



## The Skeptics SA guide to Velikovsky and his comet

**Although now completely discredited,** the “catastrophist cosmology” theories of Dr Immanuel Velikovsky (1895, Vitebsk, Russia–1979, Princeton New Jersey) from time to time still attract the attention of a new generation of readers, who may be discovering his writings for the first time.

Velikovsky obtained his medical degree from Moscow University in 1921 and after post-graduate studies he practiced psychiatry in Palestine from 1924 to 1939. In 1939 he went on sabbatical leave to the United States, intending to research a book on Oedipus, Akhenaton and Moses, however in the spring of 1940 (Velikovsky, 1972, p 12 and 1973, p v) he was diverted into a new area of research. He began to consider that there might have been a single causal event to explain many of the extraordinary Old Testament events including the ten plagues of Egypt, the parting of the Red Sea, the manna, the events at Mount Sinai and other astonishing biblical events, such as the sun standing still in the heavens. Within six months (Velikovsky, 1972, p 64) he had developed his “catastrophist cosmology” theory. This theory, which was to dominate his life, claimed all of these biblical events had been precipitated by the appearance of a planet-sized comet.

Skeptics SA

Unable to return to Palestine because of WW II, he had by 1942 completed the first full draft of his theories (Velikovsky, 1973, pp vi–vii): these would later be published as *Worlds in Collision* (1950), *Ages in Chaos* (1952), and *Earth in Upheaval* (1955). Although these books attracted a great deal of favourable public and media interest, they were criticised by many scientists who, in general, considered his claims to be unscientific nonsense.

His “catastrophist cosmology” ideas were broadly based on a natural theological approach, in which so-called biblical “miracles” tend to be attributed to naturally occurring phenomena, rather than to supernatural causes. Before the Age of Enlightenment biblical “miracles” had been accepted almost without question as examples of God using his divine powers to perform acts which were outside the limitations of the natural world. However, with the development of a more rational and scientific approach it was increasingly suggested that God may have used conventional rather than supernatural phenomena to produce these events. In adopting this approach, Velikovsky was merely following the lead of earlier writers who had also cited catastrophic events to explain extraordinary biblical events.

One of these was William Whiston (Isaac Newton’s successor at Cambridge) who believed that since God had created a perfect paradise the weather must have also been constantly perfect. This implied Paradise had only a single summery season, and so the Earth must have moved around the Sun in a perfectly circular orbit (Whiston, 1737, p 114). From Hellenic times the circle had been considered “the perfect figure” and was believed to be the orbital shape of all heavenly bodies both in the geocentric model of the cosmos and the heliocentric model of the solar system by Copernicus. However, according to Whiston, after the Fall this perfect order had been changed by the passing of a great comet. Not only had this comet forced the Earth into an elliptical orbit, which enlarged and lengthened “...its periodical time” (p 467) producing for the first time the cycle of seasons, but later, in the year 2349 BCE, the same comet had been the cause of Noah’s Flood (p 142).

Similar religiously biased ideas form the core of Velikovsky’s theories, yet while others were content to attribute the extraordinary phenomenon of Exodus to the actions of rather mundane events such as tornadoes or earthquakes, Velikovsky proposed an incredibly spectacular cosmic scenario. He claimed that

circa 2,000 BCE the planet Jupiter had ejected a huge mass of material into space. This ejecta was nothing less than a completely new proto-planet, Venus, which in the form of a comet had initially travelled in an elliptical orbit from the vicinity of Jupiter around the Sun and back again, regularly crossing the orbits of Earth and Mars (Velikovsky, 1972, p 64) and that on several occasions it had actually collided with both planets, unleashing cataclysmic destruction on both.

He claimed the comet had precipitated a number of catastrophes which coincided with certain miraculous biblical events, namely:

- 1 Circa 1495 BCE at the time of the Exodus (p 97) it had precipitated the plagues of Egypt, parted the Red Sea, and delivered the Ten Commandments
- 2 The comet left a large number of great stones suspended in the “celestial sphere” (p 152) and some fifty-two years later (p 63) these rained down onto the Amorites, the enemies of the Israelites. At the same time “...the Earth was brought out of rotation” (Velikovsky, 1942) which caused the sun to stand still in the heavens over Gibeon, (*Joshua 10:12-13*)
- 3 Circa 689 BCE the planet Mars, having been displaced by the comet, “blasted” the camp of the Assyrians who were besieging Jerusalem and killed 185,000 of them during the night (*2 Kings 19:35*).

Velikovsky (1972) claimed that the comet first approached Earth on a collision course circa

Skeptics SA

1495 BCE (p 64), at a time when Moses was demanding that pharaoh free the Israelites. When this request was refused the comet intervened and created the miraculous plagues which finally forced the pharaoh to release the Israelites. At that time, the comet “...on its way from its perihelion... touched the Earth first with its gaseous tail” (p 64) and rained down onto the Earth “...a fine dust of rusty pigment” (p 64) which choked the rivers, turned the seas, lakes and rivers a bloody red colour, poisoned the fish and brought widespread death and disease to many (*Exodus 7:20-21*): this was the first plague. The poisoned river encouraged an abundance of frogs and lice, the second and third plagues. The fourth plague was an infestation of “swarms of flies”: these, according to Velikovsky, were the vermin (p 371) that came from the comet. Similarly, Velikovsky claimed the hail and fire of the seventh plague, (*Exodus 9:23-24*) occurred when the Earth fully entered the comet’s tail and was bombarded by a great hail of meteors and enveloped in massive clouds of burning carbon and hydrocarbon naphtha gases which ignited Earth’s forests and covered the land and the seas for a period of seven years (p 71).

As the Israelites left Egypt they were accompanied by a “pillar of cloud” to lead them during the day, “...and by night in a pillar of fire, to give them light” (*Exodus 13:21*). This phenomenon, Velikovsky claimed, occurred when the Earth passed through the neck of the comet and “A tremendous spark sprang forth at the moment of the nearest approach of the comet...” (Velikovsky, 1972, p 100); this

massive flow of electrical energy between the comet and the Earth shrouded the planet “... in a dark column of gases which looked like a pillar of smoke during the day and of fire at night (p 91). When pharaoh reneged and sent his army after the Israelites they reached them on the shores of the Red Sea. At that time the pillar of cloud then moved between the Israelites and their enemies and enveloped the Egyptians in a cloud of darkness (*Exodus 14:20*). This, Velikovsky claimed, was the “angel of God” (*Exodus 14:19*) which held back the pursuing Egyptians while Moses arranged for the Lord to part the Red Sea (*Exodus 14:21*).

The Red Sea parted and the Israelites, “...went into the midst of the sea upon the dry ground” (*Exodus 14:22*). Although the Bible claims the parting of the Red Sea was due to the presence of “...a strong east wind ” (*Exodus 14:21*) which blew all night long, Velikovsky suggests the actual cause was that the sea was lifted by a combination of geological upheavals and the gravitational pull of the comet. The comet then conveniently remained in place allowing the Israelites adequate time to cross the sea-floor, but then as the gravitational attraction of the comet waned, the sea flooded back, overwhelming the Egyptians, who were thrown high into the air (p 102) and completely destroyed.

Then, as the Earth approached the head of the comet there were worldwide earthquakes on a scale never experienced before or since. The entire surface of the Earth was ripped open, volcanoes erupted worldwide, producing lava

flows 1.5 kilometers thick; the oceans were thrown from their beds creating kilometers high tsunamis which swept across the continents; rivers boiled or simply disappeared. Then, the Earth's poles were reversed, the North Pole, formerly located between Greenland and North America, moved approximately 159 degrees, to become the South Pole; the axis of the Earth shifted and the Earth's rotation was reversed (p 91). Finally, the Earth "...proceeded on a distorted orbit" (p 91), its orbital speed around the sun slowed from 260 days to 360 days. In the midst of all this devastation most of humanity perished. Above the Earth the Moon changed its orbit (p 344) and the lunar month had changed from 20 days to 29 days (p 345). In the midst of all these cataclysmic events, apparently unaffected, Moses continued to lead his people into the wilderness!

The comet then retreated from the Earth for about seven weeks (p 108) but returned briefly to produce miraculous events at Mount Sinai. It covered the mountain with a thick cloud (*Exodus* 19:9), produced thunder and lightning (*Exodus* 19:16), the mountain "quaked greatly" (*Exodus* 19:18), then great trumpeting noises were heard (*Exodus* 19:19). According to Velikovsky the comet emitted ten separate "trumpet like sounds" (p 111). Incredibly, these ten blasts were actually the Ten Commandments, and these were heard all round the world, in seventy different languages, "...so that all might understand it"(p 112).

Skeptics SA

Velikovsky (1972) claimed that the comet returned fifty-two years later when Joshua and the Israelites were in battle against the armies of the Amorite kings of Jerusalem, Hebron, Jarmuth, Lachish, and Eglon. First the comet showered the Amorites with "great stones" and "hailstones" (*Joshua* 10:11) then it temporarily interrupted the Earth's rotation (p 60) so that the sun stood still over Beth-horon (p 152, *Joshua* 10:11) to allow Joshua time to finish off his enemies. The claim that the sun stood still or reversed its rotation is used several times in the Old Testament: see also *Isaiah* 38:8 where it is claimed "...the sun returned ten degrees". This was at the time of the invasion of Judah by Sennacherib.

Later, in the eighth century BCE, Venus and Mars collided, causing Venus to change its course "...from an elliptical to a nearly circular orbit" (p 264). Then, some time between the 8th and 7th centuries BCE "...the earth and Mars... assumed new positions in the solar system" (p 368). In 747 BCE the displaced Mars began a regular cycle whereby it approached close to Earth every fifteen years. Between 747 and 687 BCE "...solar and lunar movements changed repeatedly" (p 350). The Moon changed its orbital period from 36 days to 29 days (p 345), then, at midnight, March 23 687 BCE (Velikovsky, 1942) Mars came so close to the Earth that it changed its orbital period from 360 days to 365¼ (Velikovsky, 1972, p 324, 333-344, 358). Velikovsky claimed that it was the close approach of Mars circa 689 BCE which destroyed the forces of Sennacherib who were besieging Jerusalem: "A blast

from the planet Mars fell upon the camp of the Assyrians and annihilated it" (p 298). Finally, both Mars and Venus settled into their present stable orbits.

Sagan (1979) examined Velikovsky's claims, and while he conceded "Collisions and catastrophism are part of modern astronomy" (p 105) he was generally scathing of Velikovsky's theories, particularly with respect to the "...adequacy of the purported evidence" (p 106). Some of his criticisms were:

- If Jupiter had ejected the proto-Venus, the amount of energy required would have been about the same as all of the energy expended by our sun in a single year, that is 100,000,000 times more energy than is contained in the largest observed solar flare (p 121). Yet Jupiter is primarily a gas-planet, and, unlike the sun, it is not given to releasing huge amounts of energy, so where did this energy originate?
- The energy required to eject such a mass to enable it to escape Jupiter's gravity would have been so great it would have reduced the material to very small particles (p 121), certainly not the large solid mass proposed by Velikovsky
- Velikovsky claimed the proximity of the comet caused Earth mile high tides, whereas they would actually have been "hundreds of miles high" (p 128), furthermore there is no geological evidence of any such inundation between the 15th and 6th centuries BCE (p 129)

- Velikovsky confused carbohydrates with hydrocarbons, resulting in the claim that the manna which the Israelites ate for forty years in the wilderness, was actually motor oil (p 130)
  - The amount of manna delivered during those forty years would have required the comet to have had a mass equal to that of the Sun (p 134)
  - Velikovsky (1972) claimed Jupiter and Venus are "...populated by vermin" (p 371), which Velikovsky implied was the source of the petroleum on both planets. By "vermin" Velikovsky meant the flies which had been responsible for the fourth plague mentioned in *Exodus* 8:21 which strangely were extremely selective, for they ignored the Israelites in Goshen and attacked only the Egyptians. However, as Sagan (1979) pointed out, if they had come from Jupiter in a molten comet, they would never have survived. Sagan also questions how with the same genetic code as all Earth creatures they could have evolved on Jupiter (p 131). Furthermore, since flies metabolise molecular oxygen, how could they have evolved and survived on Jupiter where molecular oxygen does not exist (p 132)?
  - If Venus and Mars had crossed the orbit of the Earth there should still be massive amounts of debris crossing Earth's orbit (p 122) yet there is no evidence of this
  - Velikovsky's claim (1972, p 60) that the Earth's mountains and valleys were only formed a few thousand years ago is disputed
- Skeptics SA

by geological evidence which dates their origins in millions of years (Sagan, 1979, p 128)

- Although Velikovsky claimed enormous tectonic and impact disturbances to the surface of the Moon occurred contemporaneously with the events on Earth, as Sagan (1979) indicated, evidence from the Apollo Moon missions suggest that it has been several hundred million years since the rocks on the Moon were molten (p 128).

Other scientists have noted other weaknesses in Velikovsky's theories:

- Friedlander (1995) noted major problems with Velikovsky's use of celestial mechanics to explain the behaviour of the planets. Ignoring Newtonian laws of planetary motion, he proposed that electromagnetic forces could explain their erratic movements, even though electromagnetic forces between planets are essentially zero (pp 11–12)
- Gurshtein (1993) pointed out that the Astrological zodiac, which has been used since circa 5,500 BCE, lies on the ecliptic, the apparent annual path of the sun across the celestial sphere: since this 'path' is determined by the tilt of the Earth, then, if the tilt of the Earth changed during Velikovsky's cataclysm, the location of the zodiac would have changed significantly, yet there is no evidence of this
- Morrison (2001) mentioned that the science of dendrochronology (using tree rings to determine the age of trees and past weather conditions) has revealed the existence of

trees 4,000 years old, that survived Velikovsky's claimed catastrophes, and which reveal no evidence of catastrophic climate changes (p 70)

- Morrison (2001) also noted that ice cores from Greenland which reveal evidence of global temperatures and volcanic activity going back tens of thousands of years, reveal no evidence of Velikovsky's claimed catastrophes (p 70).

A major problem with Velikovsky is that the catastrophic events he describes tend to be brief, isolated and poorly defined, lost in the midst of lengthy passages referring to numerous cultural myths which support his theories of catastrophes. As a result, the exact pattern of events he described is rather unclear and ambiguous. As Morrison (2001) indicated, this "...vagueness and lack of quantitative reasoning" (p 69) produces a great deal of frustration when one attempts to make sense of his various theories.

What is quite clear however is that the genesis of his theories was the claimed ejection by Jupiter of the proto-planet Venus with such force that it escaped the gravity of Jupiter to commence travelling in space as a huge comet and that in the course of its erratic travels throughout the solar system it precipitated events which formed the basis for the marvellous biblical events described in *Exodus*, *Joshua* and *2 Kings*.

As an advocate of Catastrophism and natural theology Velikovsky was so determined to harmonise the irregular behaviour of this

imaginary comet with these biblical events that he had to invent quite absurd scenarios. If Velikovsky is to be believed this was no ordinary comet, but rather one which possessed miraculous abilities. Not only was it able to appear and reappear, intervening at critical moments to assist the Israelites, causing death and destruction to their enemies, even causing worldwide cataclysms which destroyed most of humanity, but yet in some mysterious manner it never harmed the Israelites! This saga of cosmic catastrophes is so incredible it could only have been created by Velikovsky's overwhelming need to provide a natural theological explanation for many of the biblical myths. In doing so he created a number of theories about the nature and behaviour of comets which have now been revealed as completely false, thus he claimed that:

- Some comets originated in other star systems and may be the results of collisions between two stars creating a nova (Velikovsky, 1972, p 388)
- Comets are created by the collision of planets (p 374) and "...smaller comets were born in contacts between Venus and Mars..." (p 379). There is now a much better understanding of the composition of comets (Keller, Britt, Buratti and Thomas, 2005) and their origins and relationship to the trans-Neptunian Oort and Kuiper belts (Jewitt and Luu, 1993). Comets are essentially debris left over from the formation of the solar system, pieces of rock, ranging in size from small rocks up to many kilometers in size, surrounded by dust, Skeptics SA

gas and ice. Although they originally orbited the sun in the distant parts of the solar system, some were forced from their original paths, probably by collisions with other bodies, into orbits which now bring them in close to the sun. There are two types of comets, the first, long-period comets (>200 years) are thought to originate in the Oort cloud while the short-period comets (<200 years) appear to come from the trans-Neptunian Keiper Belt (Huebner, 2008, p 6)

- Before approaching Earth, having passed close to the sun, the comet was "...in a state of candescence" (p 91), however if, as he claimed, it had been ejected from Jupiter it seems likely it would already have been an incandescent mass, which would have taken hundreds of thousands of years to cool. If, on the other hand, it had already cooled, like all normal comets, it would have had a cool rocky nucleus and would not have been incandescent. While the nuclei of comets do become quite hot as they approach the sun, they never reach a temperature sufficiently high enough to become incandescent. They also lose this heat very quickly as they move away from the sun. For example, Becklin and Westphal (1966) measured the temperature of the comet Ikeya-Seki: when it was 72 million kilometers from the sun its temperature was some  $-400^{\circ}\text{C}$ . and although the temperature reached  $649^{\circ}\text{C}$  when it was 32 million kilometers from the sun, on its return journey it once again quickly dropped to  $-400^{\circ}\text{C}$

- "The tails of comets are composed mainly of carbon and hydrogen gases" (Velikovsky (1972, p 69) and that these are highly flammable when they come into contact with oxygen atmospheres (p 69). In fact comet tails are composed of non-flammable dust and ionised particles. The glowing appearance of a comet in the sky is due to the combined effects of solar radiation heating their inner core releasing a thin trail of gases, which, along with the dust they trail, is illuminated by the ionisation effect of solar radiation, not because they become incandescent
- The comet had a massive atmosphere, which fell into Earth's atmosphere (p 92), however comets do not have an atmosphere per se, their nuclei are surrounded only a very nebulous collection of dust and gases held in place by their very weak gravity
- During the cool of the night, carbohydrates precipitated from the atmosphere of the comet and fell to Earth with the morning dew to form manna (*Exodus 15:14-17*). If the surface temperature of the Earth was hot enough to evaporate the oceans, there could hardly have been morning dew!
- In a reference to Lexell's Comet he claimed that "...a comet, encountering a planet, can become entangled and drawn away from its own path" (p 92, 192). He claimed Lexell's Comet had become "entangled" in this way, temporarily "captured" by Jupiter in 1767, and had then managed to successfully free itself in 1779. However, comets do not become captured and then free themselves at

a later date. If they pass too close to a planet they can either be drawn into the planet (as occurred with Shoemaker-Levy 9 in 1994) or else have their orbits changed by the gravitational forces of the planet. According to Leverington (2003) this is what happened to Lexell's Comet in 1767 when "...Jupiter had radically changed its orbit..." (p 193). Furthermore Lexell's Comet was never captured by Jupiter and held from 1767 until 1779, since it was actually observed passing the Earth in 1770

- Venus is a very hot planet (p 6). Although it does have an abnormally high surface temperature, 750K (476°C, 890°F, Lewis, 2004, p 526) it is now known that the planet itself is not hot. The extreme temperature is due to its dense 96% carbon dioxide atmosphere (Seeds and Backman, 2007, p 457), which traps some 75% of the light reaching the surface, creating a massive greenhouse effect (Karttunen *et al*, 2003, p 154)
- The almost "uniform temperature" on both the day and night sides of Venus was because "The daily rotation of the planet Venus is very rapid" (p 372). He denied scientists who, at that time, claimed Venus rotated very slowly, once every 225 days (a period equal to its orbit around the sun) claiming "...it is difficult to see how the high temperature of the rotating layer of the night side could be maintained" (p 372), however it is now known that Venus rotates once on its axis every 243 Earth days. (Kuhn and Koupe-Skeptics SA

lis, 2004, p 247) and the heat of the night side is due to the extreme greenhouse effect

- Venus "...must be surrounded by a very extensive envelope of hydrocarbon (petroleum)" (p 6, 8) and so its atmosphere "... must be rich in petroleum gases" (p 370), however it is now known the atmosphere is rich in carbon dioxide (Fegley, 2005, p 488)
- Jupiter emitted radio signals (p 6): these are now known to be due to the interaction of the moon Io forming plasma in Jupiter's equatorial plane and, also because Jupiter also produces strong radio waves from its polar regions.

It is now known that a number of major catastrophes have shaped the development of the Earth; these include at least five extinction-level events (ELE) during the past 540 million years (Ma) with the last one, the Cretaceous-Tertiary extinction event, occurring some 65.5 Ma. Velikovsky's claims that the last worldwide catastrophe occurred as recently as 2,800–3,500 years ago is disputed by all reputable geologists, for there is simply no evidence of the cataclysmic disasters described by Velikovsky.

To support his dramatic claims Velikovsky studied the records of many ancient cultures, including the Amerindian, Assyrian, Aztec, Chinese and Indians, looking for evidence of cosmic catastrophes. While most scholars considered such stories to be mere myths, Velikovsky was convinced they were eyewitness reports of actual catastrophic events. He insisted they were so reliable they were to be

believed, over and above any modern scientific theories with which they might conflict. Despite this, he himself was rather selective in his own interpretation of these ancient texts for in quoting the Midrashim claim that the waters of the sea were raised up to a height of "sixteen hundred miles" he says this was not meant to be a literal figure but merely to indicate that "...the heap of water was tremendous" (p 87).

However what is often overlooked is that the existence of these myths is in itself proof that such events could never have occurred! Velikovsky gave a vivid description of how the entire surface of the Earth was ripped apart, uprooted and thrown around, with huge chasms opening up to expose molten magna which flooded the world, volcanoes erupted and the oceans swept across the continents in tsunamis kilometers high, huge meteors smashed into the Earth leaving a world totally devastated, and all that was left was "...a world enshrouded in an atmosphere filled with smoke and vapor" (Velikovsky, 1972, p 111). Such a description clearly suggests that the Earth must have been totally destroyed—nothing and no one could have survived—so who then could have written the myths which Velikovsky relied upon as evidence of his great cataclysms?

If by some rare chance, a few humans had survived, they would have emerged from the ruins to find a totally devastated world and they would have been forced to rebuild human civilization from the very beginning. Yet there is no evidence of this enormous worldwide de-

struction or of humans having to make a new start. Instead, we find an unbroken sequence of historical development. Even the Bible, which Velikovsky relies upon as the basis of his theories, describes how, when Moses led his people into Canaan, the land was described as flowing with milk and honey (*Numbers* 13:27); no mention of a ruined desolate landscape! In addition, rather than there being only a few survivors, the land was described as being inhabited by numerous peoples "... the Hittites, and the Hivites, and the Perizzites, and the Girgashites, and the Amorites, and the Jebusites" (*Joshua* 3:10). There were many cities in the land including Jericho, Ai, Gibeon, Jerusalem, Hebron, Jarmuth, Lachish, Eglon, Gibeon, Chephirah, Beeroth, and Kirjathjearim, so how could humankind have recovered so quickly after a worldwide catastrophe as that described by Velikovsky?

His admission that his theories were based upon his own "...reconstruction of ancient history" (Velikovsky, 1972, p 64 and 78) is particularly pertinent. It appears he not only reconstructed ancient history but also astronomy and astrophysics to fit his unique theories.

Sadly, his efforts in devising such an elaborate explanation for the extraordinary events in the Bible appear to have been completely wasted, for although he claimed the biblical accounts of the wondrous events in *Exodus* are "historically true" (p 380) it is now generally accepted that the stories of Moses, the enslavement of the Israelites in Egypt, and their escape from captivity across the Red Sea, etc. are merely

Skeptics SA

folklore. As Robertson (2004) noted, the Moses story is simply a variation of the Horus myth (p 309) while the account of the actual Exodus itself is merely an analogous myth, adapted by the Israelites from other Middle Eastern sources to demonstrate that just as pagan deities had parted the Primal Sea to create the world so too the god of the Israelites had split the Red Sea to create a new nation (Armstrong, 2005, p 96).

In describing the Israelites as "slaves" Velikovsky (1973, p 24) obviously accepted the biblical account that the Israelites had been enslaved and forced to build the great monuments in Egypt. This has now been revealed as a myth for the builders of these great buildings, including the pyramids, were the Egyptians themselves. Both Ruiz (2001) noted that in the villages where the pyramid builders resided the style of the tombs is clearly Egyptian (p 217), while David (1996) who examined the ancient town Deir el-Medina, home to the artisans who worked on the tombs in the Valley of the Kings from circa 1550–1080 BCE (the period covered by Velikovsky) reported that excavations at various workers' sites have uncovered a great deal of written material which shows these workers were clearly Egyptians. There is further evidence that these were paid workers not slaves, for as Rice (1999) indicated, on one occasion during the 29th year of the reign of Ramses III (circa 1153 BCE) the workers went on strike (p 166) upset because of a shortage of food, water, clothing and the dark eye makeup necessary to reduce the glare of the sun.

Velikovsky made a number of other unlikely claims, e.g.:

- The Earth attracted the Moon within the memory of human kind, who also witnessed the "building of the solar system" (Velikovsky, 1942)
- In the past Saturn and Jupiter had collided and, as the Earth passed close to Jupiter, it was drowned in hydrogen from Jupiter's atmosphere, which, as it drifted down through Earth's oxygen rich atmosphere, it became water" (Velikovsky 1942)
- The behaviour of our Earth, Mars, Venus, Moon, and other planets during their contacts, clearly shows that gravity does not exist, and furthermore, the mathematical proofs of Newton are completely erroneous (Velikovsky, 1942)
- "At near distances special law acts in magnetism (also electrical phenomenon)" (Velikovsky, 1942) operate which makes both levitation and perpetual motion possible
- Earthquakes are caused by the geological masses readjusting from their being displaced during the earlier cosmic-contacts (Velikovsky, 1942)
- Darwin's Theory of Evolution which proposes slow changes in life-forms is wrong (Velikovsky, 1942)
- Dinosaurs only became extinct a few thousand years ago. Most actually died during the catastrophes, and "...those that survived could not exist in new conditions, especially

because of changed weight of all objects, and of their large bodies, not capable to move, especially during gravity” [*Sic*] (Velikovsky, 1942)

- The “Brontosaurus was not a reptile ... but a mammal” (Velikovsky, 1942)
- There had formerly existed on Earth a race of giants (Gigants) who were destroyed by the catastrophes and only the smaller humans survived (Velikovsky, 1942)
- Erection of ancient structures built with huge stones had only been possible because such objects had been much lighter before the cosmic contacts (Velikovsky, 1942)
- Noah’s Flood had been due to the proto-Saturn becoming a nova, and ejecting much of its mass into space (Velikovsky, 1978, p 249)
- The planet Mercury was involved in the destruction of the Tower of Babel (Velikovsky, 1978, p 107)
- Planets revolve “...on a quite circular orbit...” (Velikovsky, 1972, p 166), until they are displaced from their original orbits by comets.

While it cannot be denied that Velikovsky was an outstanding scholar, his areas of expertise did not extend to astrophysics, so it appears that lacking definite scientific evidence he simply created his own fanciful ideas and in doing so convinced himself of the existence of an imaginary comet whose actions conveniently coincided with fictional events in the Old Testament, and even though several of his wild conjectures proved to be valid, the Skeptics SA

assumptions which led to these conclusions were completely erroneous. As Gould (1977) commented, “Velikovsky is neither crank nor charlatan—although to state my opinion and to quote one of my colleagues, he is at least gloriously wrong” (p 153).

Laurie Eddie, November 2011

## References

- Armstrong, K, 2005, *A Short History of Myth*, Melbourne, Australia: The Text Publishing Company
- Becklin, EE, and Westphal, JA, 1966, *Astrophysics*, 145, pp 445–453
- David, R, 1996, *The Pyramid Builders of Ancient Egypt*, London: Routledge Publishers
- Fegley, B, 2005, ‘Venus’ in *Meteorites, Comets and Planets*, HD Holland and KK Turekian editors, Amsterdam: Elsevier Ltd, 487–508
- Friedlander, MW, 1995, *At the Fringes of Science*, Boulder, Colorado: Westview Press
- Gould, SJ, 1977, ‘Velikovsky in Collision’, *Natural History*, March 1975; from *Ever Since Darwin: Reflections in Natural History*, New York: WW Norton & Company, 1977, pp 153–159
- Gurshtein, A, 1993, ‘On the Origin of the Zodiacal Constellations’, *Vistas in Astronomy* 36, pp 171–190
- Huebner, WF, 2008, ‘Origins of Cometary Material’, in *Origin and Early Evolution of Comet Nuclei*, editors Balsiger, H, Altwegg, K, Huebner, WF, Owen, T, and Schilz, T,

Philadelphia: Springer Science + Business Media, 5–25

- Jewitt, D, and Luu, J, 1993, ‘Discovery of the candidate Kuiper belt object 1992 QB1’, *Nature* 362, 730–732, 22 April
- Karttunen, H, Kröger, P, Oja, H, Poutanen, M, and Donner, KJ, 2003, *Fundamental Astronomy*, 4th edition, New York: Springer-Verlag
- Keller, HU, Britt, D, Buratti, BJ, and Thomas, N, 2005, ‘In situ observations of cometary nuclei’, in *Comets II*, editors Festou, M, Keller, HU, and Weaver, HA, Tucson: University of Arizona Press, 211–222
- Kuhn, KF, and Koupelis, T, 2004, *In Quest of the Universe*, Sudbury, Massachusetts: Jones and Bartlett Publishers
- Leverington, D, 2003, *Babylon to Voyager and Beyond: A History of Planetary Astronomy*, Cambridge: Cambridge University Press
- Lewis, JS, 2004, *Physics and Chemistry of the Solar System*, Burlington, Massachusetts: Academic Press
- Morrison, D, 2001, *Velikovsky at Fifty: Cultures in collision on the fringes of science*, *Skeptic* 9:1, 62–76
- Rice, M, 1999, *Who’s Who in Ancient Egypt*, London: Routledge
- Robertson, JM, 2004, *Christianity and Mythology*, Whitefish, Montana Kessinger Publishing, LLC



Ruiz, A, 2001, *The Spirit of Ancient Egypt*,  
New York: Algora Publishing

Sagan, C. 1979. 'Venus and Dr. Velikovsky'  
in *Broca's Brain: the Romance of Science*,  
editor, Carl Sagan, London: Coronet Books,  
100–159

Seeds, MA, and Backman, DE, 2007, *The Solar  
System*, Boston: Brooks/Cole Publishers

Velikovsky, I, 1942, *Affidavit of Dr Immanuel  
Velikovsky*, dated 5 December 1942, [http://  
www.varchive.org/ce/affidavit.htm](http://www.varchive.org/ce/affidavit.htm), retrieved  
April 2011

Velikovsky, I, 1972, *Worlds in Collision*, New  
York: Laurel

Velikovsky, I, 1973, *Ages in Chaos*, London:  
Abacus/Sphere Books

Velikovsky, I, 1978, *Ages in Chaos II*, p 107,  
1978 Doubleday & Company, Garden City,  
New York

Whiston, W, 1737, *A New Theory of the Earth  
from Its Original, To the Consummation of  
All Things*, London: Boyle's Head

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