

PART I

Venus

No book, or collection of books,
in the history of mankind has had
a more attentive reading, a wider
circulation, or more diligent inves-
tigation than the Old Testament.

—R. H. PFEIFFER,
*Introduction to
the Old Testament*

CHAPTER 1

The Most Incredible Story

THE MOST incredible story of miracles is told about Joshua ben Nun who, when pursuing the Canaanite kings at Beth-horon, implored the sun and the moon to stand still. "And he said in the sight of Israel, Sun, stand thou still upon Gibeon; and thou, Moon, in the valley of Ajalon. And the sun stood still, and the moon stayed, until the people had avenged themselves upon their enemies. Is not this written in the book of Jasher? So the sun stood still in the midst of heaven, and hasted not to go down about a whole day" (Joshua 10 : 12-13).

This story is beyond the belief of even the most imaginative or the most pious person. Waves of stormy sea may have drowned one host and been merciful to another. The earth could crack asunder and swallow up human beings. The Jordan could be blocked by a slice of its bank falling into the bed of the river. Jericho's walls—not by the blast of trumpets, but by an incidental earthquake—could have been breached.

But that the sun and the moon should halt in their movement across the firmament—this could be only the product of fancy, a poetic image, a metaphor;¹ a hideous implausibility when imposed as a subject for belief;² a matter for scorn—it manifests even a want of reverence for the Supreme Being.

¹ "Certainly one could not conceive a more effective flight of fancy, or one more fitted for the heights of one heroic and lyrical composition." G. Schiaparelli, *Astronomy in the Old Testament* (1905), p. 40.

² W. Whiston wrote in his *New Theory of the Earth* (6th ed., 1755), pp. 19-21,

According to the knowledge of our age—not of the age when the Book of Joshua or of Jasher was written—this could have happened if the earth had ceased for a time to roll along its prescribed path. Is such a disturbance conceivable? No record of the slightest confusion is registered in the present annals of the earth. Each year consists of 365 days, 5 hours, and 49 minutes.

A departure of the earth from its regular rotation is thinkable, but only in the very improbable event that our planet should meet another heavenly body of sufficient mass to disrupt the eternal path of our world.

It is true that aerolites or meteorites reach our earth continually, sometimes by the thousands and tens of thousands. But no dislocation of our precise turning round and round has ever been perceived.

This does not mean that a larger body, or a larger number of bodies, could not strike the terrestrial sphere. The large number of asteroids between the orbits of the planets Mars and Jupiter suggests that at some unknown time another planet revolved there; now only these meteorites follow approximately the path along which the destroyed planet circled the sun. Possibly a comet ran into it and shattered it.

That a comet may strike our planet is not very probable, but the idea is not absurd. The heavenly mechanism works with almost absolute precision; but unstable, their way lost, comets by the thousands, by the millions, revolve in the sky, and their interference may disturb the harmony. Some of these comets belong to our system. Periodically they return, but not at very exact intervals, owing to the perturbations caused by gravitation toward the larger planets when they fly too close to them. But innumerable other comets, often seen only through the telescope, come flying in from immeasurable spaces of the universe at very great speed, and disappear—possibly forever. Some comets are visible only for hours, some for days or weeks or even months.

concerning the wonder of the sun standing still: "The Scripture did not intend to teach men philosophy, or accommodate itself to the true and Pythagoric system of the world." And again: "The prophets and holy penmen themselves . . . being seldom or never philosophers, were not capable of representing these things otherwise than they, with the vulgar, understood them."

Might it happen that our earth, the earth under our feet, would roll toward perilous collision with a huge mass of meteorites, a trail of stones flying at enormous speed around and across our solar system?

This probability was analyzed with fervor during the last century. From the time of Aristotle, who asserted that a meteorite, which fell at Aegospotami when a comet was glowing in the sky, had been lifted from the ground by the wind and carried in the air and dropped over that place, until the year 1803 when, on April 26, a shower of meteorites fell at l'Aigle in France and was investigated by Biot for the French Academy of Sciences, the scholarly world—and in the meantime there lived Copernicus, Galileo Galilei, Kepler, Newton, and Huygens—did not believe that such a thing as a stone falling from the sky was possible at all. And this despite many occasions when stones fell before the eyes of a crowd, as did the aerolite in the presence of Emperor Maximilian and his court in Ensisheim, Alsace, on November 7, 1492.³

Only shortly before 1803, the Academy of Sciences of Paris refused to believe that, on another occasion, stones had fallen from the sky. The fall of meteorites on July 24, 1790 in southwest France was pronounced "un phénomène physiquement impossible."⁴ Since the year 1803, however, scholars have believed that stones fall from the sky. If a stone can collide with the earth, and occasionally a shower of stones, too, cannot a full-sized comet fly into the face of the earth? It was calculated that such a possibility exists but that it is very unlikely to occur.⁵

If the head of a comet should pass very close to our path, so as to effect a distortion in the career of the earth, another phenomenon besides the disturbed movement of the planet would probably occur:

³ C. P. Olivier, *Meteors* (1925), p. 4.

⁴ P. Bertholon, *Pubblicazioni della specola astronomica Vaticana* (1913).

⁵ D. F. Arago computed on some occasion that there is one chance in 280 million that a comet will hit the earth. Nevertheless, a hole one mile in diameter in Arizona is a sign of an actual headlong collision of the earth with a small comet or asteroid. On June 30, 1908, a calculated forty-thousand-ton mass of iron fell in Siberia at 60° 56' north latitude and 101° 57' east longitude. In 1946 the small Giacobini-Zinner comet passed within 131,000 miles of the point where the earth was eight days later.

While investigating whether an encounter between the earth and a comet had

a rain of meteorites would strike the earth and would increase to a torrent. Stones scorched by flying through the atmosphere would be hurled on home and head.

In the Book of Joshua, two verses before the passage about the sun that was suspended on high for a number of hours without moving to the occident, we find this passage:

"As they [the Canaanite kings] fled from before Israel, and were in the going down to Beth-horon . . . the Lord cast down *great stones* from heaven upon them unto Azekah, and they died: they were more which died with hail stones [stones of *barad*] than they whom the children of Israel slew with the sword."⁶

The author of the Book of Joshua was surely ignorant of any connection between the two phenomena. He could not be expected to have had any knowledge about the nature of aerolites, about the forces of attraction between celestial bodies, and the like. As these phenomena were recorded to have occurred together, it is improbable that the records were invented.

The meteorites fell on the earth in a torrent. They must have fallen in very great numbers for they struck down more warriors than the swords of the adversaries. To have killed persons by the hundreds or thousands in the field, a cataract of stones must have fallen. Such

been the subject of a previous discussion, I found that W. Whiston, Newton's successor at Cambridge and a contemporary of Halley, in his *New Theory of the Earth* (the first edition of which appeared in 1696) tried to prove that the comet of 1680, to which he (erroneously) ascribed a period of 575½ years, caused the biblical Deluge on an early encounter.

G. Cuvier, who was unable to offer his own explanation of the causes of great cataclysms, refers to the theory of Whiston in the following terms: "Whiston fancied that the earth was created from the atmosphere of one comet, and that it was deluged by the tail of another. The heat which remained from its first origin, in his opinion, excited the whole antediluvian population, men and animals, to sin, for which they were all drowned in the deluge, excepting the fish, whose passions were apparently less violent."

I. Donnelly, author, reformer, and member of the United States House of Representatives, tried in his book *Ragnarok* (1883) to explain the presence of till and gravel on the rock substratum in America and Europe by hypothesizing an encounter with a comet, which rained till on the terrestrial hemisphere facing it at that moment. He placed the event in an indefinite period, but at a time when man already populated the earth. Donnelly did not show any awareness that Whiston was his predecessor. His assumption that there is till only in one half of the earth is arbitrary and wrong.

⁶ Joshua 10 : 11.

a torrent of great stones would mean that a train of meteorites or a comet had struck our planet.

The quotation in the Bible from the Book of Jasher is laconic and may give the impression that the phenomenon of the motionless sun and moon was local, seen only in Palestine between the valley of Ajalon and Gibeon. But the cosmic character of the prodigy is pictured in a thanksgiving prayer ascribed to Joshua:

Sun and moon stood still in heaven,
and Thou didst stand in Thy wrath against our oppressors. . . .

All the princes of the earth stood up,
the kings of the nations had gathered themselves together. . . .

Thou didst destroy them in Thy fury,
and Thou didst ruin them in Thy rage.

Nations raged from fear of Thee,
kingdoms tottered because of Thy wrath. . . .

Thou didst pour out Thy fury upon them. . . .
Thou didst terrify them in Thy wrath. . . .

The earth quaked and trembled from the noise of Thy thunders.

Thou didst pursue them in Thy storm,
Thou didst consume them in the whirlwind. . . .

Their carcasses were like rubbish.⁷

The wide radius over which the heavenly wrath swept is emphasized in the prayer: "All the kingdoms tottered. . . ."

A torrent of large stones coming from the sky, an earthquake, a whirlwind, a disturbance in the movement of the earth—these four phenomena belong together. It appears that a large comet must have passed very near to our planet and disrupted its movement; a part of the stones dispersed in the neck and tail of the comet smote the surface of our earth a shattering blow.

Are we entitled, on the basis of the Book of Joshua, to assume that at some date in the middle of the second millennium before the present era the earth was interrupted in its regular rotation by a comet? Such a statement has so many implications that it should not

⁷ Ginzberg, *Legends*, IV, 11-12.

be made thoughtlessly. To this I say that though the implications are great and many, the present research in its entirety is an interlinked sequence of documents and other evidence, all of which in common carry the weight of this and other statements in this book.

The problem before us is one of mechanics. Points on the outer layers of the rotating globe (especially near the equator) move at a higher linear velocity than points on the inner layers, but at the same angular velocity. Consequently, if the earth were suddenly stopped (or slowed down) in its rotation, the inner layers might come to rest (or their rotational velocity might be slowed) while the outer layers would still tend to go on rotating. This would cause friction between the various liquid or semifluid layers, creating heat; on the outermost periphery the solid layers would be torn apart, causing mountains and even continents to fall or rise.

As I shall show later, mountains fell and others rose from level ground; the earth with its oceans and continents became heated; the sea boiled in many places, and rock liquefied; volcanoes ignited and forests burned. Would not a sudden stop by the earth, rotating at a little over one thousand miles an hour at its equator, mean a complete destruction of the world? Since the world survived, there must have been a mechanism to cushion the slowing down of terrestrial rotation, if it really occurred, or another escape for the energy of motion besides transformation into heat, or both. Or if rotation persisted undisturbed, the terrestrial axis may have tilted in the presence of a strong magnetic field, so that the sun appeared to lose for hours its diurnal movement.⁸ These problems are kept in sight and are faced in the Epilogue of this volume.

On the Other Side of the Ocean

The Book of Joshua, compiled from the more ancient Book of Jasher, relates the order of events. "Joshua . . . went up from Gilgal all night." In the early morning he fell upon his enemies unawares at Gibeon, and "chased them along the way that goes up to Beth-

⁸ This explanation was suggested to me by M. Abramovich of Tel Aviv.

horon." As they fled, great stones were cast from the sky. That same day ("in the day when the Lord delivered up the Amorites") the sun stood still over Gibeon and the moon over the valley of Ajalon. It has been noted that this description of the position of the luminaries implies that the sun was in the forenoon position.¹ The Book of Joshua says that the luminaries stood in the midst of the sky.

Allowing for the difference in longitude, it must have been early morning or night in the Western Hemisphere.

We go to the shelf where stand books with the historical traditions of the aborigines of Central America.

The sailors of Columbus and Cortes, arriving in America, found there literate peoples who had books of their own. Most of these books were burned in the sixteenth century by the Dominican monks. Very few of the ancient manuscripts survived, and these are preserved in the libraries of Paris, the Vatican, the Prado, and Dresden; they are called codici, and their texts have been studied and partly read. However, among the Indians of the days of the conquest and also of the following century there were literary men who had access to the knowledge written in pictographic script by their forefathers.²

In the Mexican *Annals of Cuauhtitlan*³—the history of the empire of Culhuacan and Mexico, written in Nahuatl-Indian in the sixteenth century—it is related that during a cosmic catastrophe that occurred in the remote past, the night did not end for a long time.

The biblical narrative describes the sun as remaining in the sky for an additional day ("about a whole day"). The Midrashim, the books of ancient traditions not embodied in the Scriptures, relate that the sun and the moon stood still for thirty-six *itim*, or eighteen hours,⁴

¹ H. Holzinger, *Josua* (1901), p. 40, in "Hand-commentar zum Alten Testament," ed. K. Marti. R. Eisler, "Joshua and the Sun," *American Journal of Semitic Languages and Literature*, XLII (1926), 83: "It would have had no sense early in the morning of a battle, with a whole day ahead, to have prayed for the lengthening of the sunlight even into the night time."

² The Mayan tongue is still spoken by about 300,000 people, but of the Mayan hieroglyphics only the characters employed in the calendar are known for certain.

³ Known also as *Codex Chimalpopoca*. "This manuscript contains a series of annals of very ancient date, many of which go back to more than a thousand years before the Christian era" (Brasseur).

⁴ *Sefer Ha-Yashar*, ed. L. Goldschmidt (1923); *Pirkei Rabbi Elieser* (Hebrew

and thus from sunrise to sunset the day lasted about thirty hours.

In the Mexican annals it is stated that the world was deprived of light and the sun did not appear for a fourfold night. In a prolonged day or night time could not be measured by the usual means at the disposal of the ancients.⁵

Sahagun, the Spanish savant who came to America a generation after Columbus and gathered the traditions of the aborigines, wrote that at the time of one cosmic catastrophe the sun rose only a little way over the horizon and remained there without moving; the moon also stood still.⁶

I am dealing with the Western Hemisphere first, because the biblical stories were not known to its aborigines when it was discovered. Also, the tradition preserved by Sahagun bears no trace of having been introduced by the missionaries: in his version there is nothing to suggest Joshua ben Nun and his war against the Canaanite kings; and the position of the sun, only a very little above the eastern horizon, differs from the biblical text, though it does not contradict it.

We could follow a path around the earth and inquire into the various traditions concerning the prolonged night and prolonged day, with sun and moon absent or tarrying at different points along the zodiac, while the earth underwent a bombardment of stones in a world ablaze. But we must postpone this journey. There was more than one catastrophe when, according to the memory of mankind, the earth refused to play the chronometer by undisturbed rotation on its axis. First, we must differentiate the single occurrences of cosmic catastrophes, some of which took place before the one described here, some after it; some of which were of greater extent, and some of lesser.

sources differ as to how long the sun stood still); the Babylonian Talmud, Tractate Aboda Zara 25a; Targum Habakkuk 3 : 11.

⁵ With the exception of the water clock.

⁶ Bernardino de Sahagun (1499?-1590), *Historia general de las cosas de Nueva España*, new ed. 1938 (5 vols.) and 1946 (3 vols.). French transl. D. Jourdanet and R. Simeon (1880), p. 481.