

COMMITTEE VI

The Universe and Its Origin:
From Ancient Myth to Present Reality
and Fantasy

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THE VELIKOVSKY AFFAIR

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The Velikovsky Affair

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In 1950 Dr. Immanuel Velikovsky, an M.D. (psychiatrist) from Moscow University, a biblical scholar, an Egyptologist, a papyrologist, a self-taught physicist and astronomer (with many gaps in this phase of his education), a linguist, a writer, a lecturer, and a most stubborn opponent in a debate, published "The Worlds in Collision", a book that stirred a violent tempest in the scientific (particularly, the astronomical) world, and generated a controversy that continued until Velikovsky's death, some thirty years later. This book would probably have caused much less of an uproar, or none at all, if it had been published some ten years earlier or later, if Velikovsky had presented it as primarily speculative rather than as scientific truth, had not affirmed categorically throughout the book that the Newtonian gravitational theory of the dynamics of the solar system is wrong, and had not insisted that he was the discoverer of a new solar system dynamics that explained all known solar system observations, ranging from the surface temperature of Venus to the emission of radio waves from Jupiter.

The scientists' (particularly the astronomers') anger was further compounded by the way the book was published, with particular annoyance at its pre-publication publicity, which promised discoveries so startling that the very foundations of science would be shaken, and all of this by a non-scientist, an outsider with whom most laymen, particularly theological fundamentalists and cranks, could easily identify. No wonder the book became an overnight best seller.

That it was first published by MacMillan, perhaps the most famous publisher at that time of the outstanding authors of physics and astronomy,

was considered an affront by many prestigious scientists, and a violent campaign, led by the late famous Harvard astronomer, Harlow Shapley, was directed against MacMillan, urging it to cease publication of "Worlds In Collision", to which MacMillan agreed, under threat of being cut off from any new book manuscripts from the science community. Fearful of irreparable financial damage to MacMillan and himself, Velikovsky accepted Doubleday's offer to take the book off MacMillan's hands and re-issue it under its own imprint. The only people who suffered under this arrangement were Gordon Atwater, then director of the Hayden Planetarium and Chairman of the Astronomy Department of the American Museum of Natural History, and James Putnam, associate editor of MacMillan; they were both summarily dismissed from their positions. Atwater had advised MacMillan to publish the book and had strongly touted and defended it in print before and after its appearance, and Putnam had accepted it for publication very enthusiastically and thus became MacMillan's natural whipping boy. Some of the orpus for the book's publication fell on others such as Eric Larrabee, author, John Lear, author, John T. O'Neill, science editor of the now defunct "New York Herald Tribune" and Dr. Horace M. Kallen a famous philosopher, who were not directly involved in the book's publication but had praised it warmly. Already in 1946 O'Neill referred to Velikovsky's manuscript before its publication as "a magnificent piece of scholarly historical research", Larrabee and Lear wrote articles in Harpers and Colliers, announcing Velikovsky's work as a major discovery, ranking with the work of Darwin, Newton and Einstein, and Kallen praised its originality.

That the book appeared, with its challenge to scientific authority, shortly after the dropping of nuclear bombs on Hiroshima and Nagasaki must have greatly influenced the scientific community in its bitter and violent denunciation of Velikovsky, which was so intemperate and uncritical as to label him a charlatan, who had no regard for truth, but sought only self-aggrandizement. The scientists who condemned Velikovsky's astronomy as

trash sought the aid of historians and biblical scholars to strip Velikovsky's historical research of any merit, although it was clear to everyone who read Velikovsky's writing that his historical research was very sound; but his astronomy and science in general were so faulty and uncritical that his worthy researches were not and are still not given the attention they deserve.

As I indicated, the tenor of the times in 1950 was hardly conducive to quiet acceptance of what many scientists considered a threat to their victory in their long struggle against ignorance and irrationalism. The production of the nuclear bomb and the direct evidence of its power had elevated scientists to unheard of social, political, and military levels. Their names were household words, and they became unfathomable, but infallible, intellectual figures to whom no problems were insoluble. But already second thoughts about the morality of the bombing of Hiroshima and Nagasaki were casting doubts about the human qualities of scientists, and now Velikovsky was questioning the validity of their science, not at some minor level, but ^{on} ~~at~~ the very highest plane - the law of Newtonian gravity as applied to planetary motions. If accepted by the public, this could lead to a backlash that would threaten scientific progress at every level. Hence the need to denounce Velikovsky's work and all he stood for if science and scientists were not to suffer a severe decline in the public's estimate. Velikovsky was to state some years later, in his own evaluation of the cause of the scientists' intense opposition to his theories, that "...I was...carrying my heresy into the a most sacred field, the holy of holies of science, to celestial mechanics..."

Velikovsky's popularity and the great appeal his books held for the public stemmed not only from his challenge to science but also from his scholarly credentials, which placed him far above the common,

run-of-the-mill crank^s who continuously bombard the public with tracts supporting such nonsensical ideas as a flat or hollow earth, astrology, perpetual motion machines, anti-gravity devices, etc. Velikovsky's credentials were not those of a scientist, but they were formidable and overwhelming to a non-scientist. He was described, in the publicity for "Worlds In Collision", as "an editor, historian and physician with an incredible range of competence in the sciences". Born in 1895 in Russia, he had, indeed, studied, though not in equal depth, a wide range of subjects, including the natural sciences, economics, law, history, medicine, and psychoanalysis at universities in Edinburgh, Charcow, Moscow, Vienna, and Zurich; he was thus, quite properly, considered to be a "universal student". This very scholarliness, of course, contributed to the anger and antagonism of the opposing scientists, for they felt that Velikovsky was using his scholarly stature to perpetrate a scientific fraud and thus to elevate himself to the ranks of the greatist minds. But in this evaluation of Velikovsky's motives, attitude, and philosophy they were wrong.

Velikovsky had not set out to challenge Newtonian authority and to invent a new cosmology, or even to question some features of Newtonian gravity as applied to the motions of the planets. Indeed, with a meager background in mathematics and astronomy and hardly any in physics, he was ill prepared for such a project, to say the least. Already established in Europe as an author and a noteworthy scholar when he came to New York in 1939 he planned only to carry on his historical researches in the Columbia University libraries. His interests turned to ancient history, particularly as developed in Egyptian papyri, biblical sources and the mythologies and folklores of various civilizations. According to his own account he spent ten years comparing these historical sources, and concluded that there is a chronological discrepancy between the

biblical portrayal of the exodus and the portrayal, in the Ipuwer Papyrus of, what Velikovsky accepted as the same series of events, a series of catastrophies that struck the Egyptians. To validate this conclusion Velikovsky had to bring Egyptian history into coincidence with biblical history and that required advancing Egyptian chronology by about 500 years. This was the starting point of "Worlds In Collision" and his cosmological adventures, which he embarked upon for historical rather than for scientific reasons. He describes his reasons for his "great adventure" and state of mind at that time in a very revealing passage in the preface of "Worlds in Collision":

It was in the spring of 1940 that I came upon the idea that in the days of the Exodus, as evident from many passages of the Scriptures, there occurred a great physical catastrophe, and that such an event could serve in determining the time of the Exodus in Egyptian history or in establishing a synchronical scale for the histories of the peoples concerned. Thus I started Ages in Chaos, a reconstruction of the history of the ancient world from the middle of the second millennium before the present era to the advent of Alexander the Great. Already in the fall of that same year, 1940, I felt that I had acquired an understanding of the real nature and extent of that catastrophe, and for nine years I worked on both projects, the political and the natural histories. Although Ages in Chaos was finished first, in the order of publication it will follow this work.

Worlds in Collision comprises only the last two acts of the cosmic drama. A few earlier acts--one of them known as the Deluge--will be the subject of another volume of natural history.

It is clear from this passage that his principal concern initially was to set the historical record straight as far as the Exodus from Egypt is concerned. But he was soon led to geologic and astronomical conclusions that are completely at variance with the the gravitational dynamics of the solar system, and ^{he} thus decided to construct his own planetary dynamics. A hint of this is given in the third sentence of the above passage where he states that in the fall of 1940 he "had acquired an understanding of the real nature and extent of that catastrophe..."

Here his interpretation and understanding of "That catastrophe" went far beyond the Exodus--to him it meant something global, which could have its explanation only in a series of vast celestial phenomena. He was drawn to that ⁿconclusion by his "discovery" that all civilizations at the time of the Exodus described catastrophic events, and these 'coeval global upheavals' greatly influenced his thinking, as indicated by the following paragraphs from "Worlds in Collision":

The historical-cosmological story of this book is based on the evidence of historical texts of many peoples around the globe, on classical literature, on epics of northern races, on sacred books of the peoples of the Orient and Occident, on traditions and folklore of primitive peoples, on old astronomical inscriptions and charts, on archaeological finds, and also on geological and paleontological material.

If cosmic upheavals occurred in the historical past, why does not the human race remember them, and why was it necessary to carry on research to find out about them? I discuss this problem in the Section "The Collective Amnesia." The task I had to accomplish was not unlike that faced by a psychoanalyst who, out of disassociated memories and dreams, reconstructs a forgotten traumatic experience in the early life of an individual. In an analytical experiment on mankind, historical inscriptions and legendary motifs often play the same role as recollections (infantile memories) and dreams in the analysis of a personality.

Can we, out of this polymorphous material, establish actual facts? We shall check one people against another, one inscription against another, epics against charts, geology against legends, until we are able to extract the historical facts.

In a few cases it is impossible to say with certainty whether a record or a tradition refers to one or another catastrophe that took place through the ages; it is also probable that in some traditions various elements from different ages are fused together. In the final analysis, however, it is not so essential to segregate definitively the records of single world catastrophes. More important, it seems, is to establish (1) that there were physical upheavals of a global character in historical times; (2) that these catastrophes were caused by extraterrestrial agents; and (3) that these agents can be identified.

The last three lines in the final paragraph of this quotation are the key to Velikovsky's transition from a scholar and historian to a purveyor of a new theory of planetary motions; he had to find some kind of celestial phenomena that had an important (that is, observable

on a grand scale) impact on the geological history of the earth and whose epoch and span of time coincided with the global catastrophes described in the bible (e.g. the exodus, Joshua's command that "the sun stand still", etc.) and ⁱⁿfolklore and tales from all over the globe (Mayan, Egyptian, Greek, Finnish) of similar events, such as fires, earthquakes, floods, etc. He buttressed his arguments for the need of a non-Newtonian solar system dynamics by pointing to the many questions about the sun and planets that are still unanswered. In particular, he emphasized the present apparent conflict between modern theories of gradual evolution and catastrophism and placed himself squarely on the side of catastrophism and, in particular, in favor of "cosmic collisions" as "implicit in the dynamics of the universe".

Having arrived at this point of view Velikovsky sought unassailable "historical evidence" for the the causes of the coincident global catastrophe's as described in prehistoric tales and legends, and found what he accepted as such evidence in the ancient records of the apparent motions of Venus among the constellations and its "strange appearance", as recorded by observers in various ancient civilizations. He discovered, according to his own account, that Venus is not mentioned in the Egyptian papyri that were written before the Exodus nor in the literature, in that period, ^{of} other civilizations. Venus' first recorded appearance came, again, according to Velikovsky, only with the onset of the catastrophes. Moreover this literature, taken from hundreds of sources by Velikovsky, describes Venus not as one of the other four known planets but as a strange extended object. From these descriptions and the datings he concluded that Venus is a new planet, born, about 1500 BC, first as a comet which, in that form, produced all the recorded catastrophes in a series of encounters with the earth. Only some hundred years later, in this Velikovskian history, did Venus shed its comet trappings to

become a well-behaved planet. From this "birth of Venus", with incredible ingenuity and disregard of basic scientific principles, did Velikovsky develop a new version of geologic catastrophism and a new dynamics of the solar system in which gravity plays a minor role. These hypotheses also led him to "novel suggestions on an almost incredible range of subjects" from the identity of the Queen of Sheba to the cause of ice ages; from a new theory of evolution to the origin and nature of the manna that fed the wandering Israelites; from the ejection of Venus from Jupiter to radio waves from Jupiter and so on. To build his case Velikovsky quotes from innumerable sources culled from many ages and many parts of the world; thus "Worlds in Collision" contains references to some 5,000 sources and over 300 correlations and deductions.

With little understanding of the severe restrictions that the basic conservation principles (the conservation of energy, momentum and angular momentum) impose upon the motions of bodies in a dynamical system such as the solar system, and a profound belief that he had unraveled a great historical mystery and thus found the answers to some very perplexing geologic, geographic and astronomical questions, it was easy for Velikovsky to jump from the apparent gaps and discrepancies in the ancient data about Venus to the conclusion and unshakable belief that Venus is a young planet that was ejected some 3,500 years ago as a huge comet by a great cataclysm on Jupiter. This idea struck him like a thunderbolt and impelled him to search for supporting evidence for his bizarre hypothesis wherever he could. If he was to challenge scientific facts ^{and theories} that had stood the test of hundreds of years of careful observations and had great predictive powers, he had to play the game of the scientists, which meant far more than just making some broad statements about biblical stories, Egyptian papyri ,

collective amnesia, and calendar discrepancies. To this end Velikovsky pursued three distinct courses: 1.) develop a new theory of geologic catastrophism as against gradualism; 2.) present a series of astronomical and geological deductions that stem from his hypothesis; 3.) learn some basic science.

Fully aware of the great gap in his knowledge and understanding of physics and astronomy, Velikovsky came to me in the early part of 1951, before "Worlds in Collision" appeared, to ask that I tutor him in astronomy, a request which I had to reject. I agreed, however, to discuss his ideas critically and point out where he was wrong. This led to a series of interviews, telenhone conversations, exchanges of letters, debates, and confrontations in journals. Two things were immediately clear to me: 1.) Dr. Velikovsky was not charlatan or crank but a dedicated, brilliant scholar whose historical investigations led him to his non-Newtonian solar system of dynamics, to which he stubbornly adhered until his death; 2.) he had only the vaguest understanding of such basic physical principles as conservation of energy, conservation of angular momentum, gravity, and entropy.

When I pointed out to him that his description of Venus as an errant, unpredictable, meandering comet conflicts and, indeed, contradicts both the principle of conservation of energy and that of angular momentum, he argued that historical evidence must guide us in our acceptance or rejection of scientific principles, and if there is a conflict between a scientific theory and history, so much the worse for the theory. If, he insisted, Newton's laws cannot explain the historical evidence about Venus' behavior, then Newtonian gravity, as the governing force in the solar system, must be replaced by another force, and he believed that he had found what he wanted in the electromagnetic force that, he insisted, could account for the "historical astronomical facts". He made the

point that Newton had developed his gravitational theory of the dynamics of the solar system long before the electromagnetic force was understood or even known in more than a very superficial way; hence, he argued, gravity plays a minor role in the solar system and, taken alone, leads to an incomplete description of planetary motions.

With this hold but incorrect idea to "guide" (really misguide) him, and, in spite of our many discussions and his gradual acceptance of basic physical principles, he persisted in maintaining his overall thesis of general catastrophism rather than gradual evolution as the prime cause of changes on the earth and in the heavens. Since, according to Velikovsky, the sudden birth of Venus caused this ^{pk}catastro^hism, this birth had to be dramatic enough to call the attention of all the peoples of the world to it and had to be accompanied by enough energy to do all the remarkable things Velikovsky ascribed to it. And here mythology came to his aid with its many references to powerful Jupiter and his "thunderbolts" and to the birth of Athene (Venus) from "the head of Jupiter" in a "ball of fire". Accepting this fanciful picture as a literal description of actual celestial events, Velikovsky based his entire thesis on the idea, which he accepted as a fact, that "Venus was expelled (from Jupiter) as a comet and then changed to a planet after contact with a number of members of the solar system". This led him to predictions about Venus, the moon, the earth, Mars and Jupiter which were later verified. Thus, he reasoned, that since Venus was born in a burst of flame only a few thousand years ago, its surface still had to be hot since it had no time to cool off, and Jupiter, still in a state of violent activity, owing its "painful" ejection of Venus, must be a strong source of radio waves. The subsequent observational discovery

by K. Franklin that Jupiter emits intense radio waves, and the further discovery, from the intensity of radar waves from the surface of Venus, that the temperature of that surface must be about 800°F convinced Velikovsky that his theory of the origin of Venus and his reconstruction of its history were correct. It was, of course, obvious to scientists that this conclusion was completely unjustified, for the prediction of an event does not validate the thesis on which that prediction is based. This was, indeed the essential point at issue between Velikovsky and his critics. That correct deductions can be drawn from false premises is too obvious a truth to be argued, but this simple point either escaped Velikovsky or he refused to accept it. In any case he built a vast pyramid of predictions on it and gathered every bit of information he could find in astronomical and geological literature that lent credence to that pyramid.

Since the scientific community on the whole was convinced that Velikovsky's researches had no merit at all, whether historical or scientific, it completely disregarded his predictions, for which he was given no credit and which were never referred to or mentioned in the literature. It is no wonder, then, that Velikovsky became deeply embittered, frustrated, and accusatory. Whether his basic assumptions were correct or not, he felt that the truth of his predictions should be recognized and his prior rights to them should be acknowledged. As a last resort in his battle for recognition he appealed for fair treatment directly to individual scientists, among them the well known Princeton physicist, Victor Bargmann and myself. Recognizing the justice of his priority claims we therefore wrote a letter to the AAAS journal SCIENCE whose last paragraph stated our position as follows:

Although we disagree with Velikovsky's theories, we feel impelled to make this statement to establish Velikovsky's priority of prediction.

This letter, appearing as it did, in the December 12, 1962 issue of SCIENCE, when the intense heat of the Velikovsky battle had been dissipated, was used as ammunition by the pro-Velikovsky forces to continue their hopeless battle to overthrow Newton. Since our position and point of view were misinterpreted or deliberately distorted by Velikovsky's supporters, I wrote a letter to HARPER's which stated our position clearly; while pointing out the unsupportableness of Velikovsky's physics, I still appealed, as indicated in the following excerpts from that letter, for a fair evaluation of Velikovsky's scholarly contributions:

"...a careless reading of Eric Larrabee's article may leave the unwary reader with the false impression that Dr. Bargmann and I accept and agree with Dr. Velikovsky's ideas...I do not support Velikovsky's theory but I do support his right to present his ideas and to have these...considered by responsible scholars and scientists as the creation of a serious and dedicated investigator and not the concoctions of a charlatan seeking notoriety.

...Dr. Velikovsky's ideas do not constitute a new theory since they contain no new fundamental principles of nature....

That there is no astronomical evidence for electromagnetic forces of the magnitude required by Velikovsky's theory...and that such forces of the required magnitude...would destroy the...completely verified laws of planetary motion are not accepted by Dr. Velikovsky as valid arguments against his ideas. Since...these...have led him to certain predictions...he is convinced that his ideas must be right. But...verified predictions alone do not validate a theory, and my position is that nothing has happened during the last decade to make Velikovsky's theory any more acceptable now than...when... first published....

...however,...his predictions should be recognized and...his writings...carefully studied and analyzed because they are the product of an extraordinary and brilliant mind, and are based on some of the most concentrated and penetrating scholarship and research of our period...Dr. Velikovsky has performed a service to science in collecting the vast amount of data...and bringing clearly to the attention of the scientific community the many discrepancies that exist in our understanding of the history of our earth during the last geologic period."

Now that the Velikovsky affair is rapidly being forgotten and losing its ability to excite antagonisms, we can evaluate dispassionately its impact on science and on our thinking in general. As far as science is concerned, its influence was nil, for Velikovsky's entire hypotheses rests on his false assumption that Venus was ejected from Jupiter as a comet. As I have already shown in a rebuttal to Velikovsky that appeared in the YALE JOURNAL following a Princeton debate between Velikovsky and myself, Velikovsky's Venus-Jupiter hypothesis is wrong, in fact, impossible from the very start. For Jupiter to have ejected from its interior a mass equal to Venus's, at a speed needed to launch it into its present orbit around the sun, Jupiter would have had to release or expend in a matter of seconds or minutes as much energy as our sun emits in more than a year. Jupiter would therefore suddenly have appeared as bright as a million suns emitting enough energy to vaporize all the planets near it, especially the earth. This alone shows the absurdity of Velikovsky's claim; but there are other arguments against it as devastating as this which I shall not go into. In any case, all of Velikovsky's "remarkable predictions" have been fully explained by the standard physical theories without calling upon Venus.

What about Velikovsky's historical research which triggered his attack on the Newtonian gravitational dynamics of the solar system? Was it honest research or deliberately falsified to support his wrong astronomical assumptions and his electromagnetic solar system? The scientists who had organized the violent and bitter attack against Velikovsky's cosmology also did all they could to discredit his historical research, calling upon such prominent historians as O. Neugebauer at Princeton to show that Velikovsky's ancient chronology is incorrect. The late noted astronomer Cecilia Payne-Gaposchkin, who was somewhat of an authority in the history of

science, accused Velikovsky directly of misquoting the Egyptian papyri and other ancient historians such as Heroditus; Neugebauer attacked him on similar grounds. Later evidence showed that Payne-Gaposchkin had misrepresented Velikovsky's historical theories to make them appear ludicrous. Similarly, Neugebauer's criticism appeared to be without merit.

At the present time the evidence about the chronology of ancient events favors Velikovsky. In particular, he was right on the age of the Meso-American civilization and the dating of Tutankhamen and so he performed an important service in calling the attention of historians to these discrepancies in ancient chronology. But his being right in these instances does not validate his astronomy.

In a recent book The Cosmic Serpent the British astronomers Victor Clube and Bill Napier refer to Velikovsky's work as a "remarkable piece of historical analysis" and that his identification of the Queen of Sheba with the Egyptian Queen Hatshepsut, who visited King Solomon in the "legendary land of Punt" (now Palestine), is a "significant and remarkable achievement" and that it has not "been given the attention by experts that it deserves." They go on further to say that "there was a widespread anticipation of an encounter of the earth with a comet or its debris in 687 B.C. and this event could have been as he (Velikovsky) suggests, a significant turning point in the history of civilization."

One final point in favor of Velikovsky is his emphasis on the important role of catastrophe in geologic processes, which is now generally accepted. Here, too, his historical analysis was decisive in bringing him to that position.

In the final analysis, the Velikovsky affair did not diminish but enriched the history of science revealing, as it did, the frailty of the tolerance of the scientific community. Velikovsky's only "sin" was in

trying to promote a faulty solar-system dynamics, but his speculations are meek and really well within the bounds of accepted scientific theorizing compared to what is going on in cosmology and particle physics today. Honest errors and speculation in the pursuit of science are absolutely essential; without them there can be no progress. We scientists should therefore welcome people like Velikovsky who, periodically, force us to re-examine our basic assumptions, rather than reject and revile them.