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by

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How I Arrived at My Concepts

I have often been asked to explain how I arrived at the concepts expressed in my books. I shall try to tell the story as briefly as possible.

I think that it was at my fortieth birthday (1935) that my father gave me as a present the Hebrew book by Bar-Droma, *Negeb* ("The South"). Busy as I was with medical practice, I did not read the book, and only opened it at a few places and chanced to read that according to somebody's view, Mt. Sinai was a volcano.

In the summer of 1937 I was in Paris to read a paper at the International Psychological Congress. In the Bibliotheque Nationale I read the articles of Freud in *Imago* about Moses. When in the Spring of 1939 the articles appeared as a book, *Moses and Monotheism*, I bought a copy in a Tel-Aviv bookstore. The reading of this book brought me to the surmise that pharaoh Akhnaton, who Freud thought to be the originator of monotheism and a teacher of Moses, was in fact the prototype of Oedipus of the Greek legend. In a few weeks I had a rather convincing list of supporting evidence, but the meager Tel-Aviv library did not suffice for the kind of research I needed to do. I planned a sabbatical year in the United States to write a book on "Freud and his Heroes." I arrived there with my family on the eve of World War II. The next eight months I spent in the Public Library on Forty-second Street in New York, reading on the subject, mostly the Egyptological material on the el-Amarna period. At the very beginning of these efforts, the Egyptologist Otto Ranke (whom I met at the Metropolitan Museum of Art in New York) gave me some guidance, yet tried strongly to dissuade me from pursuing my subject. However, I persisted.

At the beginning of April, 1940, we intended to return to Palestine, but at the last moment decided to remain a little longer. About that time, discussing with Dr. Gruenbaum, a rabbinical scholar who came to see me at our home on the fifth floor of 5 Riverside Drive, I came upon the idea that the Dead Sea might be of recent origin, because in the story of Sodom and Gomorrah the place is referred to as a plain. The idea had already visited me while still in Palestine, and at that time a check in the *Encyclopaedia Britannica* led me to an article by W. Irwin in the *Geological Journal*, printed in England. The calculation of the age of the sea based on the accumulation of salts in it showed that the sea, actually a lake, was not a million years old (the Tertiary period), but only fifty thousand years. Revising these figures (taking as a base for calculation different salts and considering other sources of accretion besides the Jordan), I came to an even more recent age for the Sea. During the discussion that took place with the visiting scholar, I remembered that in some passage dealing with the Exodus the Dead Sea was referred to as recently created. I also remembered the sentence I had read in Bar Droma's book on the Sinai and surmised that the Exodus took place in catastrophic circumstances. The story of the plagues and of the passage of the sea appeared to me as a description of some calamities in nature.

We decided to extend our stay in the United States. I looked for an Egyptian reference to natural catastrophes. In the textbooks on Egyptian history nothing was mentioned. I read the pamphlet of Charles Beke⁽¹⁾ (the author of the idea referred to by Bar Droma), who maintained that Mount Sinai was a volcano. At the occasion of a small social gathering at the home of Dr. Paul Federn,

the renowned psychologist, I put the question before a visitor, an Egyptologist from Vienna, and before Dr. Walter Federn, also an Egyptologist, the son of Paul Federn. The former asked the latter—where is the reference about the Nile turning to blood? (I did not wish to disclose my thesis and was all ears). Walter Federn referred me to a book by Junker (under whom he studied) and Delaporte. The next day in the library on Forty-second Street I read the passage: it referred to words of one Ipuwer. Next I needed to find who Ipuwer was and locate the complete text.

At the Metropolitan Museum of Art I asked the help of Dr. W. C. Hayes. For over an hour he searched in the staff library room and, finally, I myself found on the shelves the text and translation of a papyrus stored in Leyden, Holland, since the early nineteenth century, published by Alan H. Gardiner in 1909 under the title “Admonitions of an Egyptian Sage.” Studying the text, I became convinced that I had before me not just a story of a social revolution, but the Egyptian version of the plagues described by an eyewitness, and it was surprising to me that Gardiner had not observed these similarities between the Ipuwer text and the Biblical account of the plagues accompanying the Exodus. Even the wording is similar in both texts—later, in *Ages in Chaos*, I published a detailed comparison of the two sources. This was about April 20, 1940. But the true advance came a few weeks later when I realized that the Amu, who were described as having invaded Egypt while the country lay prostrate, were the Amalekites, met by the Israelites moving out of Egypt, as narrated in the Scriptures. A book on the Amalekites by Noeldeke⁽²⁾ was not in the Forty-second Street Library (one of the greatest in the world) and I went for the first time to the Columbia University Library. From Noeldeke I learned that the Arab authors of the Golden Age of Arab literature claimed that the Amalekites, coming from Mecca, had invaded Egypt and ruled over the country for several centuries at some ancient time. Noeldeke disbelieved this persistent tradition, but for me it was a strong support to what I considered a breakthrough.

This was in June 1940, and in a few days the entire plan of *Ages in Chaos* was born in my mind. I am myself surprised when looking through my one-line notes made in the excitement of the discovery, that in a couple of days I had already concluded not only that the Eighteenth Dynasty in Egypt must be contemporary with the kings of David’s Dynasty, but arrived even to such a detail as that Haremhab, assumed to be the last of the Eighteenth Dynasty, was actually an appointee of King Sennacherib, the Assyrian king—a difference of over six hundred years between the accepted chronology and my new time table.

I knew of course of the el-Amarna tablets, found in King Akhnaton’s short-lived capital, that contain the royal correspondence of the late Eighteenth Dynasty,⁽³⁾ but I had never read the text of the tablets. I remember going to the library of the Metropolitan Museum of Art with the expectation of finding in those tablets letters of king Jehoshaphat of Jerusalem, of king Ahab of Samaria, and of the kings Ben-Hadad and Hazael of Damascus—and I found them there. Similarly I went to the library on Forty-second Street, and Elisheva, my wife, who participated with me in my searches, brought from the shelves the description of the “Punt” expedition of Queen Hatshepsut (Hatshepsut) who, according to my calculations, must have been the Biblical Queen [of] Sheba. The historian Josephus Flavius described her as the queen “of Egypt and Ethiopia.” I expected to see in the reliefs reproduced in that book how the Israelites of the time of Solomon looked, and almost with trepidation I opened the volume. Next I expected to see the treasures of Solomon’s temple as the booty of Thutmose III, who followed Hatshepsut on the

throne, and in the historical atlas of Egyptian archaeology by Wreszinski I saw pictures of the sacred furniture and utensils of Solomon's temple, even in the same numbers as described in the Scriptures. All these finds were made by me in a matter of days in June 1940. At that time I thought to call the book "From Exodus to Exile" since the reconstruction at that time reached the fall of Jerusalem and the Babylonian Exile. But I had already realized that the "Forgotten Empire" of the Hittites was but the story of the Chaldean kingdom. I thought that I would finish the book in a matter of a few months.

Early in the fall of 1940 we moved to 525 Riverside Drive to a small apartment on the twelfth floor, overlooking the Hudson.

There on about October 20, in the afternoon, sitting at the window of the kitchenette, I read in the book of Joshua. I was struck by the fact that the verse in which the sun and moon are described as disrupted in their motion was preceded by a verse telling of great stones falling from the sky. In the library of Columbia University, which I visited several times each day for the next ten or twelve years, I made a list of books on Chinese and Mexican lore—east and west—to find out whether a disruption in the motion of the sun is mentioned there. From the long list made, one of the first books chosen was by Etienne Brasseur de Bourbourg, a missionary of the last century, and the first decipherer of a few Mayan hieroglyphics.⁽⁴⁾ A passage in the book attracted my special attention—it told that St. Augustine wrote that Varro (a learned Roman of Caesar's time whose books are not extant) referred to two authorities who claimed that in the time of Ogyges Venus changed its form and orbit. It was not more than two weeks, probably less, from the time that I realized that the catastrophes of the times of Moses and Joshua must have been not local but global, that I also realized that Venus must have played a decisive role in the events: I already understood that Ogyges was the Biblical Agog, the king of the Amalekites, mentioned in the blessing of Israel by Balaam in the days of the conquest by Joshua. For the next ten years I worked simultaneously on *Ages in Chaos* (a reconstruction of ancient political and cultural history) and *Worlds in Collision* (a reconstruction of natural events).

Early in my work I became convinced that not only is the cosmology of the solar system very different from what is thought, but also the celestial mechanics that claims that only inertia and gravitation participate in the spheres above will need re-examination and so also the Darwinian evolution based on the principle of uniformitarianism or gradualism.

Soon I became aware that I had precursors—one was William Whiston, successor to Newton at Cambridge, who at the end of the 17th century claimed that the Deluge had been caused by a comet that was seen in 1680. The "miracle of Joshua" however, Whiston dismissed as a worthless piece of folk fantasy. He considered that prior to the Deluge the Earth's axis of rotation had been perpendicular to the ecliptic, and therefore there were no seasons and that the year had exactly 360 days. Ignatius Donnelly, a member of the House of Representatives, in the later part of the 19th century wrote a book, *Ragnarok*, in which he claimed that in prehistoric times a comet had passed near the Earth and showered till over that part of the globe that happened to be turned toward it. A. Olrik, a Scandinavian author, wrote another book under the same title. Neither one of these two gave any indication of being aware of the work of Whiston. Georges Cuvier, the famous paleontologist, claimed catastrophic interruptions in the history of the globe but made sarcastic remarks about Whiston. Dr. Walter Federn drew my attention to the

work of the Viennese engineer Hoerbiger who claimed that thin ice pervades the universe, causes shifts in orbits, the repeated captures of successive moons, and their disintegration millions of years later.⁽⁵⁾

With Whiston I agreed as to the Deluge having been caused by a comet; but I had much more to say: Saturn was disrupted by the close approach of Jupiter, and exploded; the explosion of Saturn engulfed the Earth and other planets. This is the story of Tammuz of the Babylonians and of Osiris of the Egyptians, and of Kronos of the Greeks. Centuries later Venus was born by the fission of Jupiter, which collected much of the material dispersed by Saturn. I concluded that Saturn must be made up largely of hydrogen, a fact I soon found confirmed. From Donnelly and from Bellamy, a follower of Hoerbiger, I used a few literary references to the age of darkness and gave credit in each case.

Ages in Chaos occupied most of my time: soon I revised the chronology of ancient history up to the time of Alexander of Macedon's arrival in Egypt. For a year and a half I did not tell Walter Federn of my thesis. I showed it to Dr. Schwartz of the Oriental Department of the Public Library, Forty-second Street, and he thought me wrong; besides, he advised me to write in some language I knew well, rather than in my ferocious English. I discussed my work with Ralph Marcus, translator of Josephus Flavius, in his office at Columbia University, and he, though very friendly, advised me, too, to return to my profession and leave history alone. I corresponded with Prof. Harry Wolfson of Harvard and sent to him an early version of *Ages in Chaos* and he gave it to Prof. Robert Pfeiffer. Next I came to see both, and Pfeiffer discussed with me my history and found me knowledgeable, yet reserved judgment.

One winter night, I think it was in January 1942, I told Walter Federn of my reconstruction, and from that time on he was of great assistance to me with his knowledge of the immense literature on Egyptology. He opposed me consistently but never refused information. I had no similar help from any scholar in cuneiform, though Prof. I. J. Gelb of the Chicago Oriental Institute wrote answers to occasional inquiries.

One morning in 1942 I typed (in erroneous English) a number of pages, and went to Washington D.C. There I had a discussion with Prof. F. R. Moulton, co-author with T. C. Chamberlin of the tidal theory of origin of the solar system, and at the National Academy I tried in vain to persuade the Secretary of the Academy to accept my essay for safekeeping. Returning home I had my essay notarized, and in the court downtown had the court clerk authenticate the notary's signature.⁽⁶⁾

I also devised an experiment to find whether the velocity of light would be influenced by the motion of the illuminating or of the illuminated body. I sent it to Prof. Paul Epstein of the California Institute of Technology, but he assured me, though he did not persuade me, that the issue is settled without an experiment.

Occasionally I would find that some other author had already come to one of the aspects of my theory. Once, I remember, in the library on Forty-second Street, I read the book of an author who advanced the idea that the Pyramids were built to serve as shelters against natural catastrophes, an idea I had already put into writing several years earlier.

In 1945 I put together *Theses for the Reconstruction of Ancient History* and gave it that summer to a printer in Canaan, Connecticut. I published it as a monograph in *Scripta Academica*, a series I started with the funds of my father while still in Palestine and to which Chaim Weizmann and E. Bergmann contributed the first monograph and Prof. A. Fodor, of the Hebrew University, the second. Of the 284 statements in the “Theses,” I would today correct only a very few.

Nine publishers rejected *Ages in Chaos* though Prof. Pfeiffer tried to help. Eight publishers rejected *Worlds in Collision*, mostly because of the many footnotes, believing that the book should be brought out by some subsidized academic (University) press. It was contracted by Macmillan in 1947 and published in 1950. The history of its reception is not dealt with here and is partly known.⁽⁷⁾

References

1. *Mount Sinai, a Volcano* (1873).
2. T. Nöldeke, *Über die Amalekiter* (Göttingen, 1864).
3. I edited and published in 1923 *Scripta Universitatis*, that served as the beginning of the Hebrew University, and there was a scholarly article by Mahler of Vienna on the chronology of the el-Amarna period.
4. The book has the title *S'il existe les sources de l'histoire . . .*
5. See I. Velikovsky, “Precursors,” *Kronos* VII.1, 48-55.
6. See I. Velikovsky, “[Affidavit.](#)”
7. See I. Velikovsky, *Stargazers and Gravediggers* (William Morrow Co.: New York, 1983).

Chronicles of Discovery

Marked June 25, 1940

June 20. First time told Elisheva (on Riverside Drive walk) of my idea that coming toward the Israelites leaving Egypt, the conquering Hyksos. The same evening, in the library, I ascertained that this is true. The history must be moved by 700-800 years.

June 21. Read Josephus Flavius Against Apion.

June 22. In Metropol. Mus. of Art Library. Found in Gauthier the name of Tahpanheth. Looked for the first time in T. El Amarna letters by Knudtzon. The name of Abdi-Ashirta, called also Rib-Addi.

June 23. Till afternoon made lists from O.T. Afternoon in the library. Became satisfied from Knudtzon T A that the time is of Jehoshaphat, as also expected.

June 24. With Elisheva in the Hebrew Division of the Library (42nd Str.) The Amalekites were summoning the Israelites to slavery (upon becoming masters of Egypt)

June 25. Afternoon from 3 to 9:45 in the library. I found what I also thought the evening before. Haremhab was placed at the head of Egypt by Sennacherib. I also found confirmed what I thought that either Sethos or Ramses is Necho. By comparing the material about Nebkadnezzar and about Ramses, that Ramses is Necho. The name is mentioned also in Assyrian documents and also in Egypt. "From Exodus to Exile" (the name of the book to write).

June 26. In the library till 3 pm (forgotten to go to dentist) I met Federn. Did not tell him the subject of my work. I completed the search. Now to classify the material. Cueniform in the letter of El Amarna understandable because this was the time of Assyrian advance toward Egypt.

June 27. Queen of Seba (=Hatshepsut). At once lookup in Encycl—acc. to Jospheus, she was queen of Egypt. And what kind of theories. See Koran —I was depressed today and I was weary. Now I read a chapter in Psalms. — It was given me to solve also this riddle (Q. Sheba) and to know that I am building on a firm ground.

June 28. We have sent the children to a camp. In the evening I came afoot to the library and Elisheva also came. On the way I thought that the letter of the widow of Smenkhkare fits with the story of the Seven Against Thebes and so I learned to know who fought against Thebes. In the Library, Elisheva found the text of the travel of Hatshepsut to Solomon.

This evening we shall not forget. Like drunken wine we sat the evening in the Central Park on our way from the library.

"To remain here till the morning, and in the morning to go again to the library," said Elisheva. The life was not easy with you but I can say as Wilkie's wife (he was nominated that day and nothing to envy her) that the life with you was an adventure.

We spoke about my father and mother. We felt as if the world opened itself before us. It was fated that we remained on the sixth of April here. Who would believe that in one week all this research was made.

Not to tarry even for a day. To return respect (glory) to the nation. Sheilok situation. We have suffered for [being identified as] Amalek.

Nov. 7, 940

Less than two weeks ago I was reading the book of Joshua, as I undertook to read (a part of the chapters possible for the first time, or for the first time since childhood) up to Sam. II incl. for the chapter Hyksos-Amalekites.

As I came to the chapter 10 of Joshua, the reading instantly caused the association: the sun and moon staying at the sky and the stones which fell—a celestial body passed near by.

I read once that in Koran there is a legend that hot stones fall on sinners (with inscribed names)—I brought this in connection.

I read about Harras in Arabia, scorched by fire, I brought this in connection.

I decided: a change of the movement is possible at an impact like this. And I thought about the ice age. I knew quite nothing about it. I read about ice age. My supposition was right. When it was, why it had the shape (Am. & Eur. but not Asia), why it ceased—no satis. explanation. I measured the center. I found it to be near the Baffine. Then I thought—and where are the magnetic poles? Are they not in vicinity. I went again to the atlas and I found them in vicinity. I explained to myself that the sun is magnetizing the earth, so the poles are the result of the previous age. And now? Must be some other point—between the pole (or the point near the pole where the sun just reaches) and the magnetic pole. Thus exists at 78 degrees n. larg. (Maybe this was the ground of complicated influence?) The pole was previously in America.

At the same time I looked for comets in the old time. The list (Roscher or Wissowa) comets in ancient time started with a later time. I looked in the legends of all nations, the Sacred Books of Orient, Golden Bough—no mention of meteorites. Something in China but later. But I knew I must find it—because at the time the sun stopped, the night side of the earth had to experience the hardest blow and be in vicinity of our earth. In the legends of the redskin Indians I found about the hot stones falling from the sky. It looked like a description of a comet.

I had to look in the old description from the time before Columbus. I knew nothing about the Indians, but always was interested to have in future a chance to know what was their culture at the time Columbus came. I looked at the catalogue. Thousands books. I chose a list of them. I got nothing interesting. Next day I ordered another book of my list. It was Brasseur de Bourbourg. I found what I knew I must find. The traditions of the Mexicans from before Columbus are full of memories about great catastrophes.

The idea that meanwhile came to me that some—possibly 65— years before the earthquake and eruptions at Exodus were due to the same cause: now the comet returned to continue the destruction. (That an earthquake was at the Red Sea I found since April; together with the idea of new appearance of the Dead Sea it was the beginning of my paper; then I looked for traces in Egypt, up to - after denials on the part of the Egyptologist that any earthquake was—I found Ipuwer witness).

In Mexican sources I found that there were three catastrophes. Their identification as I possess from Brasseur de Bourbourg has satisfied my desire to find these witnesses. I have to read the sources. Meanwhile I write the chapter.

The sky had to change the constellation-view. I found it in Mexican legends. I looked at Job and found it too.

The time-measure underwent a change together with the new order in the axis, orbit, swiftness. This could be the cause why the age of the patriarchs and their contemporaries was longer and just with Joshua this age over 100 ceases. A year was shorter. Maybe under new influences the life is really shorter?

This issue may be the cause of the mistake of some 600 years in the chronology, which I discovered previously, and which let me identify: Hyksos-Amalekites. Saul freeing Egypt from

slavery, Queen Seba-Hatshepsut, Shisha-Thutmose III, El Amarna letters-letter of Jehoshaphat and Ahab or Joram, Sanherib and the time of Horemhab his soldier, Ramses and Necho, etc., etc.

Now the Atlantide disappeared at one of these two catastrophes. Arabia and Africa ceased to be lands of cultivation. Now I knew that hot ... in Arabia-Gulf was the center of the catastrophe.

And neft? May be it was sprayed by the comet?

That Europe and N. America have culture—they owe to the comet.

That we have still a moon and the happy circumstance that at the first catastrophe was full moon, (and in Mexico was day, at the second, it was begining of the month (moon afternoon).

The reading of the book of Brasseur de Bourbourg brought me to the idea that Solomon and Hiram were sending their ships to America (Tarshish). I read about Ophir and Tarshish. Would it be at Arabia or in India, they had sent caravans; things and animals that were brought from there exercised the same astonishing effect as the things and animals brought by the conquerors of America. And silver, peacocks (maybe brought just by Phoen. from America are now in Africa) apes (on the picture sof Hat-shep-sut I hoped to differentiate what ape this was from O.W or from the N.W.)

Dec. 8. 940.

More than a week ago, when two parts of the chapter about paleont. were already written, I took the liberty to say and repeat: not all of the huge animals in the hall of reptilia (extinct) are reptilia, there must be (the Brontosaurus) mammalia. As the destruction was in historical times they msut not be animals of millions years ago. I saw these animals only twice more than a year ago. The story of mutation in Indian tales was in my eyes a reflect of the history. So I told to Elisheva and children I am sure to find in Brontosaurus signs of mammalia.

I me with Elisheva and Ruth in the museum, Saturday a week ago. The pelvis, the jaw and the legs—without that I read any book about zoology at all or knew the signs of mammalia—from the common sense only—were for me the signs I found. Now I wrote the chapter about Brontos. (another animal too) as mammalia.

During the week I read a chapter in one of the encyclopedias that there are extinct mammalia—mammoth and mastodont. Mammoths that were found frozen and in condition of preservation in N.E. Siberia—I could instantly explain: they were killed by the comet and their bodies were few hours later brought into the new polar circle.

I read that Mastodont is a name given by Cuvier. I went to the geol. library and read Cuvier, one chapter. thus he begins: Mammoths were found in North, their corpses did not decay; they were killed just

before their bodies were frozen. But they could not live in a cold desert. A common ground was for the killing and the change of temperature—a catastrophe.

He is right! Now there is also found by me the cause of all this; the cause that killed (possibly asphyxiated) the animals and turned the land to be cold. —I suppose in N.E. of Siberia rich remnants of culture may be found.-

Since the second part of October (about 20) when I read the book of Jehoshua and at once returned to read two lines before the “sun stopped” about the stones that fell, I realized that...

Dec. 8. 940.

Since Friday a week ago it became clear that 7 days of a week are 7 ages; the meaning of a rest from creation—that the creation went through all the time up to Exodus. The changes in the world were the days (Mex.= the suns) of creation (for this reason all history before exodus—in Breshith). But it came a new catastrophe (in the days of Jehoshua)—this was neglected, just because it was promised, no new catastrophe will come (in Aggada—the stones of Red Sea were suspended and fall in the days of Jeshua). The prayer of Saturday evening expresses the idea: Sabbath is the remembrance of the Exodus, of the new calendar, of the Creation. What it means? All the three started together.

Also in Saturday evening prayer (Hardala) the same idea is expressed.

Now I realize that it could really be a double tide—due to the influence of the comet-gravitation. If so—the Jews have all the right to think themselves a chosen people: they were rescued from slavery and from peril at one time. Would the sea at Dunkirk open itself before the British and drown the Nazis—would not the British had the right to believe they are chosen.

In some 10 days a comet will appear in the sky. Who knows whether she will not strike with stones all over Germany? This would be a Divine participation in this struggle.

I know what can happen to our earth from a comet. I would like to have the possibility to write my book to the end.

One or two days during this week I read the legends of creation of Jews. Now the stories of huge animals, fishes and birds seen by travellers have a true part.

The whole idea of very slow development is not exact, because this theory (Darwin) never reckon the catastrophes. The piece of coal must not be of millions of years; because it could burn 3400 years ago. New conditions had to produce new forms. And then the idea of a reserve in the plasma (and in seed) came to me.

Amusant is the story in Agada that the Brontosaurus (Behemoth) in pregnancy the “last year” could not go on feet. This what I expected when I wrote few days before that due to the increase in weight these huge animals had to perish.

Also the story of a mortal battle between Brontosaurus (Behemoth) and the bid Ziz remembered me the scene I saw in Museum last Saturday as one extinct devoured another one.

These animals were remnants of a previous epoch, just as the giants the spies found in Palestine; the immigrants of Mexico found there; and recalled by other peoples too.

Geology is “writing and arithmetic.” The millions of years—as Cuvier says—“a century is of no value.”

(Darwin I have not read. I shall read him now.)

Dec. 8. 940.

Since two or three days I told Elisheva that it seems to me as if the planet Venus is the head of the comet that struck our earth many times and after one collision turned to go through the sun and became a planet. What was the suggestion? In different sagas I found the same idea. (Beside the snaring of the sun)—a stone is thrown in the sun, and a crown, or a piece or an eye (Egypt) falls. It was mere supposition. For the new star in the horizon of Mexico and Egypt could be Sirius, after the horizon moved southward. but already the confusion in Mexico and in Egypt between Sirius and Venus was a problem. Venus fumed—I found it twice. At first I thought the comet passed through Venus too, and later I came to the above idea.

Yesterday morning I remembered that there exists a legend that a goddess came out of the head of Zeus. I thought it was Aphrodite, in any way I concluded: this is the same story, the goddess is the new planet. Now I was sure. Then I asked Shulamith, she shall be reading the Bible (she was read the moment) look to find about a new star. She told me at once about the passage of Isaiah: Hillel Ben Shahaar wished to be over the world and fell: the explanation she learned: it was the morning star (Ben-Shahaar). So I had the new proof; I was without doubt. I said to Elisheva: I suppose the light of Venus must be not at all reflected, in any way Venus must be hot, after only 3400 years passed since she went through the sun. I went to the library and in Encyclop. Brit. I could read (Venus, Planets) that she emits heat, and the explanation I found (possibly she turns quick?, or she turns once a year?) was not plausible. Now our earth—similar to Venus—has done the same development.

One moment is a problem for me. When occurred this going through the sun, and “break up” of the sun? After Exodus, or after Jehoshua? In first case in days of Jehoshua the comet was already without its head.

I hope to find the answer in the story of forlorn eye of Osiris (I have not yet read it) or in other sagas.

Since or or two days I intend to think that what happened before the Exodus and in the high and day at Red Sea were two impacts with the same comet—once descending to the sun and one on her return.

The spots on the Sun—are they not smokes from nafta burning, but not escaping, some process there return the composition to nafta once more?

The semi-darkness during 25? years (Mexico)—Desert (no sun in some variant)—due possibly to the same effect.

It is good that the planet Venus is smaller (a little smaller) than our earth. It disturbed the way of our moon, but could not capture it.

Dec. 8. 940.

To day I think about the second rule of Kepler I read yesterday. How may it be that the mass and the speed of planets (of this system?) are in an invariable ratio, -without regard to the magnetic forces and the place of the axis and the magn. poles? I suppose the rule may be good only for a planet in her first age.

Since weeks I was eager to find in Hebrew sources an allusion to sun going from West to East. I was directed by the book of Thomson to Gaster; I went to 42str—but the two allusions were of no value. I wrote from Concord. west & east;

Today I asked Shulamith, (I was encouraged by her yesterday's answer) whether by reading Bible she will look to an allusion to sun rising from west. Few hours later I found in the legends of Jews—when I already was disappointed to find an allusion to what I looked for, that—the last week before the Deluge the Sun rose in the West. And it good that it is written—the deluge was combined with disurption of the run of the earth. I am under my finding done few minutes ago—and already announced to Elisheva, Shulamith & Ruth.

Dec. 8. 940.

Two days ago reading about Typhon that he ruled in the days of great perturbances; and that he was smitten by Zeus and is drowned in the sea; I came to the idea (an idea came to me) that typhon is possibly the name of the pharaoh who was smitten and drowned in the sea. The struggle between the God and the pharaoh; and the struggle between the sun and the comet were identified in the mythus. So Typhon became the name of the devil of storm, comet, volcano; but it was originally the name of the pharaoh. Now I have to find in the lists of the pharaohs of the time of Exodus this name. "Tymoetheus" begins the story of Manetho-Josephus. He was possibly the next pharaoh, as the invasion of Hyksos followed the drowning of pharaoh? Or this is the other version of the name? The other thing I understood was: the last change in the

direction of movement was during the comet of Exodus. Zeus in his struggle with Typhon has the time to rob Europe from Phoenicia. Europe-Erev-Evening. It was not alight hear on the side of Zeus: the west turned to east. Kadmus—the brother of Europe—came to Hellas; this is the time of general migration. the new dwellers of Hellas were from Phoenicia.

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Affidavit

This exposé on nine pages I brought last week, on Tuesday 24th of this November 1942, to the National Academy of Sciences, 2101 Constitution Avenue, Washington, D.C., at approximately 3,45 p.m. I applied there to Mr.P.Brockett, the curator, asking to accept from me for secure keeping the nine pages which I proposed to put in an envelope, after he would, (if he likes) to inspect them. To introduce myself I showed my publications 'Scripta Academica'. I waived in advance any responsibility on the part of the Academy, in case my exposé would be destroyed by fire, by an enemy action or be lost otherwise. I explained that the results of my research are of a far reaching importance for many fields of science. The curator refused to my asking, telling me that this is not the duty of the Academy, and such procedure is unknown. I insisted, explaining that this courtesy would be a logical duty of an academy; I do not ask printing in Proceedings, nor bringing my paper before a meeting; I am interested in securing my priority for the results of my research. I asked whether he would like hear an opinion of the President or Secretary of the Academy.He answered me that he himself is the Executive Secretary of the Academy. He suggested to me that I shall apply to the National Archiv. I replied that I understand that the suggested Institution is serving only as the Governmental Archiv, and would not accept a paper of a scholarly character brought by a private person. I was asked why I should not read about my research in a scientific society. I explained that the research with all its material is very large (The Mns now is well over five hundred pages, and it will take probably one or two years before it will be printed; another another book will precede in publication), and to bring the results without the material which served as proofs, would be unadvisable, especially because of the

extraordinary character of my results. There can't be nothing in the Statutes of the Academy, why my envelope should not be accepted. How would he act, if not my humble personality, but a Copernicus or Newton would apply with a similar asking? - But in spite of all arguments - I could not be more eloquent, and to keep better the exact measure in all respects, - I did not succeed in this long and friendly conversation. Then I asked him to write me his refusal, and he noticed my address in N.Y. But up till to day I did not receive any notice.

signed before Notary

Rose Richardson Mandel, Dec. 5, 1942
certified by Supreme Court Clerk DC. 11, 1942

I present here some results of my research based upon inquiry in different material, historical, geological, physical, geophysical, pertaining to folklore and to history of religions. A full description of results of my research will appear in book form, and there the material will be presented in full.

The results to which I arrived, appear to be of fundamental importance to science in all its branches.

To begin with, our Earth collided (contacted) in the fifteenth century before this era with a comet. The head of the comet exchanged violent electrical discharges with our planet, and also with its own tail. The Earth changed the poles, south becoming north, changed axis, changed the orbit of revolution changed speed. As a result, the year that consisted previously of 260 became 360 days (our orbit was approximately that of Venus today). The moon changed its orbit, and the month of 20 days became of 36. Iron previously neared to the core of the Earth, appeared in upper layers. Neft poured from sky and built the present deposit. Meteorites fell in abundance. Harras in desert of Arabia are meteorites fields. Lava

streamed on the surface of the Earth not only from volcanoes, but also from clefts. Continents and seas changed places. Rivers disappeared, others appeared, still others inversed their direction (f.e. Jordan, that flow previously to the Meditteraneum, Dead sea being not in existence). A major part of human kind perished. A double tide of immense high swept seas and continents. In general conflagration woods burned down, rivers boiled; magnetic storms reached degree hurtful to bioplasma; immense hurricane accompanied the change of rotation of the Earth. In places struck by electrical contact with the comet nitogren was converted into (deposits) of saltpeter. Air became filled with clouds of carbons or hydrocarbons, and Earth was enveloped in them during a number of years. These compounds of carbon precipitated slowly in the process of cooling.

South pole which was approximately between Greenland and Northern America, or in North America, changed its place by approximately 159 degrees. Its former place might be found by locating the center of the later ice-age-cover; ice age did came to close at that moment. The magnetic pole previous to that contact, or still earlier was probably coinciding with the geographic pole,

The comet changed its path too after the electrical contact with the Earth, its orbit became a stretched ellipse, and was semi-planet semi-comet. After 50 or 52 years it contacted for the second time with the Earth, and the Earth was brought out of rotation. This encounter in the fourteenth century before the present era, had similar effects as the previous contact. But there was no permanent change of direction of rotation, nor change of north and south. Since 34 centuries the sun rises in the East. After the second encounter the Earth was endangered every 50-52 years by this new planet of the solar system: this is the planet Venus. The above recorded calendar changes are effects of first a n d the second encounter.

In the ninth century Venus moving on a stretched ellipse contacted with Mars, brought Mars out of its path, and repeated this contact for a number of times, and since then has Venus occupied approximately its present position in the solar system, and ceased to endanger the Earth. But Mars brought out of its orbit became the dangerous neighbour of the Earth. In -747 the Earth contacted with Mars. The peril of contact repeated itself every fifteen years. At midnight March 23, -687, Earth contacted again with Mars. The catastrophe was of lesser dimensions than that of 14th or 15th century. Still Earth was brought out of its rotation, changed its orbit from one of 360 days to 365 and a quarter somewhat different days; the moon changed its orbit from 36 days to 29 days. Poles were displaced, Europe moving to the South, but the north and south poles did not exchange direction. Mars took its present position in the solar system. In contacts with Venus and Earth, Mars lost most of its organic life; it acquired some of the atmosphere of Venus (carbohydrate) and lost some of its atmosphere to our planet (probably argon and neon). Mars should be examined as to the presence of these rare gases. As a result of these contacts Earth, but also Venus and Mars are warmer than the solar radiation can account for. Anomaly in movement of Mercury, as well as the precession of the earth can have their origin in these displacements of planets.

Before contacts with Venus and Mars, our Earth suffered a number of cataclysmic contacts. One of the earliest was when the Earth attracted the Moon, still in memory of human kind. Thereafter passing in Saturn atmosphere the Earth was drowned in hydrogen, which drifting through oxygen of the Earth, became water. Thereafter Earth suffered heavily when Saturn and Jupiter collided, and the Earth passed dangerous close to Jupiter. Electrical contacts, change of calendar (year, month, day) happened already at that times, in the fourth (?) and third millenia before the present era. Gigantic forms of life which existed at that time, only in few exemplars survived these

catastrophes, but were still in existence 34 centuries ago, at the contact-cataclysm caused by Venus. The teaching of Darwin which supposes but slow changes in life-forms is wrong. Gigantic reptilia ceased to exist not tens of millions of years ago, but they lived still a few thousand years ago; they perished in catastrophes, and those that survived could not exist in new conditions, especially because of changed weight of all objects, and of their large bodies, not capable to move, esp. during gravity. Brontosaurus was not a reptile, as it is thought, but a mammal. Humankind survived in races of small kind. Gigants were exterminated. The buildings of cyclopic size-stones were possible chiefly because of different weight of all objects before the contacts. The theories of slowly development of mountains and valleys under causes like rain and wind, are wrong. The earthquakes are the post-effects of the contacts and are readjustments of displaced masses and twisted strata.

This my research is based not upon speculations but primarily on historical data; its results, better to say the results of the cataclysms can be proven by many different ways, astronomical, geological, physical, historical. As to the last it should be taken in consideration that the world (political) history of the thousand years, starting with the catastrophe of Venus is entirely confused. This catastrophe caused the end of the Middle Kingdom in Egypt. The Reconstruction of the Millenium which closed with arrival of Alexander into Egypt is prepared for print under the name 'A chimerical millenium'. The manuscript dealing with the here recounted cosmic revolutions is written and bears the name 'Worlds in collision' . The other research was conceived in its all main features April 1940; the present research in October 1940; Some results, (concerning Mars) and also the concrete formulating of the fallibility of Newton's teaching of gravitation were brought to clarity in March 1942.

As to this here mentioned fruit of my research I like to point out: the planetary bodies at

contacts were not crushed (this possibility is not excluded), but exchanged electrical discharges. The bipolarity is well balanced in the planets; bipolarity of comets is divided in tail and head. This is the cause of approach and retreat of comets to and from the sun.

The behaviour of our earth, Mars, Venus, Moon, and other planets at contacts, shows clearly that there is no such phenomenon as gravitation. The mathematical proofs of Newton are completely erroneous. He admitted a primary push or pull that brought the moon into motion on a straight line; he admitted gravitation force of the Earth that tries to remove the Moon from the straight line motion. An object falls near the surface of the Earth with the initial mean speed of 16,1 feet in the first second. The moon is remote from the Earth's centre sixty times the distance of an object on the Earth surface from Earth's center (Earth's radius). The initial velocity of fall at the distance of the moon should be 60 times slower, 16,1 feet in a minute. 15,43 feet in a minute is the 'fall' of the moon from the tangent of its orbit. The proximity of these two figures 16,1 and 15,4 is but accidental. There is no logical reason to count the velocity of fall by seconds, which are but human, not in nature preexisting time measure. Reckoning by two seconds the velocity of fall would be 48,3 feet here, and the same amount in the two minutes at the distance of the moon; and the fall from the tangent line is but 30,8 feet.

The fallacy of Newton's scheme is obvious also in terms of mechanics. The primary force was not infinite in its strength as pull or push. It does not act anymore. The Earth on the other side pulls permanently. In many different elementary ways it is possible to show that under such conditions the permanently acting force of gravitation would let the Moon approach the Earth in a quick spiral.

As the computation concerning the Moon caused Newton to postulate a general law concerning the whole solar system and the whole Universe, it, the

law of gravitation is wrong in all its applications. Velocities and masses computed with its help are probably wrong in many instances.

There exist attraction and repulsion. Electrical phenomena are responsible for attraction and for repulsion. To explain the fact that objects close to the surface of the Earth are more attracted than repulsed, we owe to admit that a high layer in the atmosphere repulses what the solid portion of the Earth attracts. The phenomenon of the tail of the comets repulsed from the sun, of polar light, of zodiacal light will find here their explanation. The phenomenon (why not questioned at all?) that Nitrogen lighter than Oxygen does not move to the higher level in the atmosphere, though the air is a mixture and not a compound, is another fact of disobedience to the 'law' of gravitation. Also water, in small drops, is lifted then dropped by electrical charges and discharges. The radio-layer in the atmosphere is probably the attracting and repulsing medium acting contrary to the ground. The moving of negative electricity into the ground does is due to the charge of the Earth. At near distances special law acts in magnetism (also electrical phenomenon) and electricity. Levitation is conceivable. Perpetuum mobile theroretically possible. Discharge from upper layer might be exploited, also with destructive purposes. A flight to interplanetary space in defiance of gravitation is thinkable.

Electrical charges in the Earth and its atmosphere are chiefly induced and sent by the Sun. Sun sends two kinds of charges, positive and negative. Heat and light are transformations; (transformation into heat is achieved by passing media [through?] coolness of summits, but the heating of Moon surface must be accounted for, before accepting the last hypothesis.) Cosmical rays which reach the Earth have probably their origin in the Sun (and also in other cosmical bodies). They arrive during the night or during sun-eclipse, because they are moving not in straight lines. (Their efficiency on malign tumors should be explored by sending sick persons to a mountanous sanatorium

near the southern (or northern) magnetic pole).

Whether elements mutated under influence of electrical contacts of cosmic dimensions-(in cataclysms) is difficult ascertain or to deny and laboratory work will gave reply.

The building of the solar system as revealed by grandious esperiments exhibited by the nature in sight of the historical man, is composed of a two fold process : distributing of (solar) energy and arrival of new members from interstellar space, collisions, violent discharges.If an atom is built as a microcosmical model of a solar system, elements arriving from interatomic space, also travelling from one atom to another must be in existence. Contacts between elements, increase in numbers of electrones, polarities, change of orbits, all must take place. Change of orbits and emitting of energy at these moments were supposed by Bohr.

This statement I like to have guarded by an Academy of Sciences. I wrote it the night before leaving at an early hour for Washington where I shall try to leave it at the office of the Academy (there) As the largest part of this statement I wrote directly by the typewriter, I concede that a better shape might be given to the results of my research and to the physical conclusions deducted from those results. The few lines about heat had not to be written at all, at present. In the Mns the research is put in many hundreds of pages, and the physical deductions, meanwhile, are put on some tens of pages. There are problems esp. concerning 'weight' , 'attraction and repulsion' , magnetism, cosmic rays, heat, and I would like to experiment as to come to farther answers.

November 23th, 42
[signed] Dr. Im. Velikovsky

THESES FOR THE RECONSTRUCTION OF ANCIENT HISTORY

FROM THE END OF THE MIDDLE KINGDOM IN EGYPT TO THE ADVENT OF ALEXANDER THE GREAT

BY

IMMANUEL VELIKOVSKY

1945

INTRODUCTION

The written history of the ancient world is composed without correct synchronization of the histories of different peoples of antiquity: a discrepancy of about six hundred years exists between the Hebrew and Egyptian histories as they are conventionally written; since the histories of other peoples are synchronized both with the Hebrew and the Egyptian past, they are completely distorted.

The ground plan for a redesigning of ancient history was ready in its main features in the spring 1940. During the years 1940-1944, I wrote and completed a Reconstruction of ancient history from the end of the Middle Kingdom in Egypt to the advent of Alexander the Great. Due to war conditions and their interference with the printing of extensive scientific works, the publication of "Ages in Chaos" had to be postponed. This short paper is intended to bring together in concise form most of the innovations of my work; I present them in the form of theses; the manifold proofs which underlie the Reconstruction and the numerous collations of historical material are reserved for the work itself.

New York, June 10, 1945.

I

1. Ancient History before the advent of Alexander the Great is written in a chaotic manner. It is entirely confused, and is a disarray of centuries, kingdoms and persons.
2. The cause of this confusion lies in an incorrect representation of the Egyptian past; and since the history of Egypt is chosen to serve for orientation in compiling the histories of other peoples of antiquity, the histories of these other peoples are brought into disorder as well. The error in Egyptian history consists of six to seven and, in some places, eight centuries of retardation.
3. Histories of Palestine, Syria, Babylonia, Assyria, Mycenae, Classical Greece, Chaldea, Phoenicia, and Caria, are written in duplicate form, with the same events repeated after a period of six or seven centuries. The confusion of centuries makes the life of many personages double; descendants are transformed into ancestors, and entire peoples and empires are invented.

4. The Egyptian and Jewish histories, as they are written, are devoid of a single synchronism in a period of many hundreds of years. Exodus, an event which concerns both peoples, is presumably not mentioned in the Egyptian documents of the past. The establishing of the time of the Exodus must help to synchronize the histories of these two peoples.
5. The literal meaning of many passages in the Scriptures which relate to the time of the Exodus, imply that there was a great natural catastrophe of enormous dimensions.
6. The synchronous moment between the Egyptian and Jewish histories can be established if the same catastrophe can also be traced in Egyptian literature.
7. The Papyrus Ipuwer describes a natural catastrophe and not merely a social revolution, as is supposed. A juxtaposition of many passages of this papyrus (edited by A. Gardiner, under the name "Admonitions of an Egyptian Sage", 1909) with passages from the Scriptures dealing with the story of the plagues and the escape from Egypt, proves that both sources describe the same events.
8. The Papyrus Ipuwer comprises a text which originated shortly after the close of the Middle Kingdom; the original text was written by an eyewitness to the plagues and the Exodus.
9. The plagues were the forerunners and aftermaths of a great catastrophe the nature of which will be discussed in a work dealing with the natural history of the world. Earthquakes, eruptions of volcanoes, changes of the sea profile, were some of the results of that catastrophe.
10. The tenth plague, during which the houses were struck down, was an earthquake. The clay huts of the "dwellers of the marshes" suffered less than the structures of stone.
11. The "firstborn" (b'khorim) is erroneously used instead of the original "chosen" (b'chorim), and the tenth plague originally narrated the destruction of all the choice people among the Egyptians.
12. The naos (shrine) of el-Arish, now in the Museum of Ismailia, describes the plague of darkness and the death of the pharaoh in a whirlpool. The place of the last event is at Pi-Kharoti, which is Pi-ha-Kiroth of the Book of Exodus.
13. Tom-Taoui-Toth was the Pharaoh of the Exodus.
14. The Exodus took place at the close of the Middle Kingdom: the natural catastrophe caused the end of this period in the history of Egypt. This was in the middle of the second millennium before the present era.
15. The Israelites left Egypt a few days before the invasion of the Hyksos (Amu).

16. The Israelites met the Hyksos (Amu) on their way from Egypt. The Hyksos were the Amalekites.
17. The Arabic authors of the Middle Ages related traditions which reflect actual historical events, about the Amalekites who left Mekka amidst catastrophes and plagues, the invasion of Palestine and Egypt by the Amalekites, and the Amalekite pharaohs.
18. The catastrophes and plagues of these traditions are part of the cataclysm which is described in the Scriptures, the Papyrus Ipuwer, and the naos of el-Arish. The flood, which drowned many Amalekites who escaped from Arabia, was simultaneous with the upheaval of the sea on the day of the Passage.
19. Because of the occupation of southern Palestine (Negeb) by the Hyksos, the Israelites escaping from Egypt were forced to roam in the desert. The Desert of the Wanderings stretched deep into the Arab Peninsula.
20. The Hyksos stronghold Auaris was situated at the el-Arish of today. (Its other names are Tharu and Rhinocorura).
21. Its builder Latis, mentioned in the Arabic sources, is identical with the Hyksos King Salitis of Josephus-Manetho.
22. The Hyksos King whose name is read Apop (I) is the Agog (I) of the Scriptures. Similarly Apop II is the biblical Agog II.
23. Amalekite fortresses were built in Palestine. One of them was at Pirathon in Ephraim.
24. The Amalekites employed the same tactics in their devastating raids on Palestine and Egypt, choosing the time before the harvest.
25. The process of the conquest of Palestine by the Israelites was slowed down and reversed when the Canaanites allied themselves with the Hyksos-Amalekites. The wars of the Judges were intended to free the people from the yoke of the Hyksos.
26. The cataclysm which caused a migration of peoples brought the Philistines from Cyprus to the shores of Palestine. They intermarried with the Amalekites and produced a hybrid nation.
27. The Manethonian tradition about the later Hyksos Dynasty of a "Hellenic" origin reflects the period when the Philistine element became rather dominant in the Amalekite Empire.
28. The "Amalekite city" which was captured by Saul was Auaris.
29. As the result of his victory at Auaris, Saul freed Egypt and the entire Near East.
30. In the siege of Auaris, Saul was assisted by Kamose and Ahmose, the vassal princes of Thebes.

31. Manetho's story about the Hyksos leaving Auaris by agreement reflects the scriptural incident concerning the Kenites leaving the besieged Amalekite fortress.
32. The invasion of southern Palestine by the escaping remnants of the Hyksos is reflected in I Samuel 30; and their further destruction at Sheruhen, in the Talmudic story of Joab's war against the capital of the Amalekites.
33. This last bastion of the Amalekites was probably on one of the rocks of Petra.
34. Manetho confused Sheruhen with Jerusalem, and the Israelites, the redeemers of Egypt, with the Hyksos.
35. This confusion spread in the Ptolemaic time and became the cause of the rise of anti-Semitism which, fed from different channels, survived until today.
36. The period of the Wanderings in the Desert, of Joshua, and of the Judges, corresponds to the time of Hyksos domination in Egypt and the Near East. The period of the Hyksos lasted for more than four hundred years. The archaeological findings of the Hyksos period in Palestine appertain to the time of the Conquest and the Judges.

III

37. Two kingdoms rose on the ruins of the Hyksos Empire: the kingdom of Israel under David, and the New Kingdom of Egypt under the Eighteenth Dynasty. The beginnings of these two dynasties are not separated by six centuries; they started simultaneously.
38. The Egyptian Queen Tahpenes, the sister-in-law of Hadad the Edomite, was a wife of Ahmose.
39. Thutmose I attacked Gezer of the Philistines and gave it to Solomon, his son-in-law.
40. Queen Sheba is identical with Queen Hatshepsu.
41. The information of Josephus that the queen-guest ruled Egypt and Abyssinia, is correct.
42. The theories which place Punt and God's Land in either South Arabia or Africa are equally wrong. Hatshepsu's expedition, pictured in the temple of Deir el Bahari near Thebes, went to Palestine-Phoenicia.
43. By the time of the Old Kingdom, Palestine was already known as God's Land or Holy Land. The tribe of Menashe lived in Palestine already at the time of the Old Kingdom in Egypt.
44. A preliminary expedition dispatched by Hatshepsu to prepare the way for the main expedition, was met by Peruha, the biblical Paruah, governor of Ezion-Geber.

45. The correction of the verses I Kings 4, 16-17 which place Aloth in the domain of the son of Paruah, is well founded.
46. Queen Hatshepsu participated personally in the main expedition to Ezion-Geber, Jerusalem, and Phoenicia. Her intention was to see what she had known “by hearsay” only.
47. The return voyage was made by sea from the Palestinian shore to Thebes on the Nile, and a second fleet was used. In the days of Hatshepsu there was no canal connecting the Nile with the Red Sea.
48. Jewish officers in the service of Solomon are portrayed on the walls of Deir El Bahari.
49. Exotic animals and plants, including the algum-trees “never seen before”, which Queen Hatshepsu received as gifts in God’s Land, had been brought by the navy of Hiram and Solomon from Ophir. They are seen in the pictures of the expedition.
50. Gifts were also presented to Hatshepsu by messengers of Hiram.
51. Solomon was not an obscure prince, as he is often represented. The riches of his kingdom astounded the Egyptians under their most magnificent monarch.
52. Silver-covered floors in the Jerusalem of Solomon were an actual feature; such floors were also built in the palaces of the viziers of Hatshepsu.
53. The architecture and ordinances of the Temple of Solomon were copied in the Temple of Amon at Deir El Bahari. The plan of this structure and its terraces can help in the reconstruction of the plan of the Temple of Solomon.
54. The Songs of Mounting, which are included among the Psalms, were sung by priests while ascending the terraces.
55. The office of High Priest was introduced into the Egyptian service in imitation of a similar post in the service in Jerusalem. The word pontifex is derived ultimately from the word Punt. The last word means Phoenicia.
56. The Abyssinian tradition preserved the name of the Queen of the South as Makeda, which is derived from the personal name of Hatshepsu (Make-Ra).
57. The Arabic claim that Queen Sheba was their Queen Bilkis, is unfounded.
58. The traditional origin of some Hebrew legends concerning Queen Sheba can be traced in the life and appearance of Hatshepsu.

59. Thutmose III is the scriptural Shishak; he lived not during the fifteenth, but during the latter part of the tenth and the beginning of the ninth century.
60. Thutmose III refers in his inscription in Karnak to the state of disagreement and war among the Jewish tribes of Palestine after the death of Solomon.
61. The disintegration of the empire of Solomon was planned for by Thutmose III and carried out by him. He was also the author of the division of Palestine into two kingdoms.
62. Jeroboam, the first king of the ten tribes, is pictured during his stay in Egypt on a bas-relief in Thebes, together with a small son of his, as the prince of Dunip (Tunip), which is Dan.
63. Baalbek is the ancient Dan.
64. The list of the Palestinian cities inscribed by Thutmose III in Karnak comprises the names of the cities of Rehoboam in his fifth year. The city-fortresses built or fortified by Rehoboam, Etam, Beth-Zur, Shocco, Gath, Ziph, and Adoraim, can be identified in their Egyptian transcription.
65. The chief fortress besieged and captured before the Pharaoh came to Jerusalem, was Megiddo. Megiddo was defended by Rehoboam personally, and he eluded captivity when the fortress fell.
66. The city Kadesh, the most important among the Palestinian cities, and the first in the list of Thutmose III, is Jerusalem.
67. The submission of Rehoboam and the princes of the land, and their “becoming servants” to the Pharaoh is described in the annals of Thutmose III.
68. The vessels and furniture of the Temple of Solomon sacked by Thutmose III, are pictured on a bas-relief of Karnak. They can be seen in detail: altars, tables, candlesticks, etc.
69. The ornaments of “a crown of gold round about”, “buds among flowers” and “lily-work” described in the Scriptures, are shown on the bas-relief.
70. The showbreads had a conical form. The candlesticks had three branches on either side of the stem, or seven branches ~~on either side~~ [altogether]. The fountains for perfume were vessels ornamented with figures of animals.
71. The copper covered doors and chains of gold were actual features of the Temple of Solomon.
72. Golden chariots, like those mentioned in the Song of Songs, were carried from Palestine as tribute, and are pictured in the sepulchral chambers of Rekhmire, the vizier of Thutmose III.
73. The theory about the supreme artisanship of the Canaanites in the pre-Israelite period is without foundation.

74. Jewish artists brought to Egypt introduced their fine arts and influenced the aesthetic conceptions of the Egyptians.
75. Animals and plants of Palestine of the days of Rehoboam are pictured in the temple of Karnak. They comprise the collections of Solomon.
76. "Arzenu" (our land), by which the Scriptures mean Palestine, was its name in the Egyptian tongue ("Rezenu"), a geographical equivalent of the name "God's Land".
77. The name of Israel is found in the annals of Thutmose III as that of a people bringing tribute. The assertion that the name of Israel is met for the first and only time in the inscription of Marneptah is wrong.
78. Rehoboam, "the king of Kadesh", is pictured on a bas-relief in the tomb of Menkheperre in Thebes.
79. The people of Gubath in the inscription of Thutmose III, is the people of the scriptural Gubath, son of Hadad the Edomite.
80. Sosenk, the Pharaoh of the Libyan dynasty, was not Shishak of the Scriptures.

V

81. Amenhotep II lived not in the fifteenth but in the ninth century, and was the scriptural Zerah.
82. The theory that the Ethiopian Zerah came from Arabia is wrong; equally wrong is the theory that he is a mythological figure.
83. The battle of Ain-Reshet, referred to by Amenhotep II, is the battle of Mareshet-Gath, which was lost by Amenhotep II and won by Asa.
84. This intrusion of Amenhotep II-Zerah is also narrated in the poem of Keret found in Ras Shamra.
85. The theory that Terah of the Poem, who invaded the south of Palestine with millions of soldiers, is the father of Abraham, is wrong.
86. The Shemesh-Edom of the war-annals of Amenhotep II is the Edomite city of Shapesh (Shemesh) referred to in the Poem of Keret.
87. In the days of Thutmose IV, Palestine again became a protectorate of Egypt in fear of a menacing conquest by Assurnasirpal (885-860), father of Shalmanassar.
88. Shishak mentioned in the Ras Shamra texts is Thutmose IV.
89. The texts found in Ras Shamra are not of the fifteenth, but of the ninth century.

90. The close resemblance of the texts of Ras Shamra with diverse books of the Scriptures repudiates most of the assertions of the Bible criticism (late origin of the texts), as well as the modern theory about the Canaanite heritage in the Scriptures (early origin of the texts).
91. The theory that alphabetic writing was perfected in the sixteenth century cannot be supported by the Ras Shamra texts of the ninth century.
92. As the alphabetic writing of Hebrew in cuneiform of Ras Shamra is contemporaneous with the stela of Mesha written in Hebrew alphabetic characters, the alphabet most probably did not originate in Phoenicia but in Palestine.
93. The theory that the Ras Shamra texts contain mention of Ionians, and of their city Didyme, is correct, but it concerns the ninth century Ionians.
94. The Khar of the Egyptian and Ras Shamra texts were not Hurrites or Troglodytes, but Carians.
95. The statement by classical authors that the Carians migrated from Crete is corroborated by the name of Keret of the Ras Shamra texts.
96. The Khari (Cari) of the Scriptures were the Khar or Carians from Ras Shamra.
97. The Carian language is studied in the disguise of the Hurrian (or Hurrite) language. The reading of the cuneiform Khar can be helped by a comparative study of the Carian inscriptions in Greek letters found in Egypt.
98. The reading of Carian will contribute to the decipherment of the Cyprian and Cretan hieroglyphics and may aid in reconstructing the early history of the West.
99. The name of the city Ugarit (Ras Shamra) is probably the equivalent of Euagoras, the Carian-Ionian name of a number of Cyprian kings.
100. The name Nikmed of the Ras Shamra texts is the Ionian-Carian name Nikomed(es).
101. The city of Ras Shamra was destroyed in the days of the King Nikmed by Shalmanassar (in 856 B. C. E). Its destruction is recorded by Shalmanassar and the city is called "the city of Nikdem". A proclamation telling about the expulsion of Nikmed, found in the city, refers to the same event.
102. It is highly probable that King Nikmed (Nikdem) fled to Greece, and that this man of learning there introduced alphabetic writing. Therefore, he might have been Cadmos of the Greek tradition.
103. Minoan inscriptions of the Mycenaean Age may comprise alphabetic writings following in principle the cuneiform alphabet of Ras Shamra Hebrew.

104. The vaults of the necropolis of Ras Shamra and similar vaults in Cyprus are contemporaneous, and not separated by six centuries.
105. The tombs of Enkomi on Cyprus, excavated by A. S. Murray in 1896, were correctly assigned by him to the eighth-seventh century.
106. The time table of the Minoan and Mycenaean culture is distorted by almost six hundred years, because it is dependent upon the wrong Egyptian chronology.
107. No "Dark Age" of six centuries duration intervened in Greece between the Mycenaean Age and the Ionian Age of the seventh century.
108. The large buildings and fortifications of Mycenae and Tiryns in the Argive Plain date from the time of the Argive Tyrants, who lived in the eighth century.
109. The Heraion of Olympia was built in the "Mycenaean" age, in the first millennium
110. The so-called Mycenaean ware was mainly of Cypriote (Phoenician) manufacture. It dates from the tenth to the sixth century.
111. The so-called Geometric ware is not a later product than the Mycenaean ware; they were products of the same age.
112. The entire archaeology of the eastern Mediterranean, based upon the assumption that the Mycenaean culture belongs to the fifteenth-thirteenth centuries, is built upon a misleading principle.

VI

113. The el-Amarna Letters were written not in the fifteenth-fourteenth century, but in the middle of the ninth century.
114. Among the correspondents of Amenhotep III and Akhnaton are biblical personages: Jehoshaphat (Abdi-Hiba), King of Jerusalem; Ahab (Rib Addi), King of Samaria; Ben-Hadad (Abdi-Ashirta), King of Damascus; Hazael (Azaru), King of Damascus; Aman (Aman-appa), Governor of Samaria; Adaja (Adaja), Adna (Adadanu), Amasia, son of Zihri (son of Zuhru), Jehozabad (Jahzibada), military governors of Jehoshaphat; Obadia, the chief of Jezreel; Obadia (Widia), a city governor in Judea; the Great Lady of Shunem (Baalath Nesse); Naaman (Janhama), the captain of Damascus; and others. Arza (Arzaja), the courtier in Samaria, is referred to in a letter.
115. Mesha, King of Moab, is often mentioned in the Letters by his name (Mesh). The omission of the name of the rebel king by the translators of the Letters is not warranted.
116. The King of Hatti, who for years invaded and harassed Syria, was Assurnasirpal and after him Shalmanassar.

117. The following correspondents of Amenhotep and Akhnaton are known from the inscriptions of Shalmanassar; Adima, Prince of Siana and Irqata; Mut-Balu (Matinu-Bali), Prince of Arvad.

118. Burnaburias is the Babylonian name of Shalmanassar, and under this name he corresponded with Amenhotep III and Akhnaton. In the Letters he is also referred to as Shalmajati.

119. The military chief who opposed Shalmanassar at Karkar was the governor of Megiddo Biridri (Biridia), one of the Pharaohs correspondents. The identification of Ben Hadad with Biridri is wrong.

120. Sumur of the Letters is Samaria; Gubia is Jezreel. The new residence of the king of Israel was named in honor of his wife Jezebel.

121. Jarimuta or Rimuta of the Letters is Ramoth in Gilead; Sigati is Sukkoth; Ambi - Moab; Durnui - Edom; Rubuti - Raboth in Ammon; Kilti - vadi Kelt.

122. "Elippe" in a number of el-Amarna Letters means "a man over a thousand" or a chief, and not a "ship". Several cities (Sumur being one of them) are incorrectly located on the seashore because of the mention of "elippe".

123. The scriptural penman also confused "elippe", the chief, with the same word meaning a thousand, and thus a correction of the text is required in the story of twenty-seven thousands killed by the wall of Apehek.

124. Ahab was faithful to the Egyptian protectorate. Ben Hadad, supported by Shalmanassar, inspired Mesha to revolt.

125. The capture of Ben Hadad and a covenant signed between him and the King of Samaria are events also related in the Letters.

126. The sieges of Samaria, the negotiation about sending Egyptian detachments, and the flight of the Syrians at the spreading of a rumor about the arrival of the Egyptian troops, can also be read in the Letters.

127. King Ahab was not killed at Ramoth in Gilead, but merely wounded. He survived Jehoshaphat by two years. The version 2 Kings 3, 2 is erroneous, and the rival version 2 Kings 1, 17 is correct.

128. Many events ascribed by the Scriptures to Jehoram, son of Ahab, or to the undefined "king of Israel", happened in the days of Ahab. Ahab is the author of more than sixty letters found in the el-Amarna collection.

129. Jehoram of Israel and Jehoram of Judea were probably one and the same person, a son-in-law of Ahab.

130. The insurrection of Mesha took place during the life-time of Ahab, after the defeat at Ramoth in Gilead.

131. The K-r-k-h (the capital) of the Mesha Stela means Samaria. The Moabites succeeded in entering Samaria. The Ophel of K-r-k-h is the Ophel of Samaria. The fall of Samaria signified the “everlasting humiliation” and the “great indignation” in the Scriptures and the Stela.

132. By “cuttings” of K-r-k-h, the ivory work of the palace of Samaria is meant.

133. Samaria was the center of the Egyptian administration in Palestine. Possessing and building it was the privilege of the first among the chiefs.

134. Jehoshaphat’s position was of comparative independence, as there was no permanent Egyptian governor in Jerusalem. Adaja was the deputy over Edom and he was subordinate to Jehoshaphat.

135. The expedition of three kings against Moab preceded the invasion of Palestine by tribes of Transjordan and Seir. The sequence in Josephus is wrong.

136. The invasion of the Moabites, Ammonites, and the tribes of Seir is described in the Letters. Khabiru means bandits.

137. The prayer of Jehoshaphat is authentic, being similar in spirit and content to his letters addressed to the Pharaoh.

138. The monotheism of Jehoshaphat is proved by his letters. The notion that Akhnaton was a monotheist (“the first monotheist”) is wrong.

139. The letters of Jehoshaphat’s generals and city-chiefs substantiate the complaint of the scriptural writer that idolatry was not eradicated in Judea in the days of Jehoshaphat.

140. The el-Amarna Letters provide ample material for elucidation of the feudal system in Palestine in the ninth century.

141. The failing of water sources, the drought and the great famine of seven years duration in Israel are described in many of the letters of the King of Samaria.

142. Ramoth in Gilead was a subject of rivalry because it was not afflicted by drought and famine.

143. The existence of a Great Lady of Sunem called Baalat Nesse (“Wonder occurred to her”), throws a side-light on the life and acts of Elisha.

144. The change in the attitude of Janhama, the captain of Damascus, toward the King of Samaria, throws another sidelight on the biblical narrative about Elisha.

145. The story about sending assassins against Ahab and about his repeated escapes is also narrated in the Letters.

146. The sickness of Ben Hadad, and his being killed while sick, is confirmed by the Letters. Hazael, his murderer, was his son by a harem woman.

147. The biblical dialogue of Hazael is truly transmitted, as his letters and letters about him prove. In his writing, he used the very same expressions ascribed to him in the Scriptures.

148. Hazael burnt the towns of Israel and occupied most of their land; this is verified by the Letters.

149. Hazael, after leaning toward Shalmanassar, was acknowledged King of Damascus by Akhnaton on the condition that he oppose Shalmanassar.

150. Shalmanassar's inscriptions and the letters of Hazael (Azaru) give coordinated records about their war and other conditions in Syria.

151. The theory of a Mizri kingdom in Syria is wrong. The soldiers of Mizri at Karkar were Egyptians. The gifts sent by the King of Mizri to Shalmanassar are those enumerated by Akhnaton in his letter to the King of Hatti.

152. Ahab, under pressure from Hazael, went to Beirut. He was not permitted by his brother to return to Jezreel. He went from Beirut to Sidon, to the family of his wife Jezebel. In his lifetime, rumors about his death were spread, and they contributed to the confusion of later chronographers.

153. Sawardatta of the Letters was a prince of the Sodomites who lived at Vadi-Kelt.

154. Labaja of the Letters was a rebellious prince of Libna.

155. The letter addressed by Subliliuma to Hurria does not belong to the el-Amarna collection. It was written in the seventh century and addressed to Tirhaka-Hurria, the Ethiopian. It should be a matter of further investigation, whether any other letters are wrongly ascribed to the el-Amarna archive.

156. The ivories of Samaria of the time of Ahab are not late imitations of the ivories of the time of Amenhotep III, Akhnaton and Tuthenkhamon, but are contemporaneous products.

VII

157. Between the Eighteenth and the Nineteenth Dynasties there was a period of about 150 years, during which Egypt was ruled by the Libyans and the Ethiopians (Twenty-second to Twenty-fifth Dynasties).

158. The period of the Libyans in Egypt lasted not over 200 years but about 100 years only, and its termination is correctly fixed at the end of the eighth century.

159. The only period of ancient Egypt which is correctly placed in time, is the short Ethiopian period. But this retention of its proper place at the end of the eighth and the beginning of the seventh century caused a still greater chaos in historiography; generations which actually followed became progenitors, ancestors became descendants.

160. Osorkon I was not Zerah of the Scriptures, nor did he invade Palestine. Osorkon II was not a contemporary of Omri and Ahab.

161. Hebrew letters on the statues of Osorkon and Sosenk made by the Phoenician kings Elibaal and Abibaal represent the characters of the eighth century, not the tenth century.

162. The ostraca of Samaria were not written in the days of Ahab, but close to the end of the kingdom of Israel, in the days of ~~Jehoram~~ [Jeroboam] II. These ostraca, written in characters similar to those of the Siloam inscription of Hezekiah, do not signify an abnormal development of the Hebrew script.

163. Pharaoh So who received gifts from Hoshea was Sosenk IV, and his bas-relief scene pictures this tribute. Sosenk regularly placed as I (first) was IV (last).

164. Osorkon, the priest who caused a civil war and was expelled from Egypt, was the historical prototype of Osarsiph of Manetho, whom he wrongly identified with Moses.

165. After the battle of Eiteka, Egypt became a vassalage of Sennaherib.

166. Psammetich-Seti I, King of Egypt and an ally of the Ethiopians, was deposed by his brother Haremhab, who was in charge of the government during the king's absence because of the war. Haremhab went over to the Assyrians. The legend about Harmais (Josephus-Manetho), who deceived his brother, is the story of Haremhab.

167. Haremhab was King of Egypt under Sennaherib, and in this service made war against the Ethiopians. His laws were made on the Assyrian model, as were also the punishments involved.

168. Harsiese, the priest of Ammon at the end of the Libyan Dynasty, was the man who reared Haremhab.

169. Haremhab was expelled by Tirhaka, the Ethiopian, and probably fled to Cyprus.

170. The 59th year of some reckoning mentioned in a document ~~written in~~ [referring to] the days of Haremhab, is the 59th year of the era of Nabonassar, which started in 747 B. C.E.

171. A cartouche of Haremhab on the inner wall of a sepulchral chamber cut in the days of the Ethiopians, does not constitute an enigma.

VIII

172. The so-called Nineteenth and Twenty-sixth Dynasties are substantially one and the same.

173. Ramses I is identical with, Necho 1. He was one of the viceroys under Essarhadon. After the death of Essarhadon, when the viceroys took sides with Tirhaka the Ethiopian and were killed by Assurbanipal, Ramses I, pardoned by the Assyrian King, was installed by him as the king of Egypt.

174. Shamash Shum Ukin, King of Babylon, and brother of Assurbanipal, corresponded with Tirhaka and allied himself with him.

175. Psammetich-Seti II, son of Ramses I, rose from vassal to the position of an ally of Assurbanipal in his war against Shamash Shum Ukin.

176. Psammetich-Seti II (Seti the Great) repeatedly invaded northern Palestine. He mentions smaller conflicts with Manasseh, referring to the latter by his name.

177. The city Pekaon to which he laid siege and which he captured was a fortress-capital of Peka, King of Israel, who lived two generations earlier. Being a capital, it was probably Samaria.

178. Beth-Shan-Scythopolis was the city where Seti met the vanguard of the Scythians. He occupied the city, as he reported on his stela found there.

179. Seti built a fortress on the Orontes, at Tell Nebi Mend; it is Riblah of the Scriptures.

180. Seti participated in the war in the valley of the Euphrates on the side of Assurbanipal and against Nabopolassar. The Egyptian army referred to by Nabopolassar in his annals was that of Seti.

181. Greek soldiers sent by Gyges of Sardis to Egypt in the days of Seti became the first Greek settlers there.

IX

182. There was no Empire of the Hittites in the fourteenth-thirteenth centuries. The archive found at Boghazkoi belongs in its larger part to the Neo-Babylonian Empire of the seventh-sixth centuries.

183. These documents reflect the political, religious and juridical activities of the Chaldeans.

184. In the seventh century the Chaldeans were centered in Asia Minor, in an area bounded by the Black Sea, the Euphrates, and the Halys.

185. The "Hittite" hieroglyphics are the Chaldean script.

186. The presumed “Hittite” art of the fourteenth-thirteenth centuries is the Chaldean art of the seventh-sixth centuries, and is coeval with and subsequent to late Phrygian art. The bas-relief of Yasilikaya dates from the time of the Neo-Babylonian Empire. Greek sculptures with “Hittite” (Chaldean) signs present no problem, neither does the silence of Greek authors about the “Hittites” of the “post-Empire” period.

187. The “Hittite” stela in the palace of Nebukhadnezar in Babylon is a contemporary Chaldean document. The lead tablets from Asaur with “Hittite” hieroglyphics, date from the last centuries before the present era.

188. The succession of the kings of the Neo-Babylonian Empire was: Nabopolassar, Nergilissar, Labash-Marduk, Nebukhadnezar, Evil Marduk, Nabonides. Berosus, according to whom Nergilissar and his son followed Nebukhadnezar, is wrong.*

189. The treaties of Sublilumas with Azaru of Damascus, with a patricide prince of Mitanni, and with the widow of Tirhaka, make plausible his identity with Shamash Shum Ukin. This would signify also that Nabopolassar was a son of Shamash Shum Ukin.

190. The people and the kingdom of Mitanni did not “disappear” in the thirteenth century. Mitanni is another name for Medes; the northwest part of Medes retained this name as Matiane (Herodotus).

191. Mursilis of the Boghazkoi texts (Merosar of the Egyptian texts), also known as Bijassili, is Nabopolassar of the Babylonian texts, Belesys of Diodorus or Bussalossor of Abydenos. Belshum-ishkun is another name of Nabopolassar.

192. The annals of Nabopolassar from his tenth until his seventeenth year (now in the British Museum), can be supplemented by the “Hittite” annals of his from the first to the tenth year (two variants) and from the nineteenth year on, as they survived in the Boghazkoi archive.

193. The presence of the Scythians (Umman-Manda) in Asia Minor, who in the days of Essarhaddon arrived from behind the Caucasus, is also reflected in the Boghazkoi texts dealing with the Umman-Manda.

194. The Assyro-Egyptian alliance against which Mursilis conducted a long war in the valley of the Euphrates, was the alliance of Assurbanipal and Seti (see §180).

195. Assuruballit in Harran, against whom Mursilis marched, was the younger brother of Assurbanipal.

196. The capture of Manassehand his release are recorded in the annals of Mursilis.

197. The Median prince and ally of Mursilis-Nabopolassar was his brother-in-law, known in the texts by the name of Mattiuza.

198. The sickness of Nabopolassar, his subsequent inability to head the army, his invalid condition and his death, as described by Berosus, find their confirmation in the report of Mursilis-Nabopolassar about the first and second strokes of paralysis that befell him.

199. Nergilissar who called himself son of Bel-shum-ishkun, King of Babylon, was a son of Nabopolassar. He was the second son of Nabopolassar; his elder brother died before being crowned.

200. Nergilissar followed the policy of his father in signing international protective treaties, with Chaldea playing the part of the protector.

201. The name of one of his allies, Alexandus (Alexandos) of Wilusa, who came to Alasia (Cyprus), does not imply that the name Alexandos or Alexandros was already in use in the fourteenth century. (Alexandus of Wilusa might have been identical with Alexandros, son of Akamas and father of Chytros, who was connected with the city of Chitroi on Cyprus.)

202. The Aiavolos mentioned in the Boghazkoi texts and identified as Aioles, and connected in the texts with Lesbos, were the colonists from Boeothia on Lesbos (Thukidides I, 12ff.). This process of migration is reflected in the Boghazkoi texts.

203. Nebukhadnezar left an autobiography found among the Boghazkoi texts (the autobiography of Hattusilis-Khetasar). Like other documents of Boghazkoi it is incorrectly ascribed to a period seven centuries earlier.

204. Nebukhadnezar was the third son of Nabopolassar. Of feeble health, he was reared in a temple of Ishtar. When his elder brother died, he was given the name of the deceased.

205. Nergilissar appointed Nebukhadnezar as chief of the army and governor of Assyria. In this capacity he battled the Egyptians under Ramses II, in the second year of the latter; in the fifth year of Ramses II, raised to the station of King of Assyria, Nebukhadnezar again battled the Egyptians, at Kadesh-Carchemish.

X

206. Ramses II (of the Nineteenth Dynasty) and Pharaoh-Necho (of the Twenty-sixth Dynasty) of the Scriptures or Necos of Herodotus are one and the same person.

207. The theories that make Ramses II the Pharaoh of Oppression or the Exodus are wrong.

208. For nineteen years Ramses II was in a state of war with Nebu-khadnezar.

209. The defeat of Josiah is portrayed in a mural fragment, now in the Metropolitan Museum of Art.

210. The tribute imposed upon Judea and the imprisonment of Jehoahaz are referred to on an obelisk of Tanis.

211. The first march of Necho-Ramses II toward the Euphrates is related on the obelisk of Tanis and on the rock inscription of Nahr el Kalb near Beirut, written in his second year. The rock inscriptions of Ramses II are not as old as that of Essarhadon on the same rock.
212. The second campaign which Ramses II led toward the Euphrates is narrated in his annals and in the Pentaur-poem and has a parallel record in Jeremiah 46.
213. The Shardana mercenaries were the people of Sardis (Lydians), and not of Sardinia.
214. The city Kadesh the Old of the battle was Carchemish.
215. The remnants of the fortifications and the double moats of Kadesh-Carchemish pictured by Ramses II are recognizable in situ.
216. Hieropolis the Old was situated on the site of Carchemish.
217. The river 'N-r-t or 'R-n-t was the Egyptian name of the Euphrates.
218. Bab and Aranime mentioned by Ramses II in the course of the battle are Bab and Arime on the road from Aleppo to Carchemish.
219. At the beginning of the battle, Ramses II, with the division of Amon, was northwest of Carchemish; the division of Re was between Sadjur and Carchemish; the division of Ptah and Sutekh were south of Bab. The army of Re was driven northward away from its base, and, together with the division of Amon, was thrown into the Euphrates.
220. After the defeat at Carchemish, Ramses II lost dominion over Syria and Palestine for three years, until the eighth year of Jehoiakim.
221. A fragment of a clay tablet, dealing with the battle of Carchemish, is preserved in the archive of Boghazkoi.
222. Nebukhadnezar returned from the pursuit of Ramses II because he was accused before Nergilissar of intending to usurp the imperial crown.
223. The person of his accuser, Arma, a very aged relative, whom he ultimately put to death, is intimated in the rabbinical literature and in the Fathers of the Church as that of Hiram, King of Tyre, old relative and accuser of Nebukhadnezar.
224. Nergilissar exacted an oath from Nebukhadnezar that he would be faithful to his son and heir, Labash-Marduk (Lamash or Labu in the Boghazkoi texts). After Nergilissar's death, Nebukhadnezar crowned his nephew, but nine months later, he arrested him. A letter of Nebukhadnezar (Hattusilis) to his minor nephew, containing a denunciation, is preserved.
225. The repairs of the palace and the temple of Ezagila in Babylon made by Nergilissar antedate those made by Nebukhadnezar.

226. The queen of Nebukhadnezar was a daughter of a priest of Ishtar. She was not an Egyptian or Median princess, as related by early authors.

227. Nebukhadnezar became King of Babylon five years after Ramses II became King of Egypt.

228. In his ninth year Ramses II occupied Askalon and the Philistine shore. Marching through the valley of Jezreel, his troops reached Beth Shan.

229. In the twelfth year of Ramses II, Palestine was again subdued by Nebukhadnezar.

230. During the interval between two sieges of Jerusalem in the days of Zedekiah, a treaty was concluded between Ramses II and Nebukhadnezar; its text is extant.

231. Jewish fugitives in Egypt were extradited in accordance with the treaty.

232. The "Fossae Temple" of Lachish was built in the days of Solomon and rebuilt in the days of Jehoshaphat and Amenhotep III; the city was captured by Sennaherib, and destroyed by Nebukhadnezar. The "Fossae Temple", burnt in the days of Ramses II, and the city-walls, burnt in the days of Nebukhadnezar, are remains of one and the same fire.

233. Nebukhadnezar did not invade Egypt. The only historical inscription which is ascribed to Nebukhadnezar and which deals with a march toward Egypt, has a counterpart in the Marriage Stela of Ramses II.

234. Ramses II married a daughter of Nebukhadnezar. The bas-relief of Abu-Simbel portrays the visit of Nebukhadnezar bringing his daughter to Ramses II.

235. "Bit-Niku" outside the wall of Babylon was the palace built for Ramses II who used to visit there.

236. Nebukhadnezar's daughter had a palace at Daphneh-Tahpanhes.

237. Red baked bricks of the Ramses period in Tahpanhes were an innovation introduced from the Babylon of Nebukhadnezar.

238. The Bentresh Stela deals with the mental disease of the elder daughter of Nebukhadnezar, and was written by the priests of Khons a few decades thereafter. This daughter was married to a prince of Damascus.

239. The paranoiac character of Nebukhadnezar is fully reflected by his autobiography and other texts of Boghazkoi, notably dealing with exorcisms. The biblical record about his suffering from nightmares and about his mental disease is substantiated.

240. The tomb of Ahiiram found at Bybios dates not from the thirteenth century, but from about 600 B.C.E. The Cyprian pottery of the end of the seventh century and the vases of Ramses II found in this grave are contemporaneous.

241. Itobaal, son of Ahiram, the builder of the tomb, was probably the defender of Tyre against Nebukhadnezar, as mentioned by Josephus.

242. The inscriptions of Ahiram's tomb are of the same age as the ostraca of Lachish. The development of the Hebrew letters went through a normal process without falling into archaisms.

243. The dispute as to whether Ramses II or Necho built the canal connecting the Mediterranean with the Red Sea, deals with a spurious problem.

244. Greek armor found in Daphneh (Daphnoi), as well as iron tools and ingots, are coeval with the temple of Ramses II there, and are products of the Greek mercenaries in the service of the pharaohs of the Nineteenth (Twenty-sixth) Dynasty.

245. Tiles of buildings erected by Ramses II (in Kantir) which have Greek letters on the back, are products of Greek laborers in the service of the pharaoh. The letters are genuine Greek letters of the sixth century.

XI

246. Pharaoh Marneptah is the biblical Hophra and Apries of the Greek authors. Marneptah was not the Pharaoh of the Exodus, but the Pharaoh of the Exile. His royal name usually read Hotepirma, must be read Hophra-Mat.

247. That part of the population of Palestine which escaped deportation to Babylon, went to Egypt, and this migration through the fortress city of Takhu was recorded by the officials of Marneptah.

248. The fortress and palace station Takhu on the frontier, is the biblical Tahpanhes (Daphnoi).

249. The mention of Israel in the "Israel Stela" of Marneptah as an unsettled people refers to their status of exiles.

250. Marneptah used metaphors similar to Jeremiah's in describing the plight of Palestine and Israel.

251. The incursion of Marneptah into Syria is echoed in Diodorus I, 68. This could have taken place during the mental illness of Nebukhadnezar.

252. The city Kaditis in Palestine, referred to by Herodotus, is Jerusalem, and not Gaza.

253. The Libyan campaign of Marneptah was caused by the migration of the Greeks to Cyrenae. It was not an archaic invasion of Hellenic peoples in the thirteenth century, but the mass migration encouraged by the Pythian oracle and described by Herodotus (IV, 159).

254. Amasis deposed Marneptah. There were not seven centuries between Marneptah and Amasis; the latter was a general in the service of the former. Amasis kept his prisoner for a while as co-ruler on the throne.

255. The violent death of Apries-Marneptah at the hands of the assassins was caused by a lethal wound of the head, as the perforation of the skull of his mummy shows.

XII

256. The overthrow of Egypt, which Ramses III referred to as having occurred a number of generations before his own days, is the conquest of Egypt by Cambyses in the year of Amasis' death.

257. The Palestinian Irsa who taxed Egypt is Ezra, the scribe; he taxed Egypt in accordance with the decree of Artaxerxes.**

258. Ramses III is identical with Nectanebo I of the Greek authors. He lived not in the twelfth but in the fourth century.

259. In Herodotus there can be no reference to Ramses III, because the historian lived before the pharaoh. The history of Egypt by Herodotus, though defective in details, is more nearly accurate than that of the later and modern historians, because he placed the history of the Eighteenth, the Ethiopian, and the Nineteenth Dynasties in fairly accurate order.

260. "Invasion of Egypt by the archaic Greeks" in the twelfth century is a fallacy. The Greeks who participated in the wars of Ramses III and who are shown as changing sides, were at first soldiers of Chabrias, assisting Egypt, and then troops of Iphicrates, opposing Ramses III.

261. Agesilaus, the King of Sparta, had already arrived in Egypt in the days of ~~Nectanebo I (Ramses III)~~, [*Tachos (Ramses IV)*] and Ramses III, who referred to his arrival, mentioned also his notably small stature.

262. The Pereset, with whom Ramses III was at war, were the Persians of Artaxerxes II under the satrap Pharnabazus, and not the Philistines.

263. The war described by Ramses III, and by Diodorus and other classical authors (the war of Nectanebo I), is one and the same war of 374 BCE

264. A camp was set up by Pharnabazus in Acco in preparation for an attack against the Egypt of Ramses III.

265. A naval invasion against Egypt was undertaken by forcing the Mendesian mouth of the Nile, fortified by Ramses III.

266. Flame throwers were used on the Persian ships forty years before their use by the Tyrians at the siege of Tyre by Alexander.

267. The Egyptian bas-reliefs of the temple at Medinet Habu show Sidonian ships and Persian carriages comparable to the pictures of ships and carriages on the Sidonian coins minted during the years of the invasion.
268. The bas-reliefs of Medinet Habu show the reform of Iphicrates in lengthening the swords and spears and reducing the armor intended for defense.
269. The Jewish military colony at Elephantine still existed in 374 BCE and participated in the defense of the eastern border of Egypt. These professional soldiers were called Marienu by Ramses III, which is the Aramaic Marenu.
270. Semitic languages and the Palestinian cult of Baal made headway in Egypt at the time of Ramses III.
271. The Greek letters of classical form incised on the tiles of Ramses III during the process of manufacture (found at Tell-el-Yahudieh in the Delta) present no problem. They are Greek letters of the fourth century.
272. The inlay work and glazing of the tiles of Ramses III are innovations introduced from Persia.
273. The hunting motifs in the art of Ramses III were inspired by Assyrian and Persian bas-reliefs; some motifs of the Greek art also made their influence felt in the murals of Ramses III.
274. Other kings known by the name of Ramses, from Ramses IV to Ramses XII, are identical with the kings of the Twenty-ninth and Thirtieth Dynasties and their order of succession is confused.
275. The papyrus of Wenamon describes the conditions in Syria during the late Persian or early Greek times. In the days when the Testament of Naphtali was composed, the Barakel Shipowners Company mentioned in this papyrus was still in existence and owned by a son of Barakel.
276. The so-called Twenty-first Dynasty flourished not in the twelfth-eleventh century, but in the fifth-fourth century; it was established by the Persians as a dynasty of priestly princes in the oases of the Libyan desert for strategic purposes. It existed before, during and after the Twentieth (Twenty-ninth and Thirtieth) Dynasty.
277. The so-called Stela of the Exiled is the Egyptian record of the visit of Alexander the Great to the oracle of Amon in the oasis. The question about the exiles refers to the exiles from Chios; the question about the punishment of the murderers refers to the murderers of Philip.
278. The narration of Greek and Latin authors concerning this visit of Alexander is historical and true in many details; such is, e. g., the episode of the priest applying the word "son" to Alexander, or the oracle's manner of answering questions by nodding.

279. The history of the ancient world, confused for a period of over one thousand years, reaches the end of its confusion with the time of Alexander the Great. Since then it is rendered in a synchronized form.***

280. The problem of the beginning of the Iron Age in diverse countries is confused by wrong chronology. The Iron Age developed simultaneously in Egypt and Palestine.

281. The often made assumption that the royal signs (scarabs with cartouches) of the Egyptian kings do not present a valid argument for the time valuation of the strata in which they are found, is erroneous. In most cases they were neither heirlooms deposited at a later date, nor late counterfeits, but genuine gems as old as the strata in which they are found.

282. Archaeological work in the Near East is misled by the erroneous chronology of Egypt. In the excavations where the strata were carefully distinguished, as in Beth Shan, no strata of the Israelite period above the stratum of Rames II could be found.

283. The astronomical computation of chronology made by calculation of the Sothic periods is entirely arbitrary in many aspects. The Egyptian New Year followed the planet Isis, which is Venus, and not Sirius. The Canopus Decree of the priests of Ptolemy III Euergetes was concerned with the transfer of the New Year from the heliacal rising of Venus to a date regulated by the rising of Sirius (Sothis).

284. After the end of the Middle Kingdom, a change in cosmic scenery caused a reform in the calendar. During the time of the Libyan Dynasty (between the Eighteenth and Nineteenth Dynasties) another change was made in the calendar.

* Velikovsky later concluded that there were two Nergilissars, the second reigning after Evil Marduk.

** Velikovsky later rejected Irsa being Ezra, and identified him as the Persian official Arsames. Cf. *Peoples of the Sea*, n. 8 on page 27.

*** Velikovsky later found that the confusion persists until the time of Ptolemy II. Cf. *Peoples of the Sea*.

COSMOS WITHOUT GRAVITATION

ATTRACTION, REPULSION AND ELECTROMAGNETIC CIRCUMDUCTION IN THE SOLAR SYSTEM

Synopsis

BY

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I

THE FUNDAMENTAL theory of this paper is: Gravitation is an electromagnetic phenomenon. There is no primary motion inherent in planets and satellites. Electric attraction, repulsion, and electromagnetic circumduction⁽¹⁾ govern their movements. The moon does not “fall,” attracted to the earth from an assumed inertial motion along a straight line, nor is the phenomenon of objects falling in the terrestrial atmosphere comparable with the “falling effect” in the movement of the moon, a conjecture which is the basic element of the Newtonian theory of gravitation.

Aside from several important facts discovered in the study of cosmic upheavals, which are not illuminated here and only enumerated at the end of this paper, and which are discussed at length in a work of research entitled *Worlds In Collision* now being prepared for publication, the following facts are incompatible with the theory of gravitation:

1. The ingredients of the air—oxygen, nitrogen, argon and other gases—though not in a compound but in a mixture, are found in equal proportions at various levels of the atmosphere despite great differences in specific weights. The explanation accepted in science is this: “Swift winds keep the gases thoroughly mixed, so that except for water-vapor the composition of the atmosphere is the same throughout the troposphere to a high degree of approximation.” ⁽²⁾ This

explanation cannot be true. If it were true, then the moment the wind subsides, the nitrogen should stream upward, and the oxygen should drop, preceded by the argon. If winds are caused by a difference in weight between warm and cold air, the difference in weight between heavy gases high in the atmosphere and light gases at the lower levels should create storms, which would subside only after they had carried each gas to its natural place in accordance with its gravity or specific weight. But nothing of the kind happens.

When some aviators expressed the belief that “pockets of noxious gas” are in the air, the scientists replied:

“There are no ‘pockets of noxious gas.’ No single gas, and no other likely mixture of gases, has, at ordinary temperatures and pressures, the same density as atmospheric air. Therefore, a pocket of foreign gas in that atmosphere would almost certainly either bob up like a balloon, or sink like a stone in water.” ⁽³⁾

Why, then, do not the atmospheric gases separate and stay apart in accordance with the specific gravities?

2. Ozone, though heavier than oxygen, is absent in the lower layers of the atmosphere, is present in the upper layers, and is not subject to the “mixing effect of the wind.” The presence of ozone high in the atmosphere suggests that oxygen must be still higher: “As oxygen is less dense than ozone, it will tend to rise to even greater heights.” ⁽⁴⁾ Nowhere is it asked why ozone does not descend of its own weight or at least why it is not mixed by the wind with other gases.
3. Water, though eight hundred times heavier than air, is held in droplets, by the millions of tons, miles above the ground. Clouds and mist are composed of droplets which defy gravitation.
4. Even if perfect elasticity is a quality of the molecules of all gases, the motion of the molecules, if effected by a mechanical cause, must subside because of the gravitational attraction between the particles and also because of the gravitational pull of the earth. There should also be a loss of momentum as the result of the transformation of a part of the energy of motion into vibration of molecules hit in the collisions. ⁽⁵⁾ But since the molecules of a gas at a constant temperature (or in a perfect insulator) do not stop moving, it is obvious that a force generated in collisions drives them. The molecules of gases try to escape one another. Repulsion between the particles of gases and vapors counteracts the attraction.
5. The weight of the atmosphere is constantly changing as the changing barometric pressure indicates. Low pressure areas are not necessarily encircled by high pressure belts. The semidiurnal changes in barometric pressure are not explainable by the mechanistic principles of gravitation and the heat effect of solar radiation. The cause of these variations is unknown.

“It has been known now for two and a half centuries, that there are more or less daily variations in the height of the barometer, culminating in two maxima and two minima during the course of 24 hours. Since Dr. Beal’s discovery (1664-65), the same observation has been made and puzzled over at every station at which pressure records were kept and studied, but without success in finding for it the complete physical explanation. In speaking of the diurnal and semidiurnal variations of the barometer, Lord Rayleigh says: ‘The relative magnitude of the latter [semidiurnal variations], as observed at most parts of the earth’s surface, is still a mystery, all the attempted explanations being illusory.’” ⁽⁶⁾

One maximum is at 10 a.m., the other at 10 p.m.; the two minima are at 4 a.m. and 4 p.m. The heating effect of the sun can explain neither the time when the maxima appear nor the time of the minima of these semidiurnal variations. If the pressure becomes lower without the air becoming lighter through a lateral expansion due to heat, this must mean that the same mass of air gravitates with changing force at different hours.

The lowest pressure is near the equator, in the belt of the doldrums. Yet the troposphere is highest at the equator, being on the average about 18 km. high there; it is lower in the moderate latitudes, and only 6 km. high above the ground at the poles.

6. Laplace, pondering the shape of the atmospheric envelope of the earth, came to the conclusion that the atmosphere, which rotates with the same angular velocity as the earth and which behaves like a fluid, must be lenticular in form; its polar and equatorial axes must be about 35,000 and 52,000 miles respectively; at the equator the atmosphere must extend more than 21,000 miles above the ground. At these distances from the ground the gravitational force of the earth is just equal to the centrifugal force due to rotation.

From the measurement of the pressure of the earth's atmosphere, measurement based also on the principles of gravitation, it has been deduced that the atmosphere is but 17 (not 21,000) miles high.

Observations of the flight of meteorites and of the polar auroras lead to the conjecture that the atmosphere reaches to a height of 130 miles (meteorites) or over 400 miles (polar auroras). Radio measurements yield about 200 miles for the upper layer recognizable through this method of investigation.

Two computations, both based on the principle of gravitation, differ in the proportion of 17 and 21,000. Direct observations do not justify either of the computed figures.

7. Cyclones, characterized by low pressure and by winds blowing toward their centers, move counterclockwise in the northern hemisphere and clockwise in the southern hemisphere. This movement of air currents in cyclonic vortices is generally explained as the effect of the earth's rotation.

Anticyclones, characterized by high pressure and by winds blowing from their centers move clockwise in the northern hemisphere and counterclockwise in the southern hemisphere. The movement of anticyclones has not been explained and is regarded as enigmatic.

Cyclones and anticyclones are considered a problem of fluidal motion with highest or lowest pressure in the center. As the movement of anticyclones cannot be explained by the mechanistic principles of gravitation and rotation, it must be concluded that the rotation of cyclones is also unexplained.

8. The area of land in the northern hemisphere of the earth is to the area of land in the southern hemisphere as three is to one. The mean weight of the land is two and three-quarter times heavier than that of water; assuming the depth of the seas in both hemispheres to be equal, the

northern hemisphere up to sea level is heavier than the southern hemisphere, if judged by sea and land distribution; the earth masses above sea level are additional heavy loads. But this unequal distribution of masses does not affect the position of the earth, as it does not place the northern hemisphere with its face to the sun. A "dead force" like gravitation could not keep the unequally loaded earth in equilibrium. Also, the seasonal distribution of ice and snow, shifting in a distillation process from one hemisphere to the other, should interfere with the equilibrium of the earth, but fails to do so.

9. Mountainous masses do not exert the gravitational pull expected by the theory of gravitation. The influence of the largest mass on the earth, the Himalaya, was carefully investigated with plumb line on the Indian side. The plumb line is not deflected as calculated in advance.⁽⁷⁾ "The attraction of the mountain-ground thus computed on the theory of gravitation, is considerably greater than is necessary to explain the anomalies observed. This singular conclusion, I confess, at first surprised me very much." (G. B. Airy.⁽⁸⁾) Out of this embarrassment grew the idea of isostasy. This hypothesis explains the lack of gravitational pull by the mountains in the following way. The interior of the globe is supposed to be fluid, and the crust is supposed to float on it. The inner fluid or magma is heavier or denser, the crust is lighter. Where there is a mountainous elevation, there must also be a protuberance beneath the mountains, this immersed protuberance being of lesser mass than the magma of equal volume. The way seismic waves travel, and computations of the elasticity of the interior of the earth, force the conclusion that the earth must be as rigid as steel; but if the earth is solid for only 2000 miles from the surface, the crust must be more rigid than steel. These conclusions are not reconcilable with the principle of isostasy, which presupposes a fluid magma less than 60 miles below the surface of the earth. There remains "a contradiction between isostasy and geophysical data."⁽⁹⁾
10. Over the oceans, the gravitational pull is greater than over the continents, though according to the theory of gravitation the reverse should be true; the hypothesis of isostasy also is unable to explain this phenomenon.⁽¹⁰⁾ The gravitational pull drops at the coast line of the continents. Furthermore, the distribution of gravitation in the sea often has the peculiarity of being stronger where the water is deeper. "In the whole Gulf and Caribbean region the generalization seems to hold that the deeper the water, the more strongly positive the anomalies."⁽¹¹⁾

As far as observations could establish, the sea tides do not influence the plumb line, which is contrary to what is expected. Observations on reservoirs of water, where the mass of water could be increased and decreased, gave none of the results anticipated on the basis of the theory of gravitation.⁽¹²⁾

11. The atmospheric pressure of the sun, instead of being 27.47 times greater than the atmospheric pressure of the earth (as expected because of the gravitational pull of the large solar mass), is much smaller: the pressure there varies according to the layers of the atmosphere from one-tenth to one-thousandth of the barometric pressure on the earth;⁽¹³⁾ at the base of the reversing layer the pressure is 0.005 of the atmospheric pressure at sea level on the earth;⁽¹⁴⁾ in the sunspots, the pressure drops to one ten-thousandth of the pressure on the earth.

The pressure of light is sometimes referred to as to explain the low atmospheric pressure on the sun. At the surface of the sun, the pressure of light must be 2.75 milligrams per square centimeter; a cubic centimeter of one gram weight at the surface of the earth would weigh 27.47 grams at the surface of the sun. Thus the attraction by the solar mass is 10,000 times greater than the repulsion of the solar light. Recourse is taken to the

supposition that if the pull and the pressure are calculated for very small masses, the pressure exceeds the pull, one acting in proportion to the surface, the other in proportion to the volume.⁽¹⁵⁾ But if this is so, why is the lowest pressure of the solar atmosphere observed over the sunspots where the light pressure is least?

12. Because of its swift rotation, the gaseous sun should have the latitudinal axis greater than the longitudinal, but it does not have it. The sun is one million times larger than the earth, and its day is but twenty-six times longer than the terrestrial day; the swiftness of its rotation at its equator is over 125 km. per minute; at the poles, the velocity approaches zero. Yet the solar disk is not oval but round: the majority of observers even find a small excess in the longitudinal axis of the sun.⁽¹⁶⁾ The planets act in the same manner as the rotation of the sun, imposing a latitudinal pull on the luminary.

Gravitation that acts in all directions equally leaves unexplained the spherical shape of the sun. As we saw in the preceding section, the gases of the solar atmosphere are not under a strong pressure, but under a very weak one. Therefore, the computation, according to which the ellipsoidity of the sun, that is lacking, should be slight, is not correct either. Since the gases are under a very low gravitational pressure, the centrifugal force of rotation must have formed quite a flat sun.

Near the polar regions of the sun, streamers of the corona are observed, which prolong still more the axial length of the sun.

13. If planets and satellites were once molten masses, as cosmological theories assume, they would not have been able to obtain a spherical form, especially those which do not rotate, as Mercury or the moon (with respect to its primary).
14. The Harmonic Law of Kepler views the movements of the planets as depending only on their distance from the sun. According to Newton, the masses of the sun and the planets must also enter the formulas. The Newtonian orbits differ from the Keplerian, found empirically. The Newtonian formula has a sum of masses (instead of a product of masses), and in view of the largeness of the sun, the Newtonian orbits are supposed to not deviate substantially from the Keplerian.⁽¹⁷⁾
15. Perturbations of planets due to their reciprocal action are pronounced in repulsion as well as attraction. A perturbation displacing a planet or a satellite by a few seconds of arc must direct it from its orbit. It is assumed that the orbits of all planets and satellites did not change because of perturbations. A regulating force emanating from the primary appears to act. In the gravitational system there is no place left for such regulating forces.
16. The perturbing activity appears unstable in the major planets, Jupiter and Saturn: Between the minimum of the year 1898-99 and the maximum of the 1916-17 there was found an 18 percent difference.⁽¹⁸⁾ As these planets did not increase in mass in the meantime, this change is not understandable from the point of view of the theory of gravitation, which includes the principle of the immutable gravitational constant.
17. The pressure of light emanating from the sun should slowly change the orbits of the satellites, pushing them more than the primaries, and acting constantly, this pressure should have the effect of acceleration: the pressure of light per unit of mass is greater in relation to the satellites than in relation to their primaries. But this change fails to materialize; a regulating force seems to overcome this unequal light pressure on primaries and secondaries.

18. The sun moves in space at a velocity of about twenty kilometers a second (in relation to the nearby stars). This motion, according to Lodge, must change the eccentricities of some of the planetary orbits to an extent which far exceeds the observed values.⁽¹⁹⁾
19. The motion of the perihelia of Mercury and Mars and of the nodes of Venus differ from what is computed with the help of the Newtonian law of gravitation. Einstein showed how his theory can account for the anomaly of Mercury; however, the smaller irregularities in the movements of Venus and Mars cannot be accounted for by Einstein's formulas.
20. Unaccounted for fluctuations in the lunar mean motion were calculated from the records of lunar eclipses of many centuries and from modern observations. These fluctuations were studied by S. Newcomb, who wrote: "I regard these fluctuations as the most enigmatic phenomenon presented by the celestial motions, being so difficult to account for by the action of any known causes, that we cannot but suspect them to arise from some action in nature hitherto unknown."⁽²⁰⁾ They are not explainable by the forces of gravitation which emanate from the sun and the planets.
21. It was found that "the strength of radio reception was nearly doubled with the passing of the moon from overhead to underneath the observer ... It does not appear reasonable that the relatively small gravitational tide in the earth's atmosphere, which changes the barometric pressure by less than half of one percent, could account for a sufficient change in altitude of the ionized layer to produce such marked changes in the intensity of reception."⁽²¹⁾

The lifting of the ionosphere generally results in better radio reception, and the small tidal action by the moon when overhead should improve reception a little, not impair it; in any event, the moon cannot have a marked effect on the ionosphere without being itself a charged body. But if the moon is charged, it cannot behave in its motion as though the gravitational force alone acts between it and the earth.

22. The tails of the comets do not obey the principle of gravitation and are repelled by the sun. "There is beyond question some profound secret and mystery of nature concerned in the phenomenon of their tails" ; enormous sweep which it (the tail) makes round the sun in perihelion, in the manner of a straight and rigid rod, is in defiance of the law of gravitation, nay, even of the recorded laws of motion" (J. Herschel).⁽²²⁾

"What has puzzled astronomers since the time of Newton, is the fact that while all other bodies in the sidereal universe, as far as we are aware, obey the law of gravitation, comets' tails are clearly subject to some strong repulsive force, which drives the matter composing them away from the sun with enormously high velocities" (W.H. Pickering)

23. The change in the angular velocity of comets (especially of the comet Encke) is not in accord with the theoretical computations based on the theory of gravitation.⁽²³⁾
24. Meteors, after entering the terrestrial atmosphere at about 200 km. above the ground, are violently displaced toward the east. These displacements of the meteors are usually ascribed to winds blowing in the upper atmosphere.⁽²⁴⁾ The atmospheric pressure at a height of 45 km. is supposed to be but "a small fraction of one millimeter of mercury."⁽²⁵⁾ On the other hand, the velocity with which the meteors approach the earth is between 15 and 75 km. per second, on the average about 40 km. per second or over 140,000 km. per hour. If winds of 150 km. per hour velocity were permanently blowing at the height where the meteors become visible, it would

not be possible for such winds of rarefied atmosphere to visibly deflect stones falling at the rate of 140,000 km. per hour.

Approaching the earth, the meteorites suddenly slow down and turn aside, and some are even repelled into space. "A few meteors give the appearance of penetrating into our atmosphere and then leaving it, ricocheting as it were." [\(26\)](#)

25. The earth is a huge magnet; it has electric currents in the ground and is enveloped by a number of layers of electrified ionosphere. The sun possesses an electric charge and magnetic poles; also the sunspots are found to be powerful magnets. The ionosphere is permanently charged by particles arriving from the sun; sunspots actively influence terrestrial magnetism, ground currents, the ionosphere's charge, and auroras. As the principle of gravitation leaves no room for the participation of other forces in the ordinary movements of the celestial mechanism, these obvious and permanent influences of the electromagnetic state of the sun on the magnetic field of the earth, the ionosphere, the auroras, and the earth currents are not allowed to have more than zero effect on the astronomical position of the earth, and this for the sake of maintaining the integrity of the gravitational principle.

Sun and moon, comets, planets, satellites, and meteorites - all the heavenly host - air and water, mountain massifs and sea tides, each and all of them [\(27\)](#) disobey the "law of laws" which is supposed to know no exception.

* * *

To the empirical evidences of the fallacy of the law of gravitation four well known difficulties of the gravitational theory can be added:

- a. Gravitation acts in no time. Laplace calculated that, in order to keep the solar system together, the gravitational pull must propagate with a velocity at least fifty million times greater than the velocity of light. A physical agent requires time to cover distance. Gravitation defies time.
- b. Matter acts where it is not, or *in absentia*, through no physical agent. This is a defiance of space. Newton was aware of this difficulty when he wrote in a letter to Bentley: "That gravity should be innate, inherent, and essential to matter, so that one body can act upon another at a distance through a vacuum without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity that I believe no man, who has in philosophical matters a competent faculty of thinking, can ever fall into it." Leibnitz opposed the theory of gravitation for this very reason.
- c. Gravitational force is unchangeable by any and all agents or by any medium through which it passes, always propagating as the inverse square of the distances. "Gravitation is entirely independent of everything that influences other natural phenomena" (De Sitter [\(28\)](#)). This is a defiance of the principles governing other energies.
- d. Every particle in the universe must be under a tendency to be pulled apart because of the infinite mass in the universe: it is pulled to all sides by all the matter in space.

A few additional remarks about the motion of bodies in the universe which bear upon the theory of gravitation are added here:

1. The notion of the tangential escape or inertia of the primary motion of the planets and satellites, being adopted by all cosmogonical theories of post-Newtonian days, led all of them into insurmountable difficulties. The retrograde motion of some satellites is one of these difficulties.
2. The principle of gravitation demands an ultimate balling of all matter in the cosmos. This is not in harmony with spectral observations, which suggest even an “expanding universe”
3. “An atom differs from the solar system by the fact that it is not gravitation that makes the electrons go round the nucleus, but electricity.” (B. Russell). Different principles are supposed to govern the motion of the planetary bodies in the macrocosm and microcosm.⁽²⁹⁾

* * *

Newton explained the principle underlying the motion of the planets and the satellites by the example of a stone thrown horizontally from a mountain with such force that gravitation bends its flight so that it revolves around the earth, coming back to exactly the same place, once again to repeat the course of its flight. But he admits “It is not to be conceived that mere mechanical causes could give birth to so many regular motions,” and invokes an act of Providence in providing each satellite with a tangential push of a strength which, together with the pull of the primary, creates an orbit. (General Scholium to Book III of the *Principia*) The inertia of the tangential (instantaneous) push has not exhausted itself in all the eons despite the tidal friction between a satellite and its primary, or the sun pulling the satellite away from the primary, or the resistance of matter (meteorites) in space, though all these forces act permanently and therefore with acceleration.

* * *

Newton’s gravitational theory is regarded as proved by the action of the tides. But studying the tides, Newton came to the conclusion that the moon has a mass equal to one fortieth of the earth. Modern calculations, based on the theory of gravitation (but not on the action of the tides), ascribe to the moon a mass equal to 1/81 of the earth’s mass.⁽³⁰⁾

The greatest triumph of the theory of gravitation was the discovery of the planet Neptune, the position of which was calculated simultaneously by Adams and Leverrier from the perturbations experienced by Uranus. But in the controversy which ensued concerning the priority in announcing the existence of Neptune, it was stressed that neither of the two scholars was the real discoverer, as both of them calculated very erroneously the distance of Neptune from the orbit of Uranus.⁽³¹⁾ Yet, even if the computations were correct, there would be no proof that gravitation and not another energy acts between Uranus and Neptune. The gravitational pull decreases as the square of the distance. Electricity and magnetism act in the same way. Newton was mistaken when he ascribed to magnetism a decrease that follows the cube of the distance.⁽³²⁾

Building his System of the World, Newton put before his readers “Rules of Reasoning in Philosophy.” The First Rule is: “We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances.” Rule II is: “Therefore, to the same natural effects we must, as far as possible, assign the same causes.”

Thorough theoretical and experimental investigations will be necessary to build a new theory in place of the now accepted theory of gravitation. For the present we shall offer only general suggestions.

1. *Attraction between two neutral atoms.* Each atom is made up of positive and negative electricity and, though neutral as a whole, may form an electric dipole when subjected to an electric force. Thus, in the theory presented here, this attraction is not due to “inherent gravitational” properties of mass, but instead to the well known electrical properties of attraction. Two dipoles arrange themselves so that the attraction is stronger than their mutual repulsion.
2. *Inertia, or the passive property of matter.* “The equality of active and passive, or gravitational and inertial mass was in Newton’s system a most remarkable accidental coincidence, something like a miracle. Newton himself decidedly felt it as such” (W. DeSitter).⁽³³⁾

In Einstein’s explanation, inertia and gravitation are not two different properties, but one and the same property viewed from different points in space. According to his illustration, a man in an elevator that is being continuously pulled up by a rope invisible to the man will feel his feet pressed against the bottom of the elevator and will think that he gravitates toward the floor. But someone else observing the situation from the outside in space will judge that there is a fact of inertia; the pulled elevator has to overcome the inertia of the man standing on its floor. If the man in the elevator lets an object fall from his hand, it will approach the floor at an accelerated speed because the elevator is being continuously pulled upward; to the observer on the outside it rises with acceleration.

By this illustration Einstein tried to explain the equivalence of inertia and gravitation. But it is impossible to adopt this explanation for the gravitational effect of the globe: the observer from outside cannot perceive the globe as moving simultaneously in all directions. Einstein sees the difficulty and says: “It is, for instance, impossible to choose a body of reference such that, as judged from it, the gravitational field of the earth (in its entirety) vanishes.”⁽³⁴⁾

In our explanation the active property is due to one kind of charge in the atom - the attracting (attracted) charge; the passive property, to the opposite charge, which repels (is repelled). Both exist in equal quantities in a neutral atom; this explains the equality of the gravitating and inertial properties of matter.

However, the charges must arrange themselves in such a manner that attraction proceeds: the attracting force overcomes the repelling force because the attracting poles of the dipoles are closer to one another than the repelling poles; when the repelling poles are closer, the atoms (or their combinations in molecules) repel each other, as is the case with gases.

A charged body attracts more strongly than a neutral body because of the presence of free electrons; in dipoles the charges rearrange themselves only a little, but free electrons can rearrange themselves much more.

3. *Attraction of bodies toward the earth.* The ionosphere is strongly charged with respect to the “neutral” earth; a potential difference of 100 volts per meter altitude exists near the ground, or

a difference in potentials which forces the current through the electric lamps. Does any relation exist between the difference in voltage in the lower atmosphere and the difference in weight (“at the ceiling of a room 3 meters high a kilogram weighs about one milligram less than at the floor”)?

With the altitude a voltage difference per meter is not the same as near the ground, but it accumulates to a high figure: “Between a point ten miles high and the surface of the earth there is an electrical pressure difference of about a hundred and fifty thousand volts.” [\(35\)](#)

Neutral bodies consist of both positive and negative charges. Neutral atoms form dipoles along the lines of force of the electric field with poles turned toward the earth and the ionosphere. Is the fall of objects due to their “dipole attraction” and to their movement in an electrical field as dipoles? The proximity to the ground gives its action preference over that of the ionosphere as far as the attracting force is concerned, since the distance between the opposite electric poles of the atomic dipole is much smaller in comparison to its total distance from the ionosphere than from the ground. This means, however, that when objects reach a certain altitude, they would be attracted upward. Meteorites, repelled into space, are apparently charged identically with the upper layer of the ionosphere.

This part of the theory (concerning falling bodies) requires experimentation and exact calculation. It is probable that besides carrying a charge, the ground turns all of its atoms as dipoles toward the ionosphere. [\(36\)](#)

4. “In contrast to electric and magnetic fields, the gravitational field exhibits a most remarkable property, which is of fundamental importance ... Bodies which are moving under the sole influence of a gravitational field receive an acceleration, which does not in the least depend either on the material or the physical state of the body.” (Einstein) [\(37\)](#)

This law is supposed to hold with great accuracy. The velocity of the fall is generally explored with the help of a pendulum; it appears to us that a charged object must fall with a different velocity than a neutral object. This is generally denied. But the denial is based on the observation that there is no difference in the number of swings of a pendulum in a unit of time, in the case where a charged or neutral bob is used. This method may produce inaccurate results. *In an accurate method, the falling time and the time of ascent of the pendulum must be measured separately.* In the case of a charged body, the increase in the velocity of descent of the pendulum may be accompanied by a decrease in the velocity of ascent, and thus the number of swings in a unit of time would remain the same for charged and non-charged bobs.

In a charged body the attracting and the inertial properties are not equal.

It appears also that the weight of a body increases after it is charged. An experiment made with a piece of hard rubber (ten grams), neutral and again charged by rubbing, on a scale with a sensitivity of one-tenth of a milligram, showed a change in weight of over ten milligrams. This appears to be the result of an induced charge in the bottom (ebony) of the balance (placed on a thick plate of glass). A grounded wire held over the scale with the charged rubber raises the scale. If “gravitation” is an electrical phenomenon,

attraction by induced electricity is not an entirely different phenomenon. Nevertheless, this experiment cannot be regarded as conclusive for the present problem.

In the oil-drop experiment the action of the charges may be made equal to the “gravitational” pull: One and the same action is ascribed to two fundamentally different principles.

A photograph may provide the answer to the question of how much a charged drop revolving around a pole of a magnet is influenced by the terrestrial pull.

Would a metal container filled with gas fall (in a vacuum) with the same velocity as a solid piece of metal?

III

Attraction, repulsion, and electromagnetic circumduction act in the solar system. Sun, planets, satellites, comets are charged bodies. As charged bodies they are interdependent.

The solar surface is charged negatively in relation to the charge of the earth, as the spectral lines (with the dominant red line in the spectrum of hydrogen) reveal. The sun carries a charge and rotates: it is an electromagnet.

The spots of the sun are magnetic, and the filaments of hydrogen on the sun’s surface arrange themselves as iron particles in a magnetic field.⁽³⁸⁾ Besides the spots, the sun as a whole is a magnet. “The form of the corona and the motion of the prominences suggest that it is a magnet,” wrote G.E. Hale when he undertook to detect the Zeeman effect.⁽³⁹⁾ The Zeeman effect proved to be most pronounced at 45° in both hemispheres of the sun; Hale found the displacement of lines decreases to zero at the equator and near the poles of rotation; and also that “a first approximate value for the vertical intensity of the sun’s general field at the poles is 50 gaussses.” Thus, it was confirmed that the sun is a magnet, but the magnetic field was found not to be strong.

This result is questioned here. The lines of the corona suggested the existence of a magnetic field on the sun to the scholar who discovered it. But the form of the corona suggests a powerful magnetic field.⁽⁴⁰⁾ Visible coronal bands and streamers reach a distance equal to ten and more diameters from the disc of the sun—Mercury is only forty solar diameters from the sun and Earth 108 solar diameters. More recent investigation by Stevens, who photographed the streamers from 25,000 feet, disclose a globular corona more extensive than any known from ground photographs.

Disturbances in filaments and vortices of the sun affect the ionosphere of the earth and prove the existence of a powerful charge on the sun; rotating at the speed of the solar rotation, a strong charge must produce a strong magnetic field.

A revised investigation of the magnetic power of the field around the sun is here suggested. It should be kept in mind that the observations have been made from the solar magnetic field, in which the earth is embedded, if our concept is correct. It is possible also that the strongest

Zeeman effect will show itself in latitudes higher than 45° . As is well known, the angle of observation must be taken into consideration in observing the Zeeman effect.

The sun is a rotating charged body, and it creates a magnetic field. We assume the solar charge to be large enough to produce a magnetic field with lines of force reaching the orbit of Pluto. The charged planets move at right angles to the sun's magnetic lines of force and describe the usual circular motion to which moving charged bodies are subjected in a magnetic field. Satellites, in turn, revolve in smaller magnetic fields produced by the rotation of the charged planets. The non-rotating planets have no satellites, for they do not produce magnetic fields. If there are rotating satellites, they may be able to revolve around them.

“The origin of the earth's main magnetic field has so far defied all attempts of solution.” ⁽⁴¹⁾ The cause of the earth's magnetic field is in (1) the magnetic field of the sun, and (2) the rotation of the charged earth around its axis.

It has been calculated⁽⁴²⁾ that if the earth is a magnet because of the rotating charge on its surface, the charge must be so great as to “enter as a serious factor in planetary perturbations,” and therefore the theory was dropped.⁽⁴³⁾ But this is exactly what happens: the electromagnetic fields of the earth and of other planets are the causes of the planetary perturbations.

We have constructed a theory according to which the members of the solar system are charged bodies; electric attraction and repulsion, and electromagnetic circumduction act in the system; the origin of the magnetic field around the sun is in its charge—the sun is an electromagnet; planetary motion is due to the electromagnetic force exerted on the planets by the sun. The planets as charged bodies create magnetic fields by their rotation. It follows that (a) gravity, depending on electrical charge, varies with the charge, (b) the masses of the planets are inaccurately calculated, (c) the positive and negative charges are manifested only in relation to the charge of the earth.

One of the differences between the conception of celestial mechanism expounded here and the theories of gravitation of Newton and Einstein is that in our understanding the revolution of the moon is a process of a different order from that of the falling of objects near the terrestrial ground. The revolution of the moon is a phenomenon of circumduction of a charge by a magnetic field and is not a fall combined with inertia; the primary motion of planets and satellites along a straight line is a fallacious notion. At the distance of the moon the electromagnetic field of the earth causes circumduction while in the terrestrial atmosphere the electric field between the earth and the ionosphere causes the movement of the dipoles. Like the moon, the earth and other planets and satellites are subject to electromagnetic circumduction.

IV

“Universal gravitation” is an electromagnetic phenomenon, in which the charges in the atoms, the free charges, the magnetic fields of the sun and the planets play their parts.

In the frame of this theory the following phenomena become explainable:

1. *All planets revolve in approximately one plane.* They revolve in a plane perpendicular to the lines of force of the sun's magnetic field.
2. *The planets have a greater aggregate energy of motion than the sun.* The revolution of the planets did not originate in the angular velocity of rotation of the sun; the magnetic field of the sun effected their revolution. Also, the fact that one of the satellites of Mars revolves with an angular speed greater than that of the rotation of this planet is explained here by electromagnetic circumduction.
3. *The retrograde revolution of a number of satellites.* It is due either to retrograde rotation of the primary with inversed magnetic poles or to a difference of charges. The fact that the retrograde satellites of Jupiter and Saturn are the most remote from their primaries poses the problem whether their remoteness from the primaries and their relative closeness to the sun play a role in their being of a presumably different charge than the other satellites of Jupiter and Saturn. [\(44\)](#)

In the case of Uranus, the retrograde revolution of its satellites follows the retrograde rotation of the planet and its magnetic field. (One of the magnetic poles of Uranus can be readily investigated because it faces the ecliptic.)

4. *The rotation of the earth.* The tidal theory fails to account for the rotation of the planets. The position of the magnetic poles of the earth at a distance of about 20 degrees from the geographical poles may be related to the rotation of the earth. Once each day the magnetic poles of the earth occupy the southernmost and the northernmost positions in the lines of the magnetic field of the sun.
5. *Perturbations among the members of the solar system* are actions of attraction as well as of repulsion and depend on the charges of the planets and satellites and their magnetic properties. The fact that after perturbations, the planets resume their normal courses is due to the regulating action of the sun's magnetic field. Similarly, the satellites are regulated in their motion by the electromagnetic fields of the primaries.
6. *The anomalies in the motion of Mercury and other planets.* The velocities of revolution of the planets depend on their charges. A strongly charged body is carried across the lines of the magnetic field more swiftly than a weakly charged body. If the charge of a planet increases, the velocity of revolution of such a planet must increase too. Positive as well as negative charges arrive from the sun in an uninterrupted flow.

The planet Mercury moves faster and faster. *This must be the result of an increasing charge of the planet.* Also, the anomalies in the motion of other inner planets may be attributed to a changing charge; other irregularities in the motion of the planets can be attributed to the fact that the electrical charge of the sun is not equally distributed on the solar surface.

7. *The deflection of a ray of light passing close to the sun.* Before attributing the deflection to the gravitational field of the sun, the influence of the magnetic field of the sun on the rotation of light should be calculated. (The influence of the moon on a ray of light by creating a ripple in the atmosphere during a solar eclipse must not be overlooked; an investigation of the trajectory of a stellar ray passing close to the moon in a lunar eclipse is suggested here.)
8. *The repulsion of a comet's tail by the sun.* The head of a comet and its tail are charged under a great potential difference, accounting for the manifest repulsion of the tail and attraction of the head. The neck of the comet is probably composed of positive and negative elements in equal

proportion, thus forming a neutral zone between the head and the tail. Under the influence of the temperature in space the charges change and the comet returns on its orbit.

9. *The displacement of the meteorites in the higher atmosphere.* It is caused not by the winds, but by the electromagnetic effect of the ionosphere. The light of the meteorites is caused by electric discharges. Consequently, the passage of meteorites disturbs radio reception.
10. *The influence of the moon on radio reception.* The charged moon on its hourly stations exerts an attracting-repelling action on the electrified layers of the atmosphere (ionosphere) to a greater degree than on the "insulating layer" of the earth's atmosphere.
11. *The semi-diurnal variations of the barometric pressure.* These variations with maxima at 10 a.m. and 10 p.m. have their cause in the semi-diurnal changes of the charge of the ionosphere at the same hours, 10 a.m. and 10 p.m. The barometric pressure reflects the degree of attraction exerted by the ground and the ionosphere on the gaseous envelope.
12. *The defiance of gravity by water and cloud building.* The ground and the ionosphere induce secondary charge-layers in the atmosphere. In such a secondary layer cloud-building takes place. Generation of electricity in clouds is due not to the friction of neutral clouds on mountain ridges, or to the friction of neutral clouds among themselves, or to the friction of droplets by the gravitational pull on them, but to the fact that droplets rise already charged toward the charged layer of the atmosphere, and clouds are further subjected to induction by the ground and the ionosphere. This explains also the segregation of the charges in the upper and lower levels of the clouds.
13. *Defiance of gravity experienced in the cumulo-nimbus clouds.* This defiance recorded by airplane pilots is the result of charges and electromagnetic effects prevailing in these clouds.
14. *The direction of the cyclonic and anticyclonic whirls.* Their direction on the earth, as well as on the sun, depends on the electromagnetic fields and not on the rotation of these bodies.
15. *Increased gravity over the sea.* The increase of gravity over the sea as compared with that over the continent may be explained by the higher charge of salt water.

* * *

There were a few attempts made to unite the electromagnetic and gravitational field theories; but as far as I know nobody has tried to solve the problem of planetary movement around the sun as a motion of charged bodies in a magnetic field; my explanation implies that the measurement of the solar magnetic field by Hale is not correct.

If the sun has a sufficiently strong magnetic field so as to reach the farthest of the planets, the quantitative elements are dictated by the charge of the sun, the strength of its magnetic field, and the charge of the planets.

* * *

The theory of the Cosmos without Gravitation given here in synopsis is written also in a comprehensive form (1941-43). I arrived at this concept early in 1941 as a result of my research in the history of cosmic upheavals as they affected the earth and other members of the solar system. A number of facts proved to me that the sun, the earth and other planets, the satellites, and the comets, are charged bodies, that the planets and their satellites have changed their orbits repeatedly and radically, and that gravitational attraction or the weight of objects has changed

during human history. I thus recognized the fact that not gravitation, but electric attraction and repulsion and electromagnetic circumduction govern the solar system.

In construction the electromagnetic theory of the solar system, I am indebted to Miss Shulamith Velikovsky for valuable suggestions on the dipole explanation of attraction between the atoms and the dipole concept of inertia.

REFERENCES

1. The usual term "rotation" may be misleading, as it is the phenomenon of planetary revolution, not rotation, to which it is here referred.
2. E.O. Hulburt in Fleming's *Terrestrial Magnetism and Electricity*, 1939, p.492
3. W.J. Humphreys, *Physics of the Air*, 1940, p.227
4. *Encyclopedia Britannica*, 14th edition, "Atmosphere"
5. See Sir James H. Jeans, *The Kinetic Energy of Gases*, 1940
6. W.J. Humphreys, *op.cit.*, p.240. Lord Rayleigh is quoted from the *Philos. Mag.*, May 29, 1890.
7. On the attraction of the Himalaya Mountains, by J.H. Pratt, *Philos. Transactions of the R. Soc. of London*, vol.145, London 1855.
8. On the computation of the effect of the attraction of mountain-masses, 1855.
9. W. Bowle, "Isostasy" in *Physics of the Earth*, vol.2, ed. by B. Gutenberg.
10. Vening Meinesz; see Fleming, *Terrestrial Magnetism*, p.33.
11. The Navy-Princeton Gravity Expedition to the West Indies in 1932.
12. A. Berget, *Paris C.R.* 116 (1893), pp.1501-3
13. Ch. John and H. Babcock, *Pressure and Circulation in the Reversing Layer of the Sun's Atmosphere*. Contribution of Mount Wilson Observatory, 278, 1924.
14. A. Unsold, *On the Physical Interpretation of Spectro-heliogram*, Contr. M. Wilson Obs. 378, 1929.
15. Peter Lebedew, *An Experimental Investigation of the Pressure of Light*, Ann. Rep. of the Smithsonian. Inst. 1903, John Cox, *Comets' Tails, the Corona, and the Aurora Borealis*, *ibid.*
16. Comp. Ch. L. Poor, *Gravitation versus Relativity*, 1922, p.98.
17. Comp. P. Duhem, *La Théorie Physique*, 2nd ed., 1914, pp.293 ff.
18. J. Zenneck, "Gravitation" in *Encyclop. der Mathem. Wiss.*, vol. V, part I p.44.
19. Lodge, *Philos. Mag.*, Feb. 19, 1918.
20. S. Newcomb, *Monthly Notices*, R.A.S., January 1909.
21. H.T. Stetson, *Earth, Radio, and Stars*, 1934, p.202.
22. J. Herschel, *Outlines of Astronomy*, p.406.
23. J. Zenneck, *Gravitation*, p.36.
24. Hulburt, *The Upper Atmosphere*, p.492.
25. F.H. Bigelow, *Circulation and Radiation in the Atmosphere of the Earth and the Sun*, 1915, p.42.
26. Ch. Olivier, *Meteors*, p.129.

27. The ancients assumed that the flame is not attracted to the ground. No experiment is known where this assertion had been subjected to experimental verification.
28. *Kosmos*, (1932) p.106.
29. Strangely enough, the movements of the electrons around the nucleus are ascribed to the electrical attraction between these bodies plus an infinitesimal gravitational attraction and to the inertia with which the electrons are trying to overcome these two pulls.
30. T.M. Cherry, *Newton's Principia in 1687 and 1937*, (1937) p.15.
31. Since Adams and Leverrier expected to find a planet of the size of Uranus *ca.* 1,750,000,000 miles beyond the orbit of Uranus, and it was found *ca.* 1,000,000,000 miles beyond Uranus, the mass of Neptune was overestimated by a factor of three.
32. *Principia*, Book III, Proposition V, Corr. V
33. *Kosmos*, 1932, p.107
34. A. Einstein, *Relativity*, 11th ed., London, 1936, p.69.
35. W. Swann, *Science*, July 3, 1942.
36. In connection with this, attention should be paid to the following: "When measurements of the earth's magnetic field are used to evaluate the magnetic line-integral around any chosen area on the earth's surface, the result generally differs from zero. This, according to a fundamental principle of electromagnetism, is to be taken as evidence that an electric current flows vertically across the area ... The average current-density is about 10,000 times that of the air-earth current that is derived from atmospheric-electricity measurements, so that it seems inadmissible to interpret either this aspect of the earth's magnetism or the currents observed in telegraph-lines of mountain slopes as manifestations of vertical electrical currents in the atmosphere unless there is involved here some principle or some mode of electrical transport that is yet unknown to physics... A problem that may be of fundamental importance to physical science." O.H. Gish, "Atmospheric electricity" in Fleming, *op.cit.*
37. *Relativity, The special and the general theory*, 11th ed., 1936, p.64
38. R.S. Richardson, *The nature of solar hydrogen vortices*, Contr. M. Wilson Sol. Obs. 1941
39. *Preliminary results of an attempt to detect the general magnetic field of the sun*, Contr. M. Wilson Sol. Obs N. 71, 1913.
40. F.H. Bigelow, *Circulation and rotation in the atmosphere of the earth and of the sun*, 1915.
41. A.G. McNish, *op. cit.*
42. By B. Rowland who criticized the theory of Perry and Ayrton printed in *Proc. Phys. Soc. of London* (1879)
43. Hale, Preliminary results, p.3.
44. The sixth and seventh satellites of Jupiter are 7,114,000 and 7,292,000 miles (mean distance) from the planet, and have a direct revolution. The eighth and ninth satellites, with retrograde revolution, are 14,600,000 and 14,900,000 miles distant. The farthest satellite of Saturn, with direct revolution, 2,210,000 miles away from the planet; the only satellite with retrograde revolution is 8,034,000 miles away from the primary.

Introduction

The pages that follow deal with the marvelous and the miraculous. On the pages of the Old Testament and in Hebrew lore stories are told of unusual phenomena. They intrigued me by the fact that so many of them reappear in the fields of modern paleontology, physics, and psychology. In almost every instance the gap could be bridged by an association - from archaic and miraculous to modern and self-understood, but still miraculous. Is not the phenomenon of magnetism well-known, yet still miraculous? And the same is with many other phenomena in the natural sciences. Thus a miracle of ancient lore is explained, yet the miraculous in the natural event remains.

As I proved in *Ages in Chaos* the letters found in the Egyptian State Archive of el-Amarna originated in the ninth century, and a very considerable portion of them was written in Palestine, by Ahab king of Israel, Jehoshaphat, king of Jerusalem, and their generals. The corresponding texts of the Scriptures prove a very high grade of trustworthiness, even in transmission of orations and dialogues, ascribed to historical personages. This fact encourages to approach with credence the stories of Elijah and Elisha, interwoven in the same parts of the Book of Kings.

Notes and Themes

Themes for *Shamir*

(mostly from the Old Testament; miracles-ancient lore)

Genesis Serafim

Sanverim

Sulfur (brimstone)

Interplanetary travel

Giants

“Smoke of furnace”

Deluge

Giant animals—also Ziz bird, (mammals)

Struggling with the angel?

Angels visit Abraham

Dream interpretation **Exodus** Manna—hydroc. combin. **Numbers** Radiation disease-

Tzaarat—“leprosy”-Hair fell out **Joshua** Wild ducks (meat of fowl)—radioactivity in exposed animals-case of radiated engineer.

The death after eating the wild ducks (irradiated).

Phosphorescence—hand white after being kept in dark

Karnaim-the horns or rays of Moses

(rays of Venus—like horns)

Finding water

Diamonds

Petroleum

Vermin plague

Jordan running back

Deluge of fire
Serpent and Baal worship
Leveling of mountains **Judges & Kings** Magnet
Mouth-to-mouth breathing
Weather forecast
Telepathy and hypnosis. Since 1740?
Necromancy
Shamir-radium
“Oil-enzyme”?
“Leprosy” and sulfur baths
Ball of fire (left cloth);
Sennacherib (burnt but cloth)
Sword over Jerusalem
Glilim
“Terrible ones”
Music in psychiatry
Even shetia (Mars?) (also Mecca)
Daniel & his friends
Mene Tekel - writing on the wall
Sun’s shadow returned **Elias & Elisha** Sanverim
Magnetism
Static electricity
Artificial breathing
Meteorology
Galvanism
Chariot of fire

Interplanetary Travel

The story told in Genesis 6, about the sons of God (B’nei Elim) coming to the daughters of men, is usually explained as referring to the aristocrats that mingled with common people.

In my understanding this is a literary relic dealing with the visit of intelligent beings from another planet. Actually in the rabbinical literature is preserved the story of 36(?) persons led by that descended on Mount Hermon. The new arrivals, all males, were probably of gigantic stature; their progeny with women of the earth were giants (Genesis 6). I thought that trilithon of Baalbek, near Hermon, was the work of their hands.

The planet from which they came I would not know to determine. El would refer to Saturn. The great size of the visitors would suggest a smaller body. Because of the strangeness of the idea, I thought to never publishing it. But since I came to it in about 1940-1941, the space age started, UFO were claimed to be vehicles of visitors from other planets (which idea does not find any credence in me), and previous visits to the earth by guests from other systems (other star systems) were expressed without calling for ridicule.

It appears to me that the visitors in expectation of some great catastrophe, moved out from their planet. Actually, their story precedes the story of the Deluge in the Scriptures.

Angels visit Abraham

The time of the events connected with the story of the patriarch Abraham is, in my understanding, the end of the Early Bronze or Old Kingdom in Egypt. The catastrophe of Sodom and gomorra—the overturning of the plain, the origin of the Dead Sea, was a catastrophe that ended an era; the origin of the Great (African) Rift or its greater expansion, coincided with those events. The age of the Dead Sea when measured by the amount of salts in its waters and in the supplying sources—is of the order 5,000 years, but could be even less, all depending the various factors (submarine sources, change in concentration of salts in the Jordan, the contribution of the sources on the shores of the sea, besides the main tributaries.)

The visit of “angels”—or B’nei El—to the ten of Abraham would suggest that the interplanetary visitors were still around at the end of the Old Kingdom in Egypt, or Early Bronze. To me this appears a misplaced memory. I would think that the “visitors” would be suggestive of an earlier time.

But in recent years I chanced to find my old idea concerning Genesis 6, expressed by a Russian astronomer, though he seems to be unaware of the landing at Hermon, he associated a not removed stone in the quarry near Baalbek with “their” effort to leave the earth; he also suggested that the turning of the plain was the work of their hands (atomic explosion) which might be true, considering the element of the “punishment” told in the story of Sodom.

Horn Blowing on Yom Kippur

The blowing of the horn on the New Year and on Yom Kippur (Day of Atonement) is a recreation of the noise that like blowing of the horn was heard at the day of Lawgiving—all over the world. The twisted strata of the earth produced this noise, and as I remarked in *Worlds in Collision*, the noise could also have been produced by the approach of a charged body (Teremin effect).

Hamon

I read these days (April 1967) that infra-acoustic waves can cause death. I thought of the expression that the Assyrians before their death were “permitted to hear the music of the sphere”; also the expression “Hamon” in the prophets relating to the phenomenon; also the Egyptian name of a divinity Hemon.

As I demonstrated in *Worlds in Collision*, Mars was the instrument of the debacle of the Assyrian host. Hamon must be another name for Mars, Maadim, or Aritz, from which is derived the Greek Ares.

Giant Animals in Hebrew Lore

It is remarkable that travellers of the second and possibly the first millennium before the present era, brought home these stories:

The ruler over the sea animals is Leviathan. His fins radiate brilliant light, its smell is foul.⁽¹⁾ Leviathan spouts out water.⁽²⁾ This description, one may guess, is of a whale.

Ziz is the ruler over the birds; it is monstrous in size; its wings are so huge that unfurled they darken the Sun. "Great bird Ziz slaps his wings and utters his cry, so that the birds of prey, the eagles and the vultures, blench."⁽³⁾ The span of the wings of the pterosaurs ranged from 27 feet upwards to an incredible 69 feet, whereas the span of the wings of the large eagles is less than 10 feet.

Behemot (not to be confused with the animal that bears this name at present) is the most notable representative of the mammal kind. Behemot matches Leviathan in strength. It had to be prevented from multiplying and increasing, "else the world could not have continued to exist." It is deprived of the desire to propagate its kind.

As the above-mentioned travellers could not have visited the American Museum of Natural History on their voyages, nor any other museum of paleontology, nor could they have read modern books on dinosaurs and all their classes, it is puzzling to read their description of the monstrous animals and of their behavior, and also of the weapon used by the largest land animal. In mortal combat between the gigantic beasts, Leviathan kills by a blow of its fins, and Behemot kills by a lash of its tail.⁽⁴⁾ The modern paleontologists wondered at the largest land animal's lack of weapons for attack or defense, which would have made it easy prey for every attacker, and supposed that the animal used its tail as its weapon.

Equally interesting is the description of the gigantic female Reem when heavy with young. "Leviathan, Ziz, and Behemot are not the only monsters; there are many others, and marvellous ones, like reem, a giant animal, of which only one couple, male and female, is in existence The act of copulation occurs but once in seventy years between them . . . The act of copulation results in the death of the male. He is bitten by the female and dies of the bite. The female becomes pregnant and remains in this state for no less than twelve years. At the end of this long period she gives birth to twins, a male and a female. The year preceding her delivery she is not able to move . . . For a whole year the animal can but roll from side to side, until finally her belly bursts, and the twins issue forth. Their appearance is thus the signal for the death of the mother reem."⁽⁵⁾

The problem of the statics of the dinosaurs, with their pillar-like legs, vexed modern scholars. The larger species are classified as amphibians, though no adaptation for life in water is found in their fossilized remains; they are classified so because, by wading in water, they would have a lesser load of body to carry. That this does not solve the question is shown above. The animals were apparently not adapted to the life conditions and did not survive.

To be more exact, the animals adapted themselves to conditions, but the Earth changed these conditions completely, and more than once. The variations of the force of gravitation became, more than anything else, fatal to the large dinosaurs.

References

1. L. Ginzberg, *Legends of the Jews*, I (Philadelphia, 1942), p. 28.
2. Ibid., p. 4.
3. Ibid., pp. 4-5.
4. Ginzberg, I, p. 28.
5. Ibid., pp. 30-31.

The Burning Bush

It is told in the Book of Exodus that, in advance of the great catastrophes that preceded and accompanied the flight of the Israelites from Egypt, the first sign of the things to come was the experience of Moses in the wasteland of Midian? Sinai? when he saw a burning bush. The bush, to his amazement, was burning, yet the flame did not consume it (Exodus 3:2-4). Should we assume that it was some natural phenomenon, interpreted by Moses as a miracle, we would be put before the choice: either it was a phenomenon of phosphorescence, or some similar radiation, or it was a phenomenon of an electrical nature, such as that known to us as St. Elmo fire. In the first instance a desert bush could glow in the dusk of the day if covered by phosphorus dust; and the desert of Sinai, like southern Israel, abounds in deposits of phosphorus. Irradiated by light during the day, phosphorus continues to glow in the dusk. St. Elmo fire is the visible electrical glow on the tops and extremities of masts of ships, or at the summits and ends of branches of trees; this electrical phenomenon is especially apparent when the atmosphere is charged more than usual by electricity. Neither phosphorescence nor St. Elmo fire are consuming flames; and the miracle of the revelation was the miracle of one of these phenomena, because they are revelations of nature which human genius tries to understand and has succeeded in this until now only very incompletely.

The “miracle” with the bush was followed, according to the story, by more phenomena of a related nature. Moses observed that his hand temporarily turned white, as if afflicted by leprosy, upon keeping it in the dark recess of his clothing. This, too, sounds like luminosity of phosphorescent or radioactive nature.

Assuming that what is described in Exodus 3:2-4 and 4: were phenomena that really did occur, we would think that in these unusual signs the cosmic events that were soon to take place had already their first foreboding. Moses felt an inner call to return to Egypt to announce great happenings and to demand the right of worship for his people there, not yet the permit for them to emigrate. He himself was not yet aware of the great disturbances to come. In *Worlds in Collision* and *Ages in Chaos* I offered evidence that the Earth entered the fabric of a great comet at the time that these events took place. Most probably the celestial prodigy made itself known

by irradiating the Earth with the electrical glow of its dispersed trail of thin dust or gases. A great train of meteorites was to follow; but already the precursor of the great and swiftly-moving masses, the thin dust of charged particles, could make the phenomena of phosphorescence and St. Elmo fire rather pronounced. And the future leader of the bondsmen escaping from Egypt, impressed by the glow that does not consume, felt an inner call to return to the land of his birth and to bring there the message of upheavals approaching in swift succession.

It is known that comets glow chiefly by their own light, rather than by the reflected light of the Sun: the spectral analysis of the glow coming from the tails of the comets shows that the light originates there; it shows the so-called lines of emission, whereas reflected glow would produce lines of absorption. Electrical light shining in vacuum, upon meeting some obstacles, may also produce X-rays.

The great discharges exchanged between the head and tail of the comet, retarded in its motion; the terrifying “crashes” (*kolot*) of the bolides (*barad*) on entering the Earth’s atmosphere; the magnetic disturbances; and the electrical phenomena caused by the irregularities of the terrestrial motions—all must have contributed to the increased tensions between the ground and the upper atmosphere, and the radiations, some of them of harmful nature, that filled the air of the entire world. Thus a passage of the Earth through the tail of a comet would result in phenomena the intensity of which would clearly depend on the size and mass of the comet and of its trailing tail, and the closeness of the approach.

It is narrated that when Moses came from hiding in the cloud on Mount Sinai, his face shone (Exodus 34:30,35). This was regarded as a sign of holiness, and actually in Christian times the saints are represented with a halo around their heads. Of Zarathustra it is also said that he was burned by fire, but not consumed by it, during his stay on a mountain.⁽¹⁾ Mountains themselves often possess a “halo” ; and actually, Charles Beke went to Arabia in 1874 in search of Mount Sinai, and believed to have discovered it in Mount Seir, a mountain with an electrical halo. Michelangelo portrayed Moses on his famous statue, presently in Rome, with horns over his forehead. As many artists, he was misled by the translation of the word *keren* (plural *karnaim*), which in Hebrew can mean both “horn” and “ray.” What the scriptural writer had in mind when he described Moses descending from Mount Sinai was most certainly a halo of rays of light. In the *aggadic* or legendary material not included in the Scriptures, Moses and Aaron, appearing before the Pharaoh, had already faces that were illuminated, or glowed in the dark. The Biblical narrative renders the story of Moses’ descent from the mountain after the lawgiving as the time when he impressed the people in the plain by his head shining in the dark: it was surrounded by rays of light, understood by Michelangelo, and by many others, as “horns” protruding from his head.

As we can gather from the material collected in *Worlds in Collision*, the comet that shone at the end of the Middle Kingdom in Egypt—and caused its downfall—appeared to the peoples of the world at one time as a dragon with a flaming body, at another moment as the head of a bull with horns stretched out towards the earth; these were horns of light. This explains why the Hebrew word “horns” and the word “rays” is the same (*keren*, plural *karnaim*) can be understood in terms of the phenomena attending the Exodus.

It is also very probable that the great discharges that accompanied the terrestrial catastrophes caused radiation diseases. The great role that leprosy (*zaarath*) took in the medical concern of the priests during the wandering in the desert, and the very description of this so-called “leprosy” that was cured by time and no other medicine, lets surmise that this disease was of radioactive nature. I will discuss the subject of radiation disease separately.

References

1. Dio Chrysostom, *The Thirty-Sixth Discourse*, 40f.

Matza

The most important item of the ceremonial of Passover is unleavened bread called matza; the feast itself is called the feast of the unleavened bread. Matza is not just one of several equally important other regulations of the festival of Passover: it is the main ceremonial (together with the reading of the Haggada), almost *the* symbol of the chief holiday of the Israelites. The observing of the command to eat only the unleavened cakes during the feast of Passover is ordained in the following terms: “For whosoever eateth leavened bread from the first day until the seventh day, that same shall be cut off from Israel” (Exodus 12: 15). The Book of Exodus explains this bread by the command given on the eve of the departure of the Children of Israel from Egypt:

And this day shall be unto you for a memorial; and ye shall keep it a feast to the Lord throughout your generations... Seven days shall ye eat unleavened bread. (Exodus 12:14)

After they left Rameses and came to Succoth,

And they baked unleavened cakes of the dough which they brought forth out of Egypt, for it was not leavened; because they were thrust out of Egypt and could not tarry, neither had they prepared for themselves any victuals. (Exodus 12:39)

The fact that the Israelites left Egypt in such a hurry that that night the dough did not leaven, could hardly be the only motif for a command to which the religion of Israel affords such importance. The speed of the Exodus from Egypt was not complemented with the speed of an entry into the Promised Land, but was followed by forty years of aimless wandering in the desert; the haste which saved a few hours needed for the dough to leaven was lost completely in the events of the slow-moving years that followed; the rashness of the Exodus did not even help the Israelites to run away from the pursuing Egyptian army and they would have been destroyed were it not for the sea that parted and let the Israelites pass, only to return then to its strength and engulf the Egyptian hosts. For its part, the haste of the Exodus could have been much more aptly remembered by some act symbolizing the haste of leaving one’s domicile or swiftness of retreat, or celebration of reaching a water barrier and the like; weary loins and the staff of a wanderer would express better the leaving of Egypt; and if the swift going away should be symbolized in food, uncooked victuals or eating while standing could better symbolize the speed than

unleavened cakes eaten in a reclining position, as prescribed by the ritual. And the seven-day-long observance of eating unleavened bread hardly harmonizes with the explanation that makes a one-time hurried preparation of bread the motive of it.

The other explanation of the origin of the custom of eating of matza during Passover is found in the Haggada read during the Seder, the evening meal of the first (in diaspora the first two) evenings of the feast. There it is said: "This is the bread of misery that our forefathers ate in Egypt." This explanation makes matza the replica of the poor bread eaten in the misery of serfdom. Though less popular, it sounds better rationalized. A nation that preserves the memory of the long years of affliction may institute the observance of eating—one week each year—the bread of affliction, *lakhmo anio*. It must, however, be noted that the replica of the bread of affliction is not made to taste unpleasantly and is enjoyed by adults and by children alike. There is another symbolic piece of edibles on the Seder plate, the bitter root, which is supposed to commemorate the bitterness of the days of bondage; it is eaten, however, dipped in honey.

The two explanations contradict each other: according to one of them the unleavened bread was eaten during the many decades of the sojourn in Egypt where the children of Israel were subjugated and carried the yoke of bondage; according to the other explanation this bread was eaten only on the very last night of the sojourn and possibly not even then, but was, for lack of time, made in preparation of the suddenly-undertaken migration.

Being contradictory, the two traditional explanations invite a re-examination of the motives underlying this ancient usage.

The major festivals of the Jewish calendar are connected with the memories of the Exodus, Lawgiving and living in huts during their migration in the desert. Was not some unusual phenomenon connected with the time of the Exodus of the Israelites from Egypt that could be regarded as more compelling for the origin of the custom than the above-stated motives? A usage of such persistence, predominance and antiquity, must have been instituted, so it seems, to honor some unusual and impressive occurrence. Such an occurrence was the fall of manna.

During the years when the Israelites wandered in the desert after having left Egypt manna fell from the sky. It served as their nourishment in the years when they roamed in the wasteland, in the shadow of death, when nothing budded. The customary explanation of manna as the seed of the tamarisk bush growing in the desert was refuted in *Worlds in Collision*, section "Ambrosia." Manna is called "the bread of heaven," the bread that fell from the clouds, (Exodus 16: 4) or even from the starry sky.¹ It was found by the Israelites daily in enormous quantities, and the Midrashic sources state that "the quantity that fell every day would have sufficed to nourish the people for two thousand years."² It was ground between stones and baked in pans (Exodus 16:14-34), Numbers 11:7-8). It had the shape of coriander seed, a yellowish color and oily taste.

And the people went round about, and gathered it, and ground it in mills, or beat it in a mortar, and baked it in pans, and made cakes of it. (Numbers II: 8)

The fall of manna was also not confined to the desert of wandering. It is said that all the peoples of the East and the West could see it.³ And actually we could trace the same memory to many

nations of the world. The Scandinavian peoples were destroyed almost to the last in a catastrophe, and in the Fimbul winter that followed, the survivors subsisted on the morning dew.⁴ The Scriptures also have it that “When the dew fell upon the camp in the night, the manna fell upon it.” (Numbers 11:9) The Greeks preserved the memory of manna as that of ambrosia—and it is described in the very same terms as manna. Ambrosia had the taste of oil and barley, or honeycomb; and so did manna.

It is significant in this connection that according to old rabbinical sources, matza is described as having the taste of manna.⁵ From this alone one could deduce that the custom of eating matza was first established in memory of the phenomenon of manna—yet, strangely, this has not yet been done. The fall of manna was a phenomenon of no mean significance. After the catastrophe of the days of the Exodus and in the years of its aftermath, the Israelites roaming in the desert had no leaven and they lacked salt; and until this day the unleavened bread is produced without salt being added. In the Seder night, when the great miracles are told that accompanied the Exodus and the upheaval in the physical nature, the greatest—the fall of bread from the sky—must be especially honored, it being the food of the multitude that left Egypt, and it would be strange if it would have remained without a memorial in the main feast commemorating the deliverance from Egypt and the preservation of the people, almost brought to complete annihilation by man and by elements alike.

A similar feast was celebrated in Athens during the spring month of Anthesteria—honey and flower were poured into a fissure in the earth. And since the phenomenon of manna was ubiquitous all over the earth, it is of interest and significance to note that also in India, in the *Rig-Veda*, it is said that honey (*madhu*) comes from the clouds.⁶

In that book is described how edible substances precipitated for a long period of time after the passage of the Earth through the trailing part of the planet Venus, then a comet.⁷

The planet Venus was deified by all races of antiquity and in *Worlds in Collision* I brought together reports of its being described as a comet from ancient Mexico, where it was called *la estrella que humeava*, “the star that smoked,”⁸ from Babylon, from China and from many other lands and peoples. Manna was a derivative of Venus. To eat it was like eating a portion of the god. Many ancient religions had this mystery of swallowing the god. The Christian religion, too, in the mystery of communion, had the participants eating of their god. Here it is shown how this strange idea originated; it was an element of ancient mysteries that were inherited and then incorporated in the Christian faith. The eating of the body of the god, the miracle of food falling from the sky, the food that sustained life in the wanderers in the desert—these are the wonders that impressed the ancient world and that survived in the ancient cult of matza, and also in the bread of communion, and in the custom of offering cakes to the Queen of Heaven in ancient pre-exilic Israel.

There must have been a special reason why the cakes of unleavened bread should not be implicitly connected with manna. It appears that these cakes became a part of an astral worship. It transpired to the instructed priests of the northern kingdom of Israel that it was the planet Venus that was an instrument, or as they may also have thought, the cause of the disturbances and upheaval that enabled the Israelite slaves to leave Egypt. In the northern kingdom Jeroboam,

by erecting an image of a calf in the temple of Dan and another in Beth-el, said “here are the gods that brought you out of Egypt” and he initiated the Passover service in Dan which in his plan should have served as the gathering place for the Passover week, not only for the population of the northern kingdom, but also for the people of Judah. Thus we see that Passover was a feast also in the worship of Baal; and in *Worlds in Collision* we have shown that the calf was the image of the planet Venus and that Baal was also her name.

At the end of the sixth century before the present era, shortly before the Babylonian Exile, Jeremiah accused the population of Jerusalem: “The women knead dough to make cakes to the queen of heaven, that they may provoke me to anger.” (7:18) The Queen of Heaven, we are informed by many authorities, was the planet Venus. Apparently the knowledge that Venus had something to do with the Exodus made the people of the Northern Kingdom, that of Israel, and then also of Judah, to bake cakes in honor of Venus, the planet, the role of which in the catastrophe of the days of the Exodus is described in detail in *Worlds in Collision*. And when Jerusalem fell to the Babylonians, the Jews who escaped to Egypt spoke of the incense and offerings that were given to the queen of heaven by themselves, and also by their fathers, their kings, and their princes “in the cities of Judah, and in the streets of Jerusalem.” “And when we burned incense to the queen of heaven, and poured out drink offerings unto her, did we make her cakes to worship her, and pour out drink offerings unto her without our men?(44:19)”

The heavenly bread coming from the clouds that were deposited by the comet Venus, the cakes made by the women of Jerusalem to her honor, were in memory and in thankfulness for the miracle she performed for their ancestors: Therefore the women of Jerusalem regarded the prohibition of this usage by the king Josiah and probably also by his son Zedekiah, under the influence of Jeremiah, as an offense for which their temple was destroyed; they went into refuge in Egypt, when the other remnants of the people were carried into Exile in Babylonia.

The custom of bringing bread (flour) and honey to the queen of heaven was practiced also by the Syrians in the second century before the present era, as Lucian tells in his book *De Dea Syria*. And in Greece, on the spring feast of libations of flour and honey were poured into a crevice in the ground, in memory of the flood of Deukalion, in which the population of Greece was destroyed almost to the last; this flood of Deukalion, according to tradition conserved by the fathers of the Church, occurred in the days of the Exodus (Eusebius)

Also in the Western Hemisphere the spring feast in honor of Quetzalcoatl or the planet Venus was observed once in eight years—every eight years the planet Venus presently returns to the same position in relation to the sun and the earth—the synodic cycle of Venus consists of eight terrestrial years. Venus years were rigorously observed by the Mayas in Yucatan, Aztecs in Mexico, and Incas in Peru.

During the feast of in honor of Venus, bread was baked without salt, with water alone—and Sahagun, the Spanish author who studied the life of the Mayas in the sixteenth century, wrote:

Every eighth year these natives celebrated a feast which they called Atamalqualiztli, which means “feast of bread and water.” For eight days preceding the festival they ate nothing but

tamales prepared without salt, nor did they drink anything else but clear water. ... They did not mix anything else with the dough of which they make them (tamali) not even salt...²

Here we see the feast of unleavened bread in America dedicated to Venus and was observed on its every return on its synodical cycle. Among the Mayas the feast of the bread was dedicated to the planet Venus, as it was among the women of Jerusalem in the days of Jeremiah and before him.

The word “matza” may mean “to find”; the corn of heaven was actually found on the ground.

The people of Israel in gratitude for their salvation in the desert, amidst the outraged elements, in a desert clouded by twilight, burning and waterless, observe the feast of salvation and eat the unleavened bread.

The connection by the people of Judea in the days of Jeremiah of manna and matza with Venus contributed to the separation between the custom and its cause, when religion became a monotheistic form of Judaism. Thus the root of the custom was lost and other explanations were devised and survived for many centuries, despite their obvious inadequacy.

References

1. Psalms 78:23-24; Tractate Yorna 75a.
2. Midrash Tehillim to Psalm 23; Tosefta Sota 4.3.
3. Tractate Yorna 76a.
4. J. A. MacCulloch, *Eddic Mythology* (1930), p. 168.
5. Kiddushin 38a.
6. W.H. Roscher, *Nektar und Ambrosia*, (Leipzig, 1883), p. 19.
7. [The synthesis of various edible carbohydrates and sugars from hydrocarbons by bacterial action, or from other, simpler compounds by chemical reaction aided by strong irradiation has been demonstrated experimentally. For instance, see A. J. Swallow, *Radiation Chemistry of Organic Compounds* (Oxford, 1960). V. A. Firsoff (Our *Neighboring Worlds* [1954], p. 208) described how formaldehyde could be produced from water vapor and carbon dioxide in the presence of strong ultraviolet radiation. From formaldehyde sugars, like fructose or glucose, and starches can be produced. See Wong Kee Kuong, “The Synthesis of Manna,” *Pensée* III (1973), pp. 45-46. Carbon dioxide is a major constituent of Venus’ atmosphere.]
8. Bernardino de Sahagun, *Historia general de las cosas de la Nueva Espana*, Bk. VII, Chap. 4.
9. Ibid., Appendix to Bk. II.

Shamir

In the Talmud and the Midrashim there are many references to *Shamir*—unusual qualities were

ascribed to it. For instance it reportedly could disintegrate anything, even hard, durable stones. The rabbinical literature describes it as being employed in engraving the breast plate of the High Priest. Among Solomon's possessions it was the most wondrous. King Solomon was eager to possess the Shamir because he had heard about it from earlier days; knowledge of the Shamir is in fact ascribed by rabbinical sources to Moses. After much search a grain of Shamir the size of a barley-corn was found in a distant country, in the depths of a well, and brought to Solomon. But strangely, it lost its abilities and became inactive several centuries later, about the time the Temple of Solomon was destroyed by Nebuchadnezzar.

What was *Shamir*?

In the opinion of medieval authors, Rashi, Maimonides and others *Shamir* was a living creature, a worm.¹ It was argued that *Shamir* could not have been a mineral because it was active. The Talmud transmits in the name of Rabbi Nehemiah the following description of the engraving on precious stones: The names of the twelve tribes were inscribed on the twelve semi-precious stones of the Urim and Tummim, the breastplate of the High Priest, not by carving, but by writing with a certain fluid and "showing" them to *Shamir*, or exposing them to its action. In the opinion of modern authors, the expression "was shown to *Shamir*"—"clearly shows it was the glance of a living being which effected the splitting of wood and stones."² It is admitted, however, that "in the Talmudic-Midrashic sources it is never explicitly stated that the *Shamir* was a living creature."³ An old source, *The Testament of Solomon*, a work written in Greek, probably in the early third century of the present era,⁴ refers to *Shamir* as a "green stone." But how could a greenish stone cut the hardest of diamonds with its glance?

"The Shamir is as large as a barley-corn. It was created in the six days of Genesis. There is no substance hard enough to withstand its action"⁵

Over a hundred and twenty-five years ago a Jewish scholar in Germany published a paper to prove that *Shamir* is a mineral,⁶ but more modern authorities agree with the medieval rabbis and say that they were "undoubtedly correct."⁷

The manner in which *Shamir* was kept secure may give us some clue "The *Shamir* may not be put in an iron vessel for safe-keeping, nor in any metal vessel: it would burst such a receptacle asunder."⁸ "It is kept wrapped in wool inside a box of lead filled with barley-bran." This sentence is quoted from the Tractate Sotah 48b of the Babylonian Talmud. "*Oferet*" in the text is properly translated as "lead." It contains an important clue: folkloristic fantasy would not make a leaden box of a greater resistance than an iron or a gold one: lead is a soft metal. Therefore, this must be a description based on fact. And with the knowledge of our age we may easily guess who or what was Shamir: It was a radioactive substance; radium salts, for example, acting upon certain other chemical substances, can emit a luminescence with a yellow-green hue.

The breastplate of the High Priest was engraved in the following manner. The letters were written with ink, and the stones were exposed, one after another, to the "glance" or radiation of the *Shamir*. This ink must have contained powdered lead or lead oxides.⁹ The parts of the stones which were unprotected by lead were disintegrated without leaving any dust particles which,

according to the Tractate Sotah 48b, appeared especially wondrous. Those parts protected by leaden ink stood up in relief on the surface of the gems.

The most precious possession of Solomon, his *Shamir*, did not survive. With time it became inactive. The usual version of the story—the *Shamir* “disappeared,” does not correspond to the Hebrew text. The word *batel* used to describe the end, or demise, of *Shamir*¹⁰ has only one meaning: “To become inactive.” Therefore, when occasionally it is said that the *Shamir* “vanished” at about the Temple was destroyed, this is incorrect.¹¹ The Hebrew term for a paralyzed member is *ever batel*; a loafer is *batlan*; inactivity is *batala*; all these words come from the root *batel*. In the four hundred years that passed from the building of the first Temple to its destruction by Nebuchadnezzar in -587, a radioactive substance could become inactive.¹²

In 1896, one year after Wilhelm Konrad Roentgen of Wuerzburg discovered X-rays, Antoine Henri Becquerel, son and grandson of the great physicists, discovered radioactivity by accidentally placing a photographic plate near a uranium salt.

Uranium at ordinary temperatures emits an invisible radiation which resembles X-rays, and can affect a photographic plate protected by a thin layer of metal.

Marie and Pierre Curie, led by the conviction that in the midst of pitchblende, their source of uranium, there must be still another element of a much greater radioactivity, dedicated themselves to its isolation and in 1898 they succeeded in bringing forth the new element as its bromide salt—radium.

A new era in physics began with these discoveries. And because of the dramatic circumstances under which the Curies pursued their goal—and the story of the illuminating substance they found one evening when they came to their cold and poorly-equipped laboratory—the last of the three discoveries, radium, captured the imagination of people everywhere.

Radioactivity is used in the treatment of neoplasms, while the destructive work of the uranium bomb thrown on Hiroshima also goes back to the discoveries of Roentgen, Becquerel, and the Curies.

Uranium and radium are elements—the original substances of which the universe is built; they were discovered, not invented. Therefore they were present in nature since the beginning; and since radioactive elements have a limited life-time because of disintegration through radioactivity, there must have been more radioactive elements in the past; and actually, a “radium clock” is used to measure the age of rocks. Radium itself is continuously decaying, yet continuously being replenished from the decay of thorium, of which it is a byproduct. The end result of the decay of radium is an isotope of lead. This lead differs from regular lead, and from the ratio of such lead to uranium in rocks, the age of these rocks can be determined. Lead is also the substance that protects best against the damaging effect of radium or other radionuclide irradiation; and thus laboratory radium is preserved in a lead receptacle when not in use for medical or technological purposes.

The information found in ancient sources—that *Shamir* was a greenish mineral, that it was as large as a barley-corn; that it could damage anything, even metals and other minerals, save lead, and the only protection could be found by placing *Shamir* in a leaden box; that it had a “glance” which disintegrated things without leaving filings or dust; that it became inactive after a period of four hundred years—all reveal the true nature of *Shamir*.

References

1. Rashi, *Pesahim 54a*; Maimonides, *Commentary on Abot 5.6*.
2. L. Ginzberg, *The Legends of the Jews*, (Philadelphia, 1925), vol. V p. 53, n. 165.
3. *Ibid.*, loc. cit.
4. C. McCown, *The Testament of Solomon* (Leipzig, 1922), pp. 105 ff. F C. Conybeare (“The Testament of Solomon,” *The Jewish Quarterly Review* XI [1898], p. 12) dated it to ca. 100 C.E.
5. Tractate Sotah 48b of *The Baby Ionian Talmud*.
6. S. Cassel, “Ein archaeologischer Beitrag zu natur- und Sagenkunde,” *Denkschrift der Koeniglichen Akademie gemeinmitziger Wissenschaften in Erfurt*, (19 July, 1854), pp. 48-112.
7. Ginzberg, *Legends*, loc. cit.
8. *Ibid.*, Vol. I, p. 34
9. [Possibly the ink contained sugar of lead, which is the salt of acetic acid solution—a readily available reagent for the ancients, as acetic acid is the major constituent of vinegar.—F.B.J.]
10. Tractate Sotah (Seder Nashim) 9.2.
11. E.g., Ginzberg, *Legends* I. 34.
12. Radium loses about one percent of its radioactivity every 25 years.

Magnetism

It would appear that the action of the lodestone must have been discovered very early; a legend tells how a young herdsman in the hills of Magnesia felt the nails of his shoes kept glued to the rock, and thus discovered the phenomenon of magnetism. Since magnetic rock is found in many places, the discovery of its action must have been made in more than one place; yet apparently knowledge of the phenomenon was confined to the initiated, whether the medicine man, yogi, or shaman.

Is it for certain that the phenomenon has no reference in the Hebrew Scriptures? One instance, it seems, points to its use by the seer Elisha. In the Book of Kings where the story of his deeds is given, apparently culled from some ancient source no longer extant, the following episode is described:

So he [Elisha] went with them. And when they came to Jordan, they cut down wood.

But as one was felling a beam, the ax head fell into the water: and he cried, and said, Alas, master! for it was borrowed.

And the man of God said, Where fell it? And he shewed him the place. And he cut down a stick, and cast it in thither; and the iron did swim. therefore said he, Take it up to thee. And he put it in his hand, and took it. [\(1\)](#)

Nothing is said as to whether a lodestone was attached to the twig. The onlookers could think that the twig was a wonder wand, and that a stone tied to its end was only for the purpose of approaching the twig to the sunken ax. But we know that a twig would not attract and lift iron, whereas a lodestone would—and much more easily in water than in air, because the weight of the ax would be that much lighter in water. Preoccupation with things electrical and magnetic was a trademark of Elijah and his apprentice and successor Elisha.

There remains a margin of surmise in this our explanation of the phenomenon. But should today primitives of Africa or Australia ask a missionary to perform the miracle and lift iron drowned in a stream or a lake, he would impress them greatly if he should repeat the miracle as reconstructed here. Miracle it is, but not of the one who long ago knew its use: magnetism is a miracle with which the Universe is created, and its true nature is still not known, and therefore belongs in the fold of the miraculous.

References

1. II Kings 6:4-7.

Radiation Sickness

The upheaval of the days of the Exodus caused by interplanetary perturbations and discharges, was of an intensity of many thousands of hydrogen bombs. Some of the many consequences were transmutation of elements, nuclear fission, and radiation sickness. A permanent bombardment of the Earth by cosmic rays is going on, resulting in fission of atoms, especially those of nitrogen. But the comparative rarity of cosmic rays makes the results, though spectacular in every case of collision of a ray-particle with an atom or a gene, lacking, in an overall picture, the dramatic element of massive change or transformation. In the abnormal conditions of interplanetary stress and discharges, the elements could go through transformations on a grand scale, the living organisms through the process of somatic changes, and their reproductive cells through mutations that would impress themselves on the formation of the generations to follow.

In the travelogue of the fugitives from Egypt which was ruined in the catastrophe, we read the strange story of the people's asking for meat, their request having been answered, yet the wrath of the Lord causing them to die as a consequence of eating the flesh of the quail, a large flock of which was flung towards their camp (Numbers 11:31-33). It could have been the consequence of eating meat contaminated by fallout; the flesh of the flock of wild geese could have been so

contaminated, and the description of what happened to those who feasted on them in the desert supports such an interpretation.¹

Since antiquity a story was spread that the refugees were people sick with leprosy. Manetho, an author of the third pre-Christian century, equated them with the lepers that were expelled from Egypt with the high priest Osarsiph—yet this story does not refer to the time of the Exodus but, as I will show elsewhere, belongs into the period of Libyan domination over Egypt. It is based on the story of Osorkon,² whose expulsion in the late eighth century took place in the midst of another series of catastrophes, during which portions of the Earth's ozone layer were stripped away, resulting in the penetration of dangerous amounts of radiation from space, and widespread radiation disease.

We must be impressed with the many regulations concerning the diagnosis, the isolation, the quarantine, and the symptoms of *zaraath* found in Leviticus, and related by the text of that book to the time of the wandering in the desert. It appears from the importance given to the regulations concerning those stricken with *zaraath* that it was a widespread disease in the days of the wandering in the desert. Actually, this disease occupied the minds of the priests to the extent that the code of hygiene for the purpose of preventing disease deals chiefly with *zaraath*.

A recently published report on the contamination of a group of physicists at a research laboratory tells that one of the physicists who was exposed to a larger dose of irradiation contaminated his apartment, his family, and the rugs and furniture; that the rugs and the furniture were burned, yet the neighbors continued to evade the members of the family; and though the physicist after several months was again able to work, the fear of his co-workers was so great that he was coerced to look for a place of work far away from his community, and at the time of the publication of the report was still without a job and could not find a buyer for his house.

Similarly in the Book of Leviticus (Ch. 13) we read of the fear of the community with respect to those affected with *zaraath* and of their banishment from the camp. The fear of the ancients of radiation sickness was not smaller.

Zaraath being understood in later times as leprosy, the fear of radiation disease of those times was transferred to those sick with leprosy. Today we read the reports of medical men who work with the leprosy, and we find that this disease is one of the less contagious; yet through the ages the lepers were the outcasts, kept outside the camps or any other human settlements, urban or rural. It seems as if the ancient fear of radiation disease was manifesting itself in the later fear of leprosy.

Leprosy does not break out in sudden symptoms. Yet the description we have of *zaraath* in the Scriptures ascribes to this disease a sudden outbreak.³

A famous case of *zaraath* is narrated in II Chronicles, ch. 26. It affected the king Uzziah.⁴ In *Worlds in Collision* I narrated in short the episode that preceded the outbreak of the affliction. It was during the planetary upheavals of the eighth century, namely in -747.

According to the Midrashim and Talmud, on the west side of Jerusalem a mountain was split and one of its halves was hurled to the east.⁵ Flaming seraphim leaped in the air.⁶ The population fled from Jerusalem in advance of the catastrophe; Uzziah burned incense in the Temple and addressed himself to the Lord in the name of the nation. This was interpreted by the priests as an appropriation of their priestly duties. The punishment that followed was ascribed to Uzziah's having committed a sin by burning incense in the Temple. The Temple itself was badly damaged by a great breach that rent its wall. This shows that Uzziah was appearing before the Lord in the very moment of great danger. Flaming seraphim, or tongues of fire leaped in the air. The king was stricken with *zaraath*. According to the Book of Chronicles, the signs of *zaraath* "shone on the king's forehead"⁷ in these very circumstances when the king was in the Temple usurping the duties of the official intermediary between men and God. It would appear more probable that the sickness which we would be inclined to recognize as radiation sickness, showed itself soon thereafter. The sudden outbreak of the symptoms of leprosy would be even less likely than a sudden outbreak of a sickness which we would think not entirely unexpected under the circumstances.

In Assyria, and in the entire ancient world, a new era was counted from the year -747; in Assyria it was the "era of Nabonassar," still used many centuries later in astronomical computations. In the Scriptures, too, we find that the time was counted from the days when "the people escaped from before the *raash* (commotion) of the days of Uzziah."⁸

The fact that the king who prayed for his people and realm was struck by a disease was regarded as a sign of the Lord's displeasure. Uzziah was placed in seclusion; and still today on the slopes of the Mount of Olives, close to the bottom of the Valley of Jeshoshaphat, or of the Lord's Judgment, in Jerusalem, tourists are shown the artificial grotto that looks like an enclosed balcony with supporting columns where, according to the tradition, king Uzziah spent the rest of his reign, within sight of Jerusalem and the Temple's hill Moriah yet barred from entering.

Zaraath covered also the term for leprosy, at least in later times. And it took three thousand years to separate leprosy from the fear of contamination it carried among all peoples.

References

1. Cf. the following item in *Newsweek*, November 26, 1956, p. 64: "Historians of the atomic age may one day make a prominent place in their chronicles for some oddly assorted pioneers of progress: the radioactive ducks . . . The ducks once severely upset the stomachs of some Canadian hunters who ate them. A few weeks before, the fowl, on their way north, had fed at an extremely radioactive pond at Oak Ridge, Tennessee."
2. See R. Caminos, *The Chronicle of Prince Osorkon*, in *Analecta Orientalia* (1956).
3. [E.g., Miriam became "leprous" all of a sudden after she and Aaron approached the pillar of cloud (Numbers 12:5, 10), and recovered seven days later. This course of the disease is quite unlike leprosy.]
4. Cf. Julian Morgenstern, "The Sin of Uzziah," *Hebrew Union College Annual*, Vol. XII (Cincinnati, 1937).
5. L. Ginzberg, *The Legends of the Jews* IV, 262.

6. *Ibid.*, VI, 358.
7. II Chronicles 26: 19. The King James version renders this: “He was leprous in his forehead,” but the Hebrew text has: “*ha-zaraath zarkha*”, meaning “the zaraath shone.”
8. Amos 1:1; Zechariah 14:5.

Diamonds

Diamond is a form of carbon, differing from common graphite only in its molecular structure. Using extremes of heat and pressure, artificial diamonds have been produced from graphite. By implication it is concluded that naturally found diamonds might have originated from coal, but under what conditions is not known.

Diamonds are regularly found as single crystals with no signs of previous attachment to any other mineral. They are found in several places in the world, in sands and gravels; in South Africa they are found in the “blue ground.” The nature and origin of the “blue ground” is not known; it contains splinters of minerals some of which are of the nature of the rocks in the neighborhood, and some of which cannot be traced to the surrounding formations. But in the neighboring rocks diamonds are not found. Similarly with the gravel and sands: they are only partly related to the rock formations in their vicinity; and diamonds are not found in these formations. Diamond is a form of carbon foreign to the surroundings in which it is found. Thus it is spoken of the “mystery which surrounds the natural origin of this remarkable mineral.”⁽¹⁾

The clouds which encompassed the Earth at the time of the Exodus contained carbon in abundance. There were frequent discharges of potentials at that time between the clouds and the ground. Let us make a surmise: did not diamonds originate in these clouds?

In the Tractate Yoma it is said that precious stones fell every morning with manna from the clouds.⁽²⁾

Did diamonds drop from the sky? In this connection significant is the fact that diamonds are occasionally found in meteorites.⁽³⁾

The “blue ground” of South Africa was thrown together in a catastrophe: this is well recognized. But the catastrophe appears to have been of cosmic nature.

If we are to believe the Talmud, diamonds were found in the Desert of Wandering.⁽⁴⁾ So far no diamonds are known to have been discovered in the desert of Arabia. If transformation of the carbon of the clouds into diamonds, through powerful electrical discharges, whether originating in the clouds themselves or from other planets, was facilitated by the atmospheric conditions over the desert. Possibly diamonds will yet be found in the desert of Arabia, and also possibly in the sands of the Sahara.⁽⁵⁾

References

1. Article "Diamond" in *Encyclopaedia Britannica*, 14th edition.
2. Yoma 75a.
3. Diamonds were found in the meteorites which fell in 1886 at Novo_urei near Penza in Russia; in the stone discovered at Carcote, Peru, and in the iron meteorite found at Canon Daiblo in Arizona. Also "graphitic carbons" found in meteorites are regarded as metamorphosed diamonds.
4. See "The Great and Terrible Desert."
5. [Alexander Humbold concluded "that the formation of gold veins, and consequently of diamonds, is comparatively of recent date, and scarcely anterior to the destruction of the mammoths." See J. Timbs, *Curiosities of Science* (London, 1859), pp. 122f. The same conclusion was reached by Sir Roderick I. Murchison in his *Siluria*.]

The Chariot of Fire

Asking one day a friend of mine, Horace Kallen, the well-known humanist scholar, educator and philosopher who lived in New York, which of the wonders of the Old Testament seemed to him the least plausible, he answered me, who was expecting to hear about Joshua and the sun that stood still, "The carrying of Elijah by a flaming chariot into the sky."

In the ninth century, as a result of cosmic events, the electrical charge of this planet was highly affected. The ionosphere above the earth was charged to such an extent that leaps of discharge occurred from a cloudless sky. As I proved in *Ages in Chaos*, the letters found in the Egyptian State Archive of el-Amarna originated in the ninth century, and a very considerable portion of them was written by Ahab king of Israel, Jehoshaphat king of Jerusalem, and their generals. The corresponding texts of the Scriptures prove a very high grade of trustworthiness, even in transmission of orations and dialogues, ascribed to historical personages. This fact encourages to approach with credence the stories of Elijah and Elisha, interwoven in the same parts of the Book of Kings. Incidentally I could show that the change of attitude of Captain Naaman towards the king of Samaria, from bad to good, is substantiated also by texts of the Letters. The Book of Kings ascribes this change to a rather natural cure of the captain by Elisha, who prescribed to the diseased seven baths in the Jordan river: the Jordan is rich with sulfur, magnesium, and brom salts, which enter the river at the Sea of Tiberias, and constitute, after evaporation of water in the Dead Sea, its deposits. Another instance which throws a side-light on the activity of Elisha is the fact that, as I could show, two letters of the collection were written to the Pharaoh by the Great Lady of Shunem (Kings). She wrote from that city, and sighed "Baalat-Ness", or "the Lady to whom a wonder had occurred". Elisha revived her child employing artificial breathing and a "four-cells" contact of his own body with the body of the infant.

The wonders of Elijah were of a peculiar nature: it seems that most or all of them have to do with atmospheric electricity. When a prolonged drought endured for a number of years, he sat on top of Mount Carmel with his head between his knees and from time to time asked his servant whether there was a cloud already seen over the sea. After a while a cloud appeared, approached, and burst into abundant rain.

When a detachment of the king Ahaziah was sent to interrogate him, Elijah, again “on top of the hill” invoked a lightning bolt out of an apparently cloudless sky to strike this group of men. According to the story he repeated this with a second detachment. Characteristically Elijah made all his meteorological and electrical “wonders” from the top of a hill.

Elijah was an “electrical” man, occasionally a living barometer, looking for electrical and magnetic “wonders” to employ in his miracles; in modern times and in modern attire I think of Nikola Tesla, who introduced alternating current and measured the Earth’s electrical charge; he too was a recluse who hardly published anything (of Elijah no prophetic book is known to exist). Tesla was attracted to electricity, was as if sought out by electrical phenomena. Some of his exploits may well be compared to those of Elijah—his most famous were performed from the top of a hill.

Attention should be paid to the fact that summits of certain mountains have an electrical halo, and that there is a permanent flow of electricity as can be demonstrated by a wire that connects two points at different altitudes on the slope of a hill, and that a charged electroscope is quickly discharged by ions, supposedly drifting from above. The enigmatic coolness of mountain tops is caused by an electrical process as I show elsewhere.

The death of Elijah also takes place under circumstances that suggest an electrical phenomenon. The occurrence of the phenomenon known as ball lightning was denied until very recent time, actually measured in decades. Today, the phenomenon belongs into textbooks. A ball of fire is seen sometimes moving rather slowly and then exploding.

In the Second Book of Kings, in its second chapter, the story is told how Elijah had crossed the Jordan with Elisha, his apprentice, when “behold, a chariot of fire and horses of fire . . . parted them both asunder; and Elijah went up by a whirlwind into heaven . . . And Elisha saw him no more . . . he took up also the mantle of Elijah that fell from him, and went back . . .”

The disciples looked for several days “lest peradventure the spirit of the Lord hath taken him and cast him upon some mountain, or into some valley,” but they found him not.

The detail about the mantle of Elijah that was left behind, instead of detracting from the verisimilitude of the Biblical episode, tends to support it. It is a well-known phenomenon that a wire may evaporate when an electrical discharge strikes it, yet its envelope of fabric (an insulator) remains intact. Here is what may have happened:

Traveling afoot on the east side of the Jordan, Elijah and Elisha were approached by a lightning ball that separated them; next it exploded, consuming Elijah, yet leaving his mantle unscathed, thus making it appear that it was a fiery chariot that approached them and then carried Elijah “by a whirlwind into heaven.”

It is not claimed here that this was the end of Elijah, only that such a phenomenon could be natural, though very unusual.

Resuscitation by Mouth-to-Mouth Breathing

When I was a medical student at the University of Moscow (1915-1921), we were taught the art or reviving the drowned or suffocated, or people in shock, by artificial breathing. The patient who had stopped breathing was put in the proper position (in the case of drowning on his stomach, with his tongue pulled out and held by a cloth) and his arms were lifted and then pressed to his ribs, pressure thus being rhythmically applied to his chest.

Once, years later, on a crowded beach, the body of a drowned man was brought from the sea surf. I happened to be in the crowd, and together with another doctor we desperately toiled for almost an hour, until an ambulance arrived. The doctor in the ambulance pronounced him dead—he did not breathe, nor did his heart beat.

After that incident I thought of Elisha's method of artificial breathing; but many years passed before I read in the American press of a new method—resuscitation by mouth-to-mouth breathing. Since then, the method of mouth-to-mouth breathing has become widely known, and in very many cases people were revived who otherwise would be dead. Only yesterday (of my writing this) I read of a boy of ten who was discovered by his father with his neck caught by the sling of a rope; the father cut the rope and the mother, who happened to be a nurse, applied mouth-to-mouth breathing, keeping him alive until the ambulance arrived. The boy was saved.

In the time of Elijah there lived in Shunem “a great woman.” After years of childlessness she bore a boy.

And when the child was grown, it fell on a day that he went out to his father to the reapers. And he said unto his father. My head, my head. And he said to the lad, Carry him to his mother. And when he had taken him and brought him to his mother, he sat on her knees till noon, and then died.¹

The mother put him on a bed and hurried on a donkey driven by a servant, and came to the man of God, Elisha, and begged him to hurry with her to her son. Elisha followed to Shunem, entered the house.

A staff brought in by the seer's servant, Gehazi, who arrived first, and put it on the child, did not produce any effect. Gehazi “went again to meet him [his master], and told him, saying. The child is not awakened.” Then Elisha entered the house and “found the child was dead.”

And he went up, and lay upon the child and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands; and he stretched himself upon the child; and the flesh of the child vexed warm. Then he returned and walked in the house to and fro; and went up and stretched himself upon him: and the child sneezed seven times, and the child opened his eyes.²

He called the Shunamite and said: “Take up thy son.”

The description of Elisha's miracle makes clear that he did not resurrect the child by a gesture or a word, but by a prolonged procedure, with the seer's mouth upon the child's mouth; the exercise was interrupted, the seer, after straightening his body by walking in the house, repeated the procedure, and then the child repeatedly sneezed and the breathing reflex was re-established, and the child was alive again.

The description of the child's sudden illness makes it appear that he suffered from sun-stroke when in the field with the reapers. A strong headache preceded the lapse into unconsciousness.

The mouth-to-mouth breathing accompanied by rhythmic movements of the body of the healer stretched out on the child's body, who kept his hands on the child's hands, and also warmed him by his own body warmth (and the flesh of the child vexed warm"), is an even better method than mouth-to-mouth breathing alone, and should be recommended in emergencies.

The story is apparently not fiction. In *Ages in Chaos* I have quoted from two letters of the great lady of Shunem. These two letters of the el-Amarna collection are the only ones written from Israel by a woman; she must have been a "great lady" if she corresponded directly with the pharaoh. As I could show conclusively, these two letters were written from Shunem; and the woman signed them Baalat-Ness, or "she to whom a miracle happened." From the appellation used in her letters to the pharaoh it appears that the fame of the healing reached also the palace of Egypt.

References

- II Kings 4:18-20.
- II Kings 34-35

Sanverim

The book from which I learned the history and practice of hypnosis treated it: as a rather recent discovery, crediting F.A. Mesmer with inventing hypnosis, or "animal magnetism" as he called it.¹ But it is very improbable that this natural phenomenon could have evaded the ancients and remained unknown through all the centuries and millennia of recorded history: too simple is the application and in no proportion to the mystery of the phenomenon. Many of the practices of the Hindu yogis that go back to ancient times belong to the category of autohypnosis.

In a deep hypnosis it is possible to provoke by a mere verbal order a cataleptic state, hysteria-like paralysis, and illusions. An order can be given that the person in the experiment not be able to lift his arms; in the case of a person subjected to a deeper hypnosis—that he will not be able to see; or if led to some destination, that he should believe that he is in different surroundings.

In the Hebrew Scriptures I find two instances where supposed “miracles” can be recognized as inflicted hypnotical states, consisting of paralysis and somnambulistic illusions. In both of these examples the expression *hikku b’ sanverim*—he (or they) smote with sanverim—is used to describe the phenomenon.

The first story is found in Genesis, in the narrative of the event shortly preceding the destruction of Sodom and Gomorrah. Lot had in his house as guests two of the Lord’s messengers, or *malakhim*, a word usually translated as “angels” ; but they are called also “men” in the body of the story. When the depraved people of the town demanded the delivery of the guests for their sexual debauchery and tried to force their way inside. Lot vainly negotiated with the people at the door. The messengers opened the door, stretched out their arms, brought Lot inside, and smote the assailants at the door with *sanverim*. Those smitten with *sanverim* groped for the door, unable to find it. The next morning Lot with his family hastily left the city and fled to Zoar. Then followed the destruction of Sodom and Gomorrah.

The second case where the word *sanverim* is used in the Scriptures is in the Book of Kings. King Ben-Hadad of Damascus conspired to kill the king of Samaria in an ambush, hiding his assassins near a road where the king was to pass. But the king of Samaria was warned repeatedly by the seer Elisha, and would each time select a different route and thus escape the peril. The king of Damascus spoke to his captains and expressed the belief that somebody among them had disclosed their plans to the king of Samaria. They answered him by saying that the seer in Samaria knows what he. King Ben-Hadad, says in his bedroom; in other words, that the king of Samaria is warned by his seer, who is endowed with the gift of telepathy. On hearing this, the king of Damascus sent a detachment to fetch the seer. They found him in the village of Dothan. They were under orders to bring him to Damascus; but the seer smote them with *sanverim* and commanded them to follow him, saying that he would lead them to the man they were seeking. He led them to Samaria. There he opened their sight by ordering them to see again, and they saw; “and behold, they were in the midst of Samaria,” the king’s city. Then Elisha had bread and water set before them and sent them back to Damascus.

The usual translation of the word *sanverim* is “blindness.” Yet in these instances if blindness was meant, the regular word for blindness, *ivaron* should have been used. *Iver* signifies a blind person in many Biblical texts. The Old Testament also knows the ways a person may become blind—slowly as in the case of the patriarch Isaac, or suddenly, as in the case of King Zedekiah, blinded by Nebuchadnezzar. The translation of *sanverim* as blindness is given on the basis of the fact that in both instances the effect was a transient inability to see. But in the story of Lot we have a case of blindness obviously induced by hysteria, affecting simultaneously more than one person.² In the story of Elisha it is even more obvious that the term refers to hypnotical blindness or illusion. It was inflicted by verbal means, and it was also relieved by verbal means. The fact that the soldiers of Ben-Hadad were made to travel to Samaria believing that they were going to a different destination is also an act that a good hypnotist can perform with a select group of people. Their being sent to remove the seer, whose fame had reached foreign countries, made the men of the detachment well prepared (conditioned) for this feat.

References

1. Its first use is often placed in 1840 when a surgeon working in India applied it for its anaesthetic effect before there was any other method of painless surgery. Ether was introduced for narcosis by C.W. Long in 1842 and chlorophorm by J.Y. Simpson in 1847. Even today there are physicians who apply hypnosis in childbirth.
2. The word *sanverim* is probably not of Hebrew origin; there is no word in Hebrew that is built on the same root. [A Syriac commentary on Genesis interprets the word *sanverim* as “phantasies.” Abraham Levene, *The Early Syrian Fathers on Genesis* (London, 1951) p. 92.—JNS]

The Secret of Baalbek

THE TEMPLE AT DAN

The story of Jeroboam, son of a widow of Zereda, an Ephraimite and Solomon’s servant, begins with this passage:

Solomon built Millo, and repaired the breaches of the city of David, his father. And the man, Jeroboam, was a mighty man of valor; and Solomon, seeing the young man that he was industrious, made him ruler over all the charge of the house of Joseph.¹

The ambitious servant was not satisfied with this honor of administering the land of Menashe (Manasse) and Ephraim, or even the entire northern half of the kingdom; he wished to be a king himself. When Jeroboam’s plans became known to Solomon, the king intended to kill him, but Jeroboam ran away to the Pharaoh of Egypt. When Solomon died, he returned; he tore the ten tribes’ land from Rehoboam, son of Solomon. Solomon’s realm was split in two: Jeroboam became king of Israel in the north, and Rehoboam retained the kingdom of Judah in the south. To make the rift permanent Jeroboam had to keep the people from going to Jerusalem and its new temple.

And Jeroboam said in his heart, Now shall the kingdom return to the house of David.

If this people go up to do sacrifice in the house of the Lord at Jerusalem, then shall the heart of this people turn again unto their lord, even unto Rehoboam, king of Judah, and they shall kill me, and go again to Rehoboam, king of Judah.²

From the viewpoint of serving his own ends, it was a sound idea to build on some ancient sites places for folk gathering which would compete with Jerusalem.

Whereupon the king [Jeroboam] took counsel, and made two calves of gold, and said unto [his people]. It is too much for you to go up to Jerusalem . . .

And he set the one in Beth-el, and the other put he in Dan.³

Beth-El was in the south of his kingdom, close to Jerusalem, Dan in the north of his kingdom. In order to attract pilgrims from the land of Judah, Jeroboam also made Beth-El the site of a new feast, “like unto the feast that is in Judah”.⁴ Setting up the image of the cult in Dan, Jeroboam proclaimed: “Behold thy gods, O Israel, that brought thee up out of the land of Egypt.”⁵ Thus, Dan in the north competed with Jerusalem in the days of Passover and Tabernacles. The temple of Dan was a much larger edifice than the temple in Bethel, and it became a great place for pilgrimage, attracting people even from the southern kingdom.

And this thing became a sin; for the people went to worship before the one [of the two calves], even unto Dan.⁶

The temple of Dan was called a “House of High Places” : “And he made an house of high places . . .”⁷ The Temple of Jerusalem was also called a “House” in Hebrew.

For centuries the temple of Dan in the north successfully contested with the Temple of Jerusalem, and attracted throngs of pilgrims.

Jeroboam, the man who supervised under Solomon the building of Millo, the fortress of Zion with its strong wall, and who, in recognition of his ability demonstrated in this work, was appointed governor of the northern provinces, now, when king, must have desired to erect in Dan a temple surpassing the magnificent Temple of Solomon in Jerusalem. Only in offering a more imposing building could he hope not only to turn the people from going to Jerusalem, but make the people of Judah elect a pilgrimage to Dan over one to Jerusalem. Meanwhile, Jeroboam had seen the temples and palaces of Egypt, and his ambition was, of course, to imitate all the splendor he had seen in Jerusalem, in Karnak, and in Deir el-Bahari. Or would this “mighty man of valor”, industrious constructor of Zion’s citadel, and a shrewd politician, try to contest the Temple of Jerusalem by means of an ignoble chapel? That he succeeded in his challenge is a testimony to the size and importance of the temple at Dan.

It was not enough that Dan and Beth-El were ancient places of reverence: magnificence was displayed in the capital of Solomon, and magnificence had to prevail in the temple cities of the Northern Kingdom.

The temple of Beth-El, the smaller of the two Israelite temples, was demolished three centuries later by King Josiah, a few decades before the Temple of Jerusalem was destroyed by Nebuchadnezzar. It was trampled into smithereens by the king, jealous for his God.⁸ There is no mention of a destruction of the temple in Dan. Where was Dan and its “House of High Places” ?

THE SEARCH FOR DAN

Dan was the northernmost point of the Israelite settlement where one of the twelve tribes chose its domicile. A familiar expression was: “From Dan even to Beer-Sheba.”⁹

Students of biblical geography have agreed to place Dan in the Arab village of el-Kadi, on the upper flow of the Jordan, which is there but a rivulet. In recent years very insignificant ancient

ruins have been found on this place.¹⁰ This is in accord with what the biblical archaeologists expect, for they think the temple of Dan to have been a very modest structure of which, most probably, hardly any ruins would have remained.

The biblical Dan is placed on the upper flow of the Jordan because of a passage in Josephus Flavius. In his *Jewish Antiquities*, Josephus says that Dan was on “a spot not far from Mount Libanus and the sources of the lesser Jordan”.¹¹ Commentators of Josephus deduced that by the “lesser Jordan” the upper flow of the Jordan, above the Lake of Huleh, or above the Lake of Tiberias, is meant; however, this interpretation is not supported by the words “not far from Mount Libanus” since, from the surroundings of el-Kadi and the sources of the Jordan, the snow-capped Hermon or Anti-Lebanon can be seen in the distance, but not Lebanon, far behind the Anti-Lebanon.

After having chosen the source of the Jordan as the area where to look for Dan, this ancient city was located at el-Kadi for the following reason: the name Dan is built of the Hebrew root that signifies “to counsel” or “to judge”. El-Kadi means in Arabic “the judge”. There was no other reason, beside this philological equation of Hebrew and Arabic terms, to locate the site of the ancient temple city in the small village of el-Kadi, since—until quite recently—no ruins, large or small, were found on the site.

The aforementioned reference in Josephus makes one wonder whether by “the lesser Jordan” the river Litani was meant. This river begins in the valley between Mount Lebanon and Mount Anti-Lebanon, flows to the south in the same rift in which farther to the south the Jordan flows, and towards the source of that river, but changes its course and flows then westwards and empties itself into the Mediterranean. Its source being near Mount Lebanon, it appears that the Litani was meant by “the lesser Jordan”.

However, Josephus, who wrote in the first century of the Christian era, was not necessarily well-informed concerning the location of Dan - the temple city of the Northern Kingdom - a state whose history ended with the capture of Samaria by Sargon II in -722.¹²

Therefore, it is only proper to go back to the Scriptures in trying to locate Dan.

THE PORTION OF THE CHILDREN OF DAN

When the Israelites, after the Exodus from Egypt, roamed in the wilderness, they sent scouts to Canaan to investigate the land and to report. The scouts passed the land through its length “from the wilderness of Zin unto Rehob, as men come to Hamath”.¹³ These were also destined to be the southern and northern borders of the land: “Your south quarter shall be from the wilderness of Zin” and in the north “your border [shall be] unto the entrance of Hamath”.¹⁴

The expressions “as men come to Hamath”, or “unto the entrance of Hamath” signify that Rehob, the northern point of the land visited by the scouts, was at a place where the road began that led to the city of Hamath in Syria.

In the days of conquest under Joshua son of Nun, when the land was partitioned by lot, the tribe of Dan received its portion in the hilly country on the road from Jerusalem to Jaffa. The tribe was opposed by the Philistines, also invading the same country. When the population of Philistia increased through the arrival of new immigrants from the Mediterranean islands, the tribe of Dan, being the advance guard of the Israelites, had to suffer not mere resistance, but strong counter-pressure. The Samson saga reflects this struggle. Tired of continuously opposing the increasing influx of the Philistines, the Danites migrated to the north.

They . . . came unto Laish, unto a people who were quiet and secure; and they smote them with the edge of the sword, and burned the city with fire.

And there was no deliverer, because it was far from Zidon, and they had no business with any man; and it was in the valley that lieth by Beth-Rehob. And they built a city, and dwelt therein.

And they called the name of the city Dan . . . howbeit, the name of the city was Laish at the first.¹⁵

Here we meet again the northern point Rehob or Beth-Rehob. We are also told that it was situated in a valley. Next to it was the city of Laish, and the Danites burned the city and then erected there a new city, Dan.

Beth-Rehob, or House of Rehob, is the place we met—in the story of the scouts sent by Moses—as the most remote point they visited going to the north.

The place was “far from Zidon” ; if it were where it is looked for today—at the source of the Jordan—it would not have been proper to say “far from Zidon”. but rather “from Tyre”. But if Zidon (Sidon) is named as the nearest large city. Tyre must have been still farther from Laish-Dan, and the latter city must have been more to the north, in the valley between Lebanon and Anti-Lebanon.

The Danites were in contact with the Zidonians already at the time when they fought with the Philistines for the possession of territory. Because of want of land, they sent many of their sons as sailors on Phoenician ships.¹⁶ In their new place of abode the Danites became kindred with the Phoenicians.

In Dan-Laish, “the children of Dan set up the graven image” of Micah.¹⁷ The story of this holy image is connected with the migration of the Danites to the north. Before migrating they sent a few men to find for them “an inheritance to dwell in”.¹⁸ These men traversed, on their errand, the mountainous land of Ephraim. Micah was an Ephraimite who built a private chapel in Mount Ephraim, where he placed “a graven image and a molten image”, and hired a Levite to serve there as a priest.¹⁹ The men of Dan, dispatched on the errand to find a new domicile for the tribe, heard an oracle from the priest. After having spied the place of Laish, they returned to their tribe that dwelt in the hilly borderland of Zarah, and with six hundred warriors went to the north. Passing again Mount Ephraim, they took with them the image and the priest, despite the bitter protests of Micah. When they conquered Laish “the children of Dan set up the graven image”.²⁰ Since then, there was an oracle in Dan.

The name Dan-jaan, found in the Scriptures,²¹ is apparently a synonym for Dan: it means “Dan of answer”, or “of oracle”.

Dan became the site of the temple built by Jeroboam. It was a holy place long before he built his temple there, since the story of the oracle of Micah is conspicuously narrated in the Book of Judges; it is rather probable that Rehob was a sacred place even before the Danites built their city on the ruins of Laish close by.

It cannot be said of the present village of el-Kadi that it lies on the road “as men come to Hamath” ; to satisfy this description, Rehob must be looked for farther to the north.

THE SUCCESSORS OF JEROBOAM

Being located in an outstretched part of the Israelite kingdom, Dan was often the subject of wars between the kings of Damascus and of Israel. Shortly after the death of Jeroboam, the temple city was conquered by the king of Damascus.²² It appears that, at the time of the revolution of Jehu, three generations later, in the ninth century, Dan was still in the hands of the kings of Damascus; but it is said that Jehu, who destroyed the temple of Baal in Samaria, did not destroy the temple of Dan, nor did he abolish its cult, “the sin of Jeroboam”. This implies that Dan came back into the hands of the Israelites in the days of Jehu. In any case, the population of the northern kingdom -that of Israel—but also of the southern kingdom - that of Judah-continued to go to Dan on the feasts of Passover and Tabernacles, preferring it to Jerusalem.

Jehu, jealous of the God Yahweh, did nothing to keep the people from going to Dan, and obviously even encouraged them to do so; the cult of Dan was one of Yahweh, though in the guise of a calf, or Apis.

In the eighth century the prophet Amos, one of the earliest prophets whose speeches are preserved in writing, spoke of the worship at Dan:

They that swear by the sin of Samaria, and say, Thy god, O Dan liveth; and, The manner of Beer-Sheba liveth; even they shall fall, and never rise up again.²³

For a time Amos prophesied at Beth-El, the other sacred site of the Northern Kingdom. In his time the place had a royal chapel; and in view of the statement that, of the two places where Jeroboam placed the calves, the people went to worship in Dan,²⁴ apparently the chapel of Beth-El remained a minor sacrarium and did not attract many worshippers.

Hosanna, another prophet who lived in the eighth century, admonished: “Let not Judah offend . . . neither go ye up to Beethoven.”²⁵ He prophesied also that the “inhabitants of Samaria shall fear because of the calves of Beethoven”, and that the glory of that place will depart from it.²⁶

It is generally agreed that Hosea, speaking of Beth-Aven (“the House of Sin”), referred to Beth-El This is supported by the verse in the Book of Joshua which tells: “And Joshua sent men from Jericho to Ai, which is beside Beth-Aven, on the east side of Beth-El”²⁷

It appears that the name Beth-Aven, or “The House of Sin” was applied to both places where Jeroboam built temples for the worship of the calf. It is possible that, in another verse of his, Hosea had in mind the temple of Dan; he said: “The high places also of Aven, the sin of Israel, shall be destroyed . . .”²⁸

“The sin of Israel” is the usual term for the cult of Dan; and the “high places”, according to the quoted story of Jeroboam placing calves in Dan and Beth-El,²⁹ were built in Dan.

At the beginning of the Book of Amos, the following sentence appears: “I will break also the bar of Damascus, and cut off the inhabitant from the plain of Aven (*me' bik'at Aven*) . . . and the people of Syria shall go into captivity unto Kir . . .”³⁰

I shall return later to this passage and to the accepted interpretation of “the plain of Aven”.

During the wars of the eighth century, the temple city of Dan may have taken part in the struggle of the Northern Kingdom for its existence, being oppressed first by Syria, and then by Assyria. Dan may have been besieged, and may have changed hands during these wars, but nothing is known of its destruction.

In the latter part of the eighth century the population of the Northern Kingdom was deported by Sargon II to remote countries, from where it did not return. More than a century later Jeremiah referred to the oracle of Dan: “For a voice declareth from Dan”,³¹ which shows that the oracle of Dan was still in existence after the end of the Northern Kingdom.

An oracle venerated since ancient times, a magnificent temple where the image of a calf was worshipped, a place where the tribes of Israel gathered in the days of the feasts, and the people of Judea used to come, too—this was the cult.

On the way to Hamath, on the northern frontier of the Northern Kingdom, closer to Zidon (Sidon) than to Tyre, and strategically exposed to Damascus—this was the place. Would no ruins help to identify the site?

BAALBEK

In the valley that gives birth to two rivers of Syria—the Orontes flowing to the north, and the Litani flowing to the south and west, between the mountains of Lebanon and Anti-Lebanon, where roads from Palestine in the south, Damascus in the east, and the sea-coast on the west meet and run from there to Hamath in Upper Syria—lie the ruins of Baalbek.

“When we compare the ruins of Baalbek with those of many ancient cities which we visited in Italy, Greece, Egypt, and in other parts of Asia (and Africa), we cannot help thinking them to be the remains of the boldest plan we ever saw attempted in architecture. Is it not strange then, that the age and the undertaker of the works, in which solidity and duration have been so remarkably consulted, should be a matter of such obscurity. . .?”³²

From the time when this was first written, in the fifties of the eighteenth century, and till today, nothing was added to dispel the obscurity which envelops the origin of this temple city.³³ The excavations undertaken there brought no solution to the problem of its origin or the nature of its cult.³⁴ No early inscriptions were found.

Throng of travelers who spend their day wandering among the ruins of a magnificent acropolis go away without having heard what the role of the place was in ancient times, when it was built, or who was the builder. The pyramids, the temples of Kamak and Luxor, the Forum and Circus Maximus in Rome were erected by builders whose identity is generally known. The marvellous site in the valley on the junction of roads running to Hamath is a work of anonymous authors in unknown ages. It is as if some mysterious people brought the mighty blocks and placed them at the feet and in front of the snow-capped Lebanon, and went away unnoticed. The inhabitants of the place actually believe that the great stones were brought and put together by Djenoun, mysterious creatures, intermediate between angels and demons.³⁵

SOLOMON'S BAALBEK

Local tradition, which may be traced to the early Middle Ages, points to a definite period in the past when Baalbek was built: the time of Solomon.

Ildrisi, the Arab traveler and geographer (1099-1154), wrote: "The great (temple-city) of astonishing appearance was built in the time of Solomon."³⁶ Gazwini (d. 1823 or 4) explained the origin of the edifices and the name of the place by connecting it with Balkis, the legendary Queen of the South, and with Solomon.³⁷

The traveler Benjamin of Tudela wrote in the year 1160 of his visit to Baalbek: "This is the city which is mentioned in Scripture as Baalath in the vicinity of the Lebanon, which Solomon built for the daughter of Pharaoh. The place is constructed with stones of enormous size."³⁸

Robert Wood, who stayed at Baalbek in the 1750's, and who published an unsurpassed monograph on its ruins, wrote: "The inhabitants of this country, Mohomedans, Jews and Christians, all confidently believe that Solomon built both, Palmyra and Baalbek."³⁹ Another traveler who visited Syria in the eighties of the eighteenth century recorded: "The inhabitants of Baalbek assert that this edifice was constructed by Djenoun, or genies in the service of King Solomon."⁴⁰

ON - AVEN

The identification of Bikat Aven, referred to in Amos 1:5 with the plain of Coele-Syria is generally accepted.⁴¹ The text, already quoted, reads: "I will break also the bar of Damascus, and cut off the inhabitant from the plain of Aven . . ."

The Septuagint, the Greek translation of the Bible by the Seventy, renders the above text as "the valley of On," written the same as On (or Heliopolis) in Egypt. The Hebrew spellings of Aven

and On do not differ in consonants; and vocals were inserted in the texts by the Masoretes in a late period. On is the Hebrew name of Heliopolis in Egypt, pronounced also as Aven, as in Ezekiel 30:17; Bikat Aven is the name of the plain of Baalbek in Amos. Tradition has it also that the cult of Baalbek was brought there from Heliopolis in Egypt.⁴²

Hosea, however, called by the name of Aven (Beth-Aven) the cities of Bethel and Dan;⁴³ and he spoke of “high places” there, and in the instance where he referred to “the sin of Israel” he obviously meant Dan.⁴⁴

Amos, who in the eighth chapter speaks against the worshippers at Dan, in chapter one speaks against the plain of Aven—and thus, comparing Hosea and Amos, one wonders whether Amos 1:5 speaks of Baalbek or of Dan.

The expression Bikat Aven, or the Valley (Plain) of Aven in Amos impelled the exegetes and commentators to refer the place to Coele-Syria, and this because Bi’qa is the specific name of the Coele-Syrian plain—still in use today. The very name Baalbek is generally explained as the Baal of Bi’qa or Bekaa—of the valley.

Baalbek is situated in the valley between Lebanon and Hermon. Of Dan it is also said that it was situated in a valley:

”. . . And it was in the valley that lieth by Beth-Rehob. And they built a city, and dwelt therein.”⁴⁵

BAALATH, BAAL GAD, BAAL ZAPHON, BAAL MELECH

Is Baalbek the Scriptural Baalath, as Benjamin of Tudela thought? About Baalath it is said: “And Solomon built . . . Baalath, and Tadmor in the wilderness.”⁴⁶ Tadmor is Palmyra, far to the northeast of Baalbek. Baalath is said to have belonged to the tribe of Dan.⁴⁷

Or, is Baalbek the Scriptural Baal Gad? deliberated a few scholars.⁴⁸ It is said: “Baal Gad in the valley of Lebanon under mount Hermon.”⁴⁹ In the valley of Lebanon under mount Hermon lies Baalbek. If this identification is correct then Baalbek was inside the Israelite kingdom. However, against this supposition of Baal Gad in the valley of Lebanon it was argued that the Israelite kingdom never embraced the area of Coele-Syria, or the valley between Lebanon and Hermon (Anti-Lebanon).⁵⁰

Some writers would regard Baalath and Baal Gad as two names of one place and would locate it at Baalbek.⁵¹

If Solomon built in Palmyra in the desert between Syria and Mesopotamia, the region of Coele-Syria between Lebanon and Hermon could certainly be in the area of his building activity, argued these scholars. But placing Baal Gad in Coele-Syria, where would they place Dan, the northernmost point of the Kingdom of Israel? To keep Dan in Galilee and to place Baal Gad, an

Israelite city, one hundred fifty kilometers farther to the north will not stand up against the indisputable fact that Dan was the northernmost city in Israel.

Some scholars, looking for Baalbek in the Scriptures, identified it with Baal-Hamon, referred to in the *Song of Songs*.⁵² And again, Baal Hamon is supposed to be another name for Baalath and Baal Gad.⁵³

Also Baal Zaphon, or Zeus Cassius, was proposed as Baalbek.⁵⁴ In this connection it can be said that, according to the Talmud, Gad was the name of the planet Jupiter;⁵⁵ and Zeus Cassius signifies Jupiter of Lebanon; and Hamon was supposed to be a Syrian form of the name Amon⁵⁶ who, according to the Greek authors, was Zeus-Jupiter.⁵⁷

All this together, if correct, points toward the cult of Jupiter in Baalbek, a matter to which we shall return in one of the next sections.

Besides Baal Gad, Baal Zaphon or Zeus Cassius, Baal Hamon, and Baalath, one more name is identified as Baalbek: Baalmelech, or “the royal Baal”.⁵⁸

THE TRILITHON

Already in the last century it was observed that the Acropolis of

Baalbek and the temples built on it date from different epochs. The massive substratum—the great base of the acropolis—appears to be of an earlier date; the three temples on the substratum, of a later date.

It is even probable that the wall of the acropolis did not originate in one epoch. Among the stones of which it is built there are three of an unusual size—almost twenty meters long. Each of them weighs about one thousand tons. These huge monoliths are incased in the wall. The question arises whether they are not the survivals of the original cyclopean structure—that which carried the name Rehob, or Beth-Rehob, and which served as a landmark for the scouts dispatched by Moses in their survey of Canaan, and for the emissaries of the tribe of Dan in their search for the territory in the north. Like Stonehenge in Great Britain, or Tiahuanaco in the Andes, it may have originated in an early time—not necessarily neolithic, since it appears that these stones are subjected to hewing by metal tools.

In the quarry a mile away is found another stone of comparable size, cut out of the rock from all but one side; it appears that this stone of more perfect cut was quarried in a later time, possibly in the days of Jeroboam, or even later; but, for probably mechanical considerations, the work was not finished and the stone not removed, and the emulation of the early builders not completed.⁵⁹

In another place I intend to return to the problem of the Trilithon of Baalbek, when treating cyclopean buildings and the mechanical means of quarrying and transporting these monoliths.

THE EMBOSSED QUADERS

Aside from the incased trilithon, the attention of the visitor to Baalbek who inspects the wall of the acropolis is drawn to stones of a bossed shape with an indented rim on all four sides of the face of the stone.

O. von Richter in 1822⁶⁰ and S. Wolcott in 1843⁶¹ drew attention to the fact that the quaders of the wall of the temple area of the acropolis of Baalbek have the same form as the quaders of the Temple of Solomon, namely, of the surviving western (outer) wall, or Wailing Wall. The Roman architects, wrote Wolcott, never built foundations or walls of such stones; and of the Israelite period it is especially the age of Solomon that shows this type of stone shaping (chiseling). The photograph of the outer wall of Baalbek's temple area illustrates that the same art of chiseling was employed in the preparation of stones for its construction. Whatever the time of construction of other parts of Baalbek's compound—neolithic, Israelite, Syrian, Greek, or Roman—this fundamental part of the compound must have originated in the same century as the surviving (western) wall of the area of Solomon's temple.

THE TEMPLES OF THE ACROPOLIS

The buildings on the flat plateau of the Acropolis have columns with capitals of Corinthian style. The time of the origin of these temples is disputed. An author of the last century⁶² brought forth his arguments against a late date for the temples atop the acropolis; he would not agree to ascribe them to the Roman period, or Greek period; he dated them as originating in an early Syrian period: the Romans only renovated these buildings in the second century of the present era.

The opinions of scholars are divided over whether these buildings can be ascribed to Roman times, though the source of the designs on the doorways and the ceiling and in the capitals of the columns speak for a Roman origin. When the Roman authorship of the buildings is denied, the Romans are credited only with renovating the structures.

The Emperor who is sometimes said to have built the largest of the temples in the temple area—that of Jupiter—is Aelius Antoninus Pius (138-161). The source of this information is the history of John of Antioch, surnamed Malalas, who lived not earlier than in the seventh century of this era, and wrote that Antoninus Pius built a temple for Jupiter at Heliopolis, near the Lebanon in Phoenicia, which was one of the wonders of the world.⁶³

Julius Capitolinus, who wrote the annals of Antoninus Pius and enumerated the buildings he erected, offers no material support for the assertion made by the Syrian writer of the early Middle Ages. Though Antoninus Pius did build in Baalbek, as is evidenced by his inscriptions found there,⁶⁴ his activity was restricted to reparation of the temples or the construction of one of the edifices in the temple area.⁶⁵ The work in its entirety could not have been his because Lucian, his contemporary, calls the sanctuary of Baalbek already ancient, and because Pompey had already found it in existence and Trajan consulted its oracle.

The style of the temples caused the same divergence of opinion as the style of the surviving ruins of Palmyra. Some regard them as Roman,⁶⁶ others as Hellenistic and Oriental.⁶⁷ They are sometimes called East-Roman.⁶⁸ In the case that only the ornamentation is of the Roman period the question may arise whether the walls and the columns of these buildings could be of as early a period as the seventh century before the present era, or the time of Manasseh, of whom Pseudo-Hippolytus says that he reconstructed Baalbek, built originally in the time of Solomon.⁶⁹

THE CALF

It was almost a common feature in all places where pilgrims gathered to worship at a local cult that diminutive images of the deity were offered for sale to them. Also small figures of the god or of his emblem in precious or semi-precious metals were brought by worshippers as a donation to the temple where the large scale figure had its domicile.

In Baalbek archaeological work produced very few sacred objects or figures that could shed light on the worship of the local god. "It was a disappointment, next to the brilliant success of so rich an excavation, that nothing was learned of the nature of the deity and the history of its worship."⁷⁰

Figures of Jupiter Heliopolitanus standing between two bullocks or calves have been found at Baalbek, dating from Roman times.⁷¹ In addition, an image of a calf was also found.

The only figure of an earlier time found in Baalbek is an image of a calf. Since it is to be expected that images found in an ancient temple are reproductions of the main deity worshipped in the holy enclosure, it is significant that the holy image in the temple of Baalbek was that of a calf, and of no other animal.

The name Baal-Bek (Baal-Bi'qa) is sometimes transmitted by Arab authors as *Baal bikra*, or Baal of the Steer or Calf, which is the way of folk etymology to adapt the name to the form of the worship practiced in the temple. This, together with the finding of the images of the calf in the area of the temple, strengthens the impression that the god of Baalbek was a calf.

THE ORACLE OF BAALBEK

Baalbek or, as the Romans called it, Heliopolis, was venerated in the Roman world as the place of an old cult of an ancient oracle, and it rivalled successfully other venerated temples of the Roman Empire.

It is known that the Emperor Trajan, before going to war against the Parthians in the year 115, wrote to the priests of Baalbek and questioned its oracle. The oracle remained in high esteem at least as late as the fourth century of the present era, when Macrobius in his *Saturnalia* wrote of Baalbek: "This temple is also famous for its oracles."⁷²

Was it the ancient oracle of Micah? In the words of Jeremiah, shortly before the Babylonian exile of -586 in which he spoke of “a voice . . . from Dan”,⁷³ we had the last biblical reference to the oracle of Micah. In the days of Jeremiah the oracle must have been seven or eight hundred years old. Did it survive until the days of Trajan and even later, until the days of Macrobius?

In the Tractate Pesahim of the Babylonian Talmud is written the following sentence: “The image of Micah stands in Bechi.”⁷⁴ Bechi is known as the Hebrew name for Baalbek in the time of the Talmud. As we have seen, in the Book of Exodus it is recounted that the Danites, migrating to the North, took with them Micah and his idol, and that it was placed in Dan of the North. The Talmud was composed between the second and the fifth centuries of the present era.

This passage in the Tractate Pesahim is a strong argument for the thesis of this essay, namely that Baalbek is the ancient Dan.⁷⁵

TWO PROBLEMS: A SUMMARY

The problems will be put side by side. Dan was the abode of the old oracle of Micah. Jeroboam built there a “house of high places”, or a temple. Previously, he was the builder of Jerusalem’s wall under Solomon; before becoming king of the Northern Kingdom he lived as an exile in Egypt. He introduced the cult of the calf in Dan.

The new temple was built to contest and to surpass the temple of Jerusalem. It became the gathering place of the Ten Tribes, or “the sin of Israel”, and pilgrims from Judah also went there.

The prophets, who opposed the cult of Dan, called the place Aven, like Aven, or On (Heliopolis) in Egypt.

Its oracle was still active in the days of Jeremiah, in the beginning of the sixth century.

Dan was the northernmost city of the Kingdom of the Ten Tribes, and the capital of the tribe of Dan. It was situated in a valley. If Baal Gad, between the Lebanon and the Anti-Lebanon was not the same place, Dan must have been more to the north.

The place was at the point where the roads meet that run toward Hamath.

No ruins of this temple-city are found. Where was Dan and its temple?

* * *

Remains of a great temple-city are preserved in Baalbek. At the beginning of the present era it was described as already ancient. It bore the name of Heliopolis, like the Egyptian On, or Aven (Ezekiel); and Amos, who spoke against the worshippers at Dan, prophesied the desolation of Bikat-Aven, or the Valley of Baalbek.

Its cult was introduced from Egypt. During excavations, the figure of a calf was unearthed.

The temple possessed an old oracle. The Talmud contains the information that the oracle of Micah (which according to the Book of Judges was in Dan) stands in Baalbek.

Local tradition assigns the building of the temple of Baalbek to the time of Solomon. The wall of the temple area is built of great stone blocks of the same peculiar shape as those of the Wailing Wall in Jerusalem, the remains of the outer wall of the temple area erected by Solomon.

Baalbek lies in a valley (Bi'qa) between the Lebanon and the Anti-Lebanon, and on the junction of the roads that connect Beirut from the west and Damascus from the east with Hamath in the north.

The history of the temple-city of Baalbek in pre-Roman times is not known, neither is its builder known, nor the time when it was built.

* * *

Two problems—when was Baalbek built and who was its builder, and where was Dan and what was the fate of its temple—have a common answer.

The tradition as to the age of the acropolis and temple area of Baalbek is not wrong. Only a few years after Solomon's death the house of the high places of Dan-Baalbek was built by Jeroboam.* Possibly, Solomon had already built a chapel for the oracle, besides the palace for his Egyptian wife.

The *Djenoun* who, according to Arab tradition, built Baalbek for Solomon were apparently the tribesmen of Dan. In the Hebrew tradition, too, the tribesmen of Dan, because of the type of worship in their capital, were regarded as evil spirits. In the corrupted name of Delebore, who, according to Macrobius, was the king who built Baalbek and introduced there the cult of Heliopolis from Egypt, it is possible to recognize the name of Jeroboam who actually returned from Egypt before he built "the house of the high places".

* * *

EDITORIAL POSTSCRIPT:

Velikovsky's essay on Baalbek was planned to include a discussion of the names by which this place was known in Egyptian texts. This part was not written, but a few notes of his, scattered among his papers, may help us to follow his reasoning. One note reads: "Dunip (Tunip) of the el-Amarna letters and other ancient sources was Dan. It was also Kadesh of Seti's conquest. Finally, the place is known as Yenoam ('Yahwe speaks') which refers to the oracle."

Tunip: *As Velikovsky noted in "From the End of the Eighteenth Dynasty to the Time of Ramses II" (KRONOS III.:3, p. 32) certain scholars (e.g., Gauthier) have identified Tunip with Baalbek, though others (e.g., Astour) have disputed the link. Thutmose III recorded the capture of Tunip in*

the 29th year of his reign; an inscription recounts the Egyptian king's entering the chamber of offerings and making sacrifices of oxen, calves, etc. to Amon and Harmachis. The el-Amarna letters indicate that the same gods were worshipped at Tunip as in Egypt.

On the walls of a Theban tomb of the time of Thutmose III (that of Menkheperre-Seneb), among paintings of foreigners of various nations, there is one of a personage from Tunip, carrying a child in his arms. Velikovsky thought that, possibly, it was a depiction of Jeroboam, and that the painting illustrated the passage in the First Book of Kings (II :40): "And Jeroboam arose, and fled into Egypt, unto Shishak, king of Egypt. . ."

Among the considerations which led Velikovsky to identify Tunip with Dan-Baalbek were (1) Tunip was located in the general area of Baalbek, with some scholars asserting that the two were one and the same. (2) There was a temple of Amon at Tunip; the Roman equivalent of Amon - Jupiter - was worshipped at Baalbek.

Kadesh of Seti's Conquest: *This identification was given in brief in Velikovsky's article in KRONOS III:3, mentioned above. The relevant passage reads: "There is a mural that shows Seti capturing a city called Kadesh. Modern scholars recognized that this Kadesh or Temple City was not the Kadesh mentioned in the annals of Thutmose. Whereas the Kadesh of Thutmose was in southern Palestine, the Kadesh of Seti was in Coele-Syria. The position of the northern city suggested that it was Dunip, the site of an Amon temple built in the days of Thutmose III. Dunip, in its turn, was identified with Baalbek."*

Pseudo-Hippolytus (Sermo in Sancta Theophania in J. -P. Migne, Patrologiae Cursus Completus [Graeca] Vol. 10, col. 705) gives the information that Manasseh, son of Hezekiah, restored Baalbek. In his forthcoming Assyrian Conquest, Velikovsky suggests that this could have been a reward for Manasseh for his "loyalty to the Assyrian-Egyptian axis".

Yenoam: *Regarding Yenoam, I find only the following among Velikovsky's notes: "Yenoam-Dan (Yehu probably introduced the cult of Yahwe at Dan)." Yenoam, read in Hebrew, could be interpreted as "Ye [Yahwe] speaks"; Velikovsky evidently saw in the name a reference to the oracle at Dan. Yenoam is mentioned among the towns taken by Thutmose III (he captured it soon after taking Megiddo). In the el-Amarna letter no. 197 there is a reference to a town named Yanuammu. Later, Seti recorded the despatching of an army against Yenoam, in the first year of his reign. Yenoam is once again mentioned on Merneptah's so-called Israel Stele; the claim is that it was "made non-existent." In Ramses II and His Time this deed is ascribed to Nebuchadnezzar.*

- Jan Sammer

References

1. I Kings 11:27, 28.
2. I Kings 12:26, 27.

3. I Kings 12:28, 29.
4. I Kings 12:32. 33.
5. I Kings 12:28.
6. I Kings 12:30.
7. I Kings 12:31.
8. II Kings 23: 15.
9. Judges 20:1; I Samuel 3:20.
10. See *Israel Exploration Journal*, Vol. 16 (1966), pp. 144-145; *ibid.*, vol. 19 (1969), pp. 121-123. [In 1980, an arched city gate was reportedly uncovered at this site. - LER]
11. *Anriquiries* V.3.i.
12. Similarly, the passage in *the Book of Enoch* (13:7), which refers to Dan to the “south of the western side of Hermon” must not be treated as an historical location.
13. Numbers 13:21.
14. Numbers 34:3,7-8.
15. Judges 18:27-29.
16. Judges 5:17.
17. Judges 18:30.
18. Judges 18:1.
19. Judges 17:4, 7-13.
20. Judges 18:30.
21. Samuel 24:6.
22. Kings 15:20.
23. Amos 8: 14.
24. I Kings 12:30.
25. Hosea 4:15.
26. Hosea 10:5.
27. Joshua 7:2; cf. Joshua 18:11-12: “and the lot . . . of Benjamin . . . and their border . . . at the wilderness of Beth-Aven.” Cf. also I Samuel 13:5 and 14:23.
28. Hosea 10:18.
29. I Kings 12:28-30.
30. Amos 1:5.
31. Jeremiah 4:15.
32. Robert Wood, *The Ruins of Palmyra and Baalbek* (Royal Geographical Society, London, 1827), Vol. III, p. 58; first published as *The Ruinen of Baalbec* (1757).
33. “Wir wissen aussert wenig von dem Schicksal Baalbeks in Altertum”, O. Puchstein, *Führer durch die Ruinen von Baalbek* (Berlin, 1905), pp. 3-4.
34. “Es war leider bei den an glänzenden Erfolgen so reichen Ausgrabungen eine Enttäuschung, dass sie über das Wesen des Gottes und die Geschichte seiner Verehrung nichts gelehrt hat.” H. Winnefeld, *Baalbek, Ergebnisse der Ausgrabungen und Untersuchungen von 1895-1905*, ed. by Th. Wiegand, Vol. II (Berlin, 1923), p. 110.
35. C. F. Volney, *Voyage en Syrie et en Egypte, pendant les années 1783-1785* (Paris, 1787), p. 224.
36. Idrisi in P. Jaubert, *Geographie d’Edrisi* (Paris, 1836-1840), I, p. 353; quoted by C. Ritter, *Die Erdkunde*, Vol. XVII (Berlin, 1854), p. 224.
37. Al-Qazwini Zakariya ibn Muhammad, *Kosmographie*, H. F. Wüstenfeld ed. (Berlin, 1848-49), II, p. 104.

38. A. Asher tr. and ed.. *The Itinerary of Benjamin of Tudela* (N.Y. 1840-41).
39. R. Wood, *The Ruins of Palmyran Baalbek* (London, 1827), p. 58.
40. C. F. Volney, *op. cit.*, p. 224.
41. E. Robinson, *Biblical Researches in Palestine and the Adjacent Regions* (London, 1874), Vol. III, pp. 519-520.
42. Lucian, *De Dea Syria*, par. 5; Macrobius, *Saturnalia* I. 23: Assyrii quoque Solem sub nomine Jovis, quem Dia Heliopoliten cognominant, maximis ceremoniis in civitate, que Heliopolis nuncupatur. Ejus dei simulacrum sumtum est de oppido Aegypti, quod et ipsum Heliopolis appellatur, regnante apud Aegyptios Senemure; perlatum est primum in eam per Opian, legatum Deleboris, regis Assyriorum, sacerdotesque Aegyptios, quorum princeps fuit Partemetis, diuque habitum apud Assyrios, postea Heliopolim commigravit.
43. Hosea 10:5.
44. Hosea 10:8.
45. Judges 18:28.
46. I Kings 9:17-18.
47. Joshua 19:44.
48. Michaelis, *Supplementa ad lexica hebraica* (Gottingen, 1784-1792), pp. 197-201; Ritter, *Die Erdkunde*, Vol. XVII, pp. 229-230; E. F. C. Rosenmüller, *The Biblical Geography of Asia Minor, Phoenicia and Arabia*, tr. by N. Morren (Edinburgh, 1841), 1. ii., pp. 280-281; W. H. Thomson, "Baalbek" in *Encyclopaedia Britannica* (14th ed.), Vol. II, p. 835.
49. Joshua II:17; cf. St. Jerome, *Onomastica*, article "Baalgad".
50. E. Meyer, *Geschichte des Alterthums*, Vol. I (first ed., Berlin, 1884), p. 364, note; Robinson, *Biblical Researches*, III, p. 410, n. 2.
51. Cf. Robinson, *Biblical Researches*, III, p. 519; Ritter, *Die Erdkunde* Vol. XVII, pp. 229-230.
52. *Song of Songs* 8:11.
53. G. H. von Schubert, *Reise in das Morgenland in den Jahren 1836 und 1837* (Erlangen, 1838, 1839); Wilson, *Lands of the Bible*, Vol. II, p. 384.
54. O. Eissfeldt, *Tempel und Kulte syrischer Stadte in hellenistisch-romischer Zeit* (Leipzig, 1941), p. 58.
55. F. H. W. Gesenius, *Thesaurus philologicus linguae hebraeae et chaldaee Veteris Testamenti* (Leipzig, 1829), p. 264.
56. Michaelis, *Supplementa ad lexica hebraica*, p. 201; Rosenmüller, *Biblical Geography*, I. ii, p. 281, Wilson, *Lands of the Bible*, II, p. 384.
57. Herodotus, *Histories* II. 42; Diodorus Siculus 1.13.2.
58. G. Hoffman, "Aramäische Inschriften." *Zeitschrift für Assyriologie*, XI (1896), p. 246.
59. See the recent discussion by Jean-Pierre Adam, "À propos du trilithon de Baalbek, Le transport et la mise à l'oeuvre des mégalithes," *Syria* LIV (1977), pp. 31-63.
60. O. von Richter, *Wallfahrt*, p. 88; quoted by Ritter, *Die Erdkunde*, XVII, p. 231.
61. S. Wolcott, "Notices of Jerusalem; and Excursion to Hebron and Sebeh or Masada; and Journey from Jerusalem northwards to Beirut, etc." in *Bibliotheca Sacra* (1843), p. 82; quoted by Ritter, *Die Erdkunde*, XVII, p. 232.
62. See von Schubert, *Reise in das Morgenland*, *op. cit.* Vol. III, p. 325.
63. *Chronographia* in *Corpus Scriptorum Historiae Byzantinae* 11, p. 280.
64. Robinson, *Biblical Researches*, III, p. 509.

65. Robinson suggested that “Antonine rebuilt the great temple of the Sun: and erected the lesser temple to Jupiter Baal” (*Biblical Researches*, III, p. 520, n.6).
66. O. Puchstein in Th. Wiegand ed. *Palmyra* (Berlin, 1932).
67. B. Schulz in Wiegand ed., *Palmyra*
68. H. Winnefeld, B. Schulz, *Baalbek* (Berlin, Leipzig, 1921, 1923).
69. L. Ginzberg, *Legends of the Jews* (Philadelphia, 1928), VI, p. 375.
70. Winnefeld in *Wiegand, Baalbek, op. cit.*, Vol. II (1923), p. 110:
71. Rene Dussaud, “Jupiter heliopolitain,” *Syria* 1 (1920), pp. 3-15; Nina Jidejian, *Baalbek Heliopolis “City of the Sun”* (Beirut, 1975), ill. no. 135-140.
72. *Sat.* i. 23. 12.
73. Jeremiah 4:15.
74. Pesahim 117a; see Ginzberg, *Legends of the Jews*, VI, p. 375.
75. The readers of this passage probably understood it in the sense that Micah’s oracular image, after being removed from the temple of Dan, was placed in Baalbek. Baalbek being Dan, such an interpretation is superfluous.

The “Great and Terrible Wilderness”

In *Ages in Chaos* I brought together evidence from Hebrew and Egyptian sources which enabled me to establish the identity of the Hyksos with the Amalekites. I found that the time, the place, and the circumstances corresponded in both sources. In comparing the two sources and seeking to complement them, I looked also into the ancient Arabian traditions and found there plenty of material in support of my view. I lighted upon an old pre-Islamic story describing the wandering of the tribes under Moses, a story which until now has not been recognized as such. Yet the Arabian sources speak so clearly about these events that one wonders why no heed was paid to them before. For me they were not the starting point, but merely a welcome confirmation of what I was able to establish from a comparison of the Egyptian and Hebrew histories.

Outhman, son of Sadj, recites in his history that a torrent once penetrated the Ka’aba and overthrew the structure.⁽¹⁾ This catastrophe did not influence the people of Mecca, and they persisted in their vicious ways. The signs of heavenly wrath inspired the king, Mondad, son of Amur (grandson of Mondad, the father-in-law of Ishmael) to address his people with these words:

Remember what happened to the Amalekites in the time of your fathers. They treated with scorn the Haram [the sacred dominion]; they did not respect what was sacred. The Lord expelled them from the holy place and dispersed them among the foreign countries.

You have seen how the Lord dealt with the Amalekites.

The narrator continued as follows:

The tradition reports that the Amalekites violated the privileges of the sacred territory and that the Almighty God sent against them ants of the smallest variety which forced them to desert Mecca.

Afterwards the Lord sent drought and famine and showed them the clouded sky at the horizon. They marched without rest toward those clouds which they saw near them, but were not able to reach them; they were pursued by the drought which was always at their heels.

The Lord led them to their native land, where He sent against them the *toufan*—a deluge.⁽²⁾

Our interest is aroused by this last statement—that it was a deluge that took the tribe of the Amalekites by surprise when they reached their old native land.

Evidently the disturbance in the accustomed flow of events was experienced not only in Egypt, but in Arabia, too. Mecca, like Memphis, was visited by plagues: the shock that overthrew the cities of Egypt brought the Amalekites, at that time conquerors of Mecca, into disorder and tumult. They became like herds of animals brought to a state of excitement by an earthquake, and their fugacious troops reached Mount Seir (the Old Testament designates Mount Seir as their “native land”) and arrived at the shores of the Red Sea as the Israelites were escaping from Egypt.

The catastrophe was obviously greater than a rupture of a dyke may cause. Not only the region of Seba, but Mecca, and all the shore of the sea—Tehama—were shattered. Could it be that Arim was not a “dyke” but something different? Massoudi wrote: “All persons versed in tradition among those peoples agree that the word ‘Arim’ designates a solidly built dam.” The meaning of the word “Arim” was not entirely certain if it required interpretation.

The same great catastrophe, when mountain-high waves rushed onto the land, became a theme of tradition and legends of many nations.

A Greek legend personified this upheaval in a battle of Zeus and Typhon, which took place over the sea, between Egypt and Syria. The origin of the legend and its historical background are clarified in *Worlds in Collision*. Strabo quoted Pindar: “It was father Zeus who once among the Arimi, by necessity, alone among the gods, smote monstrous Typhon of the fifty heads.” Strabo added: “But some understand the Syrians are Arimi.” This is the Greek legendary version of what happened at the Sea of Passage. The Arimi were Hebrews, who were called Arameans: Their origin was from Aram. Toufan of the Arabian author is the same as Typhon of the Greek author; Arim of the Arabian author is Arimi of the Greek author. The “flood of Arim” of the Arabian tradition was originally not the “rupture of the dyke” but the “flood of the Hebrews,” the flood which got their name because they found in it their salvation, whereas for other nations it meant destruction.

The Arab historian did not suspect any link between his story and the events of the Exodus, and he did not bring them into any connection; had he done so, it could be suspected that he was merely transmitting a passage of the Bible in an arbitrary form; but he seems unaware of the significance of his report.

THE DELUGE OF MARIB is it Marib or Arim?

A sudden inundation in which a whole country was destroyed, a land devastated, and in which a multitude of people perished is related in one of the earliest Arab pre-Islamic traditions.⁽³⁾ “The Flood of the Dyke” was an event which fixed itself indelibly in the memory of the Arabs. This flood was known also as the Deluge of Marib. Marib was the former capital of the Sabeans in Yemen, in the south of Arabia. Near this place a dam was constructed to gather the water which flowed in the wadi of Dhenne (or Adana) that divides the Balak hills. During the summer the bed of the wadi is often dry; in the winter, after rains, it often becomes so swollen as to be impossible to cross. An earthen dam, the remains of which, some 600 meters long, are still to be seen, was used for collecting and storing the water; in the rainless months an irrigation system supplied it to the gardens and to the pastures of the valley beneath.

Al-Masudi in his *Meadows of Gold and Mines of Gems*⁽⁴⁾ gives a description of what he supposed the dam of Marib to have been like before its destruction. In a dyke one parasang (ca. 2.2 kilometers) long were thirty openings which provided for the distribution of water throughout the land.

The rich fantasy of the oriental writers tells of a country in South Arabia whose beauty was proverbial far and wide. A whole month one could ride on his mule across this land (situated within the tropic of Cancer) without leaving the shade above his head. An empty basket on the head of the traveler would fill itself with fruits falling down from the trees.

The rupture of the dam turned this blessed country into ruin: the land was submerged, the structures were overthrown, the trees broken, the population drowned: the catastrophe ruined the entire kingdom.

The inhabitants of the Arabian desert preserved through centuries the memory of a remote past when the catastrophe of Marib occurred. A migration of tribes in South and North Arabia was connected with this cataclysm.

Different variants of this catastrophe were kept in the memory of generations, adorned with fancy and transmitted up to the time when Islamic writers recorded them in their histories. The catastrophe that transformed a fertile plain into a barren quarter is related in the Koran (sura 34):

Seba had in their dwellings a sign: two gardens on the right hand and on the left. Eat from the provision of your Lord, and give thanks to him! a good country and a forgiving Lord! but they turned away, and we sent against them the flood of the dyke; and we changed for them their two gardens into two gardens that grew bitter fruit and tamarisk and some few lote trees.

In other narratives referring to the flood of the Dyke, and in commentaries to the Koran, the devastation is said to have spread over all the inhabited land of South Arabia.

The story of the rupture of the dyke is one of the few recollections of ancient times in the Islamic tradition not compiled from the sacred books of the Hebrews, but received from native Arabian sources.

No one knows exactly when the dam of Marib was built. The oldest parts of the work were estimated to have been executed in the period of 1,000 to 700 B.C.E.,⁽⁵⁾ but most scholars consider this period to be too early. No one knows when it was destroyed: suppositions only were uttered.⁽⁶⁾ Neither is the cause of the destruction established with certainty. Possibly, the devastation by the water of the dam occurred more than once.⁽⁷⁾

The quoted Al-Masudi, who in general was not disinclined to render here and there a fantastic tale, gives a naturalistic explanation for this catastrophe: "The waters undermined in an imperceptible way the foundations of the dam, and its strength was sapped little by little by time and the action of the waters."⁽⁸⁾

Modern researchers also ascribe the destruction of the dyke to the action of wind and rain, which gradually disjoined the construction.⁽⁹⁾ Marib was neglected and the dam fell into disrepair.

If it is true that the dam was gradually and not suddenly destroyed and abandoned, and thus the service it rendered to the cultivation of the land ceased, how then did the many stories about the catastrophe come into existence? And if at some time a collapse really occurred, how could it be that it destroyed the whole country, even the high-lying fields and places far away? A quantity of water which a barrage of the wadi Dhenne could assemble would, at a bursting of the construction, cause a local calamity, but not a "deluge" of South Arabia. And if really only a few gardens were destroyed, how could it be that "there is hardly any historical event of pre-Islamic history that has become embellished with so much that is fanciful and related in so many different versions"⁽¹⁰⁾ as the bursting of the dam?

Were a great catastrophe that remained in the memory of the Arabs to occur at a time when Hebrew, Hellenistic, Roman and Christian historians were writing their annals, could it possibly have escaped their attention? And why does the old tradition place the catastrophe in the third or fourth generation after Ishmael, son of Abraham? Why do the old Arabian traditions connect that time with a general migration of tribes and especially with the migration of the Amalekites in the direction of Egypt and Canaan?

Could it be that the legend does not relate to the Sabean irrigation system, but to some tremendous upheaval, when not a reservoir of rain-water, but the depths of a sea threw their volume across a dam in a plain whose ground disappeared in a rupture of geological strata?

The catastrophe was obviously greater than a rupture of a dyke (Arim) may cause. Not only the region of Seba, but Mecca, and all the sea shore-Tehama, were shattered.

May be Arim signifies not a "dyke," but something different?

Masoudi: All Persons versed in tradition among those peoples agree that the word Arim designates a solidly built dam.

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* * *

The same great catastrophe, when mountain high waves rushed on land, became a theme of tradition and legends of many nations.

A Greek legend personified this upheaval in a battle of Zeus and Typhon. The origin of the legends and its historical background are put into light on a page of *Worlds in Collision*.

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Arimi were the Hebrews, who were called Arameans: their origin was from Aram.

Toufan of the Arabian authors is the same as the Typhon of the Greeks.

MARIB

What does the designation Marib mean? "Various attempts to explain the etymology of Marib are not satisfactory." ⁽¹¹⁾ Marib was identified with Saba by the Arab geographers. ⁽¹²⁾ It was supposed to be the name of a castle occupied by the rulers of Saba. ⁽¹³⁾

Does the name Marib occur in the Scriptures of the Hebrews? In the stony valley of Rephidim near Horeb, the Israelites met the Amalekites, more exactly at a point called Massa and Meriba (Exodus 17:7-8): "And he called the name of the place Massa and Meriba. Then came Amalek and fought with Israel in Rephidim." This was shortly after the Israelites had passed to the eastern shore of the Sea of Passage escaping from their persecutors.

The Amalekites, we are told by the Arab historians, when escaping from the plagues of Mecca, arrived at their native site at a time when a sudden flood overran the land; many of them perished. Their native land, according to the Old Testament, was Mount Seir, which stretches along the gulf of Aqaba and the Red Sea.

It becomes conceivable that the flood overtook a part of them near the place where the Egyptian host drowned, and where the Hebrews escaped the depths. According to al-Masudi, "the waters covered the lands . . . ruined the habitations, and let perish all the troops." The Amalekites migrated, ready for attack and battle. Why should an inundation of the Sabean gardens by the waters of the reservoir destroy all the troops?

All the troops did not perish. It is not recorded in the Scriptures that the Sea of Passage swallowed a part of the Amalekites, but the catastrophe surely was not restricted only to the place where the Israelites were: the shores of Aqaba and the slopes of Mount Seir were surely involved, and besides the Egyptians there must have been other victims.

Arabian sources also retained a recollection of some tribes that succeeded in escaping the catastrophe, being saved in a miraculous way. We are to become attentive. The story we shall hear is in no way attributed by the Arabian tellers of legends to the history of the Israelites escaping from Egypt, or to their leader. The Koran and Arabian literature generally are full of stories related to Moses (Nabi Musa), but all of them are obviously culled from Biblical or Aggadic tradition. Therefore a narration which is related by the Arab historians to the time and place of the bursting of the dyke in Merib in the Sabean realm is of value exactly because of the absence of any signs of its having been borrowed from Hebrew sources.

In the region of Marib (Meriba) was staying a tribe that had arrived there only a short time before. According to al-Masudi,

The king [in other sources the ruler of the tribe] was Amr the son of Amir; he had the surname Mozaikiya. He had a divine brother whose name was Amran. The ruler had for wife a woman skilful in the art of divination; her name was Zarifah. ⁽¹⁴⁾

This family of three persons stood at the head of the nation: two men and one woman—a ruler, his divine brother, and his wife, the prophetess. Similarly, a family of three led the Israelites according to their tradition: a ruler, his divine brother, and a sister, the prophetess. The leaders of the Israelites were sons of Amram. The leaders of the tribe rescued at Marib were sons of Amir. The divine brother of Moses was Aharon; the divine brother of the ruler of the nomads at Marib was Amran. The sister of Moses was Miriam, his wife was Zipora; the prophetess at Marib was Zeripha. If the second and the third syllables are reversed the names become identical.

The peculiar name Mozaikiya, the surname of Amr, son of Amir, was an object of surmise for Arab philologists from early times. A word which sounds similar in Arabic is *mazak*, “a piece,” and folk etymology construed a forced story: the ruler was called by this surname because he was accustomed, when going to his nightly rest, to tear to pieces the garment he wore during the day.

It seems to me that the name is not an Arabic one, but rather is of Egyptian design. Mose-ika-ya could be a name arranged similarly to Smenkh-ka-re, the last syllable being the name of a divinity—god Re (or Ra) in the case of Smenkare; in the case of Mosaikaya—the God Ya (as in the names Isa *iah*, Jerem *iah*, and the like), the syllable *ka* being the Egyptian word for “soul.” If this archaic Arabian tradition brought down to us the name of the leader correctly, we may at last have the Semitic name of the great deliverer, and also his Egyptian name. The name “the soul of Yahweh” would surely be a fitting name for the man who, according to the Scriptures, was the first to whom the Divine name was revealed.

In the Arabian story the rupture of the dam and the catastrophe were foreseen by the prophetess Zerifa. As told by al-Masudi, she had a dream:

A great cloud covered the earth and ejected lightnings and flashes. Then the thundercloud burst, and thunderbolt fell and consumed everything in its path; reaching the ground it reduced to ashes all it touched in its fall. “After this,” said the prophetess, “it will happen that everything will submerge.”

On the eve of the day when the sea burst, a dreadful cloud—not in a dreamy vision, but in the sight of a multitude—darkened the heavens, and flashes of lightning intersected the darkness. “And it came between the camp of the Egyptians and the camp of Israel; and it was a cloud and darkness, but it gave light by night.” (Exodus 14:20) The Aggada adds that “the Lord discharged hailstones and coals of fire.”

The spirit that inspired the prophetess Zaripha rescued the people. She predicted “a calamity of calamities, a momentous thing, a misfortune without precedent.” A tempest would ruin the entire country.

It was the prophetic woman in the camp of the Israelites whose exaltation is especially mentioned when on the shore of the Sea of Passage, and this time she is called “the prophetess” (Exodus 15:20-21):

And Miriam the prophetess, the sister of Aharon, took a timbrel in her hand and all the women went out after her with timbrels and with dances.

And Miriam answered them, “Sing ye to the Lord, for he hath triumphed gloriously: the horse and the rider hath he thrown into the sea.”

The Arab authors have embellished the story with the inevitable oriental addenda of palmy days in a paradise garden and of a suzerain enchanted by houries, but these are characteristic elaborations on the part of the tale tellers and do not belong to the story of the dyke broken at the sea, nor to the description of a spoiled irrigation system.

Not only the prophetess Zeripha, but also her husband and his brother had prophetic dreams. According to one source it was the “divine brother Amran who was the first to receive the revelation concerning the impending catastrophe.” This brother was gifted with magical knowledge of the right way. Thus forewarned, Mozaikiya disposed of all his possessions and emigrated with all his people (Nuwairi).

It was Aharon in the camp of the Israelites who with the help of the Urim and the Tumim oracle determined the way to go and the deed to undertake.

In the Arabian tradition, in the variants I had before me, there was no allusion to a persecuting host and no knowledge of the way the tribes passed before they reached Marib.

The Arabian philologists did not succeed in explaining the origin of the name Marib. In the books of Exodus and Numbers two similar events are recounted which occurred in two places called Meriba: in both instances the tribes complained about the absence of water; the first time at the beginning of their march through the wilderness; the second time in the last years of the wandering. The etymology of the name is explained to be “the water of discord.”

Wells in an arid region were almost always waters of dispute. That the Israelite tribes many times suffered thirst in the desert is recorded in short but dramatic sentences. In the violent changes in the different strata of that region water sources disappeared; they were blocked and

diverted; thermal springs appeared, such as the spring Mara. An inspired dowsing might be able to find hidden water sources in the blocks of split-apart rocks by striking one with a rod.

It even seems to me possible that the Sabean region of Arabia was before the catastrophe “a garden across which the traveller could voyage a month on his mule without leaving the shade,” similar to India, rich in water and on the same degree of latitude, where the vehement sun lets the soil sprout abundant vegetation. The southern and northern fringes of Arabia attained a high level of culture at a very early time, which would hardly be possible if these parts of Arabia had been as poor in water as they are today.

It was not the rupture of the dyke that caused the dwindling of the fortunes of the country, but drought and the disappearance of water sources, of which records are preserved both in the Hebrew Scriptures and in the Arab annals.

The construction of the dyke in the Sabean region could have been a remedial measure to keep alive the gardens in this plain, ten days’ march from the Red Sea and from the Gulf of Aden alike. The disasters—with a field of destruction that embraced not only the other plains of Arabia but also far-removed lands—were remembered as “the deluge of Marib,” and as a sudden torrent that overthrew the sanctuary at Mecca, and as a time of drought and famine and also of plagues, and as a time when whole countries were destroyed, left desolate and abandoned, while armies perished, and tribes migrated. But with the passing of centuries the real place and cause were forgotten and a deserted dyke in the south of Arabia was supposed to have been the main theater of events. Its ruined remnants were supposed to be coeval witnesses of days recollected as days of terror, when land and sea were shaken in spasms. Possibly this place had been called Marib since ancient times—what place of water is not a place of strife? Likewise the oil wells of today, being rare, are wells of strife. Or perhaps the deluge of Meriba at the sea was only later connected with the visible remains of the abandoned dam, the name Marib being given to it subsequently.

The drought, followed by famine and by different plagues, compelled the Amalekites to leave their ancestral home in Mecca and to migrate toward the clouds far away in the sky and “toward their native land,” where they, or a part of them, were drowned in the flood, according to *Kitab-alaghaniy*.

And then—we return to the scriptural narration—they met the migrants coming from Egypt. The latter advanced, following the mist that covered the desert in these latter days of in-the-beginning; it was like the vapor which arose from the darkness “upon the face of the deep.”

In the place where the cloud abode, there the children of Israel pitched their tents. Whether it was by day or by night that the cloud was taken up, they journeyed. And the cloud rested in the wilderness of Paran. (Numbers 9:17, 21; 10:12)

The clouds are repeatedly mentioned in the history of the wandering. According to the *Kitab-alaghaniy*, “the Amalekites journeyed in the direction of the cloud.”

If these were the same clouds which were followed by the Israelites, the two groups must have encountered each other. And this encounter in fact took place by Rephidim. (Exodus 17:8)

Jewish tradition retained a memory of the encounter in the mist: “Joshua did not at first want to expose himself to danger and leave the protection of the cloud . . . then he set forth against Amalek.” [\(15\)](#)

The author of *Kitab-alaghaniy* did not know what befel the Amalekites after they left, following the cloud. He supposed that they found their end in a sudden flood.

At Rephidim the Israelites took up arms against the vanguard of the roaming Amalekites. When, after a prolonged sojourn at Mount Horeb, they attempted to reach Canaan from the south, the scouts they had sent out brought them the ill tidings that the Amalekites already occupied the south of Canaan (Numbers 13:29). It was a hard blow to the Israelites and their hearts grew faint. They made a desperate and unsuccessful attempt to reach the land from the south, daring to attack the Amalekites: “For the Amalekites and the Canaanites are there before you, and ye shall fall by the sword.” (Numbers 14:23). They were discomfited and driven to Horma. They proceeded on their thorny way in the land of flint, in the untrodden desert, in the labyrinthine sandy ravines, upon old basalt and limestone. As a Jewish legend relates, “When they saw the vast, extensive, utterly barren wilderness before them, their courage gave way.” After the highest pitch of expectation their hopes were revealed as vain. “He tortures us with famine,” they complained.

“With the name of a new settlement he has deceived this great multitude; after he had succeeded in leading us from a well-known to an uninhabited land, he now plans to send us to the underworld, the last road of life.” [\(16\)](#)

We are at the crossing point in the desert where the Israelites coming from Egypt met the Amalekites coming from Mecca. We followed the Scripture describing the way of the Israelites and the old Arabian traditions describing the way of the Amalekites. From this point on we shall follow the Isrealites’ wandering in the desert, according to the Biblical and Arabian traditions.

MIDIAN

Mount Seir extends along the length of the Red Sea and includes the area known as Hedjaz. The mountainous chain of volcanic formations stretches along the western border of the plateau called the Arabian Desert, and constitutes a barrier opposite the depression which composes the bed of the Red Sea. When it is said that the tribes of Israel “turned and took our journey into the wilderness by way of the Red Sea [Yam Suf]” or that they “compassed Mount Seir many days” (Deuteronomy 2:1) it means just what is said, that they went southward along the mountainous chain not far from the shore of the Red Sea in the region of Hedjaz. It is difficult to understand why the historians and Bible exegetes agreed that the decades of wandering of the tribes were confined to a very small area which may be crossed in one week or two.

Arabia is wide; nomads with cattle, looking for water and pasture, drive great distances. Defeated by the hostile Amalekites in the south of Canaan, the fugitives from Egypt had no other choice but to return to Egypt or to move by way of the Red Sea.

Midian was the land where, according to the Scripture, Moses had spent his manhood when a fugitive from Egyptian justice; there he also became the son-in-law of a priest named Jethro. (Exodus 2:15-21) The habitation of the Midianite priest was to the south or to the east of Mount Horeb. (Exodus 3:1) Midian was not in the Negev or on the coast of the Aqaba Gulf: in order to escape Egyptian justice Moses needed to go farther than the Sinai peninsula.

The abode of the Midianites is to be looked for near the place where the city of Medina is today. This name Medina may likely be a remnant of the habitation of the Midianites there. The identification of Midian and Medina may be further substantiated by the name of the Midianite priest, Jethro. The old Arabian name of Medina is Yathrib.

But even here the Israelites did not pause, but continued on their way south. They were strangers in this land and they begged the Midianites to give them a guide for the way through the desert. "We went through all that great and terrible wilderness," they said at the end of the way.

Would the so-called Sinai Peninsula be called "that great and terrible wilderness" in face of the Arabian desert, fifty times as great? Did the Israelite tribes really tramp one decade after another in the narrow and short strip that runs from the south shore of the Dead Sea to the Aqaba Gulf? The desert of the forty-year wandering was not the Sinai Peninsula, but a much larger area. The inclination of the historians is generally to deny the ancients long itineraries. Midian being the Medina of Moslem times, actually deep in the Arabian Peninsula, all indications in the Old Testament are for a deep penetration of the Arabian Peninsula by the wandering Israelites who escaped the land of Egypt, destroyed by the catastrophe in the mid-fifteenth century before the present era.

A wandering of nomads with their animals in years of drought would encompass large areas. Overcome by the Amalekites of southern Canaan and driven to the Red Sea, they would scarcely remain in the same region. Their path led them to the south.

MECCA

Ka'aba, the holy spot in Mecca, was a sanctuary long before the time of Mohammed. The Ka'aba has the form of a cube or chamber, and the name is interpreted as meaning "a cube." In the immediate vicinity of this small structure—inside the walls that encircle an open-to-the-sky court—a spring enclosed in a deep well provides the faithful with health-restoring water; once it was a well of oracular decision and it is certain that the spring was held in reverence at a very early period and that the fount determined the building of the sanctuary and the foundation of the city. It is called the well of Zam-Zam.

Zam-Zam is explained to mean in Arabic “to drink with small gulps,” or also “water in abundance.” But it may be a reminiscence of the former prehistoric dwellers in Arabia. Concerning the eastern boundaries of the land of Ammon, lost in the sand of the desert, which the tribes approached at the end of their wandering, it is said (Deut. 2:20): “Giants dwelt therein in old time; and the Ammonites call them Zam-Zum(im).”

The Israelite tribes apparently visited the plains and hills where the generation of the Zamzum lived and died away in a gray antiquity. Most probably the Israelite tribes, roaming about in a thirsty land with their little ones and with their flocks, were attracted to every well yielding drink.

Let us proceed with the annals of *Kitab-alaghaniy*, which I cited up to the point when the Amalekites, driven out of Mecca by ants and drought and famine, migrated and moved toward the clouds on the horizon and came to their native land of Marib, where a flood overcame them. When they left Mecca a tribe called the Djorhomites entered the place and took care of the sanctuary neglected by the Amalekites. But they also were mindless of the holy duties imposed on them and, as they did not listen to the admonitions of their king, they were visited by warning signs; a sudden torrent of rainy flood ruined the Ka’aba. A number of years passed and the Amalekites were not heard of. The *Kitab-alaghaniy* continues:

Meanwhile arrived the tribes, brought in a disorderly retreat by the rupture of the dam of Marib; with them was the prophetess Tarickah [Zaripha] who had announced to them the disaster, and at their head Mozaikiya, the same as Amr, son of Amir, son of Thalabah. . . . On reaching the gates of Mecca, the tribes stopped, and Amr [Mozaikiya] their leader, sent to the inhabitants his son Thalabah, who spoke to them in the name of the emigrant tribes: “Departed from our native land and going in search of another, we have not found a land the inhabitants of which will agree to restrict themselves a little as to let us have a place and to grant us hospitality until our explorers will return; for we have sent on errand some of our men to explore a territory proper for our establishing ourselves on it.

“Will you cede to us a small space of your lands and allow us to remain there for a while to rest until we shall learn from our scouts whether we must go to the north or to the east? As soon as we shall learn on what site we have more chances for relief, we shall direct ourselves without delay from this place. We do hope that our sojourn with you will be very short.”

The tribe of Djorhom refused:

“No, in God’s name, we shall not put ourselves aside, we and our cattle, for having the pleasure of receiving you. Go along wherever you like to go; we have nothing to do with you.”

Mozaikiya, informed of this answer, sent them a second message worded thus:

“It is absolutely necessary that I spend at your place a whole year awaiting the answer of the messengers that I sent to explore the north and the east. If you let me take hold here and if you will receive me with good will, I will be in accord with you and we shall divide the use of the pastures and of the water; but if you will refuse this adjustment, I will establish myself with you

despite you. And then, when you will send your herds to graze on the grassland, you will find only what remains after our animals; and if you will like to drink at the well it will be measured for you by a vessel. If you will attempt to repel me by force, I will battle against you, and if I shall be the victor, I shall take your wives and kill your men; and these that may escape I shall forbid the approach to the sacred territory.”

These passages resemble another passage, in Numbers 20:14f. There is a similarity of situation, but not identity of events.

And Moses sent messengers from Kadesh unto the king of Edom, “Thus saith thy brother Israel, Thou knowest all the travail that hath befallen us . . . we have dwelt in Egypt a long time. The Lord . . . brought us forth out of Egypt: and behold, we are in Kadesh, a city in the uttermost of thy border. Let us pass, I pray thee, through thy country: we will not pass through the fields, or through the vineyards, neither will we drink of the water of the wells: we will go by the king’s high way, we will not turn to the right hand nor to the left, until we have passed thy borders.”

And Edom said unto him, “Thou shalt not pass by me, lest I come out against thee with the sword.”

And the children of Israel said unto him, “We will go by the high way: and if I and my cattle drink of thy water, then I will pay for it . . .”

And he said, “Thou shalt not go through.” And Edom came out against him with much people and with a strong hand.

Thus Edom refused to give Israel passage through his border.

The Hebrew record cites similar approaches to Moab and Ammon, also refused.

Of these two accounts, the Hebrew record relates to an episode near the end of the wandering of the tribes in the desert; the Arabian record relates to a moment during the wandering of some tribes and before the land of settlement was explored by men sent on this errand. In one case the negotiation is about a temporary stay, and in the other case about passage. And still the correspondences are conspicuous, as they repeat the plight of the Israelites in the desert and their way of dealing with the tribes through whose land they had to pass.

Upon a cursory reading of the Arabian recollections it seems as if the tribes were looking for land for themselves towards the north or the east. It is true that mention is made of some men of the tribes sent to the north and east to look for a temporary settlement; but it is also recounted about another land of which an explorers’ report is awaited.

The spies were sent from the desert of Pharan (Numbers 13:3). The desert of Pharan according to the old Arabian sources, neglected by Biblical research, is in the mountainous area of Hedjaz. ⁽¹⁷⁾ The spies returned to Pharan into Kadesh and brought their report (Numbers 13:26).

The name Kadesh was given to many different places. Jerusalem was called Kadesh, as was Carchemish on the Orontes; there was a Kadesh in Galilee, Kadesh Naphtali, mentioned a few times in the Scriptures. The word means “sanctuary” and every venerated place was called Kadesh.

Difficulties were laid before the exegetes concerning the locality called Kadesh, a station on the wandering of the Israelites. Kadesh was at the beginning of the march, Kadesh was at its end: “And the space in which we came from Kadesh-barnea, until we were come over the brook Zered, was thirty and eight years.” (Deut. 2:14). Accordingly it was surmised that for 38 out of the 40 years of the wandering the tribes were settled in Kadesh. The reason for the long stay of the Israelites at Kadesh-barnea was in the existence there of sources of water, while in the desert most of the rare sources became bitter. At Mecca there are sources of water, considered sacred and many legends are preserved about them. These water springs, not destroyed in the catastrophe, were the main incentive for the Israelites to congregate there.

May it be that these were two different holy spots, both called Kadesh? In one place in the Bible Kadesh is said to be situated in the wilderness of Pharan, and another time in the wilderness of Zin. Sometimes Kadesh is called by a fuller name, Kadesh-barnea. This designation is not consistently applied.

The place in the desert is called in the Scriptures “a city” (). This caused surprise. Usually the place is looked for in the northern part of the Sinai desert, and since Kadesh-barnea has been located in , about 18 miles south of el-Arish on the Mediterranean coast. This place never played any important role in the subsequent history of the nation. If this or another place located inside the borders of the future Jewish Kingdom had been the scene of many events during the wandering in the desert, would it not have been venerated in later centuries? The place where the tabernacle stood, where the judgment court was established, where Miriam died and was buried, should have been marked if only by the slightest sign of national veneration, if at any time in history it was at the borders of Jewish land. But it was never in its boundaries.

In 1964, more than a score of years after I came to this conclusion, Bar Droma, the author of *Negeb*, independently brought arguments to show that Kadesh-barnea was Medain-Salib, formerly El-Hejr, about 450 km southeast of Petra.⁽¹⁸⁾ As explained above, I identify Kadesh-barnea with Mecca.

The Hebrews wandered in the great desert, and not in the small one. Their way from Horma was at first southeastward. Correspondingly their camps moved: the eastern camp was the first, followed by the southern camp, and then the other two (). The southern camp was called “one that is turned to Yemen.” This description appears more proper for a camp which is in the Arabian peninsula rather than the Sinaitic triangle.

In the Arabian record we read that the tribes under Mozaikiya succeeded to enter Mecca and occupy it. The Djourhomites sent an army against Mozaikiya. The ensuing battle lasted for three days; both sides were courageous. It ended with the Djourhomites being put to a disorderly retreat, only a few of them escaping death.

Another author, al-Masudi, wrote that the Djorhomites had been expelled earlier by the children of Ismael:

The Lord sent against the Djorhomites swift clouds, ants, and other signs of his rage, and many of them perished. The children of Ismael, when grown in number, expelled the Djorhomites from Mecca. These established themselves near the land of Djohainah, where an sudden torrent drowned all of them in a single night. The theater of this catastrophe is known under the name Idam (Fury). Omeyah of the tribe Takif made an allusion to this event in a the following verse: “In the time of yore the Djorhomites took the ground at Tehamah and a furious current swept all of them away.” [\(19\)](#)

That an earthquake was the cause of the havoc is to be inferred from the already quoted passage of Masudi:

From el-Hadjoun up to Safa [\(20\)](#) all became desert; in Mecca the nights are silent, no voice of pleasant talks. We dwelt there, but in a most resounding night and in the most terrible of devastations we were destroyed.

Loud sounds often accompany an earthquake. Din and roaring became linguistic substitutes for the phenomenon itself. Mecca was abandoned by the Amalekites when, shortly before its occupation by the Israelites, it was shattered by earthquakes. This was the same catastrophe that ruined the Middle Kingdom of Egypt. The Amalekites moved toward Palestine and Egypt, and soon built their fortress-capital Avaris at el-Arish. The Israelites, who were unable to break through to Palestine from the south, reached the former capital of the Amalekites.

After occupying Mecca the conquerors allowed the Ismaelite tribes, which had not participated in the battle against them, to visit the sanctuary.

THE PROMISED LAND

The tribes under Mozaikiya did not remain in Mecca. According to Masudi, after a number of years

They continued on their way and came to camp between the land of the Aharites and Akk, near a pool named Gassan, between two valleys called Zebid and Rima, and they drank the water of the pool.

In the book of Deuteronomy it is said (2:1,3): “We compassed Mount Seir many days . . . And the Lord spake . . . turn you northward.” They reached the border of Edom and Moab (Deuteronomy 2:10-13):

The Emim dwelt therein in times past . . . which also were accounted giants, as the Anakim; but the Moabites call them Emim. The Horim also dwelt in Seir before time; but the children of Esau succeeded them . . . And we went over the brook Zerid.

According to the book of Numbers (21:12-17):

From thence they removed [i.e., from the wilderness which is before Moab, toward the sunrising], and pitched in the valley of Zared. From thence they removed and pitched on the other side of Arnon . . . and at the stream of the brooks that goeth down to the dwelling of Ar, and lieth upon the border of Moab. And from thence to Beer [pool]: that is, the well whereof the Lord spake unto Moses, Gather the people together, and I will give them water. Then Israel sang this song, Spring up, O well; sing ye unto it . . .

Then follows the song rewritten by the redactor of Numbers from “The book of the wars of the Lord” (Numbers 21:14). The pool where the migrants camped and drank and exalted themselves in praise seems to be the same pool as that mentioned by Masudi. The Aharites and the Horites are quite surely the same. Akk would stand for Anak. The valley of Zebid accordingly would be named in the Hebrew sources the valley of Zered.

Let me finish the story of al-Masudi:

They halted in that land and established their domicile in the plain, on the heights, and at all the neighboring places. This mountainous area borders upon Syria, and divides it from Hedjaz, keeping close to the territory of Damascus, the province of Jordan and Palestine, and comes to an end at the mountain of Moses. The place designated here is that part of the Promised Land that was conquered in the days of Moses, according to the Scriptures.

The author of the tenth century of our era, bringing down the record he received in his time from old sources, did not suspect any affinity of this story with the story of Moses. Therefore he designated the Mount of Moses as the border in the conquest of the tribes under Mozaikiya, tribes which escaped from a deluge and came into the depth of the great desert, and departed from there into the land between Damascus and Mount Nebo.

The Arabian tradition tells that some parts of these tribes when in the desert departed from the main stock. A similar story is preserved in the Aggada. Until recently Hebrew sects were living in the desert among the Arabs.

Is the old Arabian tradition, handed down by the Islamic historians, an authentic story of the wandering of Israel in the desert? The material is dealt with quite differently in this pre-Islamic tradition from the way the Biblical legends are repeated in the Koran. So possibly, Moses and his tribes enjoy a double existence in the Arabic tradition.

One of these two stories knows but the segment of time from the flood at Marib up to the conquest of Transjordan. In both traditions the events are ascribed to a time separated from the epoch of the patriarchs by a few generations. In both accounts destructions occurred, plagues came in abundance, water sources vanished, and an earthquake destroyed human dwellings at night. Both ages were times of the migrations of tribes. In both accounts, due to famine and drought, the migrants followed clouds through the desert. A sudden flood—in which many troops perished, having been brought to migration by former plagues—happened in both sequences of events. The places of the last occurrence were at Idam, at Tehama in one account,

and at Edom and Pi-Tehom in the other. In both cases some tribes escaped with their lives from the flood. These tribes were under the leadership of a ruler, his divine brother and sister (or a wife), all of them prophetically gifted. Their names and the name of their father are not dissimilar in the two accounts. They migrated with their treasuries and cattle; they sent spies to explore a land for their settlement; in peculiar expressions they asked local rulers permission for a temporary stay; they were ready to do battle in case they were refused; they had a temporary abode in some venerated places. They did not remain there but after a stay for a year or more departed. According to the Arabian story they marched through the land of the Ahorites and Akk and “came to a well” situated “between two valleys” and “drank water of it.” The same information is given in the Hebrew story, except that the places are called “land of the Horites” and “Anak.” They conquered the land of the Jordan from Damascus to mount Nebo.

Are these two different renderings about different tribes that had similar experiences? Or two different stories of the same tribes and the same events?

Both took place at the time when the Amalekites (called by name in both accounts) left their paternal home and came to roam about. And, from what is said in the Scriptures about the desert (“all that great and terrible wilderness”); and from the description of the way (along the Red Sea, around Mount Seir) and of the plain of their encampment; and because of the political stimuli to depart from the place of defeat; and because of the necessity of going through vast spaces away from the arid quarters—it may be concluded: the desert of wandering was the immense plateau of Arabia.

The pre-Islamic traditions of the wandering of the Tribes in the Wilderness, having been written down much later than the Hebrew text, cannot claim to be the better or more correct version; but they may cast light on many issues.

References

1. Cited in Abu'l Faradj, *Kitab-Alaghaniy (Book of Songs)*, transl. by F. Fresnel, in *Journal Asiatique*, 3rd series, Vol. VI (1838), p. 204.
2. The Arab author remarked that the word *toufan* ordinarily means “deluge,” but he ascribes to it the sense of “death.” Evidently we have to reject his effort to change the meaning of the word. Fresnel changed the meaning of the word *ghayth* which, as he wrote, signifies primarily “rain” or “clouds,” into “pasture” ; he remarks himself that a mirage could not deceive a dweller of Arabia. The original meaning of *ghayth*, i.e., “clouds,” must be retained.
3. See for instance the traditions collected by D. Reiske, *De Arabum Epocha Vetustissima, Sail Ol Arem, etc.* (Leipzig, 1748).
4. *Murudij el-Dhabab (Les Prairies d'or)* (Paris, 1861-77), Vol. III, 366 ff. Masudi, historian and geographer, was born at Baghdad; he voyaged extensively during his life, visiting Ceylon and Madagascar. He lived in Egypt, where he died ca. 956.
5. E. Glaser ed., *Reise nach Marib* (), p. 68.
6. Hamza al-Ispaham estimated the time of the destruction at about 400 years before Islam, and Ibn Khaldun gave a less remote date of about 250 years before Islam; Yakut referred

- it to the period of Abyssinian rule, i.e., 542-570 A.D. Gosselini put the date at 374 B.C.E., Reiske 30-40 B.C.E., Shulters 30-40 A.D.—see *The Encyclopaedia of Islam*.
7. Al-Masudi and Ibn Rosta speak of a first and a second devastation.
 8. Al-Masudi, *Murudij al-Dhabab*, III, 370.
 9. E. Glaser ed., “Zwei Inschriften ueber den Dambruch von Marib,” p. 13f.
 - 10.
 11. *The Encyclopaedia of Islam*, s.v. “Marib.”
 12. Cf. references collected by E. M. Jomard in F. Mengin, *Histoire sommaire de l’Egypte*, (Paris, 1839), pp. 341-44.
 13. “According to other traditions, Marib was the name of a castle that belonged to these kings in a remote age” —Al-Masudi, *Murudij al-Dhabab*, p. 374.
 14. Masudi, *Murudij al-Dhabab*, Vol. III, pp. 374f. Cf. Nuwairi, Chap. IV. *Kitab-alaghaniy* called the prophetess of the tribe Tarikah and did not mention her relationship to the leader.
 15. L. Ginzberg, *The Legends of the Jews* (Philadelphia, 1911), p. 59.
 16. Ginzberg, *Legends*, III. 41-42. Cf. Philo, *Moses* I. 35; Josephus *The Antiquities of the Jews* III, 1. 3-5.
 - 17.
 18. *Palestine Exploration Quarterly*, July-December 1964. [In Deuteronomy (1:2) it is said that the distance between Mount Horeb and Kadesh-barnea, by way of Mount Seir, is eleven days. In antiquity a day of march was a unit of distance very close to 40 km. This would mean that Kadesh-barnea was not more than about 440 km from Mount Horeb. Assuming Mount Horeb to be located somewhere in the Sinai peninsula, the distance from there to Mecca is between 800 and 900 km. Possibly the biblical figure of eleven days of march should be understood as *days and nights* of march, in which case the distance would be ca. 880 km.]
 19. Masudi, *Murudij al-Dhabab* III, chap. XXXIX. Tehamah is the stretch of land along the Arabian coast of the Red Sea. The Aggada calls Pi ha-Khiroth by the name Pi-Tehom. The first means “abyss” ; the second “entrance to the abyss.” Idam may recall Edom on the borders of which the catastrophe of the Sea of Passage took place.
 20. Safa may recall the name Yam Suf (Sea of the Torrent). Also in this version we read about clouds, various plagues, and a sudden flood.

Beyond the Mountains of Darkness

This short discourse is not a part of the chronological problem discussed in the work of reconstruction of ancient history; it deals with historical geography—the whereabouts of the places of exile of the Ten Tribes of Israel.

The sentence (II Kings 17:6) which relates how the King of Assyria took Samaria and carried Israel away into Assyria and “placed them in Halah and in Habor by the river Gozan, and in the cities of the Medes,” caused much deliberation among the historians. The mystery of the Ten Lost Tribes produced also fantastic convictions such as the belief that the Britons are the descendants of the Lost Tribes who, after much wandering, reached Albion.

The sentence in II Kings 17:6 is repeated almost verbatim in 18:11. In I Chronicles 5:26, the exile of the Transjordan tribes—Reuben, Gad and the half-tribe Manasseh—to Halah, and Habor and Hara, and to the river Gozan is ascribed to “Pul king of Assyria” and to “Tiglath-pileser king of Assyria.” Modern scholars consider Pul and Tiglath-pileser to be one and the same king, Pul having been his name in Babylonia.⁽¹⁾

It is generally agreed that the location of Halah (in Hebrew with two letters *kheth*, transcribed as h in scholarly texts), or Khalakh, is not given to identification.⁽²⁾ As to Gozan, the texts of II Kings 17:6 and 18:11 speak of Habor by the river Gozan; also I Chronicles 5:26 speaks of the river Gozan. In Isaiah 37:12 it can be understood as a region or a people of a region. The correct translation of the two passages in the Second Book of Kings is “to the confluence (*habor*)⁽³⁾ of the river Gozan.”

Biblical scholars who sought for the place of exile of, first, the two and a half tribes of Israel by Tiglath-Pileser and then of all the tribes of Israel by Sargon upon the fall of Samaria, decided that the river’s name was Habor and Gozan was the region. They have therefore identified Gozan with Guzana, modern Tell Halaf in northeastern Syria. But this interpretation is a violation of the texts. Looking for a river Habor, they thought to identify it with the tributary of the river Euphrates mentioned in Ezekiel I:3 “the word of the Lord came . . . unto Ezekiel . . . in the land of the Chaldeans by the river Chebar.” However the spellings in Hebrew of Habor and Chebar are different, the river Khvor (Chebar) is not Habor, and the latter is not a river at all. Furthermore, the co-called river Chebar is actually an irrigation canal.⁽⁴⁾

In explaining why the misfortune of exile befell the population of the Northern Kingdom, the Book of Kings says that the Children of Israel “worshipped all the host of heaven and served Baal,” and “caused their sons and their daughters to pass through the fire, and used divination and enchantments,” and therefore “the Lord was very angry with Israel, and removed them out of his sight: there was none left but the tribe of Judah only” (II Kings 17:17, 18).

“Removed them out of his sight” seems to signify that the people of Israel were removed far away, out of every contact with the remnant Judah, not even by a chance messenger.

When one hundred and thirty-eight years later, in the beginning of the sixth century, the people of Judah were also led into exile—by Nebuchadnezzar, king of Babylon—they did not find the exiled tribes of Israel in Babylonia, though they dwelt by the river Chebar (Khvor, i.e., Khabur), which flows in the central region of that country.

It appears that the places to which the Ten Tribes were removed by the Assyrian kings must have been far more remote than northeastern Syria.

Assyria, with its capital cities of Nimrud (Calah), Dur Sharrukin (Khorsabad), and Nineveh—all on the Tigris—expanded greatly in the days of its warrior kings Tiglath-Pileser, Sargon, and Sennacherib. Repeatedly, the Assyrian kings led their troops across the Caucasus northward. Not satisfied with the passage along the coastal road of the Caspian Sea, they also explored the mountainous passes. Sargon, the conqueror of Samaria, wrote in his annals:

I opened up mighty mountains, whose passes were difficult and countless, and I spied out their trails.

Over inaccessible paths in steep and terrifying places I crossed . . . ⁽⁵⁾

The descriptions of Tiglath-pileser and Sargon of their campaigns in the north lead us to recognize that they passed the mountains of the Caucasus and reached the steppes between the Don and the Volga. When the barrier of the mountains was overcome, they could proceed northward in a scarcely populated area barren of natural defenses, where they would have met less resistance than in the foothills of the mountains. It is unknown how far they may have let their armies of conquest march across the steppes, but probably they did not give the order to return homeward until the army brought its insignia to some really remote point: it could be as far as the place of the confluence of the Kama with the Volga, or even of the Oka, still farther north. The middle flow of the Volga would be the furthestmost region of the Assyrian realm.

The roads to the Russian steppes along the Caspian and Black seas were much more readily passable than the narrow path along the river Terek and the Daryal Canyon that cut the Caucasus and wind at the foot of Mount Kazbek, over sixteen thousand feet high.

The fact that the “confluence of the river Gozan” is considered a sufficient designation suggests that it must have been a great stream.

A large river in the plain behind the crest of the Caucasus is the Don, and a still larger river—the largest in Europe—is the Volga. If the Assyrians did not make a halt on the plain that stretches immediately behind the Caucasus and moved along the great rivers without crossing them to conquer the great plain that lies open behind the narrow span where the rivers Don and Volga converge—then the most probable place of exile might be reckoned to be at the middle Volga. The distance from Dur Sharrukin to this region on the Russian (Scythian) plain is in fact much less than the distance from Nineveh to Thebes in Egypt, a path taken by Assurbanipal several decades later. Under Esarhaddon and Assurbanipal, Assyrian armies repeatedly invaded “Patursi and Kusi” —Upper Egypt and Ethiopia (Sudan). But Assyrian occupation of Scythia is not a mere conjecture: it is confirmed by archaeological evidence. “The earliest objects from Scythia that we can date,” writes a student of the region’s antiquities, “referred to the VIIth and VIth centuries B.C., are under overwhelming Assyrian influence. . .” ⁽⁶⁾

The exiles who were removed from Samaria, a city of palaces and temples, no doubt, bewailed the capital they had heroically defended for three years against the army of what was, in its time, the world’s most powerful nation. Accordingly they might have called their new settlement Samaria (in Hebrew Shemer or Shomron; Sumur in the el-Amarna letters).

On the middle flow of the Volga, a city with the name Samara exists and has existed since grey antiquity. It is situated a short distance downstream from the point where the Volga and the Kama join. Russian conquerors of the ninth century found this city in existence. The medieval Arab geographer Yakubi, basing himself on accounts of the ninth-century traveller Ibn Fadlan, speaks of the Khazars who dwelt in Samara. ⁽⁷⁾ This people dominated southern and eastern Russia possibly as early as the third, ⁽⁸⁾ but especially during the tenth and eleventh centuries. They passed the Caucasus mountains to participate in the wars of the Romans and the Persians,

dominated the Ukraine as far as Kiev, concluded treaties with the emperors of Byzantium, and their influence and suzerainty sometimes reached as far west as Sofia.⁽⁹⁾

The ruling class of the Khazars used Hebrew as its language, and the Hebrew faith was the official religion in the realm of the Khazars. There was a system of great tolerance, unique in the Middle Ages, in respect to other religions; the Supreme Court was composed of two persons of Jewish faith, two Moslems, two Christians, and one idolater of the Russian population; but it was not a confusion of creeds as it had been in old Samaria, which tolerated many creeds, the monotheism of Yahweh being a protesting ingredient of the confusion.

Were the Khazars or their ruling aristocracy converted to Judaism in a later age? This position was based on what was said in a letter of the Khazar king Joseph, written about the year 961, to the Jewish grandee, Hasdai ibn-Shaprut, at the court of Cordoba. ‘Abd-al-Rahman al-Nasir, the Moorish ruler of Spain, had asked the King of the Khazars to provide any available information about his people, Hasdai’s brothers in religion. In the letter of reply the Khazar king recited a tradition or a legend; advocates of three religions came to some prior king of the Khazars, and he picked the Jewish faith because the Christian and the Mohammedan alike gave preference to the Jewish religion above that of their respective rival.⁽¹⁰⁾

The story exposes its mythical character. In the seventh or eighth centuries of the present era, the adepts of the Jewish faith were persecuted by the Christians and also by the Moslems, and would hardly be chosen to become the religion of the state. A similar legend of “choosing” a religion is told about Vladimir of Kiev: in this legend the Khazars were the delegates representing the Jewish faith.

Had the Khazars been converted to Judaism, it would be almost incredible that they would call their city by the name Samara. Samaria was a sinful city from the point of view of the nation that survived in Palestine after the fall of Samaria, and out of which eventually grew the rabbinical Judaism of later centuries.

The conversion to the Jewish religion would also not imply the adoption of the Hebrew language. It is remarkable that the state language of the Khazars was Hebrew; the king of the Khazars was quite capable of reading and answering a Hebrew letter.

Long before the correspondence between Joseph and Hasdai of the tenth century, the Khazar monarchs had Hebrew names. The dynasts previous to king Joseph were in the ascending order: Aaron, Benjamin, Menahem, Nisi, Manasseh II, Isaac, Hannukah, Manasseh, Hezekiah, and Obadiah. A conversion to Judaism in the seventh or eighth century of the present era would bring with it names common to Hebrews in the early Middle Ages, like Saadia or Nachman; the Judaism of the early Christian age was rich in names like Hillel, Gamliel, while Hellenistic names like Alexander, or Aristobul were not infrequent. Again, the Biblical names of an early period would give prominence to names like Joab, Gideon, or Iftach, and still an older group of names would be Gad, Issahar, Zwulun or Benjamin.

It is peculiar that some of the king of the Khazars were called by the names used in Israel at the time that Samaria was captured by the Assyrians. Hezekiah is said to have been the king of

Jerusalem at that time (II Kings 18:10), and the name of his son and successor was Manasseh. Obadiah was one of the most common names at that time and in the preceding century. It seems not arbitrary to assume that the Khazars absorbed, or even originally were, the remnants of some of the tribes of Israel.

It is most probable that the religious reform among the Khazars, about which some tradition was preserved until the tenth century, is to be interpreted as an act of purification of the half-pagan religion that the exiles from Samaria brought into and developed in their new abodes on the Volga, and as an act of return to the old Hebrew religion of Yahweh. This might have been performed with the help of some Hebrews who perchance left the schools of Sura and Pumbedita, where the Babylonian Talmud was composed. Old Jewish authors⁽¹¹⁾ actually mention the fact that teachers of rabbinical Judaism were invited to the kingdom of the Khazars as early as the eighth century. Possibly, the name “Khazars,” despite a difference in writing, is to be interpreted as “Those Who Return.” A long, probably illiterate period, when Hebrew was used only in speech, may have preceded the period of revival of learning and purification of faith.

I would like to express here the belief that excavation in or around Samara on the Volga may disclose Hebrew signs of the eighth and seventh centuries before the present era. Other sites of old settlements on the Volga, too, may disclose remnants of old Hebrew culture.

The Hebrew (most probably also Assyrian) name for the Volga, Gozan, seems to have survived in the name Kazan. The city Kazan is located to the north of Samara, a very short distance beyond the place of confluence of the Volga and the Kama, two equally large streams. A tributary by the name Kazanka, or “small Kazan,” flows there into the Volga.

In the days of the Khazar realm, the river Volga was called not by its Assyrian, nor by its present name, but by the name Etel (the name is given also as Itil or Atil). This name appears to derive from a Semitic root; it is also used by the medieval Arab geographers.

Many place names in southern Russia seem to be of Hebrew derivation. The name of the river Don may go back to the name of the Israelite temple-city Dan. The Caspian Sea is best explained as “The Silver Sea” from the Hebrew *caspi* (of silver). Rostov means “The Good Harbor” in Hebrew. Orel, read in Hebrew, would mean “uncircumcised”; Saratov may mean “to make an incision.”⁽¹²⁾ With our identification of Gozan—one of the places of exile of the Ten Tribes—as the Volga, we may now investigate the question, what place is Khalakh, the other place of exile mentioned in II Kings 17:6? This place name is generally regarded as unidentifiable.

The eastern coast of the Black Sea was the goal of the Argonaut expedition in its search for the Golden Fleece. This expedition, engineered by Jason, was undertaken on the boat Argo. The land on the eastern coast of the Black Sea was called Colchis in ancient times, and the region is still known by this name. In Russian literature it is called Kolchida.

I consider western Georgia—to which Colchis belongs, to be the Biblical Khalakh. Those of the expatriates of Samaria whose destination was Khalakh arrived there some decades after the

Argonaut expedition, which was regarded by the later Greeks as an historical event and chronologically placed two or three generations before the Trojan War.⁽¹³⁾

In the mountainous region of western Georgia, adjacent to the Colchian coast, live the so-called Georgian, or Mountain Jews. They claim to be of the Ten Tribes of Israel, their ancestors having been exiled there upon the destruction of the kingdom of Israel by the Assyrians. Ben Zvi (the second president of the modern state of Israel) tells of these people and their claims.⁽¹⁴⁾ He writes that “there is no reason to doubt the existence of a continuous Jewish settlement in both the north and south of Caucasia, whose roots were laid in very ancient times, perhaps as early as the days of the Second Temple, perhaps even earlier.” Yet he does not express any suspicion that Khalakh may have been Colchis.

The third place of exile of the Ten Tribes according to the Book of Kings were the “cities of the Medes.” Is it possible to locate also this last destination? The Medes first appear in Assyrian annals in the time of Shalmaneser III: it was in his days that they started to penetrate across the mountains of Iran to infringe on the boundaries of the Assyrian kingdom. They appear once again in the annals of Sargon II, who claims to have repelled “the distant Medes on the edge of the Bikni mountain.”⁽¹⁵⁾ Some scholars maintain that the homeland of the Medes before their occupation of the Iranian plateau in the seventh and sixth centuries was in Turan, that is, West Turkestan. Sargon’s reference to “distant Medes” would then designate their homeland in Turan.

In this context it is interesting to note that the Jews of Bukhara, the great trading city and metropolis of West Turkestan, (Turan) claim direct descent from the Ten Tribes.⁽¹⁶⁾ Some writers are even prepared to admit the possible veracity of this claim,⁽¹⁷⁾ though no one so far seems to have attempted to place the “cities of the Medes” in this region. While the greater part of the Jewish community of Bukhara may well be descended from migrants from the time of the Babylonian Exile or the Diaspora of Roman times or even later, it is not excluded that the oldest group among them are remnants of those tribes dispatched by Sargon to the “cities of the Medes.”

References

1. E.g., H. W. F. Saggs, *The Greatness that was Babylon* (New York, 1966), pp. 104, 557.
2. H. Graetz, *History of the Jews*, Vol. I (Philadelphia), p. 265.
3. [Cf. Strong’s *Concordance of the Bible*, p. 36 where (Hebrew section) *habor* is translated from the root word meaning “to join.”]
4. [See *Atlas of the Bible*, (ed. by J. L. Gardener, 1981), p. 145; also consult W. Gesenius, *Hebrew Lexicon* (Brown, Driver, Briggs), p. 140, “Kebar” —“a river (or perhaps a canal) of Babylonia, not at present identified . . .” —LMG/WBS]
5. Luckenbill, *Records of Assyria II*, par. 54.
6. Ellis H. Minns, *Scythians and Greeks* (Cambridge, 1913), p. 263.
7. Yakubi, *Kitab al-Buldan*, 262 (in *Bibl. Geogr. Arab*, VII, ed. De Goeje).
8. Masudi hands down a tradition that the Sassanid king Ardashir fought against the Khazars. Masudi, *Muruj al-Dhabab*, ed. Barbier de Meynard and Pavet de Courteille (Paris, 1861-78), VI, 124ff.

9. For general discussion and sources, see D. M. Dunlop, *The History of the Jewish Khazars*, (Princeton, 1954).
10. Cf. A. Koestler, *The Thirteenth Tribe*, pp. 63-64.
11. Jehudah bar Levi, *The Khazar*. [Such names were perhaps chosen to describe the inhabitants of the respective areas.—LMG]
- 12.
13. [Herodotus (II. 104) reports that in his time the people of Colchis practiced circumcision and claimed descent from Egypt. Although his inquiries in Egypt evinced no remembrance of the Colchians from among the Egyptians, Herodotus concluded that they must have been descended from the remnants of the army of the semi-legendary Sesostris. It seems to me that the Colchians may have told Herodotus the Mosaic tradition of the Exodus from Egypt—if they were Jews, they would have had to answer in the affirmative the question posed by Greek historian, as to whether their ancestors had come from Egypt.—JNS]
14. Itzak Ben-Zvi, *The Exiled and the Redeemed* (Philadelphia, 1957), p. 62.
15. Luckenbill, *Ancient Records of Assyria II*, par. 54. The location of “Bikni mountain” is uncertain.
16. See the eighteenth-century report of Joseph Maman of Tetuan, summarized in A. Ya’ari, “Emissaries of the Land of Israel” (Hebrew) (Jerusalem, 1951), p. 664.
17. Itzak Ben-Zvi, *The Exiled and the Redeemed*, p. 62.

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Ambi

Ambi in the el-Amarna letters is apparently Moab or the capital of Moab. It is referred to together with Sigata (EA 76), that I recognized as Succoth on the Jordan. The same story of rebellion against Jerusalem is found in II Chronicles 20. The assault on Jerusalem did not materialize itself when (II Chronicles 20:23) the children of Ammon and Moab stood against the inhabitants of Mount Seir. Mount Seir is the land of Seiri of the letter 288.

Ammia

Ammia is Ammon. Its capital Rabbath-Ammon (Deuteronomy 3:1) appears in the el-Amarna letters as Rubute or Rubuda.

Arzenu

The reason for referring to Palestine, or a part of it, in the Egyptian texts as Arzenu (*Rezenu) is in the fact that the Israelites called it so, as can be judged by verses in Joshua 9:11; Judges 16:24; Psalms 85:10; Micah 5:4; The Song of Solomon 2:12, etc.

See the section “God’s Land and Rezenu” in *Ages in Chaos*, Vol. I, p. 170ff.

Atlantis

The only source of the legend about Atlantis is found in Plato, who narrates the story heard by him through three intermediaries (his friend Critias, his grandfather Critias the Elder, and Solon, the friend of the latter) from an Egyptian priest.

The innumerable identifications of the site of Atlantis—wherever a legend of a submerged city is told or submerged walls are found, from Helgoland to Thera, to the Caribbean, to name only a few—are all baseless. Plato gave a definite description—opposite the Pillars of Heracles in the Ocean. This signifies the Atlantic Ocean, not far from Gibraltar.

When M. Ewing found submerged beaches near the Mid-Atlantic Ridge, he mentioned the Atlantis myth but, not to appear credulous, rejected it; nevertheless he claimed that the land must have sunk a thousand feet. From the Azores to the Mid-Atlantic Ridge is the location of Atlantis.

The cause of Atlantis' submergence was, as Plato transmits, in a disturbance effected by a celestial body passing close to the earth. The cause made land and sea change places in more than one area simultaneously: therefore many submerged cities and islands have been discovered in seas and oceans. Atlantis must have been a great colonizing power, as Plato asserts, and its disappearance could impress, as would a total submergence of Great Britain in the nineteenth century, at the apogee of its might.

Avaris

The identification of Avaris with el-Arish is detailed in *Ages in Chaos*, Vol. I, Ch. 2.

A plan to survey and dig on the site met an opposition on the part of Dr. Aviram, director of Antiquities in Israel.

It is quite probable that the Hyksos (Amalekites) hid their gold in the ground before the surrender. Therefore excavation may bring out important findings.

The river bed (of Wadi el-Arish) was the scene of fighting between the besieged and the Israelites under Saul in alliance with Kamose and Ahmose, the Egyptians.

The identification of Avaris with el-Arish goes together with the identification of the Hyksos with the Amalekites.

Batruna

A few times the king of Gubia (identified as Jezebel, later called Jezreel) mentioned in his letters the city of Batruna, and it is identified as the ancient Botrys. (Dhorme, *Revue Biblique* (1908), 509f.) Weber, in Knudtzon *Die El-Amarna Tafeln*. p. 1165). However, Menander, a Greek author, quoted by Josephus (*Against Apion* 1, 116; *Jewish Antiquities* VIII, 1) says of Ithobalos (Ethbaal), the king of Tyre in the ninth century, that "it was he who founded the city Botrys in Phoenicia." Having been built by the father-in-law of King Ahab, the city Botrys could be mentioned in the el-Amarna tablets only if the founding of the city preceded the el-Amarna age.

Al-Batrun is north of Byblos, which is north of Beirut.

Baw and Arinama and Mw-Sdt

Ramses II in describing the events preceding and following the battle of Kadesh told that when he with the division of Amon was already northwest of Kadesh, the division of Re that followed him crossed Msdt of the river Nrt. After these two divisions were "treacherously" attacked, he succeeded to fight his way back to the divisions of Ptah and Sutekh that idled "on the south of the city Aranami" (their officers were farther to the south in a place called Baw (Poem of Pentaur 11:17, 18; Breasted, *Ancient Records of Egypt* III Sec. 310).

In the section dealing with the position of Kadesh of the battle, it is shown that Kadesh was Carchemish; in the section dealing with the river (P)rint it is shown that it was Prat, or Euphrates, and not Orontes.

Baw is today's el-Bab on the road from Aleppo to Carchemish, Aranami or Aranima is Arima of today on the same road, north of el-Bab. Mw-Sdt is water (*mw*) of Sadjur, the confluent of the Euphrates that must be crossed on the same road before Carchemish is reached.

Ramses II referred to the "forest of Baw" . It is therefore of interest to read in the report of the excavations at Carchemish about the road from Aleppo to the site of the excavations:

The feature of the country which most strikes the newcomer is its treelessness. To the north and east the mountain regions still preserve something of their ancient forests ... But the land as a whole is bare and shadeless ... This was not always the case. An English traveller of the seventeenth century could lose himself in the interminable forests between Aleppo and Bab, where not a tree grows now.... There is no doubt that a vast amount of deforestation has taken place, and it is probable that in Hittite times the Carchemish country was a well-wooded one. (Wooley, *Carchemish*, Pt. 2, pp. 33-34).

Wooley wrote it with no intent to argue the site of the battle of Kadesh, or the identifications made here. These identifications further support the thesis of Kadesh of the battle being Carchemish. Various unsuccessful attempts have been made to locate Baw and Aranami or Aranima.

Beth Shulman

In the el-Amarna letters #74 and #290 there is reference to a place read (by Knudtzon) Bet-NIN.IB. In *Ages in Chaos*, following Knudtzon, I understood that the reference is to Assyria (House of Nineveh). I was unaware of an article by Julius Lewy printed in the *Journal of Biblical Literature* 59 (1940) under the title "The Sulman Temple in Jerusalem." He claimed that it was a place of worship (in Canaanite times) of a god found in Akkadian sources as Shalmi, Shulmanu, or Salamu. This correction of the reading of Knudtzon (who was uncertain of his reading) fits well with the chronological reconstruction of the period. In *Ages in Chaos* Vol. I (ch. 6,7,8) deal with the el-Amarna letters; there it is shown that the king of Jerusalem whose name is differently read Ebed-Toy, Abdi-Hiba, etc., was King Jehoshaphat (ninth century). It was only to be expected that there would be in some of his letters a reference to the Temple of Solomon.

In an article preceding that of Lewy, P. Haupt (OLZ, XVIII (1915) Cols. 71-72) translated the verse in the letter # 290: "Die Landeshauptstadt Names Jerusalem, die Stadt des Ninib-Tempels, die Königsstadt." Replacing Ninib by Shulman or Shalmi, we arrive at the conclusion that the sentence deals with Solomon's Temple.

Latest is an article in Hebrew in *Eretz-Israel*, Vol. IX (Jerusalem, 1969), by Tadmor and Kalai who read the ideogram as Beth-Ninurta and locate it in Beth-Horon. This is an error; but they have brought the pertinent literary references together.

The Septuagint has a final *n*, in the name of Shlomo (Solomon) but it appears that Lewy's reading needs to be corrected to a name without the final *n* (Salamu). Albright's remark to me that the name is not accompanied by a sign of divinity and therefore Lewy is mistaken, only supports my interpretation King Solomon was no deity.

The idea that the reference in EA 74 to Beth-Ninurta or Beth-Shulman is to some other place is based on the erroneous location of Sumuru—it being not a Syrian coastal city, but nearby Samaria.

Caphtor

The island Caphtor is named in the Scriptures. The usual identification is Crete, because the Keftiu bringing presents (vases) to Egyptian pharaohs are thought to be Cretans.

I prefer Cyprus as the biblical Caphtor and the Egyptian Keftiu.

If Caphtor is not Cyprus, then the Old Testament completely omits reference to this large island close to the Syrian coast. The phonetics of the name also point to Cyprus. Separately I show that Tarshish was the name of Crete.

It seems that the Philistines arrived in Palestine from Caphtor following the catastrophe that brought there the Israelites after their wandering in the Desert.

Carchemish

The Kadesh of the battle, described and illustrated by Ramses II was Carchemish. Details of this identification are found in the volume dealing with Ramses II and Nebuchadnezzar. There I show that Tell Nebi—Mend on the Orontes was not the Kadesh of the battle, neither was the Orontes the *(p)nrt* of the battle. In the sections “The Fortress of Carchemish” , “The Plan of the Battle” , and “Carchemish the Sacred City” , I give an exhaustive proof, historical, topographical, and geographical to the thesis that Carchemish (the City of Chemosh) was the Kadesh of the battle. The identification of *(p)r-n-t* with the Euphrates and the identification of Baw as el-Bab and Aranimi as Arima of today and Mw (water) of *Sdt* as the Sadjur, all on the way from Aleppo to Carchemish, give additional support to my identification.

The history of Carchemish and the archaeological difficulties resulting from the wrong chronology are discussed by me in the same volume of *Ages in Chaos* (dealing with *Ramses II and His Time*).

“Cities of the Medes”

Of the Medes the *Columbia Encyclopedia* says;

“Some scholars claim they were an Aryanized people from Turan.” Turan is in West Turkestan. The Bucharian Jews claim to be of the Ten Tribes, (see Ben-Zvi, *The Exiled and the Redeemed*.)

This may indicate that the “cities of the Medes” mentioned in II Kings 17:6 and 18:11 were in the region of West Turkestan. Cf. “Gozan,” “Khalakh.”

Dan

Dan is erroneously placed near the present-day Metuia, at one of the sources of the Jordan. The historical Dan was some 150 kilometers to the north, at Baalbek. The details of this explanation are written out by me since long ago.

It is important to observe also that the Image or Micah was at Baalbek and was still there when king Manasse occupied the place (following the advance of Seti) It is not known who built Baalbek (the platform). Its oracle was famous in Roman times when the Romans built there the temples to Venus, Jupiter, and possibly Mars or Saturn.

Thus the geography of Palestine, “from Dan to Beersheba” has its northern point at Baalbek, the place “as you go to Hamath”—or Dan.

Dunip (Tunip) of the el-Amarna letters and other ancient sources was Dan. It was also Kadesh of Seti’s conquest. Finally, the place is known as Yenoam (“Yahwe speaks”) which refers to the oracle.

Desert of Wandering

The desert of the forty-year wandering was not the Sinai. Peninsula, but a much larger area. The inclination of the historians is generally to deny the ancients long itineraries; Midian being the Medina of Moslem times, actually deep in the Arabian Peninsula, all indications in the Old Testament are for a deep penetration of the Arab Peninsula by the wandering Israelites who escaped the land of Egypt destroyed by the catastrophe in the mid-fifteenth century before the present era.

There are autochthonous Arab traditions about the wandering tribes led by Mosaikaia, his brother Arnran, and his sister Zeripha. These traditions have not been borrowed from the Old Testament or rabbinical tradition. From the Bible and Midrashim, the Arabs culled much of the content of the Koran, but they did not realize that their traditions about Mosaikaia (and the catastrophe that took place in his time) are of independent origin, though referring to the same persons and events.

All together indicates that the Israelites under Moses did not spend forty years in the small triangular Sinai Peninsula, but in the western regions of Arabia.

Eden

Of Aden in South Arabia, Arab historians of the Middle Ages narrated from older traditions that it was an unusually fruitful land, well-watered. One who started on his travel upon the land on a donkey with an empty basket on his head found the basket full of fruit before he reached his destination. Then in a catastrophe (called “bursting of the dam”) apparently of global dimensions, this country became a desert.

Of ancient channels of great rivers in Arabia I brought references of modern explorers in *Earth in Upheaval*. The area Arabia Felix is today a forbidden land.

Marib was the city of the area, once so fruitful, according to legend.

On some pages I tried to follow the legend to the Arab autochthonous tradition of Moses (Mosaikaia), Aharon, and Miriam and the “Bursting of the Dam” ; it was not just the Dam—I offered a philological explanation—it was a cataclysmic event. Eden (Paradise) was located in Aden.

God’s Land

In *Ages in Chaos*, in the chapters dealing with Queen Hatshepsut (Hashepsowe) and with Thutmose III, I could show that by God’s Land (Divine Land) was meant the Holy Land of Biblical and post-Biblical times: It must have had that appellation since very early times.

If the description of Hatshepsut’s travels left place to query the whereabouts of Divine Land (not after the publication of *Ages in Chaos* Vol, I), the war annals of Thutmose left no room for any other identification, but as Palestine.

Frankincense was grown there. Newer discoveries (like those of Mazar at Ein-Gedi) show that this was also the case on the shores of the Dead Sea.

Gozan

In referring to the place of exile of the tribe of Ruben and Gad and half of the tribe of Manasseh, the book of I Chronicles 5:26 states that “Pul ... and Tiglath-pileser king of Assyria carried them away... and brought them to Halah and Habor, and Hara and to the river Gozan.”

The text of II Kings 17:6 also speaks of Gozan is a river: “... the king of Assyria took Samaria and carried Israel into Assyria, and placed them in Halah and in Habor by the river Gozan and in the cities of the Medes”— similarly II Kings 18:11. In II Kings 19:12 Rabshakeh speaks in the name of Sennacherib: “How the gods of the nations have delivered them which my fathers have destroyed; (as) Gozan, and Haran, and Rezep and the children of Eden which were in Thelassar?” In this list are included countries, such as Eden (Aden) which were outside of Assyria.

In Isaiah 37:12 Gozan can be understood as a region or a people of a region. The correct translation of II Kings 17:6 and 18:11 is “in the confluence of the river Gozan.”

Biblical scholars looking for the place of exile of first, the 2½ tribes of Israel by Tiglath Pileser, and then of all the tribes of Israel by Sargon upon the fall of Samaria, decided that the river’s name was Habor and Gozan was the region. This is a violation of the texts. They identified Habor with the confluence of the Euphrates mentioned in Ezekiel 1:3, “The word of the Lord came ... unto Ezekiel” in the land of the Chaldeans by the river Chebar.

The spellings Habor and Chebar are different, and the river Khvoz (Chebar) is not Habor, and the latter is not a river at all.

When the exiles of Judah arrived in Babylonia ca. 138 years after the inhabitants of Israel were removed from their land, they did not find the Israelites in Chebar (Khvoz). It is also said that the Lord removed Israel out of his sight—or to a country far away and without communication with the motherland.

The Assyrians spread their dominion to the south as far as Ethiopia and Aden (Eden). The Assyrians crossed the Caucasus—this is known from Assyrian inscriptions themselves. In one of the Arab geographer-travellers of the Middle Ages I found confirmation of my view that the *Volga was the river Gozan*. The confluence of the Volga is where the equally wide Kama joins the Volga. Thus the “confluence of the river Gozan” was at the point where the city of Kazan is located. Not far on the Volga is also a city Samarra. This land had a Jewish kingdom of Khazars in the 6th to 12th centuries, which was visited by Benjamin of Tudela, the Spanish Jewish traveller. He claimed to have found the Ten Tribes. The region of Scythia and Sarmatia abounds in Assyrian relics of the seventh century B.C.E. The Khazars are supposed to have acquired their Jewish religion in the Christian era. However the names of the Khazar kings reveal names found among the Israelites in the days of the Jewish kings of the eighth pre-Christian century, not names of the later periods, like the Hellenistic or Roman (Matathiam, Hillel, Gamliel). It appears that Persian Jews in the Persian time established contact with the Israelites on the Volga.

Gubla

In the el-Amarna letters Gubia is the capital of Rib-Addi; his other capital is Sumur, and it is almost permanently under siege, or in danger of being taken.

Gubla is identified by all historians as Byblos; however, a certain wonder is expressed (Albright), why it is called in the letter Gubla, whereas its name in other sources is Gebal (Gwal)

As I could show in *Ages in Chaos*, in the chapters dealing with the el-Amarna letters, Gubia was the name of the summer residence of Ahab, in the Scriptures given as Izebel (Jezebel), the initial “I” being a sign of ignominy.

In the Scriptures there is a direct indication that Jezreel was previously called by the name of Queen Jezebel. When her life ended ignominiously, dogs tore her flesh, “and the carcass of Jezebel [was] as hung upon the face of the field in the portion of Jezreel, about which they [should] not say, This is Jezebel.” (II Kings 9:37). *Ages in Chaos* I, p. 233.

The location of Gubla (Zebel) in the valley of Jezreel is not established. An indication of its distance from the sea is in the story of the prophet Elijah running all the way before the chariot of king Ahab from the Carmel outlook over the sea to (Je)zebel. From there the son and heir of Ahab tried to escape to Meggido. Archaeological work is needed to locate the place, originally the vineyard of Naboth.

Hittite Empire

The “discovery” of the Hittite Empire was made in the last quarter of the 19th century. In 1905 its capital was found in the village of Boghazkoi in Anatolia—with a rich archive.

In the volume dealing with the “Hittite Empire” I show in great detail that its history needs to be brought much closer to our time—its fixing in time was due to the war carried on by Emperor Hattusilis with Ramses II. But in my reconstruction of ancient history I show that Ramses II belongs to the very end of the seventh and the beginning of the sixth centuries. Hattusilis is the Chalcean name of Nebuchadnezzar. The Hittite Empire is but the Chalcean kingdom and the pictographic script is but the Chalcean script. The land of Hatti was a wide geographical term including Northern Syria and other lands west of the Euphrates.

Ur of the Chaldees, as Cyrus Gordon claimed, could well have been in the north, and not in the lower reaches of the Euphrates. It is also certain that the Chaldeans at some historical time migrated from the south to Anatolia; they conquered Babylon and proceeded to conquer Syria and Palestine, and for two decades contested with Egypt for these two countries. The Hittite Empire is shown as a non-existent thing; its capital Hattusas (Boghazkoi) was the capital of the Chaldeans.

Jordan River

1) Thutmose I refers to a river in Palestine that “flows upstream.” Suggestions were made that it

could be the Euphrates (or the Jordan), because these rivers flow in the direction opposite to that of the Nile.

The Jordan once flowed toward the north (and quite possibly entered the Mediterranean through the valley of Jezreel). When the Dead Sea was formed in the formation of the Rift (supposedly in the Tertiary, but according to Gregory, authority on the Great Rift, still in the memory of man), possibly in the days of the overturning of Sodom and Gomorrah, or even in the days of the Exodus (in the days of Abraham, it was a valley), the Jordan changed its direction.

The Sea of Reversed Water (Ramses III) is the Dead Sea.

2) The river Eridanus into which Phaeton fell was located in many places, the Rhone and the Po among them. The Jordan is the Eridanus of Phaethon's legend. The vision of the day the sun stood still and the swarms of bodies that fell that day (Joshua) connect the Phaethon legend with this region.

Kadesh Barnea

Out of the proverbial 40 years of Wandering in the Desert, almost 38 years were spent in Kadesh Barnea. Usually the place is looked for in the Sinai Desert, and the preferred location is about 18 miles south of el-Arish on the Mediterranean coast.

As I show in another chapter, "[The Great and Terrible Wilderness](#)" was the Arabian Desert; Midian also was not in the Negev or on the coast of the Aqaba Gulf, but where today is Medina—the place where Moses spent years as a political emigré from Egypt, prior to the Exodus.

The reason for the long stay of the Israelites at Kadesh Barnea was in the existence there of sources of water, while in the Desert most of the rare sources became bitter.

I am also helped in my identification of Kadesh Barnea with Mecca by what I believe is the Arab autochthonous (in distinction with stories in the Koran which were borrowed from Jewish teachings) tradition of the passage of the Sea and wandering in the Desert told in the story of Mosai-ka-ya and his brother (carrying a name similar to Aaron, and a sister resembling Miriam), The lay flocks of wanderers under the leadership of these three occupied Mecca.

Mecca was abandoned by the Amalekites following the catastrophe that also ruined Egypt, shortly before its occupation by the Israelites, after Mecca was shattered by earthquakes and plagued by an invasion of vermin (ants). Israelites occupied the abandoned place. The Amalekites, plagued also by a plague of insects, moved toward Palestine and Egypt, and soon also built at el-Arish their fortress-capital Avaris. The Israelites, who were unable to break through to Palestine from the south, reached the abandoned capital of the Amalekites. At Mecca there are sources of water, considered sacred and many legends are preserved about them. The water sources of Kadesh-Barnea and the legends concerning the springs of Mecca indicate that

some water springs, not destroyed in the catastrophe, were the main incentive for the Israelites to congregate there.

More than a score of years after I came to this conclusion and the Arab story of Mosai-ka-ya, Bar Broma, the author of *Negeb* published his view that Kadesh Barnea was in the Arab Desert (but quite north of Mecca) at Medain-Salib, formerly El-Hejr, about 450 km farther southeast from Petra, which place he identifies as Kadesh (not Kadesh-Barnea)—*Palestine Exploration Quarterly* July-December 1964. This view was left undiscussed as far as I know. As explained above, I identify it with Mecca, farther south.

Kadesh in Judah

Kadesh is named first among the cities of Judah that Thutmose III subdued. The king of Kadesh was also the head of the opposing forces, first opposing the pharaoh at Megiddo. Suggestions were made as to the whereabouts of Kadesh: some placed it in Galilee; but the conquest of Thutmose III was limited to Judah, Israel having submitted without struggle (Thutmose III being Shishak of the Scriptures, or Sesostris of Greek authors).

In *Ages in Chaos* (Vol. I, ch. IV, section “Kadesh in Judah”) I have shown that Kadesh in Thutmose’s list is Jerusalem; I brought also many instances where the ancient Jews called it that way (in the Old Testament).

This Kadesh needs to be distinguished from Kadesh in Coele-Syria (Baalbek, or Dan) in Seti’s inscriptions and pictures, and from Kadesh of Ramses II’s inscriptions—this being Carchemish.

Khalakh

The tribes of Israel were exiled by the Assyrians to three places; Halah (Khalakh), the confluence of the river Gozan and the cities of the Medes. The first two places are beyond the mountains of the Caucasus. Khalakh, of which it is some-times said that its location is unknown (Graetz) was Colchis, the south-eastern coast land of the Black Sea. To Colchis Jason sent the legendary Argonaut expedition to bring back the Golden Fleece.

A Jewish community lives there from ancient times, claiming descent from the exiled Ten Tribes. Also in the Georgian mountains live Mountain Jews with ancient customs, also claiming descent from the Ten Tribes. See about them Ben-Zvi, *The Exiled and the Redeemed*.

Caspian Sea comes from the Hebrew word *caspi*, or silvery. Rostov from *Rosh Tov* (good estuary), Don from Dan, also *Donai* (possibly also Dnieper and Dniester) all to memory of Dan, the holy city of the Ten Tribes. A large number of the Israelites were exiled by Sargon II over the Caucasian mountains to Southern Russia.

Tarshish

References to the ships of Tarshish and to a place of that name, in the Old Testament, beginning with the time of Solomon (10th century), to the time of the prophets of the 8th and 7th centuries, make me think that by this designation the Cretan navigators and Crete itself were meant. The Minoan civilization survived until the great catastrophes of the 8th century and it would be strange if it and its maritime activities remained unmentioned in the Old Testament.

The usual explanation puts Tarshish in Spain, though other identifications are offered, like Tarsus, in Asia Minor. One of the old names for Knossos sounds like Tarshish.

Triton

In *Worlds in Collision*, Chapter VII, Section “Pallas Athene,” Diodorus Siculus and St. Augustine are quoted as claiming that a great lake named Triton disappeared in a great catastrophe connected with the birth of Athene. For this reason Athene was also called Tritogeneia or Tritonia. According to Augustine the catastrophe took place in the days of Ogyges, whom I identified as Agog, the same as Apop, the most powerful king of the Hyksos in the time following the Exodus.

In *Earth in Upheaval*, section “The Sahara,” I quoted modern authorities to the effect that neolithic implements indicate that the region was densely populated and richly watered. Egyptian rock designs show that such conditions still prevailed when Egypt was already a monarchy.

The Lake (or marsh) Triton occupied most of the region of the present Sahara. The sudden change of an agricultural land to a desert was caused, in my opinion, not only because of a change of elevation and the consequent sealing of the sources of water, but mainly because of the outpouring of naphtha of extraterrestrial origin. This means that deserts ought to be rich in petroleum. In 1938 rich petroleum deposits were discovered in Arabia, and much more recently in the Sahara—Algeria, Libya, and later also in the Egyptian part of the desert.

Introduction

A student of Greek lore on the one hand and on the other of the Old Testament and of rabbinical books and their description of the calamities that first visited Egypt, but later also the tribes of Israel for their iniquities, cannot but see the great difference in the attitude of the gods of the Greek pantheon that cause disturbances on Earth, but omit to connect them with any moral imperatives. Mount Sinai and Mount Olympus are two different, almost opposite symbolic structures.

Notes and Themes

Malki-Zedek

The name of the High Priest of Jerusalem in the days of the Patriarch Abraham indicates that Jupiter's (in Hebrew "Zedek") was the cult of that city. Malki-Zedek means "Jupiter is my lord (king)". The story of a ram in the scene of the purported sacrifice of Isaac, points also to Jupiter, ram being the animal representing that planet. Malki-Zedek, the High Priest of the Highest, plays an important role in Christian catechism.

The time of the Middle Bronze I and II was the age of Jovian dominion; and probably also the Early Bronze.

Siwa-Shiva

The oracle of Zeus-Ammon was the oracle of Jupiter (Herodotus IV.181). The name "Siwa Oasis" must have been attached to the oasis by the Macedonians, like Ptolemy I, returning from the invasion of India, Shiva or Siva being the name of Amon there. The salts of ammonia in the neighborhood of the Siwa Oasis resulted from an electrical discharge. The oracle was established in memory of the event and in honor of the deity. Jupiter has ammonia in the atmosphere. Is it not strange that ammonia was found in the neighborhood of the oasis of Amon-Zeus?

Zeus-Amon

Zeus of the Greeks, Jupiter of the Romans, Mazda of the Iranians, Amon of the Egyptians, Shiva of the Hindus, were all the same planetary god, optimus maximus. The Io, Jahwe coorelation to Io, Jupiter was already made, I assume, so obvious it is.

The Planetary Gods

Hinduism is not one but three relations closely connected. In one, Brahma is the supreme deity, in another Shiva, and in still another Vishnu. The worshippers of Agni and of Shiva were also in conflict. Equally so the worshippers of Mitra in Iran, who were in conflict with the worshippers of Mazda; and in Palestine the worshippers of El (Saturn) were in conflict with the worshippers of Jupiter and of Venus (Astarte); in Babylonia the worshippers of Enlil, of Marduk, of Ishtar, of Nergal.

The Astral Religion of Egypt

When J. Wilson writes (volume to honor Albright) that it is an admission of failure that the chief cultural content of Egyptian civilization—the religion, with its mythology again and again narrated and alluded in texts and pictured in statues and temple reliefs, is not understood—he is right. The astral meaning of Egyptian deities was not realized and the cosmic events their activities represent was not thought of.

Amon was Jupiter—and this we know from classical writers.

Another cult—Isis is Jupiter and Osiris is Saturn. The death of Osiris and its return to life; the birth of Venus-Horus, the fight of Horus and Seth (the head of the Venus comet and its tail)—all refer to celestial drama played before the eyes of the world—and of Egypt.

Monotheism

In the days of Menashe—understanding that the sun is the supreme planetary body. In the days of Jeremiah, that the Supreme Deity is no planetary body. Is there any opposition to the worship of planetary bodies in the prophets before Jeremiah? Only Abdi-Ashirta sounds like a monotheist in his letters. Yet according to the book of Jeremiah, the Jews of Israel worshipped the planet Venus and brought her cakes till the close of the time of Josiah, the grandson of Menashe.

Many passages in the psalms and in the prophets are monolatrous, not monotheistic. Hillel ben Shahar (Hillel son of the Morning Dawn) in Isaiah, was the planet Venus. Many of the psalms reflect astral religion. The psalms “Hallel” may have been adopted from the “pagan” worship of the Morning Star. The visions of the Lord traversing the sky with rays streaming from his body, as in Habbakuk, are not monotheistic. These passages, and on the other hand, the passages in the books of law that establish a worship of sacrifices to the Supreme Being are not enhancing the sacred value of the Old Testament. To expose these alien motifs may be necessary to ruin the idolatrous Christian church, built on the Old Testament.

Tragic is for ethical relation between man and his God that when the Israelite nation conceived a God not an astral being but a Supreme Creator and ruler of the world, and this in the days of Jeremiah and King Josiah, the destruction of the state was only years away.

Whereas Nebukhadnezzar was a worshipper of astral deities, a monolator, who changed his protective deity several times in his life, Josiah was a monotheist, whose God was abstracted from anything material. To experience the collapse of the state and the destruction of the temple must have been [experienced as] a great letdown of man by his God.

Menashe's Iniquity

In the days of the King Menashe, accused of reverting to idolatry and the worship of celestial bodies, a great advance in the understanding of celestial processes took place, a change comparable to that of the Copernican revolution. It was understood that the Sun is not a body dependent on the will of the planets, especially Jupiter, but that it is the central body.

In cataclysmic events, the disturbance in the motion of the Sun was ascribed to the planet at a close approach, Jupiter, Venus, or Mars, as the case would be. The Sun played a very little role on the Greek Olympus, dominated by Zeus. In global catastrophes, the Sun seemed to be powerless—at the approach of a celestial body (planet or comet) to the Earth, the Sun was disturbed in its motion, and therefore appeared to be subservient to planets of violent temper, like Jupiter. The name of the sun—shamash (Akkadian) or shemesh—the servant—reflects this understanding of the ancients.

In the ninth and eighth and seventh centuries before the present era, the understanding that the Sun may be the most powerful started to penetrate the oriental mind, possibly first in Egypt. To understand its central role was the achievement of the seventh-century astrologers in Judea and also in other countries of the Near East. Menashe, son of Hezekiah, built solar chariots for the temple of Jerusalem, which points toward a Copernican revolution in that period of history.

The realization of the leading position of the Sun, though itself never the cause of a cataclysmic event on earth, was a major step forward. A greater step was made in the next generation, when the Supreme Being was abstracted from planetary or solar body. But the idea of the invincible sun, “sol invictus” continued to live into the Roman times.

Menashe actually returned to the faith of Moses, when he killed Isaiah, opponent of Moses. At that time in Egypt was resurgence of Set’s cult. However Menashe called his son Amon.

Isaiah and Moses

The complete absence of references to Moses in Isaiah I leads to the thought that Isaiah was not at all reverend to Moses’s memory. The fact mentioned in the Book of Kings that, urged by Isaiah, king Hezekiah destroyed the brazen serpent made by Moses, an object of worship three centuries of a millennium after Moses, strengthens the impression that Isaiah was antagonistic toward Mose and his cult. Also in the rest of the prophets Moses is mentioned very rarely and mostly not at all. Compare with this the references to Moses in the Koran. There is hardly a sura where Moses is not mentioned, and mostly more than once.

Moses-Zarathustra-Quetzalcoatl

In the times following the global cataclysms the survivors banding into groups of migrants looked in their despair for leaders. Such a figure was Moses—for the migrant masses that retreated from Egypt toward Asia. Such a leader was also Quetzalcoatl in Mexico. Zoroaster of the Persians arose in a similar role, possibly, after the same catastrophe. These leaders became lawgivers. However, it is hardly possible that the temple or traveling sacrarium regulations were authored by such leaders in the form the tradition ascribes to them.

Of Moses’ monotheism more proofs are needed. The battles in the sky were visualized by all men as contests of the gods; in such times to abstract the religion from the visual planetary gods must have been near impossible. The making of the serpent carried on a pole by Moses and the making of the golden calf by Aharon, appear to be not unsimilar actions. It is remarkable that the prophets of the Israelites hardly ever referred to Moses. It is possible that Ezra, returning from Persia to Palestine, ascribed to Moses many laws and beliefs that were actually of a later date. A prophet of uncompromising monotheism is Jeremiah.

Sukkoth

The holiday of Sukkoth with building of sukka and palm branches was instituted in the days of Ezra; in his book it is said that it was not observed this way since the days of Joshua, son of Nun. It must have been a Persian custom and I saw a reference to a Persian festival when palm leaves were a part of the ceremonial.

Four Span in the Sky

The vision in the sky in the days of Joshua was that of a chariot with a driver and a span of four horses. The four horses idea repeats itself in apocalyptic literature, but also in Olympic charioteering and can be traced in ancient folklore and usage, with its mythic undertone.

Maccabees' revolt, Hannukkah

The revolt of the Hashmanaim (better known by the name of one of his sons Judah Maccabi) coincides with the conquest of Greece by Rome ca -160. It appears that the Romans fomented the revolt in the Hellenized provinces at the time of their conquest of Greece. The introduction of Hannukkah feast seems to be an adaptation of the Roman Saturnalia, and the way of praying with covered head, a taking over of the Roman usus, while the Greek usus was to pray with uncovered head.

Some hundred years later, with Pompey, the Romans wished to terminate the alliance, making Judea into a province.

Hannukkah was introduced to the memory of Saturn and the Deluge, by the time Israelites looked for alliance with Rome against Greece and Antiochus dynasty. Christmas, like Hannukkah, are memories of seven days of light that preceded the Deluge when Saturn became a nova.

The seven-branch candlestick was to serve the seven planets. But the "shamash" with a special position—is to serve the sun. It gives light to all other candles, it has also a special position; and its name indicates that it obtained that position on realization of the role of the sun.

The Ball Play

In Egypt religious observations had a counterpart in Mexico. It probably symbolized the change in the direction of the sun across the firmament.

Illumination of Bel

Compare with "Illumination of Osiris" (hayes 328) Ch. VI of the Book of the Dead.
(Explosion of Saturn: nova)

Shaddai

Shaddai may mean "breasts," or the heavenly breasts that supplied the wanderers in the desert with nectar and ambrosia. The Lord of the Breasts, the God of compassion and motherly love for mankind, received this appellative. For the Indians (Hindu) it was a holy heavenly cow.

Ashera

The worship of Ashera or a tree goes back to the time when the world was covered by an envelope of clouds that let food fall onto the ground. The idea of a tree covering the entire earth

was born in the experiences of that period when only from the heaven came food and nothing grew on the ground.

Circumcision

Behind the story of Saturn swallowing his children there must be a factual story of satellites absorbed by the body of the giant planet.

Behind the story of Saturn emasculating his father Uranus there might have been a scene in the sky.

The similar story of Jupiter emasculating his father Saturn may be “transfer” or borrowing, but may be a reflection in mythology of similar events.

Circumcision might have originated as an emulation (but *pars pro toto*) of the acts displayed in the sky—of Uranus being emasculated by Saturn, or Saturn by Jupiter. Having been “commanded” in the days of the patriarch Abraham, it may reflect the latter event. Circumcision has a hygienic value; it could have been found out and sanctified by the astral events.

Christianity

The Christian religion and its mysteries originated in Osirian death and resurrection, and also in the flood of fire caused by the Morning Star.

The first century’s world expected a repetition of cataclysmic events and the end of the world—Sibylline literature, the Apocrypha and other such books, the Gospels and the book of Revelation.

It is possible that the upsurge of such fear was motivated by the fact that between the 15th century catastrophes of the days of the Exodus and of the time of Joshua (Phaethon’s story) and the catastrophes caused by the close approaches of Mars to the Earth in the last act of the theomachy, ca. 700 years passed. After another span of 700 years the fear was intensified.

The Christian religion appealed partly because it could in visual demonstration—painting and sculpture—respond to so many instincts in man and woman—

- adoration of a newborn child
- young mother and child
- a wonder healer
- a young dead
- a mother dolorosa

but also the bi-sexual nature of Jesus (with hair of a woman and beard of a man), whatever was his appearance in life, and especially the masochistic-sadistic tendencies and expressions and experiences of his story, found an echo in many a soul.

Themes for *Sinai and Olympus*

Malki-Zedek

Filekterie

8-year feast in Mexico—Passover
cake

circumcision; Kronos, Uranos	Isaiah and Moses, cf. Koran	Athena-Aten
Angels at Mamrech	Baal	Mitra-Metatron-Mazda
Mazza-Manna	God's Land	Plato and God
Sabbath	Angels, Archangels	Cicero and planets
Shaddai	Star of David	Astrology
Amon	Seven lamps	Jupiter and Venus
Num	Festival of Sukkoth, fruits	Mars and Moon
Gad	grove, ashera	Four span in the sky
Tammuz	Leviathan (Satan)	Exodus-Passover-Mexico
Azazel	Jeremiah and monotheism	Disc of Saints
red cow	Baal psalms	God as creator
Jubilee	Habakkuk	Job and monotheism
Atonement day	Moses-Zarathustra- Quetzalcoatl	Olympus
Mora	Glilim*	Isaiah against Venus
Calendar; New Year	Disk between horns	Seth
Hanukkah; Saturnalia	Brahma-Saturn	Jupiter and Venus cults

***Glilim**

references in the Scriptures - Jeremiah, Ezekiel? Kings? Deuteron. Philol. of the word. Idea of Ben-Yahuda (Osiris). Planets. Opposition to astral religion. Hezekiah? Menashe-sun & planets. Jeremiah. Complaints of the exiled to Egypt. Planets as circling orbs. End of kingdom. When monotheism prevailed.

A 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 earth created by God. He made several earths before ours, but he destroyed them.

But even this land would have no permanence if God had executed his original plan of ruling it according to the principle of strict justice.

It was only when He saw that justice by itself would undermine the world that He associated mercy with justice, and made them to rule jointly.

This earth, too, was not created from the beginning to satisfy the Divine plan. It underwent re-shaping: Six consecutive remouldings; the primeval creation did not delight the Creator; destruction was called upon the ungainly world of flesh and when it did not ameliorate, another destruction was sent to chastise it and still another.

Six times this earth was rebuilt - without entire extirpation of life upon it, but with major catastrophes. New conditions were created after each of these catastrophes; new chances were given to men to improve their inclinations, evil from the beginning.

This is the seventh creation, the time in which we live.

*Several heavens were created, seven in fact.
Seven earths were created: the most removed
the seventh Erez,
the sixth Adamah,
the fifth Arka,
the fourth Harabah,
the third Yabbashah,
the second Tebel,
and our own land called Heled, and like the
others, it is separated [from the foregoing]
by abyss, chaos, and waters.*

The description permits an interpretation that all the seven heavens and earths exist simultaneously; but a deeper insight will allow us to recognize that the original idea did not admit seven concurrent and 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.

The separation of one world from another by abyss and chaos primarily means, it seems, the fiery nearness to the precipice and primeval matter which it encountered and into which it could be—by only a hairbreadth—reduced forever.

The heavens and the earth were changed at every catastrophe. This idea is concealed in the legend of the wandering of Man (Adam).

When Adam was cast out of Paradise, he first reached the lowest of the seven earths, the Erez, which is dark, without a ray of light, and utterly void. Adam was terrified, particularly by the flames of the ever-turning sword.

After he had done penance. God led him to the second earth, the Adamah, where is light reflected from its own sky.

After the murder of Abel, Cain was sent back to the Erez. Accepting his penitence, God permitted him to ascend to the third earth, the Arka, which receives some light from the sun.

In the Ge, the fourth earth, live the generation of the tower of Babel and their descendants - it is not far from Gehenna, close to the flaming fire.

The inhabitants of the Ge are skilful in all arts, and accomplished in all sciences, and their abode overflows with wealth.

When an inhabitant of our earth visits them, they give him the most precious thing in their possession, but then they lead him to the Neshiah, the fifth earth, where he becomes oblivious of his origin and his home.

The inhabitants of Neshiah have no memory [Neshiah = forgetting].

The fourth and fifth earths are like the Arka; they have trees, but neither wheat nor any other of the seven species.

The sixth earth, the Ziah, is inhabited by handsome men, who are the owners of abundant wealth, and live in palatial residences, but they lack water, as the name of their territory, Ziah, 'drought' indicates.

They hasten to any waterspring that is discovered. They are men of steadfast faith, more than any other class of mankind.

Adam passed all these earths, and came to the Tebel, the seventh earth, the earth inhabited by men.

In the myth of Man (Adam) travelling through all the seven earths is a transparent allegory of the physical and human history of the earth. It is even provided with a suggestion which makes it possible to recognize the periods.

The generation which built the Tower of Babel inhabited the fourth earth; but it goes over to the fifth earth, where the men became oblivious of their origin and their home: those who built the Tower of Babel after the catastrophe are told to forget their language.

In accordance with this scheme the catastrophe which destroyed Babel and dispersed the nations was the fourth one. How are the three previous ones pictured or symbolized?

The first catastrophe was symbolized by the expulsion of Man from the blessed land of Eden. It was not a single human pair; the tradition ascribes to Adam the invention of seventy languages.

Hebrew mythology ascribes to the period preceding Adam's expulsion different physical and biological conditions.

The sun was shining permanently on the earth and the Garden of Eden, placed in the East, it must be conceived, was under the permanent rays of the dawn. The earth was not watered by rain, but mist was ascending from the earth and falling 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 the later men.

The body was overlaid with a horny skin.

But Man did not keep the precepts of his Creator and a day came, and

The sun had grown dark the instant Adam became guilty of disobedience.

The flames of the ever-turning sword terrified Adam. In another legend it is told that celestial light shone a little while in the darkness. And then

The celestial light ceased, to the consternation of Adam, who feared that the serpent would attack him in the dark.

The illumination of the first period never returned.

Anticipating the wickedness of the sinful generations of the deluge and the Tower of Babel, who were unworthy to enjoy the blessing of such light. God concealed it, but in the world to come it will appear to the pious in all its pristine glory.

The sky that Man saw never appeared before him again.

The firmament is not the same as the heavens of the first day.

The moon was bigger before, and suddenly grew smaller,

"because he spake ill of the sun." "As a punishment thou mayest keep but one sixtieth of thy light."

The moon, says the Aggada, was envious and desired to be brighter than the sun. According to another legend:

The moon alone laughed when all the celestial beings were grieved by the transgressions of Adam, wherefore God obscured her light. Instead of shining steadily she must be born and reborn again and again.

The earth, too, had to suffer punishment.

Independent before, she was hereafter to wait to be watered by the rain from above. She must produce all sorts of noxious vermin; thenceforth she was to be divided into valleys and mountains; she must grow barren trees, bearing no fruit; thorns and thistles sprout from her; much is sown in the earth, but little is harvested.

Man (Adam) shrank in size.

A vast difference between his later and his former state—between his supernatural size then and his shrunken size now.

The punishment of Adam was manifold:

The food he ate was to be turned from good into bad; his children were to wander from land to land; his body was to exude sweat,

and he lost his horny skin.

It was but since the fall of Man, according to the Aggada, 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 since the same time that the days began to grow shorter and again longer. And this is told in the following story:

Cast out of the Garden of Eden, Adam and Eve sat in great distress, mourning and lamenting. Adam noticed that the days were growing shorter and feared lest the world be darkened on account of his sin, and go under soon. But after the winter solstice, when he saw that the days grew longer again, he spent eight days in rejoicing.

The narrator adds: "This is why the heathens celebrate the calends and the saturnalia in honor of their gods, though Adam had consecrated those days to the honor of God."

The myth presents the foe of Man in the form of a fallen angel, Satan, who was dismissed from the heavenly host, and whose representative on earth, and the cause of the disgrace, was the serpent.

The serpent had previously another appearance.

Before the fall of Man it stood upright, had feet, and was of extraordinary size. The mouth of the serpent was closed, his hands and feet were hacked off. "Because thou becamest the vessel of the Evil one: Upon thy breast and thy belly shall thou go, and of thy hands and thy feet thou shalt be deprived, Thou shalt not remain in possession of thy ears, nor of thy wings."

Not only the dragon and Man, whom he had brought into distress altered their ways, but the whole of nature as well. Thistles and thorns were generated by the soil. The variety of species diminished. The change was brought about partly in connection with the sin of Cain.

Earth quaked under Cain. The ground changed and deteriorated at the very moment of Abel's violent death.

The trees and the plants in the part of the earth whereon the victim lived, refused to yield their fruits, and only at the birth of Seth they began to bear again. But never did they resume their former power.

While, before, the vine had borne nine hundred and twenty-six different varieties of fruit, it now brought forth but one kind. And so it was with all other species.

The third generation—that of Enosh—was also told to have been visited by disgrace.

God caused the sea to transgress its bounds, and a portion of the earth was flooded. This was the time also when the mountains became rocks, and the dead bodies of man began to decay. For the sin of idolatry the following generations were no longer in the likeness and image of God: they resembled apes.

Since that time came a greater change in the habits of human beings:

The remnants of men began to trespass against the birds, beasts, reptiles, and fishes, eating their flesh and drinking their blood.

It was in the celestial harmony and disharmony that the secrets of the upheavals were conceived to lie; this was known to mankind already in the Adamite age, according to the Aggada.

In Hebrew mystic teachings there is the story of the book of the Angel Raziel.

After Adam's expulsion from the Garden of Eden he prayed to God:

"Grant me knowledge and understanding, that I may know what shall befall me, and my posterity, and all the generations that come after me, and what shall befall me on every day and in every month." There appeared to him the angel Raziel, bearing a book in his hand.

"Thy words were heard. I have received the charge to teach thee pure words and deep understanding, to make thee wise through the contents of the sacred book in my hand. And all thy descendants and all the later generations, if they -will but read this book in purity, with a devout heart and an humble mind, will, too, foreknow what things shall happen, and in what month and on what day or in what night. All will be manifest to them -they will know and

understand whether a calamity will come...” At the moment when Adam took the book, a flame of fire shot up and the angel rose heavenward with it.

Adam of the Aggada invented seventy languages, Cain his son built cities and monuments and ruled over kings. They were representatives of generations. It is also said that the measure of the Genesis—“a day”—is meant to be a God’s day, or a thousand years. Thus Adam, who lived 930 years, did not live even one day:

“Now, ye know not what manner of day I meant—one of My days of a thousand years, or one of your days.”

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.

This means that stelae with calendric and astronomical calculations were made public knowledge in the second or third era. 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. (Genesis 5:24)

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. He had already visited heaven in his vision

Once before he had been permitted to see all there is on earth and in the heavens. Once, a time when he was sleeping, a great grief came upon his heart and he wept in his dream, not knowing what the grief meant, nor what would happen to him.

Two men, their faces shone like the sun, their wings were brighter than gold, their hands whiter than snow, said to him: “Be of good cheer, be not afraid; the everlasting God hath sent us to thee, and lo! to-day thou shalt ascend with us into heaven. And tell thy sons and thy servants, and let none see thee, till the Lord bring thee back to them.”

He saw all the seven heavens.

He saw the fifteen myriads of angels who go out with the sun and attend him during the day, and the thousand angels who attend him by night.

Each angel has six wings, and they go before the chariot of the sun, while one hundred angels keep the sun warm, and light it up...

They showed him also the six gates in the east by which the sun goes forth, and the six gates where he sets, and also the gates by which the moon goes out, and those by which she enters.

In another variant of the *Book of Enoch* it is said:

I went to the West to the end of the earth. And I saw a burning fire which ran without resting, and paused not from its course day or night, but ran regularly.

And I asked saying: "What is this which rests not?" Then Raguel, one of the holy angels who was with me, answered me and said unto me:

"This course of fire which thou hast seen is the fire in the west which persecutes all the luminaries of heaven." —The Book of Enoch, p. 23

Enoch in his prophetic vision reached the seventh

In the seventh heaven he saw the seven bands of archangels who arrange and study the revolutions of the stars and the changes of the moon and the revolution of the sun, and superintend the good and evil conditions of the world.

After he had received all the instructions from the archangel. God revealed unto him the great secret, which even the angels do not know.

He told him how, out of the lowest darkness, the visible and the invisible were created, how he formed heaven, light, water, and earth, and also the fall of Satan and the creation and sin of Adam He narrated to him, and further revealed to him that the duration of the world will be seven thousand years, and the eighth millennium will be a time when there is no computation, no end, neither years, nor months, nor weeks, nor days, nor hours.

Go upon the earth, and tell thy sons what things I have said to thee. Give them the works written out by thee and the writings of thy fathers, and they shall read them, and shall distribute the books to their children's children and from generation to generation and from nation to nation.

The account of what I shall do may not be lost in thy family in the deluge to come. For on account of the wickedness and iniquity of men, I will bring a deluge upon the earth.

A numerous generation will rise again, I will show them the books of thy writings and of thy father, and the guardians of them on earth will show them to men who are true and please me. And they shall tell to another generation.

The *Book of Enoch* recites the vision that visited him,

"I had laid me down in the house of my grandfather when I saw a vision how the heaven collapsed and was borne off and fell to the earth.

And when it fell to the earth, I saw how the earth was swallowed up in a great abyss, and mountains were suspended on mountains, and hills sank down on hills, and high trees were rent from their stems, and hurled down and sunk in the abyss." —The Book of Enoch 83: 3-5

Enoch assembled his sons and instructed them faithfully about all the things he had seen, heard, and written down, and he gave his books to his sons, to keep them and read them, admonishing them not to conceal the books, but tell them to all desiring to know.

After thirty days the Lord sent darkness upon the earth, and there was gloom, and it hid the men standing with Enoch. And the angels hastened and took Enoch, and carried him to the highest heaven. And the people saw, and did not understand how Enoch was taken.

He was a great man in his generation.

Kings and princes, no 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.

The story of his ascension is drawn also in these features: Enoch 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 on 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 that one who disappeared.

In this story the seven heavens correspond to seven millennia; the six changes, those that have occurred or are still to occur, correspond to the six gates of the sun and the moon; the eighth revolution and the eighth millennium will have no end, no years, no time; this millennium means endlessness in chaos.

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

The myth says that Enoch was transformed into one of the celestial host.

His body was turned into celestial fire—his flesh became fire, his bones glimmering coals, the light of his eyes heavenly brightness, his eyeballs torches of fire, his hair a flaring blaze, all his limbs and organs .burning sparks, and his frame a consuming fire. To the right of him sparkled flames of fire, to the left of him burned torches of fire, and on all sides he was engirdled by storm and whirlwind, hurricane and thundering.

It was with the last day of the long age of Methuselah, the long-living son of Enoch, that the next catastrophe began. Seven days before the deluge

The people heard a great commotion in the heavens, and saw as if nine hundred of celestial mourners in the sky were deploring the end of the age.

After these “seven days of grace” when frightful sights and sounds were seen and heard, began the deluge. 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. [\(1\)](#)

It is said that the real period of grace endured for 120 years. During this time the flood was over mankind as a threat.

But men did not abandon their evil ways; the very favorable conditions under which they lived contributed to their sinfulness.

They knew neither toil nor care, and as a consequence of their extraordinary prosperity, they grew insolent.

In the last seven days before the deluge, when the terrifying signs and commotion filled the heavens, in those “last days of respite.” God changed the way of nature—as already stated.

“After seven days” [Gen. 7:4, 10] - in these seven days the Holy One changed the order of the creation and the sun was rising in the west and setting in the east.—Talmud Sanhedrin, Fol. 108b:

Then began the deluge.

All the fountains of the great deep were broken, and the windows of heaven were opened.
(Genesis 7:11)

The water was extracted from the earth and driven to the surface, and at the same time a rain poured—not out of the clouds, but out of heaven, even out of a definite direction.

The upper waters rushed through the space left when God removed two stars out of the constellation Pleiades.

These upper waters were hot, not as waters of a common rain.

The sinners were hot (in their sin) and were punished by a hot rain, God bade each drop pass through Gehenna before it fell to earth.—Talmud Sanhedrin Fol. 108b

Since the day when the waters flooded through the “windows of heaven” and during the deluge, the sun was veiled, and the earth trembled and volcanoes erupted.

The Lord shook that day the whole earth, the sun was darkened, and the foundation of the earth trembled, and all the earth vomited lava, lightnings flashed, thunders roared, and a loud din

grew all over the earth, as never known before to its inhabitants.⁽²⁾
All the time the deluge lasted the sun and the moon shed no light.

The story of the ark is well known from the biblical tale. The Aggada adds details; The waters were in no way quiet; it was dark outside; the inside of the ark was illuminated by a precious stone.

The flood began to toss the ark from side to side. All inside of it were shaken up like lentils in a pot. The lions began to roar, the oxen lowed, the wolves howled, and all the animals gave vent to their agony.

The duration of the flood is described differently—forty days and also much longer.⁽³⁾

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 without 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 and in this catastrophe. The areas where now the shores of the Mediterranean sea are, were once the shores of an open ocean: this may be concluded from the following statement, if true:

Before Noah, the sea was in the habit of transgressing its bounds twice daily, morning and evening. Afterwards, it kept within its confines.

The constellations of the sky in this part of the world, it seems, moved after the deluge from their place.

To put a stop to the flood. God had to transfer two stars from the constellation of the Bear to the constellation of the Pleiades. That is why the Bear runs after the Pleiades. She wants her two children back, but they will be restored to her only in the future world.

Before the deluge there were peoples of gigantic size. The first man grew smaller after the fall, but his dimensions were still great, and after each catastrophe the giants became increasingly rare.

A myth of the Hebrews and of many other peoples knows to recite the story of some beings called ‘the sons of God’ who came from the universe, or from another planet, and whose offspring with the women of the earth were giants.

The sons of God saw the daughters of men that they were fair; and they took them wives of all which they chose.

There were giants in the earth in those days; and also after that when the sons of God came in unto the daughters of men, and they bare children to them, the same became mighty men which were of old, men of renown. (Genesis 6: 2, 4)

‘There is nothing new under the sun.’ The fancy about the men from Mars of modern novelists was already a legend and a tradition of old. Enoch was brought away in a cyclone of stones. The sons of God of the heaven reached the earth.

The Emim, Rephaim, Zamzumim or Anakim, races of giants, were supposed to be the descendants of these sons of heaven. Few of them succeeded to survive the later catastrophes, those that followed the deluge, and were destroyed entirely shortly afterwards.

From the huge species that were found on the earth in former times, fewer and fewer specimens survived through the ages» and those only in remote countries, where they were still said to be seen, and were described by the travellers of Biblical times. Their fantasy was impressed especially by the greatest sea-animal, leviathan, the greatest mammal “Behemoth,”⁽⁴⁾ the greatest of the reptiles “reem,” and the greatest among volata, “ziz.”

Leviathan is more than merely large and strong. His fins radiate brilliant light. His food consists of the fish which go bet-ween his jaws of their own accord. When he is hungry a hot breath blows from his nostrils. “So enormous is leviathan that to quench his thirst he needs all the water that flows from the Jordan into the sea.” As leviathan is the most notable representative of the fishkind, so behemoth is the most notable representative of the mammal kind.

Behemoth matches leviathan in strength, and he had to be prevented, like leviathan, from multiplying and increasing, else the world could not have continued to exist;

after God had created him male and female He at once deprived him of the desire to propagate his kind.

Formidable though behemoth is, he feels insecure until he is certain that leviathan has satisfied his thirst.

When the leviathan and the behemoth will enter a duel with each other

the issue will be that both will drop dead, behemoth slaughtered by a blow of leviathan’s fins, and leviathan killed by a lash of behemoth’s tail.

With these descriptions (sometimes exaggerated like all travelers’ stories), the cosmogony and natural science of the Hebrews belabor a field which seems to be restituted by the excavations of fossils.

The combat of the monsters was verified by the finding of their bones together, from the position of which a duel and a devouring of one by the other was imagined.

The question was asked, what could have been the defensive or offensive weapon of the brontosaur, the largest of these animals? ; no horns, no strong teeth, no nails to attack. In the above description the answer, and a plausible one, is delivered: they struck with their mighty tails, about thirty feet long.

The peer of the leviathan and behemoth between the reptiles was reem, a giant animal which was so rare in the time it was described that the traveler stated: “only one couple, male and female, was in existence”.

The act of copulation results in the death of the male. He is bitten by the female and dies of the bite. At the end of a long period she gives birth to twins, a male and a female. The year preceding her delivery she is not able to move. For a whole year the animal can but roll from side to side, until finally her belly bursts, and the twins issue forth. Their appearance is thus the signal for the death of the mother reem. Its horns measure one hundred ells, and their height is a great deal more.

In the realm of birds ziz is the king.

When, at the time of the autumnal equinox, it uses to flap its -wings and utter its cry, the birds of prey, the eagles and the vultures blench.

The travelers reported that:

“Its wings are so huge that unfurled, they darken the sun.”

Even greater exaggerations were composed, e.g., that it is able to protect the earth against the storm of the south. The huge animal, the narrator agrees, could not be placed in the Ark of Noah. The survival of one of them is explained in a childish manner: it was tied to the ark and swam behind it.

Other animals were described. In the name of Enoch was told about the existence of

flying creatures, wonderful and strange in appearance, with the feet and tails of lions, and the heads of crocodiles; their appearance is of a purple color like the rainbow.

Leaving aside the color, which cannot be proved from the fossils, the bones of an animal of this description may be identified with the fossils of the Pterodactyl.

Through time only a few of these huge animals remained, and these even were “deprived of the desire to propagate their kind” ; they were not equipped to bear their monstrous mass upon the earth, when the conditions of gravitation changed with the change of the orbit. Only with great difficulty could they support themselves on their hind legs; in a state of pregnancy they were not able any more to erect themselves.

The places from where the travelers brought the stories of these animals were situated beyond the ocean.

The ocean is situated to the west, and it is dotted with islands upon islands, inhabited by many different peoples. Beyond it, in turn, are the boundless steppes full of serpents and scorpions... To the north of it are the supplies of snow, hail, ice, darkness and windstorms.

The Hebrew history of developments in the animal knows also to relate about other changes, occurrence of which belongs to the period of the deluge.

Before the catastrophe of the deluge

the dog united with the wolf, the cock with the pea-fowl, and many others paid no heed to sexual purity.

The “impurity” was abandoned; but the sentiment of repulsion of one species against other species grew, and developed into cruelty.

Cats and mice, foes now, were friends originally.

Similarly, dogs and cats maintained a friendly relation to each other, and only later on became enemies.

A legend connected with the sojourn of the animals in the ark brings the belief that

Even the physical peculiarities of certain animals were not original features with them, but owed their existence to something that occurred subsequent to the creation.

It was asserted that the mole lost its eyes, the frog its teeth, and the mouth of the mouse became widened, and a fable connected with the sojourn in the ark was appropriated to this alleged metamorphosis.

Lesser changes in the haircover of the steer were described in another tale.

Before the deluge the animals that are impure (for food) were in large majority; after the deluge the proportion was inverted. This tradition might be the source of the legend about the presence of seven pairs of pure and only one pair of impure animals in the ark.

As in animals, so in the human being, the sexual inclination to unite himself with not of his kind was said to have been changed into a hostile attitude towards his own kind and sex.

The descendants of Noah began to quarrel and slay, eat blood, wage wars, people against people, and nations against nations and cities against cities and do all manner of evil.

According to this cosmogony and natural history, the hunger for flesh and the thirst for blood was an obvious result of the catastrophe. Was it a sudden anemia, due to changes in the atmosphere, the oxygen of which, with the exogenous hydrogen became the water of the flood? It is said:

After the flood each and all began to bite.

And the fear of you and the dread of you shall be upon every beast of the earth, and upon every fowl of the air. (Genesis)

And every moving thing that liveth became meat of the human being like the green herb of the soil.

Restriction was to be put upon the vampirous lust:

*But flesh with the life thereof, which is the blood thereof, shall ye not eat.
And surely your blood of your lives will I require. (Genesis 9:4-5)*

Those animals and men who escaped the catastrophe with their lives were rescued, only to start a struggle of annihilation among themselves.

This stimulated lust of sadism is a corollary of the inversion of the sexual impulse. The story is told in Genesis. Ham tried to execute on his father the act of castration, or an indefinite act also belonging to the complex of inversion.

But another Aggadic story ascribes the carnivorous lust to the impulse implanted in the generations of the giants by their forefathers, who had once come as “sons of God” from the sky to this earth. Together with the longing for blood they are said to have brought their knowledge in every field of science, and especially in astronomy and astrology. This legend is in discord with the legend about the book of the angel Raziel brought to the first generation.

With the spread of mankind, corruption increased.

A civilization was destroyed the real value of which is incalculable. In the next age the whole population of the earth amounted to a few millions. Even this number if brought forth from a few rescued families is very large, but the Aggadist admits this amount:

Ten years before Noah's death, the number of subjects to the three princess Nimrod, Joktan and Phenech amounted to millions.

The knowledge of astronomy and the secrets of its reckoning were rescued and it is said in this manner and variant:

God gave to Adam the book of the angel Raziel, which he studied day and night...

Upon the death of Adam, the holy book disappeared, but later the cave in which it was hidden, was revealed to Enoch in a dream.

It was from this book that Enoch drew his knowledge of nature, of the earth and of the heavens; and he became so wise through it, his wisdom exceeded the wisdom of Adam.

Once he had committed it to memory Enoch hid the book again.

When God resolved upon bringing the flood on the earth. He sent the archangel Raphael to Noahs "I give thee the holy book, that all the secrets and mysteries written therein may be made manifest unto thee.

Noah took the book, and when he studied it, the holy spirit came upon him, and he knew all things needful for the building of the ark.

The book, which was made of sapphires, he took with him into the ark, having first enclosed it in a golden basket.

All the time he spent in the ark it served him as a time-piece, to distinguish night from day.

Before his death he entrusted it to Shem, and he in turn to Abraham. From Abraham it descended through Jacob, Levi, Mose and Joshua to Solomon.

This might even have been the knowledge of months, years and periods of comets that the remote generations had acquired—and the hope grew into faith that no such or similar destruction would come any more to decimate mankind.

A new and till then unknown atmospheric phenomenon was said to be the rainbow. In this colored reflection of the sun in small and suspended drops of water the rescued believed to see the divine promise not to repeat the flood.

The next destruction was that of the tower of Babel. A strong commotion caused that a part of the tower sank into the earth; another part was consumed by fire. Remained only a rest...

[The builders of the tower] were scattered from thence upon the face of all the earth... The Lord did there confound the language of all the earth. (Genesis 11:8-9)

(In Arabic traditions the destruction and the subsequent confusion of memory was related to the south of Arabia: it was a paramount catastrophe).

In the Aggadic cosmogony this generation is called “the people of men who lost their memory” ; the earth they inhabited was “the fifth earth”, that of oblivion.

Whether the Hebrew cosmogony reckoned one more destruction of universal character to occur between the time of the deluge and the Exodus depends on the following:

Altogether six catastrophes are supposed to have occurred, and we live on “the seventh earth”. The later catastrophe of the time of Joshua is not reckoned. The catastrophes of the Exodus could be numbered as two: one in Egypt and one at the shores of the Red Sea. If they were thought of as one, the fifth catastrophe would have been either in the time of Abraham, when in an upheaval the earth swallowed the tetrapolis, or, more probably, in the time of Peleg, about whom it is said: “in his days was the earth divided.” (Genesis 10:25.) The meaning is likely to be: “when the continents were separated”.

It is some lost knowledge that is concealed in these few words. In antiquity the traditions were vivid, were guarded as precious knowledge, and transmitted from generation to generation. It is said that Serug son of Reu taught his son Nahor the arts of the Chaldeans and the signs of the heavens; a legend told that when Abraham was born “one great star came from the east and ran athwart the heavens and swallowed up the four stars at the four corners.” It is said that in the days of Abraham the planet Jupiter appeared in the east instead of in the west;⁽⁵⁾ it is said that Abraham during his sojourn in Egypt

taught the inhabitants of that country astronomy and astrology, unknown in Egypt before his time.

The sixth earth is called Ziah, the earth which thirsts for water; her inhabitants rush to any place where they hope to find a well. This description is in accord with the stories of the patriarchs, the wells being the object of dispute. But with even more justification the earth Ziah or the sixth

earth would fit the time following the Exodus, when brooks disappeared, the populations of entire countries wandered to find pastures.

The description of the catastrophe of the Exodus was narrated *in extenso* in *Worlds in Collision*; here it will be only mentioned in short.

The destruction of the world in the days of the Exodus was not smaller than in the days of the deluge. It closed, in the conception of the Hebrews, the age of creation. The hurricane that twice during five or six weeks crossed the orbit of our earth signified the end of the time when the earth and men were to be shaped and reshaped;

the old covenant was kept only in its promise not to bring a paramount flood upon the earth: a flood of fire came instead of the flood of water. The covenant, according to the moral conception of the Hebrews, was a reciprocal deed. The one partner, that who was obliged not to shed the blood of the fellow-man was in no way a fair accomplisher of his part of the covenant.

The Israelites were tortured in Egypt. More than one legend insists that the Israelites when behind the imposed number of bricks, were punished in a cruel manner which had to horrify them and keep them in a steady check: Israelite children were put into the mortar and inserted into the walls, between the rows of bricks. There is nothing improbable in this story.

The world was shattered, and it reeled to and fro as a reed in the wind. In a crescendo came the ten plagues.

First came the thin red coloring dust; the hot blast brooded the insects and small reptiles, quick in multiplying. Unquietude seized all creatures, and they began to migrate. Then, when the earth was deeper in the trail of the comet, meteorites flew and killed everything in the field; then followed the neck of the comet and a "touchable darkness" that endured for three days; when the head of the comet passed just at its closest approach to the surface of our earth in darkness of charcoal and night, an earthquake of immense power ruined every house everywhere.

When six weeks later the Hebrews were .at the Red Sea the head of the comet was approaching on its return from perihelion. The last night before its arrival darkness again draped the world.

It was a cloud and darkness but it gave light by night. (Exodus 14:20)

The Aggada says: the darkness at the Red Sea was the same darkness of Egypt that returned once more.

The atmospheric and hydrospheric parts of the planet are the most likely to be driven towards a new gravitational field. Just as in the days of the deluge when the waters of the deep and lava were driven out of the core of the planet to its surface, the waters of the ocean and of every sea were heaped high in double tides; on the other side of the planet the waters ran asunder to find the nearest possible place to the celestial body that was passing close by; and the air moved still swifter, tossed and driven in the encounter of two celestial bodies: it was a hurricane, this "strong East wind all the night" (Exodus 14:21).

Lava flowed like in the days of the deluge; the earth trembled; the mountains melted; lands rose and others submerged; springs disappeared in one place and appeared in another; cultivable land, desert and sea, all changed their places. The desert was showered with inflammable fluid, and months and years later ignited over and again; the earth cracked and swallowed men and beasts.

The Hebrew tradition ascribes to Moses the prediction of most of these phenomena, especially of those which took place in Egypt. The Hebrew legends ascribe to him also the knowledge of the celestial movements and the art of prediction. If the periods were known to him, he could prophesy guided not only by his spirit, but also by his knowledge.

In the pitiless destruction by tempest and fire the Israelite refugees were graced; they saw nature keep the old faith and old covenant with them; not only were they graced, they were saved by the destructions. A few weeks later they stood around the mountain of Horeb and heard in a stormy night of a roaring desert the ten commandments. A new covenant was closed between the Creator of the universe and a people roaming around in a trackless desert, in a time when the entire world became once more void and waste. For them it was a rebirth of freedom.

The work of creation and the repeated reshaping of the earth and man were accomplished. It began the seventh day which lasts up to today and will last up to the final destruction.

According to the initial Hebrew conception of the creation, which I tried to reconstruct here, the six ages were terminated by six destructions; the world of today is the result of six metageneses. The story of the first chapters of the Bible is of a later, mythological, and very probably alien origin. The "six-day creation" is a mythological remodeling of an historical knowledge or belief. The whole of ancient history preceding the Exodus is the time of genesis, and therefore is also included in the book of Genesis.

With the Exodus, the end of Genesis, and the new flow of time, a new calendar was to be established.

And the Lord spake unto Moses and Aaron in the land of Egypt, saying, This month shall be unto you the beginning of months; it shall be the first month of the year to you. (Exodus 12:1-2)

The seventh age which started since then shall not be interrupted until the end of the world; the world in the perception of the remainder was by a hair breadth near to peril, and the next time it would not survive.

The sabbath, the seventh day, is a symbol and an assurance that no other metagenetic catastrophe will come. In keeping this solemn day of rest on the seventh day, the creator is implored to refrain from reshaping the earth similarly.

The seventh day was simultaneously the symbol of the grace displayed by Providence to slaves chased by their pursuers and a memorial to the Exodus. It had to become the day of freedom to all who work, man and animal.

The prayer of the Jews on the evening of Saturday, composed of two old fragments, brings together: the end of creation and the final harmony among the heavenly host, stars and planets; the beginning of a new time-reckoning from the last act of genesis, and the leaving of Egypt, house of bondage.

The sixth day. Accomplished were heaven and earth and all their host. And God accomplished at the seventh day all work He did, and abstained in the seventh day from all work He did. And God blessed the seventh day.

Blessed be God, Lord of the universe, who sanctified us by his ordinances and who was benevolent to us, and in love and good will gave us 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. Thou didst choose us, and didst sanctify us from amidst all the peoples. And the sabbath, thy holy one, in love and good will thou endowest us. Blessed be the Lord, who sanctifies the day of rest.

The assembling of three different causes for the establishment of the sabbath would seem to be a confusion, had they not been simultaneous occurrences: the last act of creation, the new flow of time, the Exodus from Egypt.

Some fifty years passed since the morning at the Red Sea. The world was once more in flames. Once more it was brought out of its path. But what happened in the days of Joshua, when the sun and the moon stood in the heaven and hot stones in myriads fell on this earth -was minimized in the Hebrew tradition. A combustion of the world was an episode, though a main episode, in the life of this disciple of Moses, who was said to be the successor of the knowledge of Enoch, and who could know what may happen after the rain of stones announced the approached of the still unvanishing errant planet; on his grave was inserted a memorial inscription to the event, which was emphasized as of no equals the Lord listened to the wish of a mortal who ordered the sun and the moon to stop and fulfilled his wish.

But this time the Israelites were the offenders; therefore the link of ethos and pathos lacked between the cosmic event and the assault by the Israelites.

References

1. Josephus, *Antiquities of the Jews* 11.8, borrowed by Yashar Bereshit 10a: These tablets with their Hebrew characters could still be seen on some island in India in the time of Alexander the Great. (L. Ginzberg, *Legends*, vol. V, p. 149).
2. *Sefer Hayashar*, new edition by L. Goldschmidt.
3. 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 when he married is told by the Aggada to have been 498 years; this would indicate that the year was shorter; it could still consist of a number of months, but not of months of thirty days; the days themselves could have been shorter.
4. *Talmud*, Shabbat 156.

5. Behemeoth means the “huge animal” or “animals”—not to be identified with the behemoth of today.

Astrology

Astrology interested itself chiefly with the relative positions of planets and with their conjunctions. Diodorus of Sicily, after recording the Chaldeans assert that planets change their velocities and periods of time, says: “These stars exert the greatest influence for both good and evil upon the nativity of men; and it is chiefly from the nature of these planets and the study of them that they know what is in store for mankind.”⁽¹⁾

It is perfectly correct to say as Diodorus did because of the great changes which were brought upon mankind and the nature of everything living on this planet by encounters with other planets. But from the truth of this belief of the Chaldeans and to the wrong conclusions was but a short distance. If the planets at their different encounters caused flood, hurricane, or conflagration, destruction of animals, or appearance of new plants, man could easily conclude that this or that consequence is the result of a special character of this or that planet.

The Chaldeans tried to build their astrology empirically: they noticed every year the movements of the stars, the conjunctions that took place and the political and natural changes in the realm. Very many such observations were made and written down.⁽²⁾ From the idea that the position of planets influences the nature and the life of nations and kings, to the idea that it influences a single individual, was but one step. A fiery character of some men could be compared with the fiery character of Venus or Mars. In the *Tractate Sanhedrin* of the *Babylonian Talmud* it is said that “He who is born under Venus will be wealthy and unchaste. What is the reason? Because fire was created therein. . . He who is born under Mars will be a shedder of blood.”⁽³⁾

It was supposed that the position of planets in the hour of conception is fateful for the building of the character and also for the future of the individual. So for example in the book of Hindi; astrology. *The Bri-hajgatakam* of Varaha Mihira, it is said: “When Venus and Saturn are in one sign, persons become short-sighted, earn money, and increase it through their wives or young women, are authors and painters . . .”⁽⁴⁾ Sahagun reports that among the Aztecs “soothsayers who tell the good or bad fortune children are going to have, according to the date, time or signs of their birth.”⁽⁵⁾

References

1. Diodorus Siculus, II. 31.1.
2. R.C. Thompson, *The Reports of the Magicians and Astrologers of Nineveh and Babylon in the British Museum* (1900).
3. Fol. 156a, transl. by H. Freedman (London, 1938).
4. *The Bri-hajgatakam* of Varaha Mihira, translated by Swami Vijnanananda (Allahabad, 1912), p. 321.
5. Bernardino de Sahagun, *Historia de las Cosas de la Nueva España*, Bk. I, ch. 1.

Amen and Aten

Amenhotep IV, who is better known by the name he adopted—Akhnaton, is described in books on Egyptian history and in those books on the development of religion as a great heretic and also as the “first monotheist.” These claims are built upon the fact that he abrogated the cult of Amon or Amen, until then the chief deity in the Egyptian pantheon, and substituted it by the worship of Aton or Aten, a reform audible in the change of names—from Amenhotep to Akhnaton. The reform was carried on with great zeal—the name of the god Amon was erased from the inscriptions of the capital Thebes and the name of Aten substituted. The name of Akhnaten’s father—Amenhotep III—was subjected to the same mutilation. Akhnaten built a new capital to the north of Thebes and called it Akhetaten, the place where Aten rises. The claim of being the “first monotheist” of world history was made for Akhnaten on the basis of his hymn to that deity, by Egyptologists and then turned again in books of authors writing on religion or history in general. The question of whether Akhaten was the first monotheist (or even a monotheist in general) requires revision already because of the fact that Akhnaten lived not in the 14th but in the 18th century. But, first of all, the identity of the rejected deity and that of the substituted require elucidation.

One is usually told that Amon was a solar deity and that Aten was also a solar deity. Thus it comes to a rather unclear reform: one deity that symbolized the sun was rejected and another deity that symbolized also the sun was elected. In this presentation the revolutionary character of the reform is hardly obvious: it amounts, actually to only a little more than to a change of names. It would be, actually not a greater reform than substitution in a modern Christian creed of a Madonna of Lourdes by a Madonna of Guadalupe. In this example, the chapel at a place where an apparition of the deity took place and the cult connected with it, are in competition with the cult and a chapel at another location, with similar claims. But hardly would the name of a deity of one place be erased and its cult debased in the second place. Therefore there is something unexplained in the violence with which the votaries of the Aten cult exterminated all that pertained to the Amen cult. If Amen and Aten were both solar deities, then the passions that accompanied the change of the cult—first from Amen to Aten and, after Akhnaten, back from Aten to Amen—must have had their origin in something that is yet unexplained.

Actually the statement that Amen was the divine personification of the sun, or the sun itself, is based on nothing known from any Egyptological source. Just because Amen was the supreme deity and the sun is the supreme luminary in the sky it is assumed without any further inquiry, that Amen was the sun. Following this kind of logic, Zeus must have been a solar deity, too. However we know that Zeus was the Roman Jupiter, was the god of that planet; Helios—the solar deity, was certainly not the highest deity; and even in the form of Apollo, the sun was not supreme on the Greek Olympus. Actually, we have statements of Greek authors that Amen was the Egyptian Zeus-Jupiter. Thus the authors who describe the visit of Alexander to the sanctuary of Amon in the oasis of Siwa in the western desert identified Amen with Zeus-Jupiter. Thus we see that the identification of Amen with Helios or the sun is not built on anything but a priori thinking, as expressed by E. Renan, who wrote that the only astral religion that appears natural is the worship of the sun, the great luminary, the giver of light and warmth, and life itself.

The cult of Jupiter was abrogated by the king-heretic and in its place was elevated the cult of Aten. Which deity was worshipped in the Aten?

The famous hymn composed by Akhnaton or by a royal poet,⁽¹⁾ says in parts:

Thou appearest beautifully on the horizon of heaven,
Thou living Aton, the beginning of life!
When thou art rise on the eastern horizon,
Thou has filled every land with they beauty....
Thy rays encompass the lands to the limit of all that thou hast made....
When thou settest in the western horizon,
The land is in darkness in the manner of death...
At daybreak, when thou arisest on the horizon,
When thou shinest as the Aton by day,
Thou drivest away the darkness...

This description is strongly suggestive of Aten being the sun. Additional indirect argument for this identification can be found in the way the Palestinian potentates used to address the pharaoh: "You shine like the sun in the heavens." The king being compared to the sun, the sun must been considered the highest deity. However, already Amenhotep II, the father of Akhnaton, was compared with the sun in the letters of these potentates. Yet these very letters disclose which was the supreme deity of the correspondents from Palestine.

The most prolific writer of letters from Palestine was the king whose name is usually read Rib Addi, but in translation into Hebrew would be the "eldest brother (or son) of the father," or equivalent of Ahab. The identification of Rib Addi with Ahab was offered and substantiated by us in *Ages in Chaos*, Vol. I, by a very extensive and detailed analysis. More than sixty letters of this king of Sumura (Shemer or Shomron-Samaria) were preserved in the archive of el-Amarna to Akhetaten the capital of Akhnaten. He usually opened his letter with this blessing: "May Belith of Gubla..." In *Ages in Chaos* we identified the deity Belith with the female consort of the god Belus, of which Josephus Flavius wrote that it was brought to Israel from Phoenicia by Jezebel, the chief wife of Ethbaal.⁽²⁾ We have also identified Gubla with the name of Jezreel until Jezebel's death.

From the Scriptures we know of the great and passionate struggle which went on in the days of Ahab in Palestine. At a time when the southern kingdom, that of Judah, the chief deity was Yahwe, in the Northern Kingdom, that of Israel, the chief deity was Baal and according to the testimony of Josephus, Baalith, which is the female form of the name. We have also the multiple testimony that Belith or Baalith was the planet Venus, or the Queen of Heaven in the language of Jeremiah, two and a half centuries later. The planet Venus or Ishtar of the Babylonian cult, as we have shown in *Worlds in Collision*, was worshipped in the Greek world as Athene. Athene was second only to Zeus and in Athens, the city called by her name, she was the most honored deity. Athene being recognized as the offspring of Zeus, that sprang fully armed from his head, it was not antagonistic to Zeus, already because of the polytheistic character of Greek religion that made it possible to worship many astral deities simultaneously. A century or two after the time we describe here, the time of Akhnaton and Ahab, the celestial conflict

between Athene and Ares (Mars) made the tribes on earth to take sides and in the time the Achaeans (the Greeks) had chosen Athene for their protecting deity, the Trojans of Priam had Ares as their protector. In another description of Athena's birth, the Greeks had it being cleaved out of a pillar of cloud by Zeus. In Palestine, however, the protracted debate—which was the astral deity that was dominating the scene in the days of the Exodus-Passage and theophany on Mt. Sinai, caused a long and bitter schism its beginning can be seen in the dispute that made Moses and Aaron...

Eliahu.

Again the hymn of Akhnaton.

Venus rivalled the sun in light.

Similarity to Ishtar hymns.

Solar cult only with Menasseh.

Aten=Athene.

Struggle also in Mazda & Mithra

References

1. The Hymn to the Aton, translated by John A. Wilson, in *The Ancient Near East, Vol. I. An Anthology of Texts and Pictures*, edited by James B. Pritchard.
2. Josephus, *Jewish Antiquities* 8:316 (Whiston translation): "Ahab... also took to wife the daughter of Ethbaal, king of the Tyrians and Sidonians, whose name was Jezebel, of whom he learned to worship her own gods. This woman was active and bold, and fell into so great a degree of impurity and madness, that she built a temple to the god of the Tyrians, which they call Belus, and planted a grove of all sorts of trees; she also appointed priests and false prophets to this god."

World Catastrophes as Punishment

In his great fright and looking back on what did happen to a former generation, the thinking man imagined that the catastrophe must have been provoked by the iniquity of the ancestors, their vices and evils. Such thought could provide a hope for a non-repetition of catastrophes: should humankind abstain from wretched acts, it would be spared. By this, man assumed that the planetary gods could be kept at bay by his own decency - and if he already formulated for himself what is good and what is evil, or ate already from the tree of knowledge of good and evil, he needed a covenant with the outraged deity and commandments for behavior.

Whether the catastrophes were really provoked by sinful behavior or not - the answer is not easily provided: is always a good deed rewarded and a sinful behavior punished?

Rabbi Abuya, surnamed Acher, one of the greatest rabbinical authorities of the second century of the present era, became an agnostic when his pious colleagues were flayed of skin and burned alive; and millions of the martyrs that were gassed in our time have raised the question of

whether mercy and righteousness save from doom, and the tens of thousands of their tormentors living to a good old age raise the same question from its other side.

The saying of the sage, "I have reached an old age and I have not seen a pious man given to evil fate," is most certainly self-deception and actually an injustice and mockery: it adds insult to injury. It is an assertion to justify the unseen power, that must be wise, good, and omnipotent; if such attributes are not the qualities of the deity, then all hope for an insurance against evil by righteousness is dissipating. But if the power against which man is pitted, is sensitive to the distinction of good and evil, then the only hope is to placate it by abstention from evil and furtherance of good.

When the chronicler tells us that the Deluge was caused by the population of the world growing evil and that the Lord repented of his act of creation and decided to destroy it, he needs to ascribe to the animal world the same depravity and moral wretchedness that he ascribed to man. G. Couvier, paleontologist and catastrophist, asked with sarcasm: Was the fish free from ardent passions that it was spared in the common destruction? (But, to a great extent, it perished, too).

Man grew evil, a catastrophe destroyed him, but did the few survivors come purified by the disaster and by their own miraculous salvation? The biblical story of the deluge tells us that as soon as the waters subsided, Noah drank himself drunk, and his son, Ham, committed some act of indecency, the Midrashic version of the act being castration of his drunken father; and this scene on the large stage of the devastated world, does not convey the thought that the worthwhile ones were the object of salvation, nor does it lend support to the conviction that a global catastrophe is called for to rejuvenate humankind.

It is asserted that the Lord made a covenant with the survivors - Noah and his descendants - as he made another one, more detailed, with the survivors of the holocaust of the days of the Exodus - the deluge of fire - when, amid the groaning nature, Moses interpreted the groans as commandments. It is clearly in the domain of a psychological truth - this imposition of self-restraint, an awakening of the sense of good and evil. Man and the animal kingdom - all on this earth together - are bound by a common bond to placate the great power by self-restraint in pursuit of pleasures, by suppression of instincts, and by sacrificing pleasurable things to the all-powerful deities.

The deity must have created man good, if it, itself, is good; if it created man bad, then there is no point in punishing him for the nature with which he was endowed from the beginning. Where is left room for absolving the deity from being unjust? Obviously, in the self-accusation by man of having lost his innate purity and of having selected evil when he was free not to do so. Here again, man, by accusing himself of degeneration, grasps for the only hope of mollifying the Great Power, or great powers; he accuses his free will and behavior for what happened in the past and ascribes to the Deity a good plan, a perfect creation, a just attitude towards its creatures, though not a merciful one. Therefore, the Lord has to repent of having created man and animal; but where is, then, the prescience of Omnipotent?

And what particular sinfulness can be ascribed to animals? If one insect places its eggs into the body of another creature and the larvae when hatched will devour the host from the inside of his

body - and if the Creator is not responsible for this arrangement, is the animal kingdom to be rightly accused of cruelty and insensitivity to the sufferings of others?

But the catastrophes did not eradicate or change such cruel urges, and witness to this is any book on zoology, especially on insects and their most cruel parasitic schemes needed for survival and procreation, or on the widespread urge to suck blood, and the almost omnipresent need to devour. With the last of these urges man is endowed, too; but strangely, the talmudic tradition tells us that only after the Deluge did man become carnivorous. Can this be regarded as a change from vice to holiness? Then is the belief that the world's population was nearly completely destroyed because its nature and behavior became unchaste or violent, only an invention to justify the act of uncontrollable powers? Was it invented to give solace and hope in the face of the unchained terrors of the past and equally horrifying prospects for the future? If bad inclination and outrage did bring chastisement, would not an upright spirit and good acts assuage the powers and avert the repetition of the act that carried the world to the brink of annihilation?

The Birth of Monotheism

Zeigt es sich so, dass die Religion Israels auch in der Gottesidee selbst dem Wandel unterworfen war, so kann das nur dem befremdlich oder anstößig erscheinen, der an den Fortschritt menschlichen Denken nicht glaubt.

H. Torzkyner, *Die Bundeslade und die Anfänge der Religion Israels*, (2nd ed., 1930), p. ii

The Israelites lived on the same planet as the other peoples; the same world catastrophes impressed them as the other peoples. The cause of the catastrophes, as far as it was known to the Babylonians or Egyptians, must have been known also to them. Since the world catastrophes were caused by planets, each of these planets must have been deified not by a single people, but by all peoples, without exception. The fact that the ancient Hebrew word for God, *Elohim*, is plural can be accounted for by this. The Bible critics since Julius Wellhausen⁽¹⁾ paid much attention to the fact that in diverse parts of the Bible God is named by diverse names: Adonai, Elohim, Jahwe. Accordingly the Bible critics discern those parts which were composed by the followers of the cult of Elohim, who supposedly lived in the Northern Kingdom (Israel) from those which were composed by the adepts of the cult of Jahwe, whose religious center was in Jerusalem (Judah). Then, in the opinion of these critics, at a later date the literary remnants of these two cults, together with the material composed by—and in the interest of—the priestly cast (Priestly codex) were edited together and thus the syncretized Bible came into being. No doubt, there are sections in the Biblical narrative where one or another name of God is persistently used to the exclusion of other of the Lord's names. The origin of this syncretized religion which eventually brought the Jewish people, and then through them a large portion of the human kind to monotheism is sought in local and regional deities which became gods of single tribes, then rising to the status of protecti

ve national gods; thus Jahwe is sometimes described as the local deity of the Sinai volcano who became the god of Israel; similarly Chemosh of Moab or Chiun of Amalek were local gods of those nations.

The historical facts are different. Gods of all nations were planetary gods, and actually the same gods. For one or another reason one or another tribe or people chose one or another deity as its protector and paid especial tribute to it. A new world catastrophe caused by another member of the planetary family would easily raise it to the position of the supreme deity; on the other hand the fidelity to the protective deity of the previous age would cause one or another tribe to remain faithful to the old cult; religions and gods are tenacious contents of the human soul and peoples do not part easily from them. Thus we see how the worship of Jupiter superceded that of Saturn; the worship of Venus (Minerva, Athena, Astarte, Baal) in many regions eclipsed the worship of Jupiter; and the advent of Mars and its participation in celestial wars brought new schisms into religious thinking and caused new religious wars. Thus the Greeks battled under the patronage of the planet Venus (Athena) whereas the Trojans battled under the protection of Mars (Ares); but Ares was also recognized as god by the Greeks and Athena as a goddess by the Trojans. Similarly the Toltecs, faithful to the cult of Quetzalcoatl, the planet Venus, warred and succumbed in the war against the Aztecs, the younger race that proclaimed Mars (Huitzilopochtli) as their god. The Romans regarded Mars as their protective deity but their main sacrarium was dedicated to Jupiter and Minerva (Athena). Egyptians also regarded Amon as their supreme deity and Ra was its other name. In another cult center of Egypt Osiris and Isis were worshipped as supreme gods; in early times they represented Saturn and Jupiter; at a later time Isis became synonymous with Astarte-Athena, the planet Venus.⁽²⁾

A few peoples through consecutive planetary ages kept fidelity to the ancient Kronos (Saturn), whose age was previous to that of Jupiter. Thus the Scythians were called Umman-Manda by the Chaldeans,⁽³⁾ and Manda is the name of Saturn.⁽⁴⁾ The Phoenicians regarded El-Saturn as their chief deity; Eusebius informs us that El, a name used also in the Bible as a word for God, was the name of Saturn.⁽⁵⁾

The different names for God in the Bible reflect the process of going through the many ages in which one planet superceded another and was again superceded 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 two major planets, Adonai, which means "my lords" became the appellative of the dual gods; then, with the victory of Jupiter, it came to be applied to him alone; thus Adonai and also Zedek was the name of Jupiter, and in the days of the patriarch Abraham, the cult of Jupiter was prominent in Jerusalem of the high priest Melchizedek (my king is Zedek).⁽⁶⁾ Zedek remained the name of Jupiter in the astronomy of the Jews in later ages and is used as such in the Talmud.⁽⁷⁾ There we find also the legend that in order to teach Abraham not to believe in astrology God reversed rising of the planet Zedek (Jupiter) and it began to move towards the west.⁽⁸⁾ In another passage of the Talmud it is said that "the planet Zedek made the night bright for him (Abraham)"⁽⁹⁾ meaning that his time was under the aegis of the planet Jupiter.

We recognize in the reversion of the revolution of Jupiter 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 Egypt. In that period Jupiter became the supreme deity having removed Saturn from its orbit. Meichizedek was the priest of the “Most High”—the name by which Jupiter was known to the Greeks: “all-highest, mighty Zeus.”⁽¹⁰⁾

The end of the Middle Kingdom in Egypt was caused by a new world catastrophe: a period of a few centuries only intervened between this catastrophe and the previous one caused by Jupiter. Actually it was caused again by Jupiter, because the comet Venus was expelled from its body; this expulsion followed the contact of Saturn and Jupiter, and the fantasy of the peoples regarded Venus as a child of Jupiter, conceived to him by Saturn. But more than this origin of Venus, the fact that the peoples of the entire earth were confused and in many instances regarded Zeus-Jupiter as the planetary god that battled with the pillar of smoke or the trail of the comet, was of far-reaching consequences for the development of religion and the progress toward monotheism.

Yahwe was the name of the deity that caused the Middle Kingdom of Egypt to fall into ruins, bringing equally great or greater disasters to the rest of the world. The name of the deity became known only a little time before the catastrophe, and this is asserted in the Book of Genesis.

The sound “yahwe” heard, amidst the catastrophe was understood as the revelation of the name of the superior deity,⁽¹¹⁾ and since and since other planets were submissive to and dependent on the planet Jupiter it grew to the position of the supreme god, other gods being its messengers; angels or archangels. It is probable that Moses in his time, as Plato eleven hundred years later understood the supreme deity as existing above and beyond the planets, regulating them, ordering them, but not one of them; Plato speaks of God and also of gods or planets; and characteristically Numenius calls Plato “Moses speaking in an Attic dialect.”⁽¹²⁾ The fact that the Decalogue contains the prohibition to make an image of the god is a strong support to this idea of Moses being aware of a Supreme Power behind the terrible planets. According to the Biblical tradition Aaron made an image of a calf (Apis) at Mount Sinai, which is the image of Venus for many centuries to come; but due to the confusion concerning the agent of the catastrophe, Zeus is also often figured as a bull. As a bull it carries the Evening land to the east⁽¹³⁾—a reversal of the poles about which we spoke at an appropriate place.⁽¹⁴⁾ The cult of Apis actually started after the end of the Middle Kingdom, in the days of the Hyksos⁽¹⁵⁾ or, according to my reconstruction of ancient history (Ages in Chaos) in the very days which followed the Exodus of the Israelites from Egypt.

But it should not go unnoticed that Moses also built an image in the desert, the image of a serpent, and though there is found a rationalistic explanation of this his deed in the assumed fact that the contemplation of the serpent was a remedy for those who were bitten by snakes—an interesting psychosomatic idea—and though an abundance of reptiles, and especially snakes, was observed also in other places at that time—so in China of the Emperor Yahu,⁽¹⁶⁾ and the Arabian desert abounded with snakes still in the time of Esarhaddon in the seventh century,⁽¹⁷⁾ yet we are not persuaded that the serpent made by Moses was not a religious symbol, a competitor of the calf image. It could have been the image of the pillar of smoke that went before the camp when the Israelites left Egypt. The Hyksos who at the same time invaded Egypt deified the snake deity known as Seth, Apopi, identified by the Greeks with on Typhon.⁽¹⁸⁾

Chiun, in the words of Amos: “Chiun, your images, the star of your god”⁽¹⁹⁾ denoting Saturn, in the opinion of Max Seligsohn,⁽²⁰⁾ is identified by Jerome as Lucifer⁽²¹⁾ or Venus; being an image of a star carried in the desert, it could be this serpent. The fact that Moses made an image—in violation of the second commandment of the Decalogue — is not necessarily inconsistent with his being a monotheist: there are many churches today where symbolic and even human figures are deified by people who profess to be monotheists. But as time passed, the presence of the serpent of Moses in the Temple of Jerusalem became so objectionable to the spirit of the prophets that in the days of Isaiah the serpent was broken into pieces.⁽²²⁾ Even though its original purpose may have been curative, it being the image of the angel who was sent in the pillar of fire and cloud to save the people of Israel from slavery, the brazen serpent with the lapse of time became an object of worship.

Whatever the sublime height to which the spirit of Moses carried him in the days of a cosmic catastrophe, with the passing of time the Jewish people reverted to idolatry—and the pages of the Bible are full of testimony to this fact.⁽²³⁾

There were no images of the deity in the Temple of Solomon as there were in Egyptian and Babylonian temples, full of statues of the planetary gods. The ark of the covenant contained the tablets with the ten commandments and the holy spirit; the holy spirit, a metaphysic nebula of the theologians, may have partaken a little of the divine clouds that surrounded the Israelites in the desert and which were of extraneous origin; it was a portion of the deity, its emanation. Also a jar with manna of the same origin was preserved in the sacrum.

The god Yahwe was the supreme Deity of the Judeans and they excluded all other rival deities from their pantheon. But in the four odd centuries of the time of Wandering and the Judges the astronomical science made progress. Soon after the sky of the desert of Wandering became free from the carbogenous clouds and the Israelites emerged from the desert they saw the comet Venus, Noga, illuminating the sky. In the days of Joshua it caused the second derailment of the earth from its path in the short interval of fifty-two years. The Israelites could believe that it was still the old and furious planet Jupiter that descended close to the earth. But as time passed, and the new orientation of the sky became better known, and the old constellations were recognized in their new positions, and the planets in their new orbits, the astronomers of Babylon, Egypt and Palestine became aware that Jupiter is not the comet Venus. During the time of the Judges the name Baal was often applied to the deity of the most popular cult, as the names of many Israelites of that period attest.

When in the fifth year after the death of Solomon the Northern part of the kingdom was separated from Judah, Benjamin, Simeon and part of Levi a temple was built in Dan to compete with the temple in Jerusalem;⁽²⁴⁾ this temple of Dan was called “the house of High Places,”⁽²⁵⁾ which translates that it served also as an observatory or center for the cult of astral deities. Jeroboam actually renewed there the cult of Aaron: a calf was worshipped, at Dan.⁽²⁶⁾ On the Phoenician coast the deity Baal, or Belith (Baalith), which is Baal in its female form, or Ishtar (Astarte), which was also a male and a female deity⁽²⁷⁾ was worshipped, this being also the comet Venus.

The supremacy of Yahwe in the Jerusalem cult rose to monotheism. Elijah was its apostle in the Northern Kingdom, and he was in strife with the priests of Venus. The spreading of the cult of Venus (Baal, Baalith, Ishtar) in the Northern Kingdom was due not only to the external influence of the Phoenicians or Babylonians, but in the first place to the fact that Venus was the most conspicuous object in the sky, which illuminated as brightly as the sun,⁽²⁸⁾ and also to the fact that it threatened the world with new catastrophes, and finally to the fact that like the Babylonians, Egyptians or Brahmans, the Israelites could find out that it was Venus, not Jupiter, that caused the catastrophes in the middle of the second millennium, which in terms of the Israelite history meant that Venus is the celestial body which had ruined the Egypt of oppression and opened the way through the Sea of Passage. This astronomical understanding of facts, together with the brilliancy of Venus, caused many to fall away from “the God of the fathers,” or from the deity of the ancient age that, after all, was not the deliverer from the yoke of Egypt. This explains the long struggle between the adherents of Yahwe and the adherents of Baal. The adherents of the cult of the “God of our fathers,” pressed by the revelations of astronomical science, ceded so far as to say that if it was not the ancient Lord who caused the deliverance from Egypt, then it was his messenger, or angel. And though Jupiter became a modest looking object in the sky when compared with Venus, it is still the stronger one. Similarly in Greece the planet Jupiter (Zeus), which looks less imposing than Venus, was recognized as the stronger deity; although in the beginning there was also a confusion as to who had battled Typhon-Pallas, the pillar of cloud—Zeus or Athena—already in the days of Homer the supremacy of the planet Jupiter which is able to remove all other planets, the earth included, from their orbits, was recognized fact.⁽²⁹⁾

In Palestine, like in Mexico and in other places, Venus was appeased every fifty years, the sending of a goat to Azazel, or Venus, into the desert⁽³⁰⁾ was not a sacrifice to a worshipped deity but the removal of a threatening and vicious deity. It seems that the Day of Atonement was observed in the beginning only once in fifty years, at the beginning of the year when Venus was expected on its cometary orbit. A number of instances in the Scriptures can be referred to to substantiate this point.⁽³¹⁾ And that Azazel is Venus is clear from the fact that Azazel was regarded as a fallen star-angel, which is Lucifer, another name of Satan. Set, the Egyptian name of the damaging comet, is the origin of the very name Satan. Uzza, the other form of Azza,⁽³²⁾ was “thrown into the Red Sea”⁽³³⁾ which implies that the authors of this legend knew the role of Venus in the cataclysm of the Sea of Passage. Also in the Arab pantheon el-Uzza is the planet Venus,⁽³⁴⁾ and as late as the Middle Ages it was venerated in Mecca, and Mohammed also paid homage to it.⁽³⁵⁾ Thus Azazel to whom the scapegoat was sent was Venus.

When in the eighth pre-Christian century Mars supplanted Venus as the threatening planet the Hebrew prophets did not regard it as a deity by itself, but as a messenger of the Supreme Deity: “Behold, the Lord hath a mighty and strong one, which is a tempest, hail and a destroying storm, as a flood of mighty waters overflowing, shall cast down to the earth with the hand,”⁽³⁶⁾ said Isaiah. And Amos spoke of the Lord who makes Khima and Kesil, or Saturn and Mars.⁽³⁷⁾

It can easily be that hymns to Baal found place in the Scriptures, and only the name of the Hebrew God was substituted instead of Baal, though I would not vouch for this.⁽³⁸⁾ The chapter of Habakkuk makes the impression of describing an apparition of the comet Venus:

“His glory covered the heavens...and his brightness was as the light; he had horns coming out of his hand... burning coals went forth at his feet ... [he] drove asunder the nations; and the everlasting mountains were scattered... Was thine anger against the rivers? Was thy wrath against the sea, that thou didst ride upon thine horses and thy chariots of salvation...? Thou didst cleave the earth with rivers. The mountains saw thee, and they trembled: the overflowing of the water passed by: the deep uttered his voice... The sun and moon stood still in their habitation: at the sight of thy arrows they went, and at the shining of thy glittering spear. Thou didst march through the land in indignation, though didst thresh the heathen in anger... Thou didst walk through the sea with thine horses, through the heap of great waters.”⁽³⁹⁾

In Judea Jupiter by-and-by became the Supreme God, not connected with any planet, a process that can be traced also in the writings of Greek philosophers, Plato in the first place, some five hundred years later. Thus religion was at odds with astronomy of the age. But in the Northern Kingdom the process of disassociating the deity from the celestial object had not yet been completed when the Kingdom was destroyed (-723 or -722), and its population was led away into captivity, from which they did not return. “And they [the tribes of the Northern Kingdom] left all the commandments of the Lord their God, and made them molten images, even two calves, and made a grove, and worshiped all the host of heaven and served Baal” (II Kings 17:16).

Since the day when Israel became a people, this Earth was severely threatened at two periods: in the days of the Red Sea passage with an epilogue at Gibeon and in the days of Jerusalem and Sennacherib, with prologues in the days of Ussiah and on the burial day of Ahaz. At the Red Sea as well as at Jerusalem heavenly wrath destroyed the host of a cruel oppressor.

Great was the wonder at the natural phenomenon which took place at the sea, but it had its physical cause. Really wondrous was the coincidence: Escaped slaves, encircled by a pursuing foe, stood before the stormy sea, when it was rent asunder before the persecuted ones, and shortly thereafter swallowed up the pursuing host of the tyrant.

When, some seven hundred years later, the Earth was again drawn out of its path, once more the wonder lay not in the retrograde rotation of the Earth for a few hours or minutes, but in the coincidence: the army of the despot before whom the whole world trembled, who had just blasphemed against the Lord of Heaven and Earth, was encamped on its way to storm Jerusalem, and the very night before the attack could begin it was scorched by a heavenly blast of combusting gases. In the morning the army was but a heap of one hundred eighty five thousand dead bodies.

Two great catastrophes, two great salvations—how could a people fail to believe that it was preserved for some great destiny?

After -687, one hundred years passed by. Not only did Hezekiah receive a period of grace, but also the people of Jerusalem—from -687 to -587.

The result of the great wonder in the days of Hezekiah was the reverse of what it should have been. Only a few years after the deliverance of Judea from the hand of Sennacherib, Manasseh,

son of Hezekiah, who at the age of twelve succeeded his father Hezekiah on the throne of Jerusalem, came under the influence of diviners hostile to Isaiah, and alienated himself from the spirit that dominated the palace in the days of his father. He “observed times,” which means that he followed the advice of the astrologers, who read in the constellation of the planets orders and vetoes for kings and their peoples. During the greater part of Manasseh’s reign, which endured for more than half a century, planets were officially worshipped in Jerusalem. Manasseh “built altars for all the host of heaven in the two courts of the house of the Lord” (II Kings 21 : 5). “For he [Manasseh] built again high places which Hezekiah his father had broken down, and he reared up altars for Baalim, and he made groves, and worshipped all the host of heaven, and served them” (II Chronicles 33 : 3). This was actually a realistic interpretation of the matter.

It was in the time of Josiah, grandson of Manasseh, and shortly before the exile of Judah to Babylon, that a pure monotheism emerged as an outcome of the progress the Jewish people had made during its long struggle for national existence, on the one hand, and for purification of its concept of God, on the other. “And the king [Josiah] commanded Hilkiah the High Priest ... to bring forth out of the Temple of the Lord all the vessels that were made for Baal and for the grove, and for all the host of heaven: and he burned them without Jerusalem in the fields of Kidron, and carried the ashes of them into Bethel. And he put down the idolatrous priests, whom the kings of Judah had ordained to burn incense in the high places in the cities of Judah, and in the places round about Jerusalem; them also that burned incense unto Baal, to the sun, and to the moon, and to the planets, and to all the host of heaven” (II Kings 23 : 4-5).

In the last passage the division of the astral gods is the same as that used by Democritus, who spoke of “Venus, sun, and moon, and the planets, thus affording to Venus a special position, a fact that surprised the commentators.”⁽⁴⁰⁾

Jeremiah had a clear conception of a God who is over the entire creation. “Do not I fill heaven and earth? saith the Lord” (Jeremiah 23:24).

The Scriptures do not hide the fact that in Judea, as well as in Israel, the planetary cult was the official cult with the priests and with kings, with many prophets and with the people. Thus Jeremiah, contemporary of King Josiah, says: “At that time, saith the Lord, they shall bring out the bones of the kings of Judah, and the bones of his princes, and the bones of the priests, and the bones of the prophets, and the bones of the inhabitants of Jerusalem, out of their graves: and they shall spread them before the sun, and the moon, and all the host of heaven, whom they have loved, and whom they have served, and after whom they have walked, and whom they have sought, and whom they have worshipped” (Jeremiah 8 : 1-2). And again he says: “And the houses of Jerusalem, and the houses of the kings of Judah, shall be defiled as the place of Tophet, because of all the houses upon whose roofs they have burned incense unto all the host of heaven” (Jeremiah 19 : 13).

In the days of Jeremiah and King Josiah, a scroll was found in a chamber of the Temple (II Kings 22). It is generally thought that it was the book of Deuteronomy, the last book of the Pentateuch. The text of the scroll made a strong impression on the king (Deuteronomy 4:19):

And lest thou lift up thine eyes unto heaven, and when thou seest the sun, and the moon, and the stars, even all the host of heaven, shouldest be driven to worship them, and serve them, which the Lord thy God hath divided unto all nations under the whole heaven.”.

The scroll continued: “Thou shalt not make thee any graven image, or any likeness of any thing that is in heaven above, or that is in the earth beneath...” (5:8), which is a passage of the Decalogue (Exodus 20 : 4) verbatim.

If there be found among you...man or woman, that hath wrought wickedness... and hath gone and served other gods, and worshipped them, either the sun, or moon, or any of the host of heaven, which I have not commanded... then shalt thou bring forth that man or that woman... and shall stone them with stones, till they die. (17: 2-5).

Thus we see the centuries-long struggle for the Jewish God, Creator and not unanimated planet, itself a creation, being carried on in the closing decades before the exile to Babylon with the help of the book whose authorship was ascribed to Moses.

In -587 Jerusalem underwent a long siege by the host of the Chaldeans. Nebuchadnezzar, a fourth-generation descendent of Sennacherib, beleaguered Jerusalem. Jeremiah did not tell the king and the people, as did Isaiah a century before, that the Lord would save them from the hand of the conqueror. Jerusalem heroically defended itself for eighteen months; at last its walls were broken through and soon thereafter the temple and the city were destroyed by the host of Nebuchadnezzar, and became a desolation. The people was dragged into slavery.

When the people of Jerusalem were exiled to Babylon, and group of refugees succeeded in escaping to Egypt, taking with them Jeremiah, they said to him: “But we will certainly ... burn our incense unto the queen of heaven, and to pour out drink offerings unto her, as we have done, we, and our fathers, our kings, and our princes, in the cities of Judah, and in the streets of Jerusalem: for then had we plenty of victuals and were well, and saw no evil. But since we left off to burn incense to the queen of heaven, and to pour out drink offerings unto her, we have wanted all things, and have been consumed by the sword and by the famine” (Jeremiah 44:17-18).

It is apparent from this passage that the population of Jerusalem that sought refuge in Egypt thought the national catastrophe fell upon their people, not because they had left the Lord God, but because in the days of Josiah and his sons they had ceased to worship the planetary gods of Manasseh and especially the Queen of Heaven, the planet Venus.

Of this remnant of the people that went to Egypt in the beginning of the sixth century a military colony was established in Ebb (Elephantine) in southern Egypt. Documents (papyri) of this colony were unearthed in the beginning of this century. The Jewish colony in Elephantine faithfully worshipped Yahu (Yahwe), the Lord of the sky, as the theophoric names of many members of the colony testify. Scholars were puzzled, however, to find on one of the papyri the name Anat-Yahu; they were uncertain whether it belonged to a goddess or a place or a person. “Anat is the familiar name of the Canaanite goddess identified with Athene in a Cyprian inscription.⁽⁴¹⁾ The historical facts revealed in the present research make the understanding of

such cult easier. The dark tradition that it was the planet Venus that played such an important role in the days when the forebears of these refugees in Egypt left that land and passed through cataclysms of fire and water, sea and desert, was responsible for this syncretism of names.

But at that time the ideas of Jeremiah and other prophets of monotheism grew to a strong flame in the soul of the people, and the moral code of the Jewish people was carried with the exile towards the east, and only a few decades after the destruction of the Temple of Jerusalem by Nebuchadnezzar, Buddha in India and Lao-tze and Confucius in China started their gospels.

The idea of some Bible critics that the Jewish people obtained their idea of monotheism in the Exile of Babylon is wrong. The Assyrians and Babylonians, according to the inscriptions which survived in abundance, worshipped simultaneously all planets. Marduk or Jupiter was the Supreme God, but in various times or even in single periods in the life of a single person, this or that deity was obtaining preeminence. So we see that Nebuchadnezzar in his younger years worshipped Astarte (Ishtar)-Venus and in later years Marduk-Jupiter; and his name indicates a reverence for Mercury (Nebo).

The Jewish people did not obtain all of its “supremacy”⁽⁴²⁾ in that one day at the Mountain of Lawgiving; this people did not receive the message of monotheism as a gift. It struggled for it; and step by step, from the smoke rising from the overturned valley of Sodom and Gomorrah, from the furnace of affliction of Egypt, from the deliverance at the Red Sea amid the sky-high tides, from the wandering in the cloud-enshrouded desert burning with naphtha, from the centuries-long battle for freedom against the Amalekite-Hyksos tyranny, from the internal struggle, from the search for God and for justice between man and man, from the desperate and heroic struggle for national existence on its narrow strip of land against the overwhelming empires of Assyria and Egypt, it became a nation chosen to bring a message of the brotherhood of man to all the peoples of the world.

In years to come, one from their midst was made god by many from among the most cultured peoples of the world; the Jews dispersed in exile among the nations were required to believe that one of their midst was god, or God’s “only son.” After having achieved pure monotheism seven hundred years earlier they would not retreat to worship god in the effigy of man. Which other people would reject the demand to believe in one of their own as the god for all nations and the lord of the universe? How much preference they could draw from it, being the nation from which God’s only son had sprung? Probably every nation of the world would have exploited such an opportunity for its own benefit, becoming priests of the world. But the Jewish people achieved its idea of God through too many sacrifices, and it was too conscious of this fact to make a deal and to succumb to this temptation; and it went to all sufferings, consciously, for the right to proclaim the faith in the only God. With this sentence they went on the *auto da fé* of the Inquisition of the Church of Love: “Hear, O Israel, there is but One God.” With these words on their lips, no doubt, most of the six million Jews who were murdered in our days ended their lives in the gas chambers built by Germans or on the gallows built by the British. The Jewish people did not invent monotheism, nor did it receive it in an easy way: it struggled to come to it, and when it came to it, it carried the message to all corners of the globe, suffering everywhere for not abandoning its conviction in an only God and one mankind.

References

1. J. Wellhausen, (*Die*) *Composition des Hexateuch und der historischen Bücher des Alten Testaments*, third edition, (Berlin, 1899).
2. Plutarch, *De Iside et Osiride*, chap. 62: "They often call Isis by the name of Athena."
3. Cyril I. Gadd, *The Fall of Nineveh* (London, 1926).
4. P. Jensen, *Die Kosmologie der Babylonier* (Strassburg, 1890), p. 114.
5. *Praeparatio Evangelica*, IV.xvi.
6. Genesis XIV. 18
7. W.M. Feldman, *Rabbinical Mathematics and Astronomy* (New York, 1931).
8. *Babylonian Talmud*, Tractate Shabbath 156b.
9. Louis Ginzberg, *The Legends of the Jews* (Philadelphia, 1925), vol. I, p. 232.
10. Homer, *The Iliad*, VIII. 22.
11. See *Worlds in Collision*, Section "Theophany."
12. Quoted in Clement of Alexandria, *Stromata*, I, 153.4; Eusebius, *Praeparatio Evangelica* IX.6 9.
13. Ovid, *Metamorphoses* II. 836ff; Moschus. *Idylls* II. 37-62.
14. *Worlds in Collision*, Section "Quarters of the World Displaced."
15. See *The Book of Sothis of Pseudo-Manetho in Manetho* (transl. Waddell) Loeb Classical Library. The introduction of the cult of Apis is there ascribed to the Hyksos king Aseth.
16. "Yao," *Universal Lexicon*, Vol. LX (1749): "A multitude of abominable vermin was brought forth."
17. E. A. Wallis Budge, *The History of Esarhaddon* (London)
18. Herodotus 11.144.
19. Amos V.26.
20. "Star Worship," in *The Jewish Encyclopedia* (New York-London, 1905).
21. Jerome's *Commentary on the Prophets*
22. This was done by King Hezekiah. See II Kings 18:4.
23. Cf. Moses' warning against the worship of the heavenly bodies in Deut. IV:19, XVII.3; also Exodus XX:4, Deut. V;8; II Kings XVII:16, XXI:5; XXIII:4-5, 11-12; Zeph. 1:5; Jeremiah VIII:2, XIX 13, also VII.8.
24. I Kings 12: 26-29.
25. I Kings 12:31
26. I Kings 12:28
27. Lucian, *De Dea Syria*.
28. Midrash Rabba, Numeri 21, 245a; see *Worlds in Collision*, Section "The Comet Venus."
29. Homer, *The Iliad* VIII.20ff.; Eustathii Archiepiscopi Thessalonicensis *Commentarii ad Homerum Iliadem* (Leipzig, 1828) Vol. II, p. 184, (695. 10-12).
30. Leviticus 16:8-26.
31. E.g. Leviticus 25:9ff. That the Day of Atonement was observed only at the Jubilee period can be concluded also from the fact that this festival was not honored by Ezra the scribe, the editor of a large part of the Scriptures.
32. Ginzberg, *Legends* V. 152, 170.
33. *Ibid.* VI. 293.
34. See "al-Uzza," (1913-1934), Vol. IV.

35. J. Wellhausen, *Reste arabischen Heidentums* (2nd ed., 1897) pp. 40-44.
36. Isaiah 28.2
37. Amos V. 8. [Cf. Velikovsky, “[In the Beginning](#),” Section “[Khima](#).”]
38. Detailed comparisons between Ugaritic and Biblical texts seem to bear this out. See in *Analecta Orientalia*
39. Habakkuk, ch. 3
40. J.B.J. Delambre, *Histoire de l’astronomie ancienne* (1817), I. 407.
41. E. Sachau, *Aramaifche Papyrus and Ostraka aus einer jüdischen Militarkolonie zu Elephantine* (1911), p. xxv.
42. S. A. B. Mercer, *The Supremacy of Israel* (1945).

Anaxagoras

Science started in the shadow of prison bars. Anaxagoras, who was born on the western shore of Asia Minor about the year 500 before the present era, taught “the moon has a light which is not its own, but comes from the sun.” From this it followed: “The sun is eclipsed at the new moon through the interposition of the moon.” ⁽¹⁾

“He was the first to set out distinctly the facts about the eclipses and illuminations,” wrote Hippolytus, a father of the Church, in his *Refutation of All Heresies*.

In the first century of the present era Plutarch gave this account:

Anaxagoras was the first to put in writing, most clearly and most courageously of all men, the explanation of the moon’s illumination and darkness. . . . His account was not common property, but was [still] a secret, current among only a few . . . For in those days they refused to tolerate the physicists and stargazers, as they were called, who presumed to fritter away the deity into unreasoning causes, blind forces, and necessary properties. Thus Protagoras was exiled, and Anaxagoras was imprisoned and with difficulty saved by Pericles. ⁽²⁾

Anaxagoras was accused of impiety and sentenced for holding that the sun is a red-hot stone and the moon is of earthy nature. This was in disagreement with the view that these luminaries were deities. He taught: “The sun, the moon, and all the stars are stones of fire, which are carried round by the revolution of the aether.” ⁽³⁾

Anaxagoras was put in prison and was marked for death, but Pericles barely succeeded to release him from the death house and set him free. ⁽⁴⁾ According to another account he was fined the heavy fine of five talents of silver and banished. ⁽⁵⁾ Possibly, the fine and expatriation were imposed upon him in lieu of capital punishment, by Pericles’ endeavor.

According to Theophrastus, Anaxagoras held that the moon was sometimes eclipsed by the interposition of other bodies (besides the earth) traveling below the moon. ⁽⁶⁾ Modern science does not know of such occultations of the moon and therefore denies such an explanation. Only large swarms of meteorites or comets, if interspersed between the earth and the moon, could cause the phenomenon.

Anaxagoras taught also that the terrestrial axis changed its direction in the past.⁽⁷⁾ But if to give credence to Hippolytus, he thought that “the earth is flat in form.”⁽⁸⁾ However, he believed that there are many earths like ours. According to a fragment of his,

Men were formed and other animals which have life; the men too have inhabited cities and cultivated fields as we do; they have also a sun and a moon and the rest (of the stars) as we have, and their earth produces for them many things of various kinds.⁽⁹⁾

In this there was already an initial departure from the belief in the uniqueness of the earth and its central position in the universe.

References

1. Hippolytus, *Refutatio Omnium Haeresium*, I. 8. 6.
2. Plutarch, *De Placitis Philosophorum*, “Anaxagoras.”
3. Diogenes Laertius, *Lives of the Philosophers* II. 8.
4. *Ibid.*, II. 13.
5. *Ibid.*, II. 12.
6. Theophrastus
7. *Diogenes Laertius*, II. 9.
8. Hippolytus, *Refutatio Omnium Haeresium*, I. 8. 3.
9. Fragment 4 (H. Diels ed., *Die Fragmente der Vorsokratiker* [Berlin, 1952] II. 59).

Aristarchus

The first of the Greek philosophers and mathematicians to unravel the celestial plan and announce the discovery was Aristarchus of the isle of Samos. Others before him assumed that the Earth is a sphere and that it moves, but he was the first to formulate plainly the heliocentric theory, the scheme which has the Sun in the center.

Aristarchus lived from about the year 310 before the present era to about 230, and among the geometers he succeeded Euclid and preceded Archimedes. In -288 or -287 he followed Theophrastus as the head of the Peripatetic School established by Aristotle.

Aristarchus' only extant treatise is “On the Sizes and Distances of the Sun and Moon.” In it he calculated the diameter of the Sun as about seven times the diameter of the Earth, thus estimating the Sun's volume as about 300 times the volume of the Earth (the actual diameter of the Sun is about 300 times the diameter of the Earth; the solar volume is equal to 1,300,000 volumes of the Earth). In this work of Aristarchus there is nothing indicating his heliocentric theory. It was probably this his realization of the superior mass of the Sun that brought him to his discovery. Or should a celestial body three hundred times larger than the Earth revolve around it each day?

Aristarchus' book on the planetary system with the Sun in the center did not survive, and we know of it only through references to its content, chiefly by Archimedes. Archimedes, who was

twenty-five years his junior, wrote: “Aristarchus brought out a book consisting of certain hypotheses. . . . His hypotheses are that the fixed stars and the Sun remain unmoved, and that the Earth revolves about the Sun in the circumference of a circle, the Sun lying in the middle of the orbit.” He also added that according to Aristarchus who is in contradiction to “the common account” of astronomers, the universe is many times larger than generally assumed by astronomers, and the fixed stars are at an enormous distance from the Sun and its planets.⁽¹⁾ Aristarchus regarded the Sun as one of the fixed stars, the closest to the Earth. “Aristarchus sets the Sun among the fixed stars and holds that the Earth moves round the sun’s circle (i.e., ecliptic)” referred another author, centuries later.⁽²⁾

As Archimedes said, the view of Aristarchus conflicted with the common teaching of the astronomers, and he also quoted it only to put it aside disapprovingly. One of the contemporaries of Aristarchus, Cleanthes, wrote a treatise “Against Aristarchus.”⁽³⁾ Whatever his scientific argument may have been, he accused Aristarchus of an act of impiety. Plutarch wrote in his book *Of the Face in the Disc of the Moon* (*De facie in orbe lunae*) that Cleanthes “thought it was the duty of the Greeks to indict Aristarchus of Samos on the charge of impiety for putting in motion the Hearth of the Universe, this being the effect of his attempt to save the phenomena by supposing heaven to remain at rest and the Earth to revolve in an oblique circle, while it rotates, at the same time, about its own axis.”⁽⁴⁾

We do not know whether there was any actual court action and verdict; however, we know that a verdict of judges, even if unanimous, could not make the Sun a satellite of the Earth. Not even a scientific tribunal can do this, not even if it is presided over by Archimedes and the most illustrious men of the generation sit as judges.

The spokesman of the scholarly world was Dercyllides, who announced that “we must assert the Earth, the Hearth of the house of the Gods, according to Plato, to remain fixed, and the planets with the whole embracing heaven to move and reject the view of those who brought to rest the things which move and set in motion the things which by their nature and position are unmoved, such a supposition being contrary to the theories of mathematicians.”⁽⁵⁾

Aristarchus had no followers in his generation, nor in the next generation. About a century after Aristarchus, Seleucus, a Chaldean of Seleucia on the Tigris, who lived and wrote about the year 150 before the present era, adopted the teaching of Aristarchus.

Hipparchus was a contemporary of Seleucus. Hipparchus is thought to be the greatest astronomer of antiquity, and even today there are worshippers of his among the members of the faculties. But he rejected the heliocentric system of Aristarchus, and this he did not on a religious ground, but on a scientific one. A system with the Sun in the center of circular orbits could not account for the peculiarities in the visible motions of the planets, but the theory of epicycles could, and this theory had the Earth immobile in the center of the universe.

Thus the religious dogma and the mathematical analysis, both, condemned Aristarchus and his teaching that the Earth circles around the Sun.

References

1. Archimedes, ed. Heiberg, vol. II, p. 244 (*Arenarius* I. 4-7); *The Works of Archimedes*, ed. Heath, pp. 221-222. See Heath, *Aristarchus of Samos*, (Oxford University Press, 1913) p. 302.
2. Aetius (ii.24.8) *Dox. Graec.* p. 355.19 Bekker. See Heath, *Aristarchus of Samos*, p. 305.
3. Diogenes Laertius, *Lives of the Famous Philosophers*, mentions such a tract among the works of Cleanthes. Cf. Th. Heath, *Aristarchus of Samos* (Oxford, 1913), p. 304.
4. *De facie in orbe lunae* ch. 6, pp. 922F-923A; cf. Heath, *Aristarchus of Samos*, p. 304.
5. Theon of Smyrna (ed. Hiller) p. 200, 7-12. Cf. Heath, *Aristarchus of Samos*, p. 304.

Plato

In -399 Socrates was made to drink poison to expiate his crimes by the verdict of an Athenian court. Following his death, Plato, his disciple then about twenty-eight years old, left Athens for a short sojourn at Megara, followed by a longer stay in Italy and Sicily (Syracuse); he also traveled to the Middle East. Only very little is known of this travel.

When a boy of about ten, Plato heard the story of Atlantis from his friend and playmate Critias the younger, what the latter was told by his grandfather, Critias the older, who in his turn had heard it from his friend Solon, who came to Sais in Egypt to learn wisdom and hear the ancient lore. From a very old priest he learned that in the past there had occurred several global catastrophes; in one of them Atlantis was swallowed by the waters of the Atlantic Ocean; in another—the one which the Greeks associated with Phaethon—there was a great conflagration caused by “a deviation of the bodies that revolve in heaven round the earth.” ⁽¹⁾

On his travels, Plato, too, endeavored to learn wisdom from the wise men of the East. But since the time of Solon’s visit in Egypt that country went through a spiritual debasement and it is questionable whether anyone of the priestly class there could be counted as a spiritual peer of Ezra, or a worthy teacher of Plato in search of wisdom.

Later Greek philosophers regarded Plato as influenced by Mosaic teaching. “Plato derived his idea of God from the Pentateuch. Plato is Moses translated into the language of the Athenians,” wrote Numenius and was quoted by Eusebius. ⁽²⁾

If one considers Plato’s monotheism, his concept of an invisible and supreme spiritual Being, so different from the prevalent polytheism of other Greek philosophers and so remote from the pantheon of Homer and its scandalous Olympians with their permanent strife and marital and extra-marital affairs with mortal women, one is inclined to think that Plato, at the time of his travel to Egypt thirty years old, happened to sit at the feet of Ezra. A late Greek tradition has it that Aristotle on his travel to the lands of the eastern Mediterranean met a very wise Jew from whom he learned much wisdom. ⁽³⁾ However, it is not known whether Aristotle ever went to Palestine and Egypt. Besides, in Aristotle, a pupil of Plato, one feels a return to a polytheistic astral religion. Could it be that the indebtedness of Greek thought in the days of Plato to the

Semitic idea of one and single invisible Creator stemmed from Ezra? We also don't know of any "wise and knowledgeable man" approximating Ezra's stature in the next few generations. All this belongs to the realm of the possible but unproven, and the probable presence of Ezra in Jerusalem after -398 (in the days of Artaxerxes II) is of interest for this intriguing problem.⁽⁴⁾

References

1. Plato, *Timaeus* 22 C-D, 25 A, D.
2. Eusebius, *Preparation for the Gospel* (transl. Gifford), XIII, 12.
3. Clearchus of Soli, quoted in Theodore Reinach, *Textes d'auteurs grecs et romains relatifs au Judaïsme* (Paris, 1895), pp. 10-11.
4. See *Peoples of the Sea*, "Ezra."

Cicero and Seneca

Cicero in the last century before the present era, the statesman and philosopher of republican Rome, declared the stars to be gods. The divinity of the planets he explained by their occupying the sublime positions and by their following unerringly their paths.

Since the stars come into existence in the aether, it is reasonable that they possess sensation and intelligence. And from this it follows that the stars are to be reckoned as gods. For it may be observed that the inhabitants of those countries in which the air is pure and rarefied have keener wits and greater powers of understanding than persons who live in a dense and heavy climate. . . . It is therefore likely that the stars possess surpassing intelligence, since they inhabit the ethereal region of the world.

Again, the consciousness and intelligence of the stars is most clearly evinced by their order and regularity . . . the stars move of their own free will and because of their intelligence and divinity. . . . Not yet can it be said that some stronger force compels the heavenly bodies to travel in a manner contrary to their nature, for what stronger force can there be? It remains therefore that the motion of the heavenly bodies is voluntary. . .

Therefore the existence of the gods is so manifest that I can scarcely deem one who denies it to be of sound mind.

This dogmatic thinking, changing the statute of faith but not the mode of thinking, existed in all ages: in the Rome of Cicero and Caesar, in the Rome of the Catholic Church, in modern observatories. The categorical manner in which the dissidents are castigated as being of unsound and vicious mind can be seen again in the burning of Giordano Bruno, in the compelling of Galileo to recant on his knees, in the coercing of the publisher of *Worlds in Collision* to give up the publication.

The notion expressed by Cicero that planets are divine bodies endowed with divine intelligence was deduced not from the fact of their occupying the ethereal heights and moving unerringly—

these attributes were only called upon to prove the existing idea of planets and stars being gods. And the source of this belief, deep-rooted and widespread, was in natural phenomena and extraordinary events of the past that grew dimmer with every passing generation.

Pliny, the Roman naturalist of the first century, knew to tell of interplanetary discharges: “Heavenly fire is spit forth by the planet as crackling charcoal flies from a burning log.” Interplanetary thunderbolts, according to him, have been caused in the past by each of the three upper planets—Mars, Mercury and Saturn.

Seneca, the contemporary of Pliny, mentor of Nero and philosopher, was no mathematician and no astronomer; however, he rose to a clearer concept of comets as members of the planetary system. The prevailing view was that of Aristotle, according to whom the comets are exhalations of the earth in sublunar space, something of the nature of rainbows. Seneca regards them as bodies akin to planets, yet not planets, on very elongated orbits, and he knows that the Chaldeans have determined their orbits: “Apollonius of Myndus asserts that comets are placed by the Chaldeans among the number of the wandering stars (i.e., planets) and that their orbits have been determined.” ⁽¹⁾ He knows that comets are seen only when they come close to the sun, or when they reach the lowest portion of their course. He opposes the view that the comets are unsubstantial bodies; the argument is brought forward that the sight can penetrate through comets and see the stars behind; Seneca answers that this is the case with the tails of the comets, not with their heads, through which one cannot see. He knows the view expounded by Artemidorus that “the five planets are not the only stars with erratic courses, but merely the only ones of the class that have been observed. But innumerable others revolve in secret, unknown to us, either by the faintness of their light, or the situation of their orbit being such that they become visible only while they reach its extremities.”

“The day will yet come,” wrote Seneca in his treatise *De Cometis*,

when the progress of research through long ages will reveal to sight the mysteries of nature that are now concealed. A single lifetime, though it were wholly devoted to the study of the sky, does not suffice for the investigation of problems of such complexity. And then we never make a fair division of the few brief years of life as between study and vice. It must, therefore, require long successive ages to unfold all. The day will yet come when posterity will be amazed that we remained ignorant of things that will to them seem so plain. The five planets are constantly thrusting themselves on our notice; they meet us in all the different quarters of the sky with a positive challenge to our curiosity.

The man will come one day who will explain in what regions the comets move, why they diverge so much from the other stars, what is their size and their nature.

Many discoveries are reserved for the ages still to be when our memory shall have perished. The world is a poor affair if it does not contain matter for investigation for the whole world in every age . . . Nature does not reveal all her secrets at once. We imagine we are initiated in her mysteries. We are, as yet, but hanging around her outer courts.

Seneca was compelled to take his own life when accused of plotting against Nero, his pupil. He was born in the same year as Jesus of Nazareth. In less than three hundred years Rome was to become the citadel of the new religion. Three forces kept science from progressing and brought about the dark ages: the invasion of the hordes coming from the east and north; the influence of the Church that imposed dogmas and made the human spirit unfree; and the scientific dogma that petrified itself in a thousand-year-long worship of Aristotle—through all the years of the Middle Ages, with their crusades, scholasticism, and Black Death.

A strange amalgam of the Christian dogma and Aristotelianism became the credo of the Church, that regarded the world as finite, the earth as the center of the universe, and also immovable. The codification in the science of astronomy was performed by a distant pupil of Aristotle, Claudius Ptolemy, an Alexandrian astronomer and mathematician, the greatest authority in those sciences for his own age—he lived in the second century—and for all successive centuries until the time of de Brahe and Kepler, almost fifteen hundred years later, it was the undisputed dogma.

References

1. *Quaestiones Naturales*, tr. Clarke, p. 275.

Newton

In the year Galileo died (1642), Newton was born. At the age of twenty-four, when a plague was ravaging the cities of England, he secluded himself at his parental home in Lincolnshire and there contemplated the motions of the heavenly bodies. This work of his was put aside for two decades; it was not until the year 1686 that the first edition of *Philosophiae Naturalis Principia Mathematica* was published. A testimony is preserved that says the figures Newton had of the size of the earth and thus of the terrestrial radius were rather inexact—and consequently his computations of the Earth's gravitational pull did not agree with observations. And, it is said, when the French savant, J. Picard upon measuring the meridian in Lapland, came to the correct result, that Newton became confident of his formula for inertia and gravitation.⁽¹⁾

Life—claims (Hooke, Flamsteed, Leibnitz). Light corp.; space empty; how does gravitation act? nature of gravitation; law of simplicity.

When explaining his theory of celestial mechanics, Newton used the following example. A projectile—a stone—is thrown horizontally from the top of a high mountain; because of its weight it is

forced out of the rectilinear path, which by the initial projection alone it should have pursued, and made to describe a curved line in the air; and through that crooked way is at last brought down to the ground; and the greater the velocity is with which it is projected, the farther it goes before it falls to the earth. We may therefore suppose the velocity to be increased, that it would

describe an arc of 1, 2, 5, 10, 100, 1000 miles before it arrived at the earth till at last, exceeding the limits of the earth, it should pass into space without touching it. ⁽²⁾

At a very definite curve, the result of a very precise and definite velocity of projection, the stone would follow the circumference of the earth and “return to the mountain from which it was projected” without falling to the ground or flying off into space.

For the sake of this example, “let us suppose that there is no air about the earth or at least that it is endowed with little or no power of resisting,” and that only the weight of the projectile causes it to bend its path.

One can observe that these two figures differ by seven percent, and that therefore complete correspondence is an exaggeration. There are other, much more close correspondences involving our moon, and they still belong in the domain of coincidences. The moon, for instance, is placed so on its orbit that it appears nearly the same size as the sun, and actually, during the full eclipses, the moon chances so to cover the sun that only the solar corona is seen over the dark zone of the moon. Also the already mentioned fact that the moon’s mean distance is very nearly equal to sixty terrestrial semi-diameters, the number of seconds in a minute; or the fact that light travels 186,000 miles in a second, and the diameter off.

At the age of fifty, when the biological process of involution generally sets in in man, Newton became ill and depressed. The excessive exploitation of his brain, his unrelenting search for answers to nature’s unsolved problems undermined and disturbed the mental balance of the genius. When Newton was forty-five years old, his *Principia* was published. Then he worked on optics. The story goes that he left his manuscript on the table close to a burning candle and went out of the room to look at a procession; a pet overturned the candle and the manuscript burned. This misfortune started his depression. It is questionable whether this is a true story. In a young man mental depression usually sets in when the person faces a big task and is afraid to fail; in the second half of life, the person becomes depressed mostly as the result of slighting and humiliation. It would be wrong to think that a person who is great is protected by his greatness from the feeling of slighting and humiliation. Newton’s experiences with Hooke, with Leibnitz, and with Flamsteed could have been the real cause.

Edlestone, *Correspondence*, p. LXIII.

Brewster, *Life of Newton*, II, 142.

Dr. Ferd. Rosenberger, *Isaac Newton und seine physikalischen Prinzipien* (Leipzig, 1895).

Letter to Pepys (p. 278 in Rosenberger)

It is possible and even probable that if Newton lived in our time he would not support his theory of the mechanical movement of the planets. At the end of the *Principia* he wrote:

But hitherto I have not been able to discover the cause of those properties of gravity from phenomena, and I have no hypotheses; for whatever is not deduced from the phenomena is to be

called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities of mechanical, have no place in experimental philosophy.

Thus he felt that he left his theory of gravitation unjustified because he was unable to explain the cause of gravity and the nature of this phenomenon. However, he must have had some intuitive inkling of where to look for explaining gravitation, because on the same page, which is at the end of the third book of *Principia*, he wrote:

References

1. But cf. the comments of F. Cajori in his edition of Newton's *Principia* (Berkeley, 1946), p. 663. Cf. also the *Mathematical Gazette* 14 (1929), p. 415.
2. Isaac Newton, *The System of the World*, Sec. 3, published with his *Principia*, transl. Motte, ed. F. Cajori (1946).

Descartes

In 1633 Rene Descartes, philosopher and geometer, then thirty-seven years old, was preparing for publication a great work, *Le Monde et le Traite de l'Homme*, when at the end of November of that year the news arrived at Deventer, Holland where Descartes was staying at that time, of the persecution to which Galileo had been subjected in Rome. Not desirous of coming into conflict with the Catholic Church, Descartes decided against the publication of his work and, being also a practicing Catholic, he wrote to the mathematician Marin Mersenne:

This [the condemnation of Galileo] came as so much of a surprise to me that I have all but made up my mind to burn my papers in their entirety, or at least not allow them to be seen by anyone. For I could not imagine that Galileo would have been prosecuted for anything else but that, no doubt, he must have wanted to establish the motion of the Earth which, I am well aware, was at one time censured by several cardinals; but I thought I heard it said that even afterwards the public teaching of it was not discontinued, not even in Rome; and I confess that if it is wrong, so are the entire foundations of my philosophy, for it [i.e., the motion of the Earth] is demonstrated by them, evidently. And it is so closely tied to all parts of my treatise that I would not know how to separate it without making the rest defective. But since I would not for anything in the world want that from me should come so much as a word disapproved of by the Church, I would prefer to suppress it, rather than to let it appear mangled. . . . I beg you also to send me whatever you know about the Galileo affair.

Descartes never again picked up the manuscript, and it was not published until decades later, long after his death. Instead, in 1644, Descartes published his *Principes de la Philosophie*, in which he developed his theory of the mechanism of planetary motions. The universe is filled with subtle matter, some kind of effluvium, not much different from the ether of later authors; the sun by its rotation causes this effluvium to be concentrated in vortices that carry the planets around the sun on their orbits.

Whatever was the manner whereby matter was first set in motion, the vortices into which it is divided must now be so disposed that each turns in the direction in which it is easiest for it to continue its movement for, in accordance with the laws of nature, a moving body is easily deflected by meeting another body.

Descartes' theory of vortices soon became the accepted teaching about the mechanism of the solar system.

Descartes himself proved, however, that philosophers who solve the mysteries of the world can commit fatal mistakes. After some deliberation and wavering, he accepted the insistent invitations to teach philosophy to Queen Christina of Sweden. As so many shallow persons, she was flattered to have the most famous philosopher of Europe at her feet—and actually at her bedside—for she ordered him to appear every morning at five to start the lesson. He cared for nothing more in his habits as for a late rising. The cold nights and early morning hours in the winter of Sweden broke his health, and four months after arrival in Sweden he died there from pneumonia.

Cartesian philosophy finds many followers until today. But his scheme of things celestial has long been regarded as discredited: this teaching prevailed on the continent in his lifetime and still in the lifetime of Newton, but not much longer.

Laplace

On February 10, 1773, Pierre Simon Laplace, a twenty-three years old scientist, read before the Academy of Sciences in Paris a paper in which, on the basis of the Newtonian theory of gravitation, he announced the invariability of planetary mean motions. “This was the first step in the establishment of the stability of the solar system,” says the *Encyclopaedia Britannica* (14th ed.). A mathematical genius, Laplace showed in a mathematical analysis that the planets must proceed on their paths to the end of time and that, accordingly, they have been on their present orbits since the very beginning. In a series of papers Laplace and Lagrange, another mathematical genius whose ideas went in the same direction, vied in a complete substantiation of this thesis of invariability of the planetary mean motions. No planet could ever have joined the family of the planets; no planet has ever changed its orbit. It was a work of stability in the cosmos carried through to the very eve of the French Revolution. In 1796, in a note to the *Exposition du systeme du monde*, Laplace offered his idea of the origin of the solar system. It was a large nebula, it rotated, and because of the gravitation of the mass to its center, a sun formed itself in the middle, and condensed. The outer parts of the nebula broke into rings, and the rings rolled themselves into globes—the planets. He insisted that there could be no accident in the fact that the sun, all known planets, all known satellites, roll in the same direction, counterclockwise. And, being a master of the theory of probabilities, he concluded that there are four billion chances against one that this plan is not the result of chance. Even the best known historical events have not been authenticated at the same ratio of four billion against one. By today we know that Laplace was wrong: with the discovery of the first retrograde satellite—and today more than ten retrograde satellites are known. The rotation of Venus is also retrograde, as

is that of Uranus, discovered in 1781. The four billion against one odds became zero against one: there may still be a common plan in the arrangement, but this plan was no more evident.

Nevertheless, the estimate of the twenty-three year old Laplace that the planetary orbits are eternal became the principal statute of faith, or the supreme dogma of the astronomers of the nineteenth and twentieth centuries. On it is based the astronomy of today.

According to Laplace, gravitation, in order to keep this system together, must propagate with a velocity that, compared to the velocity of light, is at least fifty million times greater. And since light propagates with the velocity of 300,000 kilometers in a second (186,000 miles), the velocity with which gravitation must propagate in order that the solar system should not fall apart must be infinite, or instantaneous. This last postulate of Laplace was sometimes silently dropped out of his theory; and the permanency of the celestial orbits remained, and served as alpha and omega of all subsequent thinking.

Voltaire

Francois Marie Arouet de Voltaire (1694-1778), wit, liberal, and freethinker, at the age of thirty-one was insulted by Chevalier de Rohan and answered with a biting sarcasm. A little time later, when dining at the table of the Duc de Sully, he was asked to step out and was beaten by the servants of Rohan, who looked on. For three months Voltaire postponed to challenge Rohan to a duel; then he challenged, but on the morning set for the encounter, he was arrested and put into the Bastille; after two weeks there he, in accordance with his own wish, was deported to England. there he stayed for three years, from 1726-1729.

When Voltaire returned to France, he was a self-appointed agent of all things British. In the world of thought the supreme point of difference between the French and the British lay in the conflict of views of Descartes and Newton on the mechanics of the universe. Descartes was long dead, and Newton died in 1727, during Voltaire's stay in England. The French scientists in general kept to the teaching of Descartes about the vortices that compel the planets to follow their paths; the British scientists adopted the Newtonian teaching of universal gravitation, and the debate was going on upon Voltaire's return to France. In the years that Voltaire spent at Cirey as a guest of Madame du Chatelet, he wrote, with her assistance, a long treatise on the Newtonian system of the world. The singular influence Voltaire gained in France, in Germany, and in the rest of Europe was responsible for the early acceptance of the Newtonian system and the rejection of the Cartesian. Although himself no mathematician, Voltaire set himself up as the supreme judge and decided in favor of Newton and against his compatriot. He actually stopped the debate. His influence was also responsible, more than anything else, for making the deeply Catholic France into a nation of freethinkers, thus paving the road to the French Revolution of 1789, that took place eleven years after his death.

Nicolas Boulanger

The name Nicolas Boulanger is not found in most encyclopedias and is known only to a few scholars. He was a contemporary of Jean-Jacques Rousseau, Voltaire, and Diderot, illustrious names in the history of French letters. He lived only thirty-seven years, from 1722 to 1759. I came across the name very late in my research,¹ actually in 1963 and read in his works a few years later. I found that in some aspects he was not only my predecessor, but also a predecessor of Jung and Freud, actually solving the problem Freud and Jung left unsolved. Namely, he understood that the irrational behavior of the human species together with all the heritage of religious rites and much of the political structure of his own and other ages, were engendered in cataclysmic experiences of the past, in the Deluge, or deluges, of which there could have been more than one.

In Boulanger's time geology as a science was in a prenatal stage. But as a road engineer he made observations in the valley of the Marne that made him draw conclusions which he substantiated in reading the then existing books of folklore and sacred writings; also classical writers were available to Boulanger, either in originals or in translation. He was convinced that the Deluge was a global occurrence, but this was no innovation on his part, because it was an accepted notion in his time: actually, he was the author of the entry "Deluge" in the great French *Encyclopédie*, edited by Diderot. In his books he referred sometimes to the Deluge as to a singular occurrence, but then he spoke of multiple cataclysms. He seems not to have had an idea from where the water of the universal flood could come, and did not show awareness of any extraterrestrial agent as causing the world-wide calamity. Thus Saturn does not figure as connected with the upheaval. Human beings witnessed the catastrophes and the human race suffered one or several traumatic experiences; the scars the human psyche sustained are buried deep in the souls of all of us.

"We still tremble today as a consequence of the deluge and our institutions still pass on to us fears and the apocalyptic ideas of our first fathers. Terror survives from race to race... The child will dread in perpetuity what frightens his ancestors."²

Boulanger's works were published after his premature death by Diderot, but his geological observations were not included in the printed volumes; extracts from these observations and selections appear in a recent work on Boulanger,³ and do not impress as compelling. But one has to keep in mind that the age of geology as a science did not start but after Boulanger's death. In the broad realization that our society as well as the savage society still lived in the shadow of the traumatic experience of the past, Boulanger not only preceded Jung and Freud but also spelled out the nature of the traumatic experience or experiences that caused the memory of them to submerge in the racial mind.. Thus he not only could claim priority in the understanding of the phenomenon of racial memory and collective amnesia, but also could claim the fact, unrecognized by Freud, that catastrophic events served as the trauma. Neither Jung nor Freud knew anything of Boulanger, and his name is not found in the psychological literature. Not so much his claim that catastrophic events took place in the past deserves attention—such view was already found in the writings of William Whiston; again, Buffon, Boulanger's contemporary thought that a massive comet hit the sun and caused the origin of the planetary family; and after Boulanger the scientific thought of the eighteenth century and of the first half of the nineteenth

again and again sought for the cause of the global upheavals. However Boulanger's distinction lay in his contemplating the consequences of such upheavals for the human psyche.

References

1. First in the paper by Livio Stecchini, "The Inconstant Heavens," included in the September 1963 issue of the *American Behavioral Scientist* (Vol. VII, no. 1, p. 30).
2. *L'antiquité dévoilée par ses usages, ou examen critique des principales opinions cérémonies et institutions religieuses et politiques Des différens peuples de la terre* (Amsterdam, 1766).
3. John Hampton; *Nicolas-Antoine Boulanger et la science de son temps* (Geneva-Lille, 1955).

Adams

The greatest triumph of the celestial mechanics built on gravitation and inertia to the exclusion of any other forces took place in 1846 when Neptune was discovered in the place in the sky calculated by Adams and Leverrier independently of each other; they indicated the direction where the planet would be found with the exactness of one degree; they calculated its position by considering the unaccounted for perturbations of Uranus. The story of its discovery is an exciting chapter in the history of astronomy: how the poor student Adams stood in the antechambers of the Royal Astronomer Airy and was sent away by the valet because Sir Airy was at the table, and how he tried to convince the powerful astronomer of the existence of an eighth planet by sending in his calculations; and how the Frenchman Leverrier was much more fortunate by having performed very similar calculations and by having sent them to the observatory at Potsdam where the young astronomer Gale, the very first night at the very first look at the indicated direction found the new planet. The excited scientific community in Europe was soon plunged into the debate who of the two was the true discoverer, or better prognosticator, since Gale was the discoverer of the planet; the passions were divided by the national line, with the French and British rivalries inflamed, and the Royal Astronomer had to defend his behavior; there exists quite a literature on the subject. The French insisted on their priority and even named the new planet “Leverrier,” and it took some time before its new name Neptune prevailed. Till today the case is debated and the pride of Britannia, in any event deprived of priority, of the greatest discoveries, is still not completely healed.

The discovery was hailed by the British and the French—and by everyone—as the greatest triumph of the Newtonian theory of gravitation. Uranus showed certain irregularities in its motion unaccounted for by the gravitational pull of the known planets, and the existence and the position of a planet not yet seen was claimed by Adams and Leverrier alike. This was possibly the best prognostication in the annals of science. But was it really so precise and was it such a triumph for Newton as always asserted?

The so-called Bode’s Law is the empirically established regularity, covered by a simple formula, in the mean distances of the planets from the sun. This regularity can be traced through the planetary system from Mercury to Uranus (the one vacant place, between the orbits of Mars and Jupiter, was filled in, when in the first night of the nineteenth century Ceres, the first of the many asteroids was discovered by Piazzi Smyth). Adams and Leverrier alike assumed that the planet which causes unaccounted perturbations in Uranus must be located at a distance dictated by Bode’s Law. And since

Saturn, the sixth planet, is smaller than Jupiter, the fifth, and Uranus, the seventh, is smaller than Saturn, it would be quite logical to expect a planet smaller than Uranus at a distance of 1,750,000,000 miles from its orbit. But next the calculations showed that the distance of the two planets when in conjunction is not 1,750,000,000 miles but only roughly 1,000,000,000; and with the gravitational attraction decreasing with the distance as the inverse square of the latter, the mass of the newly discovered planet was grossly overestimated: it was supposed to exert the influence from a much greater distance than one actually found. It was not enough to show the direction where the planet would be found; it was necessary, in order that the prediction should be true, that the planet would be at the distance predicted, and it was not with Adams, nor with Leverrier, both of whom committed the same error. Therefore, when the great controversy raged between the supporters of Adams and those of Leverrier, some voices were heard that neither of them was a true prognosticator and there was no point in the rivalry. To make a distance error of 75 percent was equal to a threefold overestimate of the mass of the planet. In order to produce the effects from its true distance Neptune needed to be three times as massive as it actually is. Bode's Law broke down with the discovery of Neptune. And though Neptune is a little more massive than Uranus, the discrepancy between what was expected and what was found in no manner can be regarded as a rigid confirmation of the Newtonian celestial mechanics with an exact formula of attraction between masses at changing distances. The story is not yet at its end, and we need to tell of the discovery of Pluto, the ninth planet, which should have explained what Neptune left unexplained, but failed to do so, either, and by a still larger margin.

Yet in 1846 the discovery of Neptune was acclaimed, and because of the inertia of the human mind, is still acclaimed as the greatest proof of the truth of Newtonian celestial laws of gravitational mechanics.

Nicola Tesla

In the beginning of this century a Croatian* engineer, emigrant to America, Nikola Tesla, measured the electrical charge of the planet Earth and found it of a very high potential. He made his observation during thunder storms.

My instruments were affected stronger by discharges taking place at great distances than by those near by. This puzzled me very much. . . . No doubt whatever remained: I was observing stationary waves. As the source of the disturbances [thunderstorm] moved away, the receiving circuit came successively upon their nodes and loops. Impossible as it seemed, this planet, despite its vast extent, behaved like a conductor of limited dimensions. The tremendous significance of this fact in the transmission of energy by my system had already become quite

clear to me. Not only was it practicable to send telegraphic messages to any distance without wires, as I recognized long ago, but also to impress upon the entire globe the faint modulations of the human voice, far more still, to transmit power, in unlimited amounts, to any terrestrial distance and almost without loss.⁽¹⁾

Nikola Tesla was a pioneer in many fields of electrical theory and technology. He was the first to utilize alternating current, conceiving an effective system for its generation, transmission, and utilization. Edison appealed to the public, warning that the alternating current of Tesla would cause great harm to its users, being dangerous, and that only direct current can be harmlessly used. Tesla referred to Edison as an inventor, to himself as a discoverer. Today everyone knows that alternating current, with the help of the polyphase induction motor, can be converted into mechanical energy more effectively and economically than direct current. He invented new forms of dynamos, transformers, condensers, and induction coils. He discovered the principle of the rotary magnetic field, upon which the transmission of power from the Niagara Falls and other waterfalls and dams is carried on. A regal recluse, he despised the short-seeing men of science. Many of his pioneer inventions he carried with him to his grave. But he believed in the destiny of man who, in his words, “searches, discovers and invents, designs and constructs, and covers with monuments of beauty, grandeur and awe, the star of his birth.”

This teaches us that not only have the contemporaries of a revolutionary idea in science repeatedly rejected the idea, but also that a rejection of such an idea even by the best qualified men in the field in the generation of the revolutionary, and often still in the following generations, has occurred not once or twice, but many times. Archimedes rejected the heliocentric system of Aristarchus; Brahe rejected the system of Copernicus; and Galileo was deaf and blind to the discoveries of Kepler, just as Edison warned against the alternating current developed by Tesla. And who was more competent to judge than Archimedes, in his time, Brahe in his, Galileo in his, and Edison in his?

References

1. *Electrical World and Engineer* May 5, 1904; see also *Century*, June 1900. Quoted from J. J. O’Neill, *The Prodigal Genius: Life of Nikola Tesla*, 1944, p. 181.

* [Tesla was in fact a Serb who was born in the Croatian village of Smiljane in the Lika region, which at the time was part of Austrian monarchy. His father was an orthodox priest.— Eds.]

Einstein

Einstein was born in 1879, the year Maxwell died. It was the year when Michelson made the first in the series of his experiments in investigating the velocity of light. Einstein was born in Ulm, the town in which Kepler, his favorite scientist of earlier times, had spent some of the last months of his life, before dying in 1630. In high school the geography teach declared Einstein to

be moronic; in the Zurich Polytechnic his physics professor, as Einstein told me, once said to him: "In this college the poorest class is of experimental physics, and the poorest pupil are you." Upon graduation he was unable to secure a teaching position and, after years of private tutoring of students deficient in mathematics, he was happy to receive the position of a patent examiner in the Bern Patent Office. There he profited in learning to express himself in short and exact terms. At the age of twenty-six, in 1905, he offered the theory of relativity, later called the "special" or "restricted" theory of relativity, in distinction from the theory he offered eight years later, the "general" theory of relativity.

Should I try to put into one single sentence the gist of the theory in 1905, I would do it thus:

Space and time, regarded as absolute and unvariable entities (hour is always an hour, a meter is everywhere a meter), were declared to be relative, or changing, entities; the speed of light in a vacuum, thought to be a relative quantity (depending on the relative motion of the light source and the observer) was declared to be an absolute, unvarying entity.

A second is no longer a second for all observers. A second of time is of different duration for observers in motion and at rest; but 186,000 miles per second, whatever miles or whatever seconds, was always true.

A mile-long spaceship travels and overtakes our earth. A light signal is sent in the very middle of the spaceship; for the traveler in the spaceship the light will arrive simultaneously at both of its ends; for the observer on earth (assuming he could observe such small differences) the light will come first to the rudder that travels toward the light and then to the bow that travels away from the light. Thus the very notion of simultaneity was emptied of real content.

The theory of Fitzgerald made the matter shorter when crossing through ether and thus masked the change in velocity of light; Einstein, however, made the velocity of light in a vacuum an immutable quantity, or a constant for all observers in whatever relative motion to the source of light they might be.

This is a sentence that can be expressed mathematically; but it is not easy to visualize it by reason. A light leaves its source and whatever object it meets in motion, toward or away from the source of light, the relative velocity of light and the object is always 186,000 miles per second.

Thus a ray of light speeds from the place of explosion in Coventry with the velocity of 186,000 miles per second to Birmingham and with the same velocity in the opposite direction toward Rugby; but the two photons of light speeding in opposite directions have a relative speed of 186,000 miles per second, not of 392,000 miles per second: nothing can be swifter than 186,000 miles per second, the velocity of light.

In those early years of Einstein's career, he spent often his time in discussions with another mathematical genius, W. Ritz. The latter could not see that the velocity of the source would not add itself to the velocity of light: in mechanics, a stone thrown by a passenger in a train acquires not only the velocity of throw but also the velocity of the train that carries the passenger. Ritz printed a paper to oppose the notion of Einstein. De Sitter answered Ritz and proved his point on

an astronomical reasoning. There are double stars so placed in space that one partner eclipses the other at regular intervals. If the velocity of the retreating star would reduce from the speed of light reaching the observer and the velocity of the advancing star would add to the speed of light emitted by it, the system would appear to deviate from Keplerian motions. Such is definitely not the case.⁽¹⁾ the earth would be such that the reduction in the speed of light would let the light of one star of the binary arrive to the earth when the star would appear to be in the same place where its companion would appear at the same time. [phrase better].

The special theory of relativity explained why an ether drift cannot be detected through the experiment with the velocity of light; but it went a step farther and disclaimed any necessity of an ether. This makes a very great difference—probably the next question after the perennial “Is there a God?” is “Does a medium fill all space or is space between the material masses empty?” And not just *between* material masses—ether is supposed to fill everything, all space and all matter. Between the electrons and protons of an atom there is comparatively very wide space, as it is between the sun and the planets. Is the space all filled or is it empty?

References

1. W. Ritz, “Das Prinzip der Relativitaet in der Optik,” *Gesammelte Werke* (Paris, 1911).

On Prediction in Science

In order to bring into proper focus the significance of correct prediction in science, I offer at the start a short survey of the most celebrated cases, and it is not by chance that almost all of them come from the domain of astronomy. These cases are spectacular and, with one or two exceptions, are well known.

The story of scientific “clairvoyance” in modern astronomy starts with Johannes Kepler, a strange case and little known. When Galileo, using the telescope he had built after the model of an instrument invented by a Danish craftsman, discovered the satellites circling Jupiter, Kepler became very eager to see the satellites himself and begged in letters to have an instrument sent to Prague; Galileo did not even answer him. Next, Galileo made two more discoveries, but before publishing them in a book, he assured himself of priority by composing cryptograms, not an uncommon procedure in those days: statements written in Latin were deliberately reduced to the letters of which the sentences were composed, or, if the author of the cryptogram so wished, the letters were re-assembled to make a different sentence. The second way was chosen by Galileo when he thought he had discovered that Saturn is “a triple” planet, having observed appendices on both sides of Saturn, but not having discerned that they were but a ring around the planet, a discovery reserved for Christian Huygens in 1659, half a century later. Kepler tried to read the cryptogram of letters recombined into a non-revealing sentence, but did not succeed. He offered as his solution: “Salute, fiery twin, offspring of Mars” (“Salve, umbistineum geminatum Martia proles”). Of this, Arthur Koestler in *The Sleepwalkers* (1959) wrote (p. 377): “He [Kepler] accordingly believed that Galileo had discovered two moons around Mars.” But Galileo did not

discover them and they remained undiscovered for more than two hundred fifty years. Strangely, Koestler passes over the incident without expressing wonder at Kepler's seeming prescience.

As I have shown in *Worlds in Collision* ("The Steeds of Mars") the poets Homer and Virgil knew of the trabs of Mars, visualized as his steeds, named Deimos (Terror) and Phobos (Rout). Kepler referred to the satellites of Mars as being "burning" or "flaming", the same way the ancients had referred to the steeds of Mars.

Ancient lore preserved traditions from the time when Mars, Ares of the Greeks, was followed and preceded by swiftly circling satellites with their blazing manes. "When Mars was very close to the earth, its two trabs were visible. They rushed in front of and around Mars; in the disturbances that took place, they probably snatched some of Mars' atmosphere, dispersed as it was, and appeared with gleaming manes" (*Worlds in Collision*, p. 230).

Next, Galileo made the discovery that Venus shows phases, as the Moon does. This time he secured his secret by locking it in a cryptogram of a mere collection of letters—so many A's, so many B's, and so on. Kepler again tried to read the cryptogram and came up with the sentence: "Macula rufa in Jove est gyratur mathem etc." which in translation reads: "There is a red spot in Jupiter which rotates mathematically."

The wondrous thing is: how could Kepler have known of the red spot in Jupiter, then not yet discovered? It was discovered by J. D. Cassini in the 1660's, after the time of Kepler and Galileo. Kepler's assumption that Galileo had discovered a red spot in Jupiter amazes and defies every statistical chance of being a mere guess. But the possibility is not excluded that Kepler found the information in some Arab author or some other source, possibly of Babylonian or Chinese origin. Kepler did not disclose what the basis of his reference to the red spot of Jupiter was — he could not have arrived at it either by logic and deduction or by sheer guesswork. A scientific prediction must follow from a theory as a logical consequence. Kepler had no theory on that. It is asserted that the Chinese observed solar spots many centuries before Galileo did with his telescope. Observing solar spots, the ancients could have conceivably observed the Jovian red spot, too. Jesuit scholars traveled in the early 17th century to China to study Chinese achievements in astronomy.

Kepler was well versed in ancient writings, also knowledgeable in medieval Arab authors; for instance, he quoted Arzachel to support the view that in ancient times Babylon must have been situated two and a half degrees more to the north, and this on the basis of the data on the duration of the longest and shortest days in the year as registered in ancient Babylon.¹

Jonathan Swift, in his *Gulliver's Travels* (1726) tells of the astronomers of the imaginary land of the Laputans who asserted they had discovered that the planet Mars has "two lesser stars, or satellites, which revolve about Mars, whereof the innermost is distant from the center of the primary planet exactly three of [its] diameters, and the outermost Five; the former revolves in the space of ten hours, and the latter in twenty-one-and-a-half; so that the squares of their periodical times are very near in the same proportion with the cubes of their distance from the center of Mars, which evidently shows them to be governed by the same law of gravitation that influences the other heavenly bodies."

About this passage a literature of no mean number of authors grew in the years after 1877, when Asaph Hall, a New England carpenter turned astronomer, discovered the two trabant of Mars. They are between five and ten miles in diameter. They revolve on orbits close to their primary and in very short times: actually the inner one, Phobos, makes more than three revolutions in the time it takes Mars to complete one rotation on its axis; and were there intelligent beings on Mars they would need to count two different months according to the number of satellites (this is no special case — Jupiter has twelve moons and Saturn ten*), and also observe one moon ending its month three times in one Martian day. It is a singular case in the solar system among the natural satellites that a moon completes one revolution before its primary finishes one rotation.

Swift ascribed to the Laputans some amazing knowledge—actually he himself displayed, it is claimed, an unusual gift of foreknowledge. The chorus of wonderment can be heard in the evaluation of C. P. Olivier in his article “Mars” written for the *Encyclopedia Americana* (1943):

“When it is noted how very close Swift came to the truth, not only in merely predicting two small moons but also the salient features of their orbits, there seems little doubt that this is the most astounding ‘prophecy’ of the past thousand years as to whose full authenticity there is not a shadow of doubt.”

The passage in Kepler is little known—Olivier, like other writers on the subject of Swift’s divination, was unaware of it, and the case of Swift’s prophecy appears astounding: the number of satellites, their close distances to the body of the planet, and their swift revolutions are stated in a book printed one hundred and fifty years to the year before the discovery of Asaph Hall.

Let us examine the case. Swift, being an ecclesiastical dignitary and a scholar, not just a satirist, could have learned of Kepler’s passage about two satellites of Mars; he could also have learned of them in Homer and Virgil where they are described in poetic language (actually, Asaph Hall named the discovered satellites by the very names the flaming trabant of Mars were known by from Homer and Virgil); and it is also not inconceivable that Swift learned of them in some old manuscript dating from the Middle Ages and relating some ancient knowledge from Arabian, or Persian, or Hindu, or Chinese sources. To this day an enormous number of medieval manuscripts have not seen publication and in the days of Newton (Swift published *Gulliver’s Travels* in the year Newton was to die), as we know from Newton’s own studies in ancient lore, for every published tome there was a multiplicity of unpublished classical, medieval, and Renaissance texts.

That Swift knew Kepler’s laws, he himself gave testimony, and this in the very passage that concerns us: “. . . so that the squares of their periodical times are very near in the same proportion with the cubes of their distance from the center of Mars” is the Third Law of Kepler.

But even if we assume that Swift knew nothing apart from the laws of Kepler to make his guess, how rare would be such a guess of the existence of two Martian satellites and of their short orbits and periods? As to their number, in 1726 there were known to exist: five satellites of Saturn, four of Jupiter, one of Earth, and none of Venus. Guessing, one could reasonably say: none, one, two, three, four, or five. The chance of hitting on the right Figure was one in six, or the chance of any one side of a die’s coming up in a throw. The smallness of the guessed satellites would

necessarily follow from their not having been discovered in the age of Newton. Their proximity to the parent planet and their short periods of revolution were but one guess, not two, by anybody who knew of the work of Newton and Kepler. The nearness of the satellites to the primary could have been assumed on the basis of what was known about the satellites of Jupiter and Saturn, Io, one of the Galilean (or Medicean) satellites of Jupiter, revolves around the giant planet in 1 day 18.5 hours (the satellite closest to Jupiter was discovered in 1892 by Barnard and is known as the “fifth satellite” in order of discovery; it revolves around Jupiter, a planet ten thousand times the size of Mars, in 1 1.9 hours). The three satellites of Saturn discovered by Cassini before the days of Swift - Tethys, Dione and Rhea - revolve respectively in 1 day 21.3 hours, 2 days 17 hours, and 4 days 12.4 hours. (Mimas and Enceladus, discovered by Herschel in 1789, revolve in 22.6 hours and 1 day 8.9 hours.) The far removed satellites of Jupiter were not yet discovered in the days of Newton and Swift.

It remains to compare the figures of Swift with those of Hall: there was no true agreement between what the former wrote in his novel and what the latter found through his telescope. For Deimos, Swift’s figure, expressed in miles from the surface of Mars, is 18,900 miles; actually it is 12,500 miles; Swift gave its revolution time as 21.5 hours—actually it is 30.3 hours. For Phobos, Swift’s figures are 10,500 miles from the surface and 10 hours revolution period, whereas the true figures are 3,700 miles and 7.65 hours. Remarkable remains the fact that for the inner satellite Swift assumed a period of revolution, though not what it is, but shorter than the Martian period of rotation, which is true. However, Swift did not know the rotational period of Mars and therefore he was not aware of the uniqueness of his figure. If he were to calculate as an astronomer should, he would either have decreased the distance separating the inner satellite from Mars - a distance for which he gave thrice its true value - or increased its revolution period to comply with the Keplerian laws by assuming the specific weight of Mars as comparable with that of Earth. But Swift had no ambitions toward scientific inquiry in his satirical novel.

References

1. The reference is found in the collected works of Kepler (*Astronomica opera omnia*, ed. C. Frisch, vol. VI, p. 557) published in 1866.

H. H. Hess and My Memoranda

On August 25, 1972, three years elapsed since the death of Professor Harry Hammond Hess. He died of a heart attack while presiding over a meeting (convened at Woods Hole, Massachusetts) of the Space Science Board of the National Academy of Sciences. The Board had the task of overseeing the activities of the National Aeronautics and Space Administration, with its multi-billion dollar spending. At the Woods Hole meeting Hess had intended to discuss the role of thermoluminescence (TL) tests in the lunar programs, an issue I had discussed with him.

When I moved from Manhattan to Princeton in the early summer of 1952, I became steeped in library work for *Earth in Upheaval*, and the library of Guyot Hall (Princeton’s geology department) was a place I frequented. Already known for my *Worlds in Collision* and the

discussion it provoked, I caused some curiosity among the numerous faculty members of the department. I do not remember my first contact with Hess, but from our first meeting something in both of us attracted each other.

Hess was the chairman of the department. Once when I mentioned the Vening Meinesz submarine expedition for gravitational measurements in the Caribbean in the 1930's, during which, paradoxically, a positive anomaly was regularly detected and the greater it was the deeper was the sea, or the less mass there was, Hess surprised me by telling that he participated in that expedition.

Another highlight of his career took place during World War II. In command of a naval vessel in the Pacific with certain exploratory assignments, he utilized the opportunity to explore the bottom of the ocean in a certain area. Under the water he discovered flat-topped mountains, which he named "guyots," honoring the late Princeton professor of geology, Arnold Henry Guyot (1807-84),

By the end of the war, Hess was retired from active duty with the rank of a rear admiral. In the university he taught mineralogy and crystallography, but marine geology remained his favored subject.

In November, 1955, *Earth in Upheaval* was published. Soon it was made required reading in paleontology under Professor van Houten at Princeton — along with an antidote: Loren Eiseley's *The Firmament of Time*. Hess several times during those years gave me the opportunity to address the faculty and graduate students of his department. Since from 1953 (when I spoke before the Graduate College Forum of Princeton University) to 1963 practically no college or university or scientific society extended to me an invitation to speak, those appearances at the behest of Hess meant much to me.

He gave me his published paper on guyots. Upon reading it I wrote a rather merciless criticism of his idea that the accumulation of sediment caused the submergence of the sea bottom and with it the submergence of the flat-topped guyots. In his response he showed graciousness.

By mid-1956 preparations for the International Geophysical Year were gaining momentum. On December 5, 1956, I gave to Hess a memo describing, in brevity, several projects for inclusion in the IGY. (The Year, due to start July 1, 1957, would continue until the end of 1958.) There was not yet a Space Science Board, so I gave the memo to Hess in his capacity as chairman of the geology department. Hess sent the memo to Dr. Joseph Kaplan, one of the scientific organizers of the Year. The answer came from Edward O. Hulburt, another scientist in charge of the program, and it was addressed to the "chairman of the department of physics" at Princeton. The first of the suggested projects — to investigate the earth's magnetic field above the ionosphere — had been, according to Hulburt, considered by the planning committee. (In my Forum Lecture [October 14, 1953] I had already claimed the existence of a magnetosphere above the ionosphere — the lecture was printed as a supplement to *Earth in Upheaval*.)

Three months after the beginning of the IGY the Russians startled the world by launching the first Sputnik (October 4, 1957), opening the Space Age. I was then on a visit to Israel, my second since I came to the States in July, 1939.

Although Hulburt referred to the plan of measuring the strength of the magnetic field above the ionosphere as considered for the program, the fact is that the discovery of the van Allen belts, the main achievement of IGY, was not anticipated or considered: when no charged particles were registered at a certain altitude, van Allen of the University of Iowa was startled, but one of his co-workers suggested that possibly the recording apparatus was jammed by too many charged particles; the apparatus was modified and the belts were discovered. At the beginning they were featured in the form of two halves of a doughnut; only much later was it recognized that the half on the anti-solar side is stretched far out. But in my memo as also in the Forum lecture, I visualized a magnetosphere reaching as far as the lunar orbit.

Another claim made in my Forum Lecture of 1953 — namely, that Jupiter could be a source of radio signals — was already confirmed in the spring of 1955. I never came out with “claims confirmed” until I read in the *New York Times* that nobody ever thought of Jupiter as a source of radio noises before they were discovered by chance. I turned to Lloyd Motz, Columbia University astronomer, and V. Bargmann, Princeton University physicist, both of whom were entrusted by me with the script of my Forum Lecture soon after its delivery. They wrote a joint letter to *Science*, which published it in the December 21, 1962 issue, concurrent with the yearly convention of the American Association for the Advancement of Science, publisher of *Science*. It almost coincided with the first reports of Mariner II, which had passed its rendezvous with Venus a week earlier, on December 14. The high temperature of Venus was confirmed.

This last announcement was made by Dr. Homer Newell for NASA in February, 1963. The presence of hydrocarbons in the clouds surrounding Venus was also announced as confirmed — this on the basis of the work of Dr. L. D. Kaplan (Jet Propulsion Laboratory): only compounds containing the radical CH (polymerized) could lend to the 15-mile thick cloud the same properties at the -25° F temperature at the top of the cloud and at the $+200^{\circ}$ F temperature at the bottom of the cloud separated by 45 kilometers of lower atmosphere from the sizzingly hot ground surface of the planet.

I wrote an article, “Venus — A Youthful Planet,” and sent it to the editor of *Science*. I found it back in my mailbox less than 48 hours later, returned unread.

I discussed the case with Hess, and he decided to offer it for publication in the American Philosophical Society *Proceedings*. As a member of the society he was entitled to sponsor a paper by a nonmember. The paper was submitted, and its fate was related by *Yale Scientific Magazine* (April, 1967, p. 8): “The paper was discussed at the editorial board meeting of the Society and caused prolonged and emotional deliberations, with the Board split between those favoring the publication and those opposed to it. For several months a decision could not be reached ... the decision was made, in order to safeguard the very existence of the Board, to delegate the decision on the article to three members of the society, not members of the Board. Their names were not disclosed but on January 20, 1964, Dr. George W. Corner, Executive

Officer of the Society and the editor of the *Proceedings*, informed Dr. Hess that the decision had been made to reject the article.

“Subsequently it was also rejected by the *Bulletin of Atomic Scientists*. In that magazine in April, 1964, an abusive article was published by a Mr. Howard Margolis, attacking Velikovsky and his work. The editor of the *Bulletin*, Dr. Eugene Rabinowitch, in a letter to Professor Alfred de Grazia, editor of the *American Behavioral Scientist*, offered Velikovsky an opportunity to reply with an article ‘not more abusive’ than that of Margolis, or, instead, to have some of his views presented in the *Bulletin* by some scientist of repute. Then Professor H. Hess submitted the article “Venus — A Youthful Planet,” to Dr. Rabinowitch. The latter returned it with the statement that he did not read Velikovsky’s book, nor the article.”

In July *Harper’s* printed an article by Eric Larrabee calling for an “agonizing reappraisal” of my work. Menzel of Harvard College Observatory, who not so long previously had revoked his earlier estimate of Venus’ temperature as much too high, now wrote in *Harper’s* that “hot” is a relative term and liquid helium is hot in relation to liquid hydrogen. As to my claim concerning the magnetosphere, Menzel argued that since I claimed that the magnetosphere reaches as far as the lunar orbit, I made a wrong prediction. The magnetosphere, he said, does not reach more than a few terrestrial radii, whereas the moon is 60 terrestrial radii distant.

Hess was adversely impressed by the attitude of the scientific community toward me and my work; still subscribing to the accepted uniformitarian doctrine, he had sympathy for my independent stand. He wrote a letter that was intended for public record and which Doubleday incorporated in its “Report on the Velikovsky Controversy,” printed in the Book Review Section of the *New York Times* (August 2, 1964).

While a debate was going on in several issues of *Harper’s*, the Australian physicist/cosmologist, V. A. Bailey, joined the fracas and accused Menzel of pre-space age thinking.

Hess, now president of the American Geological Society and chairman of the Space Science Board, suggested that I put together a program for space investigation. I responded without delay; the memo of September, 1963, resulted.

About that time de Grazia published a special issue of the *American Behavioral Scientist* dealing with the reception of my work. When he came to see me, Hess came too.

Once or twice I asked Hess to organize a panel of members of various faculties of Princeton University that would investigate what was right and what was wrong in my theory and what was proper or improper in the attitude of my critics. Before he decided whether to follow this course (perhaps, expecting a negative attitude by faculty members, he tarried), an initiative came from Dr. Franklin Murphy, at that time chancellor of the University of California at Los Angeles. He asked UCLA’s geophysicist, Professor Louis Slichter, to organize a committee for the same kind of inquiry I had proposed to Hess. Murphy’s initiative, however, foundered and the story needs to be told separately. It embraced the period from January to November, 1964.

In January, 1965, Hess took the initiative to organize the Cosmos and Chronos Study and Discussion Group, and he placed in the Bulletin of the University an announcement of the first open discussion. Originally we planned a debate on evolution based on the uniformitarian principle vs. evolution based mainly on cataclysmic events. My opponent was to have been Princeton professor of biology, Colin Pittendrigh. "There was a mutual respect between us (earlier he had visited me and also inscribed to me a biology text which he co-authored with G. G. Simpson, my early antagonist), but Pittendrigh insisted that the problem of extinction in the animal kingdom should not be a part of the debate. I could not see how the two parts of the evolutionary problem — the evolution of new species and the extinction of the old — could be separated in a meaningful debate. It appeared that the friendly relations between us were in jeopardy. Hess, without fanfare, offered to be my opponent.

The debate took place in the auditorium of Guyot Hall and fared well. Next, Professor Lloyd Motz came from Columbia University to debate me on astronomical subjects. The third open debate was between me and philosopher Walter Kaufmann of the Princeton faculty. Other study groups spontaneously organized themselves on various campuses. The story of the first four or five years of Cosmos and Chronos and what changes in the structure of the organization I had to demand is a story by itself;

In the fall of 1966 I spoke in the new auditorium of the Wilson School of Princeton University, under the aegis of the Princeton chapter of the American Institute of Aeronautics and Astronautics. The lecture was described by Walter Sullivan, science editor of the *New York Times*, in his column of October 2, 1966. As he described it, he first visited Hess to find out whether Velikovsky is a person of integrity. Hess assured him of my complete integrity and added something about my memory, ascribing to me more than I deserve.

An unusual memory was actually one of Hess' own characteristics. Things spoken or letters read were remembered by him years later. Once, when I exhorted him to reread a chapter in *Earth in Upheaval*, he replied that he knew the book by heart. His many very large tables that served him as desks were covered with stacks of papers, but it seemed that he could always find the necessary document; he was helped by a devoted secretary, Mrs. Knapp, who, it seems, also relied on his memory.

Despite his heavy schedule (he never stopped teaching crystallography), Hess was available for many a demand on his time. I remember the case of an uneducated but dedicated man who, living in Michigan, collected many rocks, obviously burned, and wrote me regularly of his belief that the lake was scooped out by an asteroid impact. He mailed me, at intervals, boxes with stones. I sent some of them to a scientist at the University of Pittsburgh whom I knew, and brought some others to Hess. The former did not answer; the latter took a few of them to investigate their possible meteoritic nature.

Hess ascribed the reversal of the rocks' magnetic orientation to a spontaneous process in the minerals, as he had claimed in debate with me at my occasional lectures at the geology department. But when he finally realized that such spontaneous reversals could not occur simultaneously in rocks of various compositions, he volunteered to tell me that he was wrong.

When, years after my first memo of December 5, 1956, he read or heard a paper concerning the reversal of the direction of winding in fossil vines and shells from both southern and northern hemispheres, he was pleased to let me know that the claims the IGY would not investigate were confirmed by independent research.

In 1967 I gave him a memorandum on radioactivity hazards for astronauts in several localized areas of the moon and Mars, results of interplanetary discharges. Dr. Homer Newell of NASA sent the memo to scientists on the staff who he thought would be the ones to consider the subject. By that time Hess and I started to call one another by our first names.

In 1968 Hess was named by the Italian government and Academy of Sciences the recipient of a major prize (in monetary value, approaching the Nobel prize) for his old work on the guyots. Despite all the distinctions he received, he remained a quiet and humble man. I never heard him speak in a loud voice. He did not pull or push and, which was unusual in the academic atmosphere of the time, he was sought out for his fairness.

Not long before his death he purchased a new home. Until then he had lived in a university house on Fitzrandolph Street, The house, built with its gables like a chalet, was occupied by Woodrow Wilson when he was president of Princeton University. At one of my rare visits, Hess drew my attention to the book cases built at Wilson's behest.

The last and possibly the most exciting event was quickly approaching. Hess, usually shy of publicity, made himself available to the press to state his belief that water in quantity would be found under the lunar surface. I remember how he showed me a winding rill or rift photographed on the moon and wished me to agree with him that it was caused by running water. I discussed with him my views, namely that the moon was once showered by water of the universal Deluge, but that all of it or almost all of it dissociated before the later cosmic catastrophes. The face of the moon we see was formed in those later catastrophes.

On May 19 I wrote down a few of my advanced claims concerning the moon and handed it to Hess' research assistant, who strongly supported the view that large water reservoirs lay under the moon's surface. Hess said to me, "this time you will be wrong." Until then, closely following my record, he found that all my expectations ("predictions") turned out to be true. Once, on our way from Guyot Hall to our respective homes, he ascribed my record to intuition. When I asked which of my claims does not follow from my thesis, he replied, "noises from Jupiter." He was right, but only to the extent that I have not yet published the story of the earlier cataclysms, promised in the final chapter of *Worlds in Collision*.

The events surrounding the first manned landing on the moon had a dramatic urgency, and they, too, need to be recorded separately. My two telephone conversations in which I tried to obtain Hess' support for thermoluminescence tests of lunar core extracts, as also envisioned in my article in the *New York Times* on the evening of the first lunar manned landing, can be read in the correspondence.

I saw Hess once more — he was with his secretaries and assistants, preparing for the Woods Hole meeting. He was not in a cheerful mood — that morning the news came that hydrocarbons

(petroleum derivatives) were discovered on the moon, but no water yet. (Now, almost three years later, signs of the one-time presence of water have been detected.) He was, it appeared to me, gloomy.

About half a year earlier he had suffered a heart attack. He was always a chain smoker. The load of work, the excitement of the last few weeks, and possibly a discouragement, but quite probably his premonition that he would not be able to witness the entire lunar program of many landings, must have weighed heavily on him.

On the morning of August 26, 1969, I picked up a newspaper at the Princeton Junction railway station and saw Hess' friendly face on a page carrying a eulogy.

The day the university arranged a memorial service in its chapel, I was delivering a lecture to the faculty of the Ocean County College. I spoke of Hess.

On October 21, exactly three months after the first landing on the moon, at my initiative, the geophysical department (the new name for the geology department), together with the Cosmos and Chronos Study Group, arranged a memorial lecture at the auditorium of Guyot Hall. The opening part of my lecture, "From Sputnik to Apollo XI," was dedicated to Hess.

In Hess' passing I lost the only member of the scientific elite who demanded a fair treatment for me and my work. When in November the assistant to the president of the university came to see me, I spoke of Hess and could not hide the tears in my eyes. For the rest of 1969 I felt depressed.

Of people who were prominent in their fields and who, since the beginning of my work and through the years showed me more than casual interest and sympathy, I name Robert Pfeiffer, orientalist and Biblical scholar (d. 1958); Horace M. Kallen, philosopher and educator; Walter S. Adams, astronomer (d. 1956); Albert Einstein (d. 1955); and Harry Hess, who died in his sixty-fourth year, three years ago. Kallen alone of all of them is alive, having these days reached the venerable age of ninety, still active as writer and lecturer, with time having dimmed none of his mental abilities.

They were few, but each of them was great as a human being.

The Ocean

SEDIMENTS

Poseidon, lord of the Ocean, was the first to come to my defense. A basic assumption of geology for the past century has been that, though the sea may encroach on land by covering coastal areas with shallow water, the continents and the oceans are primeval; what is now ocean was always ocean and the continents were always land masses, independent of whether they do or do not move slowly, as a certain theory (continental drift) proposes.

In *Worlds in Collision*, the permanency of land and sea was denied. In the presence of external forces, with attendant pulling and shearing, land submerged into the depths of the sea, and sea bottom rose to become land. Prior to certain catastrophes, earlier than those described in *Worlds in Collision*, the highest mountain ridges of the Himalayas must have been under sea, as the fossil content of their rock formations testifies.

Stupendous meteorite showers occurred in the past, and the red clay on the bottom of the sea must have iron and nickel content of meteoric origin. Speaking of the cataclysm that closed the period known as the Middle Bronze II (Middle Kingdom in Egypt), I wrote in *Worlds in Collision* (p. 48):

“One of the first visible signs of this encounter was the reddening of the earth’s surface by a fine dust of rusty pigment. In sea, lake and river this pigment gave a bloody coloring to the water. Because of these particles of ferruginous or other soluble pigment, the world turned red.”

In paroxysms of nature, especially during the catastrophe of the fifteenth century before the present era, ash fell on land and sea.

“Following the red dust, a ‘small dust,’ like ‘ashes of the furnace,’ fell ‘in all the land of Egypt’ (*Exodus* 9:8), and then a shower of meteorites flew toward the earth. Our planet entered deeper into the tail of the comet. The dust was a forerunner of the gravel.” (*Worlds in Collision*, p. 51).

The ash must be still found on the bottom of the ocean, its final repository.

The Earth was “in a vise” — in the grip of external forces, which altered the terrestrial rotation; the sphere was twisted, and the Atlantic ridge and African rift are only two of the visible signs of the strain to which the Earth was subjected.

“The earth groaned: for weeks now all its strata had been disarranged, its orbit distorted, its world quarters displaced, its oceans thrown upon its continents, its seas turned into deserts, its mountains upheaved, its islands submerged, its rivers running upstream — a world flowing with lava, shattered by meteorites, with yawning chasms, burning naphtha, vomiting volcanoes, shaking ground, a world enshrouded in an atmosphere filled with smoke and vapor. Twisting of strata and building of mountains, earthquakes and rumbling of volcanoes joined in an infernal din.” (*Worlds in Collision*, P. 97).

In *Earth in Upheaval*, I discussed the problem in two chapters, “Poles Displaced” and “Axis Shifted” . In “The Bottom of the Atlantic” and “The Floor of the Seas” I discussed sedimentary rock: it was not deposited evenly through the geological ages but erratically, most rapidly following natural disturbances on land. Further, the sedimentary layers were displaced in global catastrophes. Thus, it follows that the relative thicknesses of the sedimentary layers are not true indices for measuring the age of the oceans.

With such heretical ideas, my work flew in the face of accepted notions in oceanography and marine geology.

The book, *Worlds in Collision*, though already three years in the hands of Macmillan, was not yet off the press when Maurice Ewing, the Columbia University marine geologist, published an account of an expedition to the Atlantic Ocean and the mid-Atlantic ridge. This ridge runs north-south the entire length of the ocean. More than one surprise was in store for the expedition.

Whereas its members expected to find a uniform layer of sediment, the bottom of the ocean revealed no such uniformity, and I quoted from the record of the finds (*Earth in Upheaval*, p. 101: M. Ewing, "New Discoveries on the Mid-Atlantic Ridge," *National Geographic Magazine*, Vol. XCVI, No. 5 [November 1949]):

"Always it had been thought the sediment must be extremely thick, since it had been accumulating for countless ages. . . . But on the level basins that flank the Mid-Atlantic Ridge our signals reflected from the bottom mud and from the bedrock came back too close together to measure the time between them. . . . They show the sediment in the basins is less than 100 feet thick."

The absence of thick sediment on the level floor presents 'another of many scientific riddles our expedition propounded'." The bottom of the Atlantic Ocean on both sides of the Ridge must have been formed only in recent times.

But even more unexpected was the find of beach sand at a great depth and far away from any land. "One [of the 'new scientific puzzles'] was the discovery of prehistoric beach sand . . . brought up in one case from a depth of two and in the other nearly three and one half miles, far from any place where beaches exist today." One of these sand deposits was found twelve hundred miles from land.

Ewing recognized the uncomfortable dilemma: "Either the land must have sunk two to three miles, or the sea once must have been two to three miles lower than now. Either conclusion is startling. If the sea was once two miles lower, where could all the extra water have gone?" I shall return to the problem of the fallen ocean level, which I consider to have been the result of rapid evaporation due to catastrophic heating.

Five months after the publication of *Worlds in Collision*, another marine expedition — led by Professor Hans Pettersson, director of the Goteborg Oceanographic Institute (Albatross Expedition of 1947) — made a preliminary report of the findings of its fifteen-month exploratory voyage. Writing in *Scientific American* (August 1950: "Exploring the Ocean Floor"), Professor Pettersson spoke of evidence of "great catastrophes that have altered the face of the earth."

"Climatic catastrophes, which piled thousands of feet of ice on the higher latitudes of the continents, also covered the oceans with icebergs and ice fields at lower latitudes and chilled the surface waters even down to the Equator. Volcanic catastrophes cast rains of ash over the sea." Also, "tectonic catastrophes raised or lowered the ocean bottom hundreds and even thousands of feet, spreading huge 'tidal' waves which destroyed plant and animal life on the coastal plains." Pettersson also found, in addition to the ash, a "lava bed of geologically recent origin covered only by a thin veneer of sediment."

In the red clay on the bottom of the ocean Pettersson found “a surprisingly high content of nickel” (Pettersson, “Chronology of the Deep Ocean Bed,” *Tellus* 1, 1949). Nickel is not present in sea water and therefore could not have been deposited by water. “Nickel is a very rare element in most terrestrial rocks and continental sediments, and it is almost absent from the ocean waters. On the other hand, it is one of the main components of meteorites.” But the quantity of nickel in the clays in the bottom of the ocean was prodigious. Pettersson assumed very copious falls of meteorites in the geological past. He wrote in his account of the expedition, *Westward Ho with the Albatross* (1953), p. 150:

“Assuming the average nickel content of meteoric dust to be two percent, an approximate value for the rate of accretion of cosmic dust to the whole Earth can be worked out from these data. The result is very high — about 10,000 tons per day, or over a thousand times higher than the value computed from counting the shooting stars and estimating their mass.”

In other words, at some time or times there was such a fall of meteoric dust that, apportioned throughout the entire *assumed* age of the ocean, it would increase a thousandfold the daily accumulation of meteoric dust since the birth of the ocean based upon the estimated present potential rate of accretion; but since the shower of meteorites was most likely an event of short duration, measured in days or weeks only, the “thousandfold” must be changed to some astronomical figure — a figure also dependent upon ascertaining the correct age of the ocean.

In a subsequent publication (“Manganese and Nickel on the Ocean Floor” in *Geochimica et Cosmochimica Acta*, 1959, Vol. 17), Pettersson wrote: “Of all the elements found in deep-sea deposits few have a more puzzling distribution than the two ferrides, manganese and nickel.” Not only their high concentration, much higher than in continental rocks, but especially their vertical distribution appear “most enigmatic.” Pettersson concluded that “the former being largely due to sub-oceanic volcanic action, the latter [was] due to contributions from the cosmos.” It must have occurred by “an unusually heavy incidence from the cosmos.”

In a still more recent paper, Professor Pettersson discussed “The Accretion of Cosmic Matter to the Earth” (*Endeavor*, July 1960): “We found surprisingly large numbers of typical cosmic spherules in deep-sea sediments.” These magnetic particles (in diameter between 0.03 to 0.25 mm.) were not only found in very great numbers in the red clay of the oceanic bed, in the equatorial region of the Pacific, but also all over the world. In the Pacific, “their number varied from about one hundred up to several thousands per kilogram of sediment.” “In general the number of spherules is greatest in the more recent sediments.”

Pettersson observed ash on the bottom of the ocean, and such ash had already been observed by the famous expedition of the last century, that of H. M. S. *Challenger* (see Sir C. Wyville Thompson, *Voyage of the Challenger*) between the year 1873 and 1876. However, Pettersson failed to observe that the layer of ash is not just distributed here and there on the bottom of the oceans and therefore possibly attributable to volcanic eruptions, but is spread quite uniformly—and the account of an expedition led by J. Lamar Worzel, of Columbia University’s Lamont Geological Observatory, brought out this fact. The expedition of the vessel *Verna*, made in 1958, covered 500,000 square miles of the southwestern Pacific and found white ash between about 750 miles north and 850 miles south of the equator.

Writing in the *Proceedings of the National Academy of Sciences* in its March 15, 1959 issue (vol. 45, pp. 349-355), Worzel made the surmise:

“Since the layer is fairly near the surface and is not discolored and contains nothing but the glassy ash material it must have been laid down fairly quickly.” It must have been deposited in a single act, over a short period, “perhaps within a year or so.”

“The white ash immediately suggests a volcanic origin and the proximity of the Andes suggests the source. However, the great extent of the ash and its shallow cores would imply such a great amount of recent activity for a short time that it may be difficult to ascribe it to the Andes.” “. . . It may be necessary to attribute the layer to a world-wide volcanism or perhaps to the fiery end of bodies of cosmic origin.”

Maurice Ewing, as director of the Lamont Geological Observatory, joined Worzel in describing and evaluating the layer of ash; and on the basis of the random detection of similar ash in other parts of the oceanic world, he wrote (pp. 355-361):

“A single ash layer of 5 to 30 cm. thickness over such a wide area must record a notable event in the history of the area. It could hardly be without some recorded consequence of global extent.

“A re-examination of the file of Vema echograms is now in progress. It shows that sub-bottom echoes, similar to those found in the eastern Pacific, have also been recorded in the South Atlantic and Indian Oceans, [as well as] the Gulf of Mexico.

“The remarkable uniformity of thickness of the Worzel ash layer within the large area which has been cored is additional evidence suggesting that the layer may well have great extent.

“. . . The total volume of ash must be so great and the mechanism of dispersal so effective that the possibility of world-wide coverage must be considered.

“. . . Such an event could hardly fail to produce a variety of significant effects global in scale . . . conceivably a cometary collision.”

In the New York *Herald Tribune* of March 31, 1959 Dr. Worzel was quoted as saying that this ash may represent “the remains of a fantastic collision of heavenly bodies from outer space.”

A collision of the Earth with a huge comet was postulated or, at least, preferred to a huge and simultaneous eruption of a multitude of volcanoes, because of the evenness of the layer of white ash. Its position, very close to the surface, almost touching the water layer, makes it appear that the time elapsed since the deposit is very short, geologically speaking.¹

But only five or six years earlier, the consensus of scientific opinion — and it was expressed in no indefinite terms by my critics—insisted that there never was any collision of the Earth with a comet; furthermore, if such a collision were to occur, there would be no noticeable results. After all, the Earth passed through the tail of Halley’s comet in 1910 and there was no major phenomenon to register, not even flashes of shooting stars (e.g., I. Asimov).

In order to cover the expanse of the oceans with Worzel ash—this is its given name—some more significant collision must have taken place than that which occurred during the approach of Halley's comet in 1910. A phenomenon observed in the bottom of the oceans bespeaks a collision in which the Earth would have hardly proceeded undisturbed on its path.

RIFTS

In *Worlds in Collision*, it is claimed that the terrestrial sphere underwent great stresses—with resulting rifts and mountain formations—during the global catastrophism that occurred 3400 and 2700 years ago.

Professor T. Y. H. Ma of the National Taiwan University in Formosa published an article in the journal *Oceanographia Sinica* (Vol. II, No. I, September, 1955), in which he claimed a sudden shift in the oceanic bottom several times in the geological past. He found that changes in the sedimentary strata on the sea bottom must be attributed to “changes in latitude due to the sudden total displacements of the solid earth shell and the intermittent readjustments.” The last disturbance of the ocean bottom “ended only 2,600 years ago,” judging from the cores taken at the bottom of the Atlantic, while samples taken in the Pacific allow the displacement to be estimated at about “2,800 years ago.” These figures closely resemble the date of the last cosmic catastrophe fixed in *Worlds in Collision* as 27 centuries ago.

In 1960 Bruce C. Heezen of the Lamont Geological Observatory made known the results of an expedition that, in the previous months, had traversed all the longitudes and, going up and down the latitudes, had discovered a huge and strange formation twice encompassing the globe.

The structure has the form of a large and high ridge, split along its length by a deep canyon.

In a preliminary report published in *Scientific American* of October 1960, Heezen described it thus:

“It is a submarine mountain ridge that runs for 40,000 miles across the bottom of all the oceans and covers an area equal to that of all the continents. The existence of the mid-ocean ridge is a recent discovery of oceanography, and the mapping of it still far from complete. But the stretches that have been charted show a most curious aspect. Down most of its length the ridge is split by a deep canyon, or rift, in which many earthquakes originate. The ridge is apparently the locus of a crack in the crust that runs nearly twice around the earth. The discovery at this late date of the mid-ocean ridge and rift has raised fundamental questions about basic geological processes and the history of the Earth and has even had reverberations in cosmology.”

The Earth was, for some agonizing moments of its past, in a vise; and its coupling action wrenched the Earth and welled up the ridge and split it with a deep rift. The mid-Atlantic ridge known from before is but a segment of the entire serpentine formation. The area of the ridge is so great that it was estimated to equal the area of the five continents.

In *Earth in Upheaval* (1955), I wrote of the shearing action to which the Earth's crust was subjected when caught in force fields of extraneous origin. In *Worlds in Collision* (1950), I described the same occurrence as reflected in the sundials and water clocks of antiquity that certify to a changed length of the day on solstices, and thus to changed latitudes and a changed inclination of the terrestrial axis to the plane of the ecliptic (Chapter 7). The fact that the Moon does not circle the Earth on its equatorial plane and that this plane is inclined by over 23 degrees to the plane of the ecliptic - whereas the plane of the lunar orbit almost coincides with the plane of the ecliptic — made H. Jeffreys (*The Earth*, 2nd ed., 1929) speculate that the Earth was once, or several times, in a vise that turned its axis in a new direction; and I quoted him in the chapter "Axis Shifted" of *Earth in Upheaval*.

THE OCEAN LEVEL

The stress which resulted in the formation of the immense undersea rifts must have been accompanied by widespread volcanic activity, irruptions of the sea, and changes in the level of the land and in the bottom of the sea. The level of the ocean must have also changed suddenly as a consequence of such upheaval; and in *Worlds in Collision* (Chapter 4), I cited various sources in support of the fact that the sea bottom was heated and rivers and parts of the ocean evaporated ca. 1500 before the present era.

Professor Cecilia Payne-Gaposchkin, astronomer of Harvard University, wrote: "There is no evidence of a wholesale disturbance of the ocean level near 1500 B. C.," or 3500 years ago (*The Reporter*, March 14, 1950). However, Professor Reginald Daly, geologist of the same university, had claimed since the 1920's that "a recent worldwide sinking of ocean level" of twenty feet occurred "about 3500 years ago" (Daly, *Our Mobile Earth*, 1926, pp. 177-179).

Subsequent to the publication of *Worlds in Collision* and this first of a series of articles by Gaposchkin on the book, Professor Philip H. Kuenen of Leyden University made the following statement: "In thirty-odd years following Daly's first paper many further instances have been recorded by a number of investigators the world over, so that this recent shift is now well established." As to the time of this sudden drop of the ocean level, Kuenen wrote: ". . . the time can be fixed at roughly 3000 to 3500 years ago" (*Marine Geology*, 1950, p. 538).

In a paper that Dr. Rhodes Fairbridge of Columbia University read before the International Oceanographic Congress on September 7, 1959, he brought evidence from many parts of the world that 6000 years ago the oceans rose forty-five feet; he even expressed the belief that the Great Flood described in *Genesis* is an echo of that oceanic rise.

Dr. Fairbridge found in many places along the eastern coast of the United States, from Maine to North Carolina, drowned forests which had lived 2830 years ago, with a possible error of 200 years. This points to the 8th century before the present era. In *Worlds in Collision*, Part 2, are described global catastrophes of the eighth and beginning of the seventh centuries (-776 to -687) which, while being worldwide, were less violent when compared with the one that occurred in the middle of the second millennium, ca. 3500 years ago, or earlier ones. Such submerged forests

are found all around England and Wales and are described in *Earth in Upheaval* (1955), pp. 185ff.

Volcanic activity on the bottom of the oceans and seas must have been stupendous; likewise island building. On the latter we have the testimony of earlier centuries passed on in the writings of classical authors. For example, the origin of many islands as well as changes in the coastline of the Mediterranean are recorded in *Pliny's Natural History*. But, in *Worlds in Collision* I did not cite this and many other ancient chronicles, having presented only a fraction of the historical material I had before me; and again, the material I had before me and left unused is but a fraction of what is to be found in the ancient literature of the world. In *Earth in Upheaval*, however, I was careful not to include any historical or literary material at all, the work being built on the records of modern geology and paleontology.

CONCLUSION

The oceans as we know them are not tens of millions or hundreds of millions years old, as the accepted view assumes. In a sequel to *Worlds in Collision*, dealing with the catastrophic events preceding the second millennium before the present era, I shall discuss the origin of the oceans and shall try to show that their expanse grew greatly after the event known as the Universal Deluge, when cosmic water descended on Earth following the disruption of Saturn.

If this unsupported statement sounds unbelievable, the reader may rest assured that I shall underpin this thesis with as much essential documentation as I did my thesis of the youthful Venus, a newcomer to the planetary family. The provenance of the water will also explain the origin of chlorine in sea water — a problem that plagues marine geologists. For, while the land could provide sodium through erosion by rain, terrestrial rocks do not contain the requisite quantity of chlorine and are quite poor in that element. Some chlorine could have been added from volcanic eruptions but not as much as is needed to form the salt content of oceans and seas. The source of the greater part of the chlorine in oceans is of cosmic origin, and a few more words on this subject are contained in the pages of my book dealing with Saturn.

To the claims in my published work, the ocean responded with invariable support: the sediment on the bottom was not formed uniformly; the nickel content of the red clay in the sediment is of meteoric origin — cosmic dust that rained furiously on the Earth; the Worzel ash also came from cosmic sources; the Heezen ridge and rift are signs of the external torque applied to the Earth, probably more than once; the violent displacement of marine sediment layers, the changing level of the sea, coastal beach at great depths—all speak of catastrophic events temporally so close to us that our minds refuse comprehension.

References

1. See also E. Anders and D. N. Limber, "Origin of the Worzel Deep-sea Ash" in *Nature* 184 (1959), pp. 44-45.

Mercury

Mercury, the planet closest to the sun, is like Venus, a morning and evening star. But whereas Venus circles the sun in 224.7 terrestrial days, Mercury completes its orbital revolution in 88 days. Being so close to the sun it is rarely visible. Copernicus never saw it in the murky sky of Pomerania and wrote of it in his *De Revolutionibus* from what he learned in Claudius Ptolemy, the by then fourteen century old authority. Mercury is smaller than Venus and its mass was computed to be less than one eighteenth of the mass of the earth, whereas Venus is more than four-fifths of it. Mercury's diameter is by one half larger than our moon's diameter. Its orbit is a rather stretched ellipse whose perihelion, the point closest to the sun, and aphelion, the furthest point, are in the approximate ratio of two to three.

As the moon is locked with one side to the earth, its primary, so, and for the same reason, Mercury was thought to be locked permanently with one side to its primary, the sun. It was estimated that when the planet was in the process of formation, the sun must have caused in it tides, and this, in turn, must have exerted a tidal friction, and breaking of axial rotation. Thus the planet, so close to the sun for billions of years, must be permanently locked with one face to the sun.

In 1845 Adams and, independently, Leverrier, calculated in advance of its discovery, from perturbations of Uranus, the existence and the position of Neptune, thus supplying the world of physics and astronomy with what was (and often still is) regarded as the best confirmation of the scheme in which only gravitation and inertia direct the run of the celestial bodies. But in the same year Leverrier also calculated that the perihelion of Mercury advances in the direction of the planet's motion; it is the precession of the perihelion, or what is the same, a slow rotation of the long axis of the Mercurial orbit.

Laplace, who preceded Leverrier by half a century, acquired fame at the age 23 by showing that all kinds of irregularities in the celestial motions that have the appearance of "running down" and were so viewed by Newton himself who thought that Divine intervention is needed from time to time to rewind the mechanism, all these irregularities are not of a kind that accumulate, but are temporary, are actually swings or oscillations that after certain intervals reverse their direction and that therefore the celestial mechanism will never need rewinding.

Mercury's anomaly was obviously continually accumulating, and therefore not of an oscillating nature, not a swing. The anomaly was actually very minute. The observed precession amounts to 570 seconds of the arc in a century; of this amount, over 530 seconds of the arc of precession was attributed by Leverrier to the action of the planets perturbing Mercury; but some 35 seconds of the arc were unaccounted for, a figure increased by later investigation to 43 seconds. Since Mercury revolves in 88 terrestrial days around the sun, it makes more than 400 revolutions in a century and the anomaly amounts to as little as circa one tenth of a second of an arc of unaccounted precession at each revolution. How small this angle of deviation is one may perceive if one imagines a penny, 1.9cm, nearly three-quarters of an inch in diameter, viewed without magnification from a distance of about thirty miles. But so proud was the world of the mathematics of the first half of the nineteenth century, with its achievements, that such an unaccounted discrepancy in the Mercurial motions was paraded to show the acumen of science.

Leverrier, who predicted the existence of Neptune, a planet on an extreme orbit, thought that the residue of the Mercurial precession would be accounted for if yet another planet, still undiscovered, revolves inside the Mercurial orbit; because of the proximity of the sun it would not be easily observed, but Leverrier thought he had detected it. No confirmation came in the decades that followed. Other conjectures were made, such as a surmise that the mass of the Sun is not uniformly distributed, or that the Sun is a slightly “loaded” body; but there was nothing to support this particular claim apart from the fact that the anomaly of Mercury needed to be accounted for. Thus Leverrier in the same year 1845, by discovering Neptune confirmed the gravitational theory of Newton, and by discovering the anomaly of Mercury he cast doubt on the theory’s infallibility.

Seventy years after Leverrier calculated the anomaly, Einstein offered his explanation of it in his General Theory of Relativity (1911-1915) Ten years earlier he had published his Special Theory of Relativity (so named when the General Theory was adduced). In the Special Theory (1905) he deprived space and time, or their units, of the attribute of constancy--a second or a meter on a body moving in relation to an observer is no longer exactly a second or a meter, and he attributed constancy to the velocity of light, independently of whether the source of light is or is not in motion in relation to an observer. In the General Theory Einstein tackled the nature of gravitation. Space not being endowed with the attribute of constancy, Einstein visualized it as curved in the presence of a mass.

For the General Theory of Relativity Einstein offered three observational cases as proofs. The Mercurial anomaly is almost exactly what his theory would presuppose of a planet that moves in the curved space caused by the proximity of the huge mass of the sun. The next observational evidence accountable by the General Theory was the shifting towards the red (red shift) in the spectrum of light emanating from the sun, compared with the light of laboratory sources, a phenomenon in Einstein’s explanation resulting too from bending of space by the presence of heavy mass (sun).

The third phenomenon would be in light emitted by a star and passing near the solar disk (bending of the ray).

Einstein did not make “three predictions” for the validation of the General Theory of Relativity as it is often said; Sir James Jeans in his article on Relativity in the Encyclopedia Britannica refers in such terms to the three phenomena:

Einstein, knowing the mass of the sun, found himself in a *position to predict absolutely* what the motion of the perihelion of Mercury must be. It was found to be 42.9” a century, a figure which agreed with observation to well within the limits of errors of the observation . . . The theory makes one further prediction which admits of experimental test: The light received from a calcium atom situated in the intense gravitational field near the sun’s surface ought to be of slower period, and therefore of redder colour than the similar light emitted by terrestrial atoms . . . W. S. Adams found an actual shift of 0.32 A. It is hardly possible any longer to doubt that the spectral shift predicted by Einstein really exists . . .

A star or other massive body distorts the continuum [of space] in its neighborhood . . . in the neighborhood of such a body a ray of light does not travel in a straight line; it is deflected by the

gravitational field of the body . . . None of the expeditions had of course measured the deflections of the stars actually at the sun's limb; most of the stars were several diameters away from the limb, the observed deflections being corrected so as to bring them to the limb. The deflection of stars at all distances were found to agree well with the predictions of Einstein's theory.

Actually in a paper published in 1911 Einstein, claiming redshift in solar light writes in a footnote:

L. F. Jewel (*Journal de Physique*, VI (1897), 84), and especially Ch. Fabry and H. Boisson *Compt. rend.* 148 (1909), 688-90) have actually established noticeable shifts of fine spectral lines from the sequence(?) here calculated, but have ascribed them to the effect of pressure in the absorbing layer.¹

As to the Mercury's anomaly, it was announced by Leverrier in 1845 and often discussed since. Thus only the bending of light passing near a mass was in the category of prediction. A paper was printed by Soldner in the Bode's Annual but Einstein evidently did not know of that paper. Soldner calculated that following Newton's concepts of light as a stream of particles the ray of light passing near the Sun is deflected by a small angle; Einstein, however, claimed a deflection twice as large.

Every textbook on astronomy used to relate that Mercury is locked with one and the same face in relation to the Sun as the Moon is in relation to the Earth; tidal forces must have produced such effect.

With one side turned to the Sun and the other facing the cold space, it was estimated that Mercury must be as extremely hot on the lit side while the temperature on the other side must be very close to absolute zero.

Space probes have obtained the surprising result that the non-illuminated side of Mercury is comfortably warm, actually is 60 degrees F., or of room temperature. In order to explain such phenomenon it was assumed tht Mercury, thought to be without atmosphere, actually has one consisting of gases of heavy atoms; the atmosphere could carry the temperature from one side of Mercury to the other. Mercury had been thought to be void of any atmosphere because the small planet could not keep the molecules of gases from dissipating into space; first, lighter gases, but then also heavier would need to be lost to space; but in view of the observed temperature on the night side of Mercury, the assumption was made that heavy gases must have still survived on it. Great was, however, the surprise when Nicholas Kozyreff, investigating Mercury on presence of an atmosphere, announced the detection of hydrogen, the lightest of all gases. This was in sheer conflict with all theoretical computations. In the effort of finding the cause of the Mercurial temperature on the side turned away from the Sun, a new riddle that instead of explaining a phenomenon needed its own explanation, and this was not forthcoming because Mercury, millions or billions of years on its orbit, could not preserve an atmosphere of hydrogen.

In further search of the cause of Mercurial thermal "anomaly," the evident thing was undertaken and the planet was investigated by radar. There was another surprise lying in wait. The planet was rotating. This, too, was in conflict with the theoretical computations. Mercury had to be

locked with one face to the Sun. But it is not. The rate of rotation was found to be once in 58.65 days, whereas one orbital rotation of the planet equals 88 terrestrial days. The heated state of the night side of Mercury appeared to have now an explanation, though a more careful analysis must show that rotating once in 58 days, Mercurial surface temperature must drop far below 60 degrees F. It is, for instance, observed that the surface temperature of the Moon warmed by the Sun precipitously falls when during lunar eclipses Earth interposes itself between the Sun and the Moon—and the duration of an eclipse is counted in minutes, not days, as in the case of Mercury's rotation.

With the discovery of the Mercurial rotation, not sufficient to explain the thermal question, the question of why Mercury is not locked with one face to the sun became a matter of new perplexity. The observation was made by a team of Cornell University scientists. Thomas Gold speaking for the team announced that Mercury could not have been stationed on its orbit for long—400,000 years was, in the opinion of Gold, the longest stretch of time that could be allowed for Mercury to remain unlocked. On the assumption that the solar system is six or nine billion years old, 400,000 years represent only 1/10,000 of the time since the planets, following the accepted view, obtained their positions and acquired their rotational rates—and this is the upper limit. Neither the tidal nor the nebular theories can square with the newly discovered fact.

Mercury is beset by riddles: it should not have a hydrogen atmosphere, but, if Kozyrev is right, it has such atmosphere. It should not rotate, but it rotates. It should have the night side much cooler than 60 degrees F. but it has this temperature.

Actually all three unexplained phenomena point toward an adventurous past, a past counted by thousands of years, but not by millions. Mercury has heat of its own, not just reflected heat of the Sun; Mercury has still an atmosphere of hydrogen, the last vestiges of a more extensive halo and trail (caduceus) seen by our ancestors in the fourth or third millennium before the present era; Mercury rotates because it is on its orbit for only several thousands of years. It is on a stretched orbit—a relic of its recent arrival at its present orbital path. As to the last point, I would reserve an opinion because magnetic forces near the Sun need to be calculated in any motion of the planet. These forces are most probably also responsible, in our understanding for the precession of the perihelion of the planet, and Leverrier's discovery of this precession does not require a geometric curvature of space.

Mercury, Hermes of the Greeks, was thought to keep well his secrets. The ancient writings not intended for circulation but for the study of the initiated only were called hermetic books. In our days Mercury disclosed four secrets: first that it is warm on the darkened side; then that it has a hydrogen atmosphere; next, that its axis is wobbling, and finally that it is not locked with one and the same face toward the Sun. Each of the four revealed facts is in conflict with accepted solutions. All together offer a solution—a planet on a new position since, in astronomical sense, recent times.

In the story as told in the volume *Worlds in Collision* the planet Mercury plays no role; however in the projected volume about earlier events on the celestial screen, Mercury was a participant and was not an idle spectator of the theomachy, the battle of the gods. It had an epoch of its own, or an act in which it was the principle actor, in the early historical times, in an age antecedent to

the events in the solar system, dominated (as seen by man from the earth) first by Venus, then by Mars. But despite my not having introduced Mercury into the narrative of those later times (15th-7th century before this era) it could not remain even then as a completely inactive member of the planetary family. Especially if planets are charged bodies, the entrance of a new planet (Venus) into the system must have caused much havoc also on planets not in collision or near collision. One should think of the changes which the entire solar system would undergo and also keep in mind what the entrance of a new proton or electron would signify for an atom—the result could amount to the transmutation of an element.

The Romans as well as the Greeks pictured Mercury with wings, either on his headgear or at his ankles, and with an emblem, caduceus, twin snakes winding. The Babylonian name of the planet was Nebo, and he was an important deity, as the name of the mountain Nebo, on which tradition lets Moses die (Sinai, by the way, was consecrated to the Moon, Sin in Babylonian); Nebo in the names of the Kings Nabopolassar and Nebukhadnezzar testifies to its significance in the Babylonian pantheon as late as the seventh and sixth centuries. Equally pronounced was the role of Thoth, the planet Mercury of the Egyptian pantheon, the theophoric part of the name Thutmose or Tut-ankh-amen.

Mercury, or Hermes of the Greeks, was a swift messenger of the gods that speeded on his errand sent by Jupiter or Zeus.

In my understanding Mercury was once a satellite of Jupiter or of Saturn and under circumstances not understood by me, was directed toward the sun and caught there in an orbit still elliptical. It could, however, have been a comet passing near Jupiter and the entwined snakes of the caduceus may memorialize the appearance it had when seen by the inhabitants of the Earth. There are indices that point toward Mercury's involvement in the catastrophe that is described in Genesis as the confusion of the builders of the Tower of Babel, something that in modern medical terms seems like a consequence of a deep electrical shock.

The claim is that Mercury travels on its present orbit only since some five or six thousand years. This view conflicts with both standard alternatives—of nebular and of tidal theories of the origin of the planetary family and with the assumption that the planets occupy the same orbits since billions of years. Since the early days of modern science, actually since Aristotle, it was considered undisputable that since the origin of the solar system, Mercury has been moving on the very same path. The study of ancient texts convinced me that there was nothing to this belief besides wishful thinking: the entire solar system was repeatedly rearranged. Mercury does not occupy its orbit since six billion years—the assumed age of the universe (which by the way was repeatedly re-assessed from 2 billion when I started my studies till by now 10 and 12 billion years are occasionally heard).

Already before the publication of *Worlds in Collision* I considered (and let it be set in print) a system of the world in which the sun, being a charged body in rotation, creates a magnetic field; the planets, being charged bodies, move in that magnetic field and are compelled to proceed on their orbits; to this phenomenon I gave the name “circumduction” (see my *Cosmos Without Gravitation*, 1946), borrowed from J. Kepler. I considered Mercury's precession, discovered by Leverrier in 1846, as resulting from such an effect, and, possibly, from a growing charge on

Mercury (besides its not having completely settled after the celestial “battles”). I considered Einstein’s use of Mercury’s precession as an *ad hoc* argument for the General Theory of Relativity (certainly not a prediction, as James Jeans wrote in *The Encyclopedia Britannica*).

In my debate with Einstein, already early, in a letter written in August or September, 1952, I drew his attention to charges and consequences for Mercury, traveling in the extended corona of the sun. I returned to this also later in our correspondence.

Dr. Dicke came up with an oblate sun as a partial cause of the Mercurial anomaly. I drew his attention to the fact that he disregarded the by then discovered solar plasma and the magnetic field centered on the sun and permeating the solar system. He gave me a strange answer: “That is something we have to disregard.”

In my paper at the San Francisco Symposium, “Velikovsky’s Challenge to Science,” I once more drew attention to the problem and its consistent evasion in discussions of the General Theory of Relativity. Even in the days of Einstein he must have known of the general magnetic field of the sun, discovered by Hale a few years before Einstein used the argument for his theory; the magnetism of the solar spots was discovered earlier by Hale. Einstein corresponded with Hale on other matters.

As a matter of methodology it appeared to me improper that Einstein selected the case of Mercurial anomaly (precession of the perihelion) for the support of the General Theory of Relativity, without eliminating first the possible effect of the solar magnetic field on the precession of Mercury.

According to Newton an inverse cube effect when superimposed on an inverse square effect would result in a precession. A regular dipole magnetic field would produce an inverse cube effect when superimposed on an inverse square effect, due to gravitation.

The general magnetic field of the Sun was made known by G. E. Hale in 1912 at the time when Einstein was construing his General Theory. The magnetic property of solar spots had been discovered at the beginning of the century by the same Hale.

On the 14th of October, 1913, Einstein wrote to Hale on the issue of another of his advance claims, actually the only one that could put claim to this definition. In his letter he inquired whether there was a possibility to observe in broad daylight, very close to the rim of the sun, some fixed star, this with the help of the powerful telescope that Hale built (Mt. Wilson 100-inch telescope). It was a naive inquiry; however, it was suggested to Einstein by another physicist in Zurich and he followed the advice—the idea was that if the answer were positive there would be no need to wait for a full solar eclipse for observing whether the sun (or any large mass) deflects a ray of light from its rectilinear path. Writing to Hale, Einstein showed much respect—but where he had to take into account Hale’s great discoveries, he omitted to do so. Only by excluding the possibility that magnetic fields deflect a ray of light from rectilinear passage, would Einstein have cleared the way for offering an explanation based on a new principle in science.

In my understanding that goes back to the forties, the Sun being a rotating charged body creates a magnetic field that stretches far into interplanetary space. This field rotates with the Sun on which it is centered; at the distance of any planet, the field travels the length of the planetary orbit in the same time it needs for one axial rotation, or one turn of the Sun on its axis.

Mercury is a charged body and it moves in the solar magnetic field that rotates swifter than Mercury proceeds on its orbit.

In August 1952 I started my long debate with Einstein on the question whether inertia and gravitation are the only forces responsible for all the movements of the celestial clock, or whether electricity and magnetism, to whatever extent, need to be considered, too. I put the problem of Mercury squarely before him on this issue. I wrote:

Now the visible streamers of the sun that conveyed to Hale the idea that the sun is a magnet reach a long way towards Mercury, almost half the way. Was the electromagnetic state of the sun ever considered as the cause of the anomaly? The effect of the electromagnetic action must have been reckoned, and possibly excluded, but not disregarded.... Also the fact that the sun radiates at the expense of splitting (or building-up) of atoms was never followed through to the inevitable conclusion that the sun *is* a charged body in motion. At least the action of the magnetic spots of the sun with a field intensity reaching four or five thousand gauss should have been, if only once, taken into computation for its influence on planetary motion, Mercury in the first place, if only for the purpose of showing it as ineffective.

When, nine years later, Prof. H. H. Hess, upon being appointed, or elected, chairman of the Science Space Board of the National Academy of Sciences, wished to hear from me some suggestions for the activities of NASA (National Aeronautics and Space Administration), I offered, on September 11, 1963, a program for a series of investigations; concerning Mercury I wrote:

The cause of the precession of the perihelion should be re-examined in the light of the presence of a magnetic field of solar origin and solar plasma through which Mercury ploughs. An artificial satellite with a perihelion close to the sun could be tracked as to the precession of its perihelion.

Since I wrote this suggestion for experiment more than twelve years have passed. I have not heard or read of such a satellite having been dispatched.

At the symposium "Velikovsky's Challenge to Science" organized by the AAAS in San Francisco in February 1974, in my paper, entitled "My Challenge to Conventional Views in Science," I returned to the problem of the electromagnetic nature of the solar system and of the universe in general, and said concerning Mercury's anomaly:

It was, of course, known since Gilbert that the Earth is a magnet and G. E. Hale discovered that solar spots are magnetic and that the Sun possesses a general magnetic field. But this did not keep Einstein, a few years later, from accounting for the Mercurial precession by a new principle instead of first eliminating the effect of the newly discovered solar magnetic field on Mercury's movement.

If I was completely at odds with the cosmogony that had the solar system without history since creation, I was also carrying my heresy into a most sacred field, the holy of holies of science, to celestial mechanics. I had a chapter on the subject at the end of *Worlds in Collision*, but I kept those galleys from inclusion in the book and instead I included only one or two paragraphs—and the only italicized words in the book are found in them—namely: “The accepted celestial mechanics, notwithstanding the many calculations that have been carried out to many decimal places, or verified by celestial motions, stands only *if* the sun, the source of light, warmth, and other radiation produced by fusion and fission of atoms, *is as a whole an electrically neutral body*, and also if the planets, in their usual orbits, are neutral bodies.” I showed how the events I reconstructed could have occurred in the frame of classical celestial mechanics, but coming from the field of studying the working of the brain—I was the first to claim that electrical disturbances lie at the basis of epileptic seizures—I was greatly surprised to find that astronomy, the queen of sciences, lives still in the pre-Faraday age, not even in the time of kerosene lamps, but of candles and oil. It was, of course, known since Gilbert that the earth is a magnet and G. E. Hale discovered that solar spots are magnetic and that the Sun possesses a general magnetic field. But this did not keep Einstein, a few years later, for accounting for the Mercurial precession by a new principle, instead of first eliminating the effect of the newly discovered solar magnetic field on Mercury’s movement.

Thus I did not omit once more to challenge the accepted view that Mercury’s anomaly serves as confirmation of Einstein’s concept of space curved in the presence of a mass, independently of whether Einstein was right or not in the theory itself. But if the Mercurial precession has a different cause than that which Einstein envisaged, the absence of the effect expected by him could not but be damaging to his theory of the nature of gravitation.

It did not take long after the symposium in San Francisco and the Mariner X probe passing upon passing and surveying Venus, approached Mercury.

Even from a great distance the photographs of Mercury taken by the unmanned probe showed a surface that attested to a very stormy past of the planet and as the probes came closer, the features grew in detail. It revealed itself as a battered world. Its surface features were never before observed by a telescope from the Earth; but after the scientific world accustomed itself to the Martian photographs of American and Russian space probes, there was no outcry of surprise anymore, though this planet closest to the sun was the least known as to its surface features. But the explanations applied to Mars and Moon for the phenomenon of cratered surface, namely, that these celestial bodies are in travelling, Mars more, the Moon less, in the zone of the asteroids that supposedly by collisions with Mars and the Moon have caused these features, could not well be applied to Mercury, out of reach of almost all asteroids. And there were other features on the Mercurial surface that bespoke a violent past.

Very shortly after the February, 1974 symposium, Mariner X, passing near Mercury, established to the great surprise of all scientists, that it possesses a magnetosphere. Since it rotates slowly, in my opinion the magnetosphere results from the speedy relative motion of the space satellite and Mercury on its orbit. On the second passage, and third, of the satellite, the existence of the magnetic field around Mercury (magnetosphere) was confirmed. Now it becomes possible to

abstain from considering the effect of the Mercurial magnetosphere traveling with the planet through the magnetic field lines centered on the sun.

“The accepted celestial mechanics, notwithstanding the many calculations that have been carried out to many decimal places, or verified by celestial motions, stands only *if* the sun, the source of light, warmth, and other radiation produced by fusion and fission of atoms, *is as a whole an electrically neutral body*, and also if the planets, in their usual orbits, are neutral bodies.” (*Worlds in Collision*, Epilogue, p. 387). “In the Newtonian celestial mechanics, based on the theory of gravitation, electricity and magnetism play no role.”

The precession of Mercury, the planet closest to the sun, is claimed by the General Relativity theory as one of the proofs of the curvature of space around mass; but since Mercury moves close to the charged sun and actually in the outer reaches of the solar corona, the magnetic field of the sun must act on its motion; therefore the claim of the relativity theory needs reexamination as to its validity. (Already Laplace showed that should a celestial body attracted by its primary as inverse square of distance be subject to another attraction that changes as the inverse cube of distance, a precession by that body would result.)

Things axiomatic need to be repeated again and again over a score of years; the omission to take into account physical realities and calculate their effects should not be placed solely at Einstein's door; in over sixty years since the publication of the General Theory nobody was disturbed by this situation and in nearly a score of years since the space investigation started, with by now probably a thousand artificial satellites having been launched, an experiment intended to observe the behavior of a satellite on the Mercurial orbit and on an orbit perpendicular to it have not been performed or even planned.

An electromagnetic effect must be incalculated in the celestial mechanics, whether its action equals to a substantial part of the gravitational attraction, or to only a minute part: the precision of the celestial motions and the advance knowledge of planetary positions to a small degree of a fraction of a second of the arc, raises the question as to the part the electromagnetic interrelation must account for.

The discovery by John H. Nelson of certain dependence of the radio transmission and reception on the relative position of the planets (March 1951 issue of *RCA Review*) points in the same direction of an electromagnetic interdependence of planetary bodies. If an electromagnetic effect is present between these bodies, the exact masses of the planets must be recalculated, in order to leave also for the newly detected forces a role, small, however yet detectable, in the phenomenon of perturbation, or attraction of a planet by another.

References

1. “Über den Einfluss der Schwerkraft auf die Ausbreitung des Lichtes,” *Annalen der Physik*, XXXV (1911).

Jupiter's Radio Noises

One of the major deductions from the study of ancient civilizations was the recognition that the planetary and cometary bodies are charged objects and the solar system itself is regulated not solely by the law of gravitation; that electromagnetic interactions must exist and where following the inverse square law must be unrecognizable in their effects on the calculations of celestial mechanics - charge can, so to say, be hidden in or masked by the mass. Thus the problem of Pluto influencing Uranus and Neptune more than its mass can account for is a case of a substantial charge on a small planet. But where the less pronounced electromagnetic inverse cube relations take place, like in Mercury's precession of its perihelion, divergences from the celestial computations are registered as anomalies. Mercury moves through a general magnetic field of the Sun that influences it more strongly than it influences the remoter planets besides the influence on it and on them of the magnetic solar spots and solar wind.

In catastrophic conditions, with two celestial bodies approaching one another closely, the electromagnetic interactions may become most pronounced - the cometary protoplanet Venus produced a display of discharges between its head and its trailing part when the orbital movement of the protoplanet was disrupted by the close approach to the Earth; in the latter, eddy currents were generated with the effects due to such phenomenon (see *Worlds in Collision*, "Epilogue"). Interplanetary discharges took place when Mars and Earth came into close contact (*Worlds in Collision*, "Synodus"). The projected volumes dealing with catastrophes preceding those that took place at the end of the Middle Kingdom in Egypt carry the titles "Saturn and the Flood" and "Jupiter of the Thunderbolt".

The planet-god Jupiter (Zeus, Ormuzd, Shiva, Marduk) was pictured with a thunderbolt because of the spectacles witnessed by the inhabitants of the Earth —like a discharge that was directed toward Venus when it approached its parental body (*Worlds in Collision*, "Blazing Star"), or when the Earth itself might have been the target, as the content of the volume "Jupiter of the Thunderbolt" will reveal.

The understanding that the solar system is not neutral in its components but possibly neutral as a whole led me to the conclusion that the charge of the Sun may be equal to the combined charge of the planetary bodies and that quite possibly in Jupiter is assembled the major portion of it; thus, being ca. 1000 times smaller than the Sun it is charged to a very substantial potential.

Its potential could have been greater in the past; certainly planetary bodies exchanging discharges neutralized themselves to some degree; Mars, for instance, must have been much more charged in the past before the events of the first half of the first millennium before the present era. The charge of the planet, I thought, may even be decisive in the position the planet occupies in the planetary system. I even considered theoretically a system in which gravitation is completely supplanted by electromagnetic effects with the charged planets traveling in the magnetic field of the Sun, itself being a charged body that by its rotation creates the magnetic field permeating the solar system; I also contemplated the existence of magnetic shells that would be the determinative of the planetary distances (Bode's Law).

Since 1941, I insisted that electromagnetic interrelations in the solar system cannot be ignored - this was the theme of my long debate, in writing and oral, with Einstein - from August 1952 to his death in April of 1955. At some point in our debate (in a letter written in June 1954) I offered to stake our debate on whether Jupiter sends out radio noises (of non-thermal nature, as I already claimed in my Forum Lecture of 14 October, 1954), to which he reacted skeptically, yet was greatly surprised when nine days before his death I brought to him the news (New York Times of April 6, 1955) that such radio noises were accidentally detected.

It has been long known that Jupiter possesses an angular momentum that is superior to the angular momentum of the Sun, even of the Sun with the rest of the planets combined. This appeared to me not without a definite role of charges accumulated in Jupiter.

Jupiter was believed to be a cold planet - since the 19th century it was thought to be covered by a frozen mantle of ices over ten thousand miles thick. To me, however, from the knowledge of its activities in ancient times, it did not appear as an inert gravitational body; I thought also of Jupiter as a dark star (*Worlds in Collision*, p. 373); but the radio noises that I expected it to be sending out I considered as of non-thermal origin and so I also expressed myself in the mentioned Forum Lecture. But whereas I expressed myself in October 1952: "The planet is cold, yet its gases are in motion. It appears probable to me that it sends out radio noises as do the sun and the stars. I suggest that this be investigated," in June 1954 in a letter to Einstein, I took a most definite stand: "Of course, I am a heretic, for I question the neutral state of celestial bodies. There are various tests that could be made. For instance, does Jupiter send out radio-noises or not? This can easily be found if you should wish." This claim was also vindicated in the announcement made by Burke and Franklin on April 6 of 1955.

The relevance of the orbital periods of Jupiter and Saturn to the sunspot cycle appeared to me, if real, based on electromagnetic, interdependence. The highly charged Jupiter must create a powerful magnetosphere; it may even create magnetic shells, for distribution of its satellites, a thing not yet proven; but certainly the large satellites of Jupiter, and especially the innermost of the Jovian satellites, must be much affected by its magnetic field. Jupiter itself appeared to me to be of contrasting charges on various levels which would account for the potential difference observed in celestial battles by the ancients between the head and the trailing part of the Jovian progeny - protoplanet Venus (*Worlds in Collision*, "The Battle in the Sky"), the head having been expelled from Jupiter's deeper parts, the trailing part of debris and gases from a more superficial layer.

Thus discharges on Jupiter could be dictated by potential difference. The closest of the Galilean satellites must be acting as a target independent of whether a spark discharge actually takes place or a stream of charged particles is directed toward it and to a lesser extent toward other satellites (the fifth, however is only 112,000 miles mean distance from the planet). A purely gravitational relationship between Jupiter and its satellites appeared to me unthinkable; and on this phenomenon, in my estimate, the purely gravitational system of the World must stumble, as also on the case of the behavior of the comets when approaching, then circling the Sun in their perihelia a subject much discussed by me with Einstein in my effort to convince him of the fallibility of a purely gravitational system of the solar system (and of the universe in general).

The discovery of the Jovian noises (1955), and of the terrestrial magnetosphere (1958), claimed by me also in the Forum Lecture of 1953, and of the interplanetary magnetic field centered on the Sun and rotating with it (1960), and of the solar wind or uninterrupted streams of plasma (1960), made the purely gravitational system of the World untenable. Yet among astronomers, as late as 1971, the full significance of the fact for the understanding of the structure of the universe only very slowly finds its way, as can be exemplified by a paper by Prof. Ivan King, “The Dynamics of Star Clusters”, where no mention is found of any electromagnetic participation in the mechanics of the galaxies.

The realization that Jupiter, which participated in a vigorous way in the theomachy (celestial battles), is not inert and cold led me to the conclusion that Jupiter must be also hot under its cloud cover, at some depth. This afterthought made me also claim that Jupiter is hot in a discussion with Prof. I. I. Shapiro of M.I.T., well-known authority in astrophysics, who denied such a possibility. This claim was confirmed recently by probes of the temperature underlying the surface clouds.

This leads me to the necessity to discuss some other aspects of the recent history of Jupiter, which all ancient peoples of the World elevated to the role of the supreme deity, the role it took over from Kronos-Saturn. But such a discussion I will undertake separately and at some length.

Saturn

Of Saturn I intended, already for some two decades, to write in a volume “Saturn and the Flood,” in which, as the title discloses, I would endeavor to identify this planet as the prime cause of the greatest of all catastrophes in human memory—the universal flood, or Deluge. This part of *Worlds in Collision* was conceived and drafted together with the parts dealing with Venus and Mars, but the elaboration of details was postponed and other labors claimed my attention and I am still before work unfinished. I will, however, disclose in a few sentences what is the subject of that part of reconstruction of world history.

The age that man later called the Age of Cronos (Saturn) was remembered with nostalgia as the age of bliss. It was the the earliest age of which man retained some, however dim, memories, but farther into the past, the dimness amounts almost to darkness. Saturn was also a more massive body than it is now, possibly of the volume of Jupiter, ¹ whereas now the proportion is approximately 7 to 13.

At a date that I would be hard put to task to identify even with approximation, but possibly about ten thousand years ago, Saturn was disturbed by Jupiter and exploded, actually became a nova. 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.

Told in such brevity, the story sounds fantastic. I had the choice not to mention these events here at all or to refer to them and ask indulgence on the part of the readers for having said something unusual, and at the same time ask them to wait for a detailed narrative at some indeterminate time. I selected the latter. I have already mentioned that the major planets were in some way

connected with the earlier cataclysms, one of which was the Deluge (*Worlds in Collision*, p. 373).

When in 1946 the manuscript of *Worlds in Collision* was first offered to the publishers (Macmillan and Co., New York), it contained the story of the Deluge and of the catastrophe that terminated the Old Kingdom in Egypt. But, at the suggestion of the reader for the publishing company, the book should have concentrated on one event; we compromised and presented in the published volume two series of catastrophes—those that took place in the fifteenth century before the present era and were caused by near approaches of Venus, and those which occurred in the eighth century before this era, and were caused by close approaches of Mars. The unused material was left for elaboration in two volumes: “Saturn and the Flood” and “Jupiter of the Thunderbolt.”

With this hardly even a summary, as told on this page, I should possibly dispel any misconception as to what is the design of my manuscript, too slow in the making. As to “predictions,” I could make several and I offer them cognizant of the fact that a prediction in science needs to be elaborated on the reasons that led to it.

I assumed, in the first place, that the planet Saturn must contain water to the extent that it is a “water planet.” It is also possible that water that enveloped the earth following the explosion of Saturn was at least partly formed by hydrogen combining with the oxygen of the terrestrial atmosphere—and there are indications that I intend to discuss in my book on the Deluge which point toward a sudden drop in oxygen content in the terrestrial atmosphere. But the fact that comets were observed consisting of water (ice), according to their spectral picture, permits the conclusion that water “ready-made” came from the planetary “nova.” Actually, in years subsequent to my concept of *Worlds in Collision*, water was identified as present on Saturn.

Further, I assumed that sodium chloride, or common salt, is an ingredient of the Saturnian atmosphere. Geophysicists have long wondered as to the origin of salt in the ocean. Sodium could have been derived from terrestrial rocks; but they are poor in chlorine. To some extent chlorine in oceans could have come from volcanic eruptions but it would require eruptions on an almost unimaginable scale to produce all of the chlorine locked in the salt of the oceans. The ancient traditions of Deluge refer also to the water arriving from space as salty and warm.

I have thought also of free chlorine (not combined into salt) on Saturn; but it is possible that vegetable life, at least, is present on Saturn, and free chlorine would interfere with vegetation; the reasons, though not compelling, for this assumption of vegetation on Saturn are also reserved for the detailed discussion. The tradition found in ancient texts refers to innumerable new forms of life in animal and plant kingdom following the Flood, which could have been solely a result of multiple mutations. But there exists in ancient lore an ever recurring association of seeds and new plant forms, with Saturn, Osiris, Tammus, Cronos, all of whom I understand as personifications of the planet Saturn.

In recent years I have chanced to read the view of Josif Shklovsky, a Russian astrophysicist, that a nova would be a source of cosmic rays even thousands of years after the explosion. Shklovsky and his collaborators offered the suggestion that at some past time the earth, or the entire solar

system, passed through clouds of cosmic rays, resulting from a nova star, that caused the extinction of various forms of life on earth, dinosaurs and others. This thought found an echo in me because the same thoughts had been put on paper by me two decades earlier. But their assumption that cosmic rays may be discharged by a nova thousands of years after the explosion led me to think that if such is the case, Saturn may still emit cosmic rays, if, by now, only of low energy. Therefore when asked at some college gatherings what new "prediction" I would make, and desirous to tell something that in case of detection could not be ascribed to a lucky guess, I volunteered to suggest that there is a good chance that Saturn emits low energy cosmic rays. This on the assumption that the Russians were right in saying that a nova would still be sending out such radiation after so long a period.

Finally, Saturn must emit more heat than it receives from the Sun. Reasons for such conditions of Saturn are at least two: first, the residual heat of the catastrophe in which Saturn was derailed from its orbit; second, the radioactivity that resulted from the catastrophe must still be pronounced on Saturn. In addition, Saturn can be regarded as a star and may have some mechanisms that make our sun burn with intense light. Because the surface clouds of Saturn are cold and the distance of Saturn from the sun renders the heat from this source very limited, the conclusion was drawn that Saturn must be very cold, frozen to its core. We came to a different conclusion also concerning the temperature of Saturn below the surface cloud layer.

In 1966 Dr. K. I. Kellermann described in *Icarus* the surprising fact that Saturn, at the wavelength of 21.3 cm. shows a temperature of 90 degrees F., which cannot be explained by solar radiation. It will be found of still higher temperature.

The rings of Saturn are formations of less than ten or twelve thousand years old. They must consist largely of water in the form of ice, but since the ancient lore all around the world tells that it was Jupiter who put these rings around Saturn, they may have some other components, too. Since these lines were written, spectroscopic study of the Saturnian rings has revealed that they consist mainly of water in the form of ice (1966).

Sodium chloride and cosmic rays are two phenomena still waiting to be investigated. Therefore, when I presented to Dr. H. H. Hess in his capacity as chairman of the Space Board of the National Academy of Science, a memorandum (dated September 11, 1963), subsequently submitted also to Dr. Homer Newell in his capacity as Director of NASA, I included these lines concerning Saturn:

"Saturn. Tests should be devised for detection of low-energy cosmic rays emanating from Saturn, especially during the weeks before and after a conjunction of Earth-Jupiter-Saturn."

"Chlorine should be looked for in the Saturnian spectrum of absorption."

References

1. Interestingly, for certain reasons G. Kuiper assumed in recent years that Saturn originally was of a mass equal to that of Jupiter. *Sky & Telescope*, March 1959, p. 259.

Joseph and Potiphar

The story of Joseph is one of the best known in the Bible: Joseph who dreamed prophetic dreams, and wore a shirt of many colors—a distinction of his father—and was sold into Egypt by his brothers. There he became housekeeper in the household of a high official, but later was thrown in the dungeon. Then, after he had interpreted the dreams of Pharaoh about the seven years of plenty and seven years of famine, he was freed and was appointed to gather and store the produce during the good years and distribute it during the lean years.

The person of Joseph was searched for by the historians among the grandees of Syro-Canaanite origin at the court of the Egyptian Pharaohs. He was identified with Dudu, the courtier in the palace of Akhnaton; or with Iaanhamu, who was in care of the food supply in the same reign: his name is often mentioned in the el-Amarna letters as that of an official who sold food to the people of Canaan on behalf of the Pharaoh.

In *Ages in Chaos* it was demonstrated that Dudu was probably a grandson of Hadad—mentioned in I Kings 2; that the letters of el-Amarna described the famine, also known from the Scriptures, that occurred in the days of Ahab, King of Israel.

In *Ages in Chaos* and in *Worlds in Collision* I was able to establish the fact that the Exodus took place on the day when the Middle Kingdom of Egypt had its end. Thus we are carried to the conclusion that the sojourn of the Israelites in Egypt falls in the period of the Middle Kingdom. This sojourn begins, according to the Scriptures, with the arrival of Joseph, son of Jacob, who at the same time is the only figure of discern in the Egyptian Jewry before the time of Moses and Exodus. Thus, realizing that the sojourn of the Israelites in Egypt took place not during the New Kingdom but during the preceding Middle Kingdom, in order to find out whether the personality of Joseph or the patron of the early stage of his career, Potiphar, is referred to in the historical documents, we have to look into those of the Middle Kingdom. The task appears simple. According to the Book of Genesis Potiphar was “an officer of Pharaoh, captain of the guard.” In the register of the private names to the *Ancient Records of Egypt* by James Breasted, we find the name Ptahwer.

Ptahwer was at the service of the Pharaoh Amenemhet III of the Twelfth Dynasty of the Middle Kingdom. According to an inscription of Ptahwer at Sarbut el-Khadem in Sinai dated in the forty-fifth year of Amenemhet III, his office was that of “master of the double cabinet, chief of the treasury.”

Ptahwer's text reads:

I was one sent to bring plentiful ____ from the land of ____, ready in his reports to his lord, delivering Asia to him who is in the palace, bringing Sinai at his heels, traversing inaccessible valleys, bringing unknown extremities (of the world), the master of the double cabinet, chief of the treasury, Ptahwer, triumphant, born of Yata.

The inscription records the successful accomplishment of some peaceful expedition. Since there is only one Ptahwer in the historical documents, and since he lived in the time when we expect to find him, we are probably not wrong in identifying the biblical Potiphar with the historical Ptahwer.

This being the conclusion concerning Potiphar, we are curious to find whether any mention of Joseph is found in historical documents, too. The fact that from the great and glorious age of the Middle Kingdom only a very few historical inscriptions are extant. Since a great famine took place in the days of Joseph, it is, of course, important to trace such a famine in the age of which we speak. In the days of Amenemhet III there occurred in Egypt a famine enduring nine long years. Of this period we have a revealing document, which reads:

With these expressions the words of the Scriptures can be compared (Genesis 41:54):

And the seven years of dearth began to come, according as Joseph had said; and the dearth was in all lands; but in the land of Egypt there was bread.

Thus it seems that the Pharaoh in whose days was the seven years' famine was the successor of the Pharaoh in whose days began the rise of Joseph's career (if Yatu is Joseph). Potiphar, who lived under Amenemhet III, probably lived also under his successor.

The inscription which deals with Ptahwer mentions a man whose name is transliterated by Breasted as Y-t-w. Among the monuments of Amenemhet III's reign is one of the Storekeeper who was honored together with two other persons, and , with a royal If we remember that according to the Scriptural narrative Joseph was appointed storekeeper of the State (Gen. 41:40-41) in anticipation of the seven lean years, with the powers of a chief Minister of State or Vice-King, we may suspect in Yatu the Biblical Joseph. In the Scriptures it is said that his name was changed by Pharaoh to Zaphnath-paaneah, but still his original name may have been in use until he became next to the Pharaoh in importance.

The inscription that mentions Ptahwer refers to his activity in the mines of the Sinai peninsula. In this respect it is of interest to find that the Jewish

traditions connect Joseph with the area of the Sinai Peninsula saying that he kept a large quantity of treasures near Baal Zaphon, the scene of the Passage of the Sea.

The beautiful story of Joseph appears to be a narrative in the style of Egyptian literature of the Middle Kingdom. It should be noted that Egyptian literature achieved its apogee in this period of Egypt's history. Literary creations such as "The Story of Sinuhe" or "The Tale of the Shipwrecked Sailor" were equalled neither before nor after the Middle Kingdom. And the beautiful style of the story of Joseph seems to be a product of the same time; it could have been written at the end of the Middle Kingdom, before the end of the sojourn of Israel in Egypt.

Hammurabi and the Revised Chronology

King Hammurabi is the best known of the early monarchs of ancient times due to his famous law code, found inscribed on stone. This great lawgiver of ancient Babylon belonged to the First Baby-Ionian Dynasty which came to an end, under circumstances shrouded in mystery, some three or four generations after Hammurabi. For the next several centuries, the land was in the domain of a people known as the Kassites. They left few examples of art and hardly any literary works—theirs was an age comparable to and contemporaneous with that of the Hyksos in Egypt, and various surmises were made as to the identity of the two peoples. A cartouche of the Hyksos king Khyan was even found in Babylonia¹ and another in Anatolia,² a possible indication of the extent of the power and influence wielded by the Hyksos.

Until a few decades ago, the reign of Hammurabi was dated to around the year 2100 before the present era. This dating was originally prompted by information contained in an inscription of Nabonidus, the last king of Babylon, who reigned in the sixth century until the conquest of his land by Cyrus. Whereas his son and co-ruler, Belshazzar, occupied himself with the administration of the land, Nabonidus indulged in an avocation: he showed a marked interest in archaeology, and excavated the foundations of ancient temples, looking for old inscriptions.³

In the foundations of a temple at Larsa, Nabonidus found a plaque of King Burnaburiash. This king is known to us from the el-Amarna correspondence in which he participated. On that plaque Burnaburiash wrote that he had rebuilt the temple erected seven hundred years before by King Hammurabi. The el-Amarna letters, according to conventional chronology, were written about -1400. Thus, if Burnaburiash lived then, Hammurabi must have lived about -2100.

When Egyptologists found it necessary to reduce the el-Amarna Age by a quarter of a century, the time of Hammurabi was adjusted accordingly, and placed in the twenty-first century before the present era. It was also observed: "The period of the First Dynasty of Babylon has always been a landmark in early history, because by it the chronology of Babylonia can be fixed, with a reasonable margin of error."⁴ The period of Hammurabi also served as a landmark for the

histories of the Middle East from Elam to Syria, and was used as a guide for the chronological tables of other nations.

Since the dates for Hammurabi were established originally on the evidence of the plaque of King Burnaburiash found by Nabonidus—which indicated that King Hammurabi had reigned seven hundred years earlier—the revision of ancient history outlined in *Ages in Chaos* would set a much later date for Hammurabi, for it places the el-Amarna correspondence and King Burnaburiash in the ninth, not the fourteenth, century. Burnaburiash wrote long letters to Amenhotep III and Akhnaton, bore himself in a haughty manner and demanded presents in gold, jewels, and ivory. In the same collection of letters, however, there are many which we have identified as originating from Ahab of Samaria and Jehoshaphat of Jerusalem, and from their governors.⁵

Therefore, seven hundred years before this correspondence would bring us to the sixteenth century, not the twenty-first. Also, the end of the First Babylonian Dynasty—in circumstances recalling the end of the Middle Kingdom in Egypt—would point to some date close to -1500, or even several decades later.

A connecting link was actually found between the First Babylonian Dynasty and the Twelfth Dynasty of Egypt, the great dynasty of the Middle Kingdom. At Platanos on Crete, a seal of the Hammurabi type was discovered in a tomb together with Middle Minoan pottery of a kind associated at other sites with objects of the Twelfth Egyptian Dynasty,⁶ more exactly, of its earlier part.⁷ This is regarded as proof that these two dynasties were contemporaneous.

In the last several decades, however, a series of new discoveries have made a drastic reduction of the time of Hammurabi imperative. Chief among the factors that demand a radical change in the chronology of early Babylonia and that of the entire Middle Eastern complex—a chronology that for a long time was regarded as unassailable—are the finds of Mari, Nuzi, and Khorsabad. At Mari on the central Euphrates, among other rich material, a cuneiform tablet was found which established that Hammurabi of Babylonia and King Shamshi-Adad I of Assyria were contemporaries. An oath was sworn by the life of these two kings in the tenth year of Hammurabi. The finds at Mari “proved conclusively that Hammurabi came to the throne in Babylonia after the accession of Shamshi-Adad I in Assyria”.⁸

Shamshi-Adad I could not have reigned in the twenty-first century since there exist lists of Assyrian kings which enable us to compute regnal dates. Being compilations of later times, it is admitted by modern research that “the figures in king lists are not infrequently erroneous”.⁹ But in 1932 a fuller and better-preserved list of Assyrian king names was found at Khorsabad, capital of Sargon II. Published ten years later, in 1942, it contains the names of one hundred and seven Assyrian kings with the number of years of their reigns. Shamshi-Adad I, who is the thirty-first on the list, but the first of the kings whose regnal years are given in figures, reigned much later than the time originally allotted to Hammurabi whose contemporary he was.

The Khorsabad list ends in the tenth year of Assur-Nerari V, which is computed to have been -745; at that time the list was composed or copied. By adding to the last year the sum of the regnal years, as given in the list of the kings from Shamshi-Adad to Assur-Nerari, the first year

of Shamshi-Adad is calculated to have been -1726 and his last year -1694. These could be the earliest dates; with a less liberal approach, the time of Shamshi-Adad needs to be relegated to an even later date.

The result expressed in the above figures required a revolutionary alteration in Babylonian chronology, for it reduced the time of Hammurabi from the twenty-first century to the beginning of the seventeenth century. The realization that the dating of Hammurabi must be brought forward by three and a half centuries created “a puzzling chronological discrepancy”,¹⁰ which could only be resolved by making Hammurabi later than Amenemhet I of the Twelfth Dynasty.

The process of scaling down the time of Hammurabi is an exciting spectacle. Sidney Smith and W. F. Albright competed in this scaling down; as soon as one of them offered a more recent date, the other offered a still more recent one, and so it went until Albright arrived at -1728 to -1686 for Hammurabi, and S. Smith—by placing Shamshi-Adad from -1726 to -1694—appeared to start Hammurabi at -1716.¹¹

If Hammurabi reigned at the time allotted to him by the finds at Mari and Khorsabad—but according to the finds at Platanos was a contemporary of the Egyptian kings of the early Twelfth Dynasty—then that dynasty must have started at a time when, according to the accepted chronology, it had already come to its end. In conventionally-written history, by -1680 not only the Twelfth Dynasty, but also the Thirteenth, or the last of the Middle Kingdom, had expired. On the accepted timetable, the Hyksos (Dynasties 14 to 17) ruled from that year for one century, until, in -1580, the Eighteenth Dynasty initiated the era of the New Kingdom.

We have previously discussed the difficulties that followed from leaving only one hundred years for the Hyksos period.¹² The great change in scenery between the end of the Middle Kingdom and the New Kingdom made Flinders Petrie claim that an additional period of 1461 years (one Sothic period) must be placed between the two eras; but this view did not prevail. Nor were retained as valid the historical sources (Josephus-Manetho) that allotted 511 years for the Hyksos period; nor was the consideration of cultural changes, as advocated by H. R. Hall—who pleaded for four or five centuries for the Hyksos period—given a chance.

When the end of the Twelfth Dynasty was brought down to -1680, there was no time left for the Thirteenth; and with only one century for the Hyksos, the bottom of the Middle Kingdom had apparently reached a level below which it could not be reasonably or securely dropped. This also constituted a barrier against any further reduction of Hammurabi's time. Nevertheless, an attempt was made to eliminate the Hyksos period altogether: of the five hundred and eleven years of Hyksos rule, as given by Manetho and preserved by Josephus, not a single year was left.¹³ This proposed elimination of the Hyksos period, though made by a qualified scholar, was received with mixed reactions. But even this elimination did not bring the scales of the balance to rest.

Even without a further reduction of Hammurabi's time, the scaling down of his date by Albright and Smith was sufficient to call for a general lowering of the dates assigned to all west Asian and Aegean material.¹⁴ Consequently, three to four centuries were subtracted from all west Asian and Aegean chronology of the period corresponding to the Middle Kingdom in Egypt. Only the

beginning of the New Kingdom was not moved from -1580, for it was regarded as “absolutely certain” and “mathematically certain”.¹⁵

Yet the finds in Mesopotamia required a further lowering of the dates of the First Babylonian Dynasty. In one case of Middle East chronology before the New Kingdom—the date of the so-called Cappadocian tablets—a full six hundred years was excised. On tablets from Araphkha and Nuzi, seal impressions of the First Babylonian Dynasty were found. These tablets dated from the fifteenth century, “which points to a much later date than currently accepted”.

If Hammurabi lived in the sixteenth century and the First Baby-Ionian Dynasty ruled until the beginning of the fifteenth century, then many dates of early history must be revised even more drastically. But the Middle Kingdom in Egypt could not be lowered below -1580 because such a shift would make a portion of the Middle Kingdom contemporary with the New Kingdom.

In my reconstruction of ancient history, the beginning of the New Kingdom is shown to correspond with the later part of Saul’s reign, in the second half of the eleventh century. The Middle Kingdom (Thirteenth Dynasty) ended not in -1720 or -1680 but shortly after -1500. The Hyksos period regains its place in history: it continued for over four hundred years and corresponds in Biblical history to the time of the Wandering in the Desert, the Conquest of Canaan, the Judges, and to a part of Saul’s reign.

The Assyrian king lists lend support to our reconstruction by exposing the need to lower the dates of the Twelfth Egyptian Dynasty. With Hammurabi belonging to the sixteenth century, the time of Burnaburiash is in the ninth century. This is also the period to which we ascribed the el-Amarna correspondence; and not the Assyrian and Babylonian material, but the Biblical and Egyptian evidence compelled us to move the beginning of the New Kingdom from -1580 to ca. -1040, and the time of el-Amarna to ca. -860 until -840 or -830.

The archaeological facts discussed above lead to the conclusion that the First Babylonian Dynasty reigned from the eighteenth century to the very beginning of the fifteenth and was contemporaneous with the Egyptian Twelfth and Thirteenth Dynasties—the Middle Kingdom. The time of the Kassites in Mesopotamia corresponds more precisely to the time of the Hyksos in Egypt and Syria. The fall of this Amalekite (Hyksos) Empire brought down their power “from Havila [in Mesopotamia] to Shur, over against Egypt” (I Samuel 15:7).

The discoveries at Platanos, Nuzi, Mari, and Khorsabad demand that the Middle Kingdom in Egypt be brought down to the fifteenth century, and though they involve archaeological material of an epoch preceding the period discussed in *Ages in Chaos*, they give strong support to the reconstruction presented therein

References

1. B. Porter and R. Moss, *Topographical Bibliography of Ancient Egyptian Hieroglyphic Texts, Reliefs and Paintings*, Vol. VII (Oxford, 1951), p. 396.

2. H. Stock, "Der Hyksos Chian in Bogazköy," *Mitteilungen der deutschen Orient-Gesellschaft zu Berlin*, 94 (1963), pp. 73ff.
3. Raymond P. Dougherty, *Nabonidus and Belshazzar* (New Haven, 1926), p. 158-159.
4. Sidney Smith, *Alalakh and Chronology* (London, 1940), p. 2.
5. *Ages in Chaos*, Chapters 6-8.
6. F. Matz, "The Maturity of Minoan Civilization" in *The Cambridge Ancient History* (Third ed.), Vol. II, pt. 1 (1973), p. 144.
7. But cf. Smith, *Alalakh and Chronology*, n. 58.
8. *Ibid.*, p. 16.
9. *Ibid.*, p. 3.
10. *Ibid.*, p. 16.
11. Cf. A. Ungnad, "Die Venustafeln und das Neunte Jahr Samsuilunas", *Mitt. altorient. Ges.*, XIII, Heft 3, 1940.
12. R. Weill, XIIe dynastie, royauté de Haute-Egypte et domination Hyksos dans le Nord (Cairo, 1953).
13. Smith, *Alalakh and Chronology*, op. cit.
14. H. R. Hall, "Egyptian Chronology" in *The Cambridge Ancient History* (First ed.), Vol. I, p. 170; J. H. Breasted, *A History of Egypt* (2nd ed.), p. 22.

The Šulmán Temple in Jerusalem

In the el-Amarna letters No. 74 and 290 there is reference to a place read (by Knudtzon) Bet-NIN.IB. In *Ages in Chaos*, following Knudtzon, I understood that the reference was to Assyria (House of Nineveh).⁽¹⁾ I was unaware of an article by the eminent Assyriologist, Professor Jules Lewy, printed in the *Journal of Biblical Literature* under the title: "The Šulmán Temple in Jerusalem."⁽²⁾

From a certain passage in letter No. 290, written by the king of Jerusalem to the Pharaoh, Lewy concluded that this city was known at that time also by the name "Temple of Šulmán." Actually, Lewy read the ideogram that had much puzzled the researchers before him.⁽³⁾ After complaining that the land was falling to the invading bands (*habiru*), the king of Jerusalem wrote: ". . . and now, in addition, the capital of the country of Jerusalem — its name is Bit Šulmáni —, the king's city, has broken away . . ."⁽⁴⁾ Beth Šulmán in Hebrew, as Professor Lewy correctly translated, is Temple of Šulmán. But, of course, writing in 1940, Lewy could not surmise that the edifice was the Temple of Solomon and therefore made the supposition that it was a place of worship (in Canaanite times) of a god found in Akkadian sources as Shelmi, Shulmanu, or Salamu.

The correction of the reading of Knudtzon (who was uncertain of his reading) fits well with the chronological reconstruction of the period. In *Ages in Chaos* (chapters *vi-viii*) I deal with the el-Amama letters; there it is shown that the king of Jerusalem whose name is variously read Ebed-Tov, Abdi-Hiba, etc. was King Jehoshaphat (ninth century). It was only to be expected that there would be in some of his letters a reference to the Temple of Solomon.

Also, in el-Amama letter No. 74, the king of Damascus, inciting his subordinate sheiks to attack the king of Jerusalem, commanded them to "assemble in the Temple of Šulmán."⁽⁵⁾

It was surprising to find in the el-Amama letters written in the fourteenth century that the capital of the land was already known then as Jerusalem (Urusalim) and not, as the Bible claimed for the pre-Conquest period, Jebus or Salem.⁽⁶⁾ Now, in addition, it was found that the city had a temple of Šulmán in it and that the structure was of such importance that its name had been used occasionally for denoting the city itself. (Considering the eminence of the edifice, “the house which king Solomon built for the Lord”,⁽⁷⁾ this was only natural.) Yet after the conquest by the Israelites under Joshua ben-Nun, the Temple of Šulmán was not heard of.

Lewy wrote: “Aside from proving the existence of a Šulmán temple in Jerusalem in the first part of the 14th century B.C., this statement of the ruler of the region leaves no doubt that the city was then known not only as Jerusalem, but also as Bet Šulmán.”—“It is significant that it is only this name [Jerusalem] that reappears after the end of the occupation of the city by the Jebusites, which the Šulmán temple, in all probability, did not survive.”

The late Professor W. F. Albright advised me that Lewy’s interpretation cannot be accepted because *Šulmán* has no sign of divinity accompanying it, as would be proper if it were the name of a god. But this only strengthens my interpretation that the temple of Šulmán means Temple of Solomon.

In the Hebrew Bible the king’s name has no terminal “n”. But in the Septuagint — the oldest translation of the Old Testament — the king’s name *is* written with a terminal “n”; the Septuagint dates from the third century before the present era. Thus it antedates the extant texts of the Old Testament, the Dead Sea Scrolls not excluded.

Solomon built his Temple in the tenth century. In a letter written from Jerusalem in the next (ninth) century, Solomon’s Temple stood a good chance of being mentioned; and so it was.

References

1. *Immanuel Velikovsky, Ages in Chaos, vii*: “The Second Siege of Samaria.”
2. *The Journal of Biblical Archaeology* 59 (1940), pp. 519 ff.
3. Cf. Weber in Knudtzon: *Die El-Amarna Tafeln*, p. 1160 and p. 1343, for the various attempts to read the ideograms for NIN.IB. Lewy solved the problem: “The ideogram ^dNIN.IB may be pronounced Šulmánu.”
4. In an article preceding that of Lewy, P. Haupt (*Orientalistische Literaturzeitung* XVIII, 1915, cols. 71-2) translated the verse in EA 290: “Die Landeshauptstadt Namens Jerusalem, die Stadt des Ninib-Tempels, die Königsstadt.” Replacing Ninib by Shulman or Shalmi, we arrived at the conclusion that the sentence deals with Solomon’s Temple. Latest is an article in Hebrew *Eretz-Israel* IX (Jerusalem, 1969), by Tadmor and Kalai, who read the ideogram as Beth-Ninurta and locate it in Beth-Horon. This is an error; but they have brought the pertinent literary references together.
5. The idea that the reference in EA 74 to Beth-Ninurta or Beth-Shulman is to some other place is based on the erroneous location of Sumur on the Syrian coast; in *A in C* it was shown that Sumur is Samaria, a short distance from Jerusalem.
6. See *A in C, vi*: “Jerusalem, Samaria, Jezreel.”

7. I Kings 6:2

Assurballit⁽¹⁾

There are two letters in the el-Amarna collection signed by Assurballit. These letters, though rather unimportant, are given much attention by the chronologists, not for their content, but for the name of their author. Assurballit is not an unusual name, but the existence of an Assurballit in the fourteenth century would link the Assyrian king lists with the Egyptian dynasties of the New Kingdom. Thus, the letters play an important role in conventional chronology, being the sole link in the space of many centuries between the Egyptian and Assyrian histories.

In Assyria were found king lists in which the names of the kings and the number of years of their reigns are given, and nothing more. The extant versions of the lists are of a later origin, since they give the succession until the end period of the Assyrian Kingdom.

If in the Assyrian lists there is a king who wrote letters to a pharaoh known by name, then a first and single link in the space of many centuries could be established between Egypt and Assyria. And, actually, efforts were made to synchronize Egyptian and Assyrian histories starting with Assurballit I, who is called upon to hold together the two histories which otherwise appear to have no contact—and a great strain it is: This link was destined to carry the load of many centuries of disjointed histories, not only of these two lands but, more than that, of the entire history of the ancient East for the second half of the second millennium before the present era.

Probably such efforts would not have been made to accommodate this matter if it were not for the fact that in the period before Shalmaneser III, who mentions a tribute from Mizri (the name of the pharaoh is not mentioned), the Assyrian annals are silent on Egypt; and Egyptian annals, aside from the tribute paid to Thutmose III by Assur, interpreted as Assur (the name of the king is not mentioned), are silent on Assyria.

ASSURUBALLIT WAS NOT AN UNUSUAL NAME

I will offer here a few observations that may erode the link. In the first place, Assurballit is not an unusual name among the Assyrian kings. Actually, the very last king of Assyria, who continued to resist the Chaldeans and the Medes from his hideout in Harran, upon the destruction of Nineveh in ca. -612, also bore the name of Assurballit. His number in the succession of monarchs is 117, whereas that of Assurballit of the fourteenth century is no. 73: Shalmaneser III (-858 to -824) has the 102nd place.⁽²⁾ A linking of two histories, the Egyptian and the Assyrian, is rather arbitrary if it is founded on nothing else than on the provenance of one name.

ERIBA-ADAD VS. ASSUR-NADIN-AHE

In the list of Assyrian kings, Assuruballit is the son of Eriba-Adad. But Assuruballit of the letters was, as he himself attests in one of the letters, son of Assur-nadin-ahe.

The idea of Schnabel and Weber that Assur-nadin-ahe, called “Abu” by Assuruballit, was “not father but forefather”, is a strained argument, because—according to the king lists—Assuruballit was neither a son, nor a grandson, nor a descendant of Assur-nadin-ahe. Assur-nadin-ahe II was a cousin of Assuruballit and he had no offspring on the throne.⁽³⁾

On this problem Luckenbill had wondered:

In the second of the two letters Assur-uballit . . . refers to “the time when Assur-nadin-ahe, his father, wrote to Egypt.” The word “father” may here have the meaning “ancestor”, as often in the Assyrian texts, but even so our difficulties are not all cleared up. In the texts given below, Assur-uballit does not include Assur-nadin-ahe among his ancestors, although he carries his line back six generations. . . .

On a clay tablet, having the common Assyrian amulet form, we have Assur-uballit’s account of the rebuilding of the palace in the new city (text, *KAH*, II, No. 27).

. . . Assur-uballit, priest of Assur, son of Eriba-Adad; Eriba-Adad, priest of Assur, son of Assur-bel-nisheshu; Assur-bel-nisheshu . . . son of Assur-nirari; Assur-nirari . . . he is the son of Assur-rabi, Assur-rabi . . . son of Enlil-nasir; Enlil-nasir . . . son of Puzur Assur.⁽⁴⁾

And, in Section 60, Luckenbill brings another such list by Assuruballit of his ancestors where again there is no mention of Assur-nadin-ahe.

Assur-uballit, viceroy of Assur, son of Eriba-Adad; Eriba-Adad, viceroy of Assur, son of Assur-bel-nisheshu; Assur-bel-nisheshu, viceroy of Assur, son of Assur-nirari; Assur-nirari . . .⁽⁵⁾

DO ASSURUBALLIT’S AND AKHNATON’S DATES COINCIDE?

Then the computations made on the king lists showed a discrepancy of several decades between the reign of Assuruballit and the time allotted to Amenhotep III and Akhnaton, his supposed correspondents.⁽⁶⁾ When the el-Amarna letters were found in 1881 they were ascribed to the fourteenth century because they were partly addressed to Amenhotep III and Akhnaton. Since these kings, by the conventional chronology, were placed in the 14th century, the Assyrian king Assuruballit was looked for in the then available king lists. Thus, the desire to find the names mentioned in his letters in the king lists was already there. This required quite a bit of stretching.

In 1917 Weidner admitted:

The dates we have established for the Assyrian and Babylonian kings do not fit those established by Egyptian historians for the dates of the Egyptian kings.⁽⁷⁾

In order to make the reign of Assuruballit and the time of these pharaohs contemporaneous, it was necessary to shift both chronologies, the Egyptian and the Assyrian. The Amarna Period, in order to meet the the earlier found king lists,⁽⁸⁾ was moved back into the 15th century. For, as Professor Mahler brought out, the leveling of these histories required the placing of Amenhotep III at the end of the fifteenth century and Akhnaton in the years -1403 to -1391 —far too high by the standards of the next generation of chronologists. What had first led to raising the age of Amenhotep III and Akhnaton into the Fifteenth century, then required lowering it. (Due to “Poebel’s publication of the contents of the Khorsabad List in 1942/43, which proved that all previous chronologies were too high”, the age of the Assyrian kings of the period had to be reduced by 64 years.⁽⁹⁾) However, to lower the age of Akhnaton enough, in order to make him a contemporary of Assuruballit, was impossible because conventional Egyptian chronology is built on the premise that Ramses I started to reign in -1322 and after Akhnaton and before Ramses I, Tutankhamen, Smenkhkare, Aye, and Haremhab must have reigned.

About this M. B. Rowton wrote:

The Mesopotamian evidence discussed in this article indicates 1356 for the accession of Assuruballit I. . . . Egyptologists believe that the lowest possible date for the death of Akhnaton is 1358. . . a discrepancy of only two years may not seem very significant. But closer examination reveals that the discrepancy is considerably greater . . . Moreover if the Menophres theory is accepted that the Sothic cycle began in the first year of Seti I, the date 1358 for the death of Akhnaton does not allow for a sufficient interval between Akhnaton and Seti. . . . But if this discrepancy is a matter of ten years or more we are no longer entitled to regard it as insignificant.⁽¹⁰⁾

The difference in years would be greater if the reign of Assuruballit, son of Eriba-Adad were not already brought as close as possible to the reign of Amenhotep IV, the incertitude in the duration of some reigns of later Assyrian kings being exploited to make the most of it, with all ruling years being regarded as full years—though kings, like other mortals, die on every day of the year—which in a long list may make a difference of a few decades. Also, no allowance was left for co-regencies or common occupation of the throne, of father and son, a possibility which is always taken into account by chronologists.

Presently, Akhnaton is placed between 1375 and 1358 and Assuruballit between 1362 and 1327. This enables the Assyrian king Assuruballit I to write letters to the Egyptian king Akhnaton.

However, as late as 1974, Ronald D. Long was making the same point as Rowton:

Mesopotamian chronology . . . does not coordinate with the eighteenth dynasty chronology which is dependent on the era of Menophreos dating. Assuruballit I and Akhnaton were contemporaries, yet if the era’s dating is maintained their contemporaneity is non-existent.⁽¹¹⁾

THE CIRCULAR EVIDENCE

Since great stress has been put on the reliance of the chronology of the ancient world on the Assyrian king lists, a lesson needs to be drawn. The case of Hammurabi and the entire First Babylonian dynasty being lowered in age by four hundred years, because of a correlation with Egyptian material of the Middle Kingdom,⁽¹²⁾ exemplifies the dependence of cuneiform chronology on the Egyptian time-table.⁽¹³⁾ This is appropriate to remember during any effort to fortify the accepted Egyptian chronology by evidence coming from the Babylonian or Assyrian king lists.

The following quotes emphasize the direct dependence of Assyrian and Babylonian chronologies on that of Egypt:

Sidney Smith in *Alalakh and Chronology* wrote:

an approximate dating, subject to a very small margin of error, is possible for the period from 1450 *on the basis of Egyptian chronology*, which can be fixed within narrow limits.⁽¹⁴⁾

Or, as J. D. Weir wrote:

objects of Egyptian origin had been unearthed at various levels of the site. These discoveries made it possible to synchronise the development of the town of Alalak, with the main periods of Egyptian history. So *Egyptian chronology* could now be used *as a guide to Babylonian dating*. The result of this link-up was a provisional date of ± 1600 for the end of the First Babylonian dynasty.⁽¹⁵⁾

In the chapter "Astronomy and Chronology",⁽¹⁶⁾ I showed on what unfirm foundations the chronology of Egypt has been erected and how chronologies of countries that do not possess an absolute chronology of their own are built on the chronology of Egypt by the strength of archaeologically discovered contacts.

A SHORT SUMMARY

- Assuruballit was a common name, still in use 750 years later.
- Assuruballit of the list was the son of Eriba-Adad; Assuruballit of the letters was the son of Assur-nadin-ahe.
- The time of Assuruballit of the king lists was not exactly the time of Akhnaton; and efforts to synchronize them were made at the cost of inner contradictions in the Egyptian chronology (which is based on the Sothis-Menophres theory).
- Assyrian chronology is itself dependent on Egyptian chronology and therefore cannot be used as proof of its validity.

Thus, if there is no other synchronization of the Eighteenth Dynasty in Egypt with the Assyrian kings, the case of Assuruballit cannot present an invincible argument.⁽¹⁷⁾

ONE VS. MANY LINKS

But if it were only a matter of evaluating my dating of the el-Amarna letters contra the conventional dating, we would use names alone. The list of identified persons in the el-Amarna letters in chapters of the Scriptures of the time of the middle of the ninth century, as presented in *Ages in Chaos*, is imposing. Among those names mentioned in both the letters and in the books of Kings and Chronicles are such unusual ones as Jehozabad, Adaja, Ben Zichri, Biridri, and many more. And is it little that, from five generals of king Jehoshaphat named by the Scriptures, four of them signed their letter by the very same names and one is referred to by his name?

Captains of Jehoshaphat	el-Amarna correspondents
Adnah (II Chr. 17:14)	Addudani (EA 292)
Son of Zichri (II Chr. 17:16)	Son of Zuchru (EA 334, 335)
Jehozabab (II Chr. 17:18)	lahzibada (EA 275)
Adaia (II Chr. 23:1)	Addaia (EA 285, 287, 289)

Not only personal names, but dozens of parallels are found between the texts of those tablets and the scriptural narrative in the books of Kings and Chronicles, and also between them and the Assyrian texts of the ninth century. Events—down to the smallest details—were illuminated in the chapters dealing with el-Amarna: actions, wars, sieges, a seven-year famine, and geographical names were compared.

Although the el-Amarna correspondence covers only a few decades at the most, the many details that could be and have been brought to comparison lend an unshakeable support to the reconstruction of the larger period covering the time from the end of the Middle Kingdom to the time of the Ptolemies in Egypt, a span of twelve hundred years. Therefore, a single name, even were it to appear in the king lists and in the letters, would not amount to much without any support from the entire sum of evidence.

WHO THEN WAS ASSURUBALLIT, THE CORRESPONDENT OF AKHNATON?

Was Assuruballit I, son of Eriba-Adad of the 14th century, the king who wrote to Akhnaton?

In the Assyrian sources there is no reference to any contact of the king Assuruballit, son of Eriba-Adad, with Amenhotep III or Akhnaton, and nothing that would substantiate the claim that he was the author of two letters in the el-Amarna collection.

All her history long, Assyria was an important kingdom in the ancient world. Assuruballit, son of Eriba-Adad of the king list, is regarded as one of the greatest kings of ancient Assyria,⁽¹⁸⁾ and his grandson Adad-Nirari was proud to be an offspring of this great king. The letters of Assuruballit in the el-Amarna collection do not convey the impression of their author being an important suzerain. It is worthwhile to compare the meek way of writing of Assuruballit, and the self-assured way of Burraburiash. And letters of other kings on the Near Eastern scene, extensive as they are, make it by contrast little probable that Assuruballit was an important king. But decisive is the fact that the author of very extensive letters, Burraburiash, clearly refers to his “Assyrian subjects” .

Assuruballit, son of Assur-nadin-ahē, could have been a provincial prince, or a pretender to the crown of Assyria. In a later age we find a prince Assuruballit installed by his brother Assurbanipal as the governor of the Harran province. Assuruballit could have been a provincial pretender in the days of Burraburiash; and Burraburiash actually complained to the pharaoh Akhnaton for entering into direct relations with some Assyrian potentates, despite the fact that he, Burraburiash, is the lord of Assyria.

Letter 9: Burraburiash to Amenophis IV

31 - Now as to the Assyrians, my subjects

32 - have I not written thee? So is the situation!

33 - Why have they come into the land?

34 - If thou lovest me, they should not carry on any business.

35 - Let them accomplish nothing.⁽¹⁹⁾

THE IVORY OF SHALMANESER

In *Ages in Chaos*, in chapters VI-VIII, it is claimed that Shalmaneser III, was a contemporary of Kings Amenhotep III and Akhnaton, and that Burraburiash must have been the Babylonian name of Shalmaneser III, who had actually occupied Babylon. To the reader of these lines, if unfamiliar with *Ages in Chaos* (and he should judge the discussion only upon its reading), it is not superfluous to report that the kings of Mesopotamia regularly applied to themselves different names in Assyria and in Babylonia. In the el-Amarna correspondence, he signed his Babylonian name (used more in the sense of a title) also on the tablet in which he referred to his Assyrian subjects (letter no. 9).

Our identifying Shalmaneser III as Burraburiash of the letters and as a contemporary and correspondent of Akhnaton⁽²⁰⁾ could receive direct archaeological verification. In the section “The Age of Ivory”, I quoted from the letters of Burraburiash in which he demanded as presents, more in the nature of a tribute, ivory objects of art, “looking like plants and land and water animals”, and from letters of Akhnaton in which he enumerated the very many objects of ivory art, vases, and carved likenesses of animals of land and water and of paintings that were sent by him to Burraburiash.

Calakh (Nimrud) was the headquarters of Shalmaneser: what could we wish for more than that ivory objects made in Egypt in the time of Akhnaton should be found there. This also happened.

The excavation project at Nimrud on the Tigris in Iraq was initiated by M. E. L. Mallowan (1959) and continued by David Gates. Recent excavations there have been carried on in Fort Shalmaneser III that served as headquarters from the ninth to the end of the eighth century before the present era.

The reader of *The New York Times* of November 26, 1961,⁽²¹⁾ must have been surprised to find a news story titled “Ancient Swindle is Dug Up in Iraq” . The report carried news of the finds of the British School of Archaeology’s Nimrud Expedition:

When archaeologists dug into the ancient Assyrian city of Nimrud in Iraq earlier this year, they were surprised to find not Assyrian but “Egyptian” carvings. . . The explanation given . . . by David Oates, director of the British School of Archaeology’s Nimrud Expedition, is that the archaeologists had dug into an ancient Assyrian antique shop. The “Egyptian” carvings had been cut by local craftsmen . . . to satisfy their rich clients’ demands for foreign “antiquities” .

There could be no question that this was Shalmaneser’s loot or collection, for in one of the storage rooms was found his statue and an inscription attests to the king’s approval of the portrait as “a very good likeness of himself” .

Although the cut-away skirts worn by the bearers are typically Assyrian, the carvings are of a style that antedates by hundreds of years the period in which they were made. If found elsewhere, they would have been identified as Egyptian . . . they are considered to be “manufactured antiquities”, designed to satisfy a rich man’s taste for antiques.

The quantity of ivory found was so great that, in three seasons, the excavating team did not empty the first of the three storage rooms. The excavators strained their wits to understand why so much ivory work reflecting Egyptian styles of over five hundred years earlier should fill, of all places, the military headquarters of Shalmaneser III. Mallowan and his representative archaeologist on the site, David Oates, could not come up with anything better than the theory that, in the military headquarters of Shalmaneser, a factory for manufacturing fake antiques had been established.

No better explanation was in sight. Neither did the late Agatha Christie (the spouse of Mallowan), who took an intense interest in the archaeological work of her husband, know of a better solution to the mystery. Yet, the first volume of *Ages in Chaos*, with its el-Amarna chapters, had been on the shelves since 1952.

In complete accord with our historical scheme, Egyptian art of Akhnaton was found in the headquarters of Shalmaneser III. I could not say, “as we expected”, because this was too much to expect. From the point of view of the reconstruction, we could only wish that these objects would be found in Assyria, but we could hardly expect that they would be found almost intact in the fort of Shalmaneser III. Again it is too much to expect, but maybe there will still be found, in the same compound or in a room of archives to be discovered in Nimrud, original el-Amarna letters.

References

1. [This article was put together from several different versions written by I. Velikovsky at very different times; from a [letter to Mercer written in 1947](#) and up to an unfinished drafted answer to Burgstahler’s article in *Pensée IVR V* (1973). Almost all the quotes were added, but at the locations that Velikovsky had indicated. Combining such different versions and adding quotes and their connecting sentences probably caused some shift in emphasis. Also, in combining such different versions, some changes seemed necessary; and I take the responsibility for such editing pitfalls.—*Shulamit F. Kogan*]
2. A. Poebel. “The Assyrian King List from Khorsabad”, *The Journal of Near Eastern Studies* (1942-1943). [In the eponym list, as published by Daniel D. Luckenbill, an Adad-uballit appears as the *limmu* in -786 (in the time of Adad-Nerari III), between Shalmaneser II and Shalmaneser IV. A Nergal-uballit appears in -731. *Ancient Records of Assyria and Babylonia* (1926), Vol. II, pp. 434, 436.]
3. Though, according to Poebel in “The Assyrian King List from Khorsabad”, Assur-nadin-ahe II was a cousin of Assuruballit’s father, Eriba-Adad. I. J. Gelb in “Two Assyrian King Lists” brings the following list where Assur-nadin-ahe was a first cousin of Assuruballit:

<i>JNES</i> , Vol. XIII, no. 4, Oct. 1954, pp. 216-219:		
69 Assur-bel-nisesu	son of Assur-nirari	
70 Assur-rim-nisesu	son of Assur-bel-nisesu	
71 Assur-nadin-ahe	son of Assur-rim-nisesu	
72 Eriba-Adad (I)	son of Assur-bel-nisesu	
73 Assur-uballit	son of Eriba-Adad	
This can be tabulated as follows:		
Assur-bel-nisesu		
Assur-rim-nisesu	Eriba-Adad	

Assur-nadin-ahe	Assur-uballit	
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- 4.
5. Daniel D. Luckenbill, *Ancient Records of Assyria and Babylonia* (1926), pp. 21-22.
6. *Ibid.*, p. 22.
7. Actually, after the el-Amarna tablets were first published, Weber and Knudtzon had disagreed where to place Assuruballit. Weber had him reigning not only in the days of Thutmose IV, but also of Seti, because Seti was the Egyptian king who waged war against Merosar son of Subbiluliuma, and Merosar simultaneously waged war against Assuruballit in Harran. But nobody could reign from the time of Thutmose IV through the reign of Seti. Therefore, Knudtzon sounded more acceptable having two kings by the name of Assuruballit, one grandson of the other; but the second was not found in the lists. It was also stressed by M. Müller and Breasted (*Records*) that Subbiluliuma of the el-Amarna letters could not have been the grandfather of Hattusilis, or father of Merosar, because of the same chronological difficulty: there must have been a minimum of 105 years from some point in the reign of his grandson, which is regarded as unusual.
8. Weidner, 1917, quoted in E. Mahler, *Scripta Universitatis atque Bibliothecae Hierosolymitanarum*, 1924.
9. The Khorsabad list was found in 1933 and the almost identical SDAS list was published in 1953.
10. F. W. Albright, "An Indirect Synchronism between Egypt and Mesopotamia, circa 1730 B. C.", *Bulletin of the American Schools of Oriental Research* 99, Oct. 1945, p. 10.
11. M. B. Rowton, "Mesopotamian Chronology and the 'Era of Menophres,'" *Iraq* 8 (1946), p. 94.
12. Ronald W. Long, *Orientalia*, 43 (1974), pp. 261-274; *Ibid.*, KRONOS 11:4 (Summer, 1977), pp. 89-101 (p. 96).
13. [See I. Velikovsky, "[Hammurabi and the Revised Chronology](#)", KRONOS VIII: I (1982), pp. 78-84. -SK]
14. Of this, Bickerman writes: "The fixing in time of the famous Babylonian legislator, Hammurabi, on whose dating many others depend . . . illustrates the inherent difficulty of working with king-lists." *Chronology of the Ancient World*, p. 84.
15. *Alalakh and Chronology* (1940), p. I (emphasis added). (See also W. F. Albright, "An Indirect Synchronism Between Egypt and Mesopotamia", *BASOR*, 99 (1945), pp. 9-18, where synchronism between prince Entin of Byblus and Nefer-hetep of the Middle Kingdom in Egypt helped date Hammurabi.)
16. John D. Weir, *The Venus Tablets of Ammizaduga* (1972), p. 6 (emphasis added).
17. Written for *Ages in Chaos*, Vol. II, and published as a supplement to *Peoples of the Sea* (New York, 1977).
18. Concerning the Kassite kings - Burnaburiash (Burraburiash), Karaindash, Kadashman-Harbe, and Kurigalzu—who are listed in the synchronistic tables the following excerpts can be cited:
Edward F. Campbell writes:

The synchronistic histories and king lists cannot establish the dates of Burnaburias' reign, nor those of his predecessors. But information from the letters written by them can give some clear information as to the spread of the letters in the reigns of the contemporary Egyptian kings.

It is to be remembered that this particular period lies just before the time when specific information about the Kassites begins to appear in the king lists.

(Edward F. Campbell, Jr., *The Chronology of the Amarna Letters* (Johns Hopkins Press, 1963), pp. 44-47.)

Or as A. Goetze writes:

The *names* of the [Kassite] kings 16-23 have securely been *recovered from* the chronicles and contemporaneous sources like *the Amarna letters* . . . This leaves the places 10-15 still . . . open. To fill the gap attention should be called to three groups of Kassite kings of whom we have record but whose place in the dynasty still remains to be determined:

(a) Firstly, there is Burna-burias who, according to the "Synchronistic History" . . . concluded a treaty with Puzur-Assur of Assyria . . .

(b) Secondly, the available material forces us to posit another group of Kassite kings in which again a Burna-burias figures. . . .

(A. Goetze, "The Kassites and Near Eastern Chronology", *The Journal of Cuneiform Studies*, 18 (1964), pp. 97-98.)

Obviously these names are not independent evidence. In the synchronistic table published by Van der Meer, the sequence of the four kings Burraburiash, Karaindash, Kadashman-Harbe, and Kurigalzu, is exactly repeated twice in succession, besides appearing separately in the list repeatedly. See Van der Meer, *Chronology* (1963), pp. 35-36. See also D. Courville on Kurigalzu, *The Exodus Problem and its Ramifications*, Vol. 11(1971), pp. 316-317.

19. "Assuruballit was really the first of those great men who created the Assyrian empire." S. A. Mercer, *The Tel El Amarna Tablets*, p. 820.
20. Mercer, *op. cit.*, p. 31. See Mercer's note to the letter (no. 15) of Assuruballit: "As we learn from no. 9, Burraburiash II reminded Amenophis IV that the Assyrians, his subjects, had against his will intercourse with Egypt."
21. [See I. Velikovsky, "[Hammurabi and the Revised Chronology](#)", *op. cit.*, p. 78-79, about the inscription found by Nabonidus, according to which Hammurabi reigned a few years before Burraburiash. Since the time of Hammurabi was reduced from the 21st to the 17th century, the time of Burraburiash should also be reduced by the same amount of time. - SK]
22. The same story can be found in *Science Digest* of March, 1962.

World Fire

The point of origin of *Ages in Chaos* was in the realization that the Exodus of Israelites from Egypt took place amid a stupendous natural catastrophe. The question arose: Would not such a catastrophe serve as a synchronical point between the Israelite and Egyptian histories, in the case that among Egyptian literary documents reference to such a catastrophe were found? And, when such documents were properly identified as to their historical content, the next questions to arise were these:

1) at what time point did such catastrophe occur? Here was promise for a synchronization of two histories—Israelite and Egyptian. Out of this consideration arose *Ages in Chaos*, a reconstruction of ancient history.

2) the second problem was, of what nature was the catastrophe? In answering this question I wrote *Worlds in Collision*, a collection of literary and oral traditions from all parts of the globe. The catastrophe was ubiquitous.

The catastrophe that ended the Middle Kingdom (the Middle Bronze Age of the ancient East) made me start on *Worlds in Collision*. Between 1944 and 1946 I submitted *Worlds in Collision* to several publishers, with Macmillan, at last accepting *Worlds in Collision* for publication. In 1945 I published in the form of *Theses for the Reconstruction of Ancient History* the entire plan of *Ages in Chaos*, enumerating the changes, but leaving the substantiation for later. In *Ages in Chaos* the fact that the Middle Kingdom terminated in a catastrophe serves only as the point of departure, and in the *Theses* I put it in the form:

14. The Exodus took place at the close of the Middle Kingdom: the natural catastrophe caused the end of this period in the history of Egypt. This was in the middle of the second millennium before the present era.

The rest of the 284 theses deal with the problems of synchronism, and the order of events, always political or cultural in nature. The catastrophe in nature constituted but the starting point for the inquiry in chronology and true order of succession of political events. As the reader certainly noticed, it was not my prime concern in *Ages in Chaos* to establish an absolute chronology; the proper sequence of events and a correct synchronization of happenings among national histories of ancient peoples was my first concern. It was of prime importance to establish that the end of the Middle Kingdom and the Exodus were simultaneous events; their simultaneity required either an extension in the length of the Israelite history or reduction in the length of the Egyptian history; the common event could not have taken place after about -1450 nor before -1500, and the exact determination of absolute chronology was of little concern, when both histories required a major readjustment in order to make the common moment synchronical. Thus not absolute but relative chronology was my concern. I was led to synchronize the Wandering in the Desert and the time of settlement in Canaan until the time of Saul with the time of the Hyksos domination in Egypt and the Near East, and the Hyksos themselves with the Amalekites. Saul, the victor over the last Amalekite king Agog, and Kamose and Ahmose, the first kings of the Eighteenth Dynasty and the New Kingdom, were contemporaries and also allies; David and Amenhotep I (both of them retained the nimbus of saintliness in the memories

of their nations) lived at one and the same time; Thutmose I married a daughter of his to Solomon; and Hatshepsut, his other daughter and heir, visited Jerusalem of Solomon; Thutmose III, her younger brother and heir prepared the split of Solomon's empire after the latter's death, and Jeroboam was his instrument. In a campaign in the year of his reign he made Rehoboam, now the king of a small state, into a vassal. The exact date of this or other events I did not try to elucidate; such task is left to future researchers. The time of Asa was the time of Amenhotep II, with whom he successfully battled at Shamash-Edom; and the time of Jehoshaphat was that of Amenhotep III and IV (Akhnaton), to whom he also wrote letters, found in el-Amarna. With the age of el-Amarna the first volume was brought to its end. The time was about -825.

The task of synchronizing the Nineteenth and Twenty-second to Twenty-sixth Dynasties of Egypt with other kingdoms and dynasties is undertaken in *The Assyrian Conquest, and Ramses II and His Time*. In this period falls a series of great natural upheavals that shook the world in the eighth century and climaxed in the cosmic catastrophe of March 23, 687. The reader of *Worlds in Collision* knows how this date is arrived at on the basis of material collected from countries as far apart as China, Judea, and Italy. Therefore, should we wish to construe a timetable of absolute, not just of synchronical (relative) chronology, we are offered such a chance in that date: the event took place during the second campaign of Sennacherib against Judah, his last.

The entire scheme of so-called astronomical chronology is based on the assumption that no violent disturbances in nature have taken place that changed the relative motions of the celestial bodies and required a reform of the calendar. The solar eclipse of -763 serves, for instance, as a pivotal point for establishing Assyrian chronology. The sentence that we possess is as follows: "Insurrection in the city of Ashur. In the month of Siwan the sun was obscured." Solar eclipse tables, calculated by Oppolzer, Ginzler, and Mahler, were used, and an eclipse calculated to have taken place in -763 was selected for the event. Upon this date the Assyrian king list of succession of kings, Assyrian chronology was composed, and the biblical chronology corrected (by several decades) to conform with the Assyrian chronology. But in -763 there was no solar eclipse in that part of the world; I would even question whether there were lunar and solar eclipses generally, because their occurrence depends on a lunar orbit that lies generally in the ecliptic. Once in a while the moon passes between the sun and the earth, causing a solar eclipse, and at other times the earth passes between the sun and the moon, causing a lunar eclipse.

Calendar reform was executed in the Old and New worlds in the seventh century. Material for this is found in *Worlds in Collision*, chapter 8. Before this, calendar changes followed the great upheavals of the middle of the second millennium. Then what sense does it make to trace the Sothic period or the lunar festivals, or other astronomical dates, on the assumption that there had been no changes in the celestial order, when such changes occurred at the end of the Old Kingdom and the end of the Middle Kingdom, and half a century later again, and several times during the eighth century? I have also shown that the so-called Nabonassar era, was a result of a reform following a certain new arrangement in the celestial motions.⁽¹⁾

The fact that the Egyptians introduced the calendar reform under the Hyksos, increasing the number of the days in the year,⁽²⁾ and another under the Libyans in the eighth century,⁽³⁾ and that they possessed no less than three calendars --suffices by itself to cancel every effort to build absolute chronology on astronomical dates of lunations, eclipses, conjunctions, and the like.

* * *

Independently of my effort to construe a synchronical history starting with the common event that overwhelmed all nations of the globe--the great catastrophe that ended the Middle Kingdom, a similar effort was made by Claude F. A. Schaeffer, professor at College de France. The reader of *Ages in Chaos* is familiar with his work of excavating Ras-Shamra (Ugarit) from the chapter carrying this name. He observed in 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. At the occasion of his visit to Troy, excavated by C. Blegen, he became aware that Troy was destroyed by a natural catastrophe, and repeatedly so, at the same time when Ras-Shamra was destroyed.

The distance from the Dardanelles near which the mound of Troy lies, to Ras-Shamra in Syria is about six hundred miles in a straight line. In modern annals of seismology no earthquake is known to have affected so wide an area. Schaeffer investigated the excavated places in Asia Minor, and the archaeologists' reports, and everywhere found the same picture; he turned his attention to Persia, far to the East--and the very same signs of catastrophes were evident in each and every excavated place. Then he turned his attention to the Caucasus, and there, too, the similarity of the causes and effects was undeniable. In his own excavations on Cyprus he could establish the very same order of events and their causes. He was so impressed by what he found that during the next few years, in the time of World War II, he put into writing a voluminous work, *Stratigraphie comparée et chronologie de l'Asie occidentale (IIIe et IIe millénaires)*, published by Oxford University Press in 1948. In over five hundred pages he showed conclusively that the ancient East was several times disturbed by stupendous catastrophes during the third and second millennia before the present era; he also indicated that his acquaintance with European archaeology made him feel certain that Europe, too, was involved in that catastrophe; thus, it would be more than continental, perhaps global in character.

The Old Kingdom and the Middle Kingdom of Egypt ended in natural catastrophes, the catastrophes that put an end to the Early and Middle Bronze Ages. Later a catastrophe ended the Late Bronze Age in Greece. Schaeffer intended to add a volume about catastrophes in the first millennium. I, however, came to the same conclusions by another route. Actually, if I was right, it could not be but that these great upheavals would leave clear marks in the archaeological sequence all over the world. Thanks to the diligent investigations of Schaeffer such signs have been identified over a wide area of the ancient East; the enumeration of the excavated sites discussed by him, just by their names alone, would fill several pages.

In the concluding chapters of his work, Schaeffer wrote:

The great perturbations which left their traces in the stratigraphy of the principal sites of the Bronze Age of Western Asia are six in number. The oldest among them shook, between 2400 and 2300, all of the land extending from the Caucasus in the north down to the valley of the Nile, where it became one of the causes, if not the principal cause, of the fall of the Egyptian Old Kingdom after the death of Pepi II. In two important sites in Asia Minor, Troy and Alaca Huyuk, the excavators reported damage due to earthquakes. Under the collapsed walls of the buildings

contemporaneous with the catastrophe, the skeletons of the inhabitants surprised by the earthquake were retrieved. . .

Like myself, Schaeffer came to the conclusion that the invasion of Hyksos was in the aftermath of the great catastrophe that put an end to the Middle Kingdom:

This brilliant period of the Middle Bronze Age, during which flourished the art of the Middle Kingdom in Egypt and the industry of art so refined of the Middle Minoan, and in the course of which the great commercial centers such as Ugarit in Syria enjoyed a remarkable prosperity, was ended between 1750 and 1650 by a new catastrophe, equal in severity and in scope to the two preceding perturbations. Again Egypt is invaded by the North and loses its political unity along with its position of great power which it had enjoyed in Syria-Palestine and beyond . . .

The catastrophe was hardly of terrestrial causes, because the climate changed abruptly, too. Schaeffer intended to investigate the causes, but admitted his ignorance of them. Upon reading *Earth in Upheaval* he invited me to come to Cyprus to see his work there and so to become aware of the great paroxysms of nature that left their visible traces in Alasia, the capital of the isle, which he was excavating.

The work of Schaeffer gives a striking verification of the claims made in *Ages in Chaos* and *Worlds in Collision* concerning the catastrophes, their number, their destructive effects, and their at least continental spread. Not only the number and character of the catastrophes but also their timing was exactly the same in Schaeffer's and my work: we came, moving separately, and without knowledge of the work of each other, to the same conclusion--actually *to a day*, namely, both of us located the catastrophe at the very end of the Middle Kingdom (as before that at the very end of the Old Kingdom). This correspondence of results, not to a century, or a year, or a month, but to a day, could not be but the result of our having each in his own way discovered the historical truth.

The presence of archaeological signs of catastrophes in every place in Asia Minor, Syria, Cyprus, Palestine, Caucasus, Persia (Schaeffer's large volume covers only these countries, though Mesopotamia and Egypt are repeatedly referred to) created a need and an obligation to find the synchronisms between these events, and this was done by Schaeffer himself. Schaeffer used his finds to compose a comparative stratigraphy of all excavated places. He admitted that absolute chronology might be in need of revision; nevertheless, in his work he kept in rough figures to the accepted, or conventional chronology. The shortcoming of Schaeffer's work was in not making the logical deduction: if catastrophes of such dimensions took place in historical times, where are the references to them in ancient literary sources? More specifically, if a catastrophe of such dimensions took place at the end of the Middle Kingdom, decimated the population, but also left 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 care for the first necessities of life, then by the descendents of survivors. Actually, the Pentateuch, as well as many portions of prophetic writings and psalms are a constant rehearsal of the events that took place when the sky, the land, and the sea contended in the work of destruction. Should not these references be compared with the signs of destruction actually found?

As soon as we enter this gate, we observe that not only was the world disturbed, but that our concept of historical sequence is wrong as wrong could be. If the Book of Exodus and the Naos of el-Arish describe the same event, and actually in the Naos of el-Arish, following the hurricane during which “nobody could leave the palace during nine days.” As in the Exodus, the pharaoh perished “in the place of the Whirlpool” near Pi-Kharoti, so the pharaoh of the days of the Exodus perished in an avalanche of water at the sea near Pi ha-Khiroth. We have here a point of synchronism; the same with the description of the plagues in the Book of Exodus, and in the Papyrus Ipuwer. They are so similar that when I sent a comparison of the two text to Garstang, the late archaeologist of Jericho, he wrote in answer that the papyrus must be a copy from the Book of Exodus. But how could it be a copy if, as the conventional chronology maintains, the events in the text preceded the Exodus by centuries?

Here the breakthrough took place. I concluded that the catastrophe that enveloped all the lands of the ancient East can serve as a synchronizing point. From there on my research did not depend on natural events—unless we shall use the catastrophes of the eighth and beginning of the seventh centuries for the similar purpose of synchronization.

These catastrophes offer a chance to synchronize events not only in Egypt or the Near East, but all over the globe. I also made such synchronization in *Worlds in Collision* I have lengthened the accepted ages of Mesoamerican civilizations by a full thousand years; the radiocarbon dating method later completely justified this conclusion.

In the near East we have probably in no other place as good as in Jericho the chance to compare the results of chronological research with the literary traditions of catastrophic events.

References

1. It is often asserted that the Era of Nabonassar was Ptolemy’s invention; but it is a fact that one of the most important of the Babylonian historical texts, the so-called “Babylonian Chronicle” (B.M. 92502), starts with the reign of Nabonassar, or the year - 747. See H. Winckler and J. N. Strassmeier, *Zeitschrift fuer Assyriologie*, II (1887), pp. 163-168. Cf. D. J. Wiseman, *Chronicles of Chaldean Kings* (London, 1956), pp. 1-2.
2. Von Bissing, *Geschichte Aegyptens* (1904), pp. 31, 33; Weill, *Chronologie égyptienne*, p. 32.
3. Breasted, *Ancient Records of Egypt* IV. 756. Cf. R. Caminos, *The Chronicle of Prince Osorkon*, *Analecta Orientalia* 37 (1958).

Jericho

Jericho was the first city west of the Jordan to be conquered by the Israelites under Joshua. It was surrounded by a huge wall that was wide enough to have houses built on it. Joshua sent spies into the city, and Rahab, the harlot “let them down by a cord through the window: for her house was upon the town wall.” “About forty thousand prepared for war passed over before the Lord unto battle, to the plains of Jericho.” “Now Jericho was straitly shut up because of the children of

Israel: none went out, and none came in.” After a few days of siege, the earth groaned loudly - the Israelites thought in answer to their invocation and their blowing the horns, and “the wall fell down flat.” The conquerors entered the defenseless city and “utterly destroyed all that was in the city” (Joshua 2:3; 4:13; 6:1; 6:20-21).

Joshua proclaimed a curse upon anyone who would rebuild Jericho: “He shall lay the foundation thereof in his firstborn, and in his youngest son shall he set up the gates of it” (6:26). Next the Israelites went against Ai.

Jericho’s fortress wall was famous, for it was huge and impenetrable, and only thanks to a violent earthshock did the besiegers obtain entrance. This wall became even more famous after it fell, because the story of it is one of the best-known episodes of Biblical ancient history.

For about five centuries no attempt was made to rebuild the city accursed by Joshua. In the ninth century, in the days of Ahab, king of Samaria, a certain Hiel the Bethelite built Jericho: “he laid the foundation thereof in Abiram his first-born, and setup the gates thereof in his youngest son Segub, according to the word of the Lord, which he spake by Joshua the son of Nun” (I Kings 16:34).

This short record—contained in a single verse—tells not a little. In order to mollify the Deity and overcome the curse, this private man sacrificed two of his own sons. The ardor of Hiel, unsupported by the king of Israel, did not result in a true resurrection of the doomed city. For some time in the closing days of Ahab, a little band of prophets had its seat there, as we learn from II Kings 2:15. Near Jericho or its mound, Zedekiah, the last king on the throne of David, was seized by the pursuing Chaldeans, in -586. Eight centuries after Hiel, in the last pre-Christian century, Herod the Great built his winter palace and a Roman theater close to the site.

It was the Jericho that succumbed in the most dramatic circumstances, its great wall tumbling down, that beckoned archaeologists from the very first. A mound, visible from afar, covered the ancient city and its wall; an Arab village grew up nearby because of the clean springs that stream past the mound toward the Jordan and the Dead Sea, both in walking distance of a few hours: a fortified city that fell in a very definite moment of history is a desideratum and a prize that are matchless—and archaeological fervor sensed that here great discoveries awaited the diggers. But it was not until 1907 that E. Sellin and C. Watzinger, German archaeologists, after having obtained the necessary firman from the Turkish Government, lifted earth from a portion of the mound. The great wall was found and no archaeologist could possibly have missed it.

The excavation of this city brought to light three consecutive levels of occupation called by the excavators the “blue”, the “red”, and the “green”.⁽¹⁾ The “blue” was ascribed to the Canaanite period, the “red” to the Israelite period, and the “green” to the Judean period. But in the “red” level many scarabs of the Middle Kingdom were found, as well as pot handles impressed with seals of the same time. It was decided that all of them had been used as unintelligible amulets many hundreds of years after they were made.

However, thirteen years after the publication of the report of the excavations, one of the two excavators published a repudiation of their conclusions.⁽²⁾ He put the city of the “blue” level in

the third millennium, and the city of the “red” level, on the basis of its scarabs, he ascribed to the Middle Kingdom, a change of eight or nine hundred years. This “red” city had a tremendous wall and a palace that came to an end in a violent destruction. The “green” city was assigned to the ninth century, as the work of Hiel the Israelite.

As a result of this new assignment, “in the time of Joshua Jericho was but a heap of ruins on which, perchance, a few single hovels stood”.⁽³⁾

This means that the Israelites under Joshua did not find a city on the site of Jericho; the city walls could not have crumbled during the siege by the Israelites if they were already in ruins at the end of the Middle Kingdom.

The Turkish rule in Palestine ceased before the end of World War I and was followed by British occupation and mandate. John Garstang undertook new excavations at Jericho. He saw traces of intense fire. “Houses alongside the wall are found burned to the ground, their roofs have fallen upon the domestic pottery within.”⁽⁴⁾ “Palace storerooms were burnt in a general conflagration.” “White ash was overlaid by a thick layer of charcoal and burnt debris.”⁽⁵⁾

The consecutive settlements from the lowest level up were called by the letters of the alphabet. One city was destroyed at the end of the Middle Kingdom or at the beginning of the time of the Hyksos. The invasion of the Israelites was synchronized with the end of City “D”, sometime in the days of Amenhotep III: a few scarabs of this king were found in the cemetery, and the excavator reasoned that the city must have fallen during the king’s reign. This theory was inspired by another theory which identified the Habiru of the el-Amarna letters with the Israelites.

Finally, after World War II, Jericho being now a part of the Jordan kingdom, Miss Kathleen Kenyon undertook the decisive work of clarifying Jericho’s history from the Neolithic age on. In several painstaking campaigns she lifted one veil after another from the city of legend and history. She was not led by any theory about the time of the Exodus, neither by that of Garstang who claimed Exodus in the days of Amenhotep II and Conquest in the days of Amenhotep III of the eighteenth dynasty (Habiru theory), nor by that of Albright that the Exodus took place in the days of Ramses II and the Conquest in the days of Merneptah (Israel Stele), both of the nineteenth dynasty, except that in agreement with all schemes of accepted chronology she expected to find the Old Testament confirmed and the great walls of Jericho dating from some time of the Late Bronze: The New Kingdom in Egypt, to which both the eighteenth and the nineteenth dynasties belonged. Whether the Exodus took place in the days of Amenhotep III and of the el-Amarna letters, or in the days of Ramses II or Merneptah and the Israel stele, the Conquest must have fallen into the Late Bronze or the New Kingdom in Egypt. Miss Kenyon revised Garstang’s estimates.

There was found a Jericho of the days of the Early Bronze—the Old Kingdom in Egypt. Its defenses were destroyed, and immediately and in great haste the people of Jericho built again, but their hastily-erected wall was destroyed by fire before having been completed. As to the causes of these destructions, Miss Kenyon expresses herself this way: “Earthquakes undoubtedly

played their part. Owing to the cataclysmic terrestrial upheavals which resulted in the formation of this great cleft, the Jordan Valley is peculiarly liable to earthquakes.” ⁽⁶⁾

In the time of the Middle Kingdom, Jericho was at its apogee as a city and fortress. “...the Middle Bronze Age is perhaps the most prosperous in the whole history of Palestine.” ⁽⁷⁾ “The defenses ... belong to a fairly advanced date in that period.” ⁽⁸⁾ There was “a massive stone revetment... part of a complex system” of defenses. ⁽⁹⁾ “The final buildings [of the Middle Bronze Age city] were violently destroyed and left in ruins with all their contents.” ⁽¹⁰⁾ Fire was one of the agents of destruction. “Over most of the area ... excavated on the west side of the mound, the thick layer of burning above the Middle Bronze Age buildings is the highest surviving layer.” ⁽¹¹⁾

After the great fortress, its palace and its walls ruined and burned, there was no Jericho again. The near-absence of Late Bronze remains is explained by an extraordinary amount of weathering on the site. “The houses of Late Bronze Age Jericho have therefore almost entirely disappeared.” ⁽¹²⁾ Only in one small area were foundations of Late Bronze Age houses discovered. When Garstang excavated the site, he found also “traces of the several houses which sprang up independently of the fortifications upon the ruins of the city at its northern end.” ⁽¹³⁾ The time of this settlement was near the end of the eighteenth dynasty in Egypt, the days of Amenhotep III or Amenhotep IV (Akhnaton).

But of any fortifications that the Late Bronze Age settlement might have had, no trace survives. Garstang thought to have found them in the excavations that he conducted on the site between 1930 and 1936; but the double line of wall, thought by Garstang to be of the Late Bronze age, or New Kingdom in Egypt, was proved to date from the Early Bronze, contemporary with the Old Kingdom in Egypt. Garstang’s conclusion of a sizable fortress in the days of Amenhotep III was shown to be wrong. Very few traces were found above the destruction level of the Middle Bronze Age city, which, in accordance with the statement cited above, “is the highest surviving layer.”

“It is a sad fact”, wrote Miss Kenyon, “that of the town walls of the Late Bronze Age, within which period the attack by the Israelites must fall by any dating, not a trace remains. . . . As concerns the date of the destruction of Jericho by the Israelites, all that can be said is that the latest Bronze Age occupation should, in my view, be dated to the third quarter of the fourteenth century B.C. This is a date which suits neither the school of scholars which would date the entry of the Israelites into Palestine to c. 1400 B.C. nor the school which prefers a date of c. 1260 B.C.” ⁽¹⁴⁾

We carefully followed this trend of thought and we see that, under the great walls of Jericho, the theories of Conquest in the days of Habiru (El-Amarna) and the Conquest in the days of Merneptah (Israel Stele) are equally well-buried.

In Conclusions to her *Digging up Jericho*, Kathleen Kenyon wrote with a sigh:

“At just that stage when archaeology should have linked with the written record, archaeology fails us. This is regrettable. There is no question of the archaeology being needed to prove that the Bible is true but it is needed as a help in interpretation to those older parts of the Old

Testament which from the nature of their sources . . . cannot be read as a straight-forward record.”

And what a pity it is. “When Joshua wished to lead the Children of Israel into the Promised Land, he said to his spies ‘go view the land and Jericho’, because Jericho was the entrance into central Palestine.” ⁽¹⁵⁾

A tragic note is heard in Kenyon’s report. She intended to discover the truthfulness of the written record. Some other scholars did not share Kenyon’s regret. Professor Martin Noth pointed to the Jericho discrepancy as the best and most decisive proof of the unreliable character of the historical parts of the Old Testament. It became a major issue for Old Testament studies. When Professor Wright of Harvard expressed himself as trusting the historical truth of Old Testament records, he was accosted by Professor Finkelstein of Los Angeles University with reference to the walls of Jericho that were in ruins long before the Israelites reached them. ⁽¹⁶⁾

The conclusion reached by the excavator of the great-walled Jericho—a Middle Bronze city, destroyed only a short time after the end of the Middle Kingdom—is in perfect agreement with the time table of *Ages in Chaos*: the Israelites arrived at the walls of Jericho only a single generation after the end of the Middle Kingdom in Egypt, still in the Middle Bronze (the beginning of the Hyksos occupation). There is complete agreement between the archaeological finds and the scriptural record. ⁽¹⁷⁾

In the days of Ahab, Hiel, his subject, built on the ruins of Jericho. No wonder that the few buildings that were erected at that time and the few tombs that were used, date from the time of Amenhotep III and IV (Akhnaton). Hiel’s building activity in Jericho falls in their time because they were contemporaries of Ahab. Over sixty-five of Ahab’s letters addressed to these pharaohs are in the el-Amama collection, found in the short-lived capital of Akhnaton.

The stumbling block is really a foundation stone; the great walls of Jericho fell suddenly when the Israelites under Joshua, after crossing the Jordan, were closing in on the city; and the temporary reoccupation almost six hundred years later is, once more, a case of a complete agreement between archaeology and the written record; it verifies the present reconstruction and is verified by it.

References

1. E. Sellin and C. Watzinger, *Jericho, Die Ergebnisse der Ausgrabungen* (Leipzig, 1913).
2. C. Watzinger, “Zur Chronologie der Schichten von Jericho,” *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, LXXX (1926), 131-36.
3. *Ibid.*, p.135.
4. John Garstang, *The Foundations of Bible History* (1931), p. 146.
5. J. Garstang and J.B.E. Garstang, *The Story of Jericho* (1940), p. 104.
6. Kathleen Kenyon, *Digging Up Jericho* (London, 1957), pp. 175-176.
7. *Ibid.*, p.212.
8. *Ibid.*, p.214.

9. *Ibid.*, p.215.
10. *Ibid.*, p.229.
11. *Ibid.*, p.261.
12. *Ibid.*, p.261.
13. John Garstang, *The Foundations of Bible History*, 'Joshua, Judges', (New York, 1931), p. 146.
14. K. Kenyon, *op. cit.*, pp. 261-262.
15. *Ibid.*, 266.
16. G. Ernest Wright, "Is Glueck's Aim to Prove that the Bible is True?", *The Biblical Archaeologist Reader*, (Anchor Books, 1961).
17. [The archeology agrees with the Biblical account even in minor details. Miss Kenyon reports of the last Middle Bronze Age city (MB II) that "very little metal was found" (*Digging Up Jericho*, p.232.). This is consistent with Joshua 6:24: "And they burnt the city with fire, and all that was therein: only the silver, and the gold, and the vessels of brass and iron, they put into the treasury of the house of the Lord". On the archeological anomalies of Jericho see also John J. Bimson, "The Conquest of Canaan and the Revised Chronology," *S.I.S. Review* I, 3 (Summer 1976), pp. 2ff, and G. Gammon, "The Walls of Jericho," *Ibid.*, pp. 4-5.]

Beth-Shan

Palestinian archaeology is a confused terrain dug upside down. The Mycenaean ware is thought to be a product of the pre-Israelite period, whereas actually it denotes the period between Solomon and Hezekiah and even Josiah. The time of Judges is thought to follow the time of the Mycenaean ware, whereas it was antecedent to it and, together with the time of the wandering in the desert, comprises the Hyksos period in Palestine. Thus there seems to be no level for the time of the Kings in the earth of Palestine.

This can be well illustrated by the excavations at Beth-Shan.⁽¹⁾ This city in the valley of the Jordan played a notable part in all the periods of Palestinian history. During the time of the Judges it was an unsubdued Canaanite city defended by chariots of iron. When Saul fell in the war with the Philistines his body was carried to Beth-Shan and hung on the city wall. The city was an administrative center in the days of Solomon.⁽²⁾ Scythians occupied it in the days of Manasseh (Menashe) or Josiah. Whereas other sites excavated in Palestine presented chronological difficulties, it was expected that a site like Beth-Shan, occupied through all the periods of biblical history, would disclose a well-defined archaeological succession if the excavations were scrupulously executed as to stratification. This condition was also fulfilled.

The tell has been explored to a depth of about thirteen meters, and another thirteen meters conceal the older strata, still unexplored. The deepest stratum explored (IX) is that of Thutmose III and is assigned to between -1501 and -1447. Stratum VIII is ascribed to the period of -1447 to -1412, , and Stratum VII to Amenhotep III, Akhnaton, and the epigoni of the Eighteenth Dynasty. Stratum VI is divided into two thick layers, the "early Seti" and the "late Seti," together composing the period from -1313 to -1292. Stratum V, the largest, is that of Ramses II (-1292 to -1225). Stratum IV covers the time of the "Late-Ramessides, Philistines, Israelites, Assyrians,

Scythians, Neo-Babylonians, Old Persians, etc.” or from -1224 to -302, over nine hundred years of stormy history. This means that none of these periods has a separate stratum: one very thin layer represents all of them. But this stratum is less than one third of the stratum of Seti; in other words, the stratum of 922 years, including many consecutive important periods in the history of Beth-Shan, is equal in thickness to layers deposited every seven years during the reign of Seti; and again, this 922-year deposit is but one fifth the thickness of the stratum of Ramses II alone.

The real meaning of the strata archaeology of Beth-Shan is as follows: Strata IX to V (Thutmose III to Ramses II) cover the period of the kings from Solomon to Zedekiah and the exile. Stratum IV covers only the end of the Neo-Babylonian period (Nabonidus) and the old Persian, which is contemporaneous with the Later Ramessides. Strata III, II, and I are correctly presented as Hellenistic-Roman, Byzantine, and Arabian.

As, actually, the time of Seti is the same as the period of the Scythians in the Near East, the time of Ramses II the same as the period of the Neo-Babylonian Empire under Nebuchadnezzar, and the Late Ramessides period the same as the Persian, it is no wonder that the levels are found to be “disturbed.”

Dealing with the finds of the Ramses II level, the archaeologist writes: “The disturbance of the levels immediately above leaves us in uncertainty concerning the length of time during which these buildings were occupied, and we are therefore not entitled to assert that every object found upon or near the floor-level must be even approximately of the date of Rameses II. The presence of the Cypriote bottle No. 27 is sufficient by itself to rebut any such assumption, as this type is, apparently, not earlier than the eighth century.”⁽³⁾

The superimposed Level IV is thin but very confused. “The long period indicated by the title of this division [Late Ramessides, Philistines, Israelites, Assyrians, Scythians, Neo-Babylonians, Old Persians, etc.] is represented by a relatively shallow stratum, in which floor-levels are rarely distinguishable. Here, therefore, we are obliged to estimate the age of particular pieces by their characteristics rather than, as in the lower divisions, by their situation.”⁽⁴⁾

The absence of the long Israelite period of the judges as well as the Kings is explained in this way: “The disturbance of the upper levels has made it scarcely possible to distinguish any stratification. We shall therefore, in respect of the pottery from above the Rameses II floor-level, confine ourselves to indicating such pieces as are obviously of Hellenistic or later date.”⁽⁵⁾

In Lachish we had a similar case.⁽⁶⁾ One area of a certain stratum was described as containing ashes from the time of Ramses, and another area of the same stratum was said to contain ashes of the time of Nebuchadnezzar, because in one place scarabs of Ramses II were found and in the other, a short distance away, ostraca belonging to the war with Nebuchadnezzar were discovered. However, in ashes the ostraca of a vase of the Nineteenth Dynasty was found.”⁽⁷⁾

References

1. A. Rowe, Topography and History of Beth-shan; G. M. Fitzgerald, *Beth Shan: The Pottery* (Philadelphia 1930); A. Rowe, *Beth Shan: The Temples and Cult Objects* (Philadelphia, 1940)
2. Joshua 17:11-16; Judges 1:27; I Samuel 31:10-12; I Kings 4:12.
3. Fitzgerald, *Beth Shan: The Pottery*, p. 11.
4. Ibid., p. 1.
5. Ibid., p. 15.
6. I. Velikovsky, *Ramses II and His Time* (New York, 1978), pp. 44-49.
7. Cf. W. F. Albright, "The Israelite Conquest of Canaan in the Light of Archaeology," *Bulletin of the American Schools of Oriental Research*, 74 (1939), 11-23.

New Evidence for Ages in Chaos

Since the publication of *Ages in Chaos: From the Exodus to King Akhnaton* over twenty-five years have passed. Did the elapsed time supply additional proofs or disclose any weakness in the scheme? The fact that no section of that first edition was withdrawn in subsequent printings should be regarded as a sign that no disproving evidence has come from excavated ground or from deciphered texts and no disenchantment with the general scheme has taken place. On the contrary, many new proofs have presented themselves to verify the Reconstruction and more than one of them was clearly anticipated in *Ages in Chaos* and also indicated in advance.

I shall survey here some of the evidence that was adduced, and in doing so I shall follow approximately the order of chapters in *Ages in Chaos* I.

NATURAL UPHEAVALS

The catastrophic events that interrupted the flow of history served as the starting point of *Ages in Chaos* for the synchronization of the histories of the ancient East; in *Worlds in Collision* these cataclysms were reconstructed from historical documents and traditions of ancient races; in *Earth in Upheaval* the geological and paleontological evidence was presented to substantiate the same claims, and only some scattered archaeological evidence was adduced. The task of collecting and interpreting the archaeological evidence of a great natural upheaval in the area of the Near East was diligently performed by Claude F. A. Schaeffer of the College de France, the excavator of Ras Shamra-Ugarit. During the years of World War II and the years following he labored on his *Stratigraphie comparee et chronologie de l'Asie occidentale*. Working independently of me he came to the conclusion that great catastrophes of continental dimensions closed several historical ages; the greatest of them took place at the end of the Middle Kingdom in Egypt and actually caused its downfall; the earth was covered with a thick layer of ash, violent earthquakes shook the entire ancient East, from Troy at the Dardanelles to the Caucasus, Persia, Egypt; civilizations of the Middle Bronze Age were suddenly terminated; traffic, commerce, and pursuit of the arts ceased; populations of all countries were decimated; the survivors became vagrants; plagues took their toll; the climate suddenly changed, too. Thus Schaeffer and I, following different approaches, on very different material, came to identical conclusions concerning the great catastrophes in the historical past, their role in the termination of historical

ages; in the case of the catastrophe that terminated the Middle Kingdom (Middle Bronze II) our views coincide to the day.

It is fair to point out that we are in agreement on the relative, not the absolute, chronology; yet Schaeffer concedes to me that some limited reduction of historical dates may be due—a view to which today more than one scholar tends.⁽¹⁾

Examining the stratigraphical evidence, Schaeffer did not investigate literary sources that refer to the very same catastrophes; but a natural upheaval that took place in a historical period in a country of advanced culture could not but leave a memory in historical documents. Thus Schaeffer stopped short of drawing the proper conclusions for the synchronization of the histories of Egypt and Israel with all the ramifications and consequences for the history of the Near and Middle East.

THE DATE OF THE EXODUS

The Ipuwer papyrus (known also as “Admonitions of an Egyptian Sage”) was recognized by me as a script of lament at the sight of an overwhelming natural catastrophe followed by the invasion of the Hyksos (i.e., the Amalekites) and by a social upheaval; I also contended that the text was composed in the beginning of the second Interregnum or Intermediate Period. At the time *Ages in Chaos*, Vol. I was printed, the accepted view was that the papyrus describes merely a social revolution during the First Interregnum (between the Old and Middle Kingdoms); my critics did not omit to stress my divergence from accepted notions.

In the 1964 volume of the *Journal of Egyptian Archaeology* John van Seters published a paper entitled “A Date for the Admonitions in the Second Intermediate Period”⁽²⁾—a view that since then has received acceptance from other scholars: notably W. F. Albright agreed with this verdict.⁽³⁾

Since several years the view that Papyrus Ipuwer describes a natural catastrophe was repeatedly presented—by A. Galanopoulos, geologist at the University of Athens, and by B. Heezen and D. Ninkovitch, geologists at Columbia University.⁽⁴⁾ Moreover, these scientists followed my interpretation of the papyrus as describing the plagues of Egypt known from the *Book of Exodus* and thus also my timetable.

An interesting bit of supporting evidence for the identification of the Hyksos with the Amalekites was offered by one of the students of my course “The Changing View of the Universe and of Man’s Past” at the New School for Social Research in New York in the fall term of 1964.

In the pronouncement of Balaam in which he referred to the Amalekites as “first among the nations” and to Agag their king, (Numbers 24: 7, 20) there is also a reference to the Israelites, or their king, destroying, sometime in the future, the Moabites and the “children of Seth” (24:17). There is no clear opinion among the commentators as to the identity of the “children of Seth,” but it is agreed that Seth is the same as Seth, son of Adam, and therefore the Biblical concordances have: ‘an unknown king or, race’ or ‘a tribe of unknown origin.’

The Hyksos worshipped the god Seth and also introduced him into the Egyptian pantheon. The term “Children of Seth” signifies worshippers of Seth, or Hyksos. Thus the references to the Amalekites and to the children of Seth by Balaam reveal the identity of these two designations.

The Biblical reference to the horsemen (“the horse and its rider”) of the Egyptian host that perished in the Sea of Passage could be, and actually was, offered as an argument against the timetable of this reconstruction; it was generally assumed that the Hyksos arriving from Asia introduced the horse to the Valley of the Nile; therefore a Middle Kingdom’s “horse and its rider” would be an anachronism.

Walter B. Emery, digging at Buhen in the Sudan, announced that under a layer of ash, in a stratum dating from the Middle Kingdom, a skeleton of a horse was found, which fact disproves the old contention that the Hyksos were the first to introduce this animal into the Valley of the Nile.⁽⁵⁾ The layer of ash is apparently the residue of the catastrophe that terminated the age of the Middle Kingdom (Middle Bronze II) in Egypt; such a layer, according to Schaeffer, is found regularly in all excavated places from Troy to the Caucasus, Persia, and Egypt.

THE WALLS OF JERICHO

In Jericho Kathleen Kenyon found a great city wall that fell in an earthquake and an important city that was leveled in an assault following the earthquake; thereafter the city and its wall were not rebuilt, and only after several centuries was a very insignificant attempt to establish a new habitation made. Since the great wall of Jericho fell shortly after the end of the Middle Kingdom in Egypt, there was no city to vanquish, neither was there a wall to fall down when Joshua and his troops approached Jericho. “It is a sad fact that the town walls of the Late Bronze Age, within which the attack by the Israelites must fall by any dating, not a trace remains.”⁽⁶⁾ This fact is regarded by M. Noth and others as the most flagrant discrepancy between Scriptural statements and archaeological discoveries, throwing a shadow on the historical veracity of the Hebrew Testament.⁽⁷⁾

But it is very different when the timescale of the present work is considered: the Exodus took place at the very end of the Middle Kingdom, actually within its last days; the crossing of the Jordan and the arrival at Jericho took place four or five decades later, in full agreement with the results of Kenyon’s digging. Thus the excavation of Jericho actually presents a verdict of vindication of the present reconstruction and a condemnation of the conventional schemes.⁽⁸⁾ Equally, J. Pritchard, excavating at Gibeon, another city memorable in connection with Joshua’s conquest, found to his surprise no Late Bronze strata at the excavated site.⁽⁹⁾

HAZOR—“THE HEAD OF ALL THESE KINGDOMS”

In the conquest of northern Canaan the battle of Joshua against a confederation of many city-kings at the “waters of Merom” was decisive. Upon victory Joshua took Hazor—“for Hazor beforetime [in the time of Joshua] was the head of all these kingdoms . . . and he burnt Hazor with fire. . .” (Joshua XI: 10, 11).

But Hazor soon rebounded and in the days of the Judges it dominated the entire country. “And the Lord sold them [the children of Israel] into the hand of Jabin, King of Canaan, that reigned in Hazor . . . for he had nine hundred chariots of iron; and twenty years he mightily oppressed the children of Israel.” (Judges IV: 2, 3).

The deliverance of the children of Israel led by Deborah the prophetess and Barak the captain who defeated Sisera, the captain of King Jabin, is told in chapters four and five of the *Book of Judges*.

Since 1955 a team of Israeli archaeologists led by Yigael Yadin excavated at Hazor. Their chronological scale was the conventional timetable. In the Middle Bronze II (Middle Kingdom of Egypt) there was a huge settlement and fortress in Hazor; again it was a dominant city in Middle Bronze III, or the time of the Hyksos; it was not as prominent in the days of the Late Bronze (New Kingdom in Egypt); levels of a series of subsequent periods were discovered, also of the time of the el-Amarna correspondence (Hazor is mentioned twice there); next there were signs of destruction and fire; but in the level ascribed by Yadin to the period of the Judges there was no Hazor worth mentioning, and this despite the fact that according to the books of *Joshua* and *Judges* it was the most prominent city—actually the capital—of the greater Canaan, up to the slopes of Mount Hermon. This result, in conflict with the books of *Joshua* and *Judges* was most perplexing, and later caused the leader of the excavations to admit ruefully: “there existed no *city* (emphasis Yadin’s) at Hazor; thus Deborah’s battle had nothing to do with Jabin, king of Hazor.”⁽¹⁰⁾ But according to the revised chronological table the Middle Bronze III—and thus also the huge fortress-city of Hazor—falls in the time of Conquest and Judges. In the days of the Kings it was only a regional town; it was burnt and leveled by Tiglath-Pileser III in -732; the signs of this destruction were also discovered by the expedition under Yadin. Thus the revised chronological timetable finds in Hazor an expected sequence of levels and no disagreement with Biblical data.

THE SIEGE OF AVARIS

Of the archaeological discoveries related to the period of the downfall of the Hyksos-Amalekite empire made after the publication of *Ages in Chaos I*, the most important is a stele with King Kamose’s description of the siege of Avaris, the capital-fortress of the Hyksos.⁽¹¹⁾ Previously only one hieroglyphic text was known to deal with the subject—an inscription from the tomb of an officer who served under the king Amose (son or brother of Kamose). The newly discovered text makes even clearer the fact that the Egyptian native rulers had an all-important ally in the siege and capture of Avaris. Actually, Saul, King of Israel and his army were the main participants in that siege and conquest.

SCARABS OF THUTMOSE III

A large number of scarabs was found in Palestine and in Syria dating to the period of the Eighteenth Dynasty in Egypt, recognized by us as contemporary with the House of David. Scarabs—seals of the pharaohs—and impressions of these seals in clay are as a rule found in these countries in much more recent levels than expected by the established chronology. Especially startling is the fact that the scarabs of Thutmose III are regularly found in levels

supposedly five to six centuries younger; an accumulation of newly-found seals of Thutmose III since the establishment of the State of Israel has caused archaeologists to wonder increasingly at the regularity of the phenomenon;⁽¹²⁾ but this is exactly what must be expected.

To realize the state of affairs in Egyptian and Palestinian archaeology, the following observation of C. C. McCown, who dug at Tell en-Nasbeh,⁽¹³⁾ is worth considering; it is also symptomatic of all other places in Egypt and Palestine, and sounds very familiar to a reader of archaeological reports:

The scarabs and scaraboids [found in the place] are unanimously dated from the 18th Dynasty or later. Since, as all ceramic evidence clearly indicates, Tell en-Nasbeh was not occupied until the 19th Dynasty and since scarabs, especially those bearing the cartouch of Thutmose III, with his throne name, Men-kheper-re, were used and imitated for centuries after their original date, those which may have been made before 1200 have no chronological value whatever. The exact dating of such scarabs, which depends solely upon stylistic considerations, is a matter of uncertainty, upon which Egyptologists differ greatly.

The only scarabs which affect chronology seriously are those which the Egyptologists consulted have agreed in dating to the 25th [Ethiopian] Dynasty (712-663 B.C.).⁽¹⁴⁾

At Tell en-Nasbeh, various scarabs and the style of certain buildings speak for the fifteenth-thirteenth centuries, or the Eighteenth to Nineteenth Dynasties; but other evidence and the scarabs of the Ethiopian Dynasty speak for the end of the eighth and the beginning of the seventh centuries. An archaeological solution was achieved by disregarding half the evidence; in an historical construction in which only the Ethiopian period is properly anchored in time, it is inevitable, as in this instance, that the scarabs of all other periods would appear to be in conflict with the established timetable of Egyptian chronology and the sequence of dynastic succession.

In my own historical reconstruction, however, the Ethiopian Dynasty ruled between the Eighteenth and Nineteenth Dynasties; and therefore objects of closely following epochs found in the same place do not require the disqualification of half the evidence—the other scarabs and seal impressions found at Tell en-Nasbeh have an equally well-founded chronological value.

THE QUEEN OF SHEBA AND THE LAND OF PUNT

The question of whether frankincense was grown in Palestine is of historical importance for the problem of identifying God's Land, the place to which Queen Hatshepsut traveled. Because of the frankincense, the produce of the land, the place was thought to be in southern Arabia or Ethiopia.⁽¹⁵⁾

I maintained that in Biblical times frankincense grew in Palestine. (*Ages in Chaos*, pp. 141, 172-173). The recent excavations at Ein Gedi disclosed that frankincense actually was grown in the tropical climate on the shores of the Dead Sea.⁽¹⁶⁾

Some of the supporting evidence came from the literature of earlier years, not exploited in *Ages in Chaos*. W. F. Albright came to the same conclusion:

Contemporary Egyptian inscriptions almost vanish after about 1750 B.C. and do not resume their normal flow until about 1580; Babylonian inscriptions fail us entirely after the fall of Babylon cir. 1600 and are almost completely lacking until after 1400 B.C.; Assyrian records cease about 1780 and (except for a few short inscriptions from cir. 1570-1520) do not appear again until after 1450 B.C. There are hardly any contemporary Hittite inscriptions of the Old Empire, but even later copies of early documents in the archives of Khattusas break off about 1550 and contemporary inscriptions do not begin until after 1400 B.C. In short, it is certain that there was a catastrophic interruption of the normal flow of ancient history.⁽¹⁷⁾

The Greek Septuagint (“translation of the Seventy”) that dates from the third century before the present era and similarly the Vulgate (the earliest Latin translation) see in Shwa (Seba) the personal name of the Queen, not the name of a region (Regina Seba).

As to some Egyptian reference or references to Punt as located in the south, a point brought up by a few of my readers, the following needs to be said: the opening passage in the *History* of Herodotus⁽¹⁸⁾ tells that the Phoenicians came to their country on the eastern shore of the Mediterranean from their original home on the shore of the Erythrean Sea, by which the Red Sea and also the Indian Ocean are known to have been meant by the Greeks. This would explain such early reference. But in another Egyptian text Punt is referred to as being to the north of Egypt.⁽¹⁹⁾ Besides, we should be mindful of the fact elucidated in *Worlds in Collision* that in historical times the cardinal points have been—and more than once—reversed, or, as it is out in a hieroglyphic text, “the south becomes north, and the Earth turns over.”⁽²⁰⁾

The statement of an Egyptian official from the time of the Old Kingdom that he visited eleven times Byblos and Punt⁽²¹⁾ should not be interpreted, as some scholars wished that he went this number of times to South Arabia or Somaliland, and as many times to the Phoenician coast. Actually, the ships which in the New Kingdom traded with Punt were called “Byblos-ships”⁽²²⁾ Cf. also E. Danelius, “The Identification of the Biblical ‘Queen of Sheba’ with Hatshepsut, ‘Queen of Egypt and Ethiopia,’” *KRONOS I.4 and II.1* (1976).

Finally, the written account of Thutmose III’s campaign to Phoenicia-Palestine uses the same geographical name: Divine Land, that we found in the travelogue of Queen Hatshepsut, from whom Thutmose took over the throne.

THE TEMPLE OF SOLOMON

In a paper printed in the *Journal of Biblical Literature* in 1940, Professor Julius Lewy (“The Sulman Temple in Jerusalem”) proved that in Jerusalem in the days of the el-Amarna correspondence there was such a temple; the king of Jerusalem refers to it in his letters, and it must have had a dominant position in the capital city. Knudtzon, the translator of the tablets, read the ideogram, “House of Ninib,” and I followed Knudtzon and tried to interpret such references in the letters of the king of Jerusalem in the light of events that were taking place. Lewy,

however, had already shown why the ideogram must be read “Temple of Sulman” ; he interpreted the name as another version of the deity Salem. In a private discussion with me Professor Albright expressed his disagreement with Lewy’s interpretation of Sulman as the name of a deity, it not being supplied with a sign indicating divinity; but this only gives validity to my interpretation of “Temple of Sulman” as the Temple of Solomon. In the Hebrew Bible the name of the king (Shlomo), derived from the word “peace” *shalom*, has no final letter “n,” but the Septuagint of the third pre-Christian century—the earliest known translation of the Scriptures into any language—has a final “n” in Solomon’s name.⁽²³⁾

Letters written by the king of Jerusalem in the ninth century should conceivably contain a reference to the Temple of Solomon that dominated the capital. The letter #290 of the el-Amarna collection, written by the king of Jerusalem to report the approach of Trans-Jordan tribes, refers to the Temple of Sulman. In Second Chronicles (20:4-5), in the story of such an invasion, the king of Jerusalem gathered his people in the Temple and prayed to forestall the capture of the city.

It was brought out that the names of the cities in Israel and Judah as known from the books of the Old Testament correspond in pronunciation to the Egyptian usage under the Eighteenth dynasty, but differ from the pronunciation under the Nineteenth.⁽²⁴⁾ Yet, according to the accepted chronology, the events described in the Old Testament under the Dynasty of David took place not during the reign of the Eighteenth Dynasty of Egypt, not even during the Nineteenth, but much later, under the Twenty-first to Twenty-fifth Dynasties. Also the offices under the kings of the House of David are very similar to the offices in the palace of the pharaohs of the Eighteenth dynasty, supposedly five or six centuries earlier.⁽²⁵⁾

The names on the ostraca (inscribed potsherds) found in Samaria closely resemble the names found in the el-Amarna collection of letters, on tablets written from Syria-Palestine, a fact that had been observed by J. G. Duncan⁽²⁶⁾ and that is better understandable in the light of what is said in Chapters VI to VIII of *Ages in Chaos I*.

THE AGE OF IVORY

In Chapter VIII the theme is developed that the Assyrian King Shalmaneser III of the ninth century was a contemporary of Pharaoh Akhnaton, and the name Burraburiash, signed on his letters, is the Babylonian throne name of the Assyrian king, it being known that at Nineveh and at Babylon the kings of Assyro-Babylonia used different throne names; I also claimed that Shalmaneser received large quantities of art objects in ivory from Akhnaton who, in disagreement with the conventional timetable, reigned in the ninth century. The Assyrian king actually demanded the despatch of objects of ivory, and gave these orders: “Let experts, who are with thee, make animals, either of land or of river, as if they were alive. . .” Akhnaton enumerated the huge quantities of carved ivory sent to the king of the Double Stream Kingdom, and among other objects we read of “six beast-paws of ivory, nine plants of ivory . . . twenty-nine gherkin oil vessels of ivory . . . forty-four oil vessels of ivory, three hundred and seventy-five oil vessels of ivory . . . nineteen breast ornaments of ivory” —the list is excessively long.

On November 26, 1961, the *New York Times* carried this message from London:

When archaeologists dug into the ancient Assyrian city of Nimrud in Iraq earlier this year, they were surprised to find not Assyrian but 'Egyptian' carvings. The explanation given this week by David Oates, Director of the British School of Archaeology's Nimrud Expedition, is that the archaeologists have dug into an ancient Assyrian antique shop. The 'Egyptian' carvings had been cut to satisfy their rich clients' demands for foreign 'antiquities.'"

Nimrud, or Calah of ancient times, was the military headquarters of Shalmaneser, and the excavations actually "have been concentrated on Fort Shalmaneser, headquarters of the Assyrian army from the ninth to the end of the eighth century B.C." A statue of King Shalmaneser III was found, and according to an inscription on it the king considered it a good likeness of himself.

The site that has been excavated consists of three large courtyards surrounded by store-houses, workshops, administrative offices and barrack rooms." A military camp is certainly not a natural place for forgeries in foreign antiquities in ivory.

"One chamber, 90 feet in length, is packed by them [ivories]," and "three seasons' work has not emptied it. Two more rooms known to contain ivories have not yet been opened."

"The carvings are of a style that antedates by hundreds of years the period in which they were made. If found elsewhere, they would have been identified as Egyptian." The findings of this cache, in the military headquarters of Shalmaneser III, of a multitude of objects in ivory, many of which depict animals, of Egyptian make ⁽²⁷⁾ and of a time presumably by centuries preceding the time of this king, was anticipated in *Ages in Chaos*.

DARK AGES

Archaeology in general came into more and more embarrassing situations. Again and again, five to six "dark centuries" were found inserted into the histories of the peoples of antiquity: no literary document, practically no sign of habitation or relic of culture could be discovered. This is the case of Greece and the Aegean region, Crete, Asia Minor, and Cyprus, too. Ekrem Akurgal, professor at Ankara University, in his *Die Kunst Anatoliens von Homer bis Alexander* (Berlin, 1961), writes of the *dunkles Zeitalter* (Dark Ages): "The catastrophic events that took place about -1200 appear to be of such great impact that today, despite the energetic digging of the last decades, the period from 1200 to 750 for the most part of the Anatolian area lies still in complete darkness."

DECIPHERMENT OF LINEAR B

One of the most important and far-reaching theses of this Reconstruction is in the conclusion that these so-called Dark Ages of the Greek and Anatolian histories are but an artefact of the historians, and never took place. The Mycenaean Age was followed by the Ionic times with no centuries intervening; ⁽²⁸⁾ the break in culture is but the consequence of natural upheavals of the

eighth century and of the subsequent migrations of peoples. The Ionic culture must show great affinity with the Mycenaean heritage; therefore, I have also claimed that the Linear B script would prove Greek; but this was not a view that had many supporters.

In 1950 the eminent authority on Homeric Greece, H.L. Lorimer, in her *Homer and the Monuments* wrote of this script and of the efforts to read it: “The result is wholly unfavorable to any hope entertained that the language of the inscriptions might be Greek.” [\(29\)](#)

On the occasion of addressing the Forum of the Graduate College of Princeton University on October 14, 1953, I once more formulated my expectations:

“I expect new evidence from the Minoan scripts . . . I believe that when the Minoan writings unearthed in Mycenae are deciphered they will be found to be Greek. I also claim that these texts are of a later date than generally believed.” And I quoted myself from my *Theses*.

Only half a year later, on April 9, 1954, the *New York Times* carried on its front page a United Press news report that the ancient script “that for the last half-century and longer has baffled archaeologists and linguists has been decoded finally—by an amateur. The riddle was solved by Michael Ventris, an English architect.” The language proved to be Greek, to the surprise of many scholars; the entire field of early Greek civilization experienced the greatest shock since the discovery of Troy. In the deciphered tablets the names of the deities of the Greek pantheon, supposedly “created” by Homer and Hesiod in the seventh pre-Christian century were found written in the Linear B script—to the even greater surprise of the scholarly world.

When embarking on the task of deciphering Minoan Linear B, Ventris expressed his belief that it was not Greek—he worked on the premise that it was Etruscan; the inquiry [\(30\)](#) that he sent out to a large number of classicists in 1949 as to the probable language of the script did not bring even a single answer favoring Greek. [\(31\)](#)

THE GREATEST FORTRESS OF ANTIQUITY

With this imposing score of confirmations from the field of archaeology, ever growing since 1952, for my work of reconstruction of ancient history, the question could be asked: which test, besides a complete radiocarbon survey of the New Kingdom in Egypt would I desire and which discovery reflecting on chronological problems would I anticipate in the years to come? Compelling evidence will continue to arrive from almost every excavated place and there will be an ever-growing number of surprises. I shall select here one site of great promise for excavation. the identification of Avaris and el-Arish was offered by me as a crucial test—for my equation of the Hyksos (called *Amu* by the Egyptians) and the Amalekites, one of the basic contentions of *Ages in Chaos*: “generally, Avaris is looked for in the eastern part of the Delta, from Pelusium to Heliopolis, passing through Tell el Her, el-Qantara, San el-Hagar (Tanis), Tell el-Yahudieh,” wrote P. Montet in *Le Drame d’Avaris*. The site as identified in *Ages in Chaos* is quite a distance northeast from the Delta: el-Arish is at the wadi of the same name, known in the Old Testament as *Nakhal Mizraim* (“Stream of Egypt”), the historical frontier between Egypt and Palestine.

Despite many efforts made to have el-Arish surveyed and then also excavated, neither when the site was under the Egyptian authorities nor since it was occupied by the Israelis following the six-day war, has any survey or excavation taken place. In June 1968 John Holbrook jr., architect, backed by a group organized for the purpose of performing tests to determine the validity of my thesis (Foundation for Studies of Modern Science) proceeded to el-Arish in the military occupation zone to gain an impression as to the site of future excavation when, in days to come, such facilities might be extended, or permit granted. Chances are good that at such a time, however close or far, the excavators will lift sand from the greatest fortress of antiquity: before it fell it sheltered a huge garrison of warriors. It is also quite possible that much treasure had been dug into the ground by the besieged before the fortress that dominated the ancient East for several centuries surrendered. The virgin ground of the site never excavated cannot but entice the curiosity of field archaeologists; the prize of discovering Avaris is one of the great rewards that still lie in store for the enterprising.

References

1. C. H. Gordon is among those who profess such a belief, though not to the extent of this work of revision.
2. *Journal of Egyptian Archaeology* 50, pp. 13-23.
3. *Bulletin of the American Schools of Oriental Research* 179 (1965) pp. 41-42. The Egyptologists remain divided on the question.
4. A. G. Galanopoulos, "Die aegyptischen Plagen und der Auszug Israels aus geologischer Sicht," *Z. Altertum* 10 (1964) pp. 131-37; D. Ninkovitch and B. Heezen, "Santorini Tephra" in *Proceedings of the Seventeenth Symposium of the Colston Research Society* (1965) pp. 444-47.
5. *The Illustrated London News*, September 12, 1959, p. 250; *Kush, Journal of the Sudan Antiquities Service*, vol. VIII (1959) pp. 7-10. For evidence of the use of horse-drawn chariots under the XIIIth Dynasty at the very end of the Middle Kingdom, see W. Helck, "Ein indirekter Beleg fuer die Benutzung des leichten Streitwagens in Aegypten zu Ende der 13. Dynastie," *Journal of Near Eastern Studies* 37 (1978) pp. 337-340; cf. J. Bimson, "Israel in Egypt," *Society for Interdisciplinary Studies Review* IV.1 (1979) pp. 17-18.
6. Kathleen Kenyon, *Digging Up Jericho* (London, 1957) pp. 260-261.
7. See also my article, "Jericho" in *KRONOS* II.4 (1977), pp. 64-69.
8. G. Ernest Wright, "Is Glueck's Aim to Prove that the Bible is True?" *The Biblical Archaeologist*
9. W. L. Reed, "Gibeon" in *Archaeology and Old Testament Study* (Oxford at the Clarendon Press, 1967), p. 235.
10. "Excavations at Hazor (1955-1958)" in *The Biblical Archaeologist Reader* (New York, 1961) p. 224.
11. H. Smith and A. Smith, "Kamose Texts" in *Zeitschrift fuer Aegyptische Sprache und Altertumskunde* 103 (1976) pp. 59ff.
12. Cf. F. I. R. Giveon, "An Egyptian Seal from Kfar-Ruppin," *Bulletin of the Israel Exploration Society* XXV.4 (1961), p. 249.
13. [Tell en-Nasbeh is identified as ancient Mizpah, a town which for a short time, under Gedaliah, was a capital of Judah (Jeremiah 41:1f). Beginning in 1926 it was excavated by

W. F. Bade during five seasons, the last in 1935. The site is eight miles north of Jerusalem, near the ancient boundary between Israel and Judah.—JNS]

14. C. C. McCown, *et al.*, *Tell en-Nasbeh*, Vol. I (1947), p. 148.
15. As to the antiquities of southern Arabia the opinions of W. F. Albright and J. Pirenne differ by 600 years. J. Pirenne in *Annales d'Ethiopie* II (1957) dated the Sabaeen culture to the eighth century before the present era, differing from Albright, who maintained a thirteenth-century date.
16. B. Mazar, "En-Gedi," in *Archaeology and the Old Testament*, pp. 223-230.
17. William F. Albright, *From the Stone Age to Christianity* (Baltimore, 1940).
18. Herodotus I. 1; VII. 89.
19. P. Schott, *Les chants d'amour dans l'Egypte ancien*, p. 97.
20. J. Breasted, *Ancient Records of Egypt* III. 892.
21. Newberry, "Three Old Kingdom Travelers to Byblos and Pwevet," *Journal of Egyptian Archaeology* 24 (1938), pp. 182-184.
22. Breasted, *The Ancient Records of Egypt* I, sect. 360. Breasted conjectured that the ships may have been built in the extreme north of the Red Sea, but prefers to think that the Asiatics made a raid far to the south.
23. See my article "The Shulman Temple in Jerusalem" in *Society for Interdisciplinary Studies Review*, *Ages in Chaos* issue, 1978.
24. W. Vycichl, "Aegyptische Ortsnamen in der Bibel," *Zeitschrift fuer Aegyptische Sprache und Altertumskunde* 76 (1940), pp. 79-93. Resume by J. Janssen in *JEOL* 8 (1942), p. 593.
25. R. de Vaux, "Titres et fonctionnaires egyptiens a la cour de David et de Salomon," in *Revue Biblique* 48, no. 3, July, 1939.
26. *Digging Up Biblical History* (London, 1931), vol. II, p. 136.
27. It is quite conceivable that Samaria in Israel was the center of ivory work on Egyptian models. The tomb of Tutankhamen contained many art objects in ivory, not unsimilar to those found in Nimrud and Samaria.
28. "No 'Dark Ages' of six centuries' duration intervened in Greece between the Mycenaean Age and the Ionian Age of the seventh century." (from my *Theses for the Reconstruction of Ancient History*, published as an advance summary of *Ages in Chaos* in *Scripta Academica Hierosolymitana*, 1945).
29. *Homer and the Monuments* (London, 1950) p. 123.
30. "The Languages of the Minoan and Mycenaean Civilizations" or "Mid-Century Report" (1950). Cf. L. Palmer, *Mycenaeans and Minoans* (New York, 1962), p. 162.
31. *Ibid.*, p. 56.

The Pyramids

During the Old Kingdom in Egypt, under the Fourth, Fifth, and Sixth Dynasties, huge pyramids were erected at Giza, at Sakkara, and in other places of the land. That of King Khufu (Cheops of the Greek authors) is the largest, of the best workmanship, and the most famous. Alongside it is the second largest pyramid, built by the son of Khufu, Khafra (Chephren), and a smaller one built by Menkaure (Mycerinus), also a descendant of Khufu. The later pyramids are of poorer workmanship and smaller than those of Khufu and Khafra.

The Great Pyramid originally rose to a height of over 481 feet and measured ca. 756 feet at the base; it totalled 3,277,000 cubic yards of stone, or an estimated 2,300,000 blocks, which is “the largest constructed mass of stone ever erected by man.”⁽¹⁾ The precision of construction “equals to an optician’s work.”⁽²⁾ The stones were carried from the desert quarries and ferried over the Nile.

For what purpose were the pyramids erected? No hint was found in the hieroglyphic literature. Already in antiquity Greek authors debated this question. In the fifth century before the present era Herodotos gave a detailed account of their construction, but no indication of their purpose.⁽³⁾

Not even a tale concerning the purpose of the pyramids came down from the time they were constructed. “for some reason or other, the builders of the pyramids concealed the object of these structures, and this so successfully that not even a tradition has reached us which purports to have been handed down from the epoch of the pyramids’ construction.”⁽⁴⁾

Greek and Roman historians proposed some explanations, but they were confessedly only hypothetical, like those advanced by historians of later times. Diodorus of Sicily⁽⁵⁾ and Strabo⁽⁶⁾ thought that the pyramids were tombs, but this was not the generally accepted theory. Pliny wrote: “It is asserted by most persons that the only motive for constructing them was either a determination [by the kings] not to leave their treasures to their successors . . . or to prevent the lower classes from being unoccupied.”⁽⁷⁾

Strabo wrote that the entrance to the Great Pyramid was covered “by a moveable stone, and when this is raised there is a sloping passage to the vault.”⁽⁸⁾ Pliny thought that there was a well under the Pyramid communicating with the Nile.⁽⁹⁾

When the Great Pyramid was entered by Caliph Al Mamoun in the ninth century, making the first break through the masonry of the pyramid since its original closing, he found there no mummy or bones. The entrance, high over the plain of Giza, was concealed. From the entrance a corridor leads downwards and then divides itself in two: one route leads into the rock under the pyramid where a little unfinished grotto chamber is found. The ascending passage leads to the “great gallery” or the larger section of the ascending passage with steeply mounting floor, and to two chambers. One carries the name of King’s Chamber (the upper one of the two), the other of the Queen’s Chamber; these names are given by the archaeologists. The pyramid itself bears no inscription,⁽¹⁰⁾ except of the name of Khufu (Cheops), painted by the quarry workers on a slab of the ceiling of the King’s Chamber, not visible to a visitor of the Chamber.

Caliph Al-Mamoun found in the King’s Chamber a stone box, not a regular sarcophagus, but rude, unfinished, without a lid and without an inscription. “He also found no trace whatever of burial, offerings, pottery, etc., and one can presume the chamber to have been empty but for the sarcophagus itself.”⁽¹¹⁾

King Khufu was not buried in the Pyramid. He built a cemetery next to it, and there he entombed his mother and his four queens; his sons and daughters were also buried there. The tomb of his mother was found undisturbed, well-concealed:⁽¹²⁾ “Such care in concealment by Khufu of his mother’s tomb would suggest that his own tomb will scarcely jump to the eye.”⁽¹³⁾

Khufu concealed very carefully his own place of burial: “That there was a problem connected with Khufu’s burial was known in later Egyptian times . . . and the question was then put into writing as to who knew the places of burial of Im-hetep, Seneferu and Khufu, as though it were an oft-repeated query.”⁽¹⁴⁾ It shows that the Egyptians did not think of the pyramids as tombs. It is possible that Khufu’s sarcophagus will be found in the royal cemetery which he built and where he concealed the tombs of his beloved ones.⁽¹⁵⁾ But wherever it may be, the Great Pyramid was built for some other purpose than interment.

As the purpose for which the pyramids were built is by no means established, various other uses have been suggested. In the sixth century, before the Great Pyramid was entered, Gregory of Tours (540-594) thought that Pyramids were granaries built by the biblical Joseph in which he kept the harvest of the fat years.⁽¹⁶⁾ Others in modern times thought that they were built as defences against the sands of the Great Desert,⁽¹⁷⁾ and many thought that they were built to serve as astronomical observatories.⁽¹⁸⁾

If they were built for astronomical purposes only, why were they built in groups, when an unobtruded horizon requires a single elevation? And why were smaller pyramids built next to the large ones in space and after them in time? And if they were granaries, why is the space so small inside such large constructions?

But if the pyramids were intended as tombs, why were the kings who built them not entombed in them? And why was it that the kings of the great dynasties in later times, who built the imposing temples and palaces of Thebes and Memphis, did not care to build pyramid-tombs for themselves?

Some even supposed that the kings who built them did not know their purpose, which is a rather strange solution. “Cheops . . . did not intend the Great Pyramid to serve as a tomb; nor indeed, if we are to believe the reasonable deductions which are based upon historical accounts, did he [Cheops] or his Egyptian subjects know what purpose this immense edifice was intended to serve,” wrote an author.⁽¹⁹⁾ To which another author remarked: “We can picture Khufu and his officials meeting with furrowed brows, and the king saying to them, ‘What on earth am I building this thing for?’”⁽²⁰⁾

As a rational purpose was not discovered, a mystical one was suggested. A great effort was made by several inquirers to find geometrical laws symbolized or perpetuated by the pyramids. The ancient Egyptians were suspected of knowing some secrets of nature and of incorporating them into the geometrical structure of the pyramids. Even the distance from the Earth to the Sun was shown to be a clear multiple of the so-called pyramid-inch.⁽²¹⁾ Also future events and, strangely enough, concerning mainly the British Commonwealth of the Victorian and post-Victorian days were found predicted by the geometrical figures of the pyramids. Each new generation had its own pyramid maniacs. The desperation of the rational school of scholars to discover the end for which the pyramids, the greatest structures of antiquity, were built, is expressed by Petrie: “It is almost useless to speculate about their purpose.”⁽²²⁾

I shall here join the list of those who tried to solve the mystery of the pyramids and point to a purpose which, as far as I know, was never discussed, but which seems to me to be the true one. [\(23\)](#)

After the great catastrophes of the earlier ages the kings of Egypt, conscious of the possibility of their repetition, erected the pyramids as huge shelters for themselves and the most important persons of their household.

The pyramids as shelters have large bases and enormously thick walls to protect the chambers inside from hurricanes, avalanches of meteorites or brimstone, poisonous gases, [\(24\)](#) and inundation. The pyramidal form is statically the strongest possible structure for opposing a vertically directed impact from above (meteorites), as well as lateral pressure (of floods and hurricanes). The entrance is situated not on the level of the ground but high above it; the water of a flood forty feet high would not penetrate the pyramid of Cheops. But if the water were to rise as high as the entrance and force the door, it would not reach the chambers, which were situated at a higher level. The outer surface of the pyramid was covered with smooth stones, and was not in steps as it has been since the stone facade was removed and used for other purposes during the later ages. This smooth surface was the best protection against a shower of bolides and served also to protect against the penetration of water. The entrance door was a swivel construction. [\(25\)](#)

Two narrow channels inclined at 31 degrees (northern) and 45 degrees (southern) to the horizon served for passage of air to the King's Chamber. They could be closed off at their lower end. No large bolide could enter these channels. They were also placed in such a manner that from the inside of the pyramid two standard points of the sky could be observed; [\(26\)](#) but if the pyramids were tombs, no observation of the sky would take place there, and if they were observatories, two small fixed openings would enable the observer to see only very limited squares on two sides of the sky. But by observing two points on the sky one could judge meteorological conditions on the outside and also, in the case of a clear sky, whether the four directions remained unchanged.

Two other narrow channels, similar to the first ones, connect the lower chamber (Queen's Chamber) of the Great Pyramid with the outside, but the last five inches of these channels were not opened, and a stone plate separated the chamber from the channels. From this and other evidences it was concluded that the work of construction had been interrupted and that there had been "an alteration in the original plan"; [\(27\)](#) but it would appear that the second pair of the ventilating shafts was purposely not tunneled into the lower chamber: this precaution is understandable if we realize the purpose of the whole construction.

The constructors of the pyramids had very much in mind the possible effects of earthquakes, and they solved their problem very satisfactorily. The sides of the Great Pyramid, which are built at an angle of 51 degrees 51 minutes to the horizon, can hardly have their stones moved from the outside; a movement to the inside is barred insofar as the pyramid is filled from the apex to the base with stones, the only exception being the chambers and the corridor to them, including the Grand Gallery. The King's Chamber in the Cheops pyramid has five superimposed ceilings of great blocks of granite; the rest of the pyramid is built of limestone. Should one granite roof give way, the next one would absorb the shock. [\(28\)](#)

The tremendous shocks experienced by the entire globe, when the orbit changed and the poles were displaced in the cataclysms subsequent to the building of the pyramids, did not ruin the pyramids; though the granite roof-blocks over the chamber show the results of enormous twisting,⁽²⁹⁾ they did not collapse; also the channels leading to the chambers and the narrower ones directed toward the sky, are not obtruded. Earthquakes like the one in the first century during which 30,000 people perished in Egypt could do no harm to the pyramids.

The real secret of the pyramids was this stability against earthquakes. No other edifice of the Old or Middle Kingdom escaped destruction.

The huge Sphinx close to the pyramids of Gizeh is a likeness of Harmachis,⁽³⁰⁾ a form of Horus: that is, the planet-god Jupiter. His figure in front of the pyramids must have served as a charm against any harm he might feel inclined to do to the refugees inside.

Did the pyramids serve well the purpose they were built for? The pyramid age belongs to the Old Kingdom. During the Middle Kingdom only a few and very insignificant pyramids were erected. Already the cataclysm which terminated the Old Kingdom proved that the pyramids, though responding to many of the tasks of a shelter, were inadequate in some respect. The catastrophe during which the Israelites left Egypt was the same which ended the Middle Kingdom. In the inscription on the shrine from el-Arish we do not find that the royal family went to seek refuge outside the palace: "nobody left the palace during the nine days of the tempest."⁽³¹⁾ Also the biblical story tells of casualties in the family of the king and his palace when the earth was convulsed and "the houses were smitten." Apparently at that time the futility of the shelters had become known. This implies that during the cataclysm which put an end to the Old Kingdom the pyramids were recognized as potentially fatal traps.

The pyramids were not sufficiently protected against electrical discharges. Lightning is attracted by the vertex of the pyramid. The builders of the pyramids knew of course the fact that tall buildings attract lightning; they must have also known that lightning is abundant in the storms that accompany and follow cataclysms. It seems to me that the ancient way to protect a building from lightning must have been by building thick walls and erecting pillars around the buildings. Electrical currents travel the periphery of a cable: the enormously thick walls protect the inner chambers from electrical discharges. But this protection could be proven as sufficient only during ordinary thunderstorms. When at the close of the Old Kingdom interplanetary contacts caused tremendous discharges, some of the pyramids became electrocuting chambers.⁽³²⁾ The fields of saltpeter (potassium nitrate) close to the pyramids show where the bolts fell; some of the pyramids drew to themselves ramifications of the great bolt.

References

1. E. B. Smith, *Egyptian Architecture as Cultural Expression* (New York, 1938), p. 96. [The figures are those of I. E. S. Edwards, (*The Pyramids of Egypt*, revised ed. [London, 1961], pp. 116, 118, 282) who uses the survey of J. H. Cole (Cairo, 1925).]
2. F. Petrie
3. Herodotus I. 124.

4. R. A. Proctor, *The Great Pyramid* (London, 1883), p. 1.
5. *The Library* I. 63. Cf. F. W. von Bissing, *Der Bericht des Diodor ueber die Pyramiden* (Berlin, 1901).
6. *Geography* 17. 1. 33.
7. *Natural History* 36. 16. [Cf. the not entirely dissimilar theory propounded by Kurt Mendelssohn, who suggests the principal motive for building the pyramids lay in “the desire to transform an agricultural village community into a centralized form of society.” (“Pyramid Technology,” *Bibliotheca Orientalis* 30 [1973], pp. 349-355). Mendelssohn’s technical discussion of of great value, independent of his other conclusions. Cf. his *Riddle of the Pyramids* (London, 1974).]
8. Strabo, *Geography* 17. 1. 33. F. Petrie in his *The Pyramids of Egypt* (London, 1883), p. 168 interpreted Strabo’s statement as referring to a swivel door and, though any remains of it would have disappeared with the removal of the Pyramid’s outer casing, sockets, which may have served to accomodate such a moveable entrance block, were found at both the Bent Pyramid and at the Pyramid of Meidum. Cf. the discussion by Edwards in *The Pyramids of Egypt*, pp. 130f. For an attempt at a reconstruction of the swivel door, see P. Tompkins, *Secrets of the Great Pyramid* (New York, 1971), p. 3.
9. *Natural History*
10. [The outer casing of the Great Pyramid, long since removed, apparently did bear an inscription, still visible in Herodotos’ time. Herodotos’ report of its meaning, however, indicates that he was deliberately misled by his guides.]
11. G. A. Reisner and W. S. Smith, *A History of the Giza Necropolis*, Vol. II., *The Tomb of Hetep-heres, the Mother of Cheops* (Cambridge, Mass., 1955).
12. N. Wheeler, “Pyramids and Their Purpose,” *Antiquity* IX (1935), p. 179.
13. *Ibid.*, p. 188.
14. *Ibid.*, p. 182.
15. *Loc. cit.*
16. *Historia Francorum* I. 10. This legend was already known to Julius Honorius more than a century earlier.
17. J. G. V. Fialin de Persigny, *De la destination et utilite permanente des pyramides d’Egypte et de la Nubie contre les irruptions sabloneuses du desert* (Paris, 1845).
18. See for example R. A. Proctor, *The Great Pyramid, Observatory, Tomb, Temple* (London, 1883); cf. Tompkins, *Secrets of the Great Pyramid*.
19. Morton Edgar, *The Great Pyramid: Its Spiritual Symbolism* (Glasgow, 1924).
20. Wheeler, “Pyramids and Their Purpose,” p. 300.
21. Piazzi Smyth, the Royal Astronomer of Scotland, calculated the perimeter of the Great Pyramid as equal to 36,562 pyramid inches.
22. Fl. Petrie, *A History of Egypt*, Vol. I (London, 1907), p. 41.
23. As Velikovsky later found out, Comys Beaumont had made a similar suggestion in a book published in 1936.
24. [Prof. Lynn Rose pointed out to Velikovsky that the ventilating shafts draw in air from the outside, and therefore atmospheric pollution would eventually penetrate inside. It is not unthinkable that filters made of perishable materials were used in the air vents.]
25. Cf. above, note 8.

26. Virginia Trimble, "Astronomical Investigation concerning the so-called Air Shafts of Cheops' Pyramid," *Mitteilungen der deutschen Akademie, Berlin*, Vol. 10 (1964), pp. 183-187.
27. Edwards, *The Pyramids of Egypt*, p. 123.
28. [Edwards wandered at the purpose of the ceilings: "Whether such extreme precautions were required by the character of the building may be debatable; they hav, however, been justified by subsequent events." *The Pyramids of Egypt*, p. 126.]
29. Earthquakes have been "extremely severe in wrenching, as all the deep beams of granite over the King's chamber in the Great Pyramid are snapped through at the south end, or else dragged out in the upper chambers. The whole roof hangs now by merely catching contact. . . ." F. Petrie, *Egyptian Architecture* (London, 1938), p. 67.
30. [So, at least, it was regarded by Thutmose IV of the Eighteenth Dynasty a thousand years later.]
31. G. Goyon, "Les travaux de Chou et les tribulations de Geb d'apres le Naos 2248 d'Ismailia," *Kemi* (1936).
32. [Prof. Lynn Rose suggested to Dr. Velikovsky that it was not necessary for the entire charge to have been conducted through the stone. If the ventilating shafts contained any water, or were wet, the charge could have moved directly to the chambers.]

The Pitfalls of Radiocarbon Dating

Offering in 1952 his new radiocarbon method for calculating the age of organic material (the time interval since the plant or the animal died), W. F. Libby clearly saw the limitations of the method and the conditions under which his theoretical figures would be valid:

A. Of the three reservoirs of radiocarbon on earth—the atmosphere, the biosphere, and the hydrosphere, the richest is the last—the oceans with the seas. The correctness of the method depends greatly on the condition that in the last 40 or 50 thousand years the quantity of water in the hydrosphere (and carbon diluted in it) has not substantially changed. :

B. The method depends also on the condition that during the same period of time the influx of cosmic rays or energy particles coming from the stars and the sun has not suffered substantial variations.

To check on the method before applying it on various historical and paleontological material, Libby chose material of Egyptian archaeology, under the assumption that no other historical material from over 2,000 years ago is so secure as to its absolute dating. When objects of the Old Kingdom and Middle Kingdom of Egypt yielded carbon dates that appeared roughly comparable with the historical dates, Libby made his method known.

With initial large margin of error and anything that did not square with expectation, judged as "contaminated," the method appeared to work and was hailed as completely reliable—just as the atomic clock is reliable—and this nobody doubted.

But as the method was refined, it started to show rather regular anomalies. First, it was noticed that, when radiocarbon dated, wood grown in the 20th century appears more ancient than wood grown in the 19th century. Suess explained the phenomenon by the fact that the increased industrial use of fossil carbon in coal and in oil changed the ratio between the dead carbon C12 and the C14 (radiocarbon) in the atmosphere and therefore also in the biosphere. In centuries to come a body of a man or animal who lived and died in the 20th century would appear paradoxically of greater age since death than the body of a man or animal of the 19th century, and if the process of industrial use of fossil, therefore dead, carbon continues to increase, as it is expected will be the case, the paradox will continue into the forthcoming centuries.

As years passed and more tests were made (soon by laboratories counted in scores), a rather consistent deviation between radiocarbon age and historical age started to receive the attention of researchers. The radiocarbon dates diverge from the historical dates by several hundred years (often 500 to 700), and, interestingly, in the Egyptian samples more so than in samples from most other ancient civilizations. This led Libby to write in 1963: “The data [in the Table] are separated into two groups—Egyptian and non-Egyptian. This separation was made because the whole Egyptian chronology is interlocking and subject to possible systematic errors . . .” Also, “Egyptian historical dates beyond 4000 years ago may be somewhat too old, perhaps 5 centuries too old at 5000 years ago. . .” (*Science*, 140, 278).

The combined efforts of several researchers led them to believe that *one* of the conditions stipulated by Libby for a flawless functioning of his method was not historically sustained; it is claimed that the influx of cosmic rays varied with time. Yet, since this influx comes from many sources, the sun being only one of them, sunspot activity could be related to the variation only in a very limited degree. Therefore the claim was made that the magnetosphere around the earth, discovered in 1958, suffered occasional weakening, thus allowing more cosmic rays to pass it and to hit the nitrogen atoms in the upper atmosphere, changing them to radiocarbon. It was further claimed that the magnetic field of the earth might have reversed its polarity in the last 40 thousand years, a phenomenon known to have happened in geological epochs. If such reversals were not instantaneous but required thousands of years, the atmosphere during that time would not be shielded from cosmic rays and substantially more of them would reach it. However, the scientific literature of the last few decades did not contain any reference to a reversal observed on human artifacts like pottery— though a paper by Manley in 1949 (*Science News*, Penguin Publication) told of the work of G. Folghereiter done at the turn of the century on Attic and Etruscan pottery: he found that the polarity was reversed in the eighth century before the present, era.

To determine the extent of correction necessary to render the radiocarbon method reliable, dendrochronologists devised a plan to control the radiocarbon dates by building a chronology of tree rings of the white bristlecone pine, the longest living tree. The method caught the fancy of the radiocarbon researchers. However, three or four rings formed in one year is not uncommon, especially if the tree grows on a slope, with the ground several times in a year turning wet and dry because of rapid outflow of water (Glueck *et al.*, *Botanical Review*, 7, 649-713; and 21, 245-365). And certainly the building of tree “ladders,” or carrying on the count from one tree to another may cause erroneous conclusions. One and the same year may be dry in South California and wet in the northern part of the state.

Now let us review in the light of research in cosmic catastrophism the correctives that, in our view, need to be introduced into the method. We must also evaluate the basic reliance on Egyptian chronology that, as we shall see, needs to be discontinued.

Speaking of my research as far as it affects the radiocarbon dating method, I would like to separate the finds concerning natural events (*Worlds in Collision, Earth in Upheaval*) from finds concerning the true chronology of Egypt and of the ancient World in general (*Ages in Chaos*).

Libby's discoveries, published in 1952, gave immediate support and even vindication to three independent conclusions of my research into natural events of the past. In *Worlds in Collision* I claimed that the time since the last glaciation needs to be drastically shortened: the figure considered valid in 1950, the year *Worlds in Collision* was published, was still Lyell's of 100 years earlier, namely 35 thousand years. Libby found (and I quote Frederick Johnson, who participated in his volume, *Radiocarbon Dating*) that "the advance of the ice occurred about 11,000 years ago . . . previously this maximum advance had been assumed to date from about 25,000 years ago," actually 35,000 if one looks up the literature of the time. A few years later Rubin and Suess of the Geological Survey of the U. S. A. found that, as I also claimed, another advance of ice took place only 3,500 years ago.

The second confirmation came concerning the age of the petroleum. In 1950 in the *American Journal of Science* (the present publisher of *Radiocarbon*) a review was published by its editor, Yale geologist Longwell, with a rejection of my entire theory on the basis that oil is never found in Recent formations, being itself many millions of years old. A similar criticism appeared in the article by astronomer Edmondson, who cited the Indiana University geologist, J. B. Patton. One of the early radiocarbon datings of petroleum and petroleum-bearing formation on and off-shore in the Gulf area was by P. V. Smith of Esso Research Laboratory. The "surprising" fact was that oil was found there in Recent sediment and must have been deposited *during* the last 9,200 years." (Emphasis added.)

Actually I asked Libby whether he would see to it that petroleum should be subjected to tests and it was he who drew my attention to the work done by Smith.

A third confirmation also concerned one of the important conclusions of *Worlds in Collision*. To the above-mentioned article by Longwell a Mexicologist also contributed. The Mexicologist, Professor George Kubler of Yale, stressed that certain traditions contained in Mesoamerican heritage were referred by me to events of the pre-Christian era. Kubler insisted that this heritage could not date from the 8th to 4th pre-Christian centuries, but rather was generated in the 4th to 8th century of the Christian era. But in December, 1956, the National Geographical Society in conjunction with the Smithsonian Institution made it known that excavations at LaVenta proved by radiocarbon that the classical period of the Meso-American civilizations (Olmec, Toltec, Maya, etc.) needs to be pushed back by a full thousand years and ascribed not to the 4th to 8th centuries of the Christian era but to the 8th to 4th centuries before that era.

With these three confirmations (time the Ice Age ended, time petroleum was deposited, time of the classical period of the Meso-American civilizations), my *Worlds in Collision* received very substantial confirmations.

But I could not and should not satisfy myself with this support without repaying by demonstrating where the difficulties and pitfalls of the method are hidden.

In the cataclysmic events reconstructed in *Worlds in Collision* and also those that preceded the fall of the Middle Kingdom in Egypt, various effects could not but vitiate the radiocarbon performance, some of these effects tending to make organic life appear older than its actual age, and others making it appear more recent.

Bursts of cosmic rays and of electrical discharges on an interplanetary scale would make organic-life surviving the catastrophes much richer in radiocarbon and therefore, when carbon dated, that organic matter would appear much closer to our time than actually true. But if the invasion of the terrestrial atmosphere by “dead” (non-radioactive) carbon from volcanic eruptions, from meteoric dust, from burning oil and coal and centuries-old forests, predominated the picture, then the changed balance of radioactive and of radio-inert carbon would make everything in the decades following the event appear much older. Thus, it is the competition of these factors that would decide the issue in each separate case. My own impression is that in the catastrophes of the eighth century and beginning of the seventh, the second phenomenon was by far more dominant. For the events of the middle of the fifteenth century before the present era, both phenomena were very expressed, but the burning petroleum added to the exhaust of all volcanoes burning simultaneously, added also to the ash of the proto-planet in near-collision must have outweighed the greatly increased advent of cosmic rays (which resulted also from interplanetary discharges). But 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, and correspondingly, these cosmic rays must have also changed the radiocarbon clock and certainly made ensuing life, subjected today to radiocarbon tests, appear much more recent than historically true. I am not in a position to point to the century or even millennium when the Universal Deluge took place, but it must have happened between five and ten thousand years ago, probably closer to the second figure.

The Deluge also increased the water basin or hydrosphere on earth, and if we can believe some indications, the Atlantic Ocean (called the Sea of Cronus by the ancients) originated in part during the Deluge. It is quite possible that the volume of water was more than doubled on earth in this one cataclysm.

Thus both conditions stipulated by Libby (that is, constant rate of influx of cosmic rays, and constant quantity of water in the hydrosphere) have been violated, but following the uniformitarian doctrine these violations have been discarded from consideration. We are left with a method in which the researchers have failed to take heed of the warnings expressed by its inventor.

The sustained effort of radiocarbon researchers to find support in Egyptian chronology, and their reliance on that chronology, is fundamentally a mistake. As I tried to show in *Ages in Chaos*, the Egyptian chronology is basically wrong. I drew the attention of Libby to this fact in my letter of October 7, 1953, and I sent him a copy of *Ages in Chaos*; his answer was that he is not at all learned in ancient history; thus he continued to rely on what is unreliable. He cannot be blamed for it because in historical circles the conventional chronology is still the accepted dating in

absolute and in comparative sense—the latter meaning that Mycenaean or Minoan civilizations that have no absolute chronology of their own, by relations with the Egyptian past can be dated accordingly; but this means that if the Egyptian datings are wrong, the Minoan and Mycenaean are wrong, too.

Here I shall give a few figures to visualize the extent of the errors in the Egyptian chronology: The end of the Middle Kingdom of Egypt, -1780 in accepted chronology, actually took place ca. -1450—a difference of over 200 years. The following Hyksos period endured, not 100 years, but over 400 years in close agreement with the old Egyptian (Manetho) and Hebrew (*Ages in Chaos*, I, Ch. 2) sources. The beginning of the 18th Dynasty (New Kingdom) falls not in -1580 but in ca. -1050—over 500 years difference. Thutmose III belongs to the second part of the tenth century, not to the first part of the fifteenth. Akhnaton belongs not in the first half of the fourteenth but in the middle of the ninth century. Thus, as I showed in detail in vol. I of *Ages in Chaos*, there exists an error of ca. 540 years through the entire period covered by the 18th Dynasty.

Even more important is that the dynasty of Seti the Great and Ramses II, termed the Nineteenth Dynasty, did not follow the Eighteenth; the Libyan (Dynasties 22nd to 23rd) and the Ethiopian (Dynasties 24th to 25th) periods intervened. The Libyan Dynasty of Sosenks and Osorkons reigned for 100 years only, instead of over 200; the Ethiopian Dynasty, however, is the only one that in the conventionally written history of Egypt, maintains its proper place. During the Nineteenth Dynasty the error of the accepted Egyptian chronology reached the high figure of over 700 years; and together with it the time of the contemporaneous rulers of the so-called Hittite Empire is equally misplaced by over 700 years. [\(1\)](#) Finally the Twentieth Dynasty—that of Ramses III and his adversaries—*Peoples of the Sea*—needs to be brought closer to our time by a full 800 years and placed just a few decades before Alexander of Macedon. The Twenty-first Dynasty began under the Persian kings, continued contemporaneous with the Twentieth—its rulers reigned in the Libyan Desert oases — and lasted until the second Ptolemy. (I take this opportunity to give these figures because, instead of a second volume of *Ages in Chaos* that should have followed closely the first that appeared in 1952, the entire work will consist of five presently planned volumes.)

Now if the historical basis of radiocarbon studies fails so completely, many conclusions drawn and much data left unpublished require reconsideration. From some correspondence that originated at the Metropolitan Museum of Art, I have concluded that when Libby first asked for specimens, he received not only those dating from the Old and Middle Kingdoms, but also from the New Kingdom—but nothing ever was published of those early tries on New Kingdom specimens. A similar situation concerns more recently tested short-living organic material from the tomb of Tutankhamen.

After many efforts (from 1952 to 1963) to have the New Kingdom of Egypt tested in a systematic way I succeeded in having three little pieces of wood from the tomb of Tutankhamen handed over by the Laboratory Director of the Cairo Museum to Mrs. Ilse Fuhr of Munich, who was directed by me to send them to Dr. Elizabeth Ralph of the University of Pennsylvania Laboratory. Two of the pieces were from the comparatively short-lived thorn plant, *Spina Christi*, and one from the long-living Cedar of Lebanon. The three small pieces were processed together, since a test requires ca. 30 grams (1 ounce) of material. The result was -1120 ± 52 (or

following Libby's half life of C14, -1030 ± 50). Now the accepted chronology has Tutankhamen dying in -1350; my reconstruction has him entombed in ca. -830. According to Dr. Iskander Hanna of the Cairo Museum, the wood was from 30 to 50 years dried before being used for funerary equipment. The Lebanon Cedar would not have been cut as sapling—the tree reaches thousands of years of age. The sample could have been from inner rings of a trunk. Dr. E. Ralph confirmed to me on March 5, 1964, that tree rings, when carbon dated, show the date of their formation, not of the year the tree was felled. I wrote to her on March 2, 1964, suggesting that if short-living material (like seeds, papyrus, linen or cotton) should be subjected to tests from the tomb of Tutankhamen, most probably the result will show “ca. -840.”⁽²⁾

In spring, 1971, or seven years later, the British Museum processed palm kernels and mat reed from the tomb of Tutankhamen. The result, according to Dr. Edwards, Curator of the Egyptian Department of the British Museum, was -899 and -846 respectively.⁽³⁾ These results were *never* published.

These cases make me appeal that *all* tests, irrespective of how much the results disagree with the accepted chronological data, should be made public. I believe also that the curiosity of the British Museum Laboratory officials should have induced them to ask for additional material from the Tutankhamen tomb instead of discontinuing the quest on the assumption that tested material was contaminated. The tomb of Tutankhamen had not been opened since soon after the entombment. It is dry—water did not percolate through its roof or walls.

Another way of dulling the sharp disagreements between the accepted chronology and the results of the tests is described by my librarian assistant, Israel Isaacson.⁽⁴⁾ In the case described nothing was purposely hidden but two different approaches were applied.

In one and the same year the University of Pennsylvania Laboratory tested wood from a royal tomb in Gordion, capital of the short-lived Phrygian Kingdom in Asia Minor, and from the palace of Nestor in Pylos, in S.W. Greece. In Gordion the result was -1100; in Pylos -1200. However, according to the accepted chronology, the difference should have been nearly 500 years—1200 for Pylos of the end of Mycenaean age was well acceptable, but -1100 for Gordion was not—the date should have been closer to -700. Dr. Ralph came up with the solution for Gordion. The beams from the tomb were squared and the inner rings could easily be four to five hundred years old when the tree was felled. But in Pylos, the description of the tested wood indicates that these were also squared beams—yet the corrective was not applied—this “because -1200 was the anticipated figure. However, as I try to show in detail in the planned [The Dark Age of Greece](#), a separate volume of *Ages in Chaos* series, there were never five centuries of Dark Age between the Mycenaean Age and the historical (Ionic) Age of Greece. The Pylos beams are -800, the Gordion beams date from -700,

Now the question arises, how can the radiocarbon method be used for deciding between the conventional and the revised chronologies. Many a reader of Volume I of *Ages in Chaos*, and a few readers to whom I made available the sequel volumes in typescript would agree that the reconstruction is built with such profusion of contemporaneities and linked episodes that the credence given to the conventional history to serve as a control over carbon datings should be now transferred to the reconstruction and let it control, not be controlled by, carbon tests. Yet, for

less convinced audiences, the method can serve in two manners. For the period before -500, only comparative tests can serve profitably for the solution of the chronological problems: King Saul was a contemporary of kings Kamose and Amose—and lived not 540 years after them; similarly. King Solomon was a contemporary of Queen Hatshepsut, and Thutmose III of Rehoboam of Judea and Jeroboam of the Ten Tribes; and Amenhotep II of King Asa; Amenhotep III of Omri and Ahab; Akhnaton also of Ahab of Samaria and Jehoshaphat of Jerusalem, and of Shalmaneser III of Assyria. Therefore if we can compare material from two areas contemporaneous in my reconstruction but separated by 540 years in the conventionally written history, we may receive the carbon answer as to which of the two time tables is correct and which is wrong. The ivory of the Shalmaneser III fort near Nimrud and the ivory of Tutankhamen's tomb must yield very close dates.

For the period separated by 200 years from the last cosmic upheaval involving our planet (-687), say for after -500, we may apply the tests without any need to compare contemporaneous samples. Thus the 20th and 21st Dynasties, which in conventional histories occupy the 12th to the middle of the 10th century but in my reconstruction from -400 to -340 (20th) and ca. -450 to -280 (21st), are perfect choices for carbon tests.

Now we see that not only were the warning signals that Libby offered with his method disregarded, but also an unearned reliance on the accepted version of ancient history has caused much stumbling in the dark, more and more tests of diminished value, and a maze of findings, with many undisclosed results of tests, wrong deductions and much exasperation that mark the first 20 years of application of Libby's most imaginative method.

References

1. In this connection, the figure for the "Hittite" fortress, Alishar III, 800 years later than the conventional chronology has it (*Radiocarbon Dating*, 1952), is very nearly true.
2. See the correspondence file named [ASH](#).
3. Ibid.
4. ["Carbon 14 Dates and Velikovsky's Revision of Ancient History: Samples from Pylos and Gordion" in *Pensée, Immanuel Velikovsky Reconsidered IV* (Spring-Summer 1973), pp. 26-32.]

The Testimony of Radiocarbon Dating

In 1952 Willard F. Libby, then of the University of Chicago, published his *Radiocarbon Dating*. It was about half a century after the discovery of cosmic rays that he had come upon the idea, and also developed a method, of using the radioactivity resulting from cosmic rays for the purpose of dating organic remains. Libby's discoveries gave immediate support and even vindication to three independent conclusions of my research into natural events of the past, as described in *Worlds in Collision* and *Earth in Upheaval*—the time the Ice Age ended, the time petroleum was deposited, and the time of the classical period of Meso-american civilization.⁽¹⁾

However, the main interest for me in radiocarbon tests was in checking on historical dates of the ancient East, of the period covered in *Ages in Chaos*. This method was as if created to sit in judgment in the litigation between the accepted and revised time tables.

In *Ages in Chaos* we have seen that, with the fall of the Middle Kingdom and the Exodus synchronized, events in the histories of the peoples of the ancient world coincide all along the centuries.

For a space of over one thousand years records of Egyptian history have been compared with the records of the Hebrews, Assyrians, Chaldeans, and finally with those of the Greeks, with a resulting correspondence which denotes synchronism.

In Volume I of *Ages in Chaos* it was shown in great detail why Akhnaton of the Eighteenth Dynasty must be placed in the latter part of the ninth century. If Akhnaton flourished in -840 and not in -1380, the ceramics from Mycenae found in the palace of Akhnaton are younger by five or six hundred years than they are presumed to be, and the Late Mycenaean period would accordingly move forward by about half a thousand years on the scale of time.

I wished to have radiocarbon tests that would clarify the issue. I did not need the test in order to strengthen my view on the age of the Eighteenth and the following dynasties, for I considered the evidence that I had presented in *Ages in Chaos* to be strong enough to carry the weight of the revised scheme. But in view of the novelty of my contentions I realized that a confirmation from a physical method would be of great import for the acceptance of my work.

The efforts that I spent in order to achieve radiocarbon examination of any suitable object from the New Kingdom in Egypt were many and persistent. Correspondence between the British Museum and myself did not produce the desired results, though I was politely answered by the departments of Egyptian, of Assyro-Babylonian and of Greek antiquities. The Museum has a radiocarbon laboratory of its own, and therefore the task could be simplified; but the Museum claimed other preferential tasks. At one time I secured the help of the late Professor Robert H. Pfeiffer, Director of the Semitic Museum of Harvard University in an effort to obtain some organic relics from the Metropolitan Museum of Art, but to no avail. Even Albert Einstein's plea, relayed to the Museum by his secretary upon his death, to have my work of reconstruction of ancient history tested by radiocarbon, went unheeded.

The usual argument explaining the refusal of cooperation was the assertion that the Egyptian chronology of the New Kingdom is known to such exactness that no carbon tests are needed; moreover the tests were claimed to have a margin of error far greater than the incertitude of the historians as to New Kingdom dates.

Since the chronology of ancient Egypt is quite closely fixed by the astronomical evidence from the Eleventh Dynasty onward, in part, to the nearest year, radiocarbon, with its substantial margin of error, could hardly add anything to our knowledge of the chronology of the New Kingdom. . . .

Thus wrote a member of the faculty of the University of California in Los Angeles in response to an inquiry and a plea of a reader of mine.^[2] Similarly wrote an assistant curator of the British Museum:

There has been so far as I am aware no radiocarbon dating of objects from the New Kingdom. I do not think that such a test, given the necessary measure of tolerance which must be allowed, is likely at the moment to give a chronology for the New Kingdom which is any more certain than a chronology deduced by historical methods.

Another reader of mine wrote to the Director of the Metropolitan Museum and read in the reply he received:

In the light of the very complete knowledge we have on this tightly dated and closely recorded period, it would serve no useful purpose to have this done. . . .

It almost looked as if there were a concerted opposition to the submission of any object dating from the New Kingdom to a radiocarbon test. I have even employed the argument, for instance at my coming to see Dr. William Hayes, the late Director of the Egyptological Department of the Metropolitan Museum of Art: Let the test be made in order to disprove me. My book *Ages in Chaos* was read by hundreds of thousands of readers and found many followers—why not show me wrong if this is so easy? But such arguments were not effective either.

During the ten years after the publication of Libby's *Radiocarbon Dating* in 1952, which was also the year *Ages in Chaos* was published, the great period of history in accepted Egyptian chronology from -1580, the beginning of the New Kingdom (or rather from -1680, the fall of the Middle Kingdom) to the time of the Ptolemies, a period of ca. 1250 years in the accepted chronology, a tremendous stretch of time, was left out of radiocarbon testing programs. My efforts, spread over ten years and more, were directed to many museums and places of learning, but they were all in vain. I have recorded and filed the exchanges that took place between my supporters, myself, and those in whose power it was to have the tests made. The museums showed no willingness to cooperate.

For a while it looked a little more hopeful when my friend, Claude F. A. Schaeffer, the excavator of Ras Shamra (Ugarit), acceded to my urging and sent to Dr. Elizabeth Ralph of Pennsylvania University a piece of wood found in the neighborhood of another object which he dated to the reign of Merneptah of the Nineteenth Dynasty. However, the sample became contaminated in the laboratory. From a French laboratory, where a control piece of the same find was sent, no answer was forthcoming, and the circumstances of the find gave no assurance—had either laboratory succeeded in obtaining a result—that the piece of wood from Ras Shamra really dated from the reign of Merneptah in Egypt.

It looked as if the only result of all my efforts would be a stately volume of letters and memoranda entitled *ASH*. It is to ash that organic specimens must be converted to make the test. It was ash also in the sense that many efforts ended in nothing.

In the meantime, certain systematic disagreement in datings by the radio carbon method with the conventional historical time tables was observed all over the world. But above and beyond this generally observed phenomenon, the Egyptian datings stood unreconciled with the results of the carbon tests. This made quite a few Egyptologists express their disbelief in the carbon method and the physicists even bolder in assuming that the Egyptologists were victims of some undefined systematic error. The perplexing Egyptian dates were discussed at the conference of the workers in radiocarbon that took place in Cambridge July 1962, and two laboratories, of Groeningen in Holland and of the University of Pennsylvania, were entrusted with the task of clarifying the issue. At that time the New Kingdom was apparently not yet investigated on radiocarbon dates, but if it was investigated, the results were never made known.

A few years later the radiocarbon laboratory of the University of Rome published a survey of tests made by various laboratories. Dates of 54 archaeological and historical samples from Egypt were published up to the summer of 1964. Some of these have been repeatedly dated both by the same lab, and as cross-check samples.⁽³⁾

These measurements have shown that most Egyptian samples give a C-14 age which is less than expected historical age often based on astronomical evidences. No satisfactory physical or archaeological explanation of this fact yet found, except a physical attempt by Damon and Long.⁽⁴⁾

Again it seems that only Old and Middle Kingdom material was the subject of the review. The “physical attempt” of Damon and Long referred to in this report considers the possibility that about two millennia before the present era the influx of cosmic rays suddenly changed in rate and that as a consequence the radiocarbon ratio in the carbon pool changed, too. Actually such or similar surmises were expressed by Dr. Ralph, as also by Dr. H. E. Suess and by others.

The change in the influx of cosmic rays could have occurred either in the case of the Earth, together with the rest of the solar system, passing close to a source of such rays, a nova or a supernova; or, preferably, as Suess assumed, in the case of a change in the strength of the magnetic field that shields the Earth from cosmic rays.

These surmises were repeatedly made because anomalous readings from the early periods of Egyptian history accumulated, mostly pointing to more recent dates. Dr. Libby, however, expressed his view that the Egyptian chronology may be wrong.⁽⁵⁾

In *Science* for April, 1963, he wrote:

The data [in the Table] are separated into two groups—Egyptian and non-Egyptian. This separation was made because the whole Egyptian chronology is interlocking and subject to possible systemic errors . . . Egyptian historical dates beyond 4000 years ago may be somewhat too old, perhaps 5 centuries too old at 5000 years ago. . .⁽⁶⁾

Thus the two solutions offered concerning the too recent dates for the Middle Kingdom actually amounted to either a support for *Ages in Chaos* or for *Worlds in Collision*, or for both.

In the conventional scheme of history, the Middle Kingdom ended about -1680. In *Ages in Chaos* the end of the Middle Kingdom is placed at about -1450. Whereas for most of the Eighteenth Dynasty I claimed that the dates need to be reduced by about 540 years, for the end of the Middle Kingdom the restructured timetable required but about 200 years change toward greater recentness.

A later issue of *Radiocarbon* brought radiocarbon dates of the Middle Kingdom in Egypt, with the verdict that this period of history did not terminate in -1780 or even in -1680 but endured into the fifteenth century before the present era, [\(7\)](#) as postulated in *Ages in Chaos*. All this was surmised before tests on New Kingdom material were considered.

In 1963 it seemed hopeless to expect that there would ever be a radiocarbon test of Egyptian chronology of the New and Late Kingdoms, the mainstay of the chronological structure of the entire complex known as the ancient East.

But then from a series of chance meetings a story developed that had all the characteristics of a cloak-and-dagger mystery. I will not tell it here, but the result was that three small pieces of wood from the tomb of Tutankhamen were delivered from Cairo Museum to Dr. Elizabeth Ralph of the Museum of the University of Pennsylvania.

It took a long time, but finally the three pieces of wood were processed. On February 25, 1964 Dr. Ralph wrote me:

“Your great patience in waiting for the C-14 date of the wood from the tomb of Tutankhamen is greatly appreciated. The dates . . . are as follows:

U. of Pa. Lab No.	Name	Age calc. with 5568 half-life	Age calc. with 5730 half-life
P-726	Wood from coffin of Tutankhamen, 18th Dynasty	1030 ± 50 B.C.	1120 ± 52 B.C.

The carbon age of the wood from the tomb of Tutankhamen was found to be about 300 years younger than the accepted date of the death of this king—more exactly, 320 years according to Libby’s figure for the half-life of radiocarbon, or 230 years following the Washington scale (5730 half-life).

Statements had repeatedly been made—and some of them were quoted on previous pages—that the method cannot be profitably applied to the problems of Egyptian chronology of the New Kingdom because the uncertainty of the method far exceeds the uncertainty of the dates. These statements were shown to be baseless: the method with a fifty-year uncertainty exposed an error of several hundred years in Egyptian chronology. Obviously the lumber used in the tomb could not have been growing as a tree three hundred years later.

But I was not completely satisfied with the result, and I suspected where the additional two hundred years or so may have lain hidden. In my reconstruction, Tutankhamen's death falls in the second half of the ninth century. In a letter to Dr. Ralph I inquired whether the carbon age of a trunk discloses the time when the tree was felled or the time of the formation of the tree rings. To this, on March 5, 1964, a week after her first report, Dr. Ralph answered that the latter was true.

Various tests have indicated that only the outer growth ring of a tree has a contemporaneous amount of C-14, that is, it is in equilibrium with the atmospheric C-14. Except for a slight diffusion of sap inward, which seems to be insignificant, the inner rings seem to have C-14 ages representative of the years that have elapsed since they were outer rings. Therefore, a C-14 date for a sample cut from the inner part of a log would not be representative of the time of the cutting of the tree.

The magnitude of the error varies greatly in different regions and with different trees.

Among many archaeologists this fact is not known, and an Orientalist of the stature of W. F. Albright, to whom I showed the reports of Dr. Ralph, expressed great amazement over it.⁽⁸⁾

The three pieces of wood from the tomb of Tutankhamen consisted of Spina Christi (two pieces, aggregate weight 14.5 grams) and Cedar of Lebanon (weight 11.5 grams); since they together weighed but 26 grams, and 25 grams is considered the necessary minimum quantity for a test, all were tested as one batch. Spina Christi is a comparatively short-lived thorn plant; but Cedar of Lebanon is one of the longest living trees. There is no question that the Cedar of Lebanon was not cut for export as a sapling; the tree reaches the venerable age of a thousand and more years. Whoever visits the cedar forests still surviving in a few areas of Lebanon at elevations of five to nine thousand feet, and sees their majestic trunks and branches, will realize that since 43 percent of the wood from the tomb of Tutankhamen tested (11 grams out of 26) was Cedar of Lebanon, the probability is that an additional correction of several hundred years is necessary, thus making the discord between the accepted and the carbon dates much greater than three hundred years.

The report on wood from Tutankhamen's tomb was printed in 1965 in the annual volume of *Radiocarbon*. The circumstances of the find of this tomb are well known. In 1922 Howard Carter, digging in the Valley of the Kings, came upon a hidden stairway, and a door sealed with the seal of the priests of the Necropolis and also with the seal of the dead pharaoh, the youthful Tutankhamen. In my *Oedipus and Akhnaton* I presented a reconstruction of the events that led to Tutankhamen's death. If the tomb was ever opened, it could only have happened in the reign of Ay, who succeeded Tutankhamen and whom I identified as the prototype of Creon of the Greek legend of the Oedipus cycle. The tomb was also free from percolating water and therefore there was no reason to suspect contamination by water which might have first seeped through some decomposed organic material. There could not be a better source for radiocarbon test but that material itself.

Several other tests on wood from the New Kingdom in Egypt, also performed in the laboratory headed by Dr. Ralph, were published in the same volume. The specimens from the New Kingdom were assessed by their finders or by specialists as dating from the Eighteenth (or in one case possibly from the Nineteenth) Dynasty:

Sample no. & material	provenance	conventional date	C-14 date
P-717 Charcoal	estimated to be of Thutmoses III to Amenophis III periods	1500 to 1370 B.C.	1161 B.C.
P-718 Charcoal	reign of Amenophis III	1408 to 1372 B.C.	1137 B.C.
P-720 Wood from sarcophagus	may date from end of 18th Dynasty or, more likely, from the 19th Dynasty	1370 to 1314 B.C. or 1314 to 1200 B.C.	1031 B.C.

In all cases the age arrived at by radiocarbon testing was several centuries younger than the conventional chronology would allow.

In view of what was said above concerning the radiocarbon age of a piece of wood, any wood unless it is an annual plant would deceive by offering a greater antiquity than the date of its use for building purposes. Clearly, the preferred material for radiocarbon dating would be something like grain, papyrus, cotton or linen, animal hide, or mummy remains. Any result obtained from wood contains an x number of years that depend on the number of rings and their count from the bark inward—and this x must not be neglected in the estimates. Evidently further testing is necessary and the tomb of Tutankhamen could provide grain, dried flowers (probably not enough for a test), or a piece of mummy, if only the importance of such a test for the entire field of Egyptian archaeology would be realized.

In 1971, or seven years later, the British Museum processed palm kernels and mat reed from the tomb of Tutankhamen. The resulting dates, as Dr. Edwards, Curator of the Egyptian Department of the British Museum, wrote to the University of Pennsylvania radiocarbon laboratory, were - 899 for the palm kernels and -846 for the mat reed.⁽⁹⁾

These results, however, were never published.

Such cases make me appeal that all tests, irrespective of how much the results disagree with the accepted chronological data, should be made public. I believe also that if nothing else, the curiosity of the British Museum Laboratory officials should have induced them to ask for additional material from the Tutankhamen tomb instead of discontinuing the quest because “On the basis of the dating it was decided that the samples did not come from the tomb” and therefore it “was decided that the results should not be published.”⁽¹⁰⁾

In the Proceedings of the Symposium on Radiocarbon Variations and Absolute Chronology held at Uppsala in 1969, T. Säve-Söderbergh and I. U. Olsson introduce their report with these words:

C 14 dating was being discussed at a symposium on the prehistory of the Nile Valley. A famous American colleague, Professor Brew, briefly summarized a common attitude among archaeologists towards it, as follows: “If a C 14 date supports our theories, we put it in the main

text. If it does not entirely contradict them, we put it in a footnote. And if it is completely out of date we just drop it.” Few archaeologists who have concerned themselves with absolute chronology are innocent of having sometimes applied this method. . . [\(11\)](#)

Another way of dulling the sharp disagreements between the accepted chronology and the results of the tests is described by Israel Isaacson. [\(12\)](#)

In this case nothing was purposely hidden, but two different approaches were applied. In one and the same year the University of Pennsylvania tested wood from a royal tomb in Gordion, capital of the short-lived Phrygian Kingdom in Asia Minor, and from the palace of Nestor in Pylos, in S.W. Greece. In Gordion the result was -1100; in Pylos -1200. However, according to the accepted chronology, the difference should have been nearly 500 years—1200 for Pylos at the end of the Mycenaean age was well acceptable, but -1100 for Gordion was not—the date should have been closer to -700. Dr. Ralph came up with the solution for Gordion. The beams from the tomb were squared and the inner rings could easily have been four to five hundred years old when the tree was felled. But in Pylos the description of the tested wood indicates that these were also squared beams—yet the corrective was not applied—this because -1200 was the anticipated figure. However, as I try to show in detail, there were never five centuries of Dark Age between the Mycenaean Age and the historical (Ionic) Age of Greece. If the same correction had been applied to both cases, then since the Gordion beams were dated to -700, the Pylos beams should be dated to ca. -800.

As mentioned earlier, the fact that the Middle Kingdom dates were regularly found to be too young by several centuries caused the surmise by Damon and Long that the influx of cosmic rays changed four thousand years ago or thereabouts.

Now the question arises—how can the radiocarbon method be used for deciding between the conventional and the revised chronologies? [\(13\)](#)

Libby, in his *Radiocarbon Dating*, stressed that the method is good only on the condition that the influx of cosmic rays has not changed during the last 25 or 30 thousand years, and also that the quantity of water in the oceans has not changed in the same period of time. In a sequel volume to *Worlds in Collision* I intend to show that the Earth passed through a period of intense bombardment by cosmic rays at the time of the Deluge. Libby’s insight, by the very fact of stressing these preconditions for the validity of the method, is amazing.

The great catastrophe in the middle of the second millennium that terminated the Middle Kingdom must also have disrupted all processes that underlie the carbon dating method. On the one hand much radioactivity and radiation must have been engendered as the consequence of interplanetary discharges, and thus any organic material of a date after the catastrophe would appear disproportionately younger than the material from earlier periods. On the other hand, the general conflagration that accompanied the cosmic catastrophe must have caused contamination of the air by carbon from burning forests, and even more so by burning fossil carbon in oil and coal, besides the contamination of the air by the products of volcanic eruptions, which were simultaneous on all continents. Such intrusion of non-radioactive carbon into the atmosphere would have disturbed the C-12/C-14 balance in the sense of making any organic material that

grew and lived after the catastrophe appear in the carbon test as older and belonging to an earlier age.

Thus two phenomena of opposite effect have acted in the catastrophes, and depending on the preponderance of one of the two factors, the objects subjected to test would appear younger or older than their real age. Furthermore, carbon of extraterrestrial origin (ash and polymerized hydrocarbons) added a third factor, and its evaluation in the carbon pool as to its tendency to heighten or lower the radioactivity is hardly possible.

In the eighth century and the beginning of the seventh century before the present era, the last series of cosmic catastrophes took place. Although not of the same ferocity as far as the Earth was concerned, these catastrophes and conflagrations must also have left their imprints on everything organic.

Thus radiocarbon dating needs to take into consideration the catastrophic changes in historical and also prehistorical times. To determine the extent of correction necessary to render the radiocarbon method reliable, dendrochronologists, notably Suess, devised a plan to control the radiocarbon dates by building a chronology of tree rings of the white bristlecone pine. However, three or four rings formed in one year is not uncommon, especially if the tree grows on a slope with the ground several times a year turning wet and dry because of rapid outflow of water. [\(14\)](#)

And certainly the building of tree “ladders,” or carrying on the count from one tree to another may arouse erroneous conclusions. One and the same year may be dry in Southern California and wet in the northern half of the state. [\(15\)](#)

Moreover, as R. D. Long writes in a comprehensive review of dendrochronology, the Suess tree ring calibration curve data “proposed as the solution for correcting conventional radiocarbon ages cannot be applied to Egypt. As will be demonstrated, physical geographical location has crucial meaning to C 14 dating and calibration.” This, he claims, “demolishes the theory on which the Suess curve rested.” [\(16\)](#)

Then how can the radiocarbon method contribute to the clarification of Egyptian chronology, especially in the age of the New Kingdom?

The answer to this is that the method *can* be objectively and profitably used for the purpose of finding out whether the conventional or the revised scheme is the true one, and there are two ways of making the test work for this purpose. The first way is in comparative dating: according to my reconstruction, the Eighteenth Dynasty (the first of the New Kingdom) was contemporaneous with the dynasty of Saul and David; Akhnaton and Tutankhamen were contemporaneous with Jehosphaphat of Jerusalem and Ahab of Samaria, and with Shalmaneser II of Assyria, all of the ninth century before the present era. Organic material of Egypt presumably of the fourteenth century (the time the conventional chronology assigns to Akhnaton and Tutankhamen) should be compared with organic material from ninth century Israel or Assyria. I expect that the carbon analysis will certify the contemporaneity of these periods in Egyptian history on the one hand, and Judean and Assyrian history on the other.

The other way of using radiocarbon dating to test the correctness of the reconstruction of ancient history is in testing organic material from a period removed by several centuries from the last cosmic catastrophe. A choice case would be Ramses III and the Twentieth Dynasty in general. As I show in *Peoples of the Sea*, Ramses III of the historians is but Nectanebo I, who occupied the Egyptian throne in the first half of the fourth century and who warred with Artaxerxes II, the Persian.

According to the accepted chronology, Ramses III started to reign in -1200 or a few years thereafter. The UCLA Egyptologist who claimed that no carbon test is needed for dating the New Kingdom used Ramses III as an example:

. . . Since the chronology of ancient Egypt is quite closely fixed by astronomical evidence . . . radiocarbon, with its substantial margin of error, could hardly add anything to our knowledge of the chronology of the New Kingdom. Hayes, *The Scepter of Egypt*, Vol. II, dates Ramses III to 1192-1160 B.C., and this date is not likely to contain a margin of error greater than about five years each way.

The difference between the conventional dates and the timetable of the revised chronology reaches here an almost grotesque figure of 800 years. The fourth century is by three centuries removed from the last cataclysm that, according to the evidence cited in *Worlds in Collision*, took place on March 23, -687. Therefore there need be no apprehension as to the possible effect of natural events on the carbon content of the living material of the fourth century, with the exception of the inner rings of trees that in the fourth century before the present era may already have been three or more centuries old. Generally, not trees but short lived plants, such as linen, papyrus, grain, and also hide and mummies, should be used for radiocarbon tests for archaeological purposes.

Since the problem to solve is whether Ramses III lived almost 32 or less than 24 centuries ago, the difference being so great as to exceed 25 percent (33 percent if counted on 24 centuries), the radiocarbon method, with its margin of uncertainty of less than 50 years, must provide an unambiguous answer in the contest for the title of the true history.

In a number of letters directed to various persons and institutions, I have asked for such tests. Again—as before the testing of the wood from the tomb of Tutankhamen—I found resistance; some famous collections of Egyptological antiquities disclaimed possessing any organic material (wood, swathings, hide, seeds, papyrus) that could be sacrificed or even the very possession of such material dating from the Nineteenth, Twentieth, or Twenty-first dynasties. In one case I was offered one gram of linen whereas one ounce (ca. 30 grams) are needed for one single test.

Since the Oriental Institute of the University of Chicago spent decades on excavating and describing the palace temple of Ramses III at Medinet Habu, my request went also that way; but the answer I received from Professor John Wilson was not promising. Thus I decided to publish *Peoples of the Sea*, after much postponement, and let the readers of that volume clamor for the performance of radiocarbon tests for the solution of the problem—which of the two conflicting histories of the ancient world is spurious and which is genuine?

[Dr. John Iles of Ontario, actually did succeed in one such an endeavor. In 1977 N. B. Millet, curator of the Egyptian Department of the Royal Ontario Museum, described the historical background of the mummy of Nakht, which the Canadian Medical Association was analyzing. According to Millet Nakht was “invariably described as the weaver of the *kny* temple” of King Setnakht, the first ruler of the Twentieth Dynasty and father of Ramses III. Millet wrote about Nakht’s mummy that there was “unusually clear evidence of its date.”⁽¹⁷⁾

Upon reading the report, Dr. Iles wrote a letter to the Canadian Medical Association’s *Journal*, asking that a Carbon 14 test be performed.⁽¹⁸⁾

The death of King Setnakht, the first ruler of the Twentieth Dynasty, is conventionally dated at -1198.

On Dr. Iles’ initiative, the Royal Ontario Museum submitted linen wrappings from the mummy of Nakht to Dalhousie University for radiocarbon testing. On November 9, 1979, W. C. Hart of Dalhousie University wrote to Dr. Iles: “The date on linen wrappings from the mummy of Nakht is: DAL-350 2295 ± 75 years before the present (1950),” meaning -345 ± 75. Dr. Iles reported these results in a letter to the association’s journal. (March 8, 1980).

The radiocarbon date for this well-documented sample,⁽¹⁹⁾ -345 ± 75 corresponds almost precisely with the revised date for Ramses III but differs from the conventional date by ca. 800 years.—JNS]

References

1. See I. Velikovsky, “[The Pitfalls of Radiocarbon Dating](#).”
2. For this and other letters, see the exchange of letters entitled “[ASH](#).”
3. The following laboratories participated in the tests: British Museum, Groningen, Uppsala, Arizona, Pennsylvania, Rome, Louvain, Saclay, Sharp Labs., Tata Inst. Published in *Radiocarbon* 1965.
4. See Damon, P. E., A. Long, and D. C. Grey, “Fluctuations of Atmospheric C 14 during the last six millennia, *Journal of Geophysical Research*, 71 (1966), 1059.
5. Other geophysicists agreed with Libby that the problem resided with historical chronology.
6. Volume 140, 278.
7. *Radiocarbon* (1967), 491. The date for Senusret II of the Twelfth Dynasty was found by UCLA to be -1550 (or -1665 according to the Washington scale). This would bring the end of the Middle Kingdom (Thirteenth Dynasty) to the 15th century.
8. [Actually, the dendrochronological recalibration of C 14 dates rests on the fact that every ring has its own C 14 date.—JNS]
9. Dr. Edwards to Dr. Michael, Museum of the University of Pennsylvania (April 6, 1971). See the exchange of letters entitled “[ASH](#)”.

10. From a letter of G. B. Morris, Secretary, the British Museum to Dr. Iles. See the exchange of letters entitled "[ASH](#)."
11. "C 14 dating and Egyptian Chronology" in Ingrid U. Olsson ed., *Radiocarbon Variations and Absolute Chronology, Proceedings of the Twelfth Nobel Symposium Held at the Institute of Physics at Uppsala University*.
12. "Carbon 14 Dates and Velikovsky's Revision of Ancient History," *Pensée* IVR IV (1973), 26-32.
13. See also I. Velikovsky, "[The Pitfalls of Radiocarbon Dating](#)," *Pensée* IVR IV (1973), 12ff.
14. Glück, *et al.*, *Botanical Review*, 7, 649-713; and 21, 245-365.
15. See also H. C. Sorensen, "The Ages of Bristlecone Pine," *Pensée* IVR VI (1973), 15-18.
16. R. D. Long, "Ancient Egyptian Chronology," *Zeitschrift für Aegyptische Sprache* 103 (1976), 31, 33.
17. [N. B. Millet, *Canadian Medical Association Journal* September 3, 1977].
18. [CMA Journal, January 7, 1978.]
19. [Millet wrote that there is a good account of its discovery and excavation."]