VI.

Temples and places of sacrifice on top of catastrophic layers

"The varied cosmogonies which I interrogated, affirm with a single voice that the surface of Earth was destroyed by fire and by water. It seemeth, that the variety of the traditions merely derives from the variety of the lands in which the peoples lived./ We have noticed further that these old festivities [rituals] are tied to a theology in the allegorical language, which we call mythology. In this very same, the misfortunes of the earthly surface are commonly represented through symbols and images, in which one can merely make out lucky or unlucky adventures of the gods, their wars, encounters, victories, and the good and evil which they have brought onto man."[1]

If the kingship of the sacrificial priests landed on Mesopotamian soil, after the Flood had washed over it,[2] one should be able to follow its trace archaeologically. Moreover, the connection between catastrophe and the emergence of sacrifice, if it can indeed be supported, must be supported by other sources. We may call upon the so-called "Flood-story" in Akkadian cuneiform to document this connexion:

> "My race of humans, through its *destruction*, I want to...,
> To Nintu I want to return the... of my creatures,
> I want to return the people to their dwelling places.
> From these towns they shall *build the [cultic]places of the godly laws,/*
> After the... kingship was brought down from heaven,
> After the lofty crown and the throne of kingship
> had been descended from Heaven
> he fulfilled the cults and the exalted laws of the gods...,
> he founded the five cities on... unblemished sites
> gave them a name and attributed them as *centers of the cult*."[3]

---

[1] N.-A. Boulanger, *Das durch seine Gebräuche aufgedeckte Altertum: Oder Kritische Untersuchung der vornehmsten Meynungen, Ceremonien und Einrichtungen der verschiedenen Völker des Erdbodens in Religions- und bürgerlichen Sachen* (1766), Greifswald: Anton Ferdinand Rösens Buchhandlung, 1767, p. 533/ 100 f.

[2] See T. Jacobsen, *The Sumerian King List*, Chicago: University of Chicago Press, 1939, p. 71, 77

[3] Compare with S. N. Kramer, *History Begins at Sumer: Thirty-Nine Firsts in Man's Recorded History,* Philadelphia: University of Pennsylvania Press, 1981, p. 149, my emphasis: "My mankind, in its destruction I will
To Nintu I will return the ... of my creatures,
I will return the people to their Settlements,

The “destruction” through “flood,” to which humans reacted by creating the first cultic places and the first sacrificial temples, was not the only catastrophe of the Bronze Age. Mesopotamia was devastated several times. After another such catastrophes “the priestly kingship was moved to Kish.”[4] When this town was excavated in the years 1922 to 1933, the Anglo-American team of archaeologists discovered a flood layer. Upon this, they found the remains of the so-called early-dynastic Period I, that is, the first post-Stone Age, respectively First Bronze Age phase with royal sacrificial priests, which archaeologically defines the beginning of human high culture.[5] Since then, further excavations have “shown that the old-sumerian, or early dynastic civilization of the third millennium follows in various important sites upon considerable flood layers - among others in Shurrupak, Kish and Uruk... These layers put a close to the last prehistoric [Age of Copper] period.”[6]

The first investigation of the material uncovered by Woolley, which had smothered Late-Stone-Age settlements, was undertaken by Watelin, an excavator of Kisch, using the flood sediments of Ur: “Fresh-water silt, which contains but elements which one must expect from the waters of the Euphrates,”[7] such is his pronouncement. Yet, there is puzzlement at the “absence of shells of fresh-water mollusks, as well as the lack of sea organisms and the presence of only one land mollusk.”[8]

The sterility of the flood-layer seems incomprehensible because an inundation which leaves behind 370 centimeters of silt must have been all-encompassing and have dragged with it many live creatures. Even more disturbing appear the geological findings

---

Of the cities, verily they will their place of (divine) ordinances/
After the ... of kingship had been lowered from heaven,
After the exalted tiara and the throne of kingship had been
lowered from heaven, He perfected the rites and the exalted divine laws...,
Founded the five cities in ... pure places, Called their names, apportioned them as *cult centers.»*

See also J. B. Pritchard (ed.), Ancient Near Lastern Texts Relating to the Old Testament, Princeton: Princeton University Press, 1969, p. 43.

[4] See T. Jacobsen, *The Sumerian King List,* Chicago: University of Chicago Press, 1939, p. 77.

[5] See M. Gibson, «Kis. B. Archäologisch», in: *Reallexikon der Assyriologie,* Bd. 5, Berlin und New York: Walter de Gruyter, 1976-80, p. 618.

[6] N. K. Sandars, *The Epic of Gilgamesh,* Revised Edition, Harmondsworth: Penguin Books, 1972, p. 14; cf. to the stratigraphic situation in Northern Iraki Kharabeh Schattani in T. Watkins, «Kharabeh Shattani: An Halaf culture exposure in Northern Iraq», Centre National de la Recherche Scientifique (ed.), *Préhistoire de la Mésopotamie,* Paris: Edition du Centre National de la Recherche Scientifique, 1987.

[7] Cf. L. Woolley, *Ur Excavations. Vol. IV: The Early Periods,* Oxford: Oxford University Press, 1955, p. 15.

[8] Cf. V. Malycheff, «Analyse des Limons de Kish et d'Ur», *L'Anthropologie,* vol. XLI, 1931, p. 271.

that the waters of the Schatt-el-Arab, around which the flooded settlements were set, contains practically no silt at all.[9] As a result, the theory of an uncommonly strong, but otherwise entirely natural swelling of the waters as the origin of the silt must be abandoned. Even if silt were present, the speed of flow of the ripping river should "practically prevent the accumulation of silt."[10] "The enormous thickness of the deposits in Ur, superior to 3m, and in Shurrupak, of probably some 60cm, is significant as very long enduring lagunary conditions must have been necessary for its formation."[11] Why no mollusks are to be found there is then unfathomable.

In view of these facts, the theory of an inundation had to be abandoned. Instead, the theory of an accumulation of windborne silt was taken up. Yet the fact that the silt is different "from today's desert sand,"[12] from which it is supposed to have been lifted, speaks against it. Besides, "the total absence of somehow larger, round particles, which appear normally in wind deposits,"[13] is troubling.

With this, flood scholarship came to a full stop. The scholars started anew, from the beginning. They now speculated about a "capture of the [deposit bearing] water through the operation of a hitherto not identifiable phenomenon."[14] Even a downward movement of Mesopotamia "by ten to one hundred meters in a vertical direction" to below sea level, to which "a rise followed,"[15] has furnished a scenario for the deposits. Such a tremendous geological catastrophe could explain the thickness of the deposits. But then the presence of sea organisms should substantiate it, and this is not the case. Therefore this thesis is very prudently presented as being "only one among many possible explanations."[16] Yet, of the other many possible explanations, none has been imparted. The pendulum of silt studies could be made to swing back to the 1920s or 1930s, when a

---

[9] Cf. G. M. Lees, M. L. Falcon, «The Geographical History of the Mesopotamian Plains», *Geographical Journal*, vol. CXVIII, Part 1,1952.

[10] R. L. Raikes, «The Physical Evidence of Noah's Flood», in: *Iraq*, vol. XXVIII, 1966, p. 60.

[11] R. L. Raikes, «The Physical Evidence of Noah's Flood», in: *Iraq*, vol. XXVIII, 1966, p. 53.

[12] Cf. Forbes in Appendix VI von L. Woolley, *Ur Excavations. Vol. IV: The Early Periods*, Oxford: Oxford University Press, 1955, p. 160 f.

[13] Cf. M. E. L. Mallowan, «Noahs Flood Reconsidered», in: *Iraq*, vol. XXVI, 1964, p. 73.

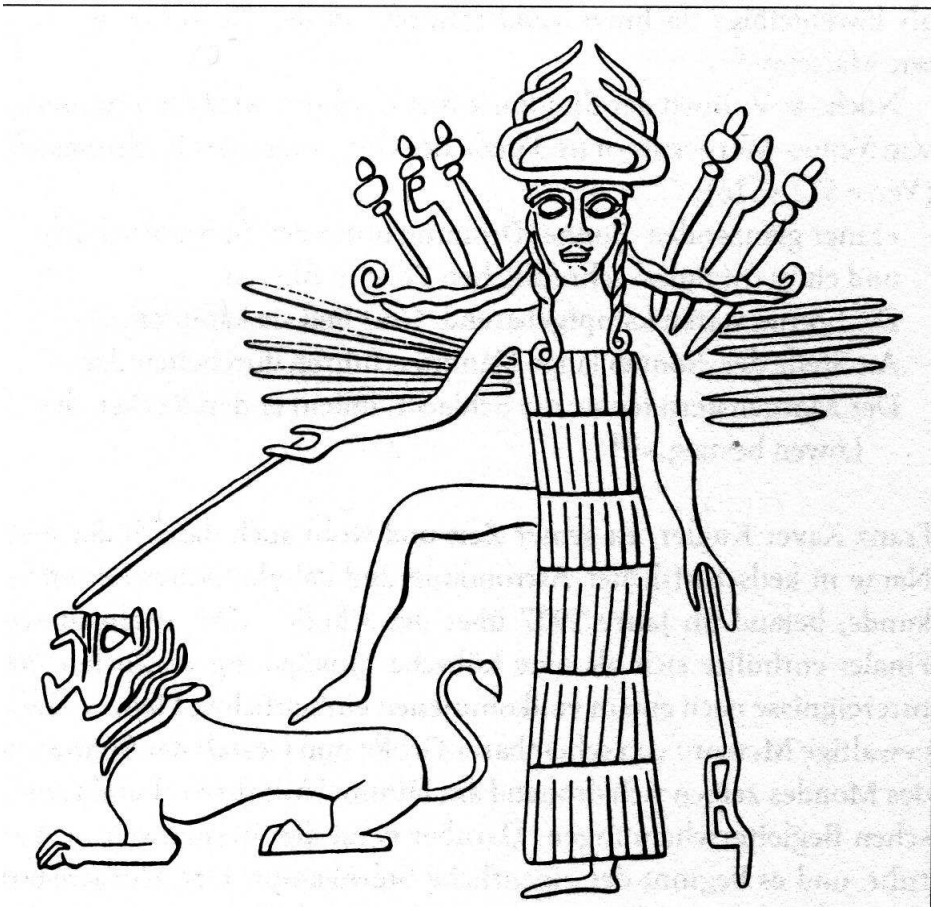
[14] Cf. R. L. Raikes, «The Physical Evidence of Noah's Flood», in: *Iraq*, vol. XXVIII, 1966, p. 62.

[15] Cf. R. L. Raikes, «The Physical Evidence of Noah's Flood», in: *Iraq, vol.* XXVIII, 1966, p. 62.

[16] Cf. R. L. Raikes, «The Physical Evidence of Noah's Flood», in: *Iraq, vol*. XXVIII, 1966, p. 62.

cosmic origin of this type of soil was held as quite possible among geologists[17] and astronomers.[18] From a comet of the type “dirty snowball” one might expect massive and relatively sterile dejections.

One heavenly object, most often perceived as female, named Inanna, Ishtar, Nintu etc., who as a queen of heaven can often not be distinguished from the heavenly serpent and was simultaneously equated to Venus, the Evening- and the Morningstar[19] appears in early myths as a co- or main culprit for the Flood disasters to which the technologically remarkable culture of the late Stone Age, with its first seals and its copper metallurgy, fell victim.



[17] K. Keilhack, «Das Rätsel der Lößbildung», in: *Zeitschrift der deutschen geologischen Gesellschaft*, vol. 72, Nr. 6 und 7,1920.

[18] Cf. J. B. Penniston, «Note on the Origins of Loess», in: *Popular Astronomy,* vol. 39, 1929, p. 429ff.; J. B. Penniston, «Additional Note on the Origin of Loess», in: *Popular Astronomy,* vol. 51,1943, p. 170ff. 39, 1929, p. 429ff.; J. B. Penniston, «Additional Note on the Origin of Loess», in: *Popular Astronomy,* vol. 51,1943, p. 170ff.

[19] Cf. J. Black, A. Green, *Gods, Demons and Symbols of Ancient Mesopotamia: An lllustrated Dictionary,* London: The Trustees of the British Museum, 1992, p. 109.

Ill.10: Assyrian representation of Inanna/Ishtar in a warrior-pose with a curved sword, about to mount (the constellation of) the Lion.[20]

In the epic "Atra-Hasis" it is said: "However could I ordain in the assembly of the gods total destruction, wept she, after the force of the Flood had descended [like a combat formation] upon mankind."[21] In Egyptian myth, the goddess appears as Hathor "and she slew the humans in the desert" or also as the lioness-bodied Sekhmet "and she stomped in the darkness her blood to mash."[22]

In Book V. of the *Sibylline Oracle*[23], the prominence of Venus-the Morning Star is expounded in the finale of the battle of the gods (verse 512-516):

> "I saw the threat of a brilliant 'Sun' among the stars
> and of a 'Moon's' terrible fury in lightning-flashes.
> The stars gave birth to the battle. God let them fight.
> The Morning Star directed the battle, by mounting on the back of the Lion."[24]

Franz Xaver Kugler, the foremost name in cuneiform astronomy and Babylonian astronomy, in his own time as well as later, opined in 1927 about the *Sibylle:* "The 'insane finale' revealed itself as a pretty disguise of true natural events following of perfectly uniform plan... Two large meteorites of the same apparent size and shape to the Sun and the Moon appear threateningly in the sky, with their characteristic, accompanying displays. At this, the world of the stars enters in upheaval and the true star battle begins. The Morning Star (Venus) standing on the back of the Lion, gives the start

---

[20] Cf. J. Black, A. Green, *Gods, Demons and Symbols of Ancient Mesopotamia: An lllustrated Dictionary,* London: The Trustees of the British Museum, 1992, p. 108.

[21] Cf. W. G. Lambert, A. R. Miliard, *Atra-Hasis: The Babylonian Story of the Flood,* Oxford: Clarendon Press, 1969, p. 95. «How did I, with them, command total destruction, she wept after the flood's might came upon the people [like a battle array]».

[22] Cf. J. B. Pritchard (ed.), *Ancient Near Eastern Texts Relating to the Old Testament,* Princeton: Princeton University Press, 1969, p. 11. «Slew mankind in the desert»; «the [beer-]mash of the night, to wade in their blood».

[23] Cf. generally on this type of text H. W. Parke, *Sibyls and Sibylline Prophecy in Classical Antiquity,* ed. by B. C. McGing, London und New York: Routledge, 1988.

[24] Cf. F. X. Kugler, *Sibyllinischer Sternkampf und Phaethon in naturgeschichtlicher Beleuchtung,* Münster I. W.: Aschendorffsche Verlagsbuchhandlung, 1927, p. 11,13.

of the battle... The stars which, at the beginning of the battle, dominated the morning sky, finally sink into the Ocean and in so doing, they set the Earth a-fire."[25] Over half a century went by before a convergence towards these views occurred within the sciences of antiquity.[26]

Practically no other old-oriental deity of the old-oriental god-heaven was as important and terrible as Ishtar. In the Gilgamesh epic she is given special prominence (table XI, 103-130):

"The Annunaki raised the torches,
to set fire to the land with their frightening shine.
The deadly silence of Adad covers the sky,
all that was light turned into darkness.
The [wide] land broke like a pot,
for one full day the south storm [raged],
with fullest speed it blew and [...].
Like a battle came [over mankind the waters]:
one cannot see the other,
men cannot be made out in the rain.
The gods themselves feared the Flood,
they shied away and fled to the heaven of Anu.
The gods are like dogs who lie outside, huddled together.
Ishtar wails like a woman giving birth,
she screams, the queen of the gods, the sweet-voiced one:
the former times have forsooth turned to mud,
because I gave evil commands in the assembly of the gods.
How could I have ordered evil in the assembly of the gods!
I myself give birth to my mankind,
then they fill up like the sea with fish.
The Annunaki-gods wail with her,/
for six days and seven nights
there rage the wind, the flood, the storm from the south and bring the land to its knees.

When there came the seventh day, the Storm from the South, the Flood retired from the battle,

The sea, which had flailed around itself like a woman giving birth,

---

[25] F. X. Kugler, *Sibyllinischer Sternkampf und Phaethon in naturgeschichtlicher* Beleuchtung, Münster i. W.: Aschendorffsche Verlagsbuchhandlung, 1927, p. 9f.

[26] See W. v. Engelhardt, «Phaetons Sturz - ein Naturereignis?», *Sitzungsberichte der Heidelberger Akademie der Wissenschaften. Mathematisch-Natur-wissenschaftliche Klasse*, 1979, p. 161-199.

quieted down, the storm subsided, the Flood stopped."[27]

An hymn to Ishtar should suffice here to underscore her exceptional cataclysmic role in the Ancient Orient:

"Proud queen of the gods of Earth, most exalted among the gods of Heaven,
Loudly thundering storm, which pours its water over all lands and all peoples.
You make the heaven shiver and the Earth quake./
You shine like lightning over the mountains; your torches you fling upon Earth.
Your deafening orders command, they howl like the South winds, they tear open the highest mountains.
You trample the disobedient like a wild bull: Heaven and Earth shake./
Your frightful roar bellowing from heaven consumes its victims./
Holy Inanna, the banks of the river are inundated by the waves welling from your

---

[27] Compare M. G. Kovacs, *The Epic of Gilgamesh,* Stanford: Stanford University Press, 1989, p. 100f.:

The Annunaki lifted up the torches;
setting the land ablaze with their flare
Stunned shock over Adad's deeds overtook the heavens
and turned to blackness all that had been light.
The [...] land shattered like a f...] pot.
All day long the South Wind blew […],
blowing fast, submerging the mountain in water,
overwhelming the people like an attack.
No one could see his fellow,
they could not recognize each other in the torrent.
The gods were frightened by the Flood,
retreated, ascending to the heaven of Anu.
The gods were cowering like dogs, crouching by the outer wall.
Ishtar shrieked like a woman in childbirth,
the sweet-voiced Mistress of the Gods wailed:
‘ The olden days have alas turned to clay,
because I said evil things in the Assembly of the Gods!
How could I say evil things in the Assembly of the Gods,
ordering a catastrophe to destroy my people?
No sooner have I given birth to my dear people
than they fill the sea like so many fish!
The gods - those of the Annunaki- were weeping with her,
Six days and seven nights came the wind and flood,
the storm flattening the land. When the seventh day arrived,
the storm was pounding, the flood was a war-
struggling with itself like a woman writhing (in labor).»

Also in German with reference to K. Hecker, W. G. Lambert, G. G. W. Müller, W. v. Soden, A. Ünal, *Texte aus der Umwelt des Alten Testaments. Band III. Lieferung 4: Weisheitstexte, Mythen und Even II,* Gütersloh: Gütersloher Verlagshaus, 1994, p. 732f. As well as H. Gressmann et al. (Ed.), *Altorientalisehe Texte zum Alten Testament,* Berlin und Leipzig: Walter de Gruyter & Co., 1926, p. 178.

heart."[28]

In Uruk, for instance, the earliest "Inanna-symbols in the form of little animal figures"[29] were excavated directly above a destruction level in the Eanna complex and show how intensively the survivors dealt with her. Let's now have a look (see list page xxx) at the survey of the archaeologically detectable catastrophes of the Bronze Age, in order to then return to the question of how mankind dealt with the cataclysms, i.e. why it produced in response sacrificial cults, temples and priests.

Archaeologically established signs of catastrophes in Bronze Age Mesopotamia.[30] (The period here represented is dated according to the dominant research - not entirely accepted by the author - between the late 4. And the late 3.rd Millennia; cf. In order to avoid a chronology debate that is irrelevant at this point to the notes 81 to 128.)

The *myth of the dying savior god*, of the *virgin birth* and the *Madonna with Child*[31] begins to be popular in the so-called late Sumerian culture.[32]

Last destruction level with the collapse of the Ziggurat of Kish ("red stratum") and the demise of the Old-Akkadian empire.

---

[28] Cf. D. Wolkstein, S. N. Kramer, *Inanna: Queen of Heaven and Earth. Her Stories andHymns from Sumer,* New York et al.: Harper & Row, 1983, p. 95.

Proud Queen of the Earth Gods, Supreme Among the Heaven Gods/Loud Thundering Storm, you pour your rain over all the lands and all the people. You make the heavens tremble and the earth quake. / You flash like lightning over the highlands; you throw your firebrands across the earth. Your deafening command, whistling like the South Wind, splits apart great mountains./You trample the disobedient like a wild bull; heaven and earth tremble. / Your frightful cry descending from the heavens devours its victims. / Holy Inanna, the riverbanks overflow with the Flood-waves of your heart.»

[29] See E. Porada, «The Relative Chronology of Mesopotamia. Part I: Seals and Trade (6000-1600 B. C.)», in: R. W. Ehrich (ed.), *Chronologies in Old World Archaeology,* Chicago und London: The University of Chicago Press, 1965, p. 156.

[30] Cf. C. F. Schaeffer, *Stratigraphie comparée et Chronologie de l'Asie Occidentale (III^c et II^c millénaires)*, London: Oxford University Press, 1948; M. E. L. Mallo-wan, «Noahs Flood reconsidered», in.- *Iraq,* vol. XXVI, 1964; T. Watkins, «Khara-beh Shattani: An Halaf culture exposure in Northern Iraq», Centre National de la Recherche Scientifique (ed.), *Préhistoire de la Mésopotamie,* Paris: Edition du Centre National de la Recherche Scientifique, 1987, s. 221 ff.; G. Heinsohn, «Destruction Layers in Archaeological Sites: The Stratigraphy of Armageddon», in: M. Zysman, C. Whelton (ed.), *Catastrophism 2000,* Toronto: Heretic Press, 1990, s. 213-247; H. Weiss et al., «The Genesis and Collapse of Third Millennium North Mesopotamian Civilization», in: *Science,* vol. 261, 20. August 1993, p. 995ff. Cf. also N. Dalfes, G. Kukla, H. Weiss (ed.), *Third Millennium BC Climate Change and Old World Social Collapse,* Berlin: Springer, 1997.

[31] Cf. already A. Jeremias, *Das Alte Testament im Lichte des Alten Orients* völlig erneuerte Auflage, Leipzig: J. C. Hinrichs'sche Buchhandlung, 1930, p.790 ,

[32] About possibly earlier appearances of the goddess with infant god, cf. W. Helck, *Betrachtungen zur großen Göttin und den ihr verbundenen Gottheiten,* München und Wien: R. Oldenbourg, 1971, p. 28ff. Cf. M. E. L. Mallowan, «The Early Dynastie Period in Mesopotamia», in: *The Cambridge Ancient History. Third Edition. Volume I. Part 2. Early History of the Middle East* (1971), Cambridge et al.: Cambridge University Press, 1980, p. 305.

Bronze Age/Early Dynastic IIIb and Old-Akkadian with iron knives[33] (Chagar Bazar, Tell Asmar)

Flood- or Destruction layer established in Ur and Kish; sterile deposit under limestone temple in Urus.

Bronze Age/Early Dynastic II/IIIa with begin of archaic cuneiform writing.

Flood- or destruction layer established in Ur and Kish.

Bronze Age/Early Dynastic I with continuation of priest-kingship and pictographic writing.

Flood- or Destruction layer established in Ur, Shurrupak (Fara) and Kish.

Bronze Age/Urus period with beginning of temple-terraces and priest-kingship, pictographic writing and Ishtar symbols.

Flood- or Destruction layer established in Ur, Kharabeh Sdhattani and (possibly) Kish.

Chalcolithic/Ubaid (last Stone Age layer, in which seals are employed, but writing and priest-kingship are still missing).

After the Bronze Age, catastrophes of a global extent are no longer to be made out on Earth. The end of the Bronze-Age with its dramatic climatic switch produced by " a sudden and steep increase of CO 14 in the atmosphere"[34] is dated in one of the most acribically studied territory in the world - the Netherlands - to 2650 years B.P., therefore, into the 7th century B.P.

According to contemporary documentary evidence, it is only in 1178 A.D. that a cataclysmic event of high magnitude is again observed from Earth, when an asteroid impacted the Moon and possibly created the Giordano Bruno crater in the process.[35] In the early 14th century, which after the so-called Small Ice Age (from 1301/1303) fell victim to the Black Death (1348-52) the contemporaries reported, in startling numbers and agreement, of dreadful signs in the heavens. Much more, probably, than the plunging of Earth into the tail of a comet did not happen then. Nevertheless astronomers of renown have attempted to explain the susceptibility to the plague epidemic by chemicals contained in this dust.[36]

The most recent serious cosmic impact to which Earth was subjected happened in

---

[33] Cf. M. E. L. Mallowan, «The Early Dynastie Period in Mesopotamia», in: *The Cambridge Ancient History. Third Edition. Volume I. Part 2. Early History ofthe Middle East* (1971), Cambridge et al.: Cambridge University Press, 1980, p. 305.

[34] Cf. B. van Geel, J. Buurman, H. T. Waterbolk, «Archaeological and Palaeological Indications of an Abrupt Climate Change in the Netherlands, and Evidence for Climatological Telecommunications around 2650 BP», in: *Journal of Quaternary Science*, vol. 11,1996, p. 275.

[35] Cf. J. Hartung, «Was the Formation of a 20-km-Diameter Impact Crater on the Moon Observed on June 18,1178?», in: *Meteoritics*, Nr. 11,1976, S. 187

[36] See F. Hoyle, N. C. Wickramasinghe, *Diseases from Space*, London et al.: J. M. Dent & Sons, 1979.

1908 above the Siberian Tunguska River. A mysterious "shock-wave from an explosion" of the power of twenty hydrogen bombs created by a bolide having intruded into the atmosphere above West China, and which came down 2000km farther to the North-East, had flattened many hundred square kilometers of forest.[37] One "contemporary who sat in his veranda in the small industrial town of Wanawara 60km to the South of the impact was 'thrown several meters away, felt a blow of strong heat and fainted.'"[38]

Since the beginning of the 1990s, the solar system is systematically searched for asteroids, evtl. for "Doomsday-comets,"[39] which might hit the Earth. Such bodies of a diameter of ca one to two kilometers are held to be extremely rare; an impact on Earth is currently expected every 100,000 years. In the years 1991 and 1992 asteroids have passed the earth at a distance of just over 170,000 kilometers which is nevertheless considered to be "a rather close shave."[40] Even without catastrophes, it is estimated that yearly up to 200,000 tons of cosmic material fall on Earth.[41]

Since the impact of Shoemaker-Levy on Jupiter in July 1994 alertness has considerably increased. Considering that this comet had only a diameter of between 500 and 700m yet that it "trailed gigantic fireballs and enormous amounts of dust, which are still [October 1995] are partly visible in Jupiter's atmosphere,"[42] danger-planning has meanwhile be again expanded. The increased attention stems from the fact that bodies of up to 500m diameter occur ten times more frequently than chunks of over one kilometer. Somewhat smaller bodies could impact every 50 or 100 years.[43] Therefore four high resolution observatories are to be positioned all over the world, exclusively dedicated to

---

[37] See J. Ganapathy, «The Tunguska Explosion of 1908: Discovery of Meteoric Debris Near the Explosion Site and at the South Pole», in: *Science,* vol. 220,1983, p. 1158ff.

[38] Cf. H. R. Shaw, *Craters, Cosmos and Chronicles. A New Theory of Earth,* Stanford / CA: Stanford University Press, 1994, p. 429; for the quote within the quote cf. E. L. Krinov, «The Tunguska and Sikhote-Alin Meteorites», in: B. M. Middlehurst, G. P. Kuiper (ed.), *The Moon, Meteorites, and Comets,* Chicago: The University of Chicago Press, 1963, p. 210.

[39] Cf. D. 1. Steel, *Rogue Asteroids and Doomsday Comets,* London: Wiley & Sons, 1995.

[40] Cf. S. Knight, «Watching Out for Doomsday. An Asteroid Heads Towards the Earth: Sarah Knight Meets the Scientists Who Are Watching the Sky», in: *Elan,* 26.-28. July 1991, p. 16.

[41] Cf. D. I. Steel, *Rogue Asteroids and Doomsday Comets,* London: Wiley & Sons, 1995, p. 91

[42] Cf. N. Hawkes, «How Great Is the Threat from Comets? Danger from Deep Space», in: *The Times, 2.* October, 1995, p. 18.

[43] A. Irwin, «Scientist Calls for Meteor Monitor», in: *The Times Higher Education Supplement,* 6. October 1995.

searching for such impact candidates.[44]

A propos of the Hale-Bopp comet, the magazine *Science* (28.3.1997, Vol. 275, nr 5308) published seven articles and, together with the *New York Times* (1. 4. 1997, "Gifts of the Comet," W. Y. Broad) undertook to enlighten the general public with a new vision of Earth. It was no longer an Earth which turned itself inside-out and then miraculously outside-in which accounted all by itself for the creation of geological formations as well as for the creation and mutation of living forms. These had supposedly been accomplished by elements carried by comets, such as water, methanol, carbon monoxide, formaldehyde, hydrogen-cyanide and hydrogen sulfite, as well as silicates and sea salt. Bioastronomy was taking on the place of Biology and Geology. Mavericks such as Keilhack, Penniston or Zynman (see note 247, 248 and 179) advanced overnight to becoming ancestors of a research science freed of ideology.

[44] Cf. generally N. Hawkes, «How Great Is the Threat from Comets? Danger from Deep Space», in: *The Times, 2.* October 1995, p. 18.