**Precursors**

Nicolaus Copernicus had a passage in the manuscript of his *De Revolutionibus* in which he gave credit to Aristarchus of Samos as his predecessor in announcing the heliocentric view of the solar system. Archimedes and Plutarch, widely read in the Middle Ages, as well as other writers of antiquity referred to this teaching of Aristarchus:[(1)](http://www.varchive.org/ce/precursors.htm#f_1) the Sun, not the Earth is the center of the solar system, and the Earth with the other planets revolves around the Sun. But Copernicus suppressed this mention of Aristarchus in his manuscript, and it did not appear in the printed *De Revolutionibus.*[(2)](http://www.varchive.org/ce/precursors.htm#f_2)

Galileo Galilei proved that all objects, independent of their weight, fall with the same velocity and the small difference is due only to the resistance of the air through which the objects fall. But already Lucretius in the first century before the present era wrote: “All things that fall through the water and thin air . . . must needs quicken their fall in proportion to their weights, just because the body of water and the thin nature of air cannot check each thing equally, but give place more quickly when overcome by heavier bodies. But, on the other hand, the empty void cannot on any side or at any time support anything, but rather, as its own nature desires, it continues to give place; wherefore all things must needs be borne through the calm void, moving at equal rate with unequal weights.”[(3)](http://www.varchive.org/ce/precursors.htm#f_3)

In 1605, Simon Stevin of Bruges published a book in which he described his experiment: he let fall two balls of lead, one ten times the weight of the other, and they landed evenly.[(4)](http://www.varchive.org/ce/precursors.htm#f_4)

Isaac Newton explained that gravity attracts the Moon to the Earth and calculated this basic notion of his theory assuming that “the mean distance of the moon is equal to sixty semi-diameters of the earth”.[(5)](http://www.varchive.org/ce/precursors.htm#f_5) “*The moon gravitates towards the earth, and by the force of gravity is continually drawn off from a rectilinear motion and retained on its orbit.”*[(6)](http://www.varchive.org/ce/precursors.htm#f_6) Thus he concluded that the Moon, like terrestrial objects, is governed by universal gravitation. Now Plutarch already in the first century wrote: “They who place the moon lowest say that her distance from us contains six and fifty of the earth’s semi-diameters, that is, that she is six and fifty times as far from us as we are from the center of the earth: which is forty-thousand stadia, according to those that take their calculations moderately. Therefore the sun is above forty millions and three hundred thousand stadia distant from the moon; so far is she from the sun by reason of gravity, and so near does she approach the earth. So that if substances are to be distinguished by places, the portion and region of the earth challenges to itself the moon, which, by reason of neighborhood and proximity, has the right to be reputed and reckoned amongst the terrestrial natures of bodies.”[(7)](http://www.varchive.org/ce/precursors.htm#f_7)

Classical authors referred to the belief of the Chaldeans that comets move on orbits and return at periodic intervals.[(8)](http://www.varchive.org/ce/precursors.htm#f_8) However, it is Edmund Halley who is credited with the discovery of the periodic return of comets.

Thus, the authors of basic discoveries of the laws of nature borrowed from the ancients or rediscovered the truths known to the ancients, but kept the ancients’ names out of their discourses.

The conclusions of my own research, that the Earth underwent successive catastrophes of a cosmic nature and that the constitution of the solar system changed in historical times, are actually based on testimonies of the ancients. The idea of a cosmic catastrophe in historical times came to me one evening in October 1940: it was inspired by the chapter in the Book of Joshua where it is told about the stasis of the Sun and Moon, and the stones that fell from the sky. In a few weeks the major part of the theory presented in *Worlds in Collision* was conceived. The first impulse after reading the Book of Joshua was to investigate Chinese records in order to see whether anything is known about the stasis of the Sun; then I addressed myself to authors who narrate the ancient history of the New World.

In the Friar Charles Etienne Brasseur de Bourbourg (1814-1874), I found an author who was very much impressed by the constant references in old sources to the fact that the continent of the New World underwent great catastrophes each of which terminated a world age. He was on an absolutely right track when he posed the principle which I had in my own mind, that of looking for references to a stasis of the Earth in Mexican traditions. “In order to rediscover the remotest history of the earth it is necessary to compare the ancient traditions of Asia and Egypt with those of the primitive peoples of America.”[(9)](http://www.varchive.org/ce/precursors.htm#f_9) But, strangely enough, the reverend author did not feel that the Scriptures contain any parallels to the Mexican traditions; and the Egyptian material in which he looked for comparisons was insufficiently known in his time. And, therefore, all his efforts to find parallels were repaid with no success. Nor did he understand the cause of the continental catastrophes, leaving to scholars in the natural sciences the task of dealing with the problem, which he felt they were compelled to do on the basis of the traditions of pre-Columbian days.

There are three more authors whom I feel obliged to mention, although I did not find in them more than one or another quotation which I could trace and re-employ, since my theory was ready when I came across their books, and it went far beyond the ideas of these authors.

The first of them is William Whiston (1667-1752), professor at Cambridge, who succeeded Newton there. Newton chose him as his successor but later opposed his being admitted as a member of the Royal Society of which Newton was the first president. In 1696 Whiston wrote a book, *A New Theory of the Earth from its Original to the Consumption of All Things,* in which he tried to prove that the Earth had contacted a comet which was the cause of the Deluge. He did not explain how a comet could cause a flood, and apparently ascribed this to the displacement of the seas. The idea that the Deluge was caused by a comet was not his: it is mentioned in the Talmud and used by Rashi (Rabbi Isaac ben Solomon), a Mediaeval rabbinical author often quoted by Christian authors during the Renaissance.[(10)](http://www.varchive.org/ce/precursors.htm#f_10)

A mention of the presence of a comet in the sky during the Deluge, though not described as its cause, is found also in the works of the chronographers of the sixteenth and seventeenth centuries who preceded Whiston: Abraham Rockenbach, Henricus Eckstormius and David Herlicius; and he refers to them as the factual sources for the basic assumptions of his theory. Whiston supposed that before the Deluge the year was equal to 360 days, and that the Earth had its pole of daily rotation perpendicular to the plane of its yearly revolution. He thought that this was the only world upheaval of which any memory survived and, not recognizing cosmic catastrophes in such events as the story described in Joshua 10:12, wrote: “The sun and moon, as if they were two globes of fire and light pendulous in our air, and hanging over certain places, are ordered to stand still, the one upon Gibeon, the other in the valley of Aijalon. . . . All which expressions, with many others through the whole Bible, plainly shew that the Scripture did not intend to teach men philosophy, or accommodate itself to the true and Pythagorick system of the world. The holy writers did not consider the heavenly bodies absolutely, as they are great and noble in themselves, main and glorious parts of the universe, very distant from our earth, placed at various and immense distances from it, and from one another ... disposed in a regular order, in proportionate and harmonious periods and revolutions. Under such consideration we might have expected another sort of presentation of the heavenly bodies, their original, designs, courses, and circumstances, than the foregoing texts, or other parallels, everywhere afford us.”[(11)](http://www.varchive.org/ce/precursors.htm#f_11)

Whiston did not see natural disturbances of world dimensions in the descriptions of Scripture, the Deluge excluded. He believed that the comet which caused the Deluge has a period of 575½ years and that it was the same comet which appeared in September -44 after Julius Caesar was killed, in the year 531 in the consulate of Lampadius and Orestes, in February 1 106, and at the end of the year 1680; and he believed that it will return again in 2256. He also came to the idea that the Earth was a comet before it became a planet. He did not recognize the role of the planets in historical cataclysms.

The second author whom I would like to mention is Baron Georges Cuvier (1769-1832). He is regarded as the father of the paleontology of the vertebrates. Investigating the strata of the ground, he came to the conclusion that the Earth underwent a series of cataclysms: “We discover in the midst of even the oldest strata of marine formation, other strata replete with animal and vegetable remains of terrestrial and fresh-water productions; and amongst the more recent strata, or, in other words, those that are nearest the surface, there are some in which land animals are buried under heaps of marine productions. When the traveller passes over those fertile plains where gently flowing streams nourish in their course an abundant vegetation, and where soil, inhabited by a numerous population, adorned with flourishing villages, opulent cities, and superb monuments, is never disturbed, except by the ravages of war, or by the oppression of the powerful, he is not led to suspect that Nature also had her internecine wars, and that the surface of the globe has been broken up by revolutions and catastrophes. But his ideas change as soon as he digs into that soil which now presents so peaceful an aspect. . . . If there is anything certain in geology, it is that the surface of our globe has been the victim of a great and sudden revolution, whose date cannot go back more than five or six thousand years.

“But these countries which today are inhabited, and which the last revolution has turned into dry land, have already been inhabited formerly, if not by men, then by land animals; consequently, a previous revolution had, at the least, brought them under water; and if one can judge by the different orders of animals whose remains one finds in them, they have perhaps undergone as many as two or three irruptions of the sea.”[(12)](http://www.varchive.org/ce/precursors.htm#f_12)

But he confessed that he was unable to find the cause of these cataclysms, and wrote: “It is these alterations which now appear to me to be the problem in geology that it is of the greatest importance to solve or, rather, to define, or even to circumscribe; for in order to resolve it satisfactorily it would be necessary to discover the cause of these events - an undertaking which presents a difficulty of quite a different kind.”[(13)](http://www.varchive.org/ce/precursors.htm#f_13)

“*In fine,* it is in those events that approach nearer to our own times, that we may hope to find some traces of more ancient events, and of their causes; if, indeed, after so many fruitless attempts as have already been made, one may be permitted to flatter himself with such a hope.”[(14)](http://www.varchive.org/ce/precursors.htm#f_14)

“These ideas have haunted, I may almost say, have tormented me, during my researches among fossil bones.”[(15)](http://www.varchive.org/ce/precursors.htm#f_15)

In a single passage Cuvier mentioned the idea of Whiston and mocked it, saying: “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 to sin, for which they were all drowned in the deluge, excepting the fish, whose passions were apparently less violent.” He was thus supporting the attitude of Voltaire against the ideas ofWhiston. As it is known, Lamarck before Cuvier, and Lyell and Darwin after him, “proved” that there were no cataclysms, and thus Cuvier was put on dusty shelves.

Ignatius Donnelly (1831-1901), a member of the American Congress in the days of Lincoln (1863-1869), ran in 1900 as a candidate for the Vice-Presidency on the “middle-of-the-road-populists” ticket. In between his political activities he wrote a few books which brought him the title the “Prince of U. S. Cranks” . In one of the books he tried to solve the authorship of the Shakespearian plays, ascribing them to Bacon; in another he tried to locate Atlantis; and in a third (the second in order of chronology), called *Ragnarok,* he came upon the idea that the Earth in the past met a mighty comet, and he attributed the deposits of clay, gravel, and silt on the Earth’s surface to contact in some bygone age with this comet. He supposed, for the sake of his theory, that clay, gravel, and silt cover only one half of the Earth, that which was facing the comet when it passed; thus China and eastern Siberia would have no clay or gravel.

Donnelly’s assumption regarding the distribution of clay and gravel is not based on any source or authority, and is entirely erroneous. He did, however, ascribe the catastrophe to the period when man already peopled the Earth; and I found in his book a number of references, especially to a few of those quoted by Brasseur, which I already possessed. The section in his book titled “Legends of the Age of Darkness” provides an abundance of references to a period of gloom. Nevertheless, Donnelly drew almost none of the conclusions to which he was obliged by his theory. He did not mention Whiston as his predecessor, and apparently was ignorant of him.

I do not know of any other modern authors who anticipated one or another point in my reconstruction of planetary disturbances in historical times.

\* \* \*

**HOERBIGER’S THEORY** To the Editor of The New York Times:

*One ofmy teachers in my adult life, a wise man, made the following observations: a newly discovered truth is first attacked as being false; but when it is finally accepted as true it is attacked as not being new.*

*During my writing of “Worlds in Collision “I often told my friends that I should like to arrive rather early at the time when my theory would be attacked as not original; it would be a sign that it was starting to become accepted.*

*R. Heymanson in a letter to* The New York Times *published on May 7 accuses me of offering what he says are “ideas which have long been old stuff to educated people in England and on the Continent of Europe” ; in his opinion my work does not possess “the virtue of originality. “ More specifically, he says that “everything” in my book is to “be found” in Hoerbiger’s theory.*

*Hoerbiger’s theory of cosmic ice is as follows: the space between the stars is not empty but is filled with thin ice; this ice offers a very minute obstacle to the movement of planets; every movement is thus slowed down; there were at least half a dozen small planets on concentric orbits between earth and Mars. The planet closest to earth was captured because of the slow-down movement and became a moon. After millions of years, again because of the obstacle presented by the cosmic ice, this moon on its orbit around the earth came so close to the earth that it was pulled down and crashed on the ground. This caused a world catastrophe. After millions of years another planet was captured, after more millions of years it also crashed on the earth and so on.*

*The present moon is at least our sixth moon and will also fall on the earth in some millions of years to which, according to Hoerbiger and his followers, the Book of Revelation of John carries testimony. Then Mars will be captured and will become our next moon.*

*The geological ages, according to Hoerbiger, must have been much longer than accepted by the geological scientists — in the range of billions of years; and for tens of millions of years human beings have existed and also carried their traditions.*

*The views expressed in “Worlds in Collision,” which hold that the geologic ages must have been much shorter (with all the implications for the theory of evolution), are diametrically opposed to Hoerbiger’s theory.*

*In two or three instances where I used a source learned by me from Hoerbiger or Bellamy, his interpreter, I gave the proper credit by indicating book and page.*

IMMANUEL VELIKOVSKY

New York. June 21. 1950

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5. *Sir Isaac Newton’s Mathematical Principles,* tr. into English by A. Mott, revised by F. Ca-jori (Berkeley, 1946), p. 408.
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8. [Seneca asserted this on the authority of Apollonius *(Quaestiones Naturales),* Bk. VII: “De Cometis,” IV.1. That the Pythagoreans held the same belief, see Aristotle, *Meteorologica* 11.6.2.; Posidonius, *Scholia ad Aratum,* 1091 in Posidonius, *The Fragments,* L. Edelstein and 1. G. Kidd eds. (Cambridge Univ. Press, 1972), fgm. 131b, p. 123. As to rabbinical sources seeW. M. *Feldman, Rabbinical Mathematics and Astronomy* (New York, 1931), p. 216 for the statement of R. Joshua of the second century mentioning a star which returns every seventy years. It is sometimes thought that the reference is to Halley’s comet. *-JS*]
9. Brasseur de Bourbourg, *S’il existe des sources de l’histoire primitive du Mexique dans les monuments égyptiens et de l’histoire primitive de l’ancien monde dans les monuments americains?* (Paris, 1864): “Pour retrouver la plus ancienne histoire du globe, il fallait comparer aux antiques traditions de l’Asie et de l’Egypte celles des peuples primitifs de l’Amerique.”
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12. G. Cuvier, *Discours sw les revolutions de la surface du globe et sur les changements qu’ellesont produitsdansle regne animal* (eighth edition, Paris, 1840), p. 280 (English transi. 1827,5th ed.).
13. Cuvier, *Discours sur les revolutions de la surface du globe,* p. 281.
14. *Ibid.,* p. 283.
15. *Ibid., loc. cit.:* “Ces idées m’ont poursuivi, je dirais presque tourmenté, pendant que j’ai fait les recherches sur les os fossiles.”