

Immanuel Velikovsky and his *Worlds in Collision*,

50 years after...

(Emilio Spedicato)

Introduction

Half a century ago (more precisely in 1950 published by McMillan, in 1951 by Doubleday, the house to which the publications rights were transferred after boycott threats to McMillan by the astronomical academia) a book was published of substantial size and very rich in references, titled *Worlds in Collision*. It was a bestseller in US in 1952 and appeared in condensed form in Readers Digest, including the Italian version Selezione. At that time the present writer was a schoolboy of seven, an avid reader of everything printed. I read the article in Selezione with utmost fascination, being particularly impressed by the explanation provided of the "miracle" of the Sun stopping in the sky during the siege of Jericho.

Then I forgot both the name of the author and the book. These I recalled suddenly over 30 years later, when I was discussing with an Irish colleague some ideas I had developed about a possible catastrophic origin of ice ages and explanation within this context of the origin of the Atlantis myth. Velikovsky had been forgotten at the conscious level, but had left a seed in the deep that was going to germinate.

When his book was published, Velikovsky (later on referred to as V.) was unknown for most people, albeit he was well known to a limited number of scientists. Indeed, in addition to several papers in psychiatry, in the Thirties V. had edited in collaboration with Albert Einstein the journal *Scripta Universitatis atque Bibliothecae Hierosolymitarum*, that was instrumental in leading to the establishment of the Hebrew University in Jerusalem. The great success of his book with the public was due to several factors, partly related to a postwar reawakening of interests in religious traditions and widespread critical sentiments against a science that had led to the atomic weapon and to the risk of a nuclear obliteration of humankind. Also a factor was the publicity provided by the opposition to the book by the astronomical academia led by Shapley and Payne Gaposhkin, who forced McMillan to discontinue the publication of the book. There are not many authors who incur the attacks of the academia, who tends to simply ignore those who propose alternative points of view from the outside.

Worlds in Collision was mainly devoted to a nonstandard presentation of events in the recent life of the solar system. In the following years V. published several other books with no less revolutionary content in the field of geology, chronology and ancient history. He gave moreover talks in several countries and

inspired a number of journals and study groups, who further developed his ideas, some of these being still quite active. Many of the ideas of V. have by now been accepted by academia, albeit quite often his precursor role is simply ignored.

Debate and influence of V. have been quite significant in the anglosaxon world (US, Canada, England, Australia and New Zealand). Much less the attention in the Latin world, perhaps due to the less interest in these countries for biblical topics. Concerning Italy, we should recall that V. got positive attention by the great mathematician Bruno de Finetti and that the science historian Federico Di Trocchio has devoted to him a substantial chapter of his book *Il Genio Incompreso*.

In next sections we will give some biographical information on V. and on the content of his main monographs *Worlds in Collision* and *Ages in Chaos*. Then we end with information on a forthcoming symposium on V. organized by the University of Bergamo.

Immanuel Velikovsky: a biographical sketch

Velikovsky was born in 1895 in Vitebsk, city of western Russia, then counting about 70.000 inhabitants, many of them Jews, native city also of Chagall. Third son, his name was chosen by father during a solitary promenade in the nearby woods. We read in his autobiography *Days and Years* available in the internet site due to Jan Sammer (www.varchive.org) "*my name was chosen from a verse of the seventh chapter of Isaiah; there was no Immanuel among the ancestors known to him... he expected from me a great role concerning the tragic story of our nation...we should see the personality of my father, a Jew with a vision of national reawakening.... When I was seven my father showed m the chapter of Isaiah with the name Immanuel...*".

1895 was the year when Freud began writing *The interpretation of dreams*, when Roentgen discovered X rays and when, exactly on 10th June, the day V. was born, Herzl wrote in his diary *I take in my hands the broken thread of the tradition of my people: I will bring them to the Promised Land...*

From Vitebsk the family moved to Moscow, where his father became a successful businessman and one of the most active persons in the Sionist movement. He was among the first organizers of the policy of buying land in Palestine for kibbutz.

Immanuel did classical studies, learnt several languages and excelled in mathematics. As teenager he traveled widely to Europe and to Palestine (Tel Aviv had been founded only three years before). He graduated in medicine in Moscow in 1921, after doing part of the studies in Montpellier. He left Russia after the revolution with an adventurous escape via the Caucasus. He settled first in Berlin, marrying Elisheva Kramer, a brilliant performing violinist and pianist. He started in this period the editorial work of the above quoted journal *Scripta Universitatis...*, whose mathematics and physics section was under the care of Albert Einstein.

From 1924 to 1939 he lived in Palestine; in 1930 he published a paper where, apparently for the first time in literature, he proposed that epilepsy was characterized by pathological encephalograms.

The interest of V. for a reinterpretation of ancient history was kindled by reading Freud's work *Moses and*

Monotheism. In contrast with the interpretation of Freud, V. got the idea that pharaoh Akhnaton was the real figure behind the mythical Oedipus. Such idea was further developed in the year 1930 that V. spent researching in the libraries of New York producing the extraordinary book *Oedipus and Akhnaton*, published only in 1960, that this writer read nonstop between 9pm and 3am. In this book V. analyzes the impressive parallelisms between what is historically known on Akhnaton and the data of the Greek tradition on Oedipus, in the context of his revised chronology of Egyptian history. Thus Akhnaton is dated not only well after Moses (therefore killing any hypothesis of Moses getting from him the idea of monotheism) but even after Solomon, i.e. in the ninth century, not many years before the Assyrians would invade Egypt and put it under their control, a thesis later developed in the book *The Assyrian conquest* (still unpublished, albeit available in the quoted internet site).

In April 1940 V. got the idea that a great natural catastrophe characterized the time of Exodus, interpreting the phenomena described in the Bible as the Ten Plagues of Egypt as natural phenomena due to an extraterrestrial cometary origin. The idea was reinforced when he found a description of similar events in an Egyptian source, i.e. the Ipuwer papyrus of the Leiden collection. He therefore abandoned his profitable profession of psychiatrist for a full time study lasting many years of ancient and modern documents useful for his thesis. *Worlds in Collision* was the outcome of ten years of research in the great libraries of New York and Princeton (he had moved to Princeton at the beginning of second world war). Several other books followed in a short time dealing with geological issues (*Earth in Upheaval*) and especially with chronological issues and corresponding revision of ancient history of the eastern Mediterranean countries.

In Princeton V. reestablished frequent and friendly contacts with Einstein, with long discussions on astronomical and historical topics. Einstein frequently visited him at his home where his violin playing was accompanied by the piano playing of V. wife Elisheva. The story of his contacts with Einstein in these years is available in another of the still unpublished books, *Before the Day Breaks*, available in the quoted internet site.

During the Fifties and Sixties V. was persona non grata in universities and research centers in US. However when first space missions confirmed in a spectacular way some of his forecasts he was invited to give talks in several universities (Brown, Yale, Pennsylvania, Columbia, Dartmouth, Duke, Rice...); of great success were his conferences at Harvard and McMaster at the beginning of the Seventies.

V. died aged 84 in Princeton, in 1979. The archive of his works – including several still unpublished monographs – is under care of his surviving two daughters, Ruth, a psychanalist in Princeton, and Shulamit, who lives in a kibbutz near Haifa, married with the well known mathematician Abraham Kogan.

Worlds in Collision

Worlds in Collision was published in US by McMillan in 1950 and from 1951 by Doubleday, that got the publications rights from McMillan, after Shapley let McMillan know that its role of important publisher of academic works in astronomy was threatened by the presence of V. book in its catalogue. The story of this censorship episode and of other events about the difficult relation of V. with American academia is available in the book *Stargazers and Gravediggers*, published in 1983 after V. death, copyright of Elisheva V.

Worlds in Collision had immediate great success with the readers, albeit it had been rejected by several publishers previously contacted (a similar story happened around that time with Thor Heyerdahl *Kon Tiki*) and was defined by New York Times "A literary earthquake". In the preface to the paperback edition V. wrote: *First published in 1950, this book was left unchanged in all subsequent printings...in 1950 it was generally assumed that the fundamentals of science were all known and that only details and decimals were left to fill in. In the same year, a cosmologist, certainly not of a conservative bent of mind, Fred Hoyle, wrote in the conclusion of his book "The Nature of the Universe": "Is it likely that any astonishing new developments are lying in wait for us? Is it possible that the cosmology of 500 years hence will extend as far beyond our present beliefs as our cosmology goes beyond that of Newton? ... I doubt whether this will be so. I am prepared to believe that there will be many advances in the detailed understanding of matters that still baffle us...But by and large I think that our present picture will turn out to bear an approximate resemblance to the cosmologies of the future..."*. That Hoyle's opinion was then the dominant one was recently confirmed to me by a statement made at a meeting dealing with the planned (in 2012) GAIA ESA mission by the famous Italian physicist Salvini (quoted not verbatim): *Forty years ago we believed to know all essentials, now we are in deep uncertainties...* About Hoyle one has anyway to observe that he later became an advocate of radical new theories and has been in particular a strong opponent of the big bang theory, albeit this name was invented by him. Hoyle has quoted V. in his autobiography (they met at a seminar given by Hoyle) without any of the usual heavy criticism by most people in the academia.

The book *Worlds in Collision* is based upon the hypothesis that the events of clearly catastrophic nature described in ancient literature, particularly in the Bible, are phenomena that really happened, whose explanation cannot be given in a purely terrestrial context and must therefore be found in interactions between Earth and extraterrestrial bodies. The book deals in particular with two catastrophes: the first one associated with Exodus, the second one with the siege of Jerusalem by Sennacherib (that is dated some 20 years after Sargon II had conquered and deported the Ten Tribes of Israel, to a place that has been subject of much discussion and that this writer have identified with eastern Afghanistan...). V. claimed that the agents of the catastrophe were not ordinary comets or asteroids but two planets, namely Venus in the first case, Mars in the second case. According to him these planets had at that time orbits with different shape, more elliptical than now, as consequence of previous interactions with other planets in the solar system (the story of the previous events in the solar system is partly given in the book *At the Beginning*, another of the unpublished works available in the cited internet site). The orbits of the two planets would have been circularized after the last catastrophe, thereby terminating for our planet the catastrophic era, where planets were a real threat and where astrology was a real science based upon the study of planetary interactions in a differently organized solar system. The book is based mainly on the analysis of a huge number of classical and mythological references (about a thousand quotations, of texts in many languages or of difficult access). While the analysis is never quantitative – and a quantitative analysis of the scenarios proposed by V. would even with present computer power be beyond modeling and computation possibilities – V. is well aware of where modern science stood and has a number of pointed criticism to the traditional scenarios, in particular where they only consider gravitational effects in the astronomical relations, neglecting the electromagnetic effects, both on large scale and in the study of close flybys of large bodies.

Worlds in Collision is written with a very clear albeit synthetic language. We cannot here give a detailed presentation of the extremely rich content of this book, thus we only review some of the main theses.

- V. stresses the information value of ancient texts, based according to him on real experiences lived in a different astronomical context than now. The idea that the events described in ancient texts pertained to real experiences used to be accepted without difficulty in western world until Illuminism: this included in particular the idea of catastrophes within human memory, including the Universal Deluge described in the Bible and in other traditions (Deucalion,...). These ideas were accepted by Newton and Cuvier. Illuminism started criticism of Bible opening the way to the so called *uniformitarianism* approach that became dominant in the 19th century thanks in particular to the works of Lyell in geology and of Darwin in biology: the present is the key of the past, there are no celestial catastrophes today, there were none in Moses time. No stones fall from the sky today, no stones could have fallen in the past (this extreme statement dominated astronomy well into the second half of 19th century, when a heavy fall of meteorites in France convinced the astronomers to accept ancient records of falling stones). Now, fifty years after *Worlds in Collision* we can certainly say that scholars in the natural sciences pay more attention to ancient records of catastrophes. Such attention is partly due also to the existence of technological means, not available at V. time, to verify the effects of such unusual events in the geological and biological record: sophisticated analysis of pollen and other organic material in lacustral and oceanic sediments, analysis of organic and inorganic materials in long ice carrots extracted in Greenland or Antarctica, dendrochronological series extending now to about 10.000 years in some cases. From such analysis evidence has emerged of strong climatic variations in the last 12.000 years, some setting so quickly that they can probably not be explained in terms of the usual terrestrial processes. Finally the direct observation in the case of the Shoemaker-Levy comet of the processes of disintegration proposed by V. and other neocatastrophists (especially Clube and Napier) and of planetary impact, an event that astronomers considered extremely unlikely to be able to observe in their lifetime, has made the astronomical community conscious that our solar system surrounding is more fraught with dangers than it was believed just fifty years ago
- V. has claimed the instability of solar system and the emergence of the present orbital configuration, with regard at least to Mars and Venus, in very recent times, in fact in historical times (the last catastrophe, associated with Sennacherib siege of Jerusalem, being dated at about 27 centuries ago). Such claim was made at a time when the solar system was considered to be an extremely stable configuration, on the basis of approximate analytical analysis of the stability of dynamical n-body systems and of the properties of the standard model (condensation from a gas cloud) for the formation of the solar system. This scenario after fifty years has dramatically changed, albeit the theses of V. about Venus and Mars are still considered unacceptable, except from a small minority of scholars. The analysis made using the modern very sophisticated analytical instruments has indeed shown that nonlinear complex dynamical system, including planetary systems, have generally a behavior of the type defined *chaotic*, whose long term behavior cannot be predicted and whose dynamical structure is extremely rich. Now it is estimated that, even disregarding the very possible interactions with other bodies and structures in the galaxy, the solar system cannot be back integrated in time for more than a few million years, a factor one thousand less than estimated fifty years ago. Moreover components of the solar system have been discovered, both at large distances or at planetary distances, that either were then unknown or their importance was not properly evaluated, e.g. the so called Apollo/Amor objects and the Kuiper belt (where objects of a considerable 600 km diameter are now known to exist). The observation, albeit incomplete, of about sixty non solar planetary systems has shown dynamical and structural features completely unexpected and actually in several cases considered previously as dynamical

impossibilities (e.g. the presence of Jovian or super Jovian planets very close to the mother star, when the current model had in that region only terrestrial type planets; or the presence of Jovian type planets in highly elliptical orbits). With a hundred arguments the astronomer Van Flandern has proposed again the hypothesis of Olbers about the explosion of one or more planets in the region of the asteroid belt, as the event that originated not only the asteroids but as well the majority of comets and probably even Mars, considered as a surviving satellite of the exploded planet. Van Flandern dates the last explosion to 3.2 million years ago. Observing, independently of Van Flandern, that the sequence of ice ages on our planet starts also 3.2 million years ago, the physicists Woelfli and Baltensperger have recently proposed a new theory for the origin of such ice ages, in terms of effects on Earth axis, called *true polar wandering* (where the north and south points move over the Earth surface), due to the close flyby of a planet, whose size was taken as default as that of ... Mars! These authors have solved on the computer the equations defining the dynamics of the flyby (considering only gravitational forces, but with heavy use of the tidal forces). Their computations have shown that a sufficiently close passage can lead to a polar displacement of even 18 degrees, a conclusion with Velikovskian flavor. They have moreover found that the body interacting with Earth at its perihelium would be heated so much by the Sun that it would move away from the Sun as a giant comet, surrounded by bluish hot gas over one million km diameter... again a wholly Velikovskian scenario. Outstanding is however still the problem of proving that the proposed rounding of orbits of Venus and Mars can be achieved in a few centuries, i. e. a few hundred revolutions, albeit we are also not aware of a rigorous proof that *it cannot*. In conclusion, fifty years after *Worlds in Collision* we are facing very open scenarios about the structural and dynamical configuration of planetary systems. This confirms the importance of the idea of V. to use the testimonial information from ancient people about the evolution of our own planetary system.

- V. has also stressed the importance of electromagnetic interactions in astronomy, with particular regard to close flybys of large bodies. Gravity still remains the only force considered by the majority of cosmologists for the evolution of the Universe and smaller structures as planetary systems, despite the authoritative alternative ideas of Nobel Prize Alfvén (quoted in several papers by V.) on the role of large scale plasma structures in the Universe. Several problems have however arisen by using the classical Newtonian law of inverse square dependence on distance when used on structures (globular clusters, galaxies, clusters of galaxies...) having much greater size than the solar system size where Kepler derived his laws. Thus the need of introducing dark matter or even more exotic structures and particles or to hypothesize a different functional relation to distance or to introduce new forces. V. had lengthy discussion with Einstein on the role of electromagnetism in the Universe, see his book in internet on his meetings with Einstein. Developments of V. ideas on electromagnetism role are due to scholars inspired by V., among them Juergens, Thornhill, Ginenthal, De Grazia, Milton, Zysman.
- V. predicted emission of radio waves from Jupiter, a high temperature of Venus surface (when it was believed it should be a little above Earth temperatures) and that Earth was surrounded by a magnetic field. These forecasts were confirmed within a few years and V. had his forecast recognized in a letter sent to *Science* (21 December 1962) by the Princeton physicist Bargmann and the Columbia University astronomer Motz. V. had moreover often insisted with Einstein to the purpose that during one of the first space missions his predicted radio emissions from Jupiter should be looked for. Einstein failed to obtain this experiment and later sent a letter to V. excusing himself for not having supported his proposal.

- The detailed pictures obtained in the last years of the surfaces of Mars and Venus have shown quite surprising geological features. Venus surface seems to have been recently melted or covered by magma emissions; erosion structures are essentially lacking. Mars surface shows evidence of very recent catastrophic sculpturing events, including unexpected evidence of subterranean water. Again there is a remarkable lack of the erosion phenomena that should have smoothed the planet surface in the course of the billion years of life in the standard model. A detailed analysis of Mars morphology at the light of V. hypotheses has been presented in a paper by Ginenthal at the New York 1995 conference for the centennial of V.

Ages in Chaos

The book *Ages in Chaos* was published in 1952, the first of a number of historical monographs, followed by *Oedipus and Akhnaton* (1960), *Peoples of the Sea* (1977) and *Ramses II and his Time* (1977). Not yet published by available in the quoted internet site are the works *The Assyrian Conquest* and *The Dark Ages of Greece*.

The basic idea of V. is that the official chronology of the first and second millennium BC of Egyptian and other civilizations dated by anchoring them to the Egyptian one (Micenean, Cananean, Ugaritic, Cretese, Anatolian...) is affected by a substantial error. This is for V. the main reason why scholars have essentially been unable to fit the events described in the Bible with the events described in Egyptian or other histories. V. claims that the fundamental error lies in the absolute anchoring of the Egyptian chronology that was made about two hundred years ago, at the beginning of Egyptology (the times of Lepsius and Champollion). A consequence of this error has also been the introduction of so called *dark centuries* for the Micenean and Anatolian civilizations. For these centuries there is practically no archeologically documented activity, with the curious fact that at the end of this sterile period archeological documentation reappears with the same styles that were active before the dark period, as if centuries had passed without any stylistic evolution.

The problem of a correct determination of the chronology of ancient civilizations is very complex, albeit it is often supposed to have been fully solved, except for a few years possible variations, on the basis of chronologies established mainly in the 19th century. This problem was of great interest to Isaac Newton, who wrote a monograph, by him considered the landmark of his life, *The Chronology of Ancient Kingdoms Amended*, product of his enormous classic culture (he had read essentially all works of the Latin and Greek fathers, to make a better personal opinion of the trinity problem). The work of Newton, originally published in 1728 one year after his death, has been recently reprinted but very few people have read it; his biographer Westfall has defined reading that book *the worst penitence one can think of for a person*. Following the seminal work of V. the chronology problem has since be at the center of the attention of several historians, especially in the anglosaxon world (Rohl, James, Bimson, Murphie...). The German scholars Heinsohn and Illig and the Russian mathematician Fomenko, who has analyzed chronological data with statistical techniques, have reached even much more radical revision in shortening the time span than V. did.

Ages in Chaos can be seen as a parallel book to *Worlds in Collision*, devoted to chronology and historical correlations, while the first book was concerned with physical phenomena and their possible explanation.

V. determines the Exodus period, hence Moses time, as the end of the Egyptian Middle Kingdom, when Egypt was invaded by a population coming from the east, called Hyksos in Manetho, Amu in contemporary Egyptian sources, Amalek in the Bible. The Hyksos devastated Egypt, destroying towns, temples and exterminating large amount of the population. The date given by V. for Exodus, based on internal chronology of the Bible and some 200 years lower than the traditional date for the Hyksos invasion, is 1447 BC. The Pharaoh is the Tutimaos of Manetho, i.e. the Dudimose in the list of kings of the well known papyrus in the Turin Egyptian Museum. Under this chronological setting it is clear that with the Exodus Moses not only terminated the slavery of Hebrews but most probably saved them from a likely annihilation by the Hyksos. This writer has recently proposed for the term Hyksos the meaning *people of the horses* and has identified their origin in the Turanian region of the Amu Darya river, wherefrom the Amu would have moved in the time of worldwide migrations due to a global catastrophe of which the events described in the Bible for Egypt are just a local case. I have also hinted that the wife of Moses from Kush, land usually identified with Ethiopia, was actually a woman from the Hindukush/Badakshan region, land of the precious lapis lazuli exported also to Egypt. Then Moses may have been informed of the arrival of the Hyksos by the wife's family and this would explain why he took the unusual way through the desert, wishing not so much to escape from a pursuing Pharaoh but from the oncoming Amu.

The dating of Exodus at 1447 BC at the end of the Middle Kingdom – now accepted with further arguments by scholars as Rohl, James, Bimson... - was at great variance with the traditional dating, which put the Exodus, of which someone even doubted the historicity, about 350 years after the Hyksos, at the time of the New Kingdom, often during the reign of Ramses II. The lack of references to Exodus in Egyptian sources was considered a sign of unreliability of the Bible as a historical document or at least of a tendency of the Bible to amplify the importance of events relating the Hebrews. The dating proposed by V. redefines completely the historical setting with important consequences on the following history, till the time of Alexander, when use can be made of the work of the Greek and Latin historians.

Now we select some statements from *Ages in Chaos*:

- The Amu/Hyksos controlled their territory from the city of Avaris, that according to V. was located near El Arish, in present Gaza strip. In this area recent archeological findings have discovered Hellenistic and Egyptian ruins under over ten meters of sand, which means that a search for the ruins of Avaris would imply a huge and very expensive excavation work
- The Amu/Hyksos were expelled by a coalition of Egyptians that had taken refuge in the south of Egypt, and of Hebrews led by Saul
- The queen of Sheba was the woman pharaoh Hatshepsut

- The pharaoh who invaded the land that had been the great kingdom of Solomon was Tuthmosis III
- Amenophis III and Amenophis IV (Akhnaton) lived in the ninth century BC, hence after Solomon (this eliminates any possibility of interpreting Akhnaton as the inspirer of Moses monotheism). The El Amarna archive of their letters, to be dated to the period 870-840 BC, includes letters sent to the Hebrew kings of the kingdom of Samaria (capital city of the territory of the Ten Tribes of Israel) and of Jerusalem (capital of the territory of the tribes of Judah and Benjamin).

In three recent monographs the Lebanese historian Kamal Salibi, professor at the American University of Beirut and director of the Interfaith Study Center in Amman, has claimed that the *land of milk and honey*

where Abraham settled (at a time that within the V. chronology may be set at about 1850 BC, probably the time also of pharaoh Sesostris I the Great) was not Palestine but the region of south-western Arabia that is now called Asir, rich of water, pastures and forests. The present writer is of the opinion that the approach of Salibi can be blended with that of V. contributing to a further resolution of many puzzles of antiquity.

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