, in the days when Octavian Augustus observed the mortuary activities in honor of Julius Caesar, and which dispersed its gases in the atmosphere of the Earth, was regarded by one contemporary author as the end of a world age and the beginning of a new one, although no perceptible changes in the motion of the earth and no greater calamity than a year-long gloom were observed.<sup>[9]</sup>

The Sabbath being a day of rest in the social order, its cosmic meaning in the great fear of the end of the world can be suspected also in view of the rigor with which it was observed; at the beginning of the Christian era, members of some sects among the Jews would not even move, and would remain in the place and position in which the beginning of the Sabbath found them.<sup>[10]</sup> Social institutions are generally not observed with such an awe and with such rigor. It was actually not the Deity, having worked during six ages and reposed in the seventh who gives example to man; it is man, by abstaining from work on the seventh day, the symbol of the seventh world age, who invites the Supreme Being to keep the established order of the heaven and earth, and not to submit them to new revolutions.

The same idea is found in the prayer of the Chinese Emperor Shun, who lived shortly after the Emperor Yahu. This prayer, declaimed by him, reads: "The sun and moon are constant; the stars and other heavenly bodies have their motions; the four seasons observe their rule." <sup>[11]</sup> A number of centuries thereafter, in the days of the Emperor Kwei, the order of the celestial sphere was again disrupted: "the planets went out of their courses." <sup>[12]</sup>

Also Hebrew psalmists and prophets tried to suggest to nature to abstain from revolt; but at the same time they expressed their fear of changes in the future comparable to those in the past. After more than two thousand five hundred years, one of the two original ideas of the Sabbath, its cosmic meaning, was lost to mankind, leaving the social idea conscious and triumphant the world over.

### References

- <sup>[1]</sup> *Præparatio Evangelica* IV.
- <sup>[2]</sup> Dio Cassius 37, 186; cf. Aulus Gellius, *Noctes Atticæ* III, 10; Petronius, *Satyricon*, 30: "lunae cursum stellarumque septem imagines."
- <sup>[3]</sup> [Donnar, or Thor was the name for Jupiter among the Nordic peoples.]
- <sup>[4]</sup> Cf. H. Gunkel, *Schöpfung und Chaos in Urzeit und Endzeit* (1895). [The same system was in use in Babylonia and is still current in India and Tibet. See Tsepon W. D. Shakabpa, *Tibet, A Political History* (Yale University Press, 1967), p. 16: "The seven days of the week are named, as in the Western system, for the sun, moon and the five visible planets." "The people of Burma" also

use a week of seven days, named after the planets." F. Buchanan, "On the Religion and Literature of the Burmas," *Asiatick Researches* VI (1799), p. 169.

5. *The Second Epistle of Peter* 3:8.
6. Tractate Shabbat 13B. S. Reinach, *Cults, Myths, Religion* (1912), pp. 168ff.
7. Ginzberg, *Legends*, VI. 367.
8. See *Worlds in Collision*, Chapter 2, section "The World Ages," and "The Sun Ages."
9. [This comet of -44 was also observed in China. See De Cambre, *Histoire de l'astronomie chinoise* (Paris, 1817), p. 358.]
10. Josephus, *The Jewish War*
11. J. Legge, *The Chinese Classics* (Hong Kong, 1865), Vol. III, p. 1.
12. *Ibid.*, p. 125.



## Deification of the Planets

The Sun and the Moon are two great luminaries, and it is easily understandable that the imagination of the peoples should be preoccupied with them and should ascribe to them mythological deeds. Yet the ancient mythologies of the Chaldeans, the Greeks, the Romans, the Hindus, the Mayans, preoccupy themselves not with the Sun or the Moon, but *primis facie* with the planets. Marduk, the great god of the Babylonians, was the planet Jupiter; so was Amon of the Egyptians, Zeus of the Greeks and Jupiter of the Romans.<sup>(1)</sup> It was much superior to Shamash-Helios, the Sun. Why was it revered by all peoples? Why was the planet Mars chosen to be the personification of the god of war? Why did Kronos of the Greeks, Saturn of the Romans, play a part in hundreds of myths and legends? Those of the Egyptians, Nebo and Nergal of the Babylonians, Mithra and Mazda of the Persians, Vishnu and Shiva of the Hindus, Huitzilopochtli and Quetzalcoatl of the Mexicans, were personifications of planets; innumerable hymns were dedicated to them and adventures and exploits ascribed to them.

"The life of our planet has its real source in the Sun," wrote E. Renan. "All force is a transformation of the Sun. Before religion had gone so far as to proclaim that God must be placed in the absolute and the ideal, that is to say, outside of the world, one cult only was reasonable and scientific, and that was the cult of the Sun."<sup>(2)</sup> But the Sun was subordinate to the planets, even though they are not conspicuous, poor sources of light, and no sources of warmth.

The night sky illuminated by stars is majestic. The geometrical figures of the constellations, such as the Pleiades, Orion, or the Great Bear, rolling from the east in the evening to the west before morning, are favorite motifs in poetry, no less than the Sun and the Moon. But the discrepancy in the choice of motifs by the ancients becomes still more obvious. The constellations of the sky took only a minor and incidental part in the mythology of the ancient peoples. The *planets* were the major gods, and they rule the universe.<sup>(3)</sup>

"It is not easy to understand the idea which was the basis for the identification of the Babylonian gods with the planets," writes an author;<sup>(4)</sup> but the same process of identification of major gods with the planets can be found in the religions of the peoples in all parts of the world. The planets were not affiliated to the gods, or symbols of the gods—they were the gods. In prayers and liturgies they were invoked as gods. "The greater gods, even when addressed by name in prayer, were regarded as astral powers."<sup>(5)</sup> This or that planet is selected, according to the text of the prayer, from "the multitude of the stars of heaven" to receive a gift.

"The planetary gods are much the most powerful of all. Their positions in the sky, their reciprocal relations . . . have a decisive influence on all physical and moral phenomena of the world."<sup>(6)</sup>

The great majority of us moderns pay no attention to these points in the night sky, and probably not one in ten or even in a hundred is able to point to Jupiter or Mars in the firmament. The planets change their places, but not conspicuously. Were they indebted for their deification to this slow movement, by which they differ from the fixed stars? Did Zeus-Jupiter-Marduk-Amon become the supreme deity, the thunderer and dreadful lord of the universe, only because of his slow movement—he passes in twelve years the circle of the zodiac, traversed by the Sun in twenty-four hours, and by the Moon even quicker? When seen with the naked eye the planet Jupiter distinguishes itself from the fixed stars of first magnitude only by this slow change of position.

Augustine, confused by the problem of the deification of the planets, wrote in the fourth century:

But possibly these stars which have been called by their names are these gods. They call a certain star Mercury, and likewise a certain other star Mars. But among those stars which are called by the name of gods, is that one which they call Jupiter, and yet with them Jupiter is the world. There also is that one they call Saturn, and yet they give him no small property beside, namely all seeds.<sup>(7)</sup>

Mercury, the closest to the Sun, is barely visible, being hidden in the Sun's rays. But the ancients made the planet Mercury into a great god—Hermes or Nebo. Why was it feared and worshiped? What is there generally in the planets to inspire awe, so as to influence people to build temples for them, to sing liturgies, to bring sacrifices, to narrate legends, and to dedicate to them the domain of science, of war, of agriculture?

The ancients were sufficiently enlightened to know that the planets are large rocks like the Earth that circle on orbits.<sup>(8)</sup> And this makes the modern scholars wonder: knowing that the planets are rocks, why did the ancients believe that they are gods?<sup>(9)</sup>

The key to this problem, which is the major problem of all classical mythology, is already in our hands. The planet Venus was deified because of its dramatic appearance and because of the havoc it brought to the world, as described in *Worlds in Collision*. I illuminated also the events which made Mars a feared god. Divine qualities were ascribed to the other planets because of the catastrophes they wrought in earlier ages.

In the Persian holy books it is said that "on the planets depends the existence or non-existence of the world—wherefore are they especially to be venerated."<sup>(10)</sup> "The seven planets rule the universe," says a Nabatean inscription.<sup>(11)</sup> The Greeks and Romans believed that "everything is, in fact, subject to the changes brought about by the revolutions of the stars."<sup>(12)</sup>

"The celestial orbs by their combined movements are the authors of all that was, and is, and is to come." According to ancient Hebrew traditions, "there are seven archangels, each of whom is associated with a planet."<sup>(13)</sup> "The seven archangels were believed to play an important part in the universal order through their associations with the planets. . . ."<sup>(14)</sup>

The reason for the deification of the planets lay in the fact that the planets only a short time ago were not faultlessly circling celestial bodies, nor were they harmless. This is also expressed in a Mandaeen text: "How

...the planets conspire in rage against us." [13]

## References

1. [These identifications are discussed below, Part IV: "Jupiter of the Thunderbolt."]
2. *Dialogues et fragments philosophiques* (Paris, 1876), p. 168. [Cf. Macrobius]
3. [For ancient planetary worship among the **Babylonians**, see Bartel L. van der Waerden, *Science Awakening*, Vol. II (Leyden, 1974), p. 59; among the **Egyptians**, see H. Brugsch, *Astronomische und astrologische Inschriften altägyptischer Denkmäler* (Leipzig, 1883); E. Naville, "La Destruction des hommes par les dieux," *Transactions of the Society for Biblical Archaeology* IV (1875), pp. 1-18; O. Neugebauer and R. Parker, *Egyptian Astronomical Texts* (London, 1969); among the **Hebrews**, see M. Seligson, "Star Worship" in *The Jewish Encyclopaedia* (New York, 1905); cf. L. Ginzberg, *The Legends of the Jews* (Philadelphia, 1925), vol. III, p. 371; vol. VI, pp. 66f.; among the **Persians**, see *The Dabistan*, transl. by D. Shea and A. Troyer (Washington, 1901); among the **Finns**, see J. M. Crawford's preface to *The Kalevala*, (Cincinnati, 1904), p. xiv.]
4. P. Jensen, *Die Kosmologie der Babylonier* (Strassburg, 1890), p. 134.
5. L. W. King, *Babylonian Magic and Sorcery*, (London, 1896), Section V.; cf. Plutarch, *De Iside et Ostride*, 48.
6. F. Cumont, *Astrology and Religion among the Greeks and Romans*, (1912), p. 120; cf. idem, "Le mysticisme astral," *Bull. Acad. de Belgique* (1909); also idem, "Les noms des planetes et l'astrologie chez les Grecs," *Antiquite Classique* IV (1935), pp. 6ff.
7. *The City of God*, transl. by M. Dods (1907), Book VII, ch. 15.
8. This was the teaching of Anaxagoras as reported by Diogenes Laertius, *Lives of the Famous Philosophers*, II. 8.
9. E. Pfeiffer, *Gestirne und Wetter im griechischen Volksglauben* (Leipzig, 1914), pp. 24f. [The deification of the planets is advocated in the Platonic *Epinomis* 471; cf. also Cicero, *De Natura Deorum* II. 21. 54-55.]
10. Yasnav 1. 307. See J. Scheffelowitz, *Die Zeit als Schicksalgottheit in der indischen und iranischen Religion* (Stuttgart, 1929), p. 2.
11. D. Chwolson, *Die Sabier und der Sabismus* (St. Petersburg, 1856), vol. II, pp. 604f.
12. Cumont, *Astrology and Religion among the Greeks and Romans*, pp. 113-114; [cf. M. P. Nilsson, "The Origin of Belief among the Greeks in the Divinity of the Heavenly Bodies," *Harvard Tr. Ref.* 33 (1940), pp. 1ff. and idem, "Symbolisme astronomique et mystique dans certains cultes publics grecs," *Homages Bidel-Cumont* (1949), pp. 217ff. Cf. also P. Boyance, "La religion astrale de Platon a Cicéron," *Revue des Etudes Grecques* LXV (1952), pp. 312-350.]
13. J. Trachtenberg, *Jewish Magic and Superstition* (New York, 1939), p. 98.
14. *Ibid.*, p. 250.
15. M. Litzbarski, "Ein mandäische Amulett," *Florilegium*, pp. 350f.



## Uranus

The seven planets of the ancients comprised the Sun, the Moon, Mercury, Venus, Mars, Jupiter, and Saturn. However, the ancients' religions and mythology speak for their knowledge of Uranus; the dynasty of gods had Uranus followed by Saturn, and the latter by Jupiter. In the clear sky of Babylon the planet Uranus could have been observed by an unaided eye; but since it was known as a deposed deity, it would seem that at some later time the planet lost much of its brightness.<sup>[1]</sup>

It is quite possible that the planet Uranus is the very planet known by this name to the ancients. The age of Uranus preceded the age of Saturn; it came to an end with the "removal" of Uranus by Saturn. Saturn is said to have emasculated his father Uranus.<sup>[2]</sup>

Behind this story there might have been a scene in the sky. In one theory of the origin of the solar system a sideswiping star tears out from the sun a long filament of gaseous material. Similarly Saturn may at one time have "emasculated" Uranus—Saturn was represented by the Romans with a sickle in his hands.

Circumcision may have originated as an emulation of the acts displayed in the sky—when it appeared that Saturn with a sickle emasculated Uranus, the Egyptians, and so also the Hebrews, introduced circumcision, the removal of the foreskin being *pars per toto*, or instead of castration.<sup>[3]</sup>

It is not unthinkable that sometime before the age the record of ancient civilizations reaches, Uranus, together with Neptune, Saturn and Jupiter, formed a quadruple system that was captured by the sun and from which the planets of the solar system had their origin—but here nothing but imagination takes over where tradition based on witnessing does not reach.

[According to Hesiod, the catastrophe described as the removal of Uranus by Saturn gave birth to Aphrodite. In *Worlds in Collision* Aphrodite was identified with the Moon.<sup>[4]</sup>

### References

1. Uranus was discovered in 1781 by William Herschel. Its planetary character was not immediately apparent to him—Herschel actually announced the discovery of a comet.
2. Hesiod, *Theogony* 133-187; cf. lines 616-623. [Cf. also the Hittite myth of "Kingship in Heaven" in J. Pritchard ed., *Ancient Near Eastern Texts Relating to the Old Testament* (Princeton, 1950), pp. 120-121.] The similar story of Jupiter emasculating his father Saturn [Apollonius Rhodius, *Argonautica* IV. 984 with scholium; scholium to Lycophron's *Cassandra* 76; Proclus, *In Timaeo*, transl. by A. J. Festugière, (Paris, 1967), Vol. III, p. 255] may be "transfer" or borrowing, but may be a reflection in mythology of similar events.
3. Circumcision has a hygienic value; it could have been found out and sanctified by the astral events. Having been "commanded" in the days of the patriarch Abraham (Genesis 17:10ff.) it may reflect the later event, i.e., Jupiter's emasculation of Saturn. Cf. Sanchuniathon's *Phoenician History* in Eusebius, *Præparatio Evangelica* I. ix: "Cronos was circumcis'd in his privities and forced his followers to do the same" (transl. by R. Cumberland [London, 1720], p. 38).
4. [Velikovskiy's identification of Aphrodite with the Moon has been disputed by several writers; but in the fourth century A.D. Macrobius was able to refer to ancient authorities who affirmed that Aphrodite was the Moon. *Saturnalia* VIII. 1-3.]



## The Earth Without the Moon

The period when the Earth was Moonless is probably the most remote recollection of mankind. Democritus and Anaxagoras taught that there was a time when the Earth was without the Moon.<sup>[1]</sup> Aristotle wrote that Arcadia in Greece, before being inhabited by the Hellenes, had a population of Pelasgians, and that these aborigines occupied the land already before there was a moon in the sky above the Earth; for this reason they were called Proselenes.<sup>[2]</sup>

Apollonius of Rhodes mentioned the time "when not all the orbs were yet in the heavens, before the Danaï and Deukalion races came into existence, and only the Arcadians lived, of whom it is said that they dwelt on mountains and fed on acorns, before there was a moon."<sup>[3]</sup>

Plutarch wrote in *The Roman Questions*: "There were Arcadians of Evander's following, the so-called pre-Lunar people."<sup>[4]</sup> Similarly wrote Ovid: "The Arcadians are said to have possessed their land before the birth of Jove, and the folk is older than the Moon."<sup>[5]</sup> Hippolytus refers to a legend that "Arcadia brought forth Pelasgus, of greater antiquity than the moon."<sup>[6]</sup> Lucian in his *Astrology* says that "the Arcadians affirm in their folly that they are older than the moon."<sup>[7]</sup>

Censorinus also alludes to the time in the past when there was no moon in the sky.<sup>[8]</sup>

Some allusions to the time before there was a Moon may be found also in the Scriptures. In Job 25:5 the grandeur of the Lord who "Makes peace in the heights" is praised and the time is mentioned "before [there was] a moon and it did not shine." Also in Psalm 72:5 it is said: "Thou wast feared since [the time of] the sun and before [the time of] the moon, a generation of generations." A "generation of generations" means a very long time. Of course, it is of no use to connect this psalm with the myth of the first chapter of Genesis, a tale brought down from exotic and later sources.

The memory of a world without a moon lives in oral tradition among the Indians. The Indians of the Bogota highlands in the eastern Cordilleras of Colombia relate some of their tribal reminiscences to the time before there was a moon. "In the earliest times, when the moon was not yet in the heavens," say the tribesmen of Chibchas.<sup>[9]</sup>

There are currently three theories of the origin of the moon:

- 1) The Moon originated at the same time as the Earth, being formed substantially from the same material, aggregating and solidifying.
- 2) The Moon was formed not in the vicinity of the Earth, but in a different part of the solar system, and was later captured by the Earth.
- 3) The Moon was originally a portion of the terrestrial crust and was torn out, leaving behind the bed of the Pacific.

All three theories claim the presence of the Moon on an orbit around the Earth for billions of years. Mythology may supply each of these views with some support (Genesis I for the first view; the birth of Aphrodite from the sea for the third view; Aphrodite's origin in the disruption of Uranus, and also the violence of Sin—the Babylonian Moon—seems to support the second view).

Since mankind on both sides of the Atlantic preserved the memory of a time when the Earth was without the Moon, the first hypothesis, namely, of the Moon originating simultaneously with the Earth and in its vicinity, is to be excluded, leaving the other two hypotheses to compete between themselves.

We have seen that the traditions of diverse peoples offer corroborative

testimony to the effect that in a very early age, but still in the memory of mankind, no moon accompanied the Earth.<sup>10</sup> Since human beings already peopled the Earth, it is improbable that the Moon sprang from it; there must have existed a solid lithosphere, not a liquid earth. Thus while I do not claim to know the origin of the Moon, I find it more probable that the Moon was captured by the Earth. Such an event would have occurred as a catastrophe.<sup>11</sup> If the Moon's formation took place away from the Earth,<sup>12</sup> its composition may be quite different.

There is no evidence to suggest whether the Moon was a planet, a satellite of another planet, or a comet at the time of its capture by the Earth. Whatever atmosphere it may have had<sup>13</sup> was pulled away by the Earth, by other contacting bodies, or dissipated in some other way.

Since the time the Moon began to accompany the Earth, it underwent the influence of contacts with comets and planets that passed near the Earth in subsequent ages. The mass of the Moon being less than that of the Earth, the Moon must have suffered greater disturbances in cosmic contacts. During these contacts the Moon was not carried away; this is due to the fact that no body more powerful than the Earth came sufficiently close to the Moon to take it away from the Earth for good; but in the contacts that took place the Moon was removed repeatedly from one orbit to another.

The variations in the position of the Moon can be read in the variations in the length of the month. The length of the month repeatedly changed in subsequent catastrophic events—and for this there exists a large amount of supporting evidence. In these later occurrences the Moon played a passive role, and Zeus in the *Iliad* advised it (Aphrodite) to stay out of the battle in which Athene and Ares (Venus and Mars) were the main contestants.

#### References

1. Hippolytus, *Refutatio Omnium Haeresium* V. ii.
2. Aristotle, fr. 591 (ed. V. Rose [Teubner:Tuebingen, 1886]). Cf. *Pauly's Realencyclopaedie der classischen Altertumswissenschaft*, article "Mond"; H. Roscher, *Lexicon d. griech. und roemisch. Mythologie*, article "Proselenes."
3. *Argonautica* IV.264.
4. Plutarch, *Moralia*, transl. by F. C. Babbitt, sect. 76.
5. *Fasti*, transl. by Sir J. Frazer, II. 290.
6. *Refutatio Omnium Haeresium* V. ii.
7. Lucian, *Astrology*, transl. by A. M. Harmon (1936), p. 367, par. 26.
8. *Liber de die natali* 19; also scholium on Aristophanes' *Clouds*, line 398.
9. A. von Humboldt, *Vues des Cordilleres* (1816), English transl.: *Researches Concerning the Institutions and Monuments of the Ancient Inhabitants of America*, (1814), vol. I, p. 87; cf. H. Fischer, *In mondener Welt* (1930), p. 145.
10. [In addition to the sources cited above, cf. *The Nihongi Chronicles of Japan* (I.i., in *Transactions and Proceedings of the Japanese Society*, vol. I [1896]) which recount how "Heaven and Earth . . . produced the Moon-god." *The Kalevala* of the Finns recalls a time "when the Moon was placed in orbit." (Runo III.35)]
11. [Cf. the effects of such an event on the Earth's rotation calculated by H. Gerstenkorn in *Zeitschrift fuer Astrophysik*, 36 (1935), p. 245; cf. idem, in *Mantles of the Earth and the Terrestrial Planets*, S. K. Runcom ed., (New York, 1967); also idem in *Icarus* 9 (1968), p. 394.]
12. [Cf. H. Alfvén and G. Arrhenius, "Two Alternatives for the History of the Moon," *Science* 165 (1969), 111f.; S. F. Singer and L. W. Bandlerman, "Where was the Moon Formed?" *Science* 170 (1970), 438-439; "... The moon was formed independently of the earth and later captured, presumably by a three-body interaction, and these events were followed by the dissipation of the excess energy through tidal friction in a close encounter." More recently, a study of lunar paleotides has shown that "the Moon could not have been formed in orbit around the Earth" (A. J. Anderson, "Lunar Paleotides and the Origin of the Earth-Moon System," *The Moon and the Planets*, 19 [1978], 409-417). Because of a certain degree of instability in the Sun-Earth-Moon system, "the planetary origin and capture of the Moon by the Earth becomes a strong dynamic possibility." (V. Szebehely and R. McKenzie, "Stability of the Sun-Earth-Moon System," *The Astronomical Journal* 82 (1977), 303ff.)]
13. [Cf. Yu. B. Chernyak, "On Recent Lunar Atmosphere," *Nature*, 273 (15 June, 1978), pp. 497ff. The author found "strong theoretical evidence of a considerable atmosphere on the Moon during the greater part of its history."]





## A Brighter Moon

Many traditions persist that at some time in the past the Moon was much brighter than it is now, and larger in appearance than the Sun. In many rabbinical sources it is stated that the Sun and the Moon were equally bright at first.<sup>(1)</sup> The same statement was made to de Sahagun by the aborigines of the New World: "the Sun and the moon had equal light in the past."<sup>(2)</sup> At the other end of the world the Japanese asserted the same: the Nihongi Chronicle says that in the past "the radiance of the moon was next to that of the sun in splendor."<sup>(3)</sup>

Traditions of many peoples maintain that the Moon lost a large part of its light and became much dimmer than it had been in earlier ages.<sup>(4)</sup>

In order that the Sun and the Moon should give off comparable light, the Moon must have had an atmosphere with a high albedo (refracting power)<sup>(5)</sup> or it must have been much closer to the earth. In the latter case the Moon would have appeared larger than the Sun. In fact, the Babylonian astronomers computed the visible diameter of the Sun as only two-thirds of the visible diameter of the Moon, which makes a relation of four to nine for the illuminating surfaces. This measure surprised modern scholars, who are aware of the exactness of the measurements made by the Babylonian astronomers and who reason that during the eclipses one can easily observe the approximate equality of the visible disks.<sup>(6)</sup>

### References

1. Targum Yerushalmi, Genesis 1:16 and Numbers 28:15; Hullin 60b; Midrash Breishith Rabba. Other sources in Ginzberg, *Legends V*, 34ff.
2. [B. de Sahagun, *Historia general de las cosas de la Nueva Espana* (Cf. the Peruvian tradition recorded by Pedro Sarmiento de Gamboa in the sixteenth century, according to which Viracocha created the Moon brighter than the Sun; *Historia de los Incas*, ch. 7.)
3. Nihongi, *Chronicles of Japan from the Earliest Times*, transl. by W. G. Aston (1896), Book I, pt. 1.
4. Cf. S. Thompson, *Matif-index of Folk Literature* (1932); cf. Ginzberg, *Legends VI*, 35; *Handbook of South American Indians* (American Bureau of Ethnology [Washington, 1948], Vol. II, p. 515).
5. See above, section "The Earth Without the Moon," n. 13.
6. E. F. Weidner, *Beitraege zur Assyriologie VII*, Heft 4 (1911), p. 99; cf. idem, *Handbuch der Babylonischer Astronomie* (1915), p. 131. Cf. "Gewichte" by Lehmann-Haupt in Pauly-Wissowa *Supplements*.



## The Worship of the Moon

Because of its size and also because of the events which accompanied the first appearance of the Moon, many ancient peoples regarded the Moon as the chief of the two luminaries. "The sun was of smaller importance than the moon in the eyes of the Babylonian astrologers."<sup>[1]</sup>

The Assyrians and the Chaldeans referred to the time of the Moon-god as the oldest period in the memory of the people: before other planetary gods came to dominate the world ages, the Moon was the supreme deity. Such references are found in the inscriptions of Sargon II (ca. -720)<sup>[2]</sup> and Nabonidus (ca. -550).<sup>[3]</sup> The Babylonian Sin—the Moon—was a very ancient deity: Mount Sinai owes its name to Sin.

The Moon, appearing as a body larger than the Sun, was endowed by the imagination of the peoples with a masculine role, while the Sun was assigned a feminine role. Many languages reserved a masculine name for the Moon.<sup>[4]</sup> It was probably when the Moon was removed to a greater distance from the earth and became smaller to observers on the earth, that another name, usually feminine, came to designate the Moon in most languages.<sup>[5]</sup>

### References

1. C. Bezold in Boll, *Sternglaube und Sterndeutung*, p. 4. [In Babylonian cosmology the Moon-god Sin (Nanna) was considered to be the father of the Sun-god Shamash (Utu) and was commonly addressed as "father Sin" (S. Langdon, *Sumerian and Babylonian Psalms* [1909], p. 193. F. Cumont noted the prominence of Sin in the earliest historical period in Babylonia and found it "remarkable that at first the primacy was assigned to the Moon." (*Astrology and Religion among the Greeks and Romans*, p. 124; cf. Lewy, "The Late Assyro-Babylonian Cult of the Moon"). According to the Dabistan (ch. 29), a Persian work of early Islamic times, the Ka'bah of Mecca was originally dedicated to the worship of the Moon. On Moon worship among the ancient Arabs, cf. also Tuch, "Sinaïtische Inschriften," *Zeitschrift des Deutschen Morgenländischen Gesellschaft* III (1849), p. 202, and Osiander, "Vorislamische Religion der Araber," *ibid.*, VII (1853), p. 483. Cf. I. Goldziher, *Mythology among the Hebrews and its Historical Development* (1877), p. 72ff. The Greeks regarded the Moon as of greater importance than the Sun: "The sun's subordination to the moon . . . is a remarkable feature of early Greek myth. Helios was not even an Olympian, but a mere Titan's [Hyperion's] son." (R. Graves, *The Greek Myths* [London, 1955] vol. I, sec. 42.1). Christoval de Molina (*An Account of the Fables and Rites of the Incas*, transl. by C. R. Markham [London, 1873], p. 56) described sacrifices to the Moon by the natives of Peru in the sixteenth century. Also the Indians of Vancouver Island assigned greater importance to the Moon than to the Sun (E. B. Tylor, *Primitive Culture* [New York., 1929], p. 299), as did several tribes in Brazil (*ibid.*, loc. cit.).
2. See Sargon II's "Display Inscription," lines 110 and 146: "since the distant days of the age of Nannaru." Cf. H. Winckler, *Himmels und Weltbild der Babylonier* (Leipzig, 1901), p. 31: "Die seltere Zeit bezeichnet Sargon II als die Zeit der Nannar—eine Erscheinungsform des Mondgottes." [A cuneiform text describes the first appearance of the Moon: "When the gods . . . fixed the crescent of the moon, to cause the new moon to shine forth, to create the month. . . . The new moon, which was created in heaven with majesty, in the midst of heaven arose." R. W. Rogers, *Cuneiform Parallels to the Old Testament* (New York, 1912), p. 46.]
3. D. D. Luckenbill, *Ancient Records of Assyria* (1926-27), II, 870; cf. J. Lewy, "The Late Assyro-Babylonian Cult of the Moon and its Culmination in the Time of Nabonidus," *Hebrew Union College Annual* (19xx), pp. 443, 461ff., 486.
4. *Yonach* in Hebrew, *Sin* in Assyrian, *der Mond* in German, *Mesiac* in Russian, and so on.
5. *Lavana* in Hebrew, *Luna* in Latin and several of the Romance languages, as well as Russian, and so on. [Macrobius (*Saturnalia* VIII, 3) quotes Philochorus as having said that "men offer sacrifices to the moon dressed as women and women dressed as men, because the moon is thought to be both male and female." (Transl. by P. Davies).]



## The Pre-Adamite Age

An ancient tradition ascribed the establishment of Moon worship to Adam, the first man. The medieval Arab scholar Abubacer wrote:

They [the Sabacans] say that Adam was born from male and female, just like the rest of mankind, but they honored him greatly, and said that he had come from the Moon, that he was the prophet and apostle of the Moon, and that he had exhorted the nations that they should serve the Moon. . . . They also related about Adam that when he had left the Moon and proceeded from the area of India towards Babylonia, that he brought many wonders with him.<sup>[1]</sup>

The Adamites, the ante-diluvial men, were most probably not the first human beings on the planet. Even admitting that by "expulsion from the Garden of Eden" is allegorized a catastrophe which quite destroyed mankind prior to the Deluge, it is impossible to declare that it was the first catastrophe. It depends on the memory of the peoples which catastrophe they consider as the act of creation. Human beings, rising from some catastrophe, bereft of memory of what had happened, regarded themselves as created from the dust of the earth. All knowledge about the ancestors, who they were and in what interstellar space they lived, was wiped away from the memory of the few survivors. The talmudic-rabbinical tradition believes that before Adam was created, the world was more than once inhabited and more than once destroyed.

It was at the end of the first age, symbolized by the expulsion of man from the blessed Garden of Eden, that the moon lost its brightness.<sup>[2]</sup> It was not just a single human pair—the tradition ascribes to Adam the invention of seventy languages.

Hebrew mythology assigns to the period preceding Adam's expulsion different geophysical and biological conditions. The sun shone permanently on the Earth, and the Garden of Eden, placed in the East, was, it must be conceived, under perpetual rays of the Dawn. The earth was not watered by rain, but mist ascending from the ground condensed as dew upon the leaves. "The plants looked only to the earth for nourishment." Man was of exceedingly great stature: "The dimensions of man's body were gigantic." His appearance was unlike that of later men: "His body was overlaid with a horny skin." But a day came and the celestial illumination ceased: "The sun . . . had grown dark the instant Adam became guilty of disobedience."<sup>[3]</sup> The flames of the ever-turning sword terrified Adam (Genesis 3:23). In another legend it is told that the celestial light shone a little in the darkness. And then "the celestial light ceased, to the consternation of Adam." The illumination of the first period never returned. The sky that man was used to see never appeared before him again: "The firmament is not the same as the heavens of the first day." The "day" of Genesis, as I have already noted, is said to be equal to a thousand years.

It was after the fall of man, according to Hebrew tradition, that the sun set for the first time: "The first time Adam witnessed the sinking of the sun, he was seized with anxious fears. All the night he spent in tears. When day began to dawn, he understood that what he had deplored was but the course of nature." It was also then that the seasons began. This is told in the following story: "Adam noticed that the days were growing shorter and feared lest the world be darkened. . . . but after the winter solstice he saw that the days grew longer again."

The earth also underwent changes: "Independent before, she was hereafter to wait to be watered by the rain from above."<sup>[4]</sup> The variety of species diminished. Man, according to Hebrew legends, decreased in size; there was a "vast difference between his later and his former state—between his supernatural size then, and his shrunken size now."<sup>[5]</sup> He also lost his horny skin. The whole of nature altered its ways.

### References

1. Quoted in Athanasius Kircher, *Turris Babel sive Archonotologia* (Amsterdam, 1679), p. 134.
2. "The very angels and the celestial beings were grieved by the transgression of Adam. The moon alone laughed wherefore God . . . obscured her light." Ginzberg, *Legends*, I, 80.
3. Ginzberg, *Legends*, I, 79.
4. Ginzberg, *Legends*, I, 79.
5. Ginzberg, *Legends*, I, 76.



## Giants

The traditions of peoples all over the world are quite unanimous in asserting that at an earlier time a race of giants lived on the earth, that most of the race were destroyed in great catastrophes; that they were of cruel nature and were furiously fighting among themselves; that the last of them were exterminated when after a cataclysm a migration of peoples brought the forebears of the peoples of today to their new homelands.

The Japanese narrate that when their forefathers after a great catastrophe about two and a half or three thousand years ago, came from the continent and invaded the isles, they found there long-legged, furry giants. These giants were called Ainu. The forefathers of the Japanese were defeated in the first encounter, but in the second encounter they were victorious.

Ixtlilxochitl described the wandering of peoples of the western hemisphere in the four ages of the world. The first age came to its end in the Flood. In the second age, called "the sun of the earthquake," there lived the generation of the giants, which was destroyed in the cataclysm that terminated this age. The third period was "the sun of the wind," called so because at the end of this period terrible hurricanes annihilated everything. The new inhabitants of the new world were Ulme and Xicalauca who came from the east to find a foothold at Potouchan: here they met a number of giants, the last survivors of the second catastrophe. The fourth age was called "the fire sun," because of the great fire that put an end to this epoch. At that time the Toltecs arrived in the land of Anahuac, put to flight by the catastrophe: they wandered for 104 years before they settled in their new home.

Also F. L. Gomara in his *Conquista de Mexico*, in the chapter about "cinco soles que son edades," wrote:

The second sun perished when the sky fell upon the earth; the collapse killed all the people and every living thing; and they say that giants lived in those days, and that to them belong the bones that our Spaniards have found while digging mines and tombs. From their measure and proportion it seems that those men were twenty hands tall—a very great stature, but quite certain.<sup>[1]</sup>

The Hebrew scriptures as preserved in the Old Testament and in the Talmud and Midrashim, narrate that among the races of the world in a previous age were races of giants, "men of great size and tremendous strength and ferocity," who were destroying other races, but also were turning upon each other and destroying themselves.

The Book of Genesis (6: 4) narrates that in the antediluvian time "there were giants in the earth in those days." The Greek Book of Baruch narrates that over four hundred thousand of the race of giants were destroyed by the Flood. After the Flood there were only a few districts where some of them remained alive.

When after a number of centuries another catastrophe ruined the world and the Israelites left Egypt and sent a few men to explore Palestine, those reported that the people of the land were generally of tall stature, and that besides "there we saw the giants, the sons of Anak, which came of the giants, and we were in our own sight as grasshoppers, and so were we in their sight."

This description clearly differentiates between the people of a tall stature and the giants, and the supposition that the Israelites found in Palestine a normal race only taller than themselves, and thought them to be giants, is not supported by the text.

A similar distinction is made in Deuteronomy (1: 28): "The people is greater and taller than we . . . and moreover we have seen the sons of the Anakim [giants] there." they—a few families—lived in Hebron (Numbers 13: 22).

At the time when the Israelites approached the fields of Bashan in the Transjordan, "only Og king of Bashan" remained of the remnant of the giants (Joshua 13:12 and Deut. 3:11). The other individuals of monstrous size had been annihilated in the meantime. "Behold, his bedstead was a bedstead of iron: is it not in Rabbath of the children of Ammon? nine cubits is the length thereof, and four cubits the breadth of it, after the cubit of a man." The text implies that at the time the book of Deuteronomy was written the bedstead of Og was still in existence and was a wonder for the onlookers.

The giants were the remnant of a race close to extinction. Og was "of the remnant of the giants that dwell in Ashteroth and Edrei" (Joshua 12: 4). They were also called Emim, or the furious ones. "The Emim dwell therein [in Moab of the Transjordan] in times past, a people great and many, and tall as the Anakim, which also were accounted giants, as the Anakim; but Moab calls them Emim" ( ). This branch of the giants was already extinct; but two cosmic ages earlier, in the days of Araphel, king of Shinar, and Abraham the Patriarch, Eimim flourished in the Transjordan (Genesis 14: 5).

### References

- Historia de la conquista de Mexico*, (Mexico City, 1943), Vol. II, p. 261.



## Nefilim

The present state of the Moon and of Mars and other celestial bodies does not imply that in the past they were equally desolate. Concerning Mars and Moon we have the testimony of our ancestors, supported by modern observations, that these bodies were engaged in near-collisions only a few thousand years ago. It is not excluded that under conditions prevailing on their surfaces prior to these events, life could have developed there or elsewhere in the solar system to an advanced stage.

Working in the early 1940's on *Worlds in Collision*, which in its original form covered also the cataclysmic events preceding the Exodus, I wondered at a certain description that sounded like a visit from space.<sup>[1]</sup>

The sixth chapter of the book of Genesis starts this way:

And it came to pass, when men began to multiply on the face of the earth, and daughters were born unto them, that the sons of God [*bnai Eilim*] saw the daughters of men that they were fair; and they took them wives of all which they chose.<sup>[2]</sup>

The story told in Genesis VI about the sons of God (*bnai Eilim*) coming to the daughters of men is usually explained as referring to an advanced priesthood that mingled with backward tribesmen.<sup>[3]</sup> When Columbus discovered America, the natives, according to the diary of his first voyage, regarded him and his crew as having arrived from the sky.<sup>[4]</sup> A similar occurrence could have taken place in prehistoric times, when some invaders from a remote part of the world came and were regarded as "sons of God."

But if we are today on the eve of interplanetary travel, we must not declare as absolutely impossible the thought that this Earth was visited, ages ago, by some people from another planet. Or was this earth alone populated by intelligent beings? In my understanding this passage from the book of Genesis is a literary relic dealing with a visit of intelligent beings from another planet.

It appears that the extraterrestrial visitors made their landing as if in

advance knowledge of the impending catastrophe of the Deluge.<sup>42</sup> It could be that Jupiter and Saturn were approaching each other ever closer on their orbits and that a disruption of one of them was expected.<sup>43</sup>

Possibly many centuries, or even millennia, passed between the landing and the Deluge. The mission could have been undertaken to ascertain the conditions on Earth. If it was an escape it could also have been from another catastrophe in the solar system, one of those that preceded the Deluge, like the one described as the dethronement and emasculation of Uranus by Kronos. If the ancient legends of a battle between the gods and titans, so persistent in the Greek world, but also in the mythologies of other civilizations, have any historical value, we may try to find what may have been the substratum of this fantasy. It seems that following great convulsions of nature observable in the celestial sphere, giant bodies were hurled on the earth. They arrived burned and were crushed by impact.<sup>44</sup> But at least one group of escapes succeeded in safely reaching the earth.<sup>45</sup> They descended on Mount Hermon or Anti-Lebanon.<sup>46</sup> Of the extra-biblical traditions dealing with the subject some reach hoary antiquity, antecedent to the composition of the Biblical texts. The Book of Enoch narrates that the group was composed of males only, two hundred in number, under the leadership of one by the name of Shemhazai.<sup>47</sup> The Aggadic literature says that the "sons of God" tried to return to heaven from where they had come, but could not.<sup>48</sup>

The new arrivals were probably of gigantic stature—their progeny with women of the earth were giants:

The Nephilim were on earth in those days, and also afterward, when the sons of God came in to the daughters of men, and they bore children to them. These were the mighty men that were of old, the men of renown.<sup>49</sup>

Having fathered giants, they themselves must have been not of human size.<sup>49a</sup>

The planet from which they came I would not know to determine. El would refer to Saturn.<sup>49b</sup> The great size of the visitors would suggest a smaller body where the gravitational influence would be less.<sup>49c</sup>

Ten thousand years is only an instant in the life of the cosmos; ten thousand years ago man was only in a rude stone age; today he contemplates to visit other planets. If such progress is made in a time as short as this, who knows what secrets are concealed in the past or in the future?

#### References

1. Because the story seemed so fantastic, I made up my mind at that time not to publish anything on the subject when discussing the Deluge and still earlier events. I came to this idea in 1940-41. In the 1950's many people reported sighting UFO's, which were claimed to be vehicles of visitors from other planets (a view which does not find any credence with me). In 1957 the space age began, and by the late 1960's, when the proposal that there were ancient visitors to Earth from other star systems found its way into print, the idea provoked little ridicule.
2. Genesis 6:1-2
3. Cf. S. R. Driver, *The Book of Genesis*, 6th ed. (New York, 1907), pp. 82f. J. Morgenstern, however, considered them to be heavenly beings ("The Mythological Background of Psalm 82," *Hebrew Union College Annual* XIV, 1939, p. 95.)
4. *The Journal of Christopher Columbus*, tr. by C. R. Markham (London, 1893)—October 14th, 1892: "They asked us if we had come from heaven. One old man came into the boat . . . to come and see the men who had come from heaven."
5. Their story in fact precedes that of the Deluge in the Scriptures.
6. [Later in this book Velikovsky traces the cause of the Deluge to a disruption of Saturn by Jupiter. See below, Part II: Saturn and the Flood.]
7. [Velikovsky seems to be referring to the passage in Ovid's *Metamorphoses* describing the crushed bodies of the defeated giants: "The terrible bodies of the giants lay crushed beneath their own massive structures." Transl. by M. Innes (London, 1955)]
8. [Analogous accounts are reported from the New World. Cf. the Inca account recorded by Pedro Cieza de Leon in the fifty-second chapter of his *La Cronica del Peru*.]
9. In 1960 a Russian physicist and mathematician, M. Agrest, came to the conclusion that the Baalbek stone was a platform for ascent by ancient space travelers, and that Sodom and Gomorrah were destroyed by atomic weapons. (*Literarnaya Gazeta*, February 9th, 1960). At the time I saw some alluring points in this thesis—but I would strongly question the implication that extraterrestrial visitors came to Earth as late as the Old Kingdom in Egypt, because this is the time to which the Patriarch Abraham, a contemporary of the destruction of Sodom and Gomorrah, belongs.
10. *The Book of Enoch* VI. 6-7, transl. by R. H. Charles (Oxford, 1912).
11. Ginzberg, *Legends* V, 172; *Aggadat Bereshit*.
12. Genesis 6:4
13. Previously several correspondents engaged me on the subject; one correctly observed that in order to procreate the visitors must have been of the same species as man.
14. [Eusebius, *Praeparatio Evangelica* IV, xvi; *inei Elinm* would more correctly be rendered as "Sons of the Gods" and may possibly be taken in the sense of "Sons of the Planets," or "Those who Came from the Planets."]
15. [Several sources, including *The Book of Enoch* and Clement of Alexandria (*Eclog. Proph.*, iii, 474, Dindorf ed.) maintain that the Nephilim brought with them much astronomical and technical knowledge which they imparted to mankind.]



## Astronomical Knowledge Before the Deluge

In the Deluge a civilization was destroyed the real value of which is incalculable. Hebrew tradition estimates that the population of the antediluvian world "amounted to millions." Adam is said to have invented seventy languages; Cain, his son, built cities and monuments and ruled over kings. They were representatives of generations. According to Hebrew legends the Deluge and its time had already been predicted by Enoch, and even more ancient generations were said to have erected tablets with calendric and astronomical calculations predicting the catastrophe.<sup>[1]</sup> This might have been the knowledge of months, of years, and of the periods of comets that the remote generations had acquired.

It was in the celestial harmony and disharmony that the secrets of the upheavals were conceived to lie. The science about the times in which calamity could return and fall on our Earth was cultivated among populations that had a vivid remembrance of days of misfortune or of lucky escape.

It is told about the children of Seth, the son of Adam, that

they were the inventors of that peculiar sort of wisdom which is concerned with the heavenly bodies and their order.

And that their inventions might not be lost before they were sufficiently known, they made two pillars upon Adam's prediction that the world was to be destroyed at one time by the force of fire and at another time by the violence and quantity of water.

The one was of brick, the other of stone, and they inscribed their discoveries on both, that in case the pillar of brick should be destroyed by the flood, the pillar of stone might remain, and exhibit these discoveries to mankind and also inform them that there was another pillar, of brick, erected by them.<sup>[2]</sup>

This means that stelae with calendric and astronomical calculations were made public knowledge in that early age. According to the Aggada it was the pious Enoch (the seventh generation) who achieved the deepest knowledge of the celestial secret. He was the man who "walked with God; and he was not; for God took him."<sup>[3]</sup> In this ascension to heaven was taken away the man who more than any other knew the plan of the world and of its creation. Enoch was a great man of his generation.

Kings and princes, not less than one hundred and thirty in number, assembled about him, and submitted themselves to his dominion, to be taught and guided by him. Peace reigned thus over the whole world for all the two hundred and forty three years during which the influence of Enoch prevailed.

In the story of Enoch's ascension it is said that he predicted the disaster.

Enoch was carried into the heavens in a fiery chariot drawn by fiery chargers. The day thereafter the kings who had turned back in good time sent messengers to inquire into the fate of the men who had refused to separate themselves from Enoch, for they had noted the number of them. They found snow and great hailstones upon the spot whence Enoch had risen, and, when they searched beneath, they discovered the bodies of all who had remained behind with Enoch; he alone was not among them: he was high in heaven.

What the Aggada means to tell is that a human being—and one gifted with the greatest "wisdom concerning the heavenly bodies and their order," was brought away in a fiery storm which killed many, brought snow and meteorites, and which had been predicted by the one who disappeared.

Some exact knowledge of the revolution of the bodies in the sky is ascribed here to the antediluvian generations.

### References

1. It is said that the real period of grace endured not for seven days, but for 120 years. During this time the flood was over mankind as a threat. (Sanhedrin 108b)
2. Josephus, *Antiquities of the Jews* II. 8, borrowed by Yashar Bereshit 10a.
3. Genesis 5. 24.



## Deluge

The scriptural deluge is regarded by historians and critical exegetes as a legendary product. "The legend of a universal deluge is in itself a myth and cannot be anything else." <sup>[1]</sup> It is "most nakedly and unreservedly mythological."

The tradition of a universal deluge is told by all ancient civilizations, and also by races that never reached the ability to express themselves in the written symbols of a language. It is found all over the world, on all continents, on the islands of the Pacific and Atlantic, everywhere. Usually it is explained as a local experience carried from race to race by word of mouth. The work of collating such material has repeatedly been done, and it would only fatigue the reader were I to repeat these stories as told in all parts of the world, even in places never visited by missionaries. <sup>[2]</sup>

The rest of the collected traditions are also not identical in detail, and are sometimes very different in their setting from the Noah story, but all agree that the earth was covered to the mountain tops by the water of the deluge coming from above, and that only a few human beings escaped death in the flood. The stories are often accompanied by details about a simultaneous cleavage of the earth. <sup>[3]</sup>

In pre-Columbian America the story of a universal flood was very persistent; the first world-age was called Atonatih, or the age that was brought to its end by a universal deluge. This is written and illustrated in the ancient codices of the Mexicans and was narrated to the Spaniards who came to the New Continent. <sup>[4]</sup> The natives of Australia, Polynesia, and Tasmania, discovered in the seventeenth century, related almost identical traditions. <sup>[5]</sup>

Clay tablets with inscriptions concerning the early ages and the deluge were found in Mesopotamia. Their similarity to the biblical account, and to the story of the Chaldean priest Berosus <sup>[6]</sup> who lived in the Hellenistic age, caused a great sensation at the end of the last century and the beginning of the current one. On this sensational discovery was based the sensational pamphlet *Babel und Bibel* by Friedrich Delitzsch (1902) who tried to show in it that the Hebrews had simply borrowed this story, along with many others, from the Babylonian store of legends.

But if here and there the story of the flood could be said to have been borrowed by the scriptural writer from the Babylonians, and by some natives from the missionaries, in other cases no such explanation could be offered. The indigenous character of the stories in many regions of the world makes the borrowing theory seem very fragile.

Geologists see vestiges of diluvial rains all over the world; folklorists hear the story of a universal flood wherever folklore is collected; historians read of a universal flood in American manuscripts, in Babylonian clay tablets and in the annals of practically all cultured peoples. But the climatologists make it very clear that even should the entire water content of the atmosphere pour down as rain, the resulting flood could not have covered even the lowland slopes, far less the peaks of the mountains, as all accounts insist that this deluge did.

### References

- <sup>[1]</sup> A. Loisy, *Les mythes babyloniens et les premiers chapitres de la genese* (Paris, 1901).
- <sup>[2]</sup> R. Andree, *Die Flutsagen* (1891); Sir J.G. Frazer, *Folk-lore in the Old Testament* (London, 1918); M. Winternitz, *Die Flutsagen des Alterthums und des Natuervolker*
- <sup>[3]</sup> Eg., the Malaya story in Andree, *Die Flutsagen*, p. 29. s
- <sup>[4]</sup> [Cf. the Vatican Codex, first published by Humboldt, and the accounts of Ixtlilxochitl and Veytia among others.]
- <sup>[5]</sup> [Cf. A. C. Cahill, *Mythes, legendes, et traditions des Polynesiens* (Paris, 1914); H. H. Howorth, *The Mammoth and the Flood* (London, 1887), pp. 455ff.]
- <sup>[6]</sup> Berosus' story of the Deluge is quoted in Eusebius' *Præparatio Evangelica* Bk. IX, ch. 12, and in Cyril's *Contra Julianum*, Bk. I.



## William Whiston and the Deluge

The years 1680 and 1682 were years of unusually bright comets. Many pamphlets were printed, especially in Germany, on the imminent end of the world; at the very least, great catastrophes were expected. There was nothing new in such prognostications. In earlier centuries and also earlier in the seventeenth century, comets were regarded with awe and every possible evil effect was ascribed to them. Thus a scholarly author, David Herlicius, published in 1619 a discourse on a comet that had appeared shortly before, in 1618, and enumerated the calamities that this comet, and comets in general, bring with them or presage:

Desiccation of the crops and barrenness, pestilence, great stormy winds, great inundations, shipwrecks, defeat of armies or destruction of kingdoms, . . . decease of great potentates and scholars, schisms and rifts in religion, etc. The portents of comets are threefold—in part natural, in part political, and in part theological. <sup>[1]</sup>

David Herlicius also quoted Cicero: "From the remotest remembrance of antiquity it is known that comets have always presaged disasters." <sup>[2]</sup>

The fear and even horror caused by the comet of 1680 was just beginning to calm down when in 1682 another great comet appeared.

Edmund Halley was twenty-six years old when this comet of 1682 appeared. He had experience in astronomical observations and calculations, having spent time on the island of St. Helena, cataloguing there 341 southern stars; he had observed the transit of Mercury, and made pendulum observations. Now he calculated the orbit of the comet of 1682, and predicted its return in 1759. Actually, the periodicity of comets was not first discovered by Halley. The ancient authors knew that comets have their time of revolution. Seneca wrote in his treatise *De Cometis*—in some respects still the most advanced discussion of this subject—that the Chaldeans counted the comets among the planets. <sup>[3]</sup> A comet with a periodicity of about 70 years was known to the rabbis. <sup>[4]</sup>

Nevertheless, only little aware of the works of the ancients, the modern world acclaimed Halley to be the discoverer of the periodicity of comets; however, this acclaim came only after his prognostication realized itself. The comet of 1682, or Halley's comet, returned in 1759. It came somewhat retarded on account of its passage near the planets Jupiter and Saturn. This delay had been calculated, though not quite accurately, by Halley. On the grave of Halley these words are engraved: "Under this marble peacefully rests . . . Edmundus Halleius, LL.D., unquestionably the greatest astronomer of his age."

But when Halley offered his theory of the periodicity of comets, and of the return of the observed comet after seventy-five years, this theory was not received immediately with enthusiasm. Yet in the mind of a contemporary mathematician the idea of a periodic return of comets was the beginning of a broadly-developed theory of the origin of the world and of the nature of the deluge.

William Whiston, born in 1667, published in 1696 his *New Theory of the*

*Earth*. In this book he claimed that the comet of 1682 was of a 575&half year periodicity; that the same comet had appeared in February of 1106, in +531 in the consulate of Lampadius and Orestes, and in September of -44, the year of Caesar's assassination.<sup>5</sup> Whiston further asserted that this comet had met the earth in -2346, and caused the Deluge.<sup>6</sup>

Whiston found in classical literature references to the change in inclination of the terrestrial axis and, ascribing it to a displacement of the poles by the comet of the Deluge, concluded that before this catastrophe the planes of daily rotation and yearly revolution coincided and that, therefore, there had been no seasons. He also found references to a year consisting of 360 days only, and although the Greek authors referred the change to the time of Atræus and Thyestes, and the Romans to the time of Numa, ca. -700, Whiston ascribed these changes to the effect of the Earth's encounter with the comet of the Deluge. Whiston thought that the Earth itself was once a comet.

Whiston was chosen by Isaac Newton to take over his chair of mathematics at Trinity College in Cambridge when Newton, after many years, retired in order to dedicate himself to the duties of the president of the Royal Society. Whiston, like Newton, was a Unitarian. He was also close to being a fundamentalist. He was certain that only one global catastrophe was described in the Scripture—that of the Deluge. Of the phenomenon described in the book of Joshua, he wrote: "The Scripture did not intend to teach men philosophy, or accommodate itself to the true and Pythagoric system of the world."

It is difficult to say what caused Newton, who selected Whiston as his successor, to oppose Whiston's election to the membership of the Royal Society. We have another similar instance a century later, when Sir Humphry Davy, the mentor of Michael Faraday, conducted a strenuous campaign to keep Faraday from being admitted to the Royal Society, of which Davy was president.

But the very idea of a periodicity of comets, gleaned by Whiston from Halley, was not yet accepted. In 1744 a German author wrote: "It is well known that Whiston and others like him who wish to predict the comings and goings of comets, deceive themselves, and have become an object of ridicule by the entire world."<sup>7</sup>

Still later Whiston was ridiculed by Georges Cuvier, himself a proponent of a catastrophist theory.

Whiston fancied that the earth was created from the atmosphere of one comet, and that it was deluged by the tail of another. The heat which remained from its first origin, in his opinion, excited the whole antediluvian population, men and animals, to sin, for which they were all drowned in the deluge, excepting the fish, whose passions were apparently less violent."

#### References

1. "Ausuerrung des Erdbodens und unfruchtbarkeit, Pestilenz, grosse mechtige Sturmwinde, Erdbeben, grosse Wasserfluthen, Schiffbruch, verenderung der Regimenten, oder verstorung der Koenigreich . . . abgang grosser Potentaten und gelaerter Leute, Rotten und Secten in Religion, etc. Sind also die significaciones oder Bedeutungen der Cometen dreyerley, etliche sind Naturales oder natuerlich, etliche Political oder weltlich, etliche Theological oder gestlich."
2. Cicero, *De Natura Deorum*: "Ab ultima antiquitatis memoria notatum cometas semper calamitatum praenuntius fuisse." The Pythagoreans believed that great comets appear at great intervals of time. Posidonius, *Fig. 131b*, L. Edelstein and I. G. Kidd eds., (Cambridge, 1972), p. 123.
3. *Quaestiones Naturales* IV.1. The same opinion was ascribed to Hippocrates.
4. In the second century of this era, Rabbi Joshua said "There is a star which appears every 70 years and misleads the captains of boats." It has been suggested that this statement is a reference to Halley's comet. (W. M. Feldman, *Rabbinical Mathematics and Astronomy* (New York, 1931), pp. 11, 216.
5. [The 575&half year periodicity of the comet of 1682, and its previous returns beginning in -44, were first proposed by Halley and accepted by Newton (*Philosophiae Naturalis Principia Mathematica* third ed., 1726, Book III, Proposition XLI, Problem XXI).]
6. "The Cause of the Deluge Demonstrated, being an Appendix to the 2nd edition of the *New Theory of the Earth*" (London, 1708). Whiston changed the date calculated by the earlier cometographers so as to have a multiple of 575½ years. David Rockenbach, Seth Calvisius, and Christopher Hevicius had fixed the date at -2292, and Henricus Eckstormius and David Herlicius at -2312.
7. S. Suschken, *Umvorgreifliche Kometen-Gedanke* (1744), p. 8. "Gewiss ist es, dass Whiston und andere, welche den Auf- und Untergang der Cometen vorher sagen wollen, sich selbst betrogen, und vor aller Welt zu Spott gemacht haben."





## Deluge and Comet

The idea that a comet heralded the Deluge was not new with William Whiston: it is found in several earlier authors, the so-called cometographers and chronologists of the seventeenth century. But they only described the appearance of the comet at the time of the Deluge as a matter of fact, and did not deduce any theory from it. No causal relation was seen: it was more in the nature of a coincidence. New in Whiston was the identification of the comet of 1680 as the comet of the Deluge, and the perturbatory effects on the position and motion of our planet, ascribed by him to the activities of the comet; finally, his general theory that the Earth itself was once a comet.

The author whom Whiston names as his source was J. Hevelius, whose *Cometographia* was published in 1668. Apparently Whiston did not go further back to the sources of Hevelius: to Abraham Rockenbach (15-16 ), Seth Calvisius (1556-1615), Henricus Estormius, Christopher Helvicus (1581-1617) and David Herlicius (1557-1636).<sup>[1]</sup> Abraham Rockenbach was a scholar of the late Renaissance, a man of broad interests, already evident from that fact that he occupied both, the chair of Greek and of Mathematics at the University of Frankfurt, and later taught law and became Dean of the Philosophical College at that University. In 1602 he published a short treatise in Latin, *De cometis tractatus novus methodicus*, and in it he had the following entry concerning the Deluge:

In the year of the creation of the world 1656, after Noah had attained the age of 600 years, three days before the death of Methusalem, a comet appeared in the constellation Pisces, was seen by the entire world as it traversed the twelve signs of the zodiac in the space of a month; on the sixteenth of April it again disappeared. After this the Deluge immediately followed, in which all creatures which live on earth and creep on the ground were drowned, with the exception of Noah and the rest of the creatures that had gone with him into the ark. About these things is written in Genesis, chapter 7.<sup>[2]</sup>

Rockenbach lived and wrote nearly a hundred years before Whiston. What were Rockenbach's sources? He did not let us know. He referred to them at the beginning of his treatise, claiming that it was based on information *ex probatissimis & antiquissimis veterum scriptoribus*—"from the most trustworthy and the most ancient of the early writers." We have already had occasion to quote from Rockenbach in connection with the comet that shone during the Exodus.<sup>[3]</sup> There he refers only to Piny, although he probably used other sources besides: Lydus, Servius, Hephaestion, and Iunctinus wrote about comets, and Servius mentions also the writings of Campester and Petosiris.

Although we may never be certain of the sources on which Abraham Rockenbach and other cometographers drew in mentioning a comet in connection with the Deluge, the great medieval rabbinical authority Rashi was probably among them.<sup>[4]</sup> Rashi wrote concerning *Khima*, a celestial body mentioned in Job 9:9 and 38:31, and in Amos 5:8, that it is "a star with a tail," or a comet. In the Talmud, *Khima* is associated with the Deluge, and this seems to have been the source of the cometographers' assertion that a comet appeared in conjunction with that event.

The question now is, what was *Khima*, and what was its role in the Deluge? Was it really a comet as Rashi thought?

### References

1. Herlicius wrote in 1619 (*Kurzer Discurs vom Cometen, etc.*): "*Man liest in den Historien dass im God. Jahr Alters Nohae, in welchem die Straffte Welt mit der Suedfluth vordorben, ein Comet in der Fischen erschienen sey unter der Gubernation Iovis, welcher 29 Tagen alle Signa oder Zeichen des Zodiaci durchgangen, und aller Welt Erschienen sey.*"
2. *Anno a conditu mundi, millesimo, sexcentesimo, quinquagesimo sexto, postquam Noa annum aetatis sexcentessimum attingit, triduo ante obitum Methusalem, Cometa in duodecimem piscium, a toto terrarum orbe, conspectus est, quid duodecim signa coeli, unius mensis spatio percurrit, dicimoq; sexto Aprilis die rursus evanuit. Post hunc, diluvium statim secutum est, in quo omnia viventa homin; serpenta animalia, Noa excepto, reliquaque creaturis cum Noa in arcam ingressis, suffocata sunt. De quibus Genesis cap. 7 scriptum est.*
3. *Worlds in Collision*, section "The Comet Typhon."
4. "Rashi" is an abbreviation for Rabbi Isaac ben Solomon; he lived in the south of France in the eleventh century. His commentary to the Bible and to some parts of the Talmud is still regarded as the most authoritative in the field of rabbinical knowledge, which has great authorities in every one of the twenty centuries since the beginning of rabbinical learning. Till today Rashi's commentary is supplied to many Hebrew editions of the Scriptures and Talmud, with supracommentary on Rashi by later authorities added as well.



## Khima

In the Tractate Brakhot of the *Babylonian Talmud* it is said that the Deluge was caused by two stars that fell from *Khima* toward the earth. The statement reads:

When the Holy One . . . wanted to bring a flood upon the world, He took two stars from *Khima* and brought a flood upon the world.<sup>[1]</sup>

I have already mentioned that Rashi, the medieval exegete whose authority is unsurpassed among the rabbis, says that in the quoted sentence *Khima* means a star with a tail, or a comet. This explanation found its way into the works of several gentile theologians.<sup>[2]</sup> Should it be understood so that two large meteorites fell from a comet and falling on Earth caused tidal waves? Instances when meteorites fell while a comet was glowing in the sky are known, and the classic case is found in Aristotle.<sup>[3]</sup> Should a meteorite equal in mass to the one which by its impact formed the Arizona crater fall into the ocean, tidal waves of a wide spread would result, possibly circling the globe. Then are we to understand the Deluge as a huge tidal wave rushing across the continents? This picture differs widely from the story in Genesis, according to which water was falling for a long period from the sky and the waters of the depths rose, covering the surface of the earth.

The Tractate Brakhot so explicitly points to the cause of the Deluge that before classifying the narrative in Genesis in its entirety as folkloristic imagery (which in part it most certainly is), and also before following Rashi's idea any further, we ought to inquire: Which celestial body is *Khima*? Is it correctly explained as a comet?

In the Old Testament *Khima* is mentioned in several instances. In Job, Chapter 9, the Lord is He who "removes the mountains . . . and overturns them . . . and shakes the earth out of her place . . . which commands the sun and it rises not . . . which alone spreads the heaven . . . which makes Aish and Kesil, and *Khima*, and the chambers of the south . . ." In the King James Version these names are translated as Arcturus, Orion, and Pleiades. Chambers of the South are usually explained as constellations of the south.

*Khima* and *Kesil* are also named in Job, chapter 38, here again in a text that deals with the violent acts to which the Earth was once subjected: ". . . Who shut up the sea with doors [barriers], when it brake forth, as if it had issued out of the womb? . . . [Who] might take hold of the ends of the earth, that the wicked might be shaken out of it? . . ." The Lord asks Job: "Canst thou bind

the chains [feters] of Khima and loosen the reins of Kesil? Canst thou lead forth the Mazzaroth in its season? . . .” Davidson and Lancheater wonder at the meaning of this passage: like the King James Version they translate Pleiades for Khima and Orion for Kesil.<sup>[4]</sup> Mazzaroth is left untranslated.

In Amos, chapter 5, once more, Khima and Kesil are mentioned in a verse that reveals the great acts of the Lord who “makes Khima and Kesil, and turns the shadow of death into morning, and makes the day dark with night: that calls for the waters of the sea, and pours them upon the face of the earth. . . .”

Hieronymus, also known as St. Jerome, the fourth century author of the *Vulgate*, the Latin version of the Old Testament, translates Khima as Arcturus in one instance (Amos 5), as Pleiades in another (Job 38), and as Hyades in the third (Job 9):

ATSH	KHIMA	KESIL
Job 9:9 Arcturus	Hyades	Orion
Job 38:31	Pleiades	Arcturus
Amos 5:8	Arcturus	Orion

Similarly Kesil was translated by the *Septuagint*, the Greek version of the Old Testament that dates back to third century before the present era, as *Hesperus*, or the Evening Star, and in another instance as Orion. Aish, translated as Arcturus in the *Vulgate*, is rendered as Pleiades by the *Septuagint*:

ATSH	KHIMA	KESIL
Job 9:9 Pleiades	Arcturus	Hesperus
Job 38:31	Pleiades	Orion

Amos 5:8 not given not given  
Obviously the true meaning of these names was lost, because one and the same authority in various instances used different star constellations or planets for each of them: Kesil, Khima, Mazzaroth, Aish. Later interpreters groped in the dark; so Calmet, the eminent French commentator and exegete of the early eighteenth century translated Khima as Great Bear.<sup>[5]</sup> Others rendered it as Sirius (Canis Major).

The interpreters were especially intrigued by the description in Job 38. The Lord asks Job whether he can bind the chains of Khima or loosen the reins of Kesil. “The word in the second clause is from a root always meaning to draw . . .”<sup>[6]</sup> Which star is in chains? And which star is drawn by reins, as if by horses?

The identities of Khima and Kesil, Aish and Mazzaroth, were of lesser importance when it amounted to finding their meaning for their own sake in the poetical sentences of Amos and Job. But such identification, especially of Khima, grows in importance if the quoted sentence from the Tractate Brakhot may contribute to an understanding of the etiology of the Deluge, as the ancients knew or thought to know it.

In *Worlds in Collision* I have already explained that Mazzaroth signifies the Morning (Evening) star, the *Vulgate* has Lucifer for Mazzaroth and the *Septuagint* reads: “Canst thou bring forth Mazzaroth in his season and guide the Evening Star by his long hair?” I have already shown why the Morning-Evening star was described as having hair or coma, and why Venus did not appear in its seasons.

Apparently the other members of the group were planets, too. And actually we could have started by the disclosure that in the rabbinical literature Khima is referred to as *Mazzal Khima*.<sup>[7]</sup> In Hebrew *mazzal* means “planet.” Then which planet is Khima? If we can find out which of the planets is Khima, then we may know also to which planet the Talmud assigned the physical cause of the world inundation. As we have seen, the Biblical texts by themselves do not contain the means to determine which of the planets Khima and Kesil are.

“Were it not for the heat of Kesil the world could not endure the cold of Khima; and were it not for the cold of Khima, the world could not endure the heat of Kesil.” This sentence is found, too, in the *Babylonian Talmud*, in the Tractate Brakhot.<sup>[8]</sup>

Kesil means in Hebrew “fool.” From the biblical texts it is not apparent why one of the planets received this adverse name, or, why, more probably, the word “fool” was derived from the name of the planet.<sup>[9]</sup>

In the *Iliad* Ares-Mars is called “fool.” Pallas Athena said to him: “Fool, not even yet hast thou learned how much mightier than thou I avow me to be, that thou matchest thy strength with mine.”<sup>[10]</sup> These words explain also why Mars was called fool: it clashed repeatedly with the planet-comet Venus, much more massive and stronger than itself. To the peoples of the world this prolonged combat must have appeared either as a very valiant action on the part of Mars, not resting but coming up again and again to attack the stupendous Venus, or it must have appeared as a foolish action of going again and again against the stronger planet. Homer described the celestial battles as actions of foolishness on the part of Mars. Thus Kesil, or “fool,” among the planets named in the Old Testament, is most probably Mars.

In Pliny we find a sentence which reads: “The star Mars has a fiery glow . . . owing to its excessive heat and Saturn’s frost, Jupiter being situated between them combines the influence of each and renders it healthy.”<sup>[11]</sup> The heating effect ascribed in the Talmud to Kesil is ascribed by Pliny to Mars, and the cooling effect of Khima to Saturn. By this sentence of Pliny we are strengthened in our identification of Kesil as the planet Mars; it corroborates the conclusion we just made with the help of the *Iliad*. But what is even more important, Pliny helps to identify the “planet Khima”: it is Saturn.

Cicero also wrote that “Saturn has a cooling influence,” whereas Mars “imparts heat.”<sup>[12]</sup> Porphyry, an author of the third century, wrote similarly with Pliny and Cicero: “The power of Kronos [Saturn] they perceive to be sluggish and slow and cold. The power of Ares [Mars] they perceive to be fiery.”<sup>[13]</sup>

Porphyry’s contemporary Plotinus wrote: “When the cold planet [Saturn] is in opposition to the warm planet [Mars], both become harmful.”<sup>[14]</sup> Other statements to the same effect are found in Vitruvius<sup>[15]</sup> and Proclus.<sup>[16]</sup> In these sentences, as in those of Pliny and of the Talmud, Mars is regarded as being a fiery planet<sup>[17]</sup> Saturn as being a cold planet.<sup>[18]</sup>

The passage in the Book of Job (38:31) can now be read: “Canst thou bind the bonds of Saturn and loosen the reins of Mars?” The bonds of Saturn can be seen even today with a small telescope. The reins of Kesil I discussed in *Worlds in Collision*, section “The Steeds of Mars.” The two small moons of Mars, Phobos and Deimos, were known to Homer<sup>[19]</sup> and are mentioned by Vergil.<sup>[20]</sup> They were regarded by the peoples of antiquity as steeds yoked to Mars’ chariot.

The passage in the Talmud that makes the planet Khima responsible for the Deluge means: “Two stars erupted from the planet Saturn and caused the Deluge.”

#### References

1. Tractate Brakhot (Seder Zerafim) chapter IX, Fol. 59a, transl. by Maurice Simon, ed. by I. Epstein (London, 1948).
2. Cf. for instance J. B. Wieleburg, *Astronomische Bedenken ueber die Frage ob der vorstehende Untergang der Welt natuerlicher Weise entstehen, insbesondere durch Annaherung eines Cometen zur Erde*

werde befoerdert werden. (Iena, 1744), pp. 80, 157.

3. The meteorite fell at Aegospotami, near the Bosphorus. See Spyridon Marinatos, *Two Interplanetary Phenomena of 468 B.C.* (Athens, 1963).
4. A. B. Davidson suppl. by H. C. Lanchester, to Job 38:31 in *The Cambridge Bible* (Cambridge, 1926).
5. Augustin Calmet, *Commentaire littéral sur tous les livres de l'ancien et du nouveau Testament, "Les XII petits prophètes"* (Paris, 1715).
6. *The Cambridge Bible*.
7. Jacob Levy, *Woerterbuch ueber die Talmudim und Midrashim* 2nd ed. (Berlin, Vienna, 1924); entry "Khuma."
8. *Op. cit.*, Fol. 58b.
9. S. R. Driver to Amos 5:8 in *The Cambridge Bible* (Cambridge, 1918).
10. *Iliad*, Book XXI, line 400.
11. Pliny, *Natural History* II, 34: "Saturni sidus gelidae ac rigentis esse naturae . . . tertium Martis ignei, ardentis a solis vicinitate . . . hujus ardore nimis et rigore Saturni, interjectum duobus ex utroque temperari Jovem salutarique fieri. . ."
12. *De Natura Deorum* II, 46.
13. L. Thorndike, *A History of Magic and Experimental Science* Vol. I (New York, 1920), p. 43.
14. Plotinus, *Is Astrology of Value?* transl. by K. Guthrie (London, 1918). [Similarly wrote the astrologer Dorotheus—see J. Haeg in *Hermes* XLV (1910), pp. 315-319. In Babylonian astrology the conjunction of the two planets was deemed favorable (J. Oppert, *Fragments mythologiques* (Paris, 1882), p. 37.)
15. *De Architectura* IX, 1, par. 16: "Martis stella, itaque fervens ab ardore solis efficitur. Saturni autem . . . vehementer est frigida. Ex eo Iovis cum inter utriusque circumfusions habeat cursum, a refrigeratione calorem certum medio convenientes temperatissimoque habere videtur effectus."
16. Proclus Diadochus, *In Timaeo* Vol. IV, p. 92: "The Stars" iii.1: "Saturn and Mars are the extremes and in opposition to one another . . . one being the principle of cooling, the other of heating . . . Jupiter holds the center and brings to a happy mix the creative activities of the other two." [Cf. also Proclus' summary of the system of Philolaos in his *In Euclide*, I, 402. 21: "Cronos in fact sustains all humid and cold substances, and Ares all the nature of fire." ]
17. The other name for Mars in rabbinical Hebrew—Maadim—signifies "red" or "reddening." Mars has a reddish color.
18. [These astrological qualities of the two planets are described at length in Ptolemy's *Tetrabiblos* II.9. Cf. R. Klibansky, E. Panofsky, and F. Saxl, *Saturn and Melancholy* (London, 1964); also D. Cardona, "The Mystery of the Pleiades," *KRONOS* Vol. 3 no. 4 (1978), pp. 24-44.]
19. *Iliad* XV, 119-120.
20. *Georgica* III, 91: "Martis equi biuges."



## Saturnian Comets

Before searching ancient traditions for any possible association of Saturn with the Deluge, let us notice that the idea that Saturn may have anything to do with the origin of some of the comets of the solar system is not without a theoretical foundation. A group of short-period comets carries the name of "Saturnian family of comets" — they revolve on ellipses that approach closely the orbit of Saturn. A larger family of short-period comets carries the name "Jovian" and Jupiter is regarded as having something to do with their origin: their orbits come close to the orbit of Jupiter.

The usual explanation for the Saturnian and Jovian families of comets is that they had originally traveled on extremely elongated or even parabolic orbits and, passing close to one of the large planets, were changed into short-period comets, traveling on ellipses—it is usual to say that they were "captured." However, the Russian astronomer K. Vshekhsviaty of the Kiev Observatory, one of the leading authorities on comets, has brought strong arguments to show that the comets of the solar system are very youthful bodies—only a few thousand years old—and that they originated in explosions from the planets, especially from the major planets Saturn and Jupiter or their moons. By comparing the observed luminosity of the periodic comets on their subsequent returns, he found it falling and their masses rapidly diminishing by loss of matter to the space through which they travel; the head of the comet emits tails on each passage close to the sun and then dissipates the matter of the tails without recovery. Thus Vshekhsviaty concluded that comets of short duration originated in the solar system, were not captured from outside of that system—a point to which the majority of astronomers still adhere—and that they came into existence by explosion from Jupiter and Saturn, and to a smaller extent by explosion from the smaller planets, like Venus and Mars.<sup>[1]</sup>

In order to originate in this manner from a planet the exploded mass must overcome the gravitational pull of the parent body; the larger the mass of the planet, the greater must be the initial velocity of the exploding matter, the velocity of escape. For this reason the idea of explosion of comets from the planets is preferred to the idea of their explosion from the sun. Due to the great mass of the sun the velocity of escape from there must be in the approximation of xxx kilometers in the first second, and from Saturn only 35 km. But even these velocities are rather high, so that Professor Vshekhsviaty acknowledged that there must have been unusual circumstances which he did not try to determine, but the existence of which he claimed on the basis of the effects produced, namely the short-lived comets reaching to the orbits of Jupiter and Saturn every time these comets recede from the sun to their farthest points (*aphelia*).<sup>[2]</sup>

The sentence in the Tractate Brakhot that ascribes the cause of the Deluge to the cometary bodies that erupted from the planet Saturn no longer appears as fantastic as when we first understood the meaning of Khima in that sentence.

The explosion of cometary bodies from Saturn and Jupiter is claimed on the basis of purely astronomical observations and calculations; the circumstances of such explosions must have been admittedly extraordinary; the time when this happened must be measured in thousands of years, not tens of thousands or millions. Will we also be able to establish with the help of collective human memory what were the extraordinary conditions?

But should we not first, as intended, place ourselves on firmer ground by showing that the statement in the Tractate Brakhot is not a lone testimony unsupported in the traditions and beliefs of the ancient races of the world?

### References

1. K. Vshekhsviaty, *Publications of the Astronomical Society of the Pacific*: Vol. 74 (1962), p. 106.
2. [Su-ma Chien, the Chinese historian (ca. -145 to ca -80) wrote that the planet Jupiter, "if it is not in the place where it should be" may produce different types of cometary bodies. (*Les gouverneurs du ciel*, transl. by E. Chavannes). The origin of comets from conjunctions of planets was postulated by several Greek philosophers, among them Democritus and Anaxagoras. (Aristotle, *Meteorologica* I, 6; Diogenes Laertius; Seneca, *Quaestiones Naturales*.)]



## Saturn and the Deluge

Following the rabbinical sources which declare that the Deluge was caused by two comets ejected by the planet Khima, and our interpretation of the planet Khima as Saturn, we begin to understand the astrological texts, such as certain passages in the *Tetrabiblos* of Ptolemy, which attribute to the planet Saturn floods and all catastrophes caused by high water.<sup>[1]</sup>

The planet's presence in Aquarius especially brought expectations of heavy rains and flooding<sup>[2]</sup> as is attested, among others, by the first-century Roman author Lucan.<sup>[3]</sup> Many of the ancient astrologers were in agreement on this point.<sup>[4]</sup> In a work entitled *Speculum astrologiae*, Junctinus ascribes inundations to the action of Saturn's comets.<sup>[5]</sup> Cuneiform texts contain prophecies of a deluge taking place when a comet assumes a direction with its head towards the Earth.<sup>[6]</sup>

Philosophers of antiquity who were not astrologers also expressed their belief that Saturn is in some way related to moisture—among them the pre-Socratics Philolaus and Philodemus<sup>[7]</sup> and, somewhat later, Plato.<sup>[8]</sup> The elder Pliny wrote in his *Natural History* that it is well known that heavy rains follow transiions of Saturn.<sup>[9]</sup> Servius asserted that "Saturn is a god of rains . . . . When in the sign of Capricorn, he causes very heavy rains, especially in Italy"<sup>[10]</sup> and again: "Saturn is the god of all that is humid and cold."<sup>[11]</sup> Proclus recorded the beliefs of the Pythagoreans: "Again, in the heavens, Ares is fire, Jupiter air, Kronos water."<sup>[12]</sup> Nonnos referred to "ancient Kronos, heavy-kneed, pouring rain."<sup>[13]</sup> Hippolytus wrote of the beliefs of a member of the Penate sect: "But water, he says, is destruction; nor did the world, he says, perish by any other thing quicker than by water. Water, however . . . they assert (it to be) Cronus."<sup>[14]</sup> We recognize that the astrological connection between Saturn and catastrophes created by high water has a very ancient origin.

In the Chaldean story of the Deluge, as told by Berossos, Kronos (Saturn) disclosed to the king Xisuthros that a universal flood would begin on the 15th of the month Dasios. Abydenos says: "Kronos announced to Xisuthros that a flood would pour from above."<sup>[15]</sup>

### References

1. *Tetrabiblos* II. 8. 84. Similar statements may be found in Hephaestion I. 20.
2. A. Bouche-Leclercq, *L'astrologie grecque* (Paris, 1899), p. 96 and n. 1; cf. J. Geffcken, "Eine gnostische Vision," *Sitzungsberichte der Preussischen Akademie der Wissenschaften* (1899), p. 699.
3. Lucan, *Pharsalia*, transl. by R. Graves (London, 1956), Bk. I, 11, 640ff: "It is not as though this were the Watercarrier's month, and the cold and malicious planet Saturn had lighted his dusky fires aloft, thereby raising a truly Deucalionian Flood to overwhelm these lands."
4. *Catalogus Codicum Astrologorum Graecorum* X, 249, 2H.
5. Junctinus, *Speculum astrologiae* p. 317a. Cf. F. Boll, *Sternklaube und Sterndeutung*, 4th ed. by W. Gundel (Leipzig, 1931), p. 114.
6. "Die Keilschriften prophezieen bereits, dass eine Hochflut eintritt, wenn der Komet diese Richtung [mit dem Kopfe nach der Erde] einnimmt." F. Boll, *op. cit.*, p. 114; Cf. Jastrow, *Die Religionen Babyloniens und Assyriens* (Giessen, 1977), Vol. II, p. 696, n.1.
7. Cf. Klibansky *et al.*, *Saturn and Melancholy*, p. 138, n. 39.
8. *Cratylus* 402b.
9. Pliny, *Natural History* II. 106: "Igitur (sidera) in suo quaeque motu naturam suam exercent, quod manifestum Saturni maxime transitu umbribus factum."
10. Servius, *Commentarii in Virgii Georgicas* I. 336: "Saturnus deus pluviarum est, unde etiam senex fingitur . . . : Hoc autem in Capricorno facit gravissimas pluvias, praecipue in Italia."
11. *Ibid.*, I. 12: "Quod Saturnus humoris totius et frigoris deus sit." Cf. *Pauly's Realencyclopädie* XI, 1987-1988, where Kronos is described as representing rivers and water. The ninth-century Arab astrologer Abu Ma'sar wrote: "[Saturn] presides over works of moisture . . . lakes and rivers." (*Introduction to Astrology*, Bk. IV, quoted in Klibansky *et al.*, *Saturn and Melancholy*, p. 130.
12. Proclus Diadochus, *In Timaeo* 32b. [In his commentary to Euclid's *Geometry* (I. 402: 21), Proclus ascribes a similar conception to the pre-Socratic philosopher Philolaos.]
13. Nonnos, *Dionysiaca* VI, 175-178.
14. Hippolytus, *Refutatio Omnium Haeresium*, Book V, chapter 11 in *The Ante-Nicene Fathers*, Vol. V. Hippolytus lived between the years 170 and 236.
15. Cyril, *Contra Julianum* I. 5. Cf. Syncellus, *Chronicon* 28 and Eusebius, *Praeparatio Evangelica* IX. 12. Cf. also the account of Alexander Polyhistor in Cyril, *Contra Julianum*, *loc. cit.* [The traditions of the Hindus assign the Deluge to the end of the Satya yuga and to the reign of Satyawrata, who is acknowledged to be Saturn (E. Moor, *The Hindu Pantheon* [1864], p. 108). Cf. Sir W. Jones, "On the Gods of Greece, Italy and India," *Asiatick Researches* Vol. I (1799), p. 234: "The Satya, or (if we may call it) the Saturnian, age was, in truth, the age of the general flood. . . ." Brahma (i.e., the planet Saturn—see below, section "The Worship of Saturn," n. 5), is said to have warned Manu of the Deluge soon to engulf the world (*The Mahabharata*, XXXX); and when the waters of the deluge covered the earth, Brahma is described as floating over the expanse of the ocean (*Agneya Parana*, chapter IV, cf. S. Shastri, *The Flood Legend in Sanskrit Literature* [Delhi, 1950], p. 51). An ancient woodcut published by Athanasius Kircher (*China Illustrata* [Amsterdam, 1667], p. 158) portrays Brahma (identifiable by his four faces, or *chakra mukha*) as seated on a navel disk, apparently Saturn, that hovers over the waters of the Deluge. Cf. F. Maucier, *Indian Antiquities* (London, 1800), Vol. II, opp. p. 352. The woodcut illustrates the third avatar of Vishnu and, more specifically, may be inspired by the words of the *Padma Parana*: "then the lord . . . floated over the vast ocean, void of the sun and the moon. . . ." (Shastri, *The Flood Legend*, p. 41; compare also Psalm 29: "The Lord sitteth upon the flood") 1].



## The Light of the Seven Days

Isaiah in describing the days to come, when great changes in nature will take place, says that the earth will give its increase in abundance, and "the light of the moon shall be as the light of the sun, and the light of the sun shall be sevenfold, as the light of the seven days. . . ." <sup>[1]</sup>

One could think that "the light of the seven days" refers to the seven days of creation—however, the actual explanation appears to me to be different: the expression "the light of the seven days" refers, in my view, to the seven days preceding the Flood that are referred to in the verse: "For yet seven days, and I will cause it to rain upon the earth. . . . And it came to pass after seven days, that the waters of the Flood were upon the earth." (Genesis 7: 4, 10) It is not explained in the text—after seven days of what? But the rabbinical tradition relates that for seven days before the Deluge "the people heard a great commotion in the heaven," that signified "the end of the age."

The Talmudic tradition that often reaches much farther into the past than better known sources, like the books of the Scriptures, reveals in this instance a memory not suspected at the reading of the seventh chapter of Genesis. But in view of what we have brought out until now, and what we intend to illuminate on the following pages, the blinding light preceding the Deluge by seven days is an interesting and important detail. The world was in a dazzling light, sevenfold stronger than the light of the sun; the light was so strong and so brilliant day and night alike, that the sun was entirely overpowered by it; and in the days of Isaiah, thousands of years later, the memory of the light of the seven days was vivid in tradition, so that the prophet could refer to it in desiring to describe the solar light of the messianic age. <sup>[2]</sup>

Numerous Sanscrit texts assert that seven or even twelve suns shone just before the Deluge. "Being ignited, all of a sudden, the entire terrestrial sphere blazed forth." Twelve suns shone with "dazzling radiance" and consumed the world. (*The Skanda Purana in Shastri, The Flood Legend in Sanscrit Literature*, p. 86). Cf. similar accounts in the *Matrya Purana*, ch. ii, the *Padma Purana*, ch. xxxvi, the *Vishnu Purana*, ch. iii, the *Kalidra Purana*, ch. xxv, and in the *Mahabharata*, chapter "Matsyopakhyaṇa." ]

The light of the seven days was not of solar origin. Of what origin was it? Was it caused by brightly illuminated clouds of ionized hydrogen, or protons, hurled throughout the solar system and poured on earth? In the latter case they could have arrived from the present distance of Saturn in about a week, considering that the proton particles—ionized hydrogen—arrive from the sun in the space of twenty-five hours. <sup>[3]</sup> This is the time which elapses from a flare-up on the sun (protuberance) to the display of the polar lights—the aurora borealis.

The light of the seven days served the population of the world as a warning of some extraordinary events. <sup>[4]</sup>

### References

1. Isaiah 30:26.
2. [A memory of the light of the seven days may be preserved in the Babylonian account of "flaming torches, lighting up the land with their brightness" just prior to the arrival of the waters of the Deluge. (*The Epic of Gilgamesh*, transl. by A. Heidel, tablet XI.)]
3. The distance of Saturn from the Sun is about 9.5 astronomical units. See below, section "Saturn's Golden Age."
4. [A warning of seven days' duration is also a feature of several of the Sanscrit accounts. See S. Shastri, *The Flood Legend in Sanscrit Literature* (Delhi, 1950), p. 30.]



## Nova

From time to time, once in a decade or once in a century, a dimly shining or invisible star flares with brilliant light; it may become brighter than any of the fixed stars, or any of the planets in the sky; it may be seen not only in the nocturnal sky, but in some cases in full daylight; it burns for weeks or months, then loses its brilliance, and finally becomes once more a hardly visible star. Such a blazing star is called a nova. <sup>[1]</sup> The stella nova seen in 1572 in the days of Tycho de Brahe belonged actually to the supernova category. De Brahe observed that the nova did not belong to the solar system but was one of the fixed stars. It was brighter than Jupiter and Venus and was seen at midday—for months it remained visible to the naked eye. Another supernova was observed by Johannes Kepler in 1604. An earlier such event, recorded in the Chinese annals for the year 1054, gave rise to the Crab Nebula. Other observations indicate that a supernova also occurred in 1006.

Isaac Newton suggested a collision between two stars as the cause of the formation of a nova. The prevalent view is that a nova results from the interaction of two stars in a binary system when the two members disrupt one another on close approach. In such a case filaments of the disrupted star are torn out of its body and hurled in great spurts, to be absorbed by the companion star. The sudden transfer of matter is thought to set off the star's cataclysmic explosion. <sup>[2]</sup>

With the development of spectroscopy in the nineteenth century it was found by the displacement of the spectral lines that the gases of a nova move rapidly toward the observer, as also in all other directions; the star's atmosphere expands with a velocity reaching at times over three thousand kilometers per second. <sup>[3]</sup>

While the star's outer gases are hurled into space, much of the inner core remains.

### References

1. [It is thought that as many as twenty novae occur in our galaxy each year, but only rarely does one become so prominent as to approach even a third magnitude brightness. A supernova in the part of our galaxy observable from the Earth may occur once in several hundred years; Kepler's nova (1604) was the last such event.]
2. [In the case of small novae the increase in brightness is about hundredfold. See J. S. Gallagher *et al.*, *Astrophysical Letters* Aug. 15, 1976.]
3. [More commonly the velocities range from 1,300 to 2,500 km/sec.]



## “Star of the Sun”

Saturn is not a conspicuous planet in the sky. Were it not for its sluggish movement, an unaided eye would hardly distinguish it from the surrounding stars. In many ancient sources Saturn is called “sun.” The usual name for Saturn in Chaldean astronomy was Alap-Shamas, meaning “Star of the Sun.”<sup>(1)</sup> Diodorus of Sicily reported that the Chaldeans called Cronos (Saturn) by the name Helios, or the sun, and he explained that this was because Saturn was the most conspicuous of the planets.<sup>(2)</sup> Hyginus also wrote that Saturn was called “Sol.”<sup>(3)</sup> In the Babylonian astrological texts the word Shamash (Sun) was used to designate Saturn: “We learn from the notes written by the astrologers that by the word ‘sun’ we must understand the ‘star of the sun,’ i.e., Saturn.”<sup>(4)</sup> Nimib was the Babylonian name for Saturn: “Nimib in various places is said to shine like the sun.” He was known as UT-GAL-LU, the “great sun of storms.”<sup>(5)</sup> The Greeks used to call Saturn *Phaenon*, “the shining one.”<sup>(6)</sup>

If Saturn was always as inconspicuous as it is at present, what could have caused the races of antiquity, as if by common consent, to give to Saturn the appellation “sun” or “the shining one”? The astrologers certainly must have found it increasingly contrary to reason to associate the star that gives us light and life with one of the palest, and the slowest of the planets.<sup>(7)</sup>

The folk etymology of the Hebrews explained the name Khima as meaning “about a hundred (*ke-me-ah*) stars.”<sup>(8)</sup>

The *Bhagavat Gita* contains the following description of a deity: “If the radiance of a thousand suns were to burst at once into the sky, that would be like the splendor of the mighty one . . . the shatterer of worlds.”<sup>(9)</sup>

All that we have considered up to now indicates that Saturn once exploded in a nova-like burst of light. The date of this event I would be hard-put to specify, even approximately, but possibly it took place about ten thousand years ago. The solar system and reaches beyond it were illuminated by the exploded star, and in a matter of a week the Earth was enveloped in waters of Saturnian origin.

### References

1. J. Menant, *La bibliothèque du Palais du Nivève* (Paris, 1890), p. 99.
2. He calls Saturn “*epiphanestaton*”—the most conspicuous (II, 30, 3-4). [J. Bidez, *Revue de Philologie* XXIX (1905), pp. 319-320 drew attention to the fact that one of the best manuscripts of the Platonic *Epinomis*, the Parisinus 1807A, has “Sun” where “Saturn” would be expected in the passage where the role of the planets is discussed; Bidez commented: “. . . La désignation qui fait du Saturne ‘l’astre du soleil’ se trouve attestée par un témoignage nouveau, extrêmement remarquable à cause de son ancienneté.” Cf. F. Boll, “Kronos-Helios,” *Archiv fuer Religionswissenschaft* XIX (1919), p. 344. The author cites also other examples. In 1869 a stele dedicated to “Kronos-Helios” was found in Beirut. See G. Colonna Ceccaldi, “Stele inedite de Beyrouth,” *Revue Archéologique* 23 (1872), Vol. I, pp. 253-256. On the solar aspect of Saturn’s cult in Roman Africa, see M. Leglay, *Saturne africain* (Paris, 1966), pp. 183-187, 229.]
3. “*Secunda stella dicitur solis quam alii Saturni dixerunt. Hanc Eratosthenes a Solis filio Phaenonta appellatum dicit.* (Hyginus, *De Astronomia* II, 42, 8-10. Cf. A. Bouche-Leclercq, *L’astrologie grecque* (Paris, 1899), p. 93, n. 2.
4. R. C. Thompson, *The Reports of the Magicians and Astrologers of Nineveh and Babylon in the British Museum*, Vol. II (London, 1900), pp. xxv-xxvi (nos. 174 and 176). [Cf. M. Jastrow, “Sun and Saturn,” *Revue d’Assyriologie et d’Archéologie Orientale* VII (1910); and idem, *Die Religion Babylonien und Assyrien* (Giessen, 1905), Vol. II, p. 483 n. 4; 578, n. 4.]
5. P. Jensen, *Die Kosmologie der Babylonier* (Strassburg, 1890), pp. 116, 140. [Cf. Jastrow, *Die Religion Babylonien und Assyrien* Vol. I, pp. 57, 154.]
6. Cicero, *De Natura Deorum* II, 52. [Cf. Manetho, *Apotelesmaticorum libri sex* IV, 14. Cf. also J. Geffcken, “Eine gnostische Vision,” *op. cit.*, p. 699. “The Shining Star” was a designation for Saturn in Babylonia. See for instance, an inscription of Nabonidus in James B. Pritchard ed., *Ancient Near Eastern Texts Relating to the Old Testament* (Princeton, 1950), p. 310.  
In India the appellation of the sun, *ariki*, was also applied to Saturn. R. Temple writes (*The Sirius Mystery* [New York, 1976], p. 180):  
In Sanscrit again *arka* means “belonging or relating to the sun.” *Arkam* means “as far as the sun, even to the sun inclusively.” *Arki* has become a name for Saturn, thought at that time to be the most distant planet. *Arv* means “to shine, be brilliant,” and can mean “to cause to shine.” *Arkin* means “radiant with light.”  
  
*Arkaja*, the name often applied to Saturn, designates it as an offspring of the Sun (*Markandeya Purana*).]
7. Bidez, *Revue de Philologie*, *op. cit.*, p. 320: “*Les astrologues trouverent sans doute de plus en plus déraisonnable de donner en appanage à l’astre d’où nous vient la lumière et la vie, une des plus pales et la plus lente des planetes.*”
8. Rabbi Samuel in Tractate Brakhot, Seder Zera’im of the *Babylonian Talmud*, IX, fol. 59.
9. *The Bhagavat Gita*, ch.



## Arrival of the Waters

Following the "seven days" when the world appeared to be ablaze in "the radiance of a thousand suns" the Deluge started.

First, according to the Hindu account, vast clouds gathered which "overshadowed the entire world."<sup>[1]</sup>

"These ominous clouds . . . rumbling and shooting lightning, overspread the sky."<sup>[2]</sup> They were "as vast as mountains," "some were dusky, some crimson, some white, some brilliant (in hue)."<sup>[3]</sup> Other sources describe them as yellow, or azure, or red. "Loud in roar and mighty in size they fill the entire sky."<sup>[4]</sup> They were "fringed with lightning, meteors and thunderbolts."<sup>[5]</sup> Then, "rumbling aloud with lightning [they] poured torrential streams thick like chariot wheels."<sup>[6]</sup> They "rained with a sullen roar, inundating the three worlds with ceaseless downpour of torrents. . . ." <sup>[7]</sup> "And then there were seen on all sides the four oceans engulfing with tempestuous waves the whole surface of the earth."<sup>[8]</sup> All creation was "smitten by the luminous dense floods."<sup>[9]</sup>

In the beginning of the deluge the nova in the sky shone through the splendor of the illuminated skies and through the sheets of rain, ever increasing in intensity.<sup>[10]</sup> The Biblical expression "the Lord sitteth upon the flood"<sup>[11]</sup> was an apt description of the blazing nova above the waters of the Deluge. It has a Babylonian counterpart in the title of Tammuz as *bel girsu*: "lord of the flood."<sup>[12]</sup> The nova blazed terrifically, but soon the light became diffused, the shadows grew ever dimmer, the world that was all splendor and light turned gloomier and gloomier; the outpouring waters grew ever thicker; the clouds of dust darkened ever more the sky, and finally the drama of what was taking place on earth went on in darkness.

The Deluge was not a peaceful though abundant rain filling the earth with water, rising ever higher. Ancient sources give a description of the Deluge that differs greatly from the pageant of showers pouring from above on a peaceful land and peaceful sea.

### References

1. Skanda Purana in S. Shastri, *The Flood Legend in Sanscrit Literature* (Delhi, 1950), p. 87.
2. Agneya Purana in *ibid.*, p. 50.
3. Kalika Purana in *ibid.*, p. 103.
4. Vishnu Purana in *ibid.*, p. 50.
5. Skanda Purana in *ibid.*, p. 88.
6. Bhagavata Purana in *ibid.*, p. 61.
7. Kalika Purana in *ibid.*, p. 103.
8. Bhagavata Purana in *ibid.*, p. 61.
9. *Ibid.*, *loc. cit.*
10. Cf. the Babylonian expression in the wailings for Tammuz: "The shining ocean to thy perditions has taken thee." (S. Langdon, *Tammuz and Ishtar* [Oxford, 1914], p. 15).
11. Psalm 29.
12. S. Langdon, *Babylonian Liturgies* (Paris, 1913), p. 96.





## The Deluge in Rabbinical Sources

During the "seven days" when the world was flooded by sheets of light, and terrifying signs and commotion filled the heavens, "the Holy One . . . reversed the order of nature, the sun rising in the west and setting in the east."<sup>1</sup>

But during the Deluge "the sun and the moon shed no light"<sup>2</sup> and for an entire year the planets did not follow their regular courses.<sup>3</sup> It may be that because of dust discharged by volcanoes the sky remained veiled for a long period, and this veil made any celestial orientation impossible for the few survivors; but quite possibly the statement refers to a change in the celestial orbits. The rabbinical sources add that the earth was quaking, and the sun was darkened, and the foundations of the cosmos were dislodged. The entire world was in volcanic activity; "amidst lightnings and thunders a very loud sound was heard in the entire world, never heard before."<sup>4</sup>

The Flood was caused by waters pouring from above, but also by waters drawn up from the ground: "All the fountains of the great deep were broken up, and all the windows of heaven were opened."<sup>5</sup> The waters that came from the sky were heated. Many passages in the rabbinical literature refer to the heated water.<sup>6</sup>

The rabbinical literature also refers to great tides and surges of water that covered the face of the earth. "The flood began to toss the ark from side to side. All inside of it were shaken up like lentils in a pot."<sup>7</sup> It is also said that not one, but many arks or vessels were used as a means of escape, but they were ruined or capsized one after the other in the surging water.<sup>8</sup> Judged by this, one would think that there were ample signs of the impending catastrophe, and attempts to organize rescue by preparing boats or ships, all probably destined to fail. The Biblical account, in order to explain the survival of the human species and some land animals, made the ark of Noah the central theme of the story. There must have been many Noahs, and the Midrashim also say so—but probably none of them escaped with his boat the outrages of nature. Possibly, in some caves high in the mountains, in far separated regions of the earth, human beings survived the Deluge; but hardly any vessel or ark. The attempt to find the remains of an ark on Mount Ararat are probably as futile as looking for the ribs of Adam. Yet such attempts are made even in our time.<sup>9</sup>

The duration of the flood is described differently—forty days, and also much longer.<sup>10</sup> Like the former catastrophe of the fall of man, this catastrophe of the Deluge, according to the Hebrew cosmogony, changed the nature of herb, animal and man. The prosperity of the time before the great flood was gone, never to return; the world lay in ruins. The earth was changed; even the sky was not the same.

The continents changed their places in the former catastrophes, and once again in the catastrophe of the Deluge. The areas which are now the shores of the Mediterranean were the shores of an open ocean—or so one may conclude from the following statement: "Before the birth of Noah, the sea was in the habit of transgressing its bounds twice daily, morning and evening. Afterwards it kept within its confines."

As volcanoes erupted, the sky was darkened, and the ocean swelled and rolled on a helpless planet that fluttered when caught in hydrogen clouds of cosmic origin.

### References

- 1.
2. Tractat Sanhedrin 108B of the *Babylonian Talmud*, ed. by I. Epstein (19xx). [Taken literally, this statement implies a reversal of the Earth's rotation, or a "flippe-top" -type reversal of its poles. For a discussion of the latter possibility, see Peter Warlow, *The Reversing Earth* (London, 1982) and discussion by V. J. Slabinski and C. L. Ellenberger in *KRONOS* VII. 2 (1982), pp. 86-96; cf. also *KRONOS* VIII.3 (1983), pp. 84-89. In the electromagnetic model proposed by Velikovsky in *Cosmos without Gravitation* (1946) or such as that conceived by R. Juergens ("On the Convection of Electrical Charge by the Rotating Earth," *KRONOS* II.3 [1977], pp. 12-30) and E. R. Milton, a disturbance of Saturn of the magnitude described here would almost certainly bring about drastic changes in the Earth's rotational motion.]
3. L. Ginzberg, *The Legends of the Jews* (Philadelphia, 1928), vol. I, p. 162.
4. Midrash Rabba to Genesis 25:2.
5. Ha-Yewani Zerahiah, *Sefer Hayashar, The Book of the Righteous*, ed. and trans. by S. J. Cohen (New York, 1973), p.
6. Genesis 7:11.
7. The opinion of Rabbi Hisda to this effect is recorded in Rosh Hashanah 12A and Sanhedrin 108B. Cf. J. B. Wiedeburg, *Astronomische Bedenken* (Jena, 1744), p. 80, and sources in Ginzberg, *Legends* Vol. V, p. 178.
8. Ginzberg, *Legends*, vol. I, p. 162.
9. *Ibid.*, Vol. VI, p. 35.
10. E.g., the expedition recounted by D. Balsinger and C. Sellier, jr. in *In Search of Noah's Ark* (Los Angeles, 1976). If there are some ancient fossilized structures that resemble an ark, as some explorers assert, then more probably it was the presence of these remains which caused the Biblical penman to relate the rescue ship to the mountainous crag of Ararat in the southern Caucasus.
11. It appears that the tradition of "a year" of the deluge led to confusion in calculations, and the traces of this confusion seem to be found in the double redaction of the story of the Deluge. The age of Noah and his contemporaries would indicate that the year was shorter; it could still have consisted of a number of months, but not of months of thirty days; and the days themselves could have been shorter.



## Hydrogen and Oxygen

The conflict between the larger planets resulted in long-stretched filaments ejected by a disturbed Saturn to cross the Earth's orbit. The hydrogen of the planet combined with the oxygen of the terrestrial atmosphere in electrical discharges and turned into water.

There are definite indications of a drastic drop in the atmospheric oxygen at the time of the Deluge—for instance, the survivors of the catastrophe are said in many sources to have been unable to light fires.<sup>(1)</sup>

The consumption of the oxygen in the air by its conversion into water could not fail to have a marked effect upon all that breathes. The animal life that survived needed to accommodate itself to the changed conditions.

According to rabbinical sources, before the Deluge man was vegetarian; but the post-diluvian population did not continue the vegetarian habits of the "sinful" population of the earth. The Talmud and the Midrashim narrate that after the Deluge a carnivorous instinct was awakened in animal and man, and everyone had the impulse to bite.<sup>(2)</sup>

The fear of you and the dread of you shall be upon every beast of the earth and upon every bird of the air. . . . Every moving thing that lives shall be food for you; and as I gave you the green plants, I will give you everything.<sup>(3)</sup>

The prohibition against quenching the thirst for blood<sup>(4)</sup> is an ordinance said to have been introduced immediately after the Deluge.

In a teleological program this result of the Deluge does not seem appropriate for a catastrophe brought about to chastize the human race and the animals, to cleanse them of their vices and make them better. Because of its non-program appearance the carnivorous urge must have been not a mythological motif, but a result of physiological changes. Most probably an anemia connected with the diminution of oxygen in the air was responsible for the new inclination.<sup>(5)</sup>

### References

1. [Such were the accounts of the Sioux, Menomini, and other Indian tribes as told by J. G. Frazer in his "Remarks" to Volume II of Apollodorus' *The Library* in the Loeb series, p. 342. Cf. Skanda Purana, describing the deluged world in which "nothing could be seen . . . fire there was not, nor moon, nor sun." (Shastri, *The Flood Legend in Sanscrit Literature*, p. 88). Even in the relatively slightly rarefied atmosphere of La Paz, Bolivia, "because of the reduced oxygen content . . . fires start with such reluctance that there is little work for the city's fire department." (*Area Handbook for Bolivia* [Washington, 1974], p. 55.)
2. *The Book of Enoch* 89:11: "After the deluge they began to bite one another." According to Midrash Aggada to Genesis 10:8, Nimrod was the first to eat meat.
3. Genesis 9:2-3
4. Genesis 9:4ff.
5. [One might speculate that the diet of meat would be conducive to the production of the additional red blood cells needed by the body to absorb more efficiently the diminished amount of oxygen entering the lungs. In Tibet the high altitude and rarefied atmosphere is said to make it impossible to follow the vegetarian diet advocated by Buddhist teaching. Cf. *Science*, Vol. 203, no. 4383 (March 23, 1979), p. 1230: "At high altitudes all animals hyperventilate—an involuntary mechanism of fast breathing in which carbon dioxide causes the *ph* of the blood to become alkaline and constricts blood vessels. This, in turn, reduces the blood flow to the brain and brain cells become starved of oxygen, eventually dying. An alkaline *ph* in the blood can also produce other fatal effects." ]



## The Origin of the Oceans

It must have been at the very beginning of my occupation with the problems later developed in my books and in not yet published manuscripts, that I came upon the question of the origin of salts in seas and oceans. The common salt is a substantial ingredient of the oceanic content, or, said differently, the water of the oceans and seas contains a substantial solution of NaCl, or sodium chloride. Even though our blood and tissues abound in sodium chloride, man and animals are not adapted to drink salty water, and life on land could develop only thanks to the evaporation of the water from the surface of seas and oceans, or to distillation—the evaporating water is free from salts. Falling as rain or snow or dew, it feeds underground sources and also glaciers, and through them the brooks and rivers and lakes, and is delivered to our use usually through concrete tubes and metal pipes.

Of the salts of the seas sodium chloride is by far the most abundant. The provenance of it is, however, a riddle. It was, and still is, assumed that the salts in the oceans originated mainly through importation from land, having been dissolved from rocks by flowing rivulets and rivers, themselves fed by underground sources, and the same process working on the rocks of the seabed. Terrestrial formations are rich in sodium, and in eons of time, it is assumed, the sodium washed out of the rocks supplied its content to the oceans; the seas evaporate and the concentration of these salts grows. But the rocks are by far not so rich in chlorine, and hence the problem—from where did chlorine come to contribute its abundance to oceanic water? There is chlorine in source water, but usually not in significant amounts. The proportion of salts in the rivers is very different from their proportion in the seas. River water has many carbonates (80 percent of the salts), fewer sulphates (13 percent) and still fewer chlorides (7 percent). Sea water has many chlorides (89 percent), fewer sulphates (10 percent) and only a few carbonates (0.2 percent). The comparison of these figures makes it clear that rivers cannot be made responsible for most of the salts of the seas. Therefore it is also obvious that there is no proper way of calculating the age of the Earth by comparing the amount of salts in the seas with the annual discharge by the rivers; the most that can be done in this respect is to calculate the rich amount of carbonates in the rivers in their relation to the relatively poor concentration to these salts in the seas; but then there will be no explanation for the rich concentration of chlorides in the seas in comparison with their poor concentration in the rivers.

A part of the salts could be traced to the washing of lands and the floor of the seas; chlorine is known also to be discharged by volcanoes, but to account for the chlorine locked in the seas, volcanic eruptions, whether on land or under the surface of the seas, needed to have taken place on an unimaginable scale—actually, it was figured out, on an impossible scale. Thus it was acknowledged that the provenance of chlorine in the salts of the seas is a problem unsolved.

Paleontological research makes it rather apparent that marine animals in some early age were more closely related to fresh-water fauna; in other words, the salinity of the oceans increased markedly at some age in the past.

The most obvious and permanent effect of a deluge of extraterrestrial origin on the Earth would be the increase in its water volume and of the place occupied by the seas. Presently four-fifths of the Earth are covered with water. A stupendous addition of water to the Earth should have decreased, not increased its salinity, if the water came down in a pure state. But if the Earth was showered by torrents of hydrogen and water some other ingredients of the Saturnian atmosphere could also have swept across the Earth's orbit.

In the Buddhist book on "The World Cycles," the *Visuddhi-Magga*, where the catastrophes that terminated the world ages are described, it is said:

But when a world cycle perishes by water . . . there arises a cycle-destroying great cloud of salt water. At first it rains with a very fine rain which gradually increases to great torrents which fill one hundred thousand times ten million worlds, and then the mountain peaks of the earth become flooded with saltish water, and hidden from view. And the water is buoyed up on all sides by the wind, and rises upward from the earth until it engulfs the heavens.<sup>(1)</sup>

Volcanoes which were active during the cataclysm of the Deluge and during other cosmic upheavals vomited sulphur, chlorine, and carbonates, and contributed to the composition of the salts of the oceans. Carbonates fell on Earth in large quantities in some of the upheavals, certainly in the one which took place in the middle of the second millennium before the present era, at the very end of the Middle Kingdom in Egypt, an upheaval described in detail in *Worlds in Collision*. But a major portion of the chlorine in which the oceans are so rich must have come from an extraterrestrial source.<sup>(2)</sup>

My explanation of the origin of a large portion of the salts of the seas suggests that Saturn is rich not only in water but also in chlorine, either in the form of sodium chloride or in some other combination, or even atomic free. The last solution, of atomic free chlorine, appeared chemically and biologically somewhat difficult to contemplate, because chlorine is a very active element, seeking ties with other elements; biologically because it would be damaging to any plant life, yet there are other indications which point to the possibility of plant life on Saturn.

### References

1. The *Visuddhi-Magga*, transl. by H. C. Warren in *Buddhism in Translations* (Cambridge, Mass., 1896), Chap. xiii, p. 327.
2. [The knowledge that the water of the oceans came from the most part from Saturn and that the waters were salty was combined by the Greeks into a metaphor which has the sea being the "tear of Kronos." This tradition originated with the Pythagorean school and may derive ultimately from Egypt. (Plutarch, *De Iside et Osiride*, ch. 32. "According to what the Pythagoreans say, the sea is the tear of Kronos." Clement of Alexandria, *Stromata*, V, §. 20f.; "This the Pythagoreans believed . . . comparing the sea to a tear of Kronos." The same is found in a fragment of Aristotle in the edition of V. Rose (Teubner, 1886), no. 196. Cf. Porphyry's *Life of Pythagoras* (Nauck ed., p. 39). Cf. also E. Lefebvre, *Études Egyptologiques*, Vol. III: *Le Mythe osirien* (Paris, 1874), p. 125: . . . et il faut sans doute regarder comme égyptienne cette croyance des Pythagoriciens rapportée par Plutarch, que la mer était une larme de Kronos. . . .]



## Saturn the God of Seeds

Saturn was called "the god of seeds" or "of sowing," (1) also "the lord of the fieldfruits." (2)

A Deluge destroying much faunal life must have caused a dissemination of plants: in many places new forms of vegetation must have sprouted from the rich soil fertilized by lava and mud; seeds were carried from all parts of the globe and in many instances, because of the change in climate, they were able to grow in new surroundings. The axis of the earth was displaced, the orbit changed, the speed of rotation altered, the conditions of irrigation became different, the composition of the atmosphere was not the same—entirely new conditions of growth prevailed.

Ovid thus describes the exuberant growth of vegetation following the Flood: "After the old moisture remaining from the Flood had grown warm from the rays of the sun, the slime of the wet marshes swelled with heat, and the fertile seeds of life, nourished in that life-giving soil, as in a mother's womb, grew, and in time took on some special form." "When, therefore, the earth, covered with mud from the recent Flood, became heated up by the hot and genial rays of the sun, she brought forth innumerable forms of life, in part of ancient shapes, and in part creatures new and strange." (3)

The innumerable new forms of life in the animal and plant kingdoms following the Deluge could have been solely a result of multiple mutations.(4) Although this seems a sufficient explanation of why and how Saturn came to be credited with the work of dissemination and mutation, the mention of another possibility should not be omitted.

If it is true that the Earth passed through the gases exploded from Saturn, it should not be entirely excluded that germs were carried together with meteorites and gases and thus reached the Earth.

The scholarly world in recent years has occupied itself with the idea that microorganisms—living cells or spores—can reach the Earth from interstellar spaces, carried along by the pressure of light rays.(5) The explosion of a planet is a more likely method of carrying seeds and spores through interplanetary spaces.

The new forms of life could be the result of mutations, a subject I have discussed in *Earth in Upheaval*. But the possibility that seeds were carried away from an exploding planet cannot be dismissed either.

### References

1. Augustine, *De Civitate Dei* VII. 13f. [Augustine wrote: "Saturnus . . . unus de principibus deum, per seipsum saluum omnium dominatus est." Cf. Amobius 4.9; Macrobius, *Saturnalia* I. 7. 25; Servius, *De Virgilii Georgics* I. 21; Saturn was credited with the introduction of agriculture in Italy (Macrobius, *Saturnalia* VII. 21). In Greece Kronos was closely associated with the harvest of grain (H. W. Parke, *The Festivals of the Athenians* (London, 1977), p. 29. Among the Egyptians it was said that "Osiris is seed." (Firmicus Maternus, *The Error of the Pagan Religions*, II. 6; cf. A. Erman, *Die Religion der Aegypter* (Berlin, 1934), p. 40; Gressman, *Tod und Auferstehung des Osiris*, p. 8ff. In Babylonia during the festival marking the drowning of Tammuz, grains and plants were thrown upon the waves. (Langdon, *Tammuz and Ishtar*, p. 13.)
2. Lydus, *De Mensibus* IV. 10.
3. Ovid, *Metamorphoses*, lines 418ff., transl. by F. J. Miller. Cf. Empedocles, fg. 60, 61, edited by J. Bruns (Paris, 1906); cf. also Plato, *The Statesman*, 65.
4. [The effects of nearby supernovae on the biosphere have been the object of intensive study by geologists in recent years, in the attempt to account for abrupt changes in the history of life on this planet. Cf. D. Russel and W. Tucker, "Supernovae and the Extinction of the Dinosaurs," *Nature* 229 (Feb. 19, 1971), pp. 553-554. Sudden extinctions were followed by the appearance of new species, quite different from those preceding them in the stratigraphic record. In a relatively brief interval whole genera were annihilated, giving way to new creatures of radically different aspect, having little in common with the forms they replaced. See N. D. Newell, "Revolution in the History of Life," *Geological Society of America Special Papers* 89, pp. 68-91; Cf. S. J. Gould and N. Eldredge, "Punctuated equilibria: the tempo and mode of evolution reconsidered," *Paleobiology* 1971, Vol. III, pp. 115-151. Thus over the past two or three decades many geologists and paleontologists have found themselves increasingly drawn to the view that the observed abrupt changes in the biosphere, such as that which marked the end of the Mesozoic and is thought to have brought with it the extinction of the dinosaurs, among other animal groups, could best be explained by the exposure of the then living organisms to massive doses of radiation coming from a nearby supernova. The radiation would annihilate many species, especially those whose representatives, whether because of their large size or for other reasons, were unable to shield themselves from the powerful rays; at the same time new organisms would be created through mutations or "macro-evolution." See Velikovsky's comments in "The Pitfalls of Radiocarbon Dating," *Pensee* IV (1973), p. 15. . . . in the catastrophe of the Deluge, which I ascribe to Saturn exploding as a nova, the cosmic rays must have been very abundant to cause massive mutations among all species of life. . . . Animals would suffer much more severely than plants—on plants the principle effect would be mutagenic. See K. D. Terry and W. H. Tucker, "Biologic Effects of Supernovae," *Science* 159 (1968), pp. 421-423.]
5. E.g. F. Hoyle and Ch. Wickramasinghe, "Does Epidemic Disease Come from Outer Space?" *New Scientist*, 17th November, 1977, pp. 402-404.



## The Worship of Saturn

Saturn, so active in the cosmic changes, was regarded by all mankind as the supreme god. Seneca says that Epigenes, who studied astronomy among the Chaldeans, "estimates that the planet Saturn exerts the greatest influence upon all the movements of celestial bodies." (1)

On becoming a nova, it ejected filaments in all directions and the solar system became illuminated as if by a hundred suns. It subsided rather quickly and retreated into far-away regions.

Peoples that remembered early tragedies enacted in the sky by the heavenly bodies asserted that Jupiter drove Saturn away from its place in the sky. Before Jupiter (Zeus) became the chief god, Saturn (Kronos) occupied the celestial throne. In all ancient religions the dominion passes from Saturn to Jupiter.(2) In Greek mythology, Kronos is presented as the father and Zeus as his son who dethrones him, Kronos devours some of his children. After this act Zeus overpowers his father, puts him in chains, and drives him from his royal station in the sky. In Egyptian folklore or religion the participants of the drama are said to be Osiris-Saturn, brother and husband of Isis-Jupiter.

The cult of Osiris and the mysteries associated with it dominated the Egyptian religion as nothing else. Every dead man or woman was catombed with observances honoring Osiris; the city of Abydos in the desert west of the Nile and north-west of Thebes was sacred to him; Sais in the Delta used to commemorate the floating of Osiris' body carried by the Nile into the Mediterranean. What made Osiris so deeply ingrained in the religious memory of the nation that his cult pervaded mythology and religion?

Osiris' dominion, before his murder by Seth, was remembered as a time of bliss. According to the legend Seth, Osiris' brother, killed and dismembered him, whereupon Isis, Osiris' wife, went on pilgrimages to collect his dispersed members. Having gathered them and wrapped them together with swathings, she brought Osiris back to life. The memory of this event was a matter of yearly jubilation among the Egyptians.(3) Osiris became lord of the netherworld, the land of the dead. A legend, a prominent part of the Osiris cycle, tells that Isis gave birth to Horus, whom she conceived from the already dead Osiris.(4)

and that Horus grew up to avenge his father by engaging Seth in mortal combat.

In Egyptology the meaning of these occurrences stands as an unresolved mystery. The myth of Osiris "is too remarkable and occurs in too many divergent forms not to contain a considerable element of historic truth," wrote Sir Alan Gardiner, the leading scholar in these fields<sup>(5)</sup> but what historical truth is it? Could it be of "an ancient king upon whose tragic death the entire legend hinges?" wondered Gardiner<sup>(6)</sup> But of such a king "not a trace has been found before the time of the Pyramid texts," and in these texts Osiris is spoken of without end. There he appears as a dead god or king or judge of the dead. But who was Osiris in his life? asked Gardiner. At times "he is represented to us as the vegetation which perishes in the flood-water mysteriously issuing from himself. . . ." <sup>(7)</sup> He is associated with brilliant light.<sup>(8)</sup>

After a life of studying Egyptian history and religion Gardiner confessed that he remained unaware of whom Osiris represented or memorialized: "The origin of Osiris remains from me an insoluble mystery." <sup>(9)</sup> Nor could others in his field help him find an answer.

The Egyptologist John Wilson wrote that it is an admission of failure that the chief cultural content of Egyptian civilization, its religion, its mythological features again and again narrated and alluded to in texts and represented in statues and temple reliefs, is not understood.<sup>(10)</sup> The astral meaning of Egyptian deities was not realized and the cosmic events their activities represent were not thought of.

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The prophet Ezekiel in the Babylonian exile had a vision—the likeness of a man, but made of fire and amber who lifted him by the lock of his hair and brought him to some darkened chamber where the ancients of the house of Israel with censers in their hands were worshipping idols portrayed upon the wall round about. Then the angel of the vision told him: "Thou shalt see greater abominations that they do"—and he brought the prophet to the door of the gate of the Lord's house—"and, behold, there at women weeping for Tammuz." Next he showed him also Jews in the inner court of the Lord's house "with their back toward the temple of the Lord and their faces toward the east; and they worshipped the sun toward the east." <sup>(11)</sup>

The worship of the sun and the planets was decried by Jeremiah, a contemporary of Ezekiel. But what was this weeping for Tammuz?

Tammuz was a Babylonian god; one of the months of the year, approximately coinciding with July, in the summer, was named in his honor; and by this very name it is known in the present-day Hebrew calendar. Tammuz was a god that died and was then hidden in the underworld; his death was the reason for a fast, accompanied by lamentations of the women of the land. His finding or his return to life in resurrection were the motifs of the passion.<sup>(12)</sup>

Tammuz was a god of vegetation, of the flood, and of seeds: "The god Tammuz came from Armenia every year in his ark in the overflowing river, blessing the alluvium with new growth." <sup>(13)</sup> In the month of Tammuz he was "bound, and the liturgies speak of his having been drowned among flowers which were thrown upon him as he sank beneath the waves of the Euphrates." <sup>(14)</sup> The drowning of Tammuz was an occasion for weeping by women: "The flood has taken Tammuz, the raging storm has brought him low." <sup>(15)</sup>

Of Tammuz it also is narrated that he was associated with brilliant light,<sup>(16)</sup> with descent into the nether world, visited there by Ishtar, his spouse. Tammuz' death, his subsequent resurrection, or his discovery in the far reaches, but no longer brilliant, were the themes of the cult that was not just one of the mysteries, but the chief and paramount cult.

The Osirian mysteries, the weeping for Tammuz, all refer to the transformation of Saturn during and following the Deluge. Osiris was not a king but the planet Saturn, Kronos of the Greeks, Tammuz of the Babylonians. The Babylonians called Saturn "the Star of Tammuz." <sup>(17)</sup> After the Deluge Saturn was invisible (the sky was covered for a long time by clouds of volcanic dust) and the Egyptians cried for Osiris, and the Babylonians cried for Tammuz. Isis (Jupiter at that time) went in search of her husband, and Ishtar (also Jupiter at that early time) went to the netherworld to find her husband Tammuz. For a time Saturn disappeared, driven away by Jupiter, and when it reappeared it was no longer the same planet: it moved very slowly. The disappearance of the planet Saturn in the "nether world" became the theme of many religious observances, comprising liturgies, mystery plays, lamentations, and fasts. When Osiris was seen again in the sky, though greatly diminished, the people were frenzied by the return of Osiris from death; nevertheless he became king of the netherworld. In the Egyptian way of seeing the celestial drama, Isis (Jupiter), the spouse of Osiris (Saturn) wrapped him in swaddling. Osiris was known as "the swaddled"—the way the dead came to be dressed for their journey to the world of the dead, over which Osiris reigns. Similar rites were celebrated in honor of Adonis, who died and was resurrected after a stay in the netherland,<sup>(18)</sup> in the mysteries of Orpheus.<sup>(19)</sup>

Sir James G. Frazer, the collector of folklore, came to regard Osiris as a vegetation god<sup>(20)</sup>; likewise he saw in the Babylonian Tammuz, an equivalent of the Egyptian Osiris, a vegetation god and, carried away by this concept, wrote his *The Golden Bough*,<sup>(21)</sup> built around the idea of the vegetation god that dies and is resurrected the following year.

A few peoples through consecutive planetary ages kept fidelity to the ancient Saturn, or Kronos, or Brahma,<sup>(22)</sup> whose age was previous to that of Jupiter. Thus the Scythians were called Umman-Manda by the Chaldeans<sup>(23)</sup>—"People of Manda"—and Manda is the name of Saturn.<sup>(24)</sup> The Phoenicians regarded El-Saturn as their chief deity; Eusebius informs us that El, a name used also in the Bible as a name for God, was the name of Saturn.<sup>(25)</sup> In Persia Saturn was known as Kevan or Kaivan.<sup>(26)</sup>

The different names for God in the Bible reflect the process of going through the many ages in which one planet superseded another and was again superseded by the next one in the celestial war. El was the name of Saturn; Adonis of the Syrians, the bewailed deity, was also, like Osiris, the planet Saturn; but in the period of the contest between the two major planets, Jupiter and Saturn, the appellation of the dual gods became Adonai, which means "my lords"; then, with the victory of Jupiter, it came to be applied to him alone.<sup>(27)</sup>

## References

1. *Naturales Quaestiones* VII. 4. 2. [An astrological treatise ascribed to Manetho states that "In the beginning Kronos the Titan ruled the entire ether; his star the far-seeing gods called 'the shining one.'" *Manethonis Apotelasmaticorum libri sex*, ed. C. A. M. Axinin and Fr. A. Rigler (Cologne, 1832), p. 64 (Bk. IV, lines 14-15). Cf. Proclus, *In Timaeo* (ed. E. Diehl, Leipzig, 1904), vol. III, p. 169.]
2. [Cf. Ovid, *Metamorphoses* I, transl. by M. Innes: "When Saturn was consigned to the darkness of Tartarus . . . the world passed under the rule of Jove." Tacitus refers to "a storm during which Saturn was forcibly expelled by Jupiter and ceased to rule." (*opus tempestate Saturnus vi Jovis pulsus cesserit regnis.* ) *The Histories* V. 2.]
3. [For a graphic description of some of the Egyptian rites, see Firmicus Maternus, *The Error of the Pagan Religions* transl. by C. Forbes (New York, 1970), pp. 44f.]
4. Plutarch, *De Iside et Ostride*.
5. Gardiner, *Egypt of the Pharaohs*, (Oxford University Press, 1961), p. 424.
6. [This view was held by Kurt Sethe. See *Urgeschichte und aelteste Religion der Aegypter* (Leipzig, 1930), p. 73, n. 3.]
7. *Ibid.*, p. 426. [The connection of Osiris with water or flood-water is frequently stressed both in native Egyptian sources and in reports by classical and early Christian authors. Plutarch (*De Iside*

- et Ostride 33, 364f) wrote that the Nile is the "moist principle and power," that the Nile is the "efflux of Osiris" (39, 366c; 32, 363d, 38, 366a) and that Osiris is Oceanus (34, 364d). Cf. Griffiths, *Plutarch's De Iside et Osiride*, pp. 36, 36f., 424. See also Origen, *Contra Celsum* 5:38; Hippolytus, (*Refutatio Omnium Haeresium* 5:7,23) reported that the Egyptians "say that Osiris is water." Cf. also Sallustius, *De diis et de mundo*, 4. Nock in his commentary to his edition of Sallustius (p. xlviii, n. 44) compared a first century Greek papyrus (P. Leiden J. 384, col. vii, 23) in which it is written "I am Osiris, who is called 'water.'" The drowning of Osiris, described by Plutarch, is attested in some of the earliest Egyptian hieroglyphic texts. See K. Sethe, *Die altagyptische Pyramidentexte* 24D, 615D, 766D; cf. idem, *Denkmal Memphitischer Theologie* 8, 10b, 19f., 62ff.; H. Gressmann, *Tod und Auferstehung des Osiris*, pp. 4, 11-12, 39].
8. [H. Brugsch, (*Astronomische und astrologische Inschriften altagyptischer Denkmäler* [Leipzig, 1883]) wrote of the identification of certain planets, among them that of Osiris, with the sun ("Die Planeten als Sonnen") and published an inscription he had copied at Philae: "es sind Sonnen, welche leuchten tagtäglich und welche strahlen in der Dämmerung, es sind (dies) der Saha-Stern der Seele des Osiris und der Sothis Stern."].
  9. Gardiner, "Was Osiris and Ancient King Subsequently Deified?" *The Journal of Egyptian Archaeology* 46 (1960), p. 104.
  10. J. Wilson, "Egyptian Culture and Religion" in *The Bible and the Ancient Near East, Essays in Honor of William Foxwell Albright* ed. by E. Wright (New York, 1961), p. 307.
  11. Ezekiel, ch. 8.
  12. S. Langdon, *Tammuz and Ishtar* (Oxford, 1914), pp. 9, 22, 84f.
  13. H. Gressman, *The Tower of Babel* (New York, 1928), p. 28; cf. Langdon, *Tammuz and Ishtar*, p. 13.
  14. Langdon, article "Tammuz" in *The Encyclopaedia Britannica, XIIIth Edition* See also idem, *Babylonian Liturgies* (Paris, 1913), p. 96.
  15. Langdon, *Tammuz and Ishtar*, p. 15. Langdon adds that "As Damu he [Tammuz] is called *bel girsu* (*ammun mersi*), 'lord of the flood.'" (*Ibid.*, p. 6 n.)
  16. Langdon, *Tammuz and Ishtar*, p. 15: "The shining ocean to thy perditions has taken thee. . . ." Cf. p. 21: "The shining crown from thy head is divested. . . ."
  17. E. F. Weidner, *Handbuch der babylonischen Astronomie* (Leipzig, 1915), p. 61; cf. A. Jeremias, *Handbuch der altorientalistischen Geisteskultur* (Leipzig, 1913), pp. 92, 137.
  18. Cf. C. Vellay, *Le Culte et les fetes d'Adonis-Thammuz, dans l'orient antique* (Paris, 1904); Sir James G. Frazer, *Adonis, Attis, Osiris*, Vols. I-II (London, 1922).
  19. Cf. W. Guthrie, *Orpheus and Greek Religion* (London, 1935).
  20. This was also recognized by Hugo Gressman ("Tod und Auferstehung des Osiris," *Das Alte Orient* [1923], p. 12.
  21. See especially the volume entitled *Adonis, Attis, Osiris*.
  22. [That Brahma is Saturn was understood by Velikovsky as long ago as the early 1940's though he did not publish the idea until 1974 in the text of his lecture before the American Association for the Advancement of Science Symposium. See *Pensée* VII (1974), p. 10 and *KRONOS* III.2 (1977), p. 6. The identification of Brahma with Saturn is evidenced by the fact that the god is assigned a celestial sphere (cf. *The Ramayana*, trans. by R. Griffith, Vol. 1 [London, 1870], Canto XLV, p. 208; cf. also *The Kalika Purana*, ch. xxv). A celestial sphere should probably be interpreted as an orbit. In the *Mahabharata* it is further said that "the high-souled Brahma [is] seated in the highest (abode)" (quoted in Shastri, *The Flood Legend*, p. 10). *The Bhavad-aranyaka Upanishad* places Brahma in the highest "world." In the cosmology of the *Yogabhasya* of Vyasa, the highest celestial sphere is that of Brahma. In the *Vishnu Purana* the Brahmaloaka, which is the heaven of Brahma, is the seventh and highest heaven. In some sources the Brahmaloaka is referred to as Satyaloka. Cf. Tacitus, *The Histories* V. 4: "In the highest orbit and exerting the greatest influence moves the star Saturn." Many years ago F. Wilford reported the opinion of certain learned Brahmans who told him that while Shiva shines in the planet Jupiter, "Saturn is directed by Brahma." ("On Egypt etc. from the Ancient Books of the Hindus," *Asiatic Researches* III (1799), p. 382). Cf. E. Moor, *The Hindu Pantheon* 1864), p. 218. I believe Wilford is the unacknowledged source of Moor's assertion that Brahma is Saturn. In China the planet Saturn was associated with the palace and with the Emperor. It was called "the planet of the Son of Heaven." (Sema Ts'ien, *Les memoires historiques*, ed. by E. Chavannes, vol. III, pt. 2, p. 367.].
  23. Cyril I. Gadd, *The Fall of Nineveh* (London, 1926); cf. D. J. Wiseman, *The Chronicles of the Chaldean Kings in the British Museum* (London, 1956).
  24. P. Jensen, *Die Kosmologie der Babylonier*, p. 114. Cf. *The Brihagatakam of Vahara Mihira*, transl. by Swami Vijnanananda (Allahabad, 1912), p. 38, n.2: "Saturn is Manda."
  25. *Præparatio Evangelica* IV.xvi: "Kronos [E] was deified in the star Saturn." This statement is quoted by Eusebius from Philo's redaction of the lost *Phoenician History* of Sanchuniathon. Some classical writers, among them Tacitus (*Historia* V.4) alleged that the Jews were worshippers of Saturn; cf. Augustine's refutation in *Contra Faustum Manichæum* XX. 13.
  26. *Dabistan* 31; Bundahis, E. West. P. Jensen, *Die Kosmologie der Babylonier*, p. 114.
  27. Origen, *Contra Celsum*, V. 41.



## Seventeen

In the story of the Universal Deluge it is said: "In the six hundredth year of Noah's life, in the second month, on the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened." <sup>[1]</sup> Five months later, according to the Book of Genesis, on the seventeenth day of the seventh month, the ark rested upon Ararat.

In Egyptian religious belief Osiris was drowned "on the seventeenth day of the month Athyr." <sup>[2]</sup> The fast for Tammuz, commemorating his descent into the netherworld, began on the seventeenth of the month named for him. <sup>[3]</sup> Although the similarity of the Babylonian and Biblical versions of the story of the Deluge was repeatedly stressed, the significance of the number seventeen in the story of Tammuz in relation to the same number in the book of Genesis was not emphasized, or even noticed.

The feast of Saturnalia began "always on the 17th of December" and with time, in imperial Rome, when it was celebrated for three consecutive days, it began on the fifteenth and continued for two more days, until the seventeenth. <sup>[4]</sup>

The connection between the number seventeen and the Deluge is thus not confined to the Biblical, Babylonian, and Egyptian sources—we meet it also in Roman beliefs and practices. The significance of the number seventeen in the mystery plays related to Osiris' drowning and in the festivities of Saturnalia is an indication that these memorials were related to the Deluge.

### References

1. Genesis 7:11.
2. Plutarch, *De Iside et Osiride*, ch. 13; cf. also ch. 42. [The coincidence of the Biblical date of the beginning of the Deluge with the date of Osiris' disappearance, or drowning, was noted by the eighteenth-century scholar Jacob Bryant, who claimed, in addition, that in both accounts the month was the second after the autumn equinox (*A New System or An Analysis of Ancient Mythology*, second edition [London, 1775], p. 334. Bryant also believed that "in this history of Osiris we have a memorial of the Patriarch and the Deluge" (*ibid.*, p. 334, n. 76). The identity of the two dates has been noted by several other authors, among them George St. Clair. See his *Creation Records Discovered in Egypt* (London, 1898), p. 437. On the significance of the date seventeen in Egypt, cf. Griffiths, *Plutarch's De Iside et Osiride*, p. 312. Cf. H. E. Winkler, "Origin of the Ancient Egyptian Calendar," *Proceedings of the American Philosophical Society* 83 (1940), p. 456 n.: "Throughout Coptic and Arab times at least, the night of June seventeenth was celebrated as "the night of the Drop" when it was believed that a miraculous drop fell into the Nile, causing it to rise."].
3. [According to Langdon, "In Babylonia the god Tammuz was said to have descended to the lower world on the 18th of Tammuz and to have risen on the 28th of Kislew (December)." (*Babylonian Menologies and the Semitic Calendars* [London, 1935], p. 121). Originally the date had been the seventeenth; but when "the reckoning of time was altered to the extent of making the day begin with sunrise instead of with the approach of night" (M. Jastrow, *The Religion of Babylonia and Assyria* [Boston, 1898], p. 78), the 18th day of the month began about twelve hours earlier and encroached upon the daylight hours of the seventeenth day, which were now counted as part of the eighteenth. According to rabbinical sources, the end of the 40 days of rain mentioned in the Genesis account came on the 27th of Kislew—the very same day as the 28th of Kislew in the Babylonian reckoning, when Tammuz is said to have risen.].
4. [Macrobius, *Saturnalia* 1. 10. 2f. Cf. Cicero, *Ad Atticum* 13. 52. 1.]



## Festivals of Light

The Deluge and the seven days of brilliant light immediately preceding it were a universal experience, and they left indelible memories. Many of the religious rites and observances of all creeds go back to these events of the past in which the celestial gods Saturn and Jupiter were the main participants. Among the most ancient of all such observances were festivals of light of seven days' duration, held in honor of Saturn. The "seven days of light" just before the Deluge overwhelmed the Earth are recreated in these feasts <sup>[1]</sup>

Herodotus describes a nocturnal light festival held each year at Sais in commemoration of Osiris' death and resurrection. It was called the Feast of Lamps:

There is one night on which the inhabitants all burn a multitude of lights in the open air round their houses. . . . These burn the whole night. . . . The Egyptians who are absent from the festival observe the night of the sacrifice, no less than the rest, by a general lighting of lamps; so that the illumination is not confined to the city of Sais, but extends over the whole of Egypt. <sup>[2]</sup>

In Rome the feast of light was named Saturnalia. According to tradition the Saturnalia had been established in honor of Saturn when, all of a sudden, after a lengthy and prosperous reign, "Saturn suddenly disappeared." <sup>[3]</sup> Macrobius wrote that in celebrating the Saturnalia the Romans used to honor the altars of Saturn with lighted candles . . . sending round wax tapers during the Saturnalia." <sup>[4]</sup> In his time the festival was celebrated for three consecutive days but, Macrobius wrote,

And yet in fact among the men of old there were some who supposed that the Saturnalia lasted for seven days . . . for Novius . . . says: 'Long-awaited they come, the seven days of Saturnalia'; and Mummius too . . . says: 'Of the many excellent institutions of our ancestors, this is the best — that they made the seven days of the Saturnalia begin when the weather is coldest.' <sup>[5]</sup>

Hannukah and Christmas are both feasts of light and, like the Saturnalia, both can be traced to the days of the Universal Deluge. The Hebrew tradition that Hannukah was established to commemorate the "miracle with the oil" that was found undepleted and sufficed for seven days, is a poor rationalization. A better ground for a re-establishment of a holiday, so similar to the Saturnalia, in Judea, was in the fact that in the middle of the second century before the present era Rome conquered Greece, and about the same time in the rebellion of the Hashimansaim (better known by the name of one of the sons, Judah Maccab) against Hellenistic rule, the people of Palestine were drawing near the Roman world with its usages. It appears that the Romans fomented the revolt in the Hellenized provinces at the time of their conquest of Greece. Thus the feast of Hannukah seems to be an adaptation of the Roman Saturnalia. <sup>[6]</sup>

The observation of this festival was later taken over by the festival of Christmas, which was originally observed for seven days, from the 25th of December until the first of the New Year.

### References

- <sup>[1]</sup> [The earliest of the festivals of this type that we know of was the yearly seven-day-long celebration commemorating the inauguration of the temple of Ningirsu in Babylonia in the time of Gudea (before ca. 2000 B.C.). For this and other similar festivals, see P. Bouhoulis, *Ancient Festivals of "Saturnalia"-Type* (Salonica, 1964). Ningirsu was "he who changed darkness into light," the same as Ninib, or Saturn (M. Jastrow, *Die Religion Babyloniens und Assyriens*, ch. IV, pp. 56ff). In Athens the feast in honor of Saturn was called the *Kronia*. See H. W. Parke, *Festivals of the Athenians* (London, 1977), pp. 29-30. It would appear that the main idea behind the Saturnalia-type festivals, so widespread in antiquity, was a re-enactment of the conditions that existed during the Golden Age when Saturn reigned. The celebration of the Roman Saturnalia, which, according to Macrobius, pre-dates the founding of Rome by many centuries (VII. ??), was marked by a reversal of social relations, the release of the statue of Saturn that stood in the Forum from its bonds (Macrobius, *Saturnalia* VII. ??), the crowning of a mock-king (apparently representing Saturn) whose every command had to be strictly obeyed (Tacitus, *Annales* 13, 15; Epictetus, *D.* I. 25, 8; Lucian, *Saturn.* 2, 4, 9), and who was later sacrificed on the altar of Saturn. Some details of such a sacrifice are given in *Acto Sancti Dasii*, ed. by F. Cumont in *Analecta Bollandiana* XVI (1897). See also Cumont, "Le roi des saturnales," *Revue de Philologie* XXI (1897), pp. 143-153. Porphyry reports the existence of a similar festival on Rhodes during which a man was sacrificed to Kronos (*De Abstinentia* II, 54). A similar Persian festival was the Sacaia (Dio Chrysostom, *Orationes* IV, 66). A possible parallel in Mexico may be the festival Atemoztli, "Coming Down of the Waters," described in a manuscript reproduced in Kingsborough, *The Antiquities of Mexico*: "On the XXI of December they celebrate the festival of that god who, they say, was the one that uncovered the earth when it was annihilated by the waters of the Deluge." ].
- <sup>[2]</sup> Herodotus II, 62, transl. by George Rawlinson. Cf. J. G. Frazer, *Adonis, Attis, Osiris*, second edition (London, 1907), pp. 300f.
- <sup>[3]</sup> Macrobius, *Saturnalia* I. 7. 24: subito non comparuisset. [It was then, according to Macrobius, that Italy came to be called Saturnia in honor of the planet. Cf. Dionysius of Halicarnassus, *Antiquitates Romanorum* I. 6; Ovid, *Fasts*, VI. 1. 31.]
- <sup>[4]</sup> (*Saturnalia* I. 7. 31-32, transl. by P. Davies, 1969). Macrobius noted also the opinion of those who "think that the practice is derived simply from the fact that it was in the reign of Saturn that we made our way, as thou to the light, from a rade and gloomy existence to a knowledge of the liberal arts." [Cf. above, "Tammuz and Osiris," n. 9 on the Egyptian light festival in honor of Osiris.]
- <sup>[5]</sup> *Saturnalia* X.
- <sup>[6]</sup> Similarly, the way of praying with covered head appears to be a taking over of the Roman usage—the Greek custom was to pray with an uncovered head.





## Saturn and Jupiter

The history of this pair, the ancient Kronos and Zeus, or Saturn and Jupiter, as reflected in many traditions all around the world, tells a story that has nothing in it resembling the sedate and uneventful circling of these bodies on their orbits that modern astronomy asserts as a fact.

Saturn and Jupiter are very much like the sun; were they not planets, they would be considered stars, like our sun.<sup>[1]</sup> Jupiter is nearly 330 times more massive than the Earth, and Saturn 80 times. Both planets are covered with gases which are in constant motion, like the gaseous atmosphere of the sun. The sun has nine satellites and numerous asteroids and comets; Jupiter has at least fourteen satellites and several asteroids and comets. Saturn has ten known satellites; and four or five comets constitute the Saturnian family (though these comets do not circle around Saturn itself, they are commonly regarded as related to the orbit of Saturn).

Were Jupiter and Saturn free from the bonds of the sun, they could be considered as stars or suns. Were two such stars set in space close to one another, they would constitute a double-star system, both stars circling around a common focus.

As told, the picture that emerges from comparative folklore and mythology presents Saturn and Jupiter in vigorous interactions. Suppose that these two bodies approached each other rather closely at one time, causing violent perturbations and huge tidal effects in each other's atmospheres. Their mutual disturbance led to a stellar explosion, or nova. As we have seen, a nova is thought to result from an instability in a star, generated by a sudden influx of matter, usually derived from its companion in a binary system. If what we call today Jupiter and Saturn are the products of such a sequence of events, their appearance and respective masses must formerly have been quite different.<sup>[2]</sup>

A scenario such as this would explain the prominence of Saturn prior to its cataclysmic disruption and dismemberment—it must have been a larger body than it is now, possibly of the volume of Jupiter. Interestingly, for certain reasons G. Kuiper assumed that Saturn originally was of a mass equal to that of Jupiter.<sup>[3]</sup> At some point during a close approach to Jupiter, Saturn became unstable; and, as a result of the influx of extraneous material, it exploded, flaring as a nova which, after subsiding, left a remnant that the ancients still recognized as Saturn, even though it was but a fraction of the celestial body of earlier days. In Saturn's explosion much of the matter absorbed earlier was thrown off into space. Saturn was greatly reduced in size and removed to a distant orbit—the binary system was broken up and Jupiter took over the dominant position in the sky. The ancient Greeks saw this as Zeus, victorious over his father, forcing him to release the children he earlier had swallowed and banishing him to the outer reaches of the sky. In Egyptian eyes it was Horus-Jupiter assuming royal power, leaving Osiris to reign over the kingdom of the dead.

If the descriptions of Saturn as a "sun" mean anything, Saturn must have been visible, in the time before its explosion, as a large disk. If this was the case the increased distance between the Earth and Saturn could have been the result of the removal of the Earth from its place or of Saturn from its place, or both. Saturn could be removed only by the planet Jupiter, the sole member of the planetary family more powerful than Saturn. And indeed, the myth says that Saturn was removed by Jupiter.

### References

- [1] In *Worlds in Collision* Velikovsky wrote of events that may theoretically take place in the future: "Some dark star, like Jupiter or Saturn, may be in the path of the sun, and may be attracted to the solar system and cause havoc in it." (Emphasis added). While in 1950 both planets were assumed by astronomers to be covered by thick layers of ice, they are now known to be star-like in their composition and thermal properties. In the case of Saturn, H. Spencer Jones (*Life on Other Worlds* [Macmillan Company: New York, 1940], ch. 6) argued that Saturn must be coated with water ice or frozen ammonia. Spencer-Jones' book was published in the same year in which Velikovsky drew very different conclusions about Saturn's thermal history and structure. The astronomers' conjecture was based on a simple calculation of the amount of heat reaching the planet: Saturn, being almost ten times farther away from the Sun than the Earth had to have a mean temperature in the neighborhood of -155 degrees Celsius. The reasons why Velikovsky concluded that Saturn's temperature must be considerably higher than the accepted estimate were, first, in "the residual heat of the catastrophe in which Saturn was derailed from its orbit" and, second, "the radioactivity that resulted from the catastrophe must still be pronounced on Saturn." (From the unpublished manuscript, *The Test of Time*). On top of all this, "based on its past history, Saturn can be regarded as a star and may have some of the mechanism that makes our sun burn with intense light."

In 1966 Kellerman described his observations and measurements at a wavelength of 21.3 cm, which showed a temperature of 90 degrees Fahrenheit for the inner atmospheric layers. (*Icarus*) Revised textbooks, taking account of the findings, began to speak of "room temperature" on Saturn, recorded in the 21-centimeter band. (E.g., Fred Whipple, *Earth, Moon and Planets* third revised edition [Cambridge, Mass., 1968], p. 187). By 1972 measurements at radio wavelengths of 50 and 100 centimeters found "unusually high" temperatures—about 240 degrees F. and 520 degrees F. respectively. "Thus it appears that Saturn, like Jupiter, is not the entirely frozen wasteland it was once thought to be." (D. McNally, "Are the Jovian Planets 'Failed' Stars?" *Nature* 244 [August, 1973], pp. 424-426).

Soon it was realized that Saturn must have an internal energy source, and is in fact more like a star than like a planet, though it is not considered sufficiently massive to function as a true star. (*Science News* 101 [1972], p. 312. The article compares the view expressed only a few years previously by C. Sagan that Saturn could not be an abode of life because of atmospheric temperatures several hundred degrees below zero Fahrenheit. Cf. *Intelligent Life in the Universe*).

Measurements in the far-infrared and submillimeter ranges, published in 1977, indicate that the internal energy source on Saturn lies "within the range of 2.3 to 3.2 times the absorbed solar flux." (R. F. Loewenstein et al., "Far Infrared and Submillimeter Observations of the Planets," *Icarus* 31 [1977], p. 315. Cf. *The Astrophysical Journal* 157, pp. 1698). In other words, Saturn gives off up to about three times the amount of energy it receives from the Sun.

At the beginning of 1980 analysis of measurements taken by Pioneer 11 during its flight past Saturn showed that the interior of the planet has a temperature exceeding 10,000 degrees Kelvin, which is considerably hotter than the surface of the Sun (less than 6,000 degrees Kelvin).
- A hypothesis that the protoplanet masses of Jupiter and Saturn were nearly the same was advanced by G. Kuiper. See *Sky and Telescope*, (March, 1959), p. 259.
- Sky and Telescope* (March, 1959), p. 259.



## The Rings of Saturn

One instance of the Saturn myth can be verified with the help of a small telescope: Saturn is in chains. Instead of solving anything, this fact presents a new problem that demands a solution. How did the ancient Greeks and Romans know that Saturn is encircled by rings?<sup>[1]</sup> It is strange

was this question was not asked before (4) the existence of these rings around Saturn became known in modern times only in the seventeenth century, after the telescope was invented. They were first seen, but misunderstood, by Galileo (5) and understood by Huygens (6)

If the myth did not by mere chance invent these rings, the Greeks must have seen them. The last case could be true if the Greeks or some other oriental people possessed lenses adapted for the observation of celestial bodies, or if the rings around Saturn were visible to the naked eye at some time in the past—today they are not visible without magnifying instruments. There are cases of exact observations by the Chaldeans which suggest the use of some accurate technical means (7) These means could consist of a sort of astrolabe like that of Tyche de Brahe who made most accurate observations of celestial bodies without the help of a telescope; also Copernicus, prior to Tyche de Brahe, made all his calculations of the movements of the planets before the telescope was invented. But neither Tycho de Brahe nor Copernicus saw the rings.

The statue of Saturn on the Roman capitol had bands around its feet (8) and Macrobius in the fifth century of our era, already ignorant of the meaning of these bands, asked: "But why is the god Saturn in chains?"

In the Egyptian legend Isis (Jupiter) swathes Osiris (Saturn). The Egyptian appellation for Osiris was "the swathed." (9)

In the *Zend-Avesta* it is said that the star Tistrya (Jupiter, later Venus) keeps Pairiko in twofold bonds (9) Saturn is encircled by two groups of rings—one larger and one smaller, with a space in between. To see this a better telescope than that used by Galilei or that used by Huygens is needed: the twofold structure of the girdle was first observed in 1675 (9)

The rings of Saturn were known also to the aborigines of America before Columbus discovered the land; this means also before the telescope was invented at the beginning of the seventeenth century. An ancient engraved wooden panel from Mexico shows the family of the planets: one of them is Saturn, easily recognizable by its rings (10)

Nor were the Maoris of New Zealand ignorant of them: "One of the great mysteries connected with Saturn is the still unanswered question of how the ancient Maoris of New Zealand knew about her rings—for there is evidence that they did have a Saturnian ring legend long before the days of Galileo." (11)

In the myth it is said that Jupiter drove Saturn away and that on this occasion Saturn was put in chains. If these words mean what they say and are not a meaningless portion of the myth—in a dream, at least, there are no meaningless parts—then the knowledge of the ancients about the rings of Saturn could have been acquired because of better visibility; in other words, at some time in the past Saturn and Earth appear to have been closer to one another.

Originally I assumed that the rings of Saturn may consist of water in the form of ice, but since the ancient lore all around the world tells that it was Jupiter that put these rings around Saturn (12) I considered that they might have some other components, too. Since the 1960's spectroscopic study of the Saturnian rings has confirmed that they consist most probably of water in the form of ice (13)

#### References

- [The rings of Saturn are referred to by Aeschylus, *Eumenides* 641: "He [Zeus] himself cast into bonds his aged father Cronus"; cf. Lucian, *Astrology*, 21: "Moreover, it is not true, neither, that Saturn is in chains." Neoplatonists like Proclus *In Timaeo*, tr. by Festugiere, vol. III, p. 255 and n. 4; *In Cratylus* 209-30) and Porphyry (*De Astro Nympharum* 67-21ff.) sought a philosophical or mystical meaning in the tradition. Cf. also Clemens Alexandrinus, *Homilia*, VI. xiii in *Patrologiae Cursus Completus*, Series Graeca, J.-P. Migne ed., vol. II.207; Dio Chrysostom, *Fourteenth Discourse* 21ff: "And yet the King of the Gods, the first and eldest one, is in bonds, they say, if we are to believe Hesiod and Homer and the other wise men who tell this tale about Cronus." Cf. Hesiod, *Works and Days*, 169ff. Augustine, refuting those who asserted that the Jewish Sabbath was held in honor of Saturn, wrote: "ita patres nostri longe fuerunt a Saturniaci catenis, quamvis pro tempore prophetae sabbati vacationem observaverint." (*Contra Faustum Manichaeum* XX. 13. in Migne ed., *Patrologiae Cursus Completus*, Series Latina, Vol. XLII, p. 379). Cf. also Amobius, *Contra Gentes* IV, 24 in *ibid.*, vol. III: "Numquid paricidi causa vincunt esse Saturnum, et suis diebus tantum vincularum ponderibus revelari?" and Minucius Felix, *Octavius* XXI in *ibid.*, vol. III, col. 304: "Quid formae ipsae et habitus? . . . Saturnus compeditis." An epigram of Martial (III, 29) refers to the bonds of Saturn, comparing them to rings: "Hae cum gemina compe dedicat catenas, Saturne, tibi Zeulus amulos priores." "These chains with their double letter Zeulus dedicated to you, Saturnus. They were formerly his rings."—transl. by W. Kerr (London, 1919). The shrines to Saturn in Roman Africa portrayed the god with his head surrounded "by a veil that falls on each of his shoulders," in a way reminiscent of the planet's rings. See J. Toutain, *De Saturni Dei in Africa Romana Cultu* (Paris, 1894), p. 42 and figs. 1 and 2.]
- [But cf. Th. Taylor in *The Classical Journal* 40 (1819), pp. 324-326, and A. de Grazia, "Ancient Knowledge of Jupiter's Bands and Saturn's Rings," *KRONOS* 13.3 (1977), pp. 65-6.]
- [When Galileo first saw the rings in July of 1610, he thought them to be two satellites on either side of Saturn, and this is what he also announced in his *Siderius Nuntius*. Cf. A. Alexander, *The Planet Saturn*, (1962), pp. 84ff.]
- [Chr. Huygens, *Systema Saturnium* (1659); Cf. Alexander, *The Planet Saturn*, loc. cit.]
- P. Jensen, *Die Kosmologie der Babylonier*, p.
- Macrobius, *The Saturnalia*, 1.8.5, transl. by P. V. Davies (New York, 1969): " Saturn, too, is represented with his feet bound together, and, although Verrius Flaccus says that he does not know the reason. . . Apollodorus says that throughout the year Saturn is bound with a bond of wool but is set free on the day of his festival." Cf. *ibid.*, 1.8.1.
- See below, section "Tammuz and Osiris". Cf. A. S. Yahuda, "The Osiris Cult and the Designation of Osiris Idols in the Bible," *Journal of Near Eastern Studies* III (1944), pp. 194-197.
- The Zend-Avesta* xvi, transl. by J. Darmesteter (1883), p. 107. [The text of the *Zend-Avesta* reads: "Tistrya, bright star, keeps Pairiko in twofold bonds, in threefold bonds." A third ring around Saturn was observed in 1980. Velikovskiy also thought that Mithic representations of Kronos with his body encircled by a snake (cf. F. Cumont, *The Mysteries of Mithra* (1903), figs 21-23) may attest to a memory of the rings of Saturn. Cf. the Hindu Sani (the planet Saturn) shown in an ancient woodcut reproduced in F. Maurice, *Indian Antiquities* (London, 1800), vol. VII, and described by the author as "encircled with a ring formed of serpents." Tammuz, who represented the planet Saturn in Babylonia (E. Weidner, *Handbuch der Babylonisches Astronomie* (Leipzig, 1915), p. 61) was called "he who is bound." See also Thorikild Jacobsen, *Toward the Image of Tammuz* (Harvard University Press, 1970), p. 85; and A. E. Tcherns, *Astrology in Mesopotamian Culture* (Leiden, 1935). Nimib, who was also Saturn, was said to hold "the unbreakable bond" or "der mächtigen Schlange"—Jastrow, *Die Religion Babyloniers und Assyriens*, ch. xvii, p. 463.]
- The observation was made by G. D. Cassini.
- Kingsborough, *Antiquities of Mexico* (London, 1830), vol. IV, the fourth plate from the end of the volume. See fig.
- Guy Murchie, *Muse of the Spheres* (Boston, 1961), p. 94. [A useful discussion of Maori astronomical ideas is provided in a

monograph by E. Oles, *The Astronomical Knowledge of the Maori, Genuine and Empirical*, New Zealand Dominion Museum Monograph no. 3 (Wellington, 1922), p. 35:

PAREARAU represents one of the planets. Stowell says that it is Saturn; that Parearau is a descriptive name for that planet, and describes its appearance, surrounded by a ring. The word *pare* denotes a fillet or headband; *arau* means "entangled"—or perhaps "surrounded" in this case, if the natives really can see the *pare* of Saturn with the naked eye. If so, then the name seems a suitable one. . . . Of the origin of this name one says, "Her band quite surrounds her, hence she is called Parearau." [

- [Regarding the process of formation of Saturn's rings, Velikovsky thought that it might have been analogous to the formation of a disc-like ring of gaseous material around some stars in binary systems, as described by H. Friedman in *Science* 181, (Aug. 3, 1973), p. 396: "The gas enters into Keplerian orbits and accumulates in a disc somewhat resembling Saturn's rings. . . ."]
- In August 1965 Tobias Owen, writing in *Science*, (p. 975) reported that "the reflection spectrum from the ice block gave best match to the absorption observed in Saturn's ring"—but that "the most likely alternatives" would be "ices of methane and ammonia"—both known ingredients of the Jovian atmosphere, methane being also in the composition of the Saturnian cloud envelope. See also Appendix 26, [As early as 1947 Kuiper (*The Atmospheres of the Earth and Planets* [1949]), concluded on the basis of spectral measurements in the infrared that "the rings are covered by frost, if not composed of ice." (E. A. Cook *et al.*, "Saturn's Rings—A Survey," *Icarus* 18 (1973), p. 317; "Although frozen H<sub>2</sub>O is a major constituent, the spectral reflectivity indicates the presence of other materials."].



## Saturn's Golden Age

The age that man later called the Age of Kronos (Saturn) was remembered with nostalgia as an age of bliss. References to the Age of Kronos in the ancient lore are very numerous.<sup>[1]</sup>

Hesiod tells of

A golden race of mortal men who lived in the time of Kronos when he was reigning in heaven. And they lived like gods without sorrow of heart, remote and free from toil; miserable age rested not on them. The fruitful earth unforced bare them fruit abundantly and without stint. They dwelt in ease and peace upon their lands with many good things. . . .<sup>[2]</sup>

Similarly writes Ovid in the sixth book of his *Metamorphoses*:

In the beginning was the Golden Age, when men of their own accord, without threat of punishment, without laws, maintained good faith and did what was right. . . . The earth itself, without compulsion, untouched by the hoe, unfurrowed by any share, produced all things spontaneously. . . . It was a season of everlasting spring.<sup>[3]</sup>

Rabbinical sources recount that men lived under very favorable conditions before the Deluge, and that these contributed to their sinfulness: "They knew neither toil nor care and as a consequence of their extraordinary prosperity they grew insolent."<sup>[4]</sup>

The dominance of Saturn at some remote period in the history of the life of the peoples on Earth was of such pronounced and all-pervading character that the question arises whether the adventures of the planet going through many exploits could by itself be the full cause of the worship of the planet and the naming of the Golden Age "the Age of Kronos" (Saturn). Saturn exploded and caused the Earth to go through the greatest of its historical catastrophes, and this was completely sufficient to make of Saturn the supreme deity; but it appears that the Age of Saturn is a name for the epoch *before* the Deluge; after the Deluge Saturn, dismembered, almost ceased to exist as a planetary body and when at length it was reconstituted it was fettered by rings, and was far from being the dominant celestial body that would behoove it as the supreme deity of the epoch. The "Age of Kronos" is so glorious an age that it is hardly thinkable to connect it with the period after the Deluge. The wailing for Adonis, Tammuz of the Babylonians, or Osiris of the Egyptians, deplored the end of its dominance, *not* the beginning of it.

Then why was Saturn the supreme deity by whose name the great and glorious age *before* the Deluge was named? Because it removed Uranus from its role of chief deity, and to the onlookers on Earth, emasculated him? If the distances between the Earth and Saturn and Uranus were then what they are now, then such occurrences could scarcely be observable: Uranus is only faintly visible in the night sky over Mesopotamia in a most translucent night. Saturn is clearly visible but is not, for an unaided eye, a spectacle in the sky; it was more voluminous and more luminous before the Deluge, but if it moved on an orbit not too different from the present one, and the Earth were moving approximately in the same quarters where it moves today, then the surprise still persists as to how a body on a 30-years-long orbit could make the inhabitants of the Earth on its one-year-long orbit, regard it the supreme of all celestial bodies in the sky.

The appellation "sun" employed for Saturn could be explained by its unusual brightness when it exploded as a nova for a short time, actually for seven days, before the beginning of the Deluge on Earth. Assuming the length of the day in those times to have been not too dissimilar from its present value, the velocity of the moving masses being on the order of 100 kilometers a second or 8,600,000 kilometers in a 24-hour period, and the Earth and Saturn being on the closest points on their reciprocal orbits, or in conjunction (which is another surmise), in seven days a distance of ca. 60 million kilometers would be covered. On present orbits the distance between Saturn and Earth varies from 1,279 million kilometers at superior conjunction to 1,578 million kilometers at opposition; the lesser of these distances is ca. 21 times greater than that above calculated. This means also that unless the velocity of the ejected water was an order of magnitude greater than 100 km per second, the distance between Saturn and Earth must have been substantially smaller than it is at present.

I have rather arbitrarily selected the figure of 100 kilometers a second for the motion of the exploded material; today the escape velocity, or the speed required for a projectile on the surface of Saturn to leave the gravitational attraction of the planet is but 35 kilometers a second. For Jupiter the escape velocity is 59 kilometers a second. Assuming that Saturn was of a mass equal to that of Jupiter, the same figure would apply to it too. With 100 kilometers a second we have almost double the velocity of escape. The arbitrariness of the assumption of such velocity for our calculations is obvious. But if the set of figures is not too far from what they actually were, the conclusion would be that the distance of the Earth from Saturn was but a twentieth part of what it is now; this would permit us to speculate whether the Earth could at some early period have been a satellite of Saturn. The distance 60 million km is commensurate with the distance of Mercury from the Sun, or 58 million km; Jupiter's satellites revolve at distances up to 24 million km from the primary. Theoretically Saturn could have satellites as large as the Earth; the Moon is only one-fortieth of the Earth in volume, whereas Saturn is 760 times larger than our planet.<sup>[5]</sup>

If such was ever the case, the "Age of Saturn" and the very unusual conditions under which mankind lived in it, and Saturn's worship prior to the Deluge, would gain in meaning. The appellation "sun" used for Saturn would be understood as resulting not only from the great light it emitted for a short period when a nova, but also from its long-standing role of a primary for the revolving Earth.

If there is truth in the surmise, and nothing more it is than a surmise, that

the Earth was once a satellite of Saturn, the latter must have revolved closer to the sun in order that the Earth should receive heat from it—Saturn exudes little heat—and if the age of Kronos was a golden age, then it is also proper to assume that the conditions on the satellite Earth were not unfavorable for life. The geological record documents extreme climates for the past of the Earth—times when corals grew in the Arctic, and times when the Earth, partly even on the equator, was fettered by ice. Such climates require definitely abnormal conditions that could be created only by varying positions of our planet as an astronomical body. Therefore surmises as made in this section are not in conflict with geological and paleo-climatological records—yet it is not what could have taken place, but what took place, or the historical record, that is the proper goal for inquest. In the absence of direct indications we may only deal with the problem of the Earth as a satellite of Saturn as with a hypothetical construction, requiring further elucidation.

It is assumed by modern astronomy that the ninth planet, Pluto, was once a satellite of Neptune, which, having collided with Triton, another satellite of the planet, was thrown out of the ring and became an independent planet, the satellite Triton, however, as a consequence of the collision, reversed the direction of its revolution and became a retrograde satellite.<sup>[2]</sup> Another instance of a postulated conversion of a planetary satellite into an independent planet is discussed by Van Flandern and Harrington in their paper "A Dynamical Investigation of the Conjecture that Mercury is an Escaped Satellite of Venus," *Icarus* 28 (1976), pp. 435-440.]. Thus the principle of a conversion of a satellite into a planet in its own right is not a phenomenon that is discussed here for the first time.

The Golden Age of Saturn or Kronos came to its end with the supreme god of that period, the planet Saturn, was broken up. The Age of Kronos was not the earliest age of which man retained some, however dim, memories—but farther into the past the dimness amounts almost to darkness.<sup>[3]</sup>

#### References

- [On Kronos' golden age see Plato, *The Statesman*, cf. P. Vidal-Naquet, "Plato's Myth of the Statesman, the Ambiguities of the Golden Age and of History," *Journal of Hellenic Studies* 98 (1978), pp. 132-141. Cf. Porphyry, *De Abstinentia* IV. 2; Teleclides, quoted in Athenaeus, *Deipnosophistae* VI. According to Macrobius, in the reign of Saturn there was no distinction between freedom and slavery (*Saturnalia* I. 7. 26) and all wealth was held in common (I. 84). Cf. Pompeius Trogus in Justin, bk. 43: "Saturn is said to have been so just that no one under him was a servant, nor did anyone have any private possessions, but all things were held in common and undivided, as if the inheritance of one belonged to all." On Saturn's reign in Italy, see Dionysius of Halicarnassus, *Antiquitates Romanorum* I. 36. 1; Vergil, *Fourth Eclogue* also, *The Aeneid* 11. 252 Silius Italicus 3. 84; 13. 63; 17. 380. Martial, *Epigrams* 63. Macrobius, *Saturnalia* VII. 26.]
- Hesiod, *Works and Days*, transl. by Evelyn-White, 110.
- Ovid, *Metamorphoses* Book I, tr. by Innes.
- Ginzberg, *Legends*, I.
- [The proportion of the Earth's mass to that of Saturn is 1:90.]
- [Analysis of the data collected by Pioneer 11 has led to an estimate of a temperature of ca. 10,000 degrees Kelvin in the interior of Saturn. There appears to be some net outflow of heat at the top of the atmosphere.]
- [R. A. Lyttleton, "On the Possible Results of an Encounter of Pluto with the Neptunian System," *Monthly Notices of the Royal Astronomical Society* 97, p. 108. Cf. the criticism of Lyttleton's suggestion of R. S. Harrington and T. C. van flandern in "The Satellites of Neptune and the Origin of Pluto," *Icarus* reprinted in *KRONOS* V. 2. (1979), p. 76. The alternative postulated by the authors involves a near-encounter between Neptune and a hypothetical planet of two to five Earth masses. The authors' suggestion that Pluto's newly-discovered moon may once also have been an independent satellite of Neptune could help solve the question of the origin of the Earth's companion.]
- [Similar traditions of a golden age existed among the Sumerians (S. N. Kramer, "Sumerian Myths and Epic Tales" in J. Pritchard ed., *Ancient Near Eastern Texts Relating to the Old Testament* [Princeton, 1950], pp. 37ff.), ancient Egyptians (F. Lenormant, *Les Origines de l'histoire* [Paris, 1880], vol. I, p. 58), Hindus (*The Laws of Manu*) and Chinese (*Les Mémoires historiques de Se-ma Ts'ien*, transl. by E. Chavannes [Paris, 18xx], vol. I, pp. 17ff.) among others.]



## Rainbow

After the Deluge the hope grew into faith that no such or similar destruction would again come to decimate mankind. The story is told that the Lord made a covenant with Noah, and the following were the terms of the covenant:

Then God said to Noah. . . . "I establish my covenant with you, that never again shall all flesh be cut off by the waters of a flood, and never again shall there be a flood to destroy the earth."<sup>(1)</sup>

As a visible sign of the obligation not to repeat the catastrophe, a colorful rainbow appeared for the first time after the Deluge—it was a new and till then unknown atmospheric phenomenon. In this colored refraction of sunlight in small and suspended drops of water the rescued believed to see the divine promise not to repeat the flood:

And God said, "This is the sign of the covenant which I make between me and you and every living creature that is with you, for all future generations: I set my bow in the cloud, and it shall be a sign of the covenant between me and the earth. When I bring the clouds over the earth and the bow is seen in the clouds, I will remember my covenant."<sup>(2)</sup>

The covenant, according to the moral conception of the Hebrews, was a reciprocal deed. It was kept only in its promise not to bring a paramount flood upon the Earth: the Earth and man continued to be shaped and reshaped in further catastrophes before the close of the age of creation that is the theme of the Book of Genesis.

### References

1. Genesis IX. 8-11.
2. Genesis IX. 12-15. [According to Genesis II. 5-6 no rain fell on the newly created earth, which was watered only by a mist ascending from the ground and falling as dew. If this phenomenon persisted until the Deluge this would explain the novelty of the rainbow after the catastrophe. Pedro Sarmiento de Gamboa, the Spanish conquistador who traveled in the Andes in the sixteenth century, recorded in his *Historia de los Incas* a tale about Manco Capac, the first Inca, which has a curious resemblance to the Biblical story. Emerging from a cave after the re-appearance of the sun, Manco Capac and his brothers "arrived at the mountain which is two leagues, approximately, from the town of Cuzco, and climbing to the top, they saw in it the rainbow, which the natives call *guanacuari*. And, interpreting it as a favorable omen, Manco Capac said: "Consider this a sign that the world will not again be destroyed by water" (*Tened aquella por señal que no sera el mundo mas destruido por agua!*" Chapter 12). The rainbow was depicted on the altar of the Coricancha in the temple of Viracocha in Cuzco. See R. T. Zuidema, "La Imagen del Sol y la Huaca de Suisurpaquio en el Sistema Astronomico de los Incas en el Cuzco," *Journal de la Societe de Americanistes* LXIII (1974-76), p. 218. If, as Dwardu Cardona has suggested, the reference to the rainbow in this passage is to the rings of Saturn—a suggestion with which I tend to concur—the "hoedage" of Saturn in its rings may have been regarded as a guarantee of its future behavior.]



## The Confusion of Languages

The sequence of events as presented in the Book of Genesis places the catastrophe of Babel next after the Deluge.

And the whole land was of one language and of one speech. . . . And they said, Go to, let us build us a city and a tower whose top may reach into heaven. . . . And the Lord said, behold, the people is one, and they have all one language. . . . Go to, let us go down, and there confound their language that they may not understand one another's speech. So the Lord scattered them abroad from thence upon the face of all the earth.<sup>(1)</sup>

The rabbinical sources explain that the purpose of the Tower was to secure a shelter for the city of Babel in case the Deluge should occur another time:

The men who were before us God has destroyed with a deluge; if he shall again think fit to be wroth with us, and seek to destroy us even with a deluge, we shall all perish to a man. But come, let us prepare bricks and burn them with fire, that they may withstand the waters and building them together with asphalt, let us make a high tower the top of which shall reach to heaven, in order that being delivered from the deluge we may find safety in the tower.<sup>(2)</sup>

This purpose of the builders is found also in an account of this catastrophe which the aborigines of Central America transmitted from generation to generation. Itzilkochitl, after narrating the story of the Deluge which brought to a close the first world age, Atonatuh, and destroyed most of mankind, described the catastrophe which ended the second age or Ehecatonatih—"the sun of wind."

And as men were thereafter multiplying they constructed a very high and strong *Zacullitl*, which means "a very high tower" in order to protect themselves when again the second world should be destroyed. At the crucial moment their languages were changed, and as they did not understand one another, they went into different parts of the world.<sup>(3)</sup>

The same author also gives another version of the same catastrophe:

When 1715 years had passed since the Deluge [men] were destroyed by a violent hurricane (Uncañ) which carried off trees, mountains, houses and people, and great buildings, although many men and women escaped, especially those that were able to take refuge in caves and places where this great hurricane could not reach.<sup>(4)</sup>

Similarly wrote Gomara (ca. 1510-1560): "The wind which occurred at that time was so great and of such force that it overthrew all buildings and trees, and even broke mountains apart."<sup>(5)</sup>

Many of the sources which recount the destruction of the Tower of Babel maintain, in close accord with the Mexican account, that the catastrophe was caused by a violent wind. Thus the Sibyl is said to have prophesied:

When are fulfilled the threats of the great God With which he threatened men, when formerly In the Assyrian land they built a tower, And all were of one speech, and wished to rise Even till they climbed unto the stary heaven. Then the Immortal raised a mighty wind And laid upon them strong necessity; For when the wind threw down the mighty tower, Then rose among mankind fierce strife and hate. One speech was changed into many dialects, And earth was filled with divers tribes and kings.<sup>(6)</sup>

In the *Book of Jubilees* it is said that "the Lord sent a mighty wind against the tower and overthrew it upon the earth."<sup>(7)</sup>

The Babylonian account, as transmitted by Abydenus, tells that once men "built a high tower where now is Babylon, and when it was already close to heaven, the gods sent winds and ruined the entire scheme. . . . and men, having till then been all of the same speech, received [now] from the gods many languages."<sup>8</sup>

Other accounts give the impression that a strong electrical discharge—possibly from an overcharged ionosphere—formed a contact body in the high structure. According to a tradition known to the twelfth century traveler Benjamin of Tudela, "fire from heaven fell in the midst of the tower and broke it asunder."<sup>9</sup> In the Tractate Sanhedrin of the Babylonian *Talmud* it is said: "A third of the tower was burnt, a third sank [into the earth] and a third is still standing."<sup>10</sup>

The Tower of Babel story was found in the most remote parts of the world prior to the arrival of missionaries in those places, thus before the Biblical account became known to the aborigines.

For instance, on the island of Hao, part of the Puamotu (or Tuamotu) islands in Polynesia, the people used to tell that after a great flood the sons of Rata, who survived, made an attempt to erect a building by which they could reach the sky and see the creator god Vatea (or Atea). "But the god in anger chased the builders away, broke down the building, and changed their language, so that they spoke divers tongues."<sup>11</sup>

The question of Biblical influence was discussed by the folklorist: "They [the natives of Hao] declared that this tradition existed already with their ancestors, before the arrival of the Europeans. I leave to them the responsibility for this declaration. All I can certify is that this tradition contains many ancient words which today are no longer understood by the natives."<sup>12</sup>

*Papud Vih*, the sacred book of the Quiche Mayas, narrates that the language of all the families that were gathered at Tulum was confused and none could understand the speech of the others.<sup>13</sup>

The Kaska (Indian) story makes the result into the cause. The Indians narrate that "a great darkness came on, and high winds which drove the vessels hither and thither. The people became separated. Some were driven away. . . . Long afterwards, when in their wanderings they met people from another place, they spoke different languages, and could not understand one another."<sup>14</sup>

With this exception—the Kaska story may refer to any great upheaval and is actually an effect of large-scale migrations—the traditions of the peoples make the catastrophe the immediate cause of the confusion of languages and the dispersion as well.

While the account in Genesis, and that given by Abydenus and various other sources connect the story with a certain place in Mesopotamia, other traditions localize it in many different countries.<sup>15</sup> In each case the entire population of the world is said to have been affected. If the nature of the catastrophe was cosmic, the same occurrence could have taken place in different countries. In this case the existence of similar traditions in many corners of the globe is of no avail for tracing the migration of ancient tribes. The Arabic tradition makes South Arabia the scene of the upheaval, followed by confusion of languages and migrations.<sup>16</sup> Similar experiences could have been brought about by one and the same cause in many places.

It appears that after the Flood the plain of Mesopotamia became one of the few cultural centers of the world. Another flood would have caused the utter destruction of the human race, and this was feared because the memory of the Flood a few centuries earlier was very vivid. Observations of the movements of the heavenly bodies may have provided a warning of a new catastrophe and large structures were built for refuge. But when the event came, the structures were overwhelmed and destroyed by hurricanes and powerful electrical discharges.

In the rabbinical concept of the seven earths, molded one out of another in successive catastrophes, the generation which built the Tower of Babel inhabited the fourth earth, but it goes on to the fifth earth where the men become oblivious of their origin and home;<sup>17</sup> those who built the Tower of Babel are told to forget their language. This generation is called "the people who lost their memory." The earth which they inhabited was "the fifth earth, that of oblivion (Neshiah)."<sup>18</sup>

In the ancient Mexican traditions it is told that those who survived the catastrophe of the "sun of wind" lost "their reason and speech."<sup>19</sup>

The characteristic of this catastrophe was its influence upon the mental, or mnemonic, capacity of the peoples. The description of it, as told by many tribes and peoples, if it contains authentic features, arouses the surmise that the earth underwent an electromagnetic disturbance, and that the human race experienced something that in modern terms seems like a consequence of a deep electrical shock.

The application of electrical current to the head of a human being often results in a partial loss of memory; also a loss of speech may be induced by the application of electrodes to specific areas of the brain.<sup>20</sup>

## References

1. Genesis XI. 1-9.
2. Quoted in Cosmas Indicopleustes, *Christian Topography* (Hakluyt Society: London, 1871). Cf. Josephus, *The Antiquities of the Jews*, I. 4. 2, and sources in L. Ginzberg, *The Legends of the Jews*, vol. V, pp. 199-200. [Some of the sources assert that the builders of the Tower feared a world conflagration. Cf. S. Bochart, *Geographia Sacra*, Lib. I, cap. xiv (Lugduni Batavorum, 1707): "... Video quosquam asserere, illos futuri incendii metu de aeylo sibi prospectisse, memores scilicet 'affore tempus quo mare, quo tellus, correptaque regia coeli ardeat, et mundi moles operosa laboret.' "]
3. Don Fernando de Alvara Ixtlilxochitl, *Obras Historicas* (Mexico, 1891), Vol. I, p. 12.
4. *Ibid.*, loc. cit. [Similarly, the sacred writings of the Burmese relate that "when the world is destroyed by wind . . . the wind begins to blow and gradually increases. At first it only raises sand and small stones; but at length it whirls about immense rocks, and the summits of mountains." F. Buchanan, "On the Religion and Literature of the Burmas," *Asiatick Researches* VII (1799), p. 244.]
5. F. L. de Gomara, *Conquista de Mexico* (Mexico, 1870), vol. II, p. 261. [The order of the "sun ages" of the ancient Mexicans is given differently by different authors; but the most reliable of the sources—the Vatican Codex, Ixtlilxochitl, and Veytia—all agree that Ehecatonatiuh, or "the sun of wind" was the second age, following after the "sun of water" or Atonatiuh.]
6. Quoted by Theophilus of Antioch, *To Autolykus* II. xxxi, transl. by M. Dods in *The Ante-Nicene Fathers*, Vol. II (Grand Rapids, 1902). Cf. Josephus, *Antiquities* I. 109-121; Bochart, *Geographia Sacra* I. 13; *The Sibylline Oracles* III. 97-107 in R. Charles ed., *Apocrypha and Pseudepigrapha of the Old Testament* (Oxford, 1913), Vol. I, pp. 380f.
7. *The Book of Jubilees* 10.26 in Charles ed., *Apocrypha and Pseudepigrapha of the Old Testament*. Cf. also Midrash Rabba to Genesis, and sources in Ginzberg, *Legends* III. 35.
8. Abydenus, quoted by Cyril, *Adversus Julianum* Bk. I, and by Eusebius, *Praeparatio Evangelica* IX, 14.
9. Quoted in Bochart, *Geographia Sacra* I. 13. Cf. M. Adler, *The Itinerary of Benjamin of Tudela* (London, 1907).
10. Tractate Sanhedrin XI (fol. 109A) of Seder Nezikin, transl. by H.

Freeman, ed by J. Epstein (London, 1933), p. 188. [The tradition that fire from heaven destroyed the tower is also a feature of some of the Meso-American accounts, e.g., the legend recorded by Pedro de los Rios concerning the foundation of the pyramid of Cholula in Mexico. After the waters of the Deluge had receded, one of the survivors came to Cholula, where he began to build a large structure. "It was his purpose to raise the mighty edifice to the clouds, but the gods, offended at his presumption, hurled the fire of heaven down on the pyramid, many of the workmen perished, and the building remained unfinished." (J. G. Frazer, *Folk Lore in the Old Testament* Vol. I [London, 1918]. Frazer adds that "It is said that at the time of the Spanish conquest the inhabitants of Cholula preserved with great veneration a large acrotile, which according to them was the very thunderbolt that fell on the pyramid and set on fire." Cf. E. B. Taylor, *Animism*, p. 277. Another Mexican tradition, recorded by Diego Duran in 1579 (*Historia de las Indias de Nueva Espana y las Islas de Tierra Firme* I [Mexico, 1867], pp. 6ff.) tells of giants who built a tower that almost reached the heavens, when it was destroyed by a thunderbolt.]

11. R. W. Williamson, *Religious and Cosmic Beliefs of Central Polynesia* (Cambridge, 1933), vol. I, p. 94.
12. A.-C. Eugene Caillot, *Mythes, legendes et traditions des Polynesiens* (Paris, 1914), p. 16, n. 1. The tradition was among those collected by Caillot in 1912 or 1913; his publication contains the story in the original Polynesian and in a French translation.
13. Brasseur de Bourbourg, *Histoire des nations civilises du Mexique* (1857-59), vol. I, p. 72. [Cf. also the Andean tradition recorded by Pedro Sarmiento de Gamboa in his *Historia de los Incas*, ch. 7. In common with other accounts, it places the confusion of languages after the Deluge.]
14. "Kaska Tales," collected by James A. Teit, *Journal of American Folklore*, no. 30 (1917), p. 442.
15. Many different traditions were collected by James G. Frazer in *Folk-lore in the Old Testament* (London, 1918), Vol. I, ch. V. Cf. H. H. Bankroft, *The Native Races of the Pacific States*, Vol. V.
16. D. Reiske, *De Abraham Epocha Vetusissima, Sæul Ol Arem, etc.* (Leipzig, 1748). [The question of whether the Greeks transmitted an account of the same events was debated by several writers in antiquity, including Philo of Alexandria (*De Confusione Linguarum*), Cyril of Alexandria (*Contra Julianum*, bk. IV) and Origen (*Contra Celsum* IV, 21). These writers saw a link between the story of the revolt of the giants—the sons of Aloeus who piled Ossa upon Olympus and Pelion atop Ossa in a vain effort to reach the lofty dwelling of Zeus and make war on the gods—and the account of the construction of the tower of Babel in Genesis XI, 3-8. The earliest allusion to these events is in Homer's *Odyssey* (XI, 315-316); Homer ascribes the destruction of the giants to Apollo. Pliny *N. H.* II, 8, 30 and Macrobius (*Satur.* I, 19, 7) identified Apollo with the planet Mercury. Apuleius wrote (*De Mundo*, 336) that Mercury and Apollo were alternate names for "Stilbon," the planet Mercury. Hesiod described the battle with the giants as an immense catastrophe involving the earth and heaven alike.

The boundless sea rang terribly around, and the earth crashed loudly; wide heaven was shaken and groaned, and high Olympus reeled from its foundations under the charge of the undying gods, and a heavy quaking reached Tartarus. . . . the cry of both armies as they shouted reached to stary heaven. Then Zeus no longer held back his might; but straight his heart was filled with fury and he showed forth all his strength. From heaven and from Olympus he came forthwith, hurling his lightning: the bolts flew thick and fast from his strong hand, together with thunder and lightning, whirling and awesome flame. The life-giving earth crashed around in whirling, and the vast wood cracked loud with fire all about. All the land seethed, and Ocean's streams and the unfruitful sea. The hot vapour lapped round the earthborn Titans; flame unspeakable rose to the bright upper air; the flashing glare of the thunder shone and lightning blinded their eyes, for all that they were strong.

It seemed as if Earth and wide Heaven above came together; for such a mighty crash would have arisen if the Earth were being hurled to ruin and Heaven from on high were hurling her down. . . . Also the winds brought rumbling earthquake and duststorm, thunder and lightning, and the lurid thunderbolt, which are the shafts of great Zeus.

Seneca also referred to the same events in mentioning Jupiter's thunderbolts "by which the threefold mass of mountains fell" and a tradition held that this was the first occasion on which Jupiter used his bolts (Ovid, *Fasts* III, 438). The pagans disputed with the Jews and Christians whether Moses took the story from Homer or Homer from Moses, but the common origin of the two accounts was generally conceded. One early writer, Eupolemus, drew on both sources in asserting that "the city of Babylon had been founded by those who saved themselves from the deluge; they were giants, and they built the famous tower." (Eusebius, *Præp. Evang.*) From the viewpoint of sequential chronology, the link is plausible. The giants' revolt is said to have occurred not long after Zeus had taken over from Kronos the dominion of the sky, and it marks the real beginning of Jupiter's dominion. Cf. Boschart, *Geographia Sacra*, I, 13.]

17. This is told in allegorical form in the tale of the wanderings of Adam. The myth of Man (Adam) traveling through all the seven earths is a transparent allegory of the physical and human history of the earth. See *Sefer Ruziel*; cf. Ginzberg, *Legends* I, 90ff., V, 117f.
18. *Midrash Rabba* to Genesis, Exodus; Ginzberg, *Legends* I, 114; *Zohar Haresh Bereshit* Sa-Sb, *Zohar Ruth* 97b, and other sources in Ginzberg, *Legends*, V, 143. [In *Tractate Sanhedrin* 109a it is said that the place where the Tower once stood retains the peculiar quality of inducing a total loss of memory in anyone who passes it.]
19. H. H. Bankroft, *The Native Races* (San Francisco, 1882), vol. III, p. 64.
20. The electro-convulsive therapy used in psychiatry for the treatment of certain mental cases is administered by passing current through electrodes on the forehead. Conducted through the brain, the electric discharge causes a period of confusion and a subsequent complete, though temporary, loss of memory of the events immediately preceding the discharge. A number of patients complain also of consequent disturbances of longer duration, and some of them suffer a patchy, retrograde amnesia. See the article by Siskind in *Archive of Neurological Psychiatry* (Chicago, 1941), p. 215, 223.



## Mercury

It can be assumed with a fair amount of probability that the planet that caused the disturbances described above was the planet Mercury, the Greek Hermes, the Babylonian Nebo.

To each of the planets is ascribed a world age, and the ages of the other planets—Moon, Saturn, Jupiter, Venus, and Mars—are well discernible; the dominion of Mercury must be looked for in one of the world ages, and one of the world cataclysms was apparently ascribed to this lesser planet. (1) Mercury was a feared god long before Mars (Nergal) became one. As the name of Mount Sinai refers to Sin, the Moon, so the name of Mount Nebo in Moab where Moses died (2) was called already in that early time by the name of the planet Mercury. Later in the seventh and sixth centuries before the present era, this god was much venerated, especially by the Chaldeans and other peoples of Mesopotamia, as the names of Nabopolassar and his son Nebuchadnezzar prove. (3) In earlier times Mercury was known to the Sumerians as Enki. (4)

Equally pronounced was the position of Thoth, the planet Mercury of the Egyptian pantheon, the theophoric part of the name Thutmose. (5) For the northern peoples, Mercury was Odin. (6)

It is characteristic that in many astronomical texts Mercury, the Greek Hermes, the Babylonian Nebo, the Egyptian Thoth, is portrayed as the planet-god which had in his dominion the physiological capacity of memory in man (7) as well as that of speech. According to Augustine, "speech is Mercury." (8)

Direct information that confirms our assumption is provided by Hyginus. Hyginus wrote that for many centuries men "lived without town or laws, speaking one tongue under the rule of Jove. But after Mercury explained the languages of men (whence he is called *hermeneutes*, 'interpreter,' for Mercury in Greek is called Hermes; he, too, divided the nations) then discord arose among mortals. . . ." (9)

The Romans as well as the Greeks pictured Mercury with wings, either on his headgear or at his ankles. (10) and with an emblem, the caduceus, a staff with two snakes winding. The double serpent (caduceus), the emblem of Mercury, is found in ornaments of all peoples of antiquity; a special treatise could be written about this subject; I found the caduceus all around the world. (11) Mercury, or Hermes of the Greeks, was a messenger of the gods that speeded on his errand, sent by Jupiter. (12)

Among the satellites that presently orbit each of the giant planets are bodies comparable in size to Mercury, or even larger. (13) Abraham Rockenbach, whose *De Cometis Tractatus Novus Methodicus* we had occasion to quote when investigating the causes of the Deluge, included in his treatise also the following entry:

In the year of the world one thousand nine hundred and forty-four, two hundred and eighty-eight years after the Deluge, a comet was seen in Egypt of the nature of Saturn, in the vicinity of Cairo, in the constellation of Capricorn, and within the space of sixty-five days it traversed three signs in the sky. Confusions of languages and dispersals of peoples followed. On this text of the eleventh chapter of Genesis speaks in more detail. (14)

From the annals of modern astronomy we know of cases when a comet traveling on an elongated orbit was "caught" by the planet Jupiter, by which is meant the change of the cometary orbit to one of a short period, with the sun in the focus of its orbit.

It is possible to reconstruct the planetary disturbances of that age with some approximation. In my understanding Mercury was once a satellite of Jupiter, or possibly of Saturn. In the course of the events which followed Saturn's interaction with Jupiter and its subsequent disruption, Mercury was pushed from its orbit and was directed to the sun by Jupiter. It could, however, have been a comet and the entwined snakes of the caduceus may memorialize the appearance it had when seen by the inhabitants of the Earth. At some point a contact occurred between the magnetospheres of Mercury and the Earth, described in the traditions of various nations. (15)

That the Earth was once a satellite of a giant planet is nothing more than a surmise; we dealt with it only as with a hypothetical construction, requiring further elucidation. But with a greater show of support derived from the mythological and folkloristic sources we have tried to demonstrate on the case of Mercury that once it had been a satellite of one of the giant planets and was "directed" by Jupiter closer to the sun. (16)

The claim therefore is that Mercury has traveled on its present orbit for only some five or six thousand years. This view conflicts with both the nebular and the tidal theories of the origin of the planetary family, and with the assumption that the planets have occupied the same orbits for billions of years.

## References

- [Among the reasons which suggest that Mercury was the planet which caused the catastrophe of the confusion of languages is the fact that the age of Mercury follows that of Saturn. In the Hindu conception of the world ages, Satya yuga, the Saturnian age, was brought to a close by a general flood. Cf. Sir William Jones, "On the Gods of Greece, Italy and India," *Asiatic Researches* I (1799), p. 234; . . . The Satya, or (if we may venture to call it) the Saturnian age was, in truth, the age of the general flood" (emphasis in text). Mercury appeared soon after the beginning of the next age, the Treta yuga; and for at least a part of this age men lived under the aegis of Mercury. In Hindu astronomy the usual name for the planet Mercury was Budha. In the *Bhagavatamrita* it is said that "Budha [Mercury] became visible the 1002nd year of the Cali yug." According to John Bentley, "the 1002nd year of the Cali yug [astronomical era] corresponds . . . with "the 179th year of the Treta yug of the poets." "Remarks on the Principal Aeras and Dates of the Ancient Hindus," *Asiatic Researches* V (1799), pp. 320f. The *Bhagavatamrita* describes in mythical language the first appearance of Mercury. See W. Jones, "On the Chronology of the Hindus," *Asiatic Researches* II (1799), p. 122. Jones also places "the ancient Budha, or Mercury . . . about the beginning of the Treta yug." In Hindu lore Budha, or Mercury, is said to have married Ila, the daughter of Satyavrata, the Manu of the Satya yuga, in whose days the Deluge occurred. This is but a way of saying that the time of Mercury's prominence was shortly after the Deluge, the age of Saturn, the Satya yuga. *The Matsya Puranam* ed. and transl. by Janna das Akhtar (Delhi, 1972), ch. xi. Among the descriptive epithets applied to Mercury in India, were *budha*—"mind, spirit, intelligence," *sarvagna*—"all-knowing," *shudhahitigna*—"possessor of the six sciences," *abhyavadi*—"eloquent, unequalled in speech." See Fr. Paulinus, *Systema Brahmanicum* (Rome, 1791), pp. 156f. The presence of the god could induce forgetfulness. (*The Matsyapuranam* XI. 61.).
- Deuteronomy 34: 1-5; cf. Jastrow, *Die Religion Babylonien und Assyriens*, p. 124, n. 3.
- [Nebo was regarded as the son of Marduk, or Jupiter. His chief cult center in Babylonia was Borsippa, whose ziggurat, or stepped pyramid, was consecrated to Nebo. In the Talmud (Sanhedrin XI 109a) the ruins of this structure were considered to be the remains of the Tower of Babel. (Cf. Obermeyer, pp. 314, 327, 346). It was of these ruins that R. Yochanan is reported to have said "a third of the tower was burnt, a third sunk [into the earth], and a third is still standing." The Talmud next quotes Rab as having said "The atmosphere of the tower causes forgetfulness." Nebo was also thought of as the herald of the gods, and as presiding over all matters pertaining to the intellect. Cf. Jastrow, *Die Religion Babylonien und Assyriens*, Vol. I, pp. 121, 123, 238; Cf. the prayer of Assurbanipal: "For Nebo the perfect son, regulator of all things in heaven and earth, him that holds the tablet of wisdom, carrier of the stylus of fate. . . ." S. Langdon, *Sumerian and Babylonian Psalms* (Paris, 1909), p. 129.].
- [The Sumerians believed that there was a time when all mankind spoke one and the same language, and that it was Enki, the Sumerian god of wisdom, who confounded their speech—so concluded S. N. Kramer after publishing his translation of a Sumerian epic fragment. See S. N. Kramer, "The 'Bible of



Tongues" : A Sumerian Version," *The Journal of the American Oriental Society* 88, pp. 108-111. The text of the tablet is translated by Kramer as follows:

The whole universe, the people in unison To Enlil in one tongue,  
Enki . . . the leader of the gods, Endowed with wisdom . . .  
Changed the speech in their mouths (brought) contention into it,  
Into the speech of man that (until then) had been one.

Cf. K. Seybold, "Der Turmbau zu Babel," *Vetus Testamentum* 26 (1974), pp. 453-479; J. van Dijk, "La 'Confusion des langues' . . . Note sur le langage et sur la morphologie d'Enmerkar," 147-155; *Orientalia* 39 (1970), pp. 302-310; B. Alster, "An Aspect of 'Enmerkar and the Lord of Aratta' . . ." *Revue d'Assyriologie* 67 (1973), pp. 101-109.

The Sumerian Enki was the same as the Babylonian Ea. See for instance: M. Jastrow, *Die Religion Babyloniens und Assyriens* (Giessen, 1905), Vol. I, p. 62. The name Ea was written with the ideogram EN.KI. Students of Babylonian astronomy are well aware that "by 'Star of the god Ea' Mercury is meant." *Ibid.*, Vol. II, p. 667, note 2.]

5. Cf. P. Boylan, *Thoth the Hermes of Egypt* (Oxford, 1922). [Diodorus wrote (I, 17, 3) that when Isis took over the kingdom from Osiris, Hermes (i.e., Thoth) became her chief counsellor. This means that the planet Mercury was prominent in the period after Jupiter replaced Saturn as the dominant planet. Diodorus also wrote that it was by the Egyptian Hermes "that the common language of mankind was first further articulated" (I, 16, 1). An Egyptian hymn calls Thoth the deity that "made different the tongue of one country from another." (J. Cerny, "Thoth as Creator of Languages," *The Journal of Egyptian Archaeology* 34 (1948), pp. 121-122.) Another text tells that this god "distinguished (or separated) the tongue of country from country." (*Ibid.*, p. 121). Yet another recounts that he "distinguished the tongue of every foreign land." (*Ibid.*, loc. cit.) Cerny comments that the words "made different" or "distinguished" or "separated" are "past participles alluding probably to some lost myth or legend according to which Thoth differentiated the languages of the various countries. These epithets might even be cited as evidence of an Egyptian parallel to the Hebrew fable of Yabve and the Tower of Babel." Cf. J. G. Griffith, *Papyrus De Jade et Osiride*, pp. 263f. In Egyptian texts Thoth was called "lord of divine words" and "mighty in speech"; according to E. A. W. Budge, "from one aspect he is speech itself . . . Thoth could teach a man not only words of power, but also the manner in which to utter them . . . The words, however . . . must be learned from Thoth." Thoth was also known as "scribe of the gods" and "lord of books." (*The Gods of the Egyptians* [London, 1904], vol. I, p. 401; cf. P. Boylan, *Thoth the Hermes of Egypt* [Oxford, 1922] and B. von Turayeff, "Zwei Hymnen an Thoth," *Zeitschrift fuer Aegyptische Sprache* 33 [1895], pp. 120-125). In the dialogue *Phaedrus* (sect. 274-275), Plato presents a story about the invention of letters by Thoth, and explores some of the implications of this new skill. It "will create forgetfulness in the learners' souls, because they will not use their memories; they will trust to the external written characters and not remember of themselves." (transl. by B. Jowett)].
6. [See Tacitus, *Germania* IX, transl. by H. Mattingly (1948): "Above all they worship Mercury, and count it no sin to win his favor on certain days by human sacrifices." Odin was the head of the Nordic pantheon. Matthew of Westminster (Flores ed., 1601, p. 82) transmits a speech by Saxon envoys to Britain ca. 450 A.D.: "*Deos patrios, scilicet Saturnum, Jovem atque ceteros, qui mundum gubernant, colimus, maxime autem Mercurium, quem lingua nostra Voden appellamus.*"—"We worship the gods of our fathers, that is, Jupiter, Saturn, and the rest of those that rule the world, but most of all [we worship] Mercury, whom in our language we call Voden." Of Odin it was said: "He spoke so well and so smoothly that all who heard him believed all he said was true."—*Heimskringla: History of the Kings of Norway*, transl. by Lee M. Hollander (Austin, 1964), pp. 10-11. He was associated with Hugin or "thought" and Munin or "memory." One of the myths about Odin connects him with the multiplicity of languages. In the *Gylfaginning*, ch. XIX, it is said that the reason why Odin is known by many different names is "the fact that there are in the world so many different languages."].
7. [*Hermes*. "The planet Mercury [is] the deity which presides over the rational energy," wrote the neo-Platonist philosopher Porphyry (*On the Wanderings of Ulysses*, transl. by Th. Taylor [London, 1823], p. 259) and Proclus, the last great representative of that school, elaborated in his description of Mercury's powers: "(Mercury) unfolds into light intellectual gifts, fills all things with divine reasons, elevates souls to intellect, wakens them as from a profound sleep . . ." (*In Euclid Elementa* lib. I, par. 14; cf. *idem*, *In Platonis Rem Publicam*, ed. Nauck, I, 255, II, 221). Proclus also described Hermes as "responsible for distinguishing and interpreting things, recalling to memory the sources of the intellect . . ." (*In Platonis Rem Publicam* II, 224). *Nebo*. See above, n. 3. *Thoth*. An Egyptian hymn assigns to Thoth control over man's mnemonic powers, invoking him as the deity "that recalls all what had been forgotten." (R. Hari, *Horemheb et le Reine Moutnedjemet* [Geneva, 1965]).].
8. *The City of God* VII, 14, 1. [Servius called Mercury "et orationis deus et interpres deorum" (*In Vergili Aeneidem* IV, 239). Arnobius (*Adversus Gentes* III, 32) argued that Mercury is simply speech and words exchanged in conversation. Cf. Hippolytus, *Refutatio* V, 2; Clement of Alexandria, *Homilia* VI, xv; Macrobius wrote in his *Saturnalia*: "*scimus autem Mercurium vocis et sermonis potentem.*" Proclus, (*Commentaire sur le Timee*, transl. by Festugiere, Vol. V, p. 237) asserted that "la faculte de langage [correspond a] Hermes. . ." Cf. F. Buffiere, *Les Mythes d'Homere et la Pensée grecque* (Paris, 1956), pp. 289ff. A scholium to Aristophanes' *Plutus*, Act. IV, scene 1, and a scholium to Apollonius Rhodius' *Argonautica* I, 517 provide further details about Mercury's association with language.].
9. Hyginus, *Fabulae*, no. 143: "Phoroneus," transl. by M. Grant in *The Myths of Hyginus* (University of Kansas Publications: Lawrence, 1960). Here Mercury is made directly responsible for the confusion of languages. "The meaning is clearly that Hermes invented one language for one people, another for another. The whole account reminds one of the Biblical Tower of Babel." *Ibid.*, p. 118.
10. According to Servius (*In Vergili Aeneidem Commentarii* IV, 229) "*Mercurius ideo dicitur habere pennas, quia citius ab omnibus planetis in ortum suum recurrit unde et velox et errans inducitur, ut (Georgica I, 337) 'quos ignis caeli Cyllenius erret in orbes.'*"
11. The caduceus was an emblem of the Babylonian deity Ningishzida, and an astronomical tablet from Boghazkoi identifies Ningishzida with Nebo-Mercury (Weidner, *Handbuch der babylonischen Astronomie*, p. 61). Cf. H. Th. Bossert, *Altägypten* (Tübingen, 1951), p. 139, figs. 442 & 445. H. Schliemann found the caduceus at Mycenae. Ancient Mexican codices portray the worship of entwined snakes. See Lord Kingsborough, *The Antiquities of Mexico* (London, 1830), Vol. II, p. 4. Cf. H. B. Alexander, *Latin American Mythology (Mythology of All Races, Vol. XI)* (1920), p. 72; cf. also Franz Boss, *Kwakiutl Culture as Reflected in Mythology*, (New York, 1935), p. 137.
12. Homer, *The Odyssey* VI; Vergil, *The Aeneid* IV, 239.
13. Jupiter's satellite Ganymede is larger than Mercury, and Saturn's biggest moon, Titan, is almost as large.

14. *De Cometis Tractatus Novus Methodicus* (Wittesbergae, 1602), pp. 113f.: "Anno mundi millesimo, nongentesimo, quadragesimo quarto. Anno post diluvium, ducentesimo octuagesimo octavo, Cometa in Aegypto nataram Saturni referens, circa Alcairam, in dodecentenario Capricorni visus est, haecque spatia sexaginta quinque dierum, tria signa in coelo percurrit. Hanc confusiones linguarum, dissipationes gentium in toto terrarum orbe, sunt secutae. De quibus Genes. undecimo capite, prolixius textus dicunt." Cf. J. Hevelius, *Cometographia* (1668).
15. [In Babylonian sources the destructive acts of Nebo are recorded: "The lofty one, furious . . . the word of him . . . causes the earth beneath to shudder, the word which in his glory he spoke. . . Waters have flooded the wide land." S. Langdon, *Babylonian Liturgies* (Paris, 1913), p. 65.]
16. Cf. R. S. Harrington and T. C. van Flandern, "A Dynamical Investigation of the Conjecture that Mercury is an Escaped Satellite of Venus," *Icarus* 28, (1976), pp. 435-440.



## The Overthrow of the Cities of the Plain

The Book of Genesis portrays the age of the patriarchs as a time of great upheavals in nature in which the geology of the Jordan Valley underwent some drastic changes. The focus of these events was in the place now occupied by the Dead Sea. The Dead Sea, according to the Genesis account, was not yet in existence in the days of Abraham. In its place there was a fertile plain, known as the plain of Sittim, with five populous cities: Sodom, Gomorrah, Admah, Zeboim, and Zoar. When Lot arrived in the region he "lifted up his eyes, and beheld all the plain of Jordan, that it was well-watered everywhere . . . even as the garden of the Lord, like the land of Egypt."<sup>[1]</sup>

The nineteenth chapter of the Book of Genesis tells of a catastrophe in which these cities were overwhelmed, overturned, and swallowed by the earth:

The sun was risen upon the earth when . . . the Lord rained upon Sodom and upon Gomorrah brimstone and fire from the Lord out of heaven; And he overthrew those cities, and all the plain, and all the inhabitants of the cities, and that which grew upon the ground. . . .

And Abraham got up early in the morning to the place where he stood before the Lord, And he looked toward Sodom and Gomorrah, and toward all the land of the plain, and beheld, and, lo, the smoke of the country went up as the smoke of a furnace.<sup>[2]</sup>

The description of this upheaval has always aroused wonder: "There is clearly something unnatural or extraordinary that is recorded," one commentator wrote.<sup>[3]</sup>

The great rift of the Jordan and the Dead Sea bear witness to a tremendous upheaval. "With the end of the Tertiary period, in an event of extreme violence . . . the entire Syrian land, from its south end to its north end, was torn apart and the ground in between sank into the depths." So wrote Professor M. Blanckenhorn, the explorer of the region of the Dead Sea.<sup>[4]</sup> In his later work he advanced the age of the rift to the pluvial, or the beginning of the first glacial age. The origin of the Dead Sea occurred "in a great mountain movement, with collapse and dislocation, that took place at the beginning of the pluvial, in the first glacial period. . . . In these titanic events conditions were created for the existence of an inner sea."<sup>[5]</sup>

A period of dryness followed the first glacial, or pluvial period. In a new pluvial period, the second glacial epoch, the lake reached its greatest dimensions; the Dead Sea spread to the northern side of the present Sea of Galilee, engulfing it together with the Jordan Valley between. At the time, as fossil snails show, the water was not yet saline.

The rift in which the Lake of Galilee, the Jordan, and the Dead Sea lie is the deepest depression on any continent. The surface of the Dead Sea is close to 400 meters below the level of the Mediterranean, and its deepest bottom is some 320 meters lower still. The shore falls steeply from the Judean mountains on the west; on the eastern side of the rift rise the Moabite mountains. The walls of the chasm show sharp broken strata that remained horizontal, which proves that the breaking down was instantaneous.<sup>[6]</sup> The force which caused this slide movement must have been stupendous. The ground of the rift around the Dead Sea is covered with coagulated lava masses, taking the form of an immense herd of giant elephants with rough skin. These lava eruptions from fissures are ascribed to the second interglacial period.<sup>[7]</sup> To the south end of the Dead Sea towers a big cliff of salt called Jebel Usdum (Mount of Sodom). "It is absolutely impossible that the salt sediment of a sea should precipitate in such a form."<sup>[8]</sup> "Only the rupture of the ground could create this site, singular in the entire world."<sup>[9]</sup>

The destruction of Sodom and Gomorrah took place in historical times, according to my scheme in a catastrophe which caused also the end of the Old Kingdom in Egypt. The geologists refer the upheaval which tore Syria in two to the end of the Tertiary period—long before human history began.

Now the question is legitimate: how old is the Dead Sea?

### References

1. Genesis 13:10. Tacitus wrote that the plain was "fruitful and supported great and populous cities." (*Historics* V, 7). According to Strabo (*Geography* XVI. 2. 44) there were "thirteen inhabited cities in that region of which Sodom was the metropolis."
2. Genesis 19: 23-25, 27-28.
3. J. Penrose Harland, "Sodom and Gomorrah," *The Biblical Archaeologist Reader* (New York, 1961), p. 61.
4. M. Blanckenhorn, "Entstehung und Geschichte des Todten Meeres," *Zeitschrift des Deutschen Palaestina-Vereins*, 19 (1896), p. 16.
5. Idem, *Naturwissenschaftliche Studien am Todten Meer und im tal* (Berlin, 1912); cf. R. Freund et al., "The Shear along the Dead Sea Rift," *Philosophical Transactions of the Royal Society of London, A*, Vol. 267 (1970), pp. 107-130.
6. Blanckenhorn, "Entstehung und Geschichte des Todten Meeres," p. 26.
7. *Ibid.*, pp. 41-42.
8. *Ibid.*, p. 34.
9. *Ibid.*, p. 35.



## The Age of the Dead Sea

There is a way of calculating the age of the Dead Sea. This interior lake contains concentrated solutions of salts. These salts flow into the sea with the waters of its tributaries. Thermal springs bring salt to the Sea of Galilee, and the Jordan carries them to the Dead Sea, which has no outlet. From the surface of the Dead Sea, in the deep hot rift, the water evaporates, leaving the salts behind. By calculating the amount of salts in the sea and the amount that reaches it annually by way of the Jordan and other streams, as well as from thermal springs on its shores, the approximate age of the Dead Sea can be determined. Such an attempt was partially made. The magnesium salts in the Jordan served as a basis for the calculation. It was reckoned that the present annual rate of influx of magnesium in the water of the Jordan alone, when related to the concentration of magnesium in the Dead Sea, should give a figure of approximately 50,000 years as the age of the sea.<sup>(1)</sup> The author of this estimate admitted that even this figure is probably too high; the salinity of the Jordan must have decreased with time, for the thermal sources carry more salt when they are young and their temperature is high.

In the above calculation, it was estimated that the Jordan carries six million tons of water daily to the Dead Sea and that it deposits 181 million tons of magnesium annually. However, on an average day more than double that amount evaporates from the Dead Sea,<sup>(2)</sup> and its surface does not fall, other sources must be making up the difference.

The rivers Zerka (Callirhoe) and Arnon, which flow into the sea from the east, carry salt solutions from many springs. The shores of the Dead Sea abound in highly concentrated thermal springs which contain rich amounts of magnesium. These sources flow directly into the sea, bringing a richer influx of magnesium than the Jordan.<sup>(3)</sup> In addition there are, on the shores of the Dead Sea, abundant vestiges of thermal springs with rich sediments of salts that are inactive at present.<sup>(4)</sup> It is highly probable, too, that there are submarine sources in the Dead Sea which may provide magnesium, but they are indeterminable.<sup>(5)</sup>

When these factors are taken into consideration the age of the Dead Sea, computed on the basis of its magnesium content, must be drastically reduced.

A computation that takes, as its basis, the amount of sodium in the Jordan points to a recent date for the origin of the Dead Sea. The proportion of sodium to magnesium in the water of the Jordan is about 4:1; in the Dead Sea it is 1:2.<sup>(6)</sup> If the Jordan were the only source of the sodium for the Dead Sea the age of the Dead Sea would be only about 6,000 years. But the thermal sources on the western, eastern, and southern shores contain sodium too; so may the submarine sources, which cannot be evaluated. It is likely, therefore, that the sea has existed for only about four thousand years. When again the fact is taken into account that the thermal sources are usually more concentrated when they first break out and when they are at a higher temperature, it may well be asked why the age of this sea should not be reduced still more. It is probable that deeper levels of water have a greater salt concentration.<sup>(7)</sup>

Fifty thousand years as the age of the Dead Sea was an unexpectedly low estimate: the rift in which the Dead Sea is situated is considered to be the result of a catastrophe at the beginning of the first glacial period.<sup>(8)</sup> Now a simple reckoning shows that the saline sea with the Jordan has not existed longer than five thousand years.

### References

1. W. Irwin, "The Salts of the Dead Sea and River Jordan," *Geographical Journal* 61 (London, 1923), p. 434. [Yacov K. Benter's 1961 publication arrived at a figure close to 12,000 years. See *Scientific American* Oct. 1983, p. 103.]
2. *Ibid.*, pp. 435-436; [cf. J. Neumann, "Tentative Energy and Water Balances for the Dead Sea," *Bulletin of the Research Council of Israel*, G, Vol. VII, nos. 2-3 (1958); cf. also H. Haude, "Ueber Klimatische und menschliche Einwirkungen auf den Wasserhaushalt des Toten Meeres in seiner Vergangenheit," *Zeitschrift des Deutschen Palaestina-Vereins*, 88 (1972), pp. 105-139.]
3. Blanckenhorn, "Entstehung und Geschichte des Toten Meeres," p. 29; cf. L. Lartet, *L'exploration geologique de la Mer Morte* (1874), p. 297.
4. R. Sachse, "Beitraege zur chemischen Kenntniss der Mineralien, Gesteine und Gewaesser Palaestinas," *Zeitschrift des Deutschen Palaestina-Vereins*, 20 (1897), pp. 25ff., esp. p. 33; cf. H. St. J. Philby, "The Dead Sea to 'Aqaba," *The Geographical Journal*, LXXVI (1925).
5. Irwin, "The Salts of the Dead Sea," *op. cit.*, p. 438.
6. *Ibid.*, p. 434. Cf. H. Boyko, *Salinity and Aridity* (The Hague, 1966), p. 15.
7. The figures for magnesium according to Terrell, quoted by Irwin (p. 431), are: At the surface of the sea, at the north shore, magnesium constitutes 13.20 percent of solid salt; 120 meters below the surface, five miles east of Kasel Fesaka, magnesium amounts to 16.80 percent of the solid residue; and 300 meters deep at the same point, 15.99 percent. From the account of Tacitus (*Histories* V. 6) it would appear that the Dead Sea was already saturated with salts nineteen centuries ago.
8. Blanckenhorn, *Naturwissenschaftliche Studien am Toten Meer*, p. 115.



## The Great Rift and the Jordan

The story of the violent changes that occurred in the Jordan Valley, the memory of which is connected with the time of the patriarchs and in which Sodom and Gomorrah were overturned, does not mention that the Valley of Sittim, where the cities were located, became an inner sea. Sulphur and brimstone fell from heaven, one of the best cultivated areas was overturned, fire from beneath and fire from above accomplished the desolation—all this is described; but not the appearance of a sea. However, when the Israelites under Moses and Joshua reached the area in their flight from Egypt, they found the lake there.<sup>(1)</sup> It seems to have appeared after a catastrophe later than the one that destroyed Sodom and Gomorrah.

But if there was no Dead Sea before the time of the Exodus, whither did the Jordan flow, assuming it was already in existence? The Jordan might not have existed at all, or it could have flowed into the open sea, the Mediterranean. It probably did not flow along the Rift over the Arabah into the Aqaba Gulf of the Red Sea, as no traces of marine life are found at

the height of the watershed of Ararat, the barrier between the east sea and the Aquaba Gulf is about 500 meters high. The watershed between the Jordan River and the Kishon River which flows into the Mediterranean, at Mount Gilboa, is 500 meters above the ocean level. The topographical shape of the region of the Beth Shan Valley, stretching from the Jordan towards the Esdraclon Valley, makes the flow of the Jordan into the Mediterranean a far more acceptable conjecture than a presumed flow of the Jordan over the slopes of the mountain of Hor into the Red Sea. Of course, it can be regarded as certain that the geography of the environs of the Red Sea and of the continents in general was quite different before and after the catastrophe that resulted in the formation of the Dead Sea.

The Great Rift, which begins in Syria between the Lebanon and Anti-Lebanon, runs along the Jordan Valley, the Dead Sea, the Arabah, the Aquaba gulf, the Red Sea, and continues through the continent of Africa as far as Zimbabwe, is generally regarded as the product of a grandiose revolution in the shell of the Earth: for many thousands of kilometers the Great Rift runs from Asia to Africa.

Prehistoric man witnessed the latest phases of widespread tectonic movements which convulsed East Africa and provoked great subsidences (of as much as 1500 feet or more) in the early Quaternary strata, whereby was occasioned the discharge of lava and erupted scoriae, modifying notably the courses of the rivers and the circumstances in which the lakes rose or fell in level, and even changing the outlines of these bodies of water.<sup>[2]</sup>

Changes in the watercourses and lakes took place along the entire length of the Rift. The deepest place in the Rift on land is the valley of the Jordan and the Dead Sea. It appears that the catastrophe which originated the Dead Sea, caused also the origin of the Great Rift.

Beyond the Red Sea, which stretches for several hundred kilometers and has not a single affluent river, the aquatic life of the African lakes and rivers belongs to the so-called Ethiopian zoogeographical region. According to Annandale "the explanation of the Ethiopian affinity of the fish fauna of the Jordan is that the Jordan formed at one time merely part of a river system that ran down the Great Rift Valley. The Jordan was one branch of this huge river system, the chain of lakes in East Africa represents the other, and together they opened into the Indian Ocean."<sup>[3]</sup>

Whatever the structural changes of the earth in the catastrophes before that which I describe here, there must have been some time when the Jordan streamed into the valley of Sittim (the name of the plain before the Dead Sea originated) and continued into the Mediterranean, most probably through the Jezreel Valley.

Legendary reminiscences from the patriarchal age indicate that the Jordan existed before the Dead Sea came into being.<sup>[4]</sup> It appears that the coming out of Paddan-aram to Canaan required the passage of a river. Today the way from Palestine to the north does not require the crossing of water. But if the Jordan did flow through the Esdraclon Valley into the Mediterranean, it had to flow in a direction opposite to the one in which it flows today.

Does there exist any reminiscence about the Jordan changing the direction of its flow?

It is not the story in the book of Joshua about the Jordan halting its flow—there it is told that the water was stopped at Adama, north of Jericho.<sup>[5]</sup> This indicates that the flow of the Jordan was already from north to south, as today. The existence of the Dead Sea is also mentioned at the time the Israelites approached Canaan, but it is described as recent: it is called "the sea of the plain."<sup>[6]</sup>

The blocking of the Jordan River by falling slices of the banks happened a number of times.<sup>[7]</sup> The stoppage referred to in the book of Joshua is described as a temporary blocking of the Jordan River in a time of frequent earthquakes, and not as a reversal of the flow.

But there are, in Scripture, references to the reversal of the flow of the Jordan:

When Israel went out of Egypt. . . The sea saw and fled: Jordan was driven back. The mountains skipped like rams, the little hills like lambs. What ailed thee, o thou sea, that thou fleddest? thou Jordan that thou was driven back? Tremble, thou earth, at the presence of the Lord. . . Which turned the rock into a standing water, the flint into a fountain of waters.<sup>[8]</sup>

Here the reversal of the flow of the Jordan is associated in time not only with the Exodus and the catastrophe of the Sea of Passage, but also with the appearance of a new inner sea ("standing water").

A river that changed the direction of its flow must have been regarded as a very remarkable phenomenon.

An inscription of Thutmose I reads: "Frontier northern, as far as that inverted water which goeth down in going up."<sup>[9]</sup> In order to explain this passage it was supposed that the Egyptians could not imagine that a river flows otherwise than from south to north, as does the Nile, and they wondered at a river flowing in another direction. The Euphrates flows from the north-west to the south-east; the Orontes north to south for part of its course, afterwards turning west and emptying into the Mediterranean. The explanation is obviously inadequate. There are many rivers in the world and they flow in all directions. The river that reversed its direction is the Jordan.

Prior to the Exodus, the Jordan Valley was on a higher level than the Mediterranean Sea. With the rupture of the tectonic structure along the river and the dropping of the Dead Sea chasm, many brooks in southern Palestine which had been flowing to the south must have changed their direction and started to flow towards Palestine, emptying into the southern shore of the Dead Sea. This occurrence served as a symbolic picture for the dispersed Children of Israel, who also will return to their homeland: "Turn again our captivity as the streams in the south."<sup>[10]</sup>

The plain of Siddim became a sea. When Israel "wandered into the wilderness in a solitary way [the Lord turned] rivers into the wilderness, and the watersprings into dry ground; and fruitful land into barrenness; [but elsewhere he turned] the wilderness into standing water, and the dry ground into watersprings."<sup>[11]</sup>

The opening of the Great Rift, or its further expansion, accompanied by the overturning of the plain and the origin of the Dead Sea, was a catastrophe that ended an era. In my understanding the end of the Early Bronze Age or the Old Kingdom in Egypt coincided with these events.

#### References

1. Joshua 3:16; Numbers 34:12; Deuteronomy 3:17.
2. H. Alimen, *The Prehistory of East Africa* (London, 1957), p. 194.
3. See R. Washbourn, "The Percy Sladen Expedition to Lake Huleh, 1935," *Palestine Exploration Fund, Quarterly Statements*, (1936), p. 209.
4. Genesis 13:10, 11; cf. Genesis 14:3.
5. Joshua 3:16.
6. Joshua 12:3.
7. J. Garstang, *The Foundations of Bible History* (1931), p. 137; cf. *Worlds in Collision*, section "Jericho," and my article "Jericho" in *KRONOS* II:4 (1977), pp. 64-69.
8. Psalm 114.
9. Breasted, *Ancient Records of Egypt*, Vol. III, par. 73.

10. Psalm 126:4.

11. Psalm 104:4, 33-35.



## The End of the Early Bronze Age

The Old Kingdom in Egypt, the period when the pyramids were built, a great and splendid age, came to its end in a natural disaster. "At the conclusion of the Sixth Dynasty . . . Egypt is suddenly blotted out from our sight as if some great catastrophe had overwhelmed it."<sup>1</sup> The second city of Troy came to an end at the same time the Old Kingdom of Egypt fell; it was destroyed in a violent paroxysm of nature. The Early Bronze Age was simultaneously terminated in all the countries of the ancient East—a vast catastrophe spread ruin from Troy to the Valley of the Nile. This fact has been extensively documented by Claude F. A. Schaeffer, professor at Collège de France, excavator of Ras Shamra (Ugarit).

Schaeffer observed at Ras Shamra on the Syrian coast clear signs of great destruction that pointed to violent earthquakes and tidal waves, and other signs of a natural disaster. Among the greatest of these took place at the end of the Old Kingdom in Egypt. At the occasion of his visit to Troy, then under excavation by Carl Blegen, he became aware that Troy, too, had been repeatedly destroyed by natural catastrophes at the same times when Ras Shamra was destroyed. The distance from the Dardanelles near which the mound of Troy lies to Ras Shamra in Syria is about 600 miles on a straight line. In modern annals of seismology no earthquake is known to have occurred covering an area of such an extent. He then compared the findings of these two places with signs of earthquakes in numerous other localities of the ancient East. After painstaking work he came to the conclusion that more than once in historical times the entire region had been shaken by prodigious earthquakes. As to the destruction that ended the Early Bronze Age, Schaeffer wrote:

There is not for us the slightest doubt that the conflagration of Troy II corresponds to the catastrophe that made an end to the habitations of the Early Bronze Age of Alaca Hüyük, of Alisar, of Tarsus, of Tepe Hissar [in Asia Minor], and to the catastrophe that burned ancient Ugarit (II) in Syria, the city of Byblos that flourished under the Old Kingdom of Egypt, the contemporaneous cities of Palestine, and that was among the causes that terminated the Old Kingdom of Egypt.<sup>2</sup>

In the same catastrophe were destroyed the civilizations of Mesopotamia and Cyprus. What caused "the disappearance of so many cities and the upheaval of an entire civilization" <sup>3</sup> "It was an all-encompassing catastrophe. Ethnic migrations were, no doubt, the consequence of the manifestation of nature. The initial and real causes must be looked for in some cataclysm over which man had no control." <sup>4</sup> Everywhere it was simultaneous and sudden.

The shortcoming in Schaeffer's work was in not making the logical deduction that if catastrophes of such dimensions took place in historical times, there must be references to them in ancient literary sources. If a cataclysm terminated the Early Bronze Age, decimated the population, but left also survivors, then some memory of the events must have also found its way to be preserved in writing—if not by survivors, turned to vagrancy and having to take care for the first necessities of life, then by the descendants of the survivors.

In my scheme the end of the Early Bronze Age or Old Kingdom in Egypt is the time of the momentous events connected with the story of the patriarch Abraham, and described in the Book of Genesis as the overturning of the plain.<sup>5</sup> The cause of the catastrophe could not have been entirely unknown to the ancients. We must therefore become attentive also to other traditions connected with these events.

### References

1. G. A. Wainwright, *The Journal of Egyptian Archaeology* 16 (1930), p. 43.
2. Claude F. A. Schaeffer, *Stratigraphie comparée et chronologie de l'Asie Occidentale* (IIIe et IIe millénaires) (Oxford University Press, 1948), p. 225.
3. R. de Vaux, "Palestine in the Early Bronze Age," *The Cambridge Ancient History*, Third ed., vol. 1, pt. 2 (1971), ch. xv, p. 236. [According to J. Mellaart ("The Catastrophe at the End of the Early Bronze Age 2 Period," *The Cambridge Ancient History* third ed. [1971], Vol. 1, pt. 2, p. 406) in the period after the catastrophe the number of settlements "is reduced to a quarter of the number in the previous period." Jacques Courtois, reporting the results of a survey in the valley of the Orontes, writes of the "extreme density of habitation of the plain in the Bronze Age, and particularly in the Early Bronze Age" (*Syria*, 50 [1973], p. 99). In eastern Arabia "a sharp downturn in settlements and activity becomes apparent" after ca. 2000 B.C. (Michael Rice, "The States of Archaeology in Eastern Arabia and the Persian Gulf," *Asian Affairs*, 64 [1977], p. 143). According to Kathleen Kenyon, "The final end of the Early Bronze Age civilization came with catastrophic completeness . . . Jericho . . . was probably completely destroyed. . . . Every town in Palestine that has so far been investigated shows the same break. . . . All traces of the Early Bronze Age civilization disappeared" (*Archaeology in the Holy Land* [London, 1960], p. 134). According to Ernest Wright, "one of the most striking facts about the Early Bronze civilization is its destruction, one so violent that scarcely a vestige of it survived. We do not know when the event took place; we only know that there is not an Early Bronze Age city excavated or explored in all Palestine which does not have a gap in its occupation between Early Bronze Age III and the Middle Bronze Age. To date this gap, we know that it must be approximately contemporary with a similar period in Egypt called the "First Intermediate Period" between dynasties VI and XI (ca. 22nd and 21st centuries B.C.)." ("The Archaeology of Palestine" in *The Bible and the Ancient Near East, Essays in Honor of William Foxwell Albright* [1961], p. 103). The destruction can be traced also in Greece. "The destruction of the Early Helladic II town at Lerna in the eastern Peloponnese" is an example of "the widespread and violent destruction that occurred ca. 2300 B.C. in the Aegean and East Mediterranean" (Marija Gimbutas, "The Destruction of the Aegean and East Mediterranean Urban Civilization around 2300 B.C.," *Bronze Age Migrations in the Aegean*, ed. by R. A. Crossland and Ann Birchall [London, 1973], pp. 129f.) For Lerna, see also J. Caskey, "The Early Helladic Period in the Argolid," *Hesperia* 29 (1960), pp. 289-290. "The burning of the House of Tiles . . . was the end of an era at Lerna." The settlement "came to a violent end." Not only Lerna, but also "the tiled buildings at Tiryns and Asine were destroyed by fire." It is quite probable that the end of the Third Dynasty of Ur occurred at the same time. Thorkild Jacobsen wonders about "the reasons for the dire catastrophes that befell the city of Ur in the reign of Ibbi-Suen, the sudden collapse of its great empire, and the later utter destruction of the city itself at the hands of barbarian invaders. . . . How an empire like that of the Third Dynasty of Ur . . . could so quickly collapse is really quite puzzling." ("The Reign of Ibbi-Suen," *The Journal of Cuneiform Studies* 7 (1953), p. 36. Although Jacobsen refers to the text known as "Lamentation over the Destruction of Ur," he does not treat it seriously. Yet this poem provides specific information about the causes of the disaster. It speaks of a "storm's cyclone-like destruction" (99), of a "storm that annihilates the land" (178), "in front of the storm fires burned; the people groan" (188). It tells of the sun being obscured: "In the land the bright sun rose; not like the evening star it shone" (191). It describes earthquakes that shook the land: "the

destructive storm makes the land tremble and quake" (199). "In all the streets, where they were wont to promenade, dead bodies were lying about" (217). "Mothers and fathers who did not leave their houses were overcome by fire; the young lying on their mothers' laps like fish were carried off by the waters" (228-229). The city, prostrated by the storm "which overwhelmed the living creatures of heaven and earth," fell prey to hostile tribes and was looted. See S. N. Kramer, "Lamentation over the Destruction of Ur," *Ancient Near Eastern Texts Relating to the Old Testament* (Princeton, 1950). Another lament, *Oh, Angry Sea*, transl. by R. Kutschera (Yale University Press, 1975), tells of the destruction of Ur, Larsa, Nippur, Sippar, Babylon and Isin by inundations sent by Enlil. I consider Enlil to be Jupiter.

4. Schaeffer, *Stratigraphie comparee*, p. 537. In Alaca Huyuk there are unequivocal signs that an earthquake was responsible for the destruction (pp. 296f.). Cf. B. Bell, "The Dark Ages in Ancient History," *American Journal of Archaeology* 75 (1971).
5. [The archaeological evidence uncovered in recent years strongly supports the conclusion that the cities of the plain flourished during the Early Bronze Age and that their destruction took place at the end of this period, more specifically at the end of EB III. See H. Shanks, "Have Sodom and Gomorrah Been Found?" *Biblical Archaeology Review* VI:5 (Sept/Oct. 1980), p. 28. Cf. D. Cardona, "Jupiter—God of Abraham (Part III)," *KRONOS* Vol. VIII.1 (1982), pp. 69ff.]



## Zedek

The time of the patriarch Abraham witnessed unusual behavior by the planet Jupiter. The fact that Jupiter displayed a burst of activity exactly in the time of Abraham must not appear a coincidence: it was in the times of great global catastrophes, when the world was threatened with destruction, that religious reformers gained prominence and contemporaries looked to a divine man for guidance.<sup>[1]</sup>

Zedek was the name of Jupiter, and we read that in the days of Abraham the planet underwent some visible changes. Rabbinical sources relate that when Abraham was on an expedition against Cherdlaomer, king of Elam, and his allied kings—who had captured and despoiled Sodom, and taken Abraham's nephew Lot into captivity—the star Zedek illuminated the night, thereby ensuring the expedition's success.<sup>[2]</sup>

"When he returned from his victory over Cherdlaomer and the kings who were allied with him," the book of Genesis relates, "the king of Sodom came out to greet him. And Melchizedek, king of Salem, brought out bread and wine; he was priest of the Most High."<sup>[3]</sup> Abraham ceded to Melchizedek the spoils of the war he had obtained in Syria from Cherdlaomer.

Ancient Salem was a holy place, and Palestine was a holy land from grey antiquity. Thus, in the documents of the Old Kingdom in Egypt, Palestine is named God's Land (*Toneter*), or Divine (Holy) Land.<sup>[4]</sup> Abraham lived at the end of the Old Kingdom in Egypt; and documents from that time already refer to Palestine as God's Land. But in early times, it was an astral god.

The meaning of the name Melchizedek is "Zedek is [My] King." Zedek, as said, is the name of the planet Jupiter, remaining so in the astronomy of the Jews in later ages. In the Talmud Zedek refers to Jupiter.<sup>[5]</sup> Zedek also has the meaning of "righteousness" or "justice." It is beyond the scope of this work to find which of the meanings—the name of the planet or a word in common usage—preceded and which followed. It is conceivable that this planet was worshipped in that remote time and that, in the days of the patriarch Abraham, the cult of Jupiter was prominent in the Salem of the high priest Melchizedek. Melchizedek, "priest of the most high," was, it follows, a worshipper of Jupiter.<sup>[6]</sup>

### References

1. For example, the time of the great catastrophes of the Exodus saw Moses leading the Israelites from Egypt, to revelations and a covenant with God. And the time of the great upheavals of the eighth and seventh century before this era heard the voice of Isaiah. In later centuries, religious reformers found an especially large and responsive following when they announced the approach of the end of the world, or the beginning of the Kingdom of God on Earth. Numerous instances may be cited, but the best known became the foundation of the religion of a large part of the Old and New World.
2. Rabbi Berkjah, quoted in *Beresheet Rabba* XLIII.3, translated by A. Ravenna (Turin, 1978), p. 328.
3. Genesis 14:17-18. [Salem is considered to be the site of the later Jerusalem. Before Joshua's conquest of Jerusalem the king of that city bore the name Adonizedek, (Joshua 10:1,2), an indication of continuing Jupiter worship among the Jebusites.]
4. In *Ages in Chaos* I have brought extensive material for the identification of the Divine Land with Palestine.
5. Cf. W. M. Feldman, *Rabbinical Mathematics and Astronomy* (New York, 1931).
6. Melchizedek, the priest-king of ancient Salem, plays an important part in Christian catechism. [*The Epistle to the Hebrews* 5:6, 10: 6:20; 7:1ff. Cf. also F. Horton, *The Melchizedek Tradition* (Cambridge University Press, 1976).]



## The Change in Jupiter's Motion

In the Tractate Shabbat of the Babylonian Talmud it is said that in order to teach Abraham the futility and meaninglessness of astrology, the Lord let the planet Zedek, or Jupiter, change its rising point from west to east:

"Go forth (i.e. cease) thy planet-(gazing), for Israel is free from planetary influence. What is thy calculation? Because Zedek (Jupiter) stands in the West? I will turn it back and place it in the East." And thus it is written, *Who hath raised up Zedek from the East? He hath summoned it for his sake* (sc. for the sake of Abraham).<sup>[1]</sup>

This statement of the rabbis contains some contradictory ideas. Nevertheless, it may preserve certain elements of ancient lore.

The Babylonians described Marduk, or Jupiter, as having an eastward motion, different from the other planets: "The earliest system from Babylon has, however, East and West reversed, and assigns to its chief god Marduk, as god of the planet Jupiter, a definite easterly direction; to Mercury, on the other hand, a westerly one."<sup>[2]</sup>

"The Ra-mythology [of Egypt] is that which describes [Ra's] course from west to east."<sup>[3]</sup> Ra, rising in the west, was called "Harakhte, only god, king of the gods; he riseth in the west."<sup>[4]</sup> However, some hymns were addressed to "Ra when he riseth in the Eastern part of heaven."<sup>[5]</sup>

Egyptian lore also knew of a "Horus of the West" and a "Horus of the East."<sup>[6]</sup> Horus was the planet Jupiter.

The expression found in Latin literature, Jupiter *Dianus*<sup>[7]</sup> or two-faced, could be interpreted as denoting two motions of Jupiter, and eastward and a westward. This conforms to the same expression applied to the Sun where, as I endeavored to show, it denotes easterly and westerly movements of the luminary.<sup>[8]</sup>

The celestial mechanics of the implied reversal of Jupiter's apparent motion remains unsolved. Jupiter apparently changed the place of its rising points without a similar and simultaneous change by the Sun and all the planets and stars. It might seem that in order for Jupiter alone to be subject to a change, a reversal of orbital motion is required, an unlikely proposition from the point of view of celestial mechanics.

Earlier we asked in relation to Saturn's great prominence, was not the Earth at some early period a satellite of that planet?; and we may ask again, with the ascendancy of Jupiter, was the Earth not in the domain of this successor to the celestial throne? Theoretically, if the Earth were revolving around Jupiter, a reversal of our planet's north and south geographical poles would cause Jupiter to appear to change the point of its rising.

### References

1. Shabbat 156b, I Epstein ed., (London, 1935). Cf. Isaiah 41:2. "Zedek also has the meaning of "righteousness" or "justice" and therefore the sentence is often rendered incorrectly as: "Who raised up the righteous (man) from the east." Cf. Hommel, *JSOR* (1927).
2. H. Winckler, *Die Babylonische Geisteskultur* second ed. (Leipzig, 1919), p. 72.
3. L. Frobenius, *Das Zeitalter des Sonnengottes* (Berlin, 1904), p. 170.
4. J. Breasted, *Ancient Records of Egypt*, III, 18. Cf. E. Meyer, *Zeitschrift fuer Aegyptische Sprache* (1877), pp. 148ff
5. Eg., E. A. W. Budge ed., *The Egyptian Book of the Dead* (London, 1899), chapter XV (Papyrus Ani), p. 246.
6. S. Mercier, *Horus, The Royal God of Egypt* (Grafton, Mass., 1942), pp. 48, 117.
7. Frazer, *Ovid's Fasti* (London, 1931), note to p. 388.
8. Cf. the ancient view, referred to by Macrobius (*Saturnalia* VIII) that the two faces of Janus symbolize the god's power over the two gates of the sky ("et illeo geminum, quasi utriusque januae coelstis potentem").



## The Worship of Jupiter

"From Zeus let us begin; him do we mortals never leave unnamed; full of Zeus are all the streets and all the marketplaces of men; full is the sea and the heavens thereof. . . . He it was who first set up the signs in heaven. . . . Wherefore him do we men ever worship first and last."<sup>[1]</sup>

In these words Aratus (fl. -310) pictured the place the planet-god Jupiter occupied in the thoughts of men. Nobody today in the streets and marketplaces mentions the planet Jupiter.

St. Augustine, seven centuries after Aratus, asked:

But since they call Jupiter king of all, who will not laugh to see his star so far surpassed in brilliancy by the star of Venus? . . . They answer that it only appears so because it is higher up and much farther away from the earth. If, therefore, its greater dignity has deserved a higher place, why is Saturn higher in the heavens than Jupiter?<sup>[2]</sup>

Marduk, the great god of the Babylonians, was the planet Jupiter;<sup>[3]</sup> so was Amon of the Egyptians;<sup>[4]</sup> Zeus of the Greeks was the same planet; Jupiter of the Romans, as the name shows, was again the same planet. Why was this planet chosen as the most exalted deity? In Greece it was called "all-highest, mighty Zeus,"<sup>[5]</sup> in Rome "Jupiter Optimus Maximus"<sup>[6]</sup> in Babylon it was known as "the greatest of the stars"<sup>[7]</sup>; in India Shiva was described as "the great ruler" and considered the mightiest of all the gods;<sup>[8]</sup> he was said to be "as brilliant as the sun."<sup>[9]</sup> Everywhere Jupiter was regarded as the greatest deity, greater than the sun, moon, and other planets.<sup>[10]</sup>

Homer makes Zeus say that all the other gods together could not pull him down, but he could pull them along with the Earth.<sup>[11]</sup> "That is how far I overwhelm you all, both gods and men." Commenting on this passage, Eustathius wrote that according to some ancient authorities Homer meant the orbits of the planets from which Jupiter could drive the rest of them, but they could not drive it.<sup>[12]</sup> This sentence of Homer is close to the truth. Jupiter is greater and more powerful than Saturn, its rival, together with Mars, Earth, Venus, and Mercury. Jupiter is more than a thousand times greater than the Earth or Venus in volume, and six thousand times greater than Mercury.<sup>[13]</sup> But it appears that one could not guess this from observation with the naked eye. Even through a very powerful telescope Jupiter looks like an inch-large flat disc, surrounded by its four larger satellites.<sup>[14]</sup>

The ancients knew something unknown to the moderns when they asserted that Jupiter can overpower all other planets, the Earth included.<sup>[15]</sup>

## References

1. Aratus, *Phenomena*, transl. by G. R. Mair (London, 1955).
2. *The City of God*, VII, 15, transl. by M. Dods (Edinburgh, 1872).
3. Bartel L. van der Waerden, *Science Awakening*, vol. II (Leyden, 1974), p. 59; cf. P. Jensen, *Die Kosmologie der Babylonier* (Strassburg, 1890), pp. 131, 134. [Marduk was called "the great lord of the gods" and also "the Enlil of the gods." See L. Legrain, *Royal Inscriptions and Fragments from Nippur and Babylon*, (Philadelphia, 1926), p. 38.]
4. [Herodotus II, 41; Diodorus Siculus I. 13. 2; Plutarch, *De Iside et Osiride*, IX.] *Amen*, used at the end of a prayer in Hebrew and in European languages that borrowed it from Hebrew, was the name of the Egyptian deity Jupiter. It is part of the names of many Egyptian kings—Amenhotep, Tutankhamen; of the same root is *amen*—"to believe." It is beyond the scope of this work to find which of the words—as the name of the deity or as a word in vocabulary, precede, and which is derived.
5. *The Iliad* VIII, 22. [In Book II of the *Iliad* (lines 410f.) Agamemnon addresses the god thus: "Zeus, most glorious, most great . . . that dwellest in the heaven." Plato wrote: "Zeus, the mighty lord, holding the reins of a winged chariot, leads the way in heaven, ordering all and taking care of all." (*Phaedrus* 246c, transl. by B. Jowett [1871]). The stellar aspect of Zeus is discussed by A. B. Cook, *Zeus, A Study in Ancient Religion* (Cambridge, 1914), pp. 751, 760.]
6. ["Optimus Maximus Caelus Aeternus Jupiter" was the planet's appellation in its official cult. Cf. Cumont, *Astrology and Religion Among the Greeks and Romans*, p. 115. Seneca called Jupiter "exalted ruler of the sky, who sittest in majesty upon the throne of heaven." Vergil termed him "the mightiest of all gods" *The Aeneid* 20, 243.]
7. Jensen, *Die Kosmologie der Babylonier*, p. 117. [Cf. Lehmann in *Zeitschrift fuer Assyriologie* II, 214ff. and M. Jastrow in *ibid.*, 353f.]
8. Herzfeld, *Altpersische Inschriften*, no. 6, quoted in A. T. Olmstead, *The History of the Persian Empire* (Chicago, 1925), p. 255. [In the *Bundahis* (transl. by E. West, *The Sacred Books of the East*, Vol. V [1880], pt. 1, p. .), the planet Jupiter is called Ahuramazda. Also in the inscriptions uncovered by Th. Goell at Nemrud Dagh, Oromazdes (Ahuramazda) is equated with Zeus. Dio Chrysostom wrote that the Persian Magi considered Zeus "as being the perfect and original driver of the most perfect chariot. For the chariot of Helios, they claim, is relatively recent when compared with that of Zeus" ("The Thirty-sixth Discourse," transl. by J. W. Coobon [London, 19xx]).]
9. [For the identification of Shiva with Jupiter, see *Lippincott's Universal Pronouncing Dictionary of Biography and Mythology*, ed. by J. Thomas, 4th edition (cxxx), p. 2203. Cf. F. Wilford, "On Egypt, etc. from the Ancient Books of the Hindus," *Asiatick Researches* III (Calcutta, 1799), p. 382: ". . . Many of the Hindus acknowledge that Siva, or the God Jupiter shines in that planet [Jupiter] . . ." *The Skanda Purana* also tells of a special relationship between Brihaspati, the astronomical designation for the planet Jupiter, and Shiva.]
10. J. Dowson, "A Classical Dictionary of Hindu Mythology," seventh ed., (London, 1950), p. 296.
11. [The Incas of Peru regarded the planet Jupiter as "the guardian and ruler of the empire." See the seventeenth-century chronicle *De las costumbres antiguas de los naturales del Piru*, published in 1879. Cf. Jan Sammer, "The Cosmology of Tawantinsuyu," *KRONOS*.]
12. *The Iliad* VIII, 18-26.
13. *Commentarii ad Homeri Iliadem* 695, 5 (Leipzig, 1828), Vol. II, p. 184: "Others believe the golden chain to refer to the orbits of the planets . . . for when the planets come together on those orbits, many are the changes that universally arise."
14. Jupiter has about 70 percent of the mass of the solar system not contained in the Sun.
15. [Jupiter's four Galilean moons may have been known to the ancients. Marduk was said to be accompanied by four dogs. Cf. Jensen, *Die Kosmologie der Babylonier*, p. 131: "Die vier Hunden des Marduk. 'Mein Herr mit den Hunden.'" In Egyptian mythology Horus, or Jupiter, was often associated with his four sons. Cf. S. Mercer, *Horus, the Royal God of Egypt*, (1942).]
16. [A similar idea is expressed in *Enuma Elish*. Marduk, or the planet Jupiter, threatens to "alter the ways of the gods" — "I will change their paths." (Tablet VI). In Tablet VII it is said of Marduk: "For the stars of heaven he upheld the paths, he shepherded all the gods like sheep." (L. W. King, *The Seven Tablets of Creation* [London, 1902]). Cf. F.-X. Kugler, *Sternkunde und Sterndienst in Babel*, Vol. I (1907), p. 7.]





## Jupiter of the Thunderbolt

Nobody who observes a thunderstorm would arrive at the conclusion that the planet Jupiter sends the lightning. Therefore it is singular that peoples of antiquity pictured the planet-god Jupiter as wielding a thunderbolt—this is equally true of the Roman Jupiter, the Greek Zeus, and the Babylonian Marduk.

Pliny wrote:

It is not generally known what has been discovered by men who are the most eminent for their learning, in consequence of their assiduous observations of the heavens, that the fires which fall upon the earth, and receive the name of thunderbolts (*fulminum nomen habent*) proceed from the three superior stars (*siderum*), but principally from the one which is situated in the middle . . . and hence it is commonly said, the thunderbolts are darted by Jupiter.<sup>[1]</sup>

Pliny knew the origin of lightning in the friction of clouds—he wrote that “by the dashing of two clouds, the lightning may flash out.”<sup>[2]</sup> He did not confuse lightning with the thunderbolt that is discharged by the planets. He makes a distinction between “earthly bolts, not from stars,” and “the bolts from the stars.”<sup>[3]</sup> Pliny knew that the Earth is one of the planets: “Human beings are distributed all around the earth and stand with their feet pointing towards each other. . . . Another marvel, that the earth herself hangs suspended and does not fall and carry us with it.”

The planet-god Jupiter was frequently shown with a thunderbolt in his hand. The electrical discharge coming from Jupiter is described in many ancient texts. In the Orphic Hymn to Jupiter the Thunderer, he is described as he “who shak’st with fiery light the World.” “From thee proceeds th’etherial lightning’s blaze, flashing around intolerable rays.” “Horrid, untamed, thou rollest thy flames along. Rapid, ethereal bolt, descending fire, the earth . . . trembles.”<sup>[4]</sup> The earth does not quake when struck by regular lightnings. The bolt of Jupiter falls from the azure sky, not veiled by clouds.

The electrical discharge from a planet is described very clearly by Pliny: “heavenly fire is spit forth by the planet as a crackling charcoal flies from a burning log.”<sup>[5]</sup> “It is accompanied by a very great disturbance of the air,” produced “by the birth-pangs, so to speak, of the planet in travail.”

Also Seneca discerns between “the lesser bolts” which seek “houses and undeserving homes” and the bolts of the planet Jupiter “by which the threefold mass of mountains fell.”<sup>[6]</sup>

In the Babylonian epic, the *Enuma Elish*, it is told how Marduk, or the planet Jupiter, “raised the thunderbolt, his mighty weapon. He mounted the chariot, the storm unequalled for terror. . . . With overpowering brightness his head was crowned.” He is also described as the planet-god “at whose battle heaven quaked, at whose wrath the Deep is troubled . . . in the bright firmament his course is supreme . . . with the evil wind his weapons blaze forth, with his flame steep mountains are destroyed. . . .”<sup>[7]</sup> A hymn to Marduk tells that “by his warfare the heaven resounds, before his anger the deep is shaken; before his sharp weapon the gods draw back.”<sup>[8]</sup>

The Egyptian pharaoh Seti described Amon as “a circling star which scatters its seed in fire . . . like a flame of fire . . . irresistible in heaven and in earth.”<sup>[9]</sup>

Brihaspati, or the planet Jupiter in Hindu astronomy, is invoked in the Rig Veda as one who “in destroying enemies cleaves apart their cities. . . . Brihaspati strikes the enemy with his thunderbolts.”<sup>[10]</sup> Shiva is called “wielder of the thunderbolt.”<sup>[11]</sup>

In *Worlds in Collision* the overpowering of one planet by another in conjunctions was quoted from the Hindu astronomical books; the electrical power which manifests itself in conjunctions is called *bala*. Jupiter as the strongest planet is a *bala*.<sup>[12]</sup>

### References

- 1.
2. Pliny, *Natural History*, transl. by J. Bostock and H. Riley (London, 1865), Book. II, ch. 18.
3. *Ibid.*, ch. 43.
4. *Ibid.*, II, 53.
5. *The Mystical Hymns of Orpheus*, transl. by Th. Taylor (London, 1846). [In the Iliad Homer calls Zeus “Lord of the bright lightning”; “even he [the ocean] hath fear of the lightning of great Zeus whenso it crashes from heaven.” (XX, 197f.) Hesiod recounts a battle among the planetary gods in which Zeus took an active part: “From heaven and from Olympus he came forthwith, hurling his lightning; the bolts flew thick and fast . . . whirling an awesome flame . . . It seemed as if Earth and wide Heaven above came together; for such a mighty crash would have arisen if Earth were being hurled to ruin and Heaven from on high were hurling her down.” It was in this battle the Zeus is said to have made use of his thunderbolts for the first time.]
6. *Natural History*, II, 18.
7. Seneca, *Thyestes*, transl. by F. J. Miller (1917), lines 1077ff.
8. King, *The Seven Tablets of Creation*, IV, 45f, 58.
9. Jastrow, *Die Religion Babyloniens und Assyriens*, Ch. XVII, p. 495. Jupiter was also known in Babylonia as Dapinu, “he of the dreadful glow” (Jensen, *Die Kosmologie der Babylonier*, p. 129). Marduk’s “word” causes “shuddering below” (Langdon, *Tammuz and Ishtar*, p. 112). Cf. idem, *Sumerian and Babylonian Psalms*, p. 41: “The word of Marduk is a flood which tears away the dikes.”
10. J. Breasted, *Ancient Records of Egypt* (Chicago, 1906), Vol. III, par. 117. The worship of Amon, as the planet Jupiter was called in the Theban cult, became supreme with the Eighteenth Dynasty. Cf. G. A. Wainwright, “The Relationship of Amon to Zeus and his Connection with Meteorites,” *The Journal of Egyptian Archaeology*, 16 (1930), pp. 35-38.
11. *Rig-Veda*, Mandala VI, 73, transl. by H. Grassmann, pt. I (Leipzig, 1876).
12. Dowson, *A Classical Dictionary of Hindu Mythology*, p. 296.
13. *Surya Siddhanta*, ch. VII (transl. by Burgess).



## Where a Planetary Bolt Struck the Ground

We recognize in the change in Jupiter's motion the cause of great catastrophes in the solar system which affected also the Earth in the age of the patriarchs, or at the close of the Old Kingdom. In that period Jupiter became the supreme deity, having removed Saturn from its orbit. Classical historians, speaking of the destruction of the Cities of the Plain, told of "fire from the sky." Tacitus narrated that the catastrophe of Sodom and Gomorrah was caused by a "thunderbolt"—the plain was "consumed by lightning"—and he added: "Personally I am quite prepared to grant that once-famous cities may have been burnt by fire from heaven." <sup>(1)</sup> Also Josephus asserted that the cities had been "consumed by thunderbolts." <sup>(2)</sup> Philo wrote that "lightnings poured out of heaven," <sup>(2)</sup> destroying the cities.

Since the time of Abraham was the period of Jupiter's domination that followed Saturn's and preceded that of Venus, we are led to the surmise that the thunderbolts which destroyed the plain with its cities originated from Jupiter, or from a magnetosphere or ionosphere overcharged by the nearby presence of the giant planet. Even today discharges leap between Jupiter and Io, one of its satellites. The charging of the Earth's atmosphere in the presence of Jupiter's huge magnetosphere prepared the way for a discharge: a planetary bolt struck the ground in the Valley of Sittim.

For a long time I thought that the destruction of Sodom and Gomorrah and other cities of the Plain resulted from an interplanetary discharge caused by Jupiter; classical historians speaking of this event told of "fire from the sky." The period was that of Jupiter's era of domination that followed that of Saturn and preceded that of Venus; and reference to the king and high priest Malki-zedek ("My King is Zedek," Zedek being the usual name of the planet Jupiter), in the days of the patriarch Abraham and of the destruction of Sodom and Gomorrah, seem to support my interpretation of the agent of the catastrophe. This very catastrophe caused the origin of the Dead Sea and also of the entire African Rift that extends from north of the River Jordan all the way through two thirds of the length of Africa. But, reading in 1960 of a reference to Professor Agrest, a Russian astronomer who thought that an atomic explosion had taken place, I saw some alluring points in it. If, as Prof. Agrest seems to assume, the three angels were extraterrestrial beings that followed Abraham from Mamre to Sodom and placed a time device in Sodom, the warning to Lot and his family to leave the place and not to turn their faces to the city they soon would flee, finds some parallels in the atomic age.

The observers of the first atomic explosion at Alamogordo, New Mexico were told, as was Lot and his family, not to look at the fission, but the wife of Lot looked; she may have been blinded—in the legend she turned into a pillar of salt.

At Alamogordo the observers were impressed, actually overwhelmed, by the tremendous light effect, even with their eyes closed. Next rose a pillar of smoke as if from a furnace (Genesis XIX: 28): Abraham "looked toward Sodom and Gomorrah, and towards all the land of the plain, and beheld, and, lo, the smoke of the country went up as the smoke of the furnace."

If the time of the event is asked to be determined, I would strongly question the implication that extraterrestrial visitors came to Earth as late as the end of the Old Kingdom of Egypt, for this is the time to which the age of the Patriarch Abraham belongs—and on this I would expand somewhere else.

Yet we are left with my original idea that goes back to the early forties—that the agent of the destruction was a bolt from Jupiter, or from the magnetosphere or ionosphere, overcharged by the nearby presence of the giant planet.

### References

1. *Histories V. 7*, transl. by K. Wellesley (London, 1964).
2. *The Jewish War IV. 480*.
3. *Moses II.53H*.



## The Origin of Nitrate Deposits

The Dead Sea, for many centuries proclaimed to be dead and capable of yielding nothing, is today one of the greatest reservoirs of natural nitrate under exploitation in the world, competing with the deposits of Chile.

The deposits of nitrate in Chile are found in a narrow strip over 1400 miles in length, in the great desert in the northern part of the country. The origin of the nitrates is a problem that has not been solved.

This is a moot question on which no two geologists agree . . . One [theory] is that in prehistoric times the entire nitrate zone was a part of the Pacific Ocean, and that through volcanic disturbances that portion of the sea was cut off and the water evaporated by a very slow process. Fish skeletons found in the caliche furnish good proof of this assertion, as does the fact that the Pacific coast is rising gradually. This theory is, however, contradicted by the fact that no bromine exists there—a substance naturally looked for in deposits thus formed.”

Another theory attributes the origin of the *caliche* to an electrical process. A passage of an electric spark through the moist air produces a combination of nitrogen and oxygen resulting in nitric acid. Electrical storms—a frequent occurrence in the Andes—may have acted in this way and formed great quantities of nitric acid. . . (1)

But thunderstorms occur in many other places all over the world, near and far from the sea, and yet there are no deposits of nitrates in these places.

“A later theory maintains that the deposits are an accumulation of land drainage brought down through ages from the highlands along the coast.” But how was it formed in the highlands of Chile? “Others explain the formation as the work of microbes, or as the result of the action of volcanoes discharging through their craters ammonia-charged steam there condensed.” But deposits of nitrates are not formed in other volcanic regions.

No explanation satisfied the chemists and geologists, and therefore new ideas were constantly launched. In the laboratory a very efficient method of building oxides of nitrates is applied: “passing air through a powerful electric arc, in which the nitrogen and oxygen of the air combine chemically to form oxides of nitrogen.” (2)

Nature is a great laboratory too. The Dead Sea region was the scene of an interplanetary electrical discharge when a powerful electrical spark leaped down from above or sprang up from the earth.

A similar event created the Chilean deposits of nitrates, and the recollections of the Incas of Peru preserved the memory of this grandiose discharge: “Fire came down from heaven and destroyed a great part of the people, while those who were taking to flight were turned into stones.” (2)

### References

1. Enrique Cuevas, transl. in P. G. Beery, *Stuff, The Story of Materials in the Service of Man* (1930), p. 41.
2. *Ibid.*, p. 43.
3. Christoval de Molina, *An Account of the Fables and Rites of the Yucas*, transl. and ed. by C. R. Markham (London, 1873). The chronicle is dated 1574. The event it refers to is said to have occurred “in Pucara, which is forty leagues from the city of Cuzco on the Collao road.



## The Transmutation of Oxygen into Sulphur

In the building of saltpeter, or potassium nitrate, the nitrogen of the air took a major part. How was the oxygen of the atmosphere affected by the interplanetary discharges?

It has been observed since ancient times that lightnings are attended by an odor of sulphur. In the twelfth book of the *Odyssey*, Homer says:

"Zeus thundered and hurled his bolt upon the ship, and she quivered from stem to stern, smitten by the bolt of Zeus, and was filled with sulphurous smoke." (1)

Again, in the *Iliad*: "When beneath the blast of father Zeus an oak falleth uprooted, and a dread reek of brimstone ariseth therefrom,—then verily courage no longer possesseth him that looketh thereon. . ." (2)

And: "[Zeus] thundered horribly and let loose the shimmering lightning and dashed it to the ground in front of the horses of Diomedes, and a ghastly blaze of flaming sulphur shot up, and the horses, terrified, both cringed away against the chariot." (3)

The same observation is put into a scientific prose by Pliny: "Lightning and thunder are attended with a strong smell of sulphur, and the light produced by them is of a sulphurous complexion." (4) The second part of Pliny's sentence is also correct: pioneer work on electrical discharges in modern times was produced using globes of sulphur in rotation. Sulphur is one of the best insulators and static electricity, when accumulated on it, discharges in electrical sparks toward objects brought close to it.

Electrical discharges produced without the help of sulphur are also accompanied by the smell of it. This odor was referred to by Benjamin Franklin who, comparing lightning and electricity, wrote to the Royal Society in London that both phenomena are attended by a sulphurous smell. This he mentioned among twelve other properties which suggested that lightning is an electrical discharge. No importance was attributed by him or by anyone else since to this sulphurous smell. The smell of ozone is different from the smell of vaporized sulphur or sulphurous compounds (5) and the supposition that the ancients were unable to distinguish between the two disregards the fact that besides the smell of ozone a sulphurous smell follows an electric discharge (6).

This suggests to me that sulphur is actually produced from the air by the passage of an electrical discharge. The quantity of sulphur must be detectable in a careful laboratory experiment.

Quite possibly the detection of sulphur produced by a strong electrical discharge, by means other than smell, has already been fulfilled. A very strong discharge of electricity passing through the air formed solid sulphur. The bolt of electricity that fell upon the plain of the Pentapolis was of a magnitude sufficient to cause a transmutation of elements on a great scale. It rained "brimstone and fire from the Lord out of heaven." The overturned plain became full of sulphurous deposits—"the whole land thereof is brimstone, and salt [probably potash], and burning" (7)—and when later in another great upheaval the plain became covered by the Dead Sea, sulphurous springs continued to flow into the valley of the Jordan and into the Dead Sea from submerged strata and from the springs on the shores.

At the end of the eighth century and the beginning of the seventh century before the present era, when every fifteen years Mars was approaching dangerously close to the Earth, Isaiah prophesied "the day of the Lord's vengeance," in which day "the streams [of Idumea] shall be turned into pitch, and the dust thereof into brimstone, and the land thereof shall become burning pitch." (8) A curse upon man and his land was that "brimstone shall be scattered upon his habitation." (9) "Upon the wicked he shall rain pitch, fire and brimstone, and a horrible tempest." (10) This eschatological vision was alive with Ezekiel in the days of the Babylonian Exile. He spoke about "an overflowing rain, and great hailstones [meteorites], fire and brimstone." (11)

These stories of sulphur raining from the sky and the fearful expectations built upon them could be taken as fictions of an imaginative mind, were not the smell of sulphur an indication of its presence in the air following the passage of a discharge, and were not also the presence of sulphur deposits around the Dead Sea, thrust in deep below the ocean level, a substantiation of the story of the cataclysm.

Is the atomic source of sulphur generated by a discharge in oxygen, or does the nitrogen of the air participate also in the building of sulphur? It seems more probable that two atoms of oxygen are smashed into one atom of sulphur. If the atomic weight of sulphur obtained by electrical discharge will be found to be more than 32 (that of sulphur is 32.06) it might be due to the presence of some atoms of oxygen of the atomic weight 17. This heavy oxygen is the product of a nitrogen atom transmuted by the bombardment of alpha particles. (12) We must reckon with the possibility that a proton from broken atoms of oxygen or ozone or nitrogen enters the new combination, or that electrons which cause the perturbation are able by themselves to change the atomic weight of the elements (13).

### References

1. *The Odyssey*, XII.
2. *The Iliad*, XIV.
3. *Ibid.*, VIII, 133-136, transl. by R. Lattimore (Chicago, 1951).
4. *Natural History* 25.50, transl. by Bostock and Riley.
5. Elemental sulphur is odorless.
6. W. J. Humphreys, *Ways of the Weather* (London, 1942), p. 243.
7. Deuteronomy 29:23.
8. Isaiah 34:9.
9. Job 18:15.
10. Psalm 11:6.
11. Ezekiel 38:22.
12. Rutherford:  $N^{14} + He^4 = O^{17} + \text{proton}^1$ .
13. In the late 1940s I asked Dr. A. V. Grosse whether it would be possible to create, by a strong discharge, an atom of sulphur from two atoms of oxygen. His answer was that, as soon as there would be developed cyclotrons capable of releasing two billion electron-volts of energy, sulphur could be made from oxygen. [Cf. also the comments of Frederic B. Jueneman in *KRONOS* VI.4 (1981), pp. 53-56.]



## Jupiter, Gold, and the Birth of Athene

Pindar, speaking of the island of Rhodes, says that Zeus "rained down on the city with golden flakes of snow" at the time Athene was born from Zeus' head, "shouting as a far-ripping cry, and all Heaven and Mother Earth shuddered before her." (1) Homer also says that "upon them [the people of Rhodes] wondrous wealth was shed by the son of Cronus." Strabo, after quoting Homer, adds that other writers "say that gold rained on the island the time when Athene was born from the head of Zeus, as Pindar states." (2)

Gold-bearing gravel—with ingots in it—originated from outside of the Earth and, if we should look upon the Greek legend of Zeus and the golden rain in Rhodes as containing revealing elements, then the ingots came from Jupiter. (3) It could be meteoric gold, and as to the origin the ancients could err; but the event happened in human memory, actually during the Early Bronze Age, or at its end. (4)

In 1866 a human skull was unearthed in the interior of Bald Mountain near Altaville, in Calaveras County, California. The skull of Bald Mountain was reported to have been found in the shaft of a gold mine, in a layer of auriferous (gold-bearing) gravel, beneath four layers of lava, each separated from the other by four layers of gravel. The skull did not differ in structure or dimensions from the skull of modern man; however, it was fossilized. (5) In the gold-bearing gravel of Calaveras were also unearthed fossilized bones of the mammoth, the great mastodon, the tapir, horse, hippopotamus, rhinoceros and camel, all extinct animals in pre-Columbian America. But geologically the layer in which it was found belongs to the Tertiary, and therefore a great embarrassment was in store for the geologists and evolutionists. They divide the strata according to the fossils found in them and hold that in the Tertiary there could have been no human beings, for it is an age before the advent of man. But we have seen in the case of the Dead Sea that the great upheavals ascribed to the end of the Tertiary took place at a much later time, actually in the time of the Patriarchs, which is the end of the Early Bronze Age period. The auriferous gravels of California and of the Ural Mountains had their origin at this same time.

The rain of gold on Rhodes is assigned by Pindar to the time when Athene was born from the head of Zeus. The expulsion of the protoplanet Venus from the body of Jupiter followed, by decades or by centuries, the contact of Saturn and Jupiter, and the fantasy of the peoples regarded Venus as a child of Jupiter, conceived to him by Saturn.

The ancient Persians called Venus Tishtrya, "a magnificent and glorious star which Ahura Mazda [i.e., Jupiter] has established as master and overseer of all the stars." (6) Plutarch described the events in the following terms: "Then Hormozdes [Ahura Mazda], having magnified himself to three times his size, removed himself as far from the sun as the sun is distant from the earth . . . and one star, *scirys* [i.e., Tishtrya, or Venus] he established above all others as a guardian and watcher." (7)

## References

1. Pindar, *The Seventh Olympian Ode*, transl. by L. R. Farnell (London, 1930), p. 35.
2. Strabo, *Geography*.
3. [On another occasion Zeus is said to have come to Danae, the mother of Perseus, in the form of a shower of golden rain. See Hyginus, *Fabulae* 63; Apollodorus, *The Library* II. 4. 1; Horace, *Odes*, III. 16. 1. Cf. L. Radermacher, "Danae und der goldene Regen," *Archiv fuer Religionswissenschaft* 25 (1927), pp. 214ff. Cf. Pindar's twelfth Pythian and seventh Isthmian odes. A fragment of a lost play of Sophocles (1026) designates Zeus as "chrysomorphos"—having the form of gold. Rains of gold are reported also in the Chinese chronicles. See Abel Rémusat, *Catalogue des bulides et des aéroolithes observés a la Chine et dans les pays voisins* (1819), p. 6. The Scythians are said by Herodotus (IV. ) to have venerated certain golden objects which they believed had fallen from the heavens in early times. In the sacred texts of the Hindus it is said that "gold belongs to Brihaspati." Brihaspati is the planet Jupiter. *The Maitrayani Samhita* I. 18. 6. Cf. S. Bhattacharji, *The Indian Cosmogony* (Cambridge, 1970), p. 318.]
4. [It is a remarkable fact that gold appears only in very recent geological formations. Sir Roderick Impey Murchison dedicated chapter XVII of his geological opus *Siluria* to this phenomenon: "On the Original Formation of Gold and Its Subsequent Distribution in Debris over Parts of the Earth's Surface." He argued, on the basis of his field observations in northern Russia, that gold is of recent origin:

Whatever may have been the date when the rock was first rendered auriferous [gold-bearing], the date of this great superficial distribution of gold is clearly indicated. For it contains in many places the same remains of extinct fossil quadrupeds that are found in the coarse drift-gravel of Western Europe. The elephant primogenius, or Mammoth, bos aurochs, rhinoceros tectorhinus, with gigantic stags, and many other species, including large carnivores, were unquestionably before that period of destruction the denizens of Europe and Siberia.

The period of the distribution of gold in the late Pleistocene strata was that of the mass extinctions of the great quadrupeds at the end of the last ice age, next Murchison tried to determine the time when the rocks were first "impregnated with gold." He wrote:

Now, it would seem as if these rocks, in the Ural, have been chiefly impregnated with gold, in a comparatively recent period. In the first place, the western flank of the Ural chain offers strong evidence that this golden transmutation had not been effected in this region when the Permian deposits were completed.

No sign of gold was found in these older strata.

Nowhere does it [the Permian debris] contain visible traces of gold or platinum. Had these metals then existed in the Ural mountains, in the quantities which now prevail, many remnants of them must have been washed down together with the other rocks and minerals and have formed part of the old Permian conglomerates. On the other hand, when the much more modern debacles, that destroyed the great animals, and heaped up the piles of gravel above described, proceeded from this chain, then the debris became largely auriferous. It is manifest therefore that the principal impregnation of the rocks with gold—i.e., when the lumps and strings of it were formed—took place in the intervening time.

Sometime between the Permian and the last ice age some event resulted in the infusion of the rocks with gold. Murchison tried to fix the time more precisely:

We cannot believe that it occurred shortly after the Permian era, nor even when any of the secondary rocks were forming; since no golden debris is found in any of the older Tertiary grits and sands which occur in the Siberian flank of the chain. If, then, the mammoth drift be the oldest mass of detritus in which gold occurs abundantly, not only in the Ural, but in many parts of the world, we are led to believe that this noble metal, though for the most part formed in ancient crystalline rocks, or in the igneous rocks which penetrated them, was only abundantly imparted to them in a comparatively recent period—i.e., a short time (in geological language) before the epoch when the very powerful and general denudations took place which destroyed the large extinct mammals.

In another work of his, *The Geology of Russia and the Ural Mountains*, Vol. 1 (London, 1845), p. 473, Murchison presented his conclusions about the geological events which accompanied the deposition of gold:

. . . We conclude that the [Ural] chain became (chiefly) auriferous during the most recent disturbances by which it was affected, and that this took place when the highest peaks were thrown up, when the present watershed was established, and when the syenitic eranic and other comparatively recent igneous rocks were erupted

along its eastern edges.

Murchison, one of the founders of modern geology, insisted that it was during a major geological upheaval that gold became part of the rocks—it was the time of mountains being “thrown up” and molten rock flowing, before solidifying into granite. Murchison next wondered about the “agency” which deposited the gold in the mountains of the Ural and elsewhere. As a geologist he observed that “the material has been chiefly accumulated towards the surface of the rocks, and then by the abrasion and dispersion of their superficial parts, the richest golden materials have been spread out. . . .” (*Siberia*, p. 455). This last observation is of fundamental importance, in that since the gold was deposited close to the surface, it could not have come from inside the earth.]

5. J. D. Whitney, *The Auriferous Gravels of the Sierra Nevada of California* (1880), pp. 268-269.
6. *Yasht* 8: 44.
7. *De Iside et Osiride*, ch. 47.

