NEWTON, EINSTEIN & VELIKOVSKY
Contents

Preface ....................................................................................................................................................... 5

Chapter 1: Celestial Mechanics .................................................................................................................... 8

Tidal Theory, Gravity and Mathematics ..................................................................................................... 9

Stability-Instability, the Earth-Moon System ............................................................................................ 24

Kepler’s First Law of Planetary Motion ..................................................................................................... 28

Kepler’s Third Law of Planetary Motion ..................................................................................................... 36

Circular Motion / Torque and Gravity ......................................................................................................... 39

Rotation of Celestial Bodies Torque and Electromagnetism ................................................................. 42

Planets and Torque .................................................................................................................................... 47

Retrograde Orbits ....................................................................................................................................... 53

Chapter 2: Electromagnetism and Celestial Motion ................................................................................. 62

The Experimental Evidence ....................................................................................................................... 69

Chapter 3: Solar System Instability ........................................................................................................... 84

Chapter 4: “The Proofs” of Solar System Instability in Recent Times ...................................................... 113

Earth, Mars and Venus: The Interdisciplinary Evidence for Solar System Instability ............................. 118

Terrestrial Pole Shifts in Recent Times ....................................................................................................... 122

The Proofs of Recent Instability of Mars’ Orbit ......................................................................................... 136

Problem One: The Continuously Habitable Zone ....................................................................................... 138

Problem Two: The Faint-Sun-Paradox ....................................................................................................... 140

Mars: An Inner Planet .................................................................................................................................. 149

A Martian Ocean and Great Floods Out of It ............................................................................................. 161

Erosion and the Age of Mars’ Surface ....................................................................................................... 167

Venus – A Newborn Planet ......................................................................................................................... 187

Misshapen Craters ..................................................................................................................................... 195

The Newborn Babe Surface of Venus In Spite of Erosion ....................................................................... 199

Venus’ Newborn Atmosphere .................................................................................................................... 202

Venus’ Argon-36 and Argon-40 Age .......................................................................................................... 203

Venus’ Carbon Dioxide Age ....................................................................................................................... 205

Venus’ Sulfuric Acid Age and Those of Other Acids in It ....................................................................... 207

Venus’ Neon Krypton Age .......................................................................................................................... 209

Venus’ Water Age ...................................................................................................................................... 210
PREFACE

“[In science] there are no sacred truths, all assumptions must be critically examined; arguments from authority are worthless.

“Whatever is inconsistent with facts must be discarded or revised . . . we must understand [the] cosmos as it is and not confuse how it is with how we wish it to be. The obvious is sometimes false; the unexpected sometimes true.”

Carl Sagan, Cosmos TV. series, Episode 13, “Who Speaks for Earth”

If Velikovsky’s celestial hypothesis is correct, it must not only correlate with historical evidence, but must also correlate with and be corroborated by scientific evidence. His thesis requires that there should exist unambiguous scientific evidence that celestial mechanics, accepted by all scientists as being perfect as possible, is in error. If that can be proved to be the case, that cosmological theory for the stability of the solar system and the evolution of the universe — birth and evolution of galaxies, as well as stars — must also be in error.

The need for such a book that gathers the evidence for celestial mechanics, the cosmology of the universe and especially the evolution of the solar system in recent times that Immanuel Velikovsky presented, is long overdue. Although I intend to present a great deal of new evidence regarding these matters, it is unavoidable that I will have to present materials already published in order to elucidate the problems, and possible solutions that face Velikovsky’s unstable solar system hypothesis. In this respect, one must not only deal with the question of planetary orbital changes, but also of these changes in terms of their chronology in recent history into which these chaotic motions must be proved to fit. Hence, much of this book will examine not only the evidence for the very recent unstable orbits of Mars and Venus, but it must examine the chronological, scientific evidence that conforms with Velikovsky’s time scale as well.

Both the evidence for solar system instability and for the return to stability for the chronological framework that Velikovsky presented must agree if his theory is valid. More than that, these varied forms of scientific evidence must contradict the scientific establishment’s hypothesis on the very same points. Much of this book will, therefore, deal with various forms of scientific evidence that contradicts the chronology of a stable solar system over, say, 20 million years. For those who have read Pillars of the Past, Volumes I, II, III and IV, will remember I employed several forms of scientific evidence to analyze the chronology of the ancient world. In this respect, my approach to the established astronomical chronology of the solar system, like that of the ancient historical established chronology, will be based on presenting a great number of different forms of interdisciplinary scientific evidence that correlate and corroborate one another, but are also fully congruent with Velikovsky’s hypothesis, and are clearly contradictory to, or highly problematic for, the thesis that the solar system has been stable in recent times.
In the next part of this book, Velikovsky’s concept of the important role electromagnetism plays in celestial mechanics will be examined, as well as its application to solar system stability, and also to cosmology. Thus, in a sense, this volume is a continuation of my book, *The Electro-Gravitic Theory of Celestial Motion and Cosmology*. As we will see in the next chapters, the astrophysicists, astronomers and cosmologists have literally outdone Aristotle and the Greek astronomers’ inventions of epicycles by creating new forms of matter, new celestial mechanical forces, and even new dimensions of space. It has actually reached the point where many scientists are now saying the entire cosmological edifice upheld by these new forms of matter, energy and multiple dimensions, is a colossally false rendering of celestial reality.

What has always been the problem for Velikovsky and his followers is the important role mathematics has played in all this. Up until now, we have assumed that Newtonian/Einsteinian theory is as perfect as can be and perfectly reflects the forces governing the motions of celestial bodies. It will be shown that mathematics has played a leading part in driving the entire scientific community regarding these matters of celestial mechanics blindly into error. This will be examined toward the end of the book that too great a reliance and belief in the absolute validity only of mathematics to explain the universe is not just a modern cosmological blunder, but a repetition of these same blunders of the ancient past like the Aristotelian geocentric theory.

Lastly, I will deal with the philosophy of science in order to understand the relationship between what has been assumed to be objective scientific truth, the method and human psychology and sociology as these interrelate and as these were understood by Velikovsky and others. It must be noted that those who attempt to criticize this book but ignore or who have failed to read *The Electro-Gravitic Theory of Celestial Motion & Cosmology*, are not dealing honestly with the materials presented here. The celestial mechanics presented in the earlier work will be greatly enlarged in this. Therefore, failure to understand that earlier evidence or deal with as it relates to the foregoing evidence means that that critic is either ignorant of what scholarship requires, or is determined to discredit this book’s evidence without knowing it, or even allowing their readers to know it.

What I conceive to be Velikovsky’s greatest problem and misfortune is that his ideas are so far ahead of his time that he had to be pilloried because the great paradigms and scientists whose concepts he challenged were the false idols of his age, and it was inconceivable to the scientists, academics and mass media that their idols could be wrong. Newton, Einstein and all their theories, and those that had been derived from them, were the scientific idols of the twentieth century to whom all bowed as having established the indisputable laws that govern reality. This book is addressed to dealing with these giants and their theories.

Because this theory is largely derived from Velikovsky who maintained that planets in close contact would be cushioned by their repelling magnetic fields, I have maintained that these fields must weaken at greater distances but are still operating in a repelling manner. Therefore, since this book is a defense of my own theory and indirectly of Velikovsky’s celestial scenario, I take full responsibility for it. Velikovsky could not have known what would be developed and/or derived from his recent unstable solar system theory and he cannot, therefore, be held responsible for what I produced. No more, could Velikovsky be held responsible for the creationists that followed him. Nevertheless, this connection has been employed by Michael D. Gordin, in his book, *The Pseudoscience Wars: Immanuel Velikovsky and the Birth of the Modern Fringe*
(Chicago 2012). It is a simple ‘guilt by association’ critique of Velikovsky and in no way proves anything about Velikovsky because it fails to examine Velikovsky’s thesis but only his connection with later other groups. As Tom Van Flandern tells us, “THE VALIDITY OF AN IDEA CAN BE DETERMINED SOLELY BY AN EXAMINATION OF ITS MERITS. . .”1 This examination Gordin has not done and, thus, his critique is shallow and beside the point.

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CHAPTER 1: CELESTIAL MECHANICS

“Einstein, when discussing an experimental test of his general theory of relativity was once asked what he would do if the experiment didn’t agree with theory. He was unperturbed at the prospect, ‘so much the worse for experiments, the theory is right.’”


This statement by Einstein, in a sense, explains the dilemma Velikovsky and his proponents have faced from the beginning. The physicists, astronomers and mathematicians have argued that there is no evidence to bring Newtonian/Einsteinian celestial mechanics into question. How can Velikovsky be right when the most perfect of sciences — celestial mechanics — completely corroborated, correlated and congruent with the motions of celestial bodies and with the most perfect of sciences, mathematics that absolutely proves him in error. The reason I maintain that Velikovsky can be and is correct is that celestial mechanics is not corroborated, correlated and congruent with the motions of celestial bodies; in fact, application of the most perfect of sciences, mathematics, shows that the laws of physics presented by Newton and Einstein fail to prove or explain these motions. To the contrary, the application of Newton’s laws and Einstein’s curved space, to mathematically prove what they claim to prove, does no such thing. Let me begin.

I. Bernard Cohen has written:

“Immanuel Velikovsky attempted to revolutionize physical science with a radical set of ideas concerning the way the solar system came into its present state . . . Needed to say, Velikovsky’s ideas contradict basic laws of dynamics and gravity. Velikovsky proposed that electrical and magnetic forces overwhelmed the action of gravity on the close encounter of planets. Though widely disseminated in the public press, Velikovsky’s ideas were not accepted by the scientific community.

. . .

. . . Robert Jastrow . . . ‘nothing could be more exciting than to witness a revolution of scientific thought in our own lifetime.’ ‘Unfortunately,’ he concluded, ‘the evidence does not support this possibility.’”

Therefore, let us examine these laws that Cohen claimed refuted Velikovsky’s hypothesis to see if they truly are all that is claimed for them.

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TIDAL THEORY, GRAVITY AND MATHEMATICS

“We have explained the phenomena of the heavens and of our [tidal] sea by the power of gravity . . . it is enough that gravity does really exist and act according to the laws we have explained and abundantly serves to account for the motions of celestial bodies and of our sea [tides].”


The understanding of the tides has been a problem; for science from the very early times as described by Dominic Reeve, Andrew John Chadwick and Christopher A. Fleming: “Tides have been studied from earliest times. Indeed, it is documented that Aristotle spent the final part of his life on the Island of Euboa, where he studied the tidal flows. It has been suggested that his failure to explain tidal variations drove him to hurl himself into the ocean where he drowned.”

Galileo also had a theory of tides to prove that the Earth rotated and the tides were a clear indication of this motion. J. Glyn Ford maintains that Galileo’s tidal theory “As an empirical attempt to explain the facts . . . worked much better than Newton’s wholly theoretical treatment of the problem.” He goes on to suggest:

“Galileo’s tidal history has normally been treated by historians of science as an aberration within the context of his work. It is generally thought of as nothing more than a hasty attempt to supply an answer to one of the demands of the anti-Copernicans who wished for proof of the Earth’s motion. However, when looked at from the point of an empirical oceanographer, it turns out to be a sophisticated theory which explains, to a high degree of accuracy, the complex tidal movements of the Adriatic [Sea], from where it is known Galileo obtained his data. His theory [of the Adriatic’s tides] was in this respect of far greater explanatory value than the later Newtonian theory, although less theoretically satisfying. Hence, this theory was an attempt by a scientist in the true Baconian spirit to make the theory fit the facts. Set in the scientific context of the time it was a creditable attempt to solve a problem WHICH IS STILL CAUSING DIFFICULTIES TODAY.”

(Capitalization added)

Nevertheless, Newton’s analytical description of the tide has been accepted as correct by most modern scientists as it is presented in textbooks and books on astronomy and gravity. But Ford, above, just told that the problem of applying gravitational theory to explain tides “is still

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2 Dominic Reeve, Andrew John Chadwick, Christopher A. Fleming, Coastal Engineering (Abingdon OX UK 2004), p. 103.
4 Ibid.
causing difficulties today.” Harlow Shapley was unaware that these difficulties were actually contradictions to Newtonian tidal theory – in a letter to Horace Kallen, Dean of the Graduate Faculty of the New School for Social Research on May 27, 1950, chided Velikovsky for not understanding these long established laws of gravity that explain the tides writes:

“Dr. Velikovsky’s claim that there have been changes in the structure of the solar system during historical times has implications which apparently he has not thought through; or perhaps he was unable to convey to me in our brief conversation. If in historical times there have been these changes in the structure of the solar system, in spite of the fact that our celestial mechanics has been for scores of years able to specify without question the positions and motions of the planetary system for many millennia fore and aft, then the laws of Newton are false. The laws of mechanics which worked to operate the tides . . . are fallacious. But they have been tested competently and thoroughly. In other words, if Velikovsky is right the rest of us are crazy. And seriously that may be the case. It is however improbable.”

The point regarding tides as proposed and explained by Newton and all who attempted to make gravitational theory correlate with tidal motions has failed, but Shapely, and nearly all those who repeat Shapley’s claim, are simply not mindful of that basic fact. Newton, himself, was unable to make his theory congruent with the actual behavior of tides and was forced to repeatedly cull the data to force it to appear to fit gravitational theory. In this respect, Hans C. Ohanian explains.

“A careful examination of Newton’s writings have revealed that some of the errors in the Principia were a deliberate and dishonest attempt to mislead. In the Principia, Newton proposed that the exact quantitative agreement between theory and observation was the ultimate criterion of scientific truth. As he said in the preface, ‘He that works with less accuracy is an imperfect mechanic, and if any could work with perfect accuracy, he would be the most perfect mechanic of all.’ And to convince his audience he would be the ‘most perfect mechanic,’ he proceeded to fabricate the required agreement between theory and observation, by fair means or foul. Newton faked some theoretical calculations and he engaged in flagrant cherry-picking of observational data, discarding those data that did not quite fit his calculations. Richard Westfall, one of Newton’s most incisive biographers, called this ‘nothing short of deliberate fraud,’ and he labeled Newton a master of the . . . ‘fudge factor’ . . .

“. . . examples of . . . fakery are found in Newton’s theoretical calculations of the precession of the equinoxes, the magnitude of the force of gravity acting on the moon, THE HEIGHT OF THE TIDES . . . In all of these cases he has a good qualitative understanding of the underlying physics, but inadequate mathematical tools and/or inadequate observational data for an adequate quantitative analysis…

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“These instances of fraud by Newton are somewhat reminiscent of . . . that Galileo perpetrated with his theory of tides. But whereas we might give Galileo the benefit of the doubt and charity regarding his mistaken theory of tides as an isolated case of self-delusion, no such excuse will serve for Newton. His acts of fraud occurred repeatedly, much too often to admit of self-delusion as a plausible explanation. In the perpetration of fraud, Newton was a recidivist, deserving of no charity. Besides, we have documentary evidence from letters between Newton and Roger Cotes, the editor of the second edition of the Principia, that they engaged in collusion to ‘mend’ the numbers. Cotes would propose some fraudulent adjustment of observational data ‘to make that Scholium appear to best advantage as to the numbers’ and Newton would do Cotes one better by contriving some fudge factor that suited the occasion.”

As will be shown below, Newton’s laws do not now, nor ever could, mathematically explain ocean tides. It is only by assuming that a Newtonian explanation works that Shapley’s argument for tides has been presented by many of Velikovsky’s critics. The fact of the matter is that Velikovsky did answer Shapley directly on this point:

“Oceanic tides according to Shapley, follow precisely Newton’s formula . . . [was] proof that Velikovsky could not be right. How precisely do they follow the formula? [In James Gilluly, Aaron C. Waters and A.O. Woodford’s Principles of Geology (1951), the year after Shapley used tidal theory to discredit Velikovsky, pages 396 and 398 we read]:

‘The ancients knew that the ebb and flow of the tides varied with phases of the moon. So complex is the real Earth as compared with the idealized Earth assumed by astronomers and physicists that we have, as yet, no general [gravitational] theory that permits tidal forecast for any point on an ocean. Tides are, of course, predicted with great accuracy for all principal ports; these are not computed from general [Newtonian] theory, however, but from analysis of tidal records over a long period of years at the particular port concerned.’

‘[And] the Newtonian scheme fails to explain fully the vagaries of the local tides. For example, many ports have but one tide in a lunar day; [instead of two which Newtonian theory requires]; in others the lag is many hours from the time the moon is at zenith; in still others the two daily tides are of greatly different height. They also vary with the seasons [which does not affect the distance between the Earth and the moon as gravity is only affected by mass and distance squared.] These and many other facts make it clear that the tides are not a simple direct response to the vertical component of THE MOON’S GRAVITATIONAL PULL WHICH IS REALLY FAR TOO SMALL FOR EFFECTIVE LIFTING OF WATER MASSES ANYWAY.”

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7 Velikovsky, Stargazers and Gravediggers, op. cit., p. 57. (Capitalization added)
Velikovsky and many of his supporters have failed to dig deeper into this problem, and his critics have failed to gather the full significance of just how important this failure of gravitational theory is. In this respect, Velikovsky wrote:

“The authors of the textbook on geology . . . did not express any doubt concerning the Newtonian theory of tides; they showed only that there exist many irregularities that require explanation, that the force of the moon’s gravitational pull is insufficient [to raise the size of the tides observed], and that no theoretical prediction of tides is possible. Therefore, to refer to the tides as providing support for the Newtonian theory is once more a statement in contradiction with the known facts.”

Many critics will respond saying that these are complications caused by the shape of continents, bays, depths of water, etc. that can account for these discrepancies between theory and observation. That is simply not true of the overall problem with tidal theory and is simply a way to avoid facing the fundamental fact that tidal theory has always failed as will be shown below. The problems with this theory have long been debated. For example, a popular weekly magazine, Our Home Journal, for September 2, 1871, page 151 contains a response to a writer who maintained that the moon produces these tides. G.W.P. writes his views on this problem:

“Your correspondent [W.R.E.] has presented no new arguments in favor of Lunar theory of the tides, except those founded upon a mistaken view of facts; and the insuperable objection to such a theory . . . We may very well admit, as he says, that ‘the difficulties connected with the Lunar theory presented by G.W.P., may not be explained satisfactorily, in harmony with the moon theory.’ That is really giving up the whole matter in controversy. If there are facts against a theory, that cannot be made to harmonize with it, then the theory is false.

“That ‘the tides keep time with the revolutions of the moon’ is by no means in accordance with the facts . . . The tides gradually and regularly rise or flow about six hours – remain stationary about six hours to flow again after another brief response.

“The attraction of gravitation confines the moon . . . to its orbit . . . the moon’s attraction of the Earth is so small as to be imperceptible. If the moon’s attraction is so powerful as to lift the waters of the ocean from forty to seventy feet above their natural level, it would surely raise a feather from the ground; and ‘W.J.B. would be enabled to demonstrate his theory by his own weight [when standing on a scale] which would . . . when she is overhead exerting her vast power of attraction in raising him up. But the fact that he really weighs the same in any possible position of the moon is fatal to his theory.

“The Lunar theory involves the following absurdities. The moon has not the slightest power to attract solid bodies [on the Earth’s surface]; not even lifting the down of a thistle from the ground; while her attraction of water is so powerful as to lift up to a height of sixty to seventy feet, thousands of square miles of the waters of the ocean . . . But while she attracts water with so vast a power, she exercises no

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8 Velikovsky, Stargazers and Gravediggers, op. cit., p. 57.
perceptible influences over another fluid, the air which surrounds the Earth to a [closer] great depth, and from its nature and position [to the moon] should be more susceptible to the moon’s attraction than are the waters of the ocean.

“Your correspondent is mistaken in supposing that the Lunar theory has never been questioned by men of scientific reputation. Lieut. Maury has done more toward explaining the causes and the directions of the currents of air and of the ocean than any living man . . . yet he rejects the Lunar theory as without foundation in fact, and replete with inconsistencies.

“But the moon’s force of attraction, small as it is compared to that of the Earth, is diminished and nearly destroyed by her great distance, of nearly two hundred and thirty-nine thousand miles from the Earth. It would be in utter violation of the [Newtonian laws of nature for a small body like the moon, at so great a distance to overcome the attraction of the Earth, a larger body [whose gravity is pulling down the ocean levels with a force far greater than that of the moon pulling the oceans upward] . . .

“The waters of the ocean being fluid may be put in motion by the wind, by the daily rotation of the Earth, or by currents of electricity, and rolled up into waves, or tides or caused to flow in vast currents like the Gulf Stream; but to be lifted up by attraction [of the moon’s gravity] would require a force strong enough to overcome the [far greater gravitational] attraction of the Earth . . . Not until the [Newtonian] laws of nature shall be entirely reversed, . . . can such a [tidal] event take place.”

This description, however flawed, is only the tip of the tidal theory problem, but it indicates that for a long time it was well-known that tidal theory was deeply mired in contradictions.

With regard to atmospheric tidal theory, which should follow the behavior of oceanic tides. Sidney Chapman and Richard S. Lindzen tell us:

“By analogy with the sea tides, the lunar atmospheric tide must cause a rise and fall of the barometer, of semidiurnal period [each about six hours long]. In the tropics the barometer does show a marked semidiurnal variation, but its period half a solar, not lunar, day”9

They show that at Batavia in Indonesia over a five-day period near the equator there is only one atmospheric tide each day; while at Potsdam in Europe there are only two tides that occur over the same five day period. And, of course, they attempt to find ways to explain these differences away. That is, the atmospheric tides occur once every twelve hours with very slight indications of these, even at Potsdam.10 What tidal theory cannot explain is this dichotomy between ocean and atmospheric tides.

In this respect, M. Arago, who tested these barometric readings at Paris over several years, discovered: “It is evident, then, that if the moon had any influence on our atmosphere it does not proceed from any cause analogous to that which produces the tides of the ocean; and therefore,

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that the fact that the moon does not produce such tides can afford no countenance to the imputed meteorological influence."  

The problem of tides has baffled the greatest minds of science for centuries and is still inexplicable in terms of gravitational law, although it should not be inexplicable. If gravity was solely responsible for lifting masses, then the atmospheric tides should coincide with the oceanic ones, not that they should be of the same height. The atmosphere, being easier to lift than water, should be raised to a greater height than the ocean, but in reality, it falls far short of the ocean tidal heights and it does not exhibit the same periodicities as the ocean is clear proof that gravity is not the sole force operating. There must be some other force creating these great dichotomies between oceanic and atmospheric tides.

Richard Lindzen has argued that heating and cooling of ozone in the upper atmosphere by the Sun causes that part of the atmosphere to expand or contract, thus allowing atmospheric tides to be fully explained. As the atmosphere heats up during the day, it expands, and at night, when it cools, it contracts, each phase occurring every 12 hours. Nevertheless, in a 1980 paper, he admits to a contradiction that exists with this theory, namely that the expansion and contraction are not connected with surface air pressure: “None of the above [expansions and contractions] resulted in any improvement in the phase discrepancy of the solar semi-diurnal [12 hour] surface pressure oscillation.”

If Lindzen’s theory was correct, then the daily heating of the upper atmosphere should cause the surface pressure to fall, while contractions should act to raise the surface pressure. But these day-night oscillations do not correlate with surface atmospheric pressures; as Lindzen admits, they exhibit a phase discrepancy. Again, as with ocean tides, neither gravity nor solar heating explains atmospheric tides. What, then, is the possible solution? Again, electromagnetism has been left out of these matters.

Since the discovery in 1752 by Benjamin Franklin’s kite experiment, it has been demonstrated repeatedly that the atmosphere is electrically charged and that electricity can be drawn down from the clouds. Other later experiments that were carried out show not only that the atmosphere is charged, but that its charge varies over a 12-hour period from the day side to that of the night side. According to D. R. MacGorman and W. D. Rust:

“Also in 1752, the French scientist, [Emile] Lemonnier, detected weak electrification in the atmosphere, when there were no clouds and determined that the intensity of fair weather electricity varied from night to day. This was confirmed in 1775 by the more sensitive experiments of the Italian scientist [Cesare] Beccaria . . .”

What we have here, instead of a thermal forcing oscillation of the atmosphere, as Lindzen suggested, is an electrical oscillation operating every 12 hours in phase with the day and night atmospheric tides. This is not connected to the solar day to night heating variation, nor to the Sun’s gravitational pull. In essence, what we actually have is an oscillating, electrified atmosphere in phase with the Sun, and the atmospheric tides rising and falling with it. This is

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never taken into scientific consideration because of the shackles that Newtonian theory has on the thinking of atmospheric scientists. Electromagnetic effects have no place in their tidal theories.

As we can see, electromagnetism apparently correlates with ocean tides in tandem with lunar gravitation. It also correlates with atmospheric tides and solar electromagnetic effects on the Earth. Having omitted electromagnetic evidence from their considerations, the scientists are left with many contradictions associated with ocean and atmospheric tides, and actually have “no theory at all!”

Typical of the failure to understand the problems inherent in tidal theory is one of Velikovsky’s most severe modern critics, astronomer Philip Plait of the physics and astronomy department of Sonoma State University, California. Laird Scranton, in his book, *The Velikovsky Heresies*, reports:

“Astronomer and skeptic-at-large Philip Plait has argued steadfastly against the proposition raised by Velikovsky in *Worlds in Collision*. He states in an online [Internet] blog regarding Velikovsky, ‘I wrote a chapter in my book about V[elikovsky]’s theories, and could easily have written a whole book on just his terrible astronomy claims. I can't remember a single thing V[elikovsky] said in his book ‘*Worlds in Collision*’ that was astronomically correct. It is an astonishing collection of rampant wrongness.’”

In the same book where he criticizes Velikovsky, *Bad Astronomy*, Plait claims that he has a very clear understanding of tides and explains this understanding in a chapter titled, “The Gravity of the Situation: The moon and the Tides.” Let us examine whether Plait actually knows what he claims to know about tides or whether his knowledge is, in his own words, “Terrible astronomy” and whether he has presented in his chapter on tides “an astonishing collection of rampant wrongness.” Plait writes:

“Because the moon is smaller and less massive than the Earth you would feel a gravity [on it of] about one-sixth that of the Earth . . .

“That [gravitational] grasp weakens with distance giving rise [to a tidal] effect on Earth. The part of the Earth nearest the moon feels a stronger pull than the part of the Earth farthest from the moon. The difference in distance – the diameter of the Earth – means a difference in gravity. The near side of the Earth feels a pull about 6 percent stronger than the far side. . .

“So you would think, since the near side of the Earth feels a stronger pull, water would pile up there, giving us a high tide. [But] On the far side of the Earth there should be a low tide . . .

“But we know that’s not right. There are two high tides and two low tides a day . . . How can this be?”

Plait explains this seeming incongruity between the near side and the far side tides by the analogy of a man holding a child in his arms while dancing in circles. Since the child, like the far side of the Earth, moves in a larger circle at a greater velocity than the man’s back that represent

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the near side of the Earth to the moon, this difference explains the tides generally observed on the Earth each day. Plait adds:

“So what does this have to do with tides? *Everything.* Our little dance is a tiny version of the same tango in which the Earth and moon participate. Instead of holding each other’s hand, the Earth and moon use gravity to embrace . . . they both make circles . . . the moon makes a big circle around the Earth, the Earth also makes a little circle at the same time. [Actually these are not circles but ellipses.]

“This means that the moon and the Earth are actually orbiting a point in between the two bodies as if all the mass in the Earth-moon system is concentrated. This point is called the *center of mass,* or technically the barycenter . . .

“Someone standing under the moon on the Earth’s surface *would* feel the moon pull [upward as does the water in the ocean] . . . But the person on the far side of the Earth feels less force toward the moon . . . [which creates] a positive force in the other direction, *away from the moon.*

“It seems paradoxical that gravity can act in such a way as to make something feel a force away from an object but in this case it’s because we are measuring that force relative to the center of the Earth. When you do that then you do indeed get a force pointing away from the Earth.

“That is why we have *two* high tides. There is a net [gravitational] force toward the moon on the near side, and a net force away from the moon on the far side.”

All this Plait considers “good astronomy,” in spite of the fact that, on Earth, there are two high tides in certain places but not others, and atmospheric tides do not correlate with sea tides. This clearly contradicts Newtonian theory. But for all Plait’s understanding of the standard model of tides, once gravitational theory is actually applied mathematically to this standard model, it simply fails. The model and the Newtonian mathematics that should fit it are in such great disagreement that the theory cannot be made to work. In short, Newtonian theory does not mesh the mathematics with the data Plait presented. Plait simply has no understanding that what he presented regarding tides is “bad astronomy.” This was pointed out in 1974, the time of the AAAS Symposium on Velikovsky, by Irving Michelson who spoke there. He wrote an analysis of tidal theory in the *Bulletin of the Atomic Scientists* titled “Tides’ Tortured Theory” that very same year.

“Pressing questions of Earth’s physics, astronomy and the eternal riddle of Solar System formation should be explainable in terms of tidal motions and tidal friction but tidal knowledge always falls short of these expectations in these discussions. Tide theory condemned by competent impartial experts as being no theory at all but only a mass of doubtful assumptions obstructing scientific progress is due for a major overhaul.”

How can Harlow Shapley and Philip Plait be correct regarding tidal theory when an authority on tidal theory says it is “only a mass of doubtful assumptions obstructing scientific progress,” “condemned by competent impartial experts.”

Michelson goes on to say:

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“Neither the results of Laplace’s calculations nor the efforts of tidal researchers in the past 200 years . . . have appreciably reduced the huge discrepancy between the composite theory [of tides] and the hard facts of observations on the other. However, Laplace’s doctrine still remains as the cornerstone in the baroque structure of monolithic ocean tide theory and as the unquestioned tidal model base for allied [astronomical] studies. Rival theories have been assigned to the [scientific] Index Expurgatorius without exception.”

Michelson further shows:

“Francois Arago, the French astronomer and physicist called the study of tides ‘the tomb of human curiosity’ and all who have attempted it agree. For if we rely solely on the relevant physical principles, consisting of nothing more than Newtonian mechanics and gravitation, we are to this day unable to decide whether high tide occurs when the moon is in the meridian or whether the exact opposite, low tide is more nearly correct.”

How can Newtonian theory be correct when it can predict both a high tide and low tide at one place on the Earth at the same time? That is why Michelson claimed it was “no theory at all.” But Plait is totally oblivious to all this! Michelson reports just as did Velikovsky: “It is fortunate that routine preparation of tide tables does not suffer from this strong and glaring failure of the exact sciences, since the computation for [tide] tables are based on empirical methods.”

Of course, critics of Velikovsky can argue this has nothing to do with the rest of the solar system, but in this respect they are also incorrect. Tidal theory is tied to a large number of celestial phenomena that are crucial to a correct understanding of astronomy and cosmology. Here Michelson pertinent shows:

“Apsidal motions of binary star systems [where the major axis between the stars rotates in space] have been observed and explained tentatively in terms of tidal friction; but no agreement is found when standard tide theory is introduced. Deceleration of the Earth’s rate of rotation evidenced by the secular accelerations of the sun, moon and planets is reasonably supposed to be a consequence of the action of tidal friction. Classical tidal theory indicating maximum dissipation rates that are roughly 1,000 times smaller than observations lead us to expect. In all these cases, and numerous others as well, the only consistent feature of our knowledge of tides is its failure to confirm seemingly reasonable [Newtonian gravitational] hypotheses.”

The entire ensemble of astronomical phenomena related to tidal theory is not, nor ever has been, explained by gravitational theory. For example, Michelson pointed out that the “Deceleration of the Earth’s rate of rotation,” especially related to tides caused by the moon is a “failure. Nevertheless, Carl Sagan also erroneously argued that “tidal theory and the conservation of energy and angular momentum with the Earth-moon system [show that Velikovsky is wrong]...”

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18 Ibid., p. 31.
19 Ibid. (Emphasis added)
20 Ibid.
21 Ibid.
without appeal to cometary or other exogenous intervention. But tidal theory does not explain the slowing of the Earth’s rotation; there too it has failed, but Sagan was also ignorant of this.

The underlying problem with all analyses of tidal theory is that the application of gravitational theory to that problem shows the mathematics employed always gives figures that are so much greater than the actual observations require or contradictions to the theory showing that the theory must be wrong or as Michelson said above, “is due for a major overhaul.” Clearly, something is missing, some other force than gravity applies to all these astronomical phenomena. As with Velikovsky, I suggest it is electromagnetism that is the missing force. Lee Smolin’s discussion of the superstring theory, I maintain, also applies to tidal theory: “The one thing everyone who cares about fundamental physics seems to agree on is that new ideas are needed . . . we are missing something big . . . every physicist I know will agree that probably at least one big idea is missing.”

Henri Poincaré stated that the solar system “may in fact be subject to forces other than those of Newton.”

At this stage it must be pointed out that when the scientific establishment was shown that its theory of tides is invalid, it failed to acknowledge this very fact. Miles Mathis, a physicist, whom we will be discussing below, sent a mathematical analysis to the Wikipedia that proved what that bastion of establishment science was presenting to the world via the Internet about tides was totally incorrect; they simply used administrative means to cover up that failure. Mathis informs us that:

“Confronted with parts of this paper [on tidal theory] in late 2005, Wikipedia deleted all its tidal theory math, its tidal theory page, and ordered a rewrite with lots of new illustrations. It appears they are perfecting their propaganda rather than admitting their math and theory doesn’t work. This change affected many other websites as well, since wiki is linked to a large percentage of online encyclopedia entries. Large parts of tidal theory have gone into hiding since the publication of this [Mathis] paper.”

With respect to Einstein’s theory; how does it create tides when Einstein claims a body in curved space feels no force? Mathis explains:

“Notice how theorists who claim to believe in General Relativity always revert to Newton when it comes time to explain [tidal] forces in gravitational fields. In . . . General Relativity we are told that an orbiting body is feeling no forces. It is simply following curved space, the ‘line’ of least resistance . . . the ball-bearing [orbiting] on the piece of rubber and the tiny marble orbiting it . . . [feel] no centripetal [center pulling] force. All quite ingenious, except that it does not explain the genesis of the forces at a distance used in tidal theory. How can an orbiter that is feeling no force achieve tides? Even more to the point, how can another orbiter [the moon] that is traveling in the curved space of its primary [the

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23 Lee Smolin in Steven Scoular, *First Philosophy* (Boca Raton FL 2007) p. 84.


Earth] recure that space in order to transmit a tidal force to the primary . . . It cannot be curving both ways at once.”

What we see is that when Newtonian theory is mathematically calculated to explain tides, the math does not agree with the theory and can even give both high tides or low tides at the same point on the Earth at the same time as Michelson pointed out. When we turn to Einstein, whose warped space theory was created to explain Newton’s laws, there is no way for the moon orbiting in the warped space around the Earth to rewarped it, and in terms of Einsteinian theory, the Earth oceans should feel no force since General Relativity does not create forces. Both Newton and Einstein’s theories fail to explain tides, but that fact will never see the light of day at Wikipedia nor, I believe, anywhere else in media presentations for the public.

There is, in fact, no tidal theory and no mathematics that correlates with reality and it. If Mathis’s analysis was false or in some way fraudulent, the university authorities at Wiki would have found that out. When they pulled down the Wikipedia site with its mathematics they were admitting that their theory and math were wrong. Furthermore, if they had better mathematics to replace it they would have done so. Illustrations are not mathematics but that is all they have to uphold their tidal theory – pictures! Mathis has literally torn the heart out of standard tidal theory and this will be presented again in the Appendix where Plait’s work will be examined again.

Velikovsky pointed to massive contradictions with gravitational theory as early as 1946 in his paper, *Cosmos Without Gravitation*, now on the Internet, particularly as it relates to gravity over the oceans:

“Over the oceans the gravitational pull is greater than over the continents, though according to the theory of gravitation the reverse should be true. The hypothesis of isostasy also in unable to explain this phenomenon. The gravitational pull drops at the coastline of the continents. Furthermore, the distribution of gravitation in the sea often has the peculiarity of being stronger where the water is deeper: In the whole Gulf of the Caribbean region the generalization seems to hold that the deeper the water the more strongly positive the anomalies.

“As far as observations could establish the sea tides do not influence the plumb line which is contrary to what is expected.”

This clearly implies that salt water oceans are not aligning themselves with Newtonian theory. As with tidal theory that too is a failure; the ocean itself as a whole is not responding to gravitation. The fact of the matter is that sea water is to a certain degree electrified. David Edgar Cartwright describes these effects on conducting cables:

“Probably the strongest electromagnetic effect of a tidal nature to be directly measured was the difference in electric potential recorded in 1851 . . . on the first telephone cable across the English Channel. The signal of amplitude about 1 volt was obviously fluctuating in sympathy with the tidal stream in Dover Straight and was in fact generated by the mass of water in the vertical component of the Earth’s magnetic field . . .

“Most recently, electromagnetic signals of tidal nature have been recorded at the bottom of the ocean using pairs of electrodes separated by a meter and a

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sensitive three-component magnetometer. The recorded signals are [believed to be] partly due to ionospheric origin and partly due to direct induction by barotropic tidal flow. (i.e. the depth-mean tidal current).”

That is, the depth of the water affects an electric current in a wire or a magnetometer. The deeper the water the greater the effect.

Here, Mae-Wan Ho points out,

“The water molecule is a permanent electric dipole in which positive and negative charges are separated, with the two hydrogen atoms of the positive pole and the oxygen atom at the negative pole . . . Like other dipoles, water molecules can stack together in dipole interactions with alternating positive and negative poles next to each other. They can also engage in electrostatic interactions with charged ions and other dipoles [of minerals] dissolved in the water.”

In essence, water will often, as it slows or stops flowing, create an electromagnetic field that can respond (as Velikovsky suggested) to outside space fields by repelling them and offset the pull of gravity, as Ho goes on to show.

“The dipolar nature of water and its propensity for hydrogen account for its unusually high dielectric constant of ~78 at room temperature . . . the dielectric constant or relative static permittivity is a measure of the extent to which it concentrates electrostatic lines of flux relative to a vacuum. Researchers led by Manu Shama at Princeton University have shown by molecular dynamics computer simulations from first principles that the high dielectric constant of water is due to two effects of the hydrogen bonds contributing in almost equal measure. The hydrogen-bonding serves to align the dipoles and, at the same time, pull away positive and negative charges within a molecule, enhancing the average molecular polarization.”

Putting this together with Velikovsky’s evidence in Cosmos Without Gravitation, the deeper the water the greater its gravity and its electromagnetism, the shallower the water the smaller is its gravity and its electromagnetism. What follows from this is that tides in the central oceans will be harder to raise because they are gravitationally more massive and have an electromagnetic repulsion to lunar gravity and/or lunar electromagnetism. At points along the coasts where the water is shallow, gravity pulls it more strongly than electromagnetism repels it. The typical answer to this variation is that the tide is forced to pile up along a coast where the water is shallow, and expressed by Arnold Schumacher thus:

“Out in the open sea the range of the tide is small. This follows from theoretical considerations and is supported by the tide observations made on oceanic islands. In the Atlantic Ocean the tide on the shores of such midocean islands as St. Helena, Ascension Island and the Azores has a mean range from 1½ to 3 feet. In the Hawaiian Islands, and in the North Pacific, the mean range is less than 2 feet; and in the great number of midocean islands of the South Pacific the range is with few exceptions less than 3 feet.

28 Mae-Wan Ho, *Living Rainbow H₂O* (Singapore/Hackensack, NJ/London 2012 (p. 9)
“It is only along the coasts of the continental land masses that large ranges of the tide occur. In accordance with the stationary-wave theory of the tide this is explained by the existence of stationary waves, with the continental land masses at the ends of the waves [acting as barriers to allow the tidal waters to pile up].”

All this would make perfect sense if, and only if, tidal theory actually correlated with Newtonian theory. Based on the physics/mathematics, the tides in the midocean should be about 40 times greater, as Mathis points out in the Appendix. On the basis of tidal theory, the height of the tides on midocean islands, which range from about two to three feet, should range from about 80 to 120 feet, and the coastal tides should range up to several hundred feet! What the physicists are doing is maintaining that their failed tidal theory is valid by suggesting tides operate on “the baroque structure of monolithic ocean tide theory.” Since that theory is invalid, our interpretation, although not proved, has at least the merit of explaining tides by observations of gravity made directly over the oceans. Deeper oceans do in fact have more gravity and greater electromagnetism; shallower oceans do in fact have less gravity and less electromagnetism. The laws of gravity specifically demand that heavier or more massive bodies are harder to lift than lighter or less massive objects. The deeper ocean, having greater mass cannot, according to Newton, be lifted to a greater height than the waters along the coastal regions which have far smaller mass. This behavior of the oceans appears to be completely in accord with Velikovsky’s theory. To negate this behavior is to negate the laws of gravity.

The deep ocean, because it is more difficult to lift, having greater gravity and, as I suggest, a greater electromagnetic repulsion to lunar gravity and electromagnetism, rises only a few feet. The shallow oceans near the continental coasts are less difficult to lift, having weaker gravity and a weaker electromagnetic repulsion to lunar gravity and electromagnetism can be raised a great many feet. This is an interpretation which seemingly conforms with the data that is actually measured – the gravimeters’ readings over midocean and coastal ocean regions and the observed sizes of the tidal readings in both regions. Neither of these gravimeter and tidal gauge readings agree with tidal theory. If gravitational tidal theory is correct, these fundamental contradictions should not exist. As Lee Smolin suggested above, “we are missing something” and “at least one big idea is missing” in modern physics. The experimental evidence that electromagnetism does play a direct role in motion will be discussed in the chapter on Electromagnetism below and how these experiments are directly related to tides, as well as to gravity. That is, experimental data and observations are completely in agreement with the interpretation of tides just presented. Now this does not in any way suggest that tides in very large or small bays are directly related to this explanation. The shapes of bays etc. do require that high tides in them will come later and more slowly and therefore not be related to the forces just presented, nor does this theory reject the power of winds to heap tides far higher than normal.

Note: Velikovsky pointed out above that the gravity in the Gulf of the Caribbean, that is the Gulf of Mexico, is quite large because of its great depth. But the Gulf of Mexico is an immensely wide bay-like structure into which the supported tide from the Atlantic Ocean spills.

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Therefore, it should exhibit moderately high tides. But this is not the case. They are relatively small.\textsuperscript{31}

Thus, we are specifically told “Gulf of Mexico tides are small and noticeably less developed than many other coastal areas of the Atlantic or Pacific states. The ranges of tides throughout the Gulf are typically on the order of 0.3-1.2 m[eters] depending on location and time of year.”\textsuperscript{32} That is, the tides in the Gulf of Mexico, unlike Atlantic and Pacific coastal regions, are on about one to three and a half feet high. The opening to the Gulf of Mexico is quite large, which will admit Atlantic Ocean tidal waters to enter it to produce high tidal ranges, unlike the Red Sea, with a very small opening that will not allow Indian Ocean tides to fill it rapidly. As the tides move from east to west the Gulf should have much larger tides from the Atlantic; instead the Atlantic tides flowing into it play no role nor have any effect. Where the oceans have the strongest gravity – the deepest midocean regions, it is naturally more difficult to raise high tides; conversely, where the oceans have the weakest gravity – the shallowest coastal regions, it is naturally very easy to raise high tides. The physics and the logic of this evidence unites all the phenomena together.

On the other hand, I also suggest: Can electricity act as a hydraulic lifter of water? That is the question I will now address. According to Peter Tomkins and Christopher Bird:

“In 1747 Jean Antoine Nollet . . . physics tutor . . . was informed by a German physicist in Wittenberg that water – which normally issued drop by drop from a capillary tube, would run at a constant stream if the tube was electrified. After repeating the German’s experiments . . . Nollet as he put it ‘began to believe that this electrical virtue employed in a certain manner might have some remarkable effect on . . . bodies which can be looked upon in some way as hydraulic machines prepared by nature itself.’ Nollet put several plants in metallic pots next to a conductor and was intrigued to note that the rate of transpiration [lifting water from the roots to the leaves and out the leaf pores] increased.\textsuperscript{33}

That is, the water in the ground flowed upward in response to an electric current. But what then of the oceans? Robert Michael Ballantyne long ago reported:

“We turn back now from the atmosphere to the aqueous ocean. Yet so intimate is the connection between the two . . . it is impossible to avoid occasional reference to the former.

“Our present subject waterspouts, are to a great extent, if not altogether obliges us to refer . . . to the atmosphere . . .

“There is now no doubt that waterspouts are to a great extent if not altogether due to the presence of electricity in the air. When . . . clouds have been raging [with lightning and thunder] for some time in the skies of tropical regions . . . they seem to grow unusually thirsty, the ordinary means of water supply [evaporation] through the atmosphere do not appear to be sufficient for the demand . . . [of] nature. The clouds therefore descent to the sea and . . . lick up the water in the form of

\textsuperscript{32} Regional Environmental Impact Statement \textit{Gulf of Mexico} (August 1982), p. 137.
\textsuperscript{33} Peter Tomkins, Christopher Bird, \textit{The Secret Life of Plants} (NY 1973), p. 182.
waterspouts. These whirling pillars of water frequently appear in groups of several at a time. These are of various heights sometimes ranging [sic] up to several hundred yards with a thickness of fifty yards...

“That they are caused by electricity has been proved by experiment — miniature waterspouts have been produced by artificial means and as Dr. Bonazano of New York gives... we quote his words...

“(From the conductor of an electrical machine suspended by a wire or chain a small metallic ball (one of wood with tin foil), under the ball place a rather wide metallic basin, containing some oil of turpentine at a distance of about a quarter of an inch. If the handle of the machine is now turned slowly, the liquid in the basin will begin to move in different directions and form whirlpools. As the electricity on the conductor accumulates, the liquid will elevate itself in the center and at last become attached to the ball.’...

“The same phenomena take place with oil or water, using the latter [the water] the ball must be brought nearer, or a much greater quantity of electricity is necessary to raise it.

“If, in this experiment we let the ball swing to and fro, the little waterspout will travel over the miniature sea carrying its whirlpools along with it.’...”

In essence, water can be lifted by electricity. Tides may also be a clear indication of charging and discharging of water, while gravity plays only a minute role. However, gravitational theorists cannot bring themselves to consider this even in the face of a failed theory.

It is obvious that all the astronomers who maintain that gravitational theory is as near to a perfect explanation of the motions of tides are incapable of proving their case. Worse, than that, nearly every discussion of tides fails to address the immense failure of gravitational theory to prove itself valid there. The physicists and mathematicians, for over 300 years, have been unable to connect gravitational theory through mathematics to the behavior of tides and have failed to live up to their scholarly duty of presenting this factual objective truth both to their students and informing the broad public of that failure. What they have done, like the Wikipedia, when shown that fact, was to present instead a willful distortion of science. This, indeed, speaks volumes about the dishonesty that permeates modern science. How could Shapley, Plait and all those others have been so ignorant of the findings in their own field? And I again point out that tidal theory applies not only to oceanic tides but as Michelson showed above, to “the eternal riddle of Solar System formation.” Yet the critics of Velikovsky do not suggest that their theory of solar system formation based on tidal theory has failed. They claim that solar system formation occurred by condensation and contraction of gas and dust and that the present form of the solar system has been stable for billions of years. Yet this is based on a theory that has never been proved. Since Michelson showed the “Apsidal motions of binary stars... explained tentatively in terms of tidal friction... [exhibit] no agreement when standard tidal theory is introduced,” how can one accept as proven the apsidal motions of planets around the sun based on the same failed tidal theory? The slowing of the Earth’s rotation based on tidal theory also failed, as it did “In all these cases and numerous others as well.”

Note: This author must admit that I, too, had accepted tidal theory as a valid aspect of Newtonian/Einsteinian theory until I uncovered this research. I retract this acceptance based on all this research above. Would that Velikovsky’s critics have the decency to do the same. They simply can’t because to admit this is to also admit that Newtonian/Einsteinian theory breaks down when it comes to tides. That means that some other force than gravity is operating in space, and that would imply Velikovsky could be right about what this force is. That they will not and cannot ever admit for very understandable reasons. Not only must they admit that the theory of gravity is not universal, but that it clearly implies Velikovsky may very well be right! More on this will be presented in the Appendix.

Nevertheless, critics will surely argue that because Newton’s laws do not account for lunar tides and numerous other phenomena, has nothing to do with the criticism of Velikovsky’s instability thesis. They will argue that, as a matter of fact, planetary motions are in full accord with Newtonian celestial mechanics and nothing can explain this away. The problem is that since no one has reevaluated Newtonian theory, vis à vis planetary motion, this argument can and will be shown below to be false.

STABILITY-INSTABILITY, THE EARTH-MOON SYSTEM

Scientists have maintained that the solar system is quite stable and that any deviations from stability are self-correcting.

On the other hand, Richard Sympson reports that Jonathan Swift, knowing the astronomy of his day, believed that the Earth would “be absorbed or swallowed up” by the sun, and tells us “fears were all entertained by scientists in Swift’s day. Newton’s calculations in the Principia recognized the possibility that the Earth would eventually fall into the sun.” This was based on perturbation theory or the theory that tugs on the Earth by the sun would gradually pull the Earth to the sun.

In this respect, let us move on to the gravitational effects of the moon and Earth on one another. Newton’s laws and the application of these to the moon and the Earth’s orbits should, therefore, show that our present understanding of their orbits is fully explained by these same laws. If Newtonian theory is correct, it will clearly reflect that understanding. But as we will see, the application of Newton’s laws to the moon-Earth system tells a very different story. Here Miles Mathis has presented an analysis that destroys that stability concept:

“A moon creates a perturbation that cannot correct itself. For instance take the familiar two-body illustration and add a 3rd body. Say this 3rd body is the moon and put the moon between the Earth and the sun... well the moon [at this point] is going to pull the Earth into a fractionally lower orbit [closer to the sun]. Physicists have never explained how this is not fatal to the orbit [of the Earth]. They know it is not fatal, since the Earth does not crash into the sun so they simply do the math to explain how the Earth gets to the next position [that will correct the pull of the

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moon on the Earth farther from the sun . . . They give the Earth a little tug here and there saying the moon corrects for itself . . . A balancing of velocities like this cannot be self-correcting.

“For instance, if you think that the moon simply pulls the Earth back [away from the sun] out of danger two weeks later when it is farthest from the sun you are not thinking right. The moon has pulled the Earth closer to the sun: [but] in order for it [on the antisolar side of the Earth to] pull it back two weeks later, it would have to be bigger [that is, more massive]. It takes a greater force to nudge a planet into a higher orbit [more distant from the sun] than it does to nudge it into a lower orbit.”

To move the Earth into a higher orbit requires more energy than to move it to a lower one.

It must be understood that, during these interactions, the Earth and the moon perturb each other but this does not change the conclusions as Mathis has demonstrated.

To understand this it must be explained that the moon does not orbit around the Earth; in fact, it orbits around the sun. Likewise, the Earth does not orbit the moon. At about 160,000 miles from the Earth, the sun’s gravity starts to become greater than that of the Earth, and at the distance of the moon is over twice that of the Earth. Thus, the moon is in orbit circling the sun as does the Earth and the Earth-moon system is known as a double planet. The reason for the moon moving in a seeming orbit around the Earth are the perturbations on it by the Earth. Nevertheless, the moon’s orbital arc is always centered on the center of the sun, not the center of the Earth. Therefore, perturbation [or pulls/tugs] by these bodies on one another are either pulling them closer to the sun to a lower orbit, or pulling them farther from the sun to a higher orbit. It takes less force to pull a body to a lower orbit closer to the sun than to a higher orbit farther from the sun. When we add the sun’s gravitational pull to this situation, the problem becomes clearer for the stability of the Earth-moon system.

This can be understood by considering the force necessary to pull a piano up a hill rather than down that same hill. In terms of gravity, it takes more energy to pull a piano up a hill than down. Applying a force to the piano will move it farther down the hill than if the identical force pulls it uphill. The sun and it’s gravitational force is the hill on which the Earth and moon are orbiting and, therefore, to pull the Earth downhill toward the sun to a lower orbit requires less force than to pull the Earth uphill away from the sun to a higher orbit. If one thinks of lower orbit as downhill and of a higher orbit as uphill, the theoretical understanding of this problem becomes clear. If a force pulls the piano downhill by say 20 feet, that same force will not pull it uphill the same 20 feet, but perhaps 15 feet. That is what is at the heart of the problem of the stability of the Earth-moon system. Furthermore, the interaction must be reciprocal. If they weren’t, the Earth would move either closer to the sun or farther from it. Since it does neither, the action of gravitational attraction must be reciprocal to a repulsion action in the system.

Since the moon is the same size and mass on both the solar and antisolar sides of the Earth, it simply must, while on the solar side, pull the Earth downhill closer to the sun. But because it has the same size and mass, while on the antisolar side of the Earth, it cannot correct the Earth’s

orbit by pulling it farther uphill away from the sun; it requires more energy to do this. The moon being the same body on both sides lacks the additional mass on the antisolar side to correct the inward pull it gave two weeks earlier. This also cannot be correct by changing the velocity of the Earth when the moon is ahead and/or behind the Earth. Here Mathis explains:

“The same problem is going to be met when the moon is sideways to the Earth.
[When the moon is behind the Earth.] It is going to slow it down [so the Earth falls closer downhill to the sun] and then speed it up two weeks later [so the Earth supposedly moves uphill away from the sun].”

When the moon is behind the Earth it slows the Earth’s velocity causing it to fall downhill closer to the sun. But two weeks later when it is ahead of the Earth it cannot offset this because it still takes more energy to move the Earth to a higher uphill orbit. The moon is still the same size and mass therefore its mass must be greater when it is ahead of the Earth to speed it up sufficiently to offset what happened two weeks earlier. As Mathis explains:

“All the perturbations cannot be made to offset. No matter which direction you have the moon going (clockwise or counter) you are going to have the Earth thrown into ever lower orbits for two straight weeks. The next two weeks of corrections cannot [fully] offset this. And this is not even taking into account the sun’s effect on the moon’s orbit, which causes further uncorrectable perturbations.”

When one adds the gravitational pull of the sun always tugging the moon closer to the sun along its orbit, the situation for orbital stability becomes even more disastrous. Mathis adds:

“Gravitational theory gives us no force to explain it [the Earth’s orbital stability]. Neither Newton nor Kepler nor Einstein have anything to say on the subject. It is one of the great unseen gaps in kinematics.

“This is not to say the math is incorrect. It isn’t. It is simply unsupported. We have simply failed to build an orbit that is correctable or stable. Our engineers can build a stable orbit, our mathematicians can build a stable orbit, but our theory [of gravity] cannot yet do so.”

The very same process goes for the moon. When the Earth is on the sunward side of the moon, it pulls the moon to a lower downhill orbit but two weeks later when the Earth is on the antisolar side of the moon it cannot correct this because it still requires more energy to pull the moon uphill away from the sun, and the Earth has the same mass as before.

Likewise, when the Earth is behind the moon and slows its motion, the moon must fall closer to the sun, but two weeks later when the Earth is ahead of the sun it cannot correct this by speeding it up because it still requires more energy to move the moon to a more distant/higher uphill orbit, but the Earth has the same mass as before. Both the Earth and the moon, according to the laws of gravity, should be gradually falling ever closer downhill to the sun, and the size of the sun as seen from the Earth because of this should be getting larger and larger.

It may be argued that the Earth-moon system will not migrate toward the sun because the sun is only pulling on the Earth-moon barycenter, or center of mass at only this point. The barycenter is located at a point about 1,000 miles beneath the Earth’s surface, on the side of the

38 Ibid., p. 137.
39 Ibid.
40 Ibid., pp. 137-138.
Earth facing the moon. This does keep the Earth and moon locked in the gravitational grip of the sun, but this has absolutely nothing to do with the perturbations or gravitational tugs the Earth and the moon exert upon each other. When I am speaking about Earth-moon stability, I am addressing their perturbation tugs on one another that must gravitationally cause both the Earth and the moon to gradually fall or migrate toward the sun as a unit. That is what Mathis was describing above. To appeal to the barycenter to overcome this problem is, in reality, denying perturbation theory, and to do this is, in reality, to deny gravitational theory! One cannot isolate a gravitational interaction, namely solar pull on the Earth-moon barycenter, and deny that there are perturbation interactions between the Earth-moon system; both sets of interactions are operating. Because the sun’s gravitational pull on the moon is always about twice that of the Earth’s gravitational pull, the moon is actually orbiting the sun. Its arc is always concave to the center of the sun. The Earth merely perturbs the moon’s orbit so that it orbits the Earth.

Why haven’t the astronomers recognized this fatal flaw in their theory? Here Mathis puts the problem in the starkest terms. They can’t believe their theory is wrong and have never questioned it:

“The history of celestial mechanics is a history of mathematical analysis that is very short on theory. Every book you will find in the section on celestial mechanics at even the largest university libraries concerns creating equations to explain orbits based on observations. Most books have differential equations on the first page, and those that don’t begin by glossing the history from Newton to Gauss — [strictly as] a history of mathematical analysis. Most books don’t have a single page on the theory of orbits. That is because no one has done theory since Kepler and Newton. The problems I am enumerating here are mostly not known to exist anymore, for the very reason that all study of orbits and gravity is now strictly mathematical. No one cares ‘why’ [bodies move], they only want to discuss “how” [they move]. If there are huge holes in the gravitational theories of Newton and Einstein what does it matter? We have a heuristic theory [unrelated to the forces involved] but which mathematically — and only mathematically — pinpoints the positions of celestial bodies] that allows us to put our objects into orbit, what else do we need?”

Newtonian gravitational theory does not explain the underlying forces which keep the Earth and the moon from gradually falling toward the sun. In order for the Earth and the moon to remain in their stable orbits, some other force must be pushing both bodies farther from the sun during certain points along their orbits. Again I maintain that the force which does so is an electromagnetic repulsion. Let us analyze how this works. When the moon is on the solar side of the Earth it blocks to some extent the electromagnetic repelling field of the sun and thus the moon pulls the Earth closer to the sun. However, two weeks later, when the moon is on the antisolar side of the Earth it is pulling the Earth farther from the sun but the sun’s repelling electromagnetic field is not blocked and it pushes the Earth’s magnetosphere more strongly also pushing the Earth outward enough to offset the earlier interaction. When the moon is behind the Earth it again blocks to some extent the rotating solar electromagnetic field slowing the Earth’s orbital velocity and causing the Earth to fall closer toward the sun. Again, two weeks later, when the moon is ahead

\[\text{Ibid., p. 138.}\]
of the Earth, it pulls it forward at a greater velocity, but the sun’s rotating repelling electromagnetic field is not blocked and it pushes the Earth forward enough to offset the earlier interaction. The very same applies to the Earth’s gravitational and electromagnetic interactions with the moon so that it also does not fall gradually to the sun.

In the discussion below of experimental evidence that shows electromagnetic effects tests carried out on Earth show electromagnetism actually creates motion.

Although critics of my analysis will reject this concept and its application to the Earth-moon system, the real problem for them is that strictly using gravitational theory, the Earth and the moon should be falling ever so slowly toward the sun. That this is not happening requires another force to offset gravity. That this is not happening is simply another nail in the coffin of strict gravitational theory as the only force in the universe or as the only force in celestial mechanics!

**KEPLER’S FIRST LAW OF PLANETARY MOTION**

Kepler published his first law of planetary motion based on the data gathered by Tycho Brahe in 1609. The law states that planets orbit the sun in ellipses with the sun at one focus.

Nevertheless, S. James Press and Judith M. Tanur show Kepler fudged his first law of planetary motion.

“Kepler continued to work on the orbit of Mars. He tried unsuccessfully to fit [Tyco] Brahe’s data on Mars to a circle to show that Mars moved in a circle around the sun, but he failed. He finally realized . . . that it must move in an ellipse (he also tried an oval and other geometric shapes). He then generalized the concept to all the planets. With the help of Tyco Brahe’s database Kepler became determined to quantify the motions of all the planets and in 1609 he published . . . *Astronomia Nova*, a volume that summarized not only his work on the orbit of Mars but also two of his famous three laws of planetary motion.

“Almost 400 years later, William H. Donohue undertook the task of translating Kepler’s 1609 *Astronomia Nova* into the English *New Astronomy* (Donohue 1992) when in the course of his work he redid many of Kepler’s calculations, he was startled to find some fundamental inconsistencies with Kepler’s reporting of these same calculations (Donohue 1988). Writing of Donohue’s pathbreaking work in *The New York Times*, William Broad (1990) summarized Donahue’s findings saying that although Kepler claimed to have confirmed the elliptical orbit by independent observations and calculations of the position of Mars, in fact Kepler derived the data from the theory instead of the other way around . . .

“But a close study of Kepler’s *New Astronomy* . . . shows that the plotted points [he used] do not fall exactly on the ellipse (of course, measurements rarely fall exactly on a theoretical curve because they usually have random error sources incorporated into them.) Curtis Wilson (1968), however, carries error argument further. The lack of precision inherent in the method . . . would have forced Kepler to use the plotted points only as a guide to his theorizing . . .

“After detailed computational arguments Donahue concluded the results reported by Kepler . . . were not at all based on Brahe’s observational data; rather
they were fabricated on the basis of Kepler’s determination that Mars’s orbit was elliptical. Donahue reasons that Kepler must have gone back to revise his earlier calculations that were made prior to his understanding that the orbit of Mars was actually elliptical. Thus, anyone who cared to check Kepler’s tables would find numbers that are consistent with the elliptical orbit [he] postulated for Mars and would be inclined to believe that the numbers represented observational data. In fact, they were computed from the hypothesis of an elliptical orbit and then modified for measurement error; such data, if they were truly observations, would be prime facie evidence of the theories’ correctness.

“So Donahue . . . realized that the theory was not obviously derivable from the observations, . . . ‘Not only would the numbers be confused, but Kepler saw clearly that no satisfactory theory could come from such a procedure. . . . [Instead], he chose a short cut.’ What appears to have occurred here is that a great scientist . . . seems to have crossed the line of acceptable scientific practice. He became so convinced of what drove these physical processes that he subjectively projected his personal nonobservational-based belief onto the reporting scene to convince others in the scientific community of the validity of his theories.”

Thus, the very first law of planetary motion was built not on observation but on theory and the mathematics was then employed to prove the theory not test it. While I greatly admire Kepler and his contributions to astronomy, I have added this material to show, as with all scientists and humanity in general, he and we all have feet of clay. None of us are perfect. Those who demand such perfection are in pursuit of neurotic reality. There is no perfection in humanity, and those who create god-like figures of great scientists are seeking a perfect father or mother that can never exist. That pursuit is neurotic and can only lead to rage against them when that figure fails to live up to this neurotic ideal.

This law was explained by Newton in his Principia, Section III, Proposition XI wherein he claims “A body is revolving in an ellipse, to find the law of force tending to a focus of the ellipse [is undertaken].” And indeed it seemed Newton had successfully explained the ellipses of planetary orbits on strictly gravitational grounds. Since that time no one has looked at the evidence Newton gave and it is assumed that there was nothing to add nor anything missing regarding these elliptical planetary orbits with the sun at one focus. Having supposedly proved this, and having this been accepted for over 300 years no one has questioned this.

Nevertheless, physicist Miles Mathis did indeed reexamine the evidence of ellipses and found to his astonishment that Newtonian theory was a failure for this phenomenon as well:

“All orbits whether elliptical or circular, are assumed by historical and current theory to be composed of only two motions, a centripetal [center pulling] force to the celestial body the planet is orbiting] caused by gravity, and a velocity due to the orbiter’s ‘innate motion.’ This term ‘innate motion’ was most famously used by Newton, and has never been updated. It is still considered to be the velocity that the orbiter carried into the orbit from prior forces or interactions [with other bodies].

43 Isaac Newton, Newton’s Principia, Percival Frost, ed. (London 1900), p. 120.
It may also be a motion caused by the formation of a nebula [cloud around the sun] or solar disc [cloud], but it cannot be caused by the gravitational field of the current orbit. Why? Because there is no mechanism to impart tangential [sideways] velocity by a gravitational field. Both Newton and Einstein agreed on this. Einstein’s tensor calculus shows unambiguously that there is no force [sideward] at a perpendicular to the [gravitational] field; and Einstein stated it in plain words . . . The force [of a gravity] field is generated [inward] from the center of the field, and there is no possible way to generate a perpendicular [sideward] force from the center of a spherical or elliptical gravitational field.

“The orbital velocity of an orbiter at any point in the orbit is a vector addition of the two independent motions; that is to say, [an arrow vector for] the centripetal [center pulling] acceleration at that point in the field and the [sideward] tangential arrow vector for the perpendicular velocity, which is [the innate motion] which is a constant . . . the orbiter must retain its innate motion throughout the orbit, no matter the shape of the orbit. If it dissipated, the orbit would not be stable. Therefore, the orbiter always retains its [constant] innate motion over each and every differential [equation applied to it]. If we take the two most important differentials, those at perihelion and aphelion, and compare them, we find something astonishing. The [sideward] tangential velocities due to innate motion are equal, meaning that the velocity tangent [sideward] to the ellipse is the same in both places. But the accelerations are vastly different, due to the gravitational field. And yet [in spite of these differences] the ellipse shows the same curvature [identical arc] at both places.”

"The vector accelerations in the diagram show that the innate velocity vector arrows sideward/tangential to the orbit are the same length; that is \( V_1 \) equals \( V_2 \). However, the centripetal gravitational vector arrows inward to the sun are not equal: \( A_1 \) is not equal to \( a_2 \). Because of these inequalities we are led to an immense gravitational contradiction between Newtonian law and the

\[ V_1 = V_2 \]

equal arc shapes at perihelion (closest point to the sun) and aphelion (most distant point from the sun). According to Mathis:

“This is physically impossible, using the given motions, the [ellipse] is impossible to explain. The logical creation of an ellipse requires [equal] forces from both foci, but one of our foci is empty. It is a ghost. . .

“I know that many will cringe that I have claimed in my illustration that $v_1 = v_2$. I don’t know that the orbital velocity varies in an elliptical orbit [where the planet moves fastest at perihelion and slowest an aphelion]? Yes I do. Once [let me emphasize] my velocities are not orbital velocities, they are tangential [sideward] velocities. In a nutshell, the orbital velocity [specifically] describes an arc or curved line. It is the vector [arrow] addition of [both] the tangential velocity and the [center pulling] centripetal acceleration, over the same interval [that creates the shape of the arc of the ellipse]. Newton first created this analysis, and I do not disagree with it. Unfortunately, contemporary physics has forgotten this distinction [between orbital velocity and tangential velocity]. But the tangential velocity does not curve. It is a straight-line vector with its tail [endpoint] at the tangent [of the ellipse]. It does not curve even at the limit. It only gets very small at the limit. By going to the limit or to Newton’s ultimate interval we do not [ever] curve the tangential velocity, we straighten out the arc. That is to say, we straighten out the orbital velocity so that we can apply a vector addition to putting it in the same equation as the straight tangential velocity.

“Am I saying that celestial bodies cannot be in elliptical orbits? No. [What] I am saying [is] that these elliptical orbits cannot be explained with the [gravitational] theory we currently have. What we currently have is a very complex set of equations for determining the orbits we actually see. This is called heuristics, the theory underlying this math, which is called the theory of the gravitational field, cannot explain the most basic math it contains. From the time of Newton and Kepler, the foundational theory of ellipses has existed with a ghost in it. That is to say, a huge theoretical hole. It is time to fill that hole.”

To make his case regarding the dichotomy between what gravitational theory claims but what should actually occur with elliptically orbiting bodies if that theory is used, Mathis adds:

“Current theory attempts to plaster up that hole by summing the closed circuit [force of gravity] whether it is circular or elliptical, showing that everything resolves. But this proves nothing, since they cannot help but resolve. [This is because] We are talking about a closed [elliptical] circuit by definition. It would be very surprising if the sums [of gravity] did not resolve. What I am talking about is differentials [equations]. Just like in orbital theory these differentials can be summed to show a[n] [elliptical] circuit the variance they contain cannot be explained by [the two vector fields namely] the gravitational field or the innate motion.

“To make the ellipse [actually] work you have to vary not only the orbital velocity, but also the tangential [sideward] velocity. To get the correct shape and curvature to the orbit, you have to vary the object’s innate motion. But the object’s innate motion cannot vary [because it is a constant]. The [orbiting] object is not self-propelled [to change the innate motion]. It cannot cause forces for the convenience of theorists or diagrams.

“CELESTIAL BODIES HAVE ONE INNATE MOTION AND ONLY ONE AND IT CANNOT VARY [anywhere along the orbit].”

To illustrate the shape of the orbit that must occur if one employs strict gravitational theory to the problem, Mathis presents the following diagram:

Figure 2:

He then goes on to explain:

“As you can see [using gravitational theory], the orbital velocity at perihelion \(V_2\) is indeed greater than at aphelion \(V_1\) as shown by the [hypotenuse] length of the vector. But the tangential [sideward innate motion] or perpendicular velocities at all points on the orbital path must be the same. Therefore, we must find the curvatures [at perihelion and aphelion] as I have drawn them here. Now, perhaps, you can more clearly see that [the differences in the curvatures of] these two ‘ends’ of the ellipses cannot be made to meet up [to form an ellipse]. You cannot have a greater [sharper] curvature at perihelion and less [wider] curvature at aphelion and draw any shape [in which the ends of these curves] will meet up. That is the central thesis in this paper. I am not claiming that Kepler’s or Newton’s math is wrong, I am not claiming that planets do not . . . [travel along] ellipses. Emphatically we know that both the equations and the orbital shapes are correct. The problem is with the underlying [gravitational] mechanics. The gravitational field [as presented in Newtonian physics] as it is presently defined cannot support the shapes or the equations.”

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46 Ibid., pp. 109-110. (Capitalization added)
47 Ibid., pp. 110-111.
The tremendously important consequences of this evidence are breathtaking. In the first place, Mathis claims this is one of his strongest arguments against a strict gravitational explanation to celestial mechanics. Secondly, he claims that no astronomer or physicist has published in either a book or journal a mathematical rebuttal to this analysis. But of greatest importance, gravitational theory, as it is currently applied, cannot be made to conform with the “shapes” or the equations regarding elliptical orbits. The arcs simply do not meet up to form an ellipse with the sun at one focus. This not only applies to planetary orbits, but the failure of Newton’s laws and Einstein’s curved space explanation of these laws, also fail to explain elliptical orbits for every orbiting body in the universe for every planet orbiting a star, for every natural satellite orbiting a planet, for every asteroid orbiting the sun, even in the asteroid belt, as well as for every comet doing the same. It fails as well for the objects in the Kuiper belt and those in the Oort cloud belt. It fails for all the double, triple elliptically orbiting star systems in the galaxies that number into untold billions. All the small satellite galaxies orbiting the Milky Way Galaxy in elliptical orbits cannot do so based strictly on Newton’s laws. And what applies to our galaxy applies to the hundreds of billions of other galaxies in the universe which contain planetary systems, asteroids, comets planetary satellites and double, triple etc. orbiting stellar systems. Even the globular clusters in our galaxy on highly elliptical orbits, which number over 150, fail to meet this test. Galaxies orbiting other galaxies also fail to meet this test. Whenever this law is called upon by Velikovsky’s critics to prove they know and understand the nature of planetary orbits in terms of the underlying physics of celestial mechanics, they are basing their proof on a theory that does not explain that underlying physics. Their celestial mechanical arguments are unrelated to reality and therefore cannot count as evidence that flatly refutes Velikovsky.

This becomes significant for the stability of the Earth-moon system when taking the barycenter of these bodies discussed above into account. Cesare Barbieri puts it this way:

“...the Earth-moon...barycenter...follows Kepler’s laws with respect to the barycenter of the solar system.”

Therefore, there can be no stability of the Earth/moon system when we explain it in terms of their barycenter moving in an ellipse around the sun at one focus. There must be a counterforce to allow these bodies’ barycenter to move in an ellipse around the sun. Without this counterforce, again, the Earth/moon system could not be stable in the solar system.

Scientists may continue to offer that discredited argument that, in spite of this failure to suggest, this still does not allow for Velikovsky’s theory; what they have failed to take note of is that the entire edifice of solar system stability is based on the assumption that Newton’s laws do explain the underlying physics of the elliptical orbits of planets in the past and into the future. Since it cannot explain these elliptical planetary orbits, on what basis can it be used or possibly qualify as a proper scientific method to derive the past and future positions of planets?

Again, the critics may argue that this does not explain how electromagnetic effects, as presented by Velikovsky, resolves this problem. It must be remembered that Velikovsky said that planets embedding in their magnetic fields will not collide but will avoid a direct collision. As Denis Brian explains in his biography of Einstein:

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“Einstein’s main objection to Velikovsky’s ideas was his contention that close encounters of the three planets [Venus, mars, Earth] – had occurred when electrical and magnetic fields had overwhelmed [the force of] gravity – which contradicted the laws of both dynamics and gravity.”

However, Mathis has provided an electromagnetic solution, which he calls a “charge field” for the problem of the physics underlying elliptical orbits:

“Fortunately, the solution is just as simple as the problem. It has been overlooked for centuries, but that does not mean it must be esoteric. It only means the problem was hidden for a long time. Newton hid the problem so cunningly that no one has detected it since his time.

“The solution is that the orbital field is a two force field [one of gravitational attraction, the other an electromagnetic repulsion.] . . . Therefore, any orbiter must be exhibiting at least three basic motions, the two above, [the innate motion tangential to the orbit and the gravitational center pulling force of the sun] and one other. This other is a motion due to the combined E/M [electromagnetic] fields of the orbiter and the object orbited. In this case, the sun and the Earth. The force created by the E/M field is a repulsive force, like that between two protons. It is therefore a negative vector compared to the gravitational field which is an attractive field. And so the total field described by gravity and E/M is a differential of the two. In the end you subtract the E/M acceleration from the acceleration due to gravity.

“This explains the ellipse because the E/M repulsive force increases as the objects get nearer. As the gravitational acceleration gets bigger, so does the repulsive acceleration due to E/M [just as Velikovsky claimed].

“We have a balancing of forces. This not only explains the varying shape of the orbit from circle to ellipse to parabola . . . It explains why we don’t often find orbiters crashing into primaries. It explains how we have a ghost in the other focus of the ellipse; the ghost was inhabited by the E/M field.

“This also explains the cause of the ellipse.”

Mathis’s theory is extraordinarily like that which I presented in my 1999 book, *The Electro-Gravitic Theory of Celestial Motion & Cosmology*, where I presented a slightly different concept of the differences between attraction and repulsion of gravity and electromagnetism, wherein I wrote the following on page 7:

“A body in orbit around another in which both masses possess electromagnetic fields is subject to two forces – gravity or attraction and magnetism or repulsion. Magnetism, like that of gravity – is strongest between the two bodies when they are closest to one another, while it is weakest between the masses when they are most distant from each other.

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50 Mathis, *The Un-Unified Field*, op. cit., p. 112.
Therefore, when the orbiting body comes closest to its primary [perihelion] it feels not only a stronger repulsion on its own field away from the primary, but because the magnetic field of the primary is rotating, the orbital body receives an additional acceleration along its orbit . . .

“These two magnetic accelerations – one away from the primary and the other forward along the orbit cause the orbiting mass to have a greater pericenter distance from the center of the primary than if only gravity were operating. . .

“On the other hand, at the greatest distance [aphelion] an orbiting mass is from its primary, the weakest the repulsion away [from the primary is felt] and along its orbit.”

In terms of the ellipse, this means that when a planet is at perihelion it is pushed outward by the electromagnetic repulsion of the sun’s repulsive field so that it has not reached a point along its orbit closer to the sun were that repulsion not there. Being pushed outward ever more strongly as it approaches perihelion its orbital curve will be greater than if only gravity was operating. However, this effect will have been operating well before and after perihelion. It will have begun just as the planet passes its semi-major axis – the median distance from the sun – both moving along its orbit to and away from perihelion. At aphelion just the opposite occurs, the planet is pushed outward but more weakly and pulled inward more strongly so that it has not reached a point along its orbit farther from the sun. Being pushed outward ever more weakly as it approaches aphelion, its orbital curve is more acute than had only gravity been operating. Again, this effect will have begun well before and after aphelion. It will have begun at the semi-major axis both moving along its orbit to and away from aphelion. At perihelion, electromagnetic repulsion offsets gravity; at aphelion gravitational attraction offsets electromagnetic repulsion. Therefore, because the forces are reciprocal, the arcs are identical in shape.

At this point, I must make a correction to my theory. I had wrongly assumed that it was possible for celestial bodies to have no electromagnetic fields. All bodies have some electromagnetic properties and therefore must follow an elliptical orbit, even if it is one that is hardly perceptible. This fact has an important application for celestial mechanics.

Because this evidence proves that there is a counter force – electromagnetism – to gravity means that this is not the only way it operates in celestial mechanics. What has been shown below is that tidal forces on the Earth and in space in terms of pure gravitation theory does not and cannot explain these tidal phenomena and that pure gravitational theory does not and cannot explain the elliptical motions of celestial bodies, and that pure gravitational theory cannot and does not explain why the Earth and the moon are not gradually falling closer to the sun. In each of these cases, the theory of gravity fails, but more importantly, it means that there is another force that is operating in celestial mechanics. The only forces that exist outside the realm of the atom are gravity and electromagnetism. Since gravity, by itself, cannot account for the behavior of bodies outlined below, the only other force that does exist outside the atom is electromagnetism.
This means that Velikovsky was right when he posited it as a counterforce to gravity. This being the case, let us turn another gravitational holy of holies:

**KEPLER’S THIRD LAW OF PLANETARY MOTION.**

Kepler’s Third Law states the square of the period of the orbit of a planet around the sun will be equal to the cube of that planet’s distance from the sun.

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\text{Period}^2 = \text{distance}^3
\]

\[
p^2 = d^3
\]

Jupiter orbits the sun in about 11.88 years and is 5.2 times more distant from the sun. Therefore,

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11.88 \times 11.88 = 5.2 \times 5.2 \times 5.2
\]

\[
141 = 140
\]

Although these are not exact figures, had we used much more exact values for period and distance, they would be equal to each other. Notice that Kepler’s law does not contain any value for the gravitational mass of the planet, but it clearly describes numerically/mathematically the relationship between a planet’s distance from the sun and the length of time it will orbit the sun once. Mathis explains this as follows:

“What this means, of course, is that the orbit of the planet has nothing to do with the mass of the planet. According to Kepler’s law, one must balance only the distance and the period. To see what I mean, take the Earth out to the distance of Jupiter and try to build an orbit. Can you do it? Of course [at the distance of Jupiter]. You just slow the Earth’s orbital velocity down until it offsets the centripetal force of the sun. What you will find is that the Earth will match the orbital velocity of Jupiter exactly. Somewhat surprising isn’t it? I assume that some readers will have thought that the Earth would be going slower, since it is smaller. It feels a smaller force from the sun, therefore, it has less centripetal acceleration to offset with its velocity. Yes, the force is different, but the acceleration is the same. \( F = ma \) [force = mass x acceleration]. That is why all objects fall at the same rate in a vacuum, remember? Jupiter and the Earth fall toward the sun at the same rate – that is, the same acceleration – if they are at the same distance. You will say, ‘But the sun must pull harder on Jupiter, surely to keep its orbit, than on the Earth,’ Yes, surely. And that is my point . . . [this behavior has] never been explained . . . [It has] been *described* in . . . different ways by Newton, Einstein, etc., but never explained.”

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The same would apply to a large rock going around the sun at the distance of Jupiter or a small star. All would accelerate in that orbit in the same period as does Jupiter. Mathis adds:

“Nor has this problem been solved by General Relativity. More money is now being spent worldwide to find the graviton [the particle that carries gravity between bodies] than on any other scientific project. Billions literally. It will not be found, but a good question to ask those who seek it is this: Would the sun need to send out bigger or more powerful gravitons to Jupiter [because it is more than 318 times as massive] than the Earth, if they were both at the same orbital distance? If so, how does the sun know which to send?

“Perhaps we need to look for a messenger particle, one that precedes the graviton and asks the orbiting object how much it weighs. I know that this all sounds like a joke, but the question must be addressed seriously by those who put ‘no action at a distance’ on their T-shirts. The status quo in physics, made up of the biggest names in the field in the 20th century, still brags about this [Keplerian law] in the latest books. But they explain absolutely nothing [about it].”

What must be explained is why bodies of different masses fall at the same rate in a vacuum. The answer that is given is the term “inertia.” In simple terms, a more massive body is harder to pull by gravity than one less massive. This can be explained by two vehicles – an automobile of a few tons weight and a large truck loaded with steel weighing 20 tons. The automobile is much easier to start moving with its small engine power than the truck. If one is standing in a road lane in an automobile next to a heavy laden truck at a traffic light, when the light turns green the car accelerates much more rapidly than the truck. It uses much less fuel, that is, energy, than the truck to get started. This type of explanation describes “inertia.” However, it highlights the problem with inertia. If we were to have both vehicles powered by either the engine in the car or by the engine in the truck, it would change nothing. The automobile would still accelerate more rapidly than the truck, in both cases. That is the same with inertia pulling on two different bodies falling in a vacuum. The far less massive body than the other should begin to accelerate more rapidly, not only in the first instance, before they were released, but it should be easier to accelerate, throughout the length of the fall and, therefore, hit the ground before the more massive one. The engine of pull is the same in both cases – gravity. But this does not occur.

I am not saying that different size masses fall at different rates. What I am saying is that the laws of gravity do not explain the underlying reality of the physics involved. The mathematics, therefore, only describes the equal velocity of massively different falling objects. Something else must be operating. As we pointed out above, that electromagnetism affects various tidal and celestial movements, it is, therefore, the only force left to explain why celestial objects of different sizes in the same orbit accelerate at

52 Ibid., pp. 141-142.
the same velocity/velocities. It is the only force that can explain why massively different sized bodies orbit the sun at the same rate.

What is needed to resolve this problem is that the two forces – gravitational attraction and electromagnetic repulsion – oppose each other and operate in such a way that slows Jupiter’s acceleration along its orbit, but should speed up the motion of the Earth in the same orbit. Without such a force operating on Jupiter to slow its acceleration and by the same force to speed up the acceleration of the Earth in the same orbit, there would be no explanation of what is happening. Now, I am not saying inertia does not exist, but what I am saying is that electromagnetism exhibits the same inertial behavior. That is, a very massive body with a large magnetosphere (its electromagnetic field) is harder to accelerate tangentially / sideward than a smaller, less massive body with a small magnetosphere. Both Jupiter and the Earth or another body in the same orbit have not only different masses, but very different sized electromagnetic fields. All these celestial orbiting bodies are also moving in the sun’s rotating electromagnetic field, its immense magnetosphere that not only encompasses all the planets, but travels far beyond them. Therefore, to push Jupiter and its great magnetosphere sideward requires more electromagnetic energy to do so than to push the Earth with its much smaller magnetosphere sideward. Someone can, however, argue that the sideward push of the sun’s magnetosphere on planetary magnetospheres is unknown to science, and one cannot compare the inertia of gravity to the inertia of electromagnetism. In this respect, Petr Beckmann informs us to the contrary regarding this concept:

“Mass has inertia charge does not is false, inertia is the reaction to a force, the resistance to being accelerated. The phenomenon is observed with charges, or at least with their fields, just as surely as with masses . . . When a large number of charges – a current – is accelerated we call the phenomenon – ‘self-inductance’; when a single (point) charge is accelerated, the same resistance to acceleration sets in but we have not been paying much attention to it in our textbooks. The classics of the late 19th century worked with the concepts of ‘electromagnetic mass’ and ‘electromagnetic momentum’; the concepts have gone out of fashion, but they have not been refuted. In both cases the resistance to acceleration is proportional to the acceleration and the mass or charge of the object that is resisting. ‘Proportional to’ is made by nature, ‘equal to’ when it depends on units is made by man. Any difference between the inertia of mass and the inertia of charge, is therefore of our own making.”

With respect to Kepler’ Third Law, to move the enormous electromagnetic field of Jupiter embedded in it as it moves along its orbit, just as with mass and gravity, requires that it will be more resistant to motion, while the Earth in the same orbit will exhibit less resistance to motion. The same solar repelling and rotating electromagnetic field acts on both the large planet, Jupiter, and the much smaller planet, Earth, with different electromagnetic effects on their motions. No matter in what orbital distance from the sun

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we place both planets or any planets, their masses are affected by gravity and their electromagnetic field embedded in the field of the repelling and rotating one of the sun will be such that their accelerations will be equal. The planets are falling in the gravitational field but being repelled sideward by the sun’s electromagnetic field.

Bodies falling from the same height encounter another phenomenon. The place where this was done was on the moon in the near vacuum of space. The lunar module was called *Falcon*, and the falcon’s feather and a hammer were dropped from the same height and hit the lunar surface at the same time. To do so, the feather and hammer were also falling through the sun’s electromagnetic field that encompasses the moon. They are in reality not falling through a vacuum but through a repelling / resisting electromagnetic field. It is similar to the feather and the hammer falling through air or water and being repelled by that resisting medium differentially.

The way to test this concept that bodies fall at the same rate, is to drop a ball attached to a wire that is also allowed to fall with it, and time that fall precisely. Then repeat the experiment when a large charge is sent down the wire to the ball and time that fall precisely. The experiment must be carried out in a chamber that is a vacuum stronger than that of space, and the temperature in the chamber must be cryogenic to replicate space as closely as possible. The larger the charge the slower the ball should fall. Instead, as in inertial gravity, the first fall of the ball will be more rapid than the second electrified fall of the ball, with an electromagnetic field being opposed by that of the Earth’s field.

When we treat electromagnetic inertial effects as we do gravitational inertial effects, we have a new and different understanding of the underlying physics that governs these motions. When we do this, we can explain the underlying physics of Kepler’s Third Law as it applies to larger and smaller planets moving in the same orbit at the same rate of speed. We can also explain the underlying physics for why a feather and a hammer falling through an electromagnetic field fall at the same rate. As Mathis above said of Kepler’s Third Law, “A gravitational field is a strange creature and its characteristics have never been explained.” But employing electromagnetic repulsion as a counterforce to gravity that strangeness disappears and the behavior of these two phenomena may well be understood and well explained.

**CIRCULAR MOTION / TORQUE AND GRAVITY**

How does one get a celestial body to orbit around another in a gravitational field? This sideward motion known as torque exists for planets, asteroids, comets, dust in space, stars around one another, stars in galaxies and galaxies orbiting other galaxies. Although the concept is clearly observed throughout the universe, it has never been explained by purely gravitational means. Here, yet once again, Mathis is given leave to speak:

“Newton... described circular motion in Proposition I of *The Principia*. The orbiting body is assumed by Newton to have a velocity due to ‘its innate force.’ So this motion must be independent of the gravitational field. His assumption has never been questioned.
“When we are shown the illustration of circular motion in our physics textbooks, we are always shown the accompanying illustration, which is that of a ball on a string. The boy whirls the ball around him, and a circular orbit is created. The force that the boy's hand must exert on the string is analogous to the gravity of the Sun as we are told. The swing action of the boy creates the tangential [sideward] velocity. So in this case, the hand creates both velocities. In fact, there is a dependence between the tangential velocity and the centripetal [center pulling] acceleration, a dependence given mathematical form by the equation \[ a = \frac{v^2}{r} \] [acceleration equals velocity squared divided by the radius of the orbiting body from its primary]. But in the illustration of the orbiting Earth, the Sun does not swing the Earth – there is no implication of that. The tangential velocity and the centripetal acceleration are completely independent [of one another]. There is no string or other force that could impart tangential [sideward] velocity to the Earth. Assuredly, the Sun is spinning, and this may create tangential perturbation in an accompanying E/M field; but there is no way, in this simplified illustration, that the Sun could be the [gravitational] cause of tangential velocity of the Earth. And if the Sun is creating tangential perturbations in the gravitational field, the theory must mechanically explain how they are produced, No theories have ever done this!”

The problem is, how does one explain the tangential motions of planets and the underlying physics at the same time? At this point, Mathis delivers this stunning actually fatal blow to the whole theory:

“According to current theory, gravity is either an attractive [Newtonian] force or a[n] Einsteinian] space warp. In neither case can you explain torque. The field is generated from its center and cannot possibly do anything but pull inward from that center. Even with a spinning gravitational field, no torque is possible. We are told that angular momentum is carried out to orbiting bodies, but how? It cannot be via the gravitational field. There is no proposed mechanism [in gravitational theory to do this]. Einstein expresses known forces with tensor . . . [equations], but he cannot explain the genesis of those tensors. Where [then] do the tangential components of the tensors come from? We don’t get so much as a theory. Nothing. That is the main reason physicists have added the graviton to the fundamental field of gravity, despite the fact that Einstein assured them that objects in curved space ‘felt no force, and despite the fact that they still parrot this claim – believing G[eneral R[elativity] is geometric not force-carrying. They need the graviton to help them explain torques.

“But The graviton would not help them anyway. A torque could be applied by an exclusionary field – like the E/M field. But a torque could

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not be applied by an attractive or space warping field. The graviton, if it existed, would cause attraction or the equivalent of attraction.\(^{55}\)

To see this more clearly one need only imagine a very large sloping funnel. We have seen such toys and have rolled balls into them. They are similar to a ball on a string. Only when our hand gives the ball a tangential / sideward impetus does it move sideward and downward in diminishing orbits around the funnel hole at the bottom until at last it falls into it. It was our hand that created the tangential motion as with the boy’s hand and the ball on a string. However, if we were to place the ball on the funnel and give it no movement in any direction with our hand and then release it, the only force it would feel is the direct rectilinear pull of the slope inward to the central hole. Therefore, the ball must roll in a straight line down the radius of the funnel into the central hole; it can never develop a motion other than that. That is how gravity works based on Newton’s law and Einsteinian warped space. Neither the gravitational equations of Newton nor the tensor equations of Einstein allow for a tangential motion perpendicular to the pull of gravity or warped space.

Let us nevertheless remember that Mathis has told us above that a “torque could be applied by an exclusionary field – like the E/M [electromagnetic] field.” As I have maintained in *The Electro-Gravitic Theory of Celestial Motion and Cosmology* and elsewhere, the electromagnetic field of any body will rotate with it. That is, electric currents generate magnetic fields attached to it and repelling as in an electric motor. This creates torque to rotate the cylinder in an electric motor or rotation in a charged celestial body. This is not in dispute and is well-known in physics and electrohydrodynamics. With this in mind, let us reexamine our funnel experiment, but instead, allow that funnel slope to become ever smaller with its radius outward. Instead of having one stationary, gently sloping funnel, let us place a second similarly gently sloping funnel just below it that is rotating with magnets that are of ever weaker strength attached to it as we go farther from the central hole. Furthermore, instead of putting plain iron balls in the top funnel let us introduce magnetic balls. Then let us cool down the entire apparatus to cryogenic temperatures. As we pointed out in *The Electro-Gravitic Theory* . . . book pages 1-2, in such a cold environment all magnetic fields repel one another. Therefore, while a magnetic ball on the top funnel feels an impetus to roll downslope, it also feels a repelling magnetic field from the lower funnel pushing sideward and outward. Since the magnetism of the lower funnel is stronger – closer – to the central hole and these two fields repel one another, the smaller field will naturally feel a sideward and outward push. Furthermore, the lower funnel rotating magnetic field being larger overall than the magnetic field of the ball will repel the ball in the direction it is moving giving the ball a tangential torque push in that same direction. Once this sideward motion is imparted to the ball, it will continue to move in an orbit around both funnels. This illustration gives us a picture of how the two force fields operate; the static top funnel slope acting gravitationally to pull the balls toward the center, the rotating magnetized lower funnel acting to give the balls outward and tangential motion, that is – torque. Given different masses and magnetic strengths of different balls under these conditions means, I suggest, the orbits of the balls like planets will stabilize in

some form of ellipse. This simple illustration is a way to understand the way the two forces gravity and electromagnetism work in a celestial system. All similar funnel experiments, or rotating platter experiments, have no such interacting force fields or more accurately counter force fields. Since it is inconceivable that another force exists, in celestial mechanics these experiments are believed to be incorrect in explaining the accepted celestial mechanics theory. As all the foregoing evidence has shown, a one force celestial mechanics is invalid.

**ROTATION OF CELESTIAL BODIES**

**TORQUE AND ELECTROMAGNETISM**

Not only does electromagnetism explain how celestial bodies are able to have circular / elliptical orbits, it can also explain why they rotate as they do on their axes. When we examine the gravitational theory that supposedly creates this torque, we run into a problem that is only explicable in terms of electromagnetism. Let us for a moment assume as do astronomers that all celestial bodies form when dust and gas in a region of space gravitationally collapses inward to form a small dense body of these materials. The theory, however, requires that these materials fall inward as if in a whirlpool. But as Mathis has already pointed out, even a whirlpool requires something that gravitational theory will not create, namely torque. While the establishment astronomers and astrophysicists suggest electromagnetism would have nothing to do with the final rotation / spin of a planet, star, asteroid, comet or any other body, they have invented a whirlpool seemingly out of no theory at all to accomplish this. The more matter that falls inward to form a body, using their unproven theory means that it will have more rotational energy and thus faster rotation than smaller bodies. And they do argue that this is precisely the case. As J. R. P. Angel and D. Landstreet show, “In single stars, especially those of [very large] spectral types [such as O, B, and A stars] rotation is rapid. The velocity of rotation drops rapidly down the main sequence [to smaller stars] and usually is too small to be detected in single stars of type later than G [type stars].”

If this is the cause of stellar and planetary spin, then the orientation of the magnetic poles of all the bodies should have nothing to do with their final rotation after the accretion process ends. However, this is not the case, as astronomer Hilton Ratcliffe points out:

“While the Sun is spectacular and close enough to give us goosebumps, it is pretty tame compared with some of the [giant] monsters out there. The [15 times larger] solar mass naked-eye star, tau Scorpii, is a real dynamo. It emits energy at a titanic rate – millions of times the output of the Sun – and it is characterized by a gargantuan electro-magnetic field . . . [It’s] quite an electric power plant station we have there!

“One of the problems with tau Scorpii [sic] that particularly pains astrophysicists who have never heard of electricity is why it spins so slowly.

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It rotates at a far lower rate than other similar stars with less frenetic magnetic fields.\textsuperscript{57}  

His explanation in terms of gravitational theory is as follows:
“\text{The outflow of electricity into surrounding plasma acts as a natural brake by bleeding off angular momentum. The stronger the magnetic field, the greater the acceleration of charged particles and consequently the greater the braking effect that results. The properties of celestial bodies dovetail together so coherently, when electricity is taken into account that it is quite understandable that electrophysicists become frustrated with individuals who would rather live with an unexplained quandary than admit that electricity is a dynamic rather than \textit{sic} element of the stellar environment.}\textsuperscript{58}"

Philip Plait explains the possible slowing of the sun by emissions of its ions as does Ratcliffe.

“\text{The Sun is constantly blowing a wind. This solar wind flows from the sun’s surface at a rate of about a thousand tons of gas per second. But the Sun is pretty big and has mass to lose. It can easily shed a few billion tons a year and hardly notice the difference.}

“\text{The solar wind is made up of charged particles – electrons and protons. Left to themselves, they would blow straight out from the Sun into infinity. But they are not left to themselves. The Sun itself has a pretty hefty magnetic field, and this rotates with the sun. As it spins, the Sun drags the particles along with it. This in turn acts like a brake on the Sun’s rotation slowing its spin . . .}

\text{“This drag . . . has a long time in which to work. Over 4.5 billion years it has quite possibly slowed the Sun substantially to its current stately monthly rotation. While this theory has not been conclusively proven, it remains a leading contender to explain [the slowing of the Sun]. There are other theories as well, such as the idea that the Sun lost most of its angular momentum very early on [by the same method], as a proto star. [Then] It may have shed a lot of its mass through long episodes of a sort of super solar wind. While astronomers are not totally sure which of these ideas is the correct solution, the fact remains that there \textit{are} plenty of ideas, and they use good, solid physics.}\textsuperscript{59}"

This emission theory, for all its use in “good, solid physics,” is not “conclusively proven.” The point Plait cannot admit is that gravitational theory of stellar emission to slow the rotation of stars has simply failed.

When the mathematics / physics was applied to how much material must be emitted from tau Scorpii to cause it to slow so greatly, the concept fell apart. The

\textsuperscript{58} \textit{Ibid.}
\textsuperscript{59} Plait, \textit{Bad Astronomy, op. cit.}, p. 198.
Observatoire de Paris specifically put out an article on the Internet titled “The magnetic nature of mysterious naked-eye cosmic X-ray emitter which states:

“This model provides a natural explanation of why tau Scorpii is such an intense X-ray emitter. However, it is not yet clear how the magnetic field succeeded in slowing down the rotation rate of the star to less than one-tenth of otherwise non-magnetic massive stars. Sun-like stars [it is believed] can be slowed down through their magnetic wind, just as ice-skaters are spun down when outstretching their arms; tau Scorpii does not however lose material fast enough to have its rotation modified [so greatly] within its very short lifetime of ‘only’ a few million years.”

The researchers just cited mention that tau Scorpii is a highly magnetic star, as opposed to “non-magnetic massive stars.” If this theory of electrical emissions from highly magnetic stars is correct, it should apply to all magnetic stars. There are indeed two types of highly magnetic massive stars, known as Ap type stars with peculiar chemical make-up, and Am stars, with high metallic make-up. The Ap stars have strong magnetic fields, while the Am stars have extremely weak ones. Both Ap and Am stars are of roughly the same size and, therefore, if the emission concept is correct, the highly magnetic Ap stars should be emitting greater amounts of charged particles into space and, therefore, should rotate more slowly than the Am type.

Sidney C. Wolff points out that Ap stars do not slow via a braking mechanism posited by Ratcliffe:

“In a discussion of the data . . . Wolfe (1981) considers possible braking mechanisms. Mass loss . . . in the presence of a magnetic field can account for loss [of spin] . . . on the time scale of $6 \times 10^7$ to $6 \times 10^8$ years. This is the time scale required to explain the correlations for hot Ap stars. Wolff argues, however, that mass loss is unlikely to be the braking mechanism. First, there is no reason to expect radiation-driven, thermally driven or centrifugally driven winds in Ap stars. Second, the required mass loss rate is so high that the entire atmosphere down to optical depth $r \sim 5$ would be lost in 10 to 100 years. This time scale is much shorter than the diffusion time scale . . . and may pose problems for any model in which the abundance [of chemical] anomalies are confined to the outer layers of the star only. Third, because the magnetic fields of Ap stars are presumed to be independent of $\Omega$, the angular velocity decreases exponentially. Unless the time constant for this decrease happens to be critically matched to the stellar lifetime [of Ap stars] mass loss will result in virtually no braking or an excessive amount of it. The fact that Ap stars are rotating, but only very slowly, would then depend on a coincidence for which there is no apparent explanation (Mestel 1975).”

Accretion of additional materials back on to the stars that is then thrown off in abundance, are argued will brake these Ap stars, as Wolff adds: “It must be stressed, . . .

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the time period required to accrete sufficient material to produce the large abundance [of peculiar chemicals] that are present in very young Ap stars seems to be prohibitively long.”

As for the magnetic braking of Ap stars she adds, “However satisfying . . . agreement between theory and observation may seem a caveat is in order. Most of the young [Ap] stars with the large magnetic fields are actually [another type of star known as] He-weak Bp stars which are more massive than the stars classically defined as Ap stars. Therefore, existing data can be interpreted equally plausibly as a correlation between mass and [magnetic] field strength [rather than magnetic braking].”

Basically, it is far from proved that magnetic ion ejection slows Ap stars with weaker magnetic fields.

With respect to the sizes of both star types of magnetic fields, Baidyanath Basu shows: “Ap stars possess magnetic fields of sufficient intensity, ranging from a few hundred gauss to as high as 34,000 gauss.” He also points out that: “The slow rotation of Am stars is accompanied by their weak magnetic fields. In some of these [Am] stars a few hundred gauss have been measured, while in some others, no fields at all could be measured.

Therefore, if Ratcliffe – who has a highly negative view of Velikovsky – and those others who agree with the concept that the stronger the magnetic field the greater the electric braking of a star should be, we run into a contradiction. The much weaker magnetic fields of Am stars will experience less braking than Ap stars and therefore, Am stars should, according to theory, rotate more rapidly than their Ap siblings. However the exact opposite is the case as Basu further reports, “As a class the Am stars are slow rotators compared to the Ap stars.” This cannot be the case if, as Ratcliffe and his colleagues have argued: “. . . the stronger the magnetic field the greater the acceleration of charged particles and consequently the greater the braking effect.” Nevertheless, it can also be argued that because Am stars are most often found in close binary star systems, that the great tidal drag of the companion star on the Am star; like the moon’s tidal tug on the Earth that slows the Earth’s rotation, also applies to Am stars. However, not all Am stars are found in close binary systems, hence what is slowing “their” rotations more greatly than Ap star rotations? “. . . approximately two-thirds of the Am stars are members of such close binary systems.”

Gregory W. Henry and Francis C. Fekel report on one such case:

“The star HD 8801, is an Am metallic-line [spectroscopic] star that appears to be single . . . HD 8801’s slow rotation compared to normal A Stars [therefore] does not appear to arise from either a binary companion or evolutionary [electric particle braking] and thus remains a puzzle.”

Therefore, the theory of electric particle outflow braking and tidal braking by a companion star does not explain this contradiction. Neither theory fits this star though if a

61 Ibid.
62 Ibid, p. 70.
64 Ibid, p. 207.
theory is correct it must fit the observations, but it simply does not. Beyond this, the researchers report that “its [HD 8801’s] projected rotational velocity of 55 km s\(^{-1}\) is typical of Am stars as a group . . . “ Since neither theory for the slowing explains the problem of slow rotating single Am stars, and there are a number of them, some other force or mechanism must be operating. The theory I presented in Electro-Gravitic Theory is that it is the orientation of the magnetic poles that in great part determine the rate of stellar and planetary rotations as these relate to the rotational poles. Magnetic Am and Ap stars have their magnetic axes at a great angle from that of their rotational axes, so that the magnetic poles rotate close to the rotational equator according to Jean-Louis Tassoul.\(^{66}\) I maintain that the rate of spin of a star is directly related to this obliquity of the magnetic axis to that of the rotational axis. Therefore, the larger the obliquity of the magnetic axis to the rotation, the stronger it is; the slower its rotation, as well. One further point before proceeding, the magnetic polar oblique axes of Am and Ap stars over time move away from the equatorial regions and migrate closer to the rotational axes.\(^{67}\) Therefore, the younger the star the greater will be the obliquity of the magnetic pole and the slower it will rotate.

This, I suggest, is the case with neutron stars and their earlier forerunners, magnetars. Neutron stars, also known as pulsars, have their magnetic pole axes close to their rotational equators like Ap and Am stars. The same condition applies to magnetars.\(^{68}\) “A rotating magnetized neutron star is somewhat like a light house beacon.”\(^{69}\) But in this case, the beacon is the magnetic pole rotating with the pulsar. As just stated above, the younger the star with an oblique magnetic pole, the closer it will be to its rotational equator and, therefore, based on the theory I propose, the slower it should rotate. Therefore, stars of the same class with oblique magnetic poles that have stronger magnetic fields will rotate more slowly because they are younger and their magnetic axes have not moved closer to their rotational axes. This, I further propose, is the case with neutron stars and magnetars. That is, the magnetars have their magnetic poles closer to their rotational equators than their siblings. The sizes of their magnetic fields, I maintain, have nothing to do with neutron star and magnetar rotation. This is because of the fact that Ap stars with extremely strong magnetic fields rotate more rapidly than Am stars with much smaller magnetic fields. Until this immense contradiction to the established theory of stellar rotation is resolved, especially with single Am stars, such as HD 8801, there is no theory that fits the evidence except the one I have proposed. Therefore, I claim the younger magnetars have their poles much closer to their rotational equators than do neutron stars and thus rotate slower. Here, the Wikipedia, under “Magnetar” reports, “A magnetar is a type of neutron star with an extremely powerful magnetic field.” But “Magnetars are differentiated from other neutron stars by having stronger magnetic fields, and rotating comparatively slower,

\(^{68}\) Neal F. Commins, William J. Kaufmann, Discovering the Universe: From Stars to Planets (NY 2009), pp. 233-234.
\(^{69}\) Ibid., p. 235.
with most magnetars completing a rotation once every one to ten seconds.” However, Commins and Kaufmann tell us, “The Vela pulsar with a period of 0.089 s[econds], is the slowest pulsar ever detected at visual wavelengths.” Magnetars rotate from about 10 times to 100 times more slowly than neutron stars.

Again, this cannot be attributed to the strengths of their magnetic fields because if that was the case, I reiterate, then Ap stars with extremely strong magnetic fields should rotate more slowly than Am stars with weak magnetic fields.

In fact, a very young pulsar, SXP1026, contains a disk of material around it. Therefore, it is quite young, perhaps 10,000 to 40,000 years of age. It should be rotating quite rapidly since electromagnetic braking has hardly had time to slow its rotation. Nevertheless, in complete contradiction to the electromagnetic braking theory, it is rotating in “just once every 18 minutes or so.” This is precisely what I suggested is the case and precisely the opposite of the electromagnetic braking theory.

Finally, with regard to tau Scorpii, its magnetic field is highly complex, not like other stars of its type.

“Tau Scorpii a massive . . . star and one of the rare high mass stars for which magnetic fields have been measured. To distinguish it further, studies have shown that its magnetic field is unusually complex, being much more tangled than most stars and not showing distinct dipoles. Additionally, this unusual star has been shown to have weaker stellar winds (and consequently, mass loss rates) than most . . . stars [of its type].”

The accompanying schematic of the magnetic field on that internet site shows it has highly dispersed magnetic ejection points all over it reaching out into space, like Ap and Am tars. Note that its stellar winds are “weaker” and “consequently [weaker] mass loss rates,” just the opposite of what is expected in terms of the mass loss ejection theory for its slowing. Thus, tau Scorpii fully corroborates the skewed magnetic field theory I have enumerated. For an even more impressive view of just how skewed tau Scorpii magnetic fields are, see, “The surprising magnetic field of young massive star” on the Internet:

**PLANETS AND TORQUE**

The rotation of stars just examined shows that torque / spin rates have nothing to do with electrical particle braking. When it comes to the solar system and the revolution of planets around the sun – another form of torque suggests no explanation for how the torque was imparted to cause them to orbit the sun. Without torque there would be no

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71 Commins, Kaufmann, Discovering the Universe From the Stars to the Planets, op. cit., p. 236.
72 Rare Slow Spinning Star Reveals Space Oddity (Dec 27, 2011) (Internet).
73 Jon Voisey, A New Class for Tau Scorpii (Internet).
planets, as John Wilkinson explains. “The planets and other bodies in the Solar System formed because the solar nebula was rotating. Without rotation, everything [into the Solar System] would have collapsed into the proto sun.” The cause of the spin of this early gas/dust cloud is unknown as S.A.Qazi reports, “Most scientists agree that the Earth had its origin about 10 billion years ago in a vast interstellar cloud of dust and gas. According to the widely held belief, it collapsed upon itself (with an unknown cause) the forces caused the cloud to start rotating.”

The force of gravitation will cause the cloud to fall to its center, but it was “an unknown cause” that “caused the cloud to start rotating. In Working Papers: Astronomy and Astrophysics Panel Reports (Washington D.C. 1991), page 30 reports, “Theoretical models of the evolution of disks around protostars envision the growth of the disk by accretion [of gas and dust] and the possible development of disk instabilities . . . [that] cause material [in it] to spiral . . .”

The fact remains that there is no gravitational explanation for how these nebular disks began to spin, that is, to have torque. In every reference to having that disk spin, it is suggested, that inhomogeneities, or magnetic fields or whatever may have created torque, but that is all. Gravity will not do it, so everything and anything is being called upon to spin the nebula. It is like the hand of the boy holding the string with a ball on the end who creates torque on the ball. In like manner, it is the need to create torque in the nebula that drives these theories which we were told are derived from “an unknown cause.” Instead of yielding a ball with a string, the astronomers are actually yielding a slight of hand to spin a nebula or more aptly, a magic wand.

Nevertheless, let us only for the moment, allow that torque had been created by a non-gravitational force; does that resolve the problem of planet formation with torque? The problem is that given this assumed torque, planets would not form and the reason they would not form is the law of gravity. Evgeny Griv and Michael Gedalin explain the second aspect of planet formation: “During the early evolution of the disk, it is believed that the dust coagulated into kilometer-sized rocky comets – ‘planetesimals.’” It is from these planetesimals that were at co-orbital distances from the sun that had to crash into the largest one in that orbit, that would allow the planets to form. But as stated above, gravity will not allow these co-orbital planetesimals to collide. And, this was pointed out to the astronomical community by astronomer Tom Van Flandern 20 years ago, but the information and explanation he presented has failed to sink in. The reason for going into this is to show that the concept of torque in celestial systems and by means of gravitation theory is a failure, one that astronomers refuse to recognize. Van Flandern explains why planetesimals in collinear orbits will not condense into a planet thus:

“No suppose you are piloting a rocket [in a co-linear orbit with a space station] and trying to dock [with it]. Let us assume that you start with the same [co-linear] orbit as the space station, but following some distance

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behind it. If you use your ground-based intuition, you will fire your rockets to propel yourself toward the space station in order to dock with it. This is what early astronauts and cosmonauts did, and they found docking almost impossible. Firing your rockets to propel yourself ahead adds energy to your orbit increasing its average height [above the Earth], and putting you into an orbit which takes longer than the space station to get around the Earth . . . The [gravitational] result: you fall further behind.

“To catch up, you must fire retro-rockets. Although this slows you momentarily, you quickly regain the speed as you drop to a lower orbit which takes less time to go around the Earth and you gain on the space station . . .”

The same applies if a spaceship is ahead of a space station and tries to dock with it. The normal response of an astronaut or cosmonaut is to slow the spaceship by firing retrorockets. This, however, causes the spaceship to fall to a lower orbit so it cannot dock with the spaceship. To fall back, the rockets must be fired, which speeds up the spaceship momentarily. But since the spaceship is in a higher orbit, which takes longer to go around the Earth than the space station, its orbital speed is slower and it falls back toward the station. How, then, does this basic gravitational understanding apply that explains why planetesimals in co-orbital, linear positions will not crash into each other and form a larger planetary body. Here, Van Flandern shows:

“Now consider the case of an asteroid orbiting the Sun in or near Jupiter’s orbit . . .

“Let us assume that the asteroid is approaching Jupiter from behind. Jupiter’s gravity begins pulling on the asteroid which accelerates it toward Jupiter. This is just exactly analogous to a rocket firing to increase its velocity toward a space station ahead, . . . The result of Jupiter’s pull is that the asteroid must drop back in its orbit away from Jupiter because the asteroid is moved to an orbit with a longer period by the tug of Jupiter. Conversely, if the asteroid is ahead of Jupiter, Jupiter’s [gravitational] tug slows it down, drops it into a shorter-period orbit, which causes it to move further ahead of Jupiter. Such an asteroid would ‘vibrate’ back and forth in Jupiter’s orbit relative to Jupiter (while always moving ahead relative to the Sun). similar to Jupiter's so they can never be swept up by it, and it cannot ever be swept up by Jupiter.

“In order to be able to penetrate Jupiter’s sphere of influence, or collide with Jupiter, an object’s orbit must allow it to attain velocities relative to Jupiter which exceed Jupiter’s own ability to cancel. Objects in orbits very similar to Jupiter’s always have velocities similar to Jupiter’s so they can never be swept up by Jupiter. (This is contrary to the often-invoked idea that planets all condensed from a collapsed cloud of material in orbit around

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the Sun. Planets cannot sweep up material moving in orbits similar to their own. This remains true even if the period of the planet were slowing, changing, say, due to friction in a resisting medium [‘drag’], or tides.”

Van Flandern’s analysis is not a theoretical one but an observed one that exists in the solar system with Saturn’s natural satellites, Janus and Epimetheus. Kenneth R. Lang shows how gravitational theory proves Van Flandern is correct.

“Saturn’s two co-orbital satellites, Janus and Epimetheus . . . move in almost identical orbits. The satellite on the inmost orbit that is closest to Saturn moves slightly faster, overtaking the outer satellite every four years. But the bodies’ diameters are greater than the distance between their orbital paths, so they cannot pass [one another] without some fancy pirouetting. They avoid a collision at the last moment by gravitationally exchanging energy and switching orbits. The inner one is pulled [forward] by the outer one and [hence] raised into the outer orbit [of the outer satellite], and *vice versa.* [The outer one is pulled back and falls to the lower orbit of the inner satellite]. They then move apart only to repeat this *pas-de-deux* four years later, and exchange [orbits] again.”

This simply means that any theory of planet or natural satellite formation such as the formation of the moon, cannot be valid if it depends on gravitational condensation of co-orbiting materials – gas – dust – tiny planetesimals – rocks, etc.

Let us examine the origin of the moon. There are at present four theories: the condensation of the moon from a disk of co-orbiting gas and dust at the same time as the Earth condensed from a disk of co-orbital gas and dust, the fission of the moon from the Earth in its early history when the Earth was spinning (had torque), and ejected a lump of itself into orbit, the moon was born elsewhere and was captured into Earth’s orbit by a highly unusual close meeting of the Earth, moon and another larger body that slowed the moon’s approach to Earth so it could be captured and the theory that the Earth was struck obliquely in its early history by a planetesimal the size of Mars that ejected a large mass of materials – rocks, dust, regolith – into space in co-orbital orbits that gravitationally condensed to form the moon. The reader will notice that two of the lunar origin theories are disk condensation theories and are, therefore, invalid because gravity will not allow this to form by condensation. But, again, this fundamental understanding of gravity has not sunk in and the literature is full of this condensation concept that is forbidden by gravity. That is, gravity works if it supports established theory but doesn’t if it contradicts it.

One concept that has not been considered is that planetary electromagnetic fields play a fundamental role in planetary satellite formation. Lang informs us:

“Any origin theory must, for example, explain why the Earth has a relatively massive moon when Mercury and Venus have no known moons, and Mars only has two miniscule ones that may be captured asteroids.”

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78 Ibid. pp. 141-142.
80 Ibid., p. 188.
Furthermore, the outer planets – Jupiter, Saturn, Uranus and Neptune, have numerous large satellites. What does the Earth have in common with Jupiter, Saturn, Uranus and Neptune that will allow it to have a large satellite – the moon? No one has ever considered that the one major dynamic element they have in common are that each of these planets have large electromagnetic fields compared to Mercury, Venus and Mars. These electromagnetic fields rotate with their planets and are like the sun’s rotating electromagnetic field, pushing outward and away from them. Anybody that has a very small electromagnetic field that approaches these planets will feel this repulsion and thus will be slowed down as it approaches, especially if it is moving away from the sun toward the planet. The sun will be slowing the velocity of the satellite.

On this process, Hannes Alfven and Gustaf Arrhenius explain the probability of capture taking place:

“... we learn from Kepler that if a body leaves the neighborhood of a planet after an encounter it will move in an ellipse which will bring it back to the vicinity of the orbit of the planet, once or twice for every revolution. If the body is not in resonance, it will have innumerable new opportunities to encounter the planet... Hence, even if at any specific encounter capture is ‘horrendously improbable’ as Kaula puts it, subsequent encounters will occur a ‘horrendously’ large number of times, so that the probability of a final capture becomes quite large, and may approach unity [the capture event must happen].

“In fact, we can state as a general theorem (with specific exceptions) that if two bodies move in crossing orbits and they are not in resonance, the actual result will be either a collision or capture.”

Because of the laws of gravity, that satellite will return again and again to that same planet, and it will be slowed and slowed again until it cannot escape the gravitation hold of the planet and being closed in the planet’s rotating electromagnetic field, its orbit will be circularized. That is, Electro-Gravitic Theory can explain why only the planets with large electromagnetic fields have large satellites, while those with practically no fields do not have them. This does not deny that gravitational theory can also account for captured satellites, but these theories require a third body acting to permit capture. In this respect, Tom Van Flandern has presented a purely gravitational explanation for the capture of Pluto’s moon, Charon.

Based on the above, I maintain that the planets in the solar system are captured bodies from interstellar space. Recently it was discovered that there are indeed rogue, Jupiter-sized planets throughout the galaxy that are not orbiting any star. We will have more to say about these below, but this allows me to show how electromagnetic fields not only allow for planetary capture, but impart torque to them so that they develop circular type orbits. Let us return to the two funnel description presented below. Only this time, let the funnels, as their radius expands out into space with ever gentler slope, reach many

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miles beyond the laboratory. The miles being schematic of hundreds of astronomical units and reflect in miniature the solar system’s gravitational and rotating solar electromagnetic fields into interstellar space.

The Jupiter-sized rogue planet in interstellar space will be in orbit around the galaxy; however, it is not following Kepler’s law. It will be traveling at the same velocity as the sun. Therefore, when the sun is in a lower orbit in the galaxy and catches up to a Jupiter-sized planet in an outer orbit, the sun slows that planet’s velocity and it must fall closer toward the center of the galaxy and, therefore, closer to the sun. As it does so, it comes into the sphere of a gravitational influence of the sun, as well as its rotating electromagnetic field. While the gravitational fields of the sun and Jovian type planets attract each other, their electromagnetic fields are repelling one another. That is, the rogue Jovian planet will be slowing even more and fall closer toward the center of the galaxy. When it is ahead of the sun’s orbit, the gravitational pull of the sun will slow it even more so that it falls toward the sun and is captured in an elliptical orbit where, over time, gravitational pull and electromagnetic repulsion establish it in an orbit that reflects the measure of these two forces acting on it. The body has achieved torque around the sun.83 Therefore, extrasolar planets recently captured would exhibit in some cases before their orbits were circularized highly elliptical orbits and that is also what was discovered.

Stephen P. Maran tells us:

“Some other new planets which I call the ‘eccentrics,’ have pronounced elliptical orbits. This is in clear contrast to the near-circles traversed by Earth and its neighboring planets. The eccentric orbits take them out great distances, when they plunge back toward their stars, moving faster and faster. On an eccentric planet such as 70 Virginis winter is long [because the planet is for a long time far from its primary and outside the Continuous Habitable Zone where the star’s heat is greatly attenuated.] Summer is short [because the planet is for a short time much closer to its primary and far inside the Continuous Habitable Zone where the star’s heat is much greater] and the contrast may be exceptional. Stranger yet is the eccentric 16 Cygni Bb which revolves around 16 Cygni B . . . has a pronounced elliptical path . . . By one estimate . . . [it] comes within 56 million miles of its star . . . at nearest approach and swings out at the opposite end of the orbit. (In our solar system . . . [its] path would take it from well inside the orbit of Venus to far beyond Mars in the asteroid belt).”84

The Wikipedia under the heading “Exoplanets” on the Internet shows that most of the long-period exoplanets have extremely eccentric orbits compared to most of the planets in the solar system except the planetoid Pluto:

“Most exoplanets [near their primaries] with orbital periods of 20 days have near circular orbits, i.e., very low eccentricity . . . By contrast, most known exoplanet [far from their primaries] with longer orbital periods have

quite eccentric orbits (As of 2010, 55% of such exoplanets have eccentricities greater than 0.2, while 17% have eccentricities greater than 0.05 . . . The prevalence of elliptical orbits is a major puzzle, since current theories of planetary formation strongly suggest planets should form with circular (that is, non-eccentric) orbits.”

Pluto’s eccentricity is 0.25 or half of that of 17% of long-period exoplanets, and four times smaller than 55% of these exoplanets. What we have is contrary to everything suggested for planet formation via strict gravitational theory. Why, then, are the overwhelming majority of exoplanets found to move on orbits that are so eccentric compared with what was expected – fairly circular orbits? The answer that none of the astronomers want to consider is that these are all recently captured rogue planets from interstellar space. That, of course, is unthinkable because it suggests a different explanation for solar system formation.

In fact, when a body is found in the solar system to be on a highly eccentric orbit around its primary, astronomers claim it was captured. However, when they discovered that exoplanets exhibit highly eccentric orbits, something else, some other process, was involved. Thus, they maintain a double standard of inference to make bodies on eccentric orbits do what they need / want them to do.

The germane point is that astronomers have always claimed that celestial bodies in the solar system on highly elliptical orbits, such as comets and asteroids, are captured bodies placed by the capture mechanism into these great eccentric paths. Again, it is inconceivable to them that when they actually encounter Jovian-sized planets on cometary or asteroidal, highly eccentric orbits, these were also captured bodies.

While achieving rotational and revolutionary torque for a star or planet so that it spins on its axis and orbits another body is basically inexplicable and unknown, given gravity as the sole force operating in celestial mechanics, torque is a natural outcome of our two-force field system.

**RETROGRADE ORBITS**

Here I give leave for Mathis to delineate the problem of retrograde orbits:

“Retrograde orbits are another hidden problem of current celestial mechanics. The current model hides the problem under piles of math, but, as with ... torques, the gravity-only model has no way to match the data mechanically. ... objects in retrograde orbits lose angular momentum and tend to decay ...”

“So let us look at an orbit like that of Triton [a natural satellite of Neptune] from the point of view of current theory. The current model believes that some satellites, like Triton and Phoebe, are captured satellites ...”

“It is true that the orbit of Triton is decaying, so that the orbit is not in fact completely stable. But this is not the question. No field is infinitely forgivable, but orbits show a degree of float that is not in line with current
There appear to be constraints on decay and escape [of bodies in orbit] far beyond what would be logically expected. A decaying orbit like Triton’s would be [based on gravitational theory] expected to fail [decay] exponentially. As Triton lost energy it would fall into a lower orbit. At this lower orbit the acceleration toward Neptune is even faster. To be in a stable orbit at a smaller radius, triton would have needed to gain [enough] energy [to offset] it’s orbital decay], or speed up. [However,] It has lost energy and gone lower therefore we would expect a multiplied effect [of the decay of its orbit]. Instead we see a long slow decay. Once again, empirical evidence directly contradicts the given theory of gravity and orbit.

“According to the [gravitational] postulates of current theory, a decaying orbit would be expected to fail exponentially and therefore very quickly. A decaying orbit [like Triton’s] would not last a thousand years much less millions or billions of years, but that is what we see.”

Why is this so? The reason is that gravitational theory of a body in close orbit to another supposedly raises tides. In the Earth-moon system the tidal bulge of the ocean on the Earth is a little ahead of the moon. This tidal mass ahead of the moon supposedly tugs it forward along its orbit and gives it more speed and therefore lifts it to a higher orbit. Measurements with mirrors on the moon and lasers on Earth emitting light to these mirrors proves the moon is moving away from the Earth by a tiny amount every year. However, if the moon was in a retrograde orbit around the Earth which is still spinning in the same direction, that tidal bulge would be behind the moon instead of ahead of it. It would be pulled backward and slow momentarily to fall to a lower orbit closer to the Earth. In this new orbit closer to the Earth its pull on the Earth’s oceans would be even stronger using strictly gravitational theory. Therefore, the tide behind it would be greater, that is, have more mass, and that greater mass would pull even more strongly on the moon slowing it more greatly and causing it to fall to an even lower orbit. Each tide is greater in mass than the previous one and exponentially slows the moon’s forward motion so that it falls exponentially closer to the Earth. The very same tides must affect Triton except Triton is pulling on the very heavy / massive atmosphere of Neptune. But it is not following Newton’s law. Something else must be pushing it outward so that its decay is extraordinarily slow compared to what a sole gravitational theory demands.

According to C. J. Ransom, “Neptune’s magnetic axis is angled at about forty-seven degrees to its rotational axis.”

On the other hand, Triton has an orbital inclination of 157 degrees so that in its orbital plane it goes well above Neptune’s rotational equator for part of its circuit and well below Neptune’s rotational equator for part of its orbit. Therefore, Neptune’s magnetic poles will be aimed toward it twice every rotation. As I pointed out to Dr. James Warwick, Ap stars with extremely strong magnetic field and poles close to their equators are single

85 Mathis, The Un-Unified field, op. cit., pp. 149-151.
stars or have very distant partner stars. Am stars with highly skewered axes as Ap stars, with extremely weak magnetic fields, appear to have extremely close companion stars.\(^{87}\)

I then pointed out:

“The only principle which coherently explains the fact that Ap stars with strong magnetic fields are largely single and not spectroscopic binaries, is the electromagnetic repulsion that is too powerful to overcome by gravity at close distance. The only principle which coherently explains the fact that the Am stars with weak magnetic fields are almost all spectroscopic binaries, is a magnetic repulsion that is weak and is thus overcome by gravity at close distance. There is no other force known to account for the differences in the nature of the two types of magnetic stars in binary systems.”\(^{88}\)

Triton is feeling an electromagnetic repulsion twice each time Neptune rotates and this to a significant extent offsets Triton’s decay to Neptune. Again, strict gravitational theory does not explain the very slow decay of Triton, but electrogravitic theory does.

This brings us back to exoplanets. As we know, Triton and many long period exoplanets have retrograde orbits. We also know that Triton’s orbital plane is highly skewered to that of Neptune by 157 degrees, another indication that it is a captured body. That being the case, we should expect that a certain number of exoplanets to be in solar systems like our own and more than half these planets should orbit their primary on orbits that are substantially tilted relative to one another, and that too is the case. “Measurements have shown that some [exo]planetary systems contain planets tilted relative to each other, unlike the solar system [where the planets orbit close to the ecliptic or solar plane]. Research has shown that more than half of Hot Jupiters have orbital planes misaligned with their parent star’s rotation.”\(^{89}\)

Extrasolar planets show on three levels of celestial mechanics that they are captured bodies: they move in retrograde orbits like Triton. Their orbital planes, relative to one another, are “significantly tilted relative to each other,” and, like Triton, “more than half of Hot Jupiters have orbital planes misaligned with their parent star’s rotation.”

The concept that Velikovsky suggested, namely, that there is another force operating in celestial mechanics – electromagnetism – is well supported by a number of contradictions to a purely gravitational interpretation for them. On all these levels, Newtonian theory and Einsteinian theory have failed to account for them.

1. Their theories have failed to explain tides. As Michelson told us above, there is no theory of tides for the oceans, for the apsidal motions of binary star systems, for the deceleration of the Earth’s rate of rotation evidenced by the secular accelerations of the Sun, Moon and planets. “Classical tidal theory indicating maximum dissipation rates that are roughly 1,000 times smaller than observations lead us to expect. In all these cases, and numerous others as well, the only consistent feature of our knowledge of tides is its failure . . .” Velikovsky pointed to this problem long ago:


\(^{89}\) “Extrasolar Planets,” Wikipedia [Internet].
“[John Q] Stewart finds the complexity of lunar motion [because of tides]
‘one of the most imposing demonstrations of the validity of celestial mechanics.’ S.
Newcomb, however, on the basis of eclipses from Ptolemy to this century, found disturbing
variations.” I quoted Simon Newcomb, the great American mathematical astronomer [in
rebuttal to Stewart], on this very problem of lunar motion [created by tides] as checked by
ancient eclipses:

“I regard these fluctuations as the most enigmatical phenomenon
presented by celestial motions, being so difficult to account for by the action
of any known causes, that we cannot but suspect them to arise from some
action in nature hitherto unknown . . . . It would be natural to associate them
with the Sun’s varying magnetic activity and the varying magnetism of the
Earth.”

Stewart, Shapley and others’ claims of the absolute truth of Newtonian and
Einsteinian law, as it applies to tidal theory in all its ramifications, were never true. In fact,
Mathis has come to the same conclusion that electromagnetism or charge is the cause of
tides.

2. While gravitational theory predicts that neither the Earth nor the moon
should gradually fall closer to the sun, when we apply it to these bodies, both are required
to gradually do so. Since it takes more energy to move a body to a more distant one from
its primary than to move it closer to its primary, the moon, when it is on the solar side of
the Earth will pull the Earth closer to the sun. But when the moon is on the antisolar side
of the Earth it cannot pull the Earth far enough to offset what transpired two weeks earlier
because it is still of the same mass and it requires the moon’s mass plus some additional
mass to create the gravitational energy to pull the Earth back to its former distance. The
very same condition applies to the orbit of the moon when pulled to a lower orbit and two
weeks later to a higher one by the Earth. Neither of these motions can be corrected when
these bodies are ahead or behind each other, as Mathis pointed out. Again, since strict
gravitational theory requires that the Earth-moon system fall very slowly toward the sun,
and this obviously is not happening, some other force is needed to maintain their orbital
stability. And yet again it must be a force that repels these bodies away from the sun. The
only force that exists in astronomical space other than gravity is electromagnetism.

3. Kepler’s First Law of planetary motion, as developed by Isaac Newton, does
not explain how planets orbiting one another can move in ellipses with the sun at one focus.
While the “innate motion” tangential vector along the planet’s orbit is always the same, the
centerpulling or centripetal vector at perihelion is greater and at aphelion smaller, thus the
orbital arcs at these points on the orbit will be of different curvatures. Based strictly on
gravitational theory, the curves will not form an ellipse with the sun at one focus. AGAIN,
some other force is required to be operating in space to create ellipses. AND AGAIN, the
only other force besides gravity in outer space is electromagnetism.

4. Torque or spin is ubiquitous in the universe, as Hilton Ratcliffe tells us.

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“There is a particular and almost magical property of matter that has a profound effect on every single thing we’ve ever come across. It’s called spin. In a sub-atomic particle, or a planet, or a star, or a galaxy . . . it’s the same thing . . . without it the universe would be totally uniform, smooth and featureless. In a word, dead . . . Look closely at astrophysical systems and remember this: systems from atoms to galaxies are a balance of attraction and repulsion. . . . The morphology of any material system depends on its rotational state. . . . The imperative to spin is so fundamental . . . [but] it is difficult to determine. . . . In the first instance, unless a body of mass rotates, it will collapse under its own gravity, so the populants of our universe just have to rotate!”

However, gravity pulls bodies in straight lines, as pointed out above, so what causes nearly everything in the universe to spin? Ratcliffe explains:

“We can see electrical effects much closer to home except we most often do not make the connection. Ever wonder what makes a tornado spin? Although storm watchers cannot fail to notice that tornadoes are often associated with electrical storms and lightning, they are unable to take it a step further. Tornadoes are characterized by columns (‘jets’) that rotate in a classical vortex. Sooner or later scientists are going to realize that wherever we see spin, there’s electricity involved. In the case of tornadoes, electrical engineers call it a ‘charged sheath vortex’ which causes the inner walls of the vortex to glow electrically.”

While gravitational theory does not account for torque, electromagnetism does. Ratcliffe explains why this force has been ignored for so long: “We are trained . . . in all our schools to believe in a purely mechanical universe with no electric potential, a place where rotational [torque] dynamics are solely the result of interaction between mass and gravity. The evidence of our eyes tells us in no uncertain terms that it is not such a place.”

What does exist?

“The picture is this: We have a web of magnetic force fields crisscrossing the deep sky, and into it surge endless clouds of electrically charged plasma. Electricity meet magnetism. What do you think happens next? That’s right, the plasma rotates. Most of what we can see in the cosmos is plasma, concentrated in the stars and spread throughout gap interstellar voids . . . The Solar System is suffused with plasma in the form of solar winds. It is all around us, and must therefore surely be the richest and most fertile field of investigation . . . ”

Charged bodies like planets, stars, etc., like charged particles – plasma – spin! No theory of gravity or electric braking of star rotation, especially Ap and Am magnetic stars, explains their behavior. Not only is the problem of torque for these bodies unexplained, there is no explanation for why some spin rapidly and others of the same class spin slowly, except Electro-Gravitic theory. Electricity and magnetism are dualities; you cannot have one without the other!

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91 Ratcliffe, The Virtue of Heresy, op. cit., p. 212.
92 Ibid., p. 228.
93 Ibid., p. 208.
94 Ibid., p. 221.
5. The reason that moons/satellites in retrograde orbit such as Triton don’t fall exponentially cannot be explained along strict gravitational lines, is that some other force must be operating to repel Triton so that its orbital decay is far slower than gravity demands. In each of the above contradictions to gravitational theory, where the mathematics of Newton cannot account for the actual behavior of celestial bodies, a counterforce to gravity is required to account for these behaviors of celestial bodies. To repeat yet again, the only other force in space that exists besides gravity is electromagnetism and it is undoubtedly the counterforce that explains these phenomena.

In 1988, Roger Ashton wrote the following critique of Velikovsky’s hypothesis:

“Velikovsky wrote at the end of Worlds in Collision that his thesis therein created more problems than it solved. I see no sign that his supporters and his followers drew the obvious inference. . .

“The trouble is that the version of that sky propounded by Velikovsky, and even more so with certain of his successors, has the Sun, Moon, and all of the [naked-eye] visible planets in an arrangement radically different from that now obtaining.

“A convincing case for that form of a different sky quite reasonably requires a greater bulk of hard evidence than Establishment scientists have [presented] to the contrary. A heavy burden of proof, therefore, rests upon anyone who wishes the claim for such a radical rearrangement of the planets to be given proper attention. The burden of proof is heavier than that upon the scientific Establishment for its own views, because one must, at every step and substep, respect the requirements of scientific and scholarly epistemology. . . . In addition, every one of the prohibiting and limiting [gravitational] factors cited in regard to the various orbital models herein must be satisfactorily gainsaid. In both respects, Velikovskians have not met even .01% of their burden of proof, and have shown no sign of recognizing it is due in full.”

Ashton further argues:

“Velikovskians tend very strongly to take facts and ideas in isolation and out of context and then glue them together. They then anachronistically try to distort the remaining 99% or 99.99% of facts in each sector in order to try to make it conform to the ideas of gluing . . . [This criticism] was to undo all of that gluing.”

What now exists for Establishment scientists is to answer the fundamental huge flaws in gravitational theory outlined above. It seems that all the astronomers who have deigned to criticize Velikovsky on the basis of celestial mechanics are woefully ignorant or indifferent to their own sciences’ failures to match Newtonian law to astronomical reality. To rephrase Ashton’s words as the evidence above relates to celestial mechanics,

“A convincing case for a stable solar system with a sky identical to the one observed today in the past requires hard evidence that Newtonian theory is valid and the mathematics that support it match reality is due in full. A heavy burden of proof now rests upon any scientist who dares to claim that Newtonian theory matches celestial reality when the evidence presented above proves otherwise. The burden of proof is now heavier upon the scientific establishment for its own views, because one must at every step and substep respect the requirements of scientific and scholarly epistemology in the course of upholding gravitational theory to

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96 Ibid., p. 55.
explain the underlying physics of the movements of all celestial bodies, in the form of it that is presently accepted. In addition, every one of the prohibiting and limiting factors that deny the validity of strict Newtonian law regarding celestial mechanics must be satisfactorily gainsaid. In fact, in this respect the scientific Establishment has not met 0.1% of their burden of proof, and have shown no signs of recognizing that it is due in full.

“Above it has been shown that it is in fact the scientific Establishment that tends very strongly to take facts and ideas about celestial mechanics in isolation and out of context, and then glue them together, then try to distort the remaining 99% or 99.99% of the facts of celestial mechanics in each sector in order to try to make it all conform with the laws of Newton and the gluing.”

Robert J. Schadewald, in this regard, writes:

“Velikovsky and his followers had thirty-seven (written in January 1991 ed.) years to show his scenario is scientifically plausible. They have utterly failed. The equations of celestial mechanics . . . are well-known and they have been verified to high precision, . . . Velikovsky himself was not competent to do the required mathematics, some of his followers are. If they want the astronomers to take them seriously, let them publish a hypothetical orbit for a body which behaves remotely as they claim Venus behaved.

“But this sort of ‘put up or shut up’ attitude enrages the Velikovskians. No such orbits exist, so they can’t put up, and they are psychologically incapable of shutting up.”

In this case too, Schadewald, with the advice of Ellenberger, failed to point out that C. J. Ransom and L. H. Hoffee published in Pensée (Winter 1973), a paper that showed how mathematically a “hypothetical orbit for a body . . . behaves . . . as they claim Venus behaves.”

This was published 25 years before Schadewald wrote. Why didn’t he tell us that? We cite Köhler who read this article and wrote, “It has even been worked out how Venus could have switched step-wise from an orbit between Jupiter and Saturn to its present (quite circular) orbit inside the Earth’s [orbit].” This was written a full four years before Schadewald wrote.

In fact, the Edinburgh Review, for October 1874 page 205, 134 years before Schadewald on Ellenberger’s advice raised this issue showed that Lexall’s comet had an orbit in the 1760s had an orbit between Jupiter and Earth but had a close interaction with the Earth and then Jupiter in the same year, just as Venus did in Velikovsky’s scenario. Who can trust such people? Lastly, in terms of celestial mechanics, their statement, “The equations of celestial mechanics . . . are well-known and have been verified to high precision,” has now been shown to be false by all the evidence above. The shoe is now on the other foot. What critics of Velikovsky must do is answer Miles Mathis’s evidence about the false claims of celestial mechanics and also Mathis’s and Irving Michelson’s evidence that gravitational celestial mechanics has utterly failed to explain tides. In the arrogant and harsh words of Schadewald, this is a “put up or shut up” situation for them.” If they want us to take them seriously, then publish the counter evidence. Ellenberger is, of course, psychologically incapable of shutting up,” and presenting wild absurdities about Velikovsky. Of course, Einstein’s statement above that he could explain

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97 Schadewald, Worlds on their Own: A Brief History of Misguided Ideas . . . (Xlibris Publs. 2008), p. 29.
Velikovsky’s celestial scenario, including the circularization of Venus, was casually suppressed by Schadewald.

The critics of Velikovsky cannot, in the face of these negations of Newtonian theory, argue that celestial mechanics is so perfect that it does not allow for Velikovsky’s thesis. Since it does not explain planetary motion, it cannot possibly qualify as a method of deriving the past positions of the planets. The basis of their outrage was the unfounded belief that Newtonian theory was in error. In the words of Mathis, “That means that orbital mechanics is just magic. The mechanics we have doesn’t work and we haven’t tried to replace it with one that does.”

Mathis is to be more than just commended for his insights into the magic of present-day celestial mechanics. What he has done of greatest importance, for those of us involved in Velikovskian studies, is present these concepts in book form and in paper after paper on the Internet so that this understanding of the failures of Newtonian theory are out in the world. The vast majority of critics who reject his deconstruction of their most profound theory have rarely, if ever, provided the counter mathematics to discredit his analyses. Others simply insult him because they lack the capacity to disprove his work. But that will change nothing, the work is out there. It shows that there is an electromagnetic counterforce to gravity and, ineluctably, here and there, scientists will begin to consider and examine this concept and begin to work with it to fulfill its paradigmatic development with evidence and additional mathematics. Velikovsky’s most vital concept that electromagnetism plays a role in celestial mechanics cannot be stopped. It will inexorably grow and grow in the future until future generations will look back on the present generation of scientists as misguided at best, and dogmatic at worst.

Before proceeding to the next chapter on solar system instability, one other point must be made, namely, that the only scientific argument against Velikovsky – celestial mechanics – proves his theory to be impossible. What is this based on? It is based on the very same mathematics that does not fit the behavior of celestial bodies as they actually move. Yet the astronomers and physicists maintain they cannot be in error. Let them, therefore, explain the shortfalls and overabundance of gravitational energy in each of the above phenomena, or the simple fact that gravity does not create torque. For those, however, who will come forth to criticize this material, I request they present both their explanations and mathematics to Miles Mathis at MM@MilesMathis.com rather than to me, since I lack the mathematical skills to respond to such arguments. This, I fear, critics will never do. As they have rarely, if ever, responded to Velikovsky and his proponents who answered their criticisms, and they will, I believe, not publish their evidence in book form or in journals where that material will become part of the published debate. The evidence presented in the foregoing were raised to elicit just such a scholarly, scientific debate. I am not very sanguine that physicists or astronomers will pick up the gauntlet Mathis has thrown down to them. I hope I am wrong. So far as I know, no physicist or astronomer has specifically addressed these problems which implies they have no answers for these contradictions to pure gravitational theory that has been accepted and taught in classrooms throughout the world for centuries.

One additional point: although I agree with Mathis that electromagnetism is a counterforce to gravity, I do not agree with the formulation of his theory mathematically. Nevertheless, what is extraordinary is that he has derived his concept on the theoretical supposition that the density of a celestial body overall determines its electromagnetic field. I, on the other hand, maintain that the greater the pressure at the centers of celestial bodies, created by the gravitational mass above compresses the central mass and, in so doing, creates a piezoelectric

100 ‘The Central Discoveries of this Book a top-ten list,” Miles Mathis (Internet).
magnetic field that emanates from that center. I further maintain that the interaction of that field with a surrounding encompassing electromagnetic field causes that body to rotate. That body then becomes a dipole rotating antenna which emits a radial and tangential electromagnetic wave that moves outward after five rotations of that body falls to zero. For the Earth that rotates in one day, the distance where its magnetosphere ends is five light days away in space. The sun, which has the most dense central core of all the bodies in the solar system, rotates in about 28 days and its magnetosphere becomes zero at a distance of 140 light days away from the sun. Mathis, however, posits a scalar field with Coulomb’s Law as the expression of electromagnetism such that the electromagnetic force falls off as the square of the radial distance from a celestial body. His approach leads to the concept that the smaller the body the greater is its electromagnetic field. With these theoretical concepts I am in strong disagreement, although I am deeply thankful for his work on the problems connected with gravitational theory. He came to his theory through mathematical physics and observation, I through observation, but in certain respects our theories are very much alike.
CHAPTER 2: ELECTROMAGNETISM AND CELESTIAL MOTION

“Robert Millikan was asked ‘whether he knew of anyone who had ever found a way of modifying or influencing the force of gravity. Millikan is said to have replied brusquely, ‘Of course not, such a thing is impossible and out of the question.”


Velikovsky challenged the concept that only gravity affected celestial motions when he wrote unambiguously:

“. . . The accepted celestial mechanics, notwithstanding the many calculations that have been carried out to many decimal places, or verified by celestial motions, stands only if the sun, the source of light, warmth and other radiation . . . is as a whole an electrically neutral body, . . .”

“Fundamental principles of celestial mechanics, including the law of gravitation, must come into question if the sun possesses a charge sufficient to influence the planets in their orbits or the comets in theirs. In the Newtonian celestial mechanics, based on the theory of gravitation, electricity and magnetism play no role.”

He further held that “Gravitation is an electromagnetic phenomenon.” In that citation, Lynn E. Rose pointed out that Velikovsky had moved away from some of these positions.

“It should be noted that during the last two decades or so of Velikovsky’s life, the ideas that had been expressed in *Cosmos Without Gravitation*, and in the fourth of the ‘Four Plans of the Universe’ no longer reflected Velikovsky’s approach to the extent that they once did. In particular, he backed off considerably from the idea of circumduction as a non-gravitational, non-inertial account sufficient in itself to explain orbital motions, and he also backed off from any general suggestion that gravity and inertia might somehow be banned from the celestial arena. What he often said in his later years was, not that gravity and inertia played no role, but rather that they did not play the only role, that is, that gravity and inertia were not alone responsible for what occurred in the celestial arena: electromagnetic interactions also played a considerable role in cosmic events – especially when celestial bodies were in close approach to each other, but also even when they were far apart. . .

“In any case, each of ‘The Four Plans of the Universe,’ even the fourth, should be taken as a ‘construction,’ a working hypothesis for the purposes of discussion,

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not as a final position. The same is true of *Cosmos Without Gravitation*: not all of the ideas that were formulated in that early monograph were ones that Velikovsky continued to adhere to in his later work.

“Nevertheless, it must be emphasized that Velikovsky did not ever abandon the idea that gravity itself might eventually be interpreted as an electromagnetic phenomenon, nor did he ever abandon the idea that the solar magnetic field might, to some extent, be responsible for the fact that the planetary orbits are roughly coplanar.”

This, then, is the general concept that Velikovsky believed celestial mechanics rested upon. Nevertheless, before proceeding, it must be pointed out that Robert J. Schadewald, on the advice of one of Velikovsky’s disgruntled followers, brought up *Cosmos Without Gravitation* and cited it without ever letting his readers know that Velikovsky no longer agreed with much of that material – but clearly and anger driven, claimed these were still Velikovsky’s positions. Nevertheless, Velikovsky’s electromagnetic concept is now out in the scientific community and as we will see, it is growing. As was also pointed out above in the chapter on “Celestial Mechanics,” there are several aspects of celestial mechanics that cannot be correlated mathematically with Newtonian theory, but require an additional force [electromagnetic force] in order to operate. Miles Mathis, who well understood the depths of maniacal rage this Velikovskian concept held for his critics, pointedly states, “astrophysicists, [who] would have to admit that Velikovsky was at least partially right . . . would rather tear out their eyeballs and eat them than go there.”

In terms of Freudian psychology, the great underlying neurotic problem of humanity is the Oedipal complex as outlined by the Greek playwright, Sophocles in his trilogy, “Oedipus.” Oedipus, unable to deal with the fact that he had violated every moral aspect of his life, when discovering he had actually done so, gouged out his eyes unable to face his behavior. So, too, the scientists of this generation according to Mathis, rather than admit “Velikovsky was at least partially right . . . would rather tear out their eyeballs . . .”

Velikovsky has related a story he liked to tell:

“Once in the twilight hour a visitor came to my study, a distinguished looking gentleman. He brought me a manuscript dealing with celestial mechanics. After a glance at some of the pages, I had the feeling that this was the work of a mathematical genius. I entered into a conversation with my visitor and mentioned the name of James Clerk Maxwell. My guest asked: ‘Who is he?’ Embarrassed I answered: ‘You know the scientist who gave a theoretical explanation of the experiments of Faraday.’ ‘And who is Faraday?’ inquired the stranger. In growing embarrassment I said: ‘Of course, the man who did pioneer work in electromagnetism.’ ‘And what is electromagnetism? Asked the gentleman. ‘What is your name?’ I inquired. He answered, ‘Isaac Newton.’ When Velikovsky awoke, on his knees was an open volume: Newton’s *Principia*.

This story is told to illustrate what I have said before. Would you listen to anybody discuss the mechanics of the spheres, who does not know the elementary physical forces existing

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4 Schadewald, *Worlds of their Own*, op. cit., p. 28.

5 Miles Mathis, “The Cause of Axial Tilt,” Part I, paragraph three (Internet).
in nature? But this is the position adopted by astronomers who acclaim as infallible a celestial mechanics conceived in the 1660s in which electricity and magnetism play not the slightest role.\textsuperscript{6}

Let us first examine the reaction of the astronomers to evidence that electromagnetism plays in celestial mechanics before looking at the experimental evidence related to it.

This brings us to the first part of the Velikovsky Affair, when critics of Velikovsky’s concept that electromagnetism plays a crucial role in celestial mechanics, was debated and forcefully denied. What we will see is that in each and every instance, when a critic leveled a charge against Velikovsky’s electromagnetic concept and it was shown to be in error, and further the evidence instead supported Velikovsky, the critic never faced up to that counter evidence and acted as if the counter evidence never existed by retreating into a state of silence and denial. Let us now look at these early critics and the evidence: the first critic was Donald Menzel, Director of the Harvard College Observatory as explained by Ralph E. Juergen:

“In 1952, in the \textit{Proceedings of the American Philosophical Society}, Menzel had offered calculations to show that if Velikovsky were right about electromagnetic forces in the solar system, the sun would have a surface electric potential of $10^{19}$ (10 billion, billion) volts – an absolute impossibility, according to the astronomers; but in 1960, V.A. Bailey, emeritus Professor of Physics at the University of Sidney, claimed that the sun is electrically charged and that it had a surface potential of $10^{19}$ volts – precisely the value calculated by Menzel. Bailey, at the time his theory was first published, was entirely unaware of Velikovsky’s work and of Menzel’s rebuttal of it.

“The idea that his ‘quantitative refutation of Velikovsky’s wild hypothesis – Menzel’s own description of his contribution to the Proceedings in 1952 – should now be brought to Velikovsky’s support was intolerable to the Harvard Astronomer. So when he mailed his paper to Harper’s in 1963, he also sent a copy to Baily in Sidney and asked him in a covering letter to revoke his theory of electric charge on the sun. That theory was casting doubt on the continuing efforts of Menzel and other American scientists to discredit Velikovsky, and Menzel pointed out what he conceived to be an error in Bailey’s work.”\textsuperscript{7}

The mathematical error, to the contrary, had been made by Menzel. Nevertheless, when new scientific evidence supported Velikovsky’s concept regarding electromagnetism, neither Menzel nor the rest of the astronomical / physics establishment jumped at the opportunity of evaluating how it might operate, but instead, tried to deny the evidence existed. Einstein agreed with Velikovsky who said, ‘‘The real cause of indignation against my theory of global catastrophes is the implication that celestial bodies may be charged.’ he [Einstein] wrote in the margin ‘ja’ (‘Yes’).\textsuperscript{8} Just like the scholastic professors denied that Galileo’s telescope showed Jupiter had four moons circling it, the entire scientific establishment denied that the sun may very well carry a charge capable of affecting the orbits of the planets. There was no investigation, only flat out denial.

The second astronomer who criticized Velikovsky’s electromagnetic concept in the early part of the Velikovsky Affair was James Warwick, who specifically wrote a paper on magnetic stars that, like Menzel’s, was supposedly a devastating calculation and rebuttal to

\textsuperscript{6} Immanuel Velikovsky, \textit{Earth in Upheaval} (NY 1955), pp. 298-299.
\textsuperscript{8} Ginenthal, \textit{Carl Sagan & Immanuel Velikovsky, op. cit.}, p. 358.
Velikovsky. He claimed that astronomers had been working with magnetic star motions for years and found nothing to indicate that their high magnetic fields had any influence on motion in this regard. The original criticism appeared in KRONOS, vol. x, no. 3 (1985), pages 10-11. My answer to Warwick was published three years later:

Immanuel Velikovsky claimed that two magnetic stars orbiting at close quarters would not only be influenced by gravitational interaction, but also by magnetic interaction. [Earth in Upheaval, NY (1955), “Forum Address,” p. 297.] Radio astronomer, James Warwick, calculated the influence of two magnetic stars, each of 10,000 gauss separated by three solar radii and aligned with their dipole moments directed toward each other to maximize the magnetic interaction. Based on his careful calculation, he could claim that the magnetic interaction between the magnetic stars was about a billion times smaller than gravity – far too small to influence the orbits of these bodies.

“We wish to challenge this conclusion based on mathematics and physics and offer observed evidence that denies the validity of Dr. Warwick’s calculation and conclusion. Magnetic stars fall into two classes. The first type of magnetic star is called an Ap star. Jean-Louis Tassoul, in his Theory of Rotating Stars (Princeton, NJ, 1978), p. 430, informs us that ‘Almost all high intensity magnetic fields known in non-degenerate stars, are found in the peculiar A-type (Ap) stars.’ Therefore, these stars are on the main sequence of stars with the largest magnetic fields. The other class of magnetic stars are the Am stars which, if they have magnetic fields, they are not nearly as powerful as the Ap stars with the strongest fields. What is quite unique is that the magnetic axes are at [a] great angle with the rotational axis and thus the magnetic poles are observed to be close to the equator.\(^9\) When stars are in close binaries, tidal forces drive the two stars into a position in which their rotational axes move toward parallelism. Thus, the point where very close companions would be in orbit around a magnetic star is at the rotational equator where in Ap magnetic stars, the gravitational forces will be in competition with the dipole moment’s magnetic forces, in order to form a close binary system [like that proposed by Warwick]. There is also another phenomenon observed with magnetic stars. ‘The distribution of the obliquity angles (of the magnetic axes) appear to be random . . . but becomes increasingly bimodal as evolution proceeds.’\(^10\) Therefore as the star ages, the magnetic axis will move to align itself with the rotational axis. The magnetic axes of stars with the strongest magnetic fields will, based on this data, be found nearer to the rotational equator . . . Thus, any star that forms a binary that is close to these magnetic stars, especially those with the strongest fields (namely the Ap type) must do so against at least one of the magnetic dipole moments.

“It is well observed that both types of magnetic stars – Ap and Am – form binary systems, but there is a significant difference that appears to deny Dr. Warwick’s views that electromagnetism is an inconsequential force in these star systems. Spectroscopic binary systems are double stars that are so close together that they can only be distinguished by spectroscopic analysis. Nearly all main sequence stars, can and do, form spectroscopic binary systems. Based on Dr. Warwick’s

\(^9\) Tassoul, Theory of Rotating Stars, pp. 431-432.
calculation, there is absolutely no reason for the highly magnetic Ap stars not to be members of such spectroscopic systems . . . The fact of the matter is that Ap stars are rarely found to have spectroscopic binary companions [and never so far as I have been able to find, with another Ap companion]. And we are specifically told that ‘Ap stars are generally slow rotators, but they differ (from Am stars) in being single rather than spectroscopic binaries.’ (The fact on File Dictionary of Astronomy, 2ed. V. Illingworth, ed. (NY 1985), p. 22.\(^\text{11}\)

Since all other main sequence stars have such binaries, one astronomer remarked: “There seems to be a severe shortage of such spectroscopic binaries among the Ap stars.”\(^\text{12}\)

While M. Floquet, in “Les Etoiles Ap Binaries,” in Astronomy and Astrophysics Abstracts, Vol. 30, Pt. 1 (1983), p. 439, has come to the conclusion that “The magnetic field seems to play an important role in the relation between binarity and the Ap phenomenon.” That is, gravitation being about a billion times more influential than magnetism or even several millions of times more so does not explain why these highly magnetic stars seem to be singular rather than in rare cases form spectroscopic binary systems. But what of the extremely weak magnetic Am stars? Interesting, we are informed, that they are “almost all short period spectroscopic binaries.”\(^\text{13}\)

Clearly the only force that distinguishes Ap stars from Am stars is the strength of their magnetic poles and perhaps the inclinations of their magnetic axes to the rotational axes. There is no other force known to account for the differences in the nature of these stars in binary systems. The only principle that coherently explains the fact that Ap stars with high magnetic fields are overwhelmingly single and rarely spectroscopic binaries is [as Velikovsky suggested] an electromagnetic repulsion that is too strong to overcome by gravity at close distance. The only force which coherently explains the fact that Am stars with weak or tiny magnetic fields are, by and large, almost all spectroscopic or very close binary systems is an electromagnetic repulsion that is too weak and thus allows companions to move close to them. In addition, we were informed above that all magnetic stars are slow rotators, unlike the same sized stars without their magnetic axes skewered toward their equators. This is clearly a direct indication that the inclination of the magnetic axes pushing through the galactic magnetic field are slowed. But Warwick, in both cases, never answered nor mentioned any of these phenomena which directly undercut and contradicted his calculations.

Is it even remotely possible that Warwick, an authority on magnetic stars, was ignorant of the binary behavior of Ap and Am stars and of the fact that they are all slow rotators, when he presented his challenge to Velikovskian researchers? Of course, he had to have known about all these elements, but in all the years that this response to his critique was presented, he never presented or even acknowledged the answer to his criticism existed! He merely presented mathematical equations as proof, but withheld from his readers the actually observed behavioral characteristics of magnetic stars that were in direct contradiction to that math. As with Menzel, when confronted by the evidence, Warwick failed to carry out his scientific and scholarly duty and left his erroneous criticism in the literature.

The third instance in the early Velikovsky Affair wherein a critic attacked Velikovsky’s concept that there was an electromagnetic force, in addition to gravity operating, is Ivan King, an astronomer, and one of the organizers of the 1974 AAAS Symposium on Velikovsky who bluntly stated before the meeting was even held:

\(^{11}\) Ginenthal, Carl Sagan & Immanuel Velikovsky, op. cit., pp. 358-359. (Emphasis added)
\(^{13}\) Fact on File Dictionary of Astronomy, op. cit., p. 11.
“What disturbs the scientists is the persistence of these views, in spite of all the efforts that scientists have spent on educating the public. It is in this context that the AAAS undertakes the Velikovsky Symposium. Although the symposium necessarily includes a presentation of opposing views, we do not consider this to be the primary purpose of the symposium. None of us in the scientific establishment believes that a debate about Velikovsky’s [astronomical electromagnetic force] views . . . would be remotely justified at a serious scientific meeting.”

Strangely enough, King’s research deals with the behavior of globular clusters that are spherical in shape and are made up of 10,000 to one million, mostly old red giant stars. There are a few hundred globular clusters in the Milky Way with the greatest concentration of stars toward their central cores. Also unusual, is that these globular clusters do not revolve about the galaxy as do stars in the galactic disk on relatively circular orbits. Rather, these clusters have orbits that are highly elliptical, like those of most comets in the solar system. Globular clusters orbit toward and away around the galactic core. Furthermore, the orbits of the stars in these globular clusters do not orbit its core in circular orbits, but do so on orbits that are highly elliptical. This creates a major gravitational problem in explaining how these clusters can survive. Over time, stars will approach one another and gravitational interactions will accelerate one of them so greatly that it will leave the cluster forever. Therefore, these globular clusters should be shedding members and becoming ever smaller in size.

However, when a star is kicked out of the cluster, it will remove gravitational energy or angular momentum with it and to make up for this loss of gravitational energy, the star that interacted with the escaped one must move inward to counter-balance that loss. The law of conservation of angular momentum is fundamental to gravitational theory and demands this. Therefore, because the globular cluster is now somewhat smaller in size, the stars in it left behind will move closer to one another and will then repeat the interaction process again and again – sending stars out of the cluster while the cluster continues to contract. But, for some reason, this law of gravity is not working in these globular systems.

King well understood this fundamental contradiction to gravitational theory and admitted this. Now, this not only relates to the hundreds of globular clusters in the Milky Way, but to the billions upon billions of other spiral galaxies with globular clusters throughout the universe. In other words, celestial mechanical equations cannot account for the failure of these fundamental laws to work as they should throughout the universe. Here, then, is how King dealt with this massive negation of the theory he claims disproves Velikovsky:

“Although globular clusters are obviously long lived, they are not immutable. Slowly, but steadily, stars evaporate [escape] from the cluster as they reach escape velocity from the cluster [during near interactions]. A [gravitational] theory that adequately predicts the resulting evolution of the cluster is basically simple, but many of the details have remained elusive.

“The binding energy of a cluster [holding it together] is really an energy deficit: the energy it would take to accelerate all the stars to their escape velocity and tear the cluster apart. To reach escape velocity, a star must acquire enough kinetic energy to overcome the cluster’s negative gravitational energy. Thus, the stars that escape are those with the most kinetic energy, whereas the amount of gravitational energy they contribute to the cluster is no more than average. As a result, the

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14 Ginenthal, Carl Sagan & Immanuel Velikovsky, op. cit., p. 35.
evaporation of stars increases the amount of binding energy per star remaining in
the cluster as the cluster contracts.

“According to current theory, it does not reach a steady state. Instead, energy
from the contraction [of the cluster] is converted to kinetic energy of stellar motion,
thereby ‘heating’ the core [the core becomes more dense and the stars in or near it
move more rapidly, therefore]. More stars evaporate and the core continues to
contract and heat without bound until it is infinitely dense. Donald Lyden-Bell,
proponent of the theory, has dubbed this positive feedback phenomenon the
‘gravitational catastrophe.

“When the theory was first put forward in 1960 by Michael Henon of the Nice
Observatory, there was little observational evidence to support it. Only one
globular cluster, M15, shows any sign of the sharp density peak one would expect
in a collapsed core. Recently, however, my colleague, Stanislav Djorgovski, and I
have been making more careful observations of a large number of globular clusters.
We have observed at least half a dozen displaying density peaks we believe to be
evidence of core collapse. Still, half a dozen is not many; [gravitational] theories
of cluster evolution predict that a much larger fraction of the ancient globular
clusters in the Milky Way should have collapsed by now . . . The various analytical
and numerical models also concur in predicting that once the core collapse begins,
it proceeds so rapidly one would be unlikely to observe it in progress! . . . Why
have more central density peaks not been detected?

“One possibility is that the predicted timescales for core collapse are too short.
A MORE LIKELY EXPLANATION IS THAT SOME MECHANISM HALTS
THE COLLAPSE AND EVEN CAUSES THE CORE TO RE-EXPAND [back]
TO NORMAL.”15

In other words, King is directly saying that something else must be happening
in globular clusters that is acting against gravity to keep it from collapsing. That is, as the cluster
begins to develop a smaller core, something else comes into play and offsets collapse and then
actually “re-expands” or pushes the cluster back to its more normal size. He had completely
overlooked that this specifically would be explained by Velikovsky who maintained that charged
celestial bodies, when close to one another, would be cushioned by their repelling magnetic
fields.16 Yet, here again, we have Ivan King offering that some sort of mechanism at close quarters
is able to overwhelm gravity! William R. Corliss understood the dilemma that underlay
gravitational processes in globular clusters that kept them from collapsing as they shed stars into
space and calls the mechanism just what it is, a “force.” “Some unidentified force at the cores of
the cluster may be operative.”17 What force outside of gravity is known to exist in space except
Electromagnetism, but King would gouge his eyes out rather than suggest Velikovsky might be
right!

All sorts of ideas have been invoked to fill this gaping hole in gravitational theory. For
example, one is that as the core collapses, many close binary stars will then form to offset the
single stars that can interact. But the only information for this is an interpretation of X-ray sources

15 Ivan King, “Globular Clusters,” Scientific American, vol. 252 (June 1985), pp. 87-88. (Capitalization
added)
16 Brian, Einstein a Life, op. cit., p. 399.
at the cores of these clusters. But this explanation only applies to “some globular clusters.” If the theory was correct, it would apply to nearly all of them. Other scientists have even suggested that an undiscovered form of matter called “Dark Matter” somehow halts the collapse, though this highly speculative idea is not accepted. Theory has been piled on theory in an attempt to salvage the globular cluster contradiction for gravitation theory. Earlier it was suggested that these clusters are rotating which would clearly resolve the problem since the stars would be in more circular orbits and rarely interact. But as Dewey Larson pithily explained: “Showing that some clusters rotate is meaningless. All must be rotating quite rapidly to give any substance to the hypothesis that rotational forces counter balance the gravitational attraction. If even one cluster is not rotating, or is rotating slowly, this is sufficient to demonstrate that rotation is not the answer to the problem.” Only Velikovsky’s theory that charged celestial bodies would exhibit a cushioning effect at close range explains the behavior of globular clusters throughout the universe. King, of course, could never consider this because it would mean Velikovsky could be right.

In every case, in the early Velikovsky Affair, the arguments raised to dispute that electromagnetic effects play no role in celestial mechanics, have been answered. At no time did Velikovsky’s critics ever acknowledge that their attacks were answered in Velikovskian or other literature, nor did they ever respond to the answers and evidence provided by Velikovsky or proponents of his ideas. They failed in all these cases to act in a scholarly, scientific or rational manner and eluded their duty by simple denial of these realities they could not explain away nor prove were invalid.

Before going on, it must also be reported as did Colin Wilson: “His electromagnetic theory . . . led Velikovsky to predict that Jupiter would be found to emit radio waves and that the sun would have an extremely powerful magnetic field . . . It could be said that many of Velikovsky’s theories [including the idea that Jupiter and the sun have large magnetospheres] are now accepted as part of astrophysics, except, of course, that no one acknowledges that Velikovsky was the first one to formulate them.” So, too, the electromagnetic evidence below to be presented is also unacknowledged by the scientific community.

THE EXPERIMENTAL EVIDENCE

The development of gravitational theory grew out of experiments attributed to Galileo who created an entirely different form of physics than that of Aristotelian logical deductive physics. Aristotle’s physics was based on thought experiments that had not been subjected to experiment or if so subjected, were shown to be false. Galileo, we are told, carried out foundational experiments upon which gravitational theory was forged. We are told, in history of science books that cover this period, that his meticulous experiments, coupled with his application of mathematics to them, showed that all falling bodies followed the same rules. Typical of such heroic descriptions is that given by Robert K. Logan:

“Galileo did a number of experiments investigating the nature of motion by using pendulums and inclined planes. Through his experimentation, he discovered

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19 Dewey B. Larson, the Universe of Motion (Portland, OR 1984), p. 30.
that aside from air resistance, all bodies accelerate uniformly when falling to Earth. . . . the famous story that he made this discovery by dropping objects from the Leaning Tower of Pisa is a myth. The actual discovery was made by rolling objects down an incline plane. His investigation of the pendulum began with his observation of a chandelier swinging back and forth in church. . . . He was fascinated by the regularity of the motion which he saw. . . .

“Galileo’s experiments and observations led him to formulate the parabolic law of motion of a projectile in the Earth’s gravitational field. These studies also led him very nearly to a formulation of inertia, the concept that a body stays at rest on a straight-line motion unless a force acts upon it. . . . Another of the important contributions is the incorporation of mathematics into his description of nature. There is no doubt he was influenced by Euclid and Archimedes when he wrote ‘trying to deal with physical problems without geometry is attempting the impossible’ or ‘the book of Nature is written in mathematical characters.’

Historian of science, Alexander Koyré, on the other hand, disputed this as mythical and heroic scientific history, claiming Galileo’s achievements were not based strictly on the experiments that he allegedly carried out, but were, in reality, theoretical and sustained by his use of mathematics to give legitimacy to his experiments. According to the “Published Preface” of Koyrê’s book, From the Closed World to the Infinite Universe (Baltimore, MD 1957), pages viii-ix:

“Koyré was suspicious of scientist’s claims to be proving natural or fundamental truths through their experiments. He argued these experiments were based on complicated premises, rather than real truth. He repeatedly criticized Galileo’s experiments claiming that some of these experiments could not have taken place and brought into question the results Galileo claimed and modern historians had heretofore accepted.

The idea that Galileo was driven by theory to create experiments that could not actually derive these results and then applying mathematics to give these experiments the backing of scientific truth was a devastating attack, and it suggested that the foundation of modern gravitational physics was inconsistent with the scientific method. According to Koyré, the theory of motion came before Galileo’s experiments and the mathematics was then used to confirm these. This criticism of one of the giants, who had suffered greatly at the hands of the Inquisition for his work, was just too much for historians of science and Koyré’s criticisms were analyzed and attacked: Michael Segre reports:

“Yet there were those who tried to turn the clock back, to invalidate Koyré arguments, by irrational criticism. It all started in 1961 when Thomas Settle repeated Galileo’s incline-plane experiment to ridicule Koyré.

“Settle’s description of the repetition of Galileo’s experiment in a nice short article is among the most quoted in Galilean studies. It concluded, in contradiction to Koyré, that the experiment could be performed with the means Galileo described. Settle’s experiment, however, neither refuted nor claimed to refute Koyré’s general methodological argument that since all experiments are premeditated [to get specific results], whether or not Galileo performed some experiments is not important.

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21 Robert K. Logan, The Poetry of Physics and the Physics of Poetry (Singapore et al., 2010), p. 51
“Settle’s interesting result, however, was twisted by several later empirically oriented works. Typical of these is Stillman Drake’s complaint, in his classic and outstanding article on Galileo’s experimental confirmation of horizontal inertia [wherein Drake states]: ‘Koyré’s paper was reprinted years later in book form without so much as a note by the editors concerning Settle’s refutation of his thesis.’

“In his article Drake attempted to reconstruct Galileo’s inclined-plane experiment on the basis of unpublished manuscripts . . . Let me here only quote Jürgen Teichmann, a scholar who had the perseverance to follow it [the inclined-plane debate] throughout and study its results. His conclusion was that these as a whole strengthen the Galileo myth.”

[Segre defines this as] “The myth of Galileo’s empiricism.”22

In this sense, Galileo’s experiments were like those of Einstein, in part, because he understood the answers prior to supposedly performing them. Peter Dear explains:

“Galileo’s work on falling bodies has long stood as a classic case of early-modern physical science, but its character has been contested ever since Alexandre Koyré’s Etudes galiléennes of 1939. Against the then prevailing view of Galileo as a great experimentalist, Koyré . . . portray[ed] him as a metaphysician. According to Koyré, Galileo did not perform the experiments that he described in his published writings. Nowadays, however, there is general agreement [but not proof] that Galileo did indeed develop his ideas with physical apparatus (although according to what precise relationship is not clear). Nonetheless, Galileo undoubtedly [like Einstein] included a considerable number of ‘thought experiments’ in his work, wherein the outcome of a contrived trial was [actually] deduced from more general considerations typically not themselves relying on a deliberate test.”23

In basic terms, Koyré was right. The foundational experiments upon which gravitational law was constructed was not confirmed by Galileo’s experiments. In later times, however, these were carried out with greater precision and are assumed to be basic scientific truth. However, even though they were carried out, one aspect of science was not applied to them until the 20th century, namely, pendulum experiments that were electrically charged. If, as Velikovsky maintains, electromagnetic force plays a role in celestial mechanics, as much of the above discussion indicates, then pendulum and other electrified motion experiments should give different results than pure gravitation. If charged pendulums move differently than uncharged ones, that would be a direct contradiction to the underlying concepts developed by Newton and Einstein’s theories, and show that electromagnetism must be incorporated into celestial mechanics. Surprisingly, such experimental works had been carried out and were well-known even before Velikovsky wrote, but none of his critics discussed these, nor did Velikovsky’s early proponents.

Up to this point, these physical experiments have rarely been discussed and their implications for Newtonian/Einsteinian theory have been generally ignored by the scientific establishment because they open a whole can of worms respecting gravitational theory. But this aspect of Velikovsky’s theory is crucial. Galileo, in analyzing the new concept of motion, had been investigating, and used inclined-planes and pendulum experiments to explain the mechanics

of motion. In like manner, charged pendulum experiments become crucial in any experimental evaluation of Velikovsky’s hypothesis. Thomas Kuhn maintains that “No part of the aim of normal science is to call forth new sorts of phenomena.” “Indeed, those [forms of evidence] that will not fit the box are often not seen at all.”24 Philosopher of science, Paul Feyerabend, more emphatically states, “Whatever fails to fit into the established category system is either viewed as something quite horrifying or, more frequently, it is simply declared to be non-existent.”25 This, I will demonstrate below, is just how scientists have dealt with charged pendulum experiments that indicate electromagnetic forces affect their motions.

Before doing so, because pendulums reflect the orbits of planets, it must follow that they, too, can exhibit chaotic motion. Yuri Baryshev and Pekka Teerikorpi explain:

“How a pendulum connects chaos and fractals.”

“Chaos is not just a question of practical calculation accuracy, but has a much deeper meaning related to fundamental unpredictability of physical systems. Because of the endlessly dense distribution of numbers along the real number axis, there is no ‘accurate’ initial value which could be ascribed to the position or velocity of a particle. Furthermore, along the endless paths toward the unachievable correct initial value, the corresponding end results or calculations may fluctuate strongly, so that there is no convergence toward some definite state. Nevertheless, the chaos is not just a ‘state of confusion’: after all, the evolution of a physical system is ruled by definite laws – a particle in a chaotic system does not ‘feel’ anything mysterious, just the influence of ordinary force [electromagnetism is not considered one of these ordinary forces, as with planets]. Hence, the calculated end results for the system though apparently ‘chaotic’ actually reveal complicated order, fractility. In fact, the words by the physicist, Joseph Ford, on the mystery of chaos, have a definite feeling of fractal [patterns] with them. It is a paradox, hidden inside a puzzle shrouded by an enigma.

“The link between chaos and fractals is difficult to show [physically] without going into mathematical details, but it may be illustrated by a simple toy called a spherical pendulum. The pendulum is hung so that it may swing freely in any direction and has on its end an iron bob [like the iron core at a center of the Earth or of other planets.] Directly below it is a square of four magnets, painted green, red, yellow, and violet. Push the pendulum a little aside and then let it swing. Which magnet will trap the [iron] bob? If the starting point is close to one magnet, then that magnet will catch [and hold] the bob, [away from the others]. However, if the pendulum is released close to the two perpendicular straight lines with the magnets [located] symmetrically in the quadrants, then it is increasingly complicated to predict the final magnet [that will catch and hold the iron bob].

“One may decide to make repeated experiments, noting each time the initial bob position and also the color of the corresponding end state . . . But close to the perpendicular boundary lines there appears quite a complicated mix of [the final] differently coloured areas. A small shift brings you another colour, i.e., if you hold and release the pendulum, its ultimate destination will abruptly change from one

magnet to another . . . In the boundary regions [just as with planets] the outcome of the experiment is virtually unpredictable.\textsuperscript{26}

As with planets, the impossibility of knowing the precise initial conditions makes it impossible to determine whether the final motion of these pendulums will be to one magnet or another. Thus, in terms of strict gravitational theory, knowing the final outcome of a pendulum motion is unknown because the initial conditions cannot be precisely known. Any bit of electrical energy or magnetic energy in the surrounding environment, although unseen or unknown, can cause chaotic change in the pendulum’s motions. The same condition, I maintain, also is significant in the chaotic motions of planets. As Mathis above wrote: “In the 50s, it was discovered that Jupiter was sending out strong radio noises (predicted . . . by Velikovsky), and, more recently, similar noises were found coming from Saturn . . . Beyond that, it has long been known that the Moon strongly affects radio reception, . . . All these signals, noises and effects are direct evidence of electrical perturbations. If the mainstream have ignored them or buried them, that is not proof they do not exist . . .”\textsuperscript{27}

The question, therefore, arises: is there a lunar effect on charged pendulums such that it affects their motions? Thus, we come to the charged pendulum experiments carried out by Edwin Saxl and Mildred Allen that undoubtedly contradict the scientific establishment’s contention that gravity is the only force operating on motion. Because the moon comes between the sun and the Earth during a solar eclipse and covers the sun, it should strongly affect the motion of a charged pendulum at that time. Quite early, it was nevertheless maintained that gravity can pass through an object to reach another or, more to the point, gravity cannot be shielded or interfered with by another body. Scoular explains:

“In 1690, Dutch physicist, Christiaan Huygens, observed that any interposed objects couldn’t screen off gravity: one of the mysteries of gravity is why gravity cannot be screened: in particular, why have no gravity shields been discovered. Independent thinker, Mark McCutcheon, writes:

“Another ongoing mystery surrounding gravity is the idea of a “gravity shield.” After all, by using various materials, we are able to insulate electricity, electric fields, light, radio waves and radio-activity, so why not the gravitational field as well? Since science has never had a clear understanding of gravity, it has been impossible to either conceive of or rule out the possibility of developing some material or device to shield us from gravity.”\textsuperscript{28}

Since gravity cannot be shielded, if it operates with an additional electromagnetic field opposing it, then charged pendulums would be subject to shielding and would move differently when a shield interferes with it. This, we will see, is just what happens when charged pendulums on Earth are subjected to solar and lunar eclipses. The experiments were carried out by Edwin Saxl and Mildred Allen:

“A former student of Albert Einstein published the results of most convincing experiments in the reputable British science magazine, \textit{Nature}, July 11, 1964 (pp. 136-138). The author, Dr. Edwin Saxl, of Harvard, Mass., and a native of Australia, felt justified in making the following statement: - ‘When working as a post-doctoral student of Einstein, we discussed the probability that there were

\textsuperscript{26} Yuri Baryshev, Pekka Teerikorpi, \textit{Discovery of Cosmic Fractals} (Singapore/River Edge, NJ/London 2003), pp. 252-254.

\textsuperscript{27} Mathis, \textit{The Un-Unified Field}, op. cit., p. 289.

\textsuperscript{28} Scoular, \textit{First Philosophy the Theory of Everything}, op. cit., p. 218.
interrelations between electricity, inertial mass and gravitation. These experimental results make me wonder whether they may properly be so interpreted . . .

“Dr. Saxl . . . working quietly in his home laboratory for the past ten years, is well aware that he is making one of the most controversial scientific propositions of the [20th] century. If proven, it would mean a complete revision of current cosmological concepts and [the] fundamental laws [of gravitation].

“His experiments conducted with highly sophisticated and exquisitely sensitive electronic equipment . . . have indicated the presence of electro-gravitic forces – and he is firmly convinced that the equipment is not erroneous. However, partly because Dr. Saxl’s work was privately financed, and not officially authorized or funded, the results aside – by at least some officials, according to information received by this author of this book – . . . [give] the caustic remark ‘Nutty!’

“For the lay reader, a short description of the research results was published by the Boston Sunday Globe, Boston, Mass., June 14, 1964, under the heading “Gravity Not Constant, Einstein Pupil Makes Discovery” . . .

“The report states as follows – ‘A one-time pupil of Albert Einstein has obtained experimental evidence that upsets one of the most firmly established concepts in modern physics . . . He has found that the so-called “gravitational constant” a number heretofore believed to be unchanging – appears to vary under dynamic conditions. At the same time he has found evidence that gravity and electricity, until now believed completely unrelated, do, in fact, interact. If his experiments are confirmed, it will mean rewriting the books from start to finish. In sum, it will be one of the most important scientific discoveries in history, on par with Newton’s laws of gravity and Einstein’s theories of relativity, adding a completely new dimension to both their concepts of the universe’ . . . ‘This is the first time’ concluded the paper, ‘gravitation and electricity have been connected experimentally, and if the evidence could be confirmed, its scientific import would be staggering.’

“‘It would make possible, finally, a completely unified picture of the Universe,’ states Dr. Saxl flatly . . .

“Over the years, certain exceptions to Newton’s Laws of Gravitation have been found which were largely resolved and accounted for in Einstein’s relativistic concepts . . . But now Dr. Saxl’s experiments – undertaken under unique conditions – suggest something completely different . . .

“By introducing the concept of dynamic interaction between electricity and gravity, we come upon a new and breathtaking view, which could explain a great deal! In essence, what Dr. Saxl did is this: instead of testing the gravitational constant in a motionless system, he set about to study it under dynamic conditions. He built a system which permitted a huge ceramic disc to rotate from a solid suspension, specifically designed and constructed to prevent vibration or any outside interference. Then he found a way of regenerating the rotation of the ‘pendulum’ electrically under exceedingly precise control. Finally, using a light beam and photo-electric cell, he succeeded in measuring the time it took the pendulum to swing over a certain arc with the accuracy of one part in 10 million!”
“Putting his system to work in the middle of the night to avoid as much disturbance as possible to his incredibly sensitive instruments, he determined whether a pendulum, given precisely the same starting impulse every time, would take exactly the same amount of time to swing over its arc. Since the mass of the pendulum does not change, the swing of the pendulum should be strictly a function of gravity, and according to Newton’s laws, should not change. But Saxl found it does!

“Groping for the answer to the variations he obtained in the gravitational force as reflected in the movement of the pendulum, he decided to see what would happen if the pendulum were charged with electricity. In his own words, ‘All hell broke loose!’ Specifically, he found that when the pendulum was charged positively, it takes longer to swing through its arc than when charged negatively!

“Extensive additional experiments with his instruments indicated that there was a definite relation between gravity and electricity, an association which had never before been made. This means, since the mass of the pendulum does not change, that the electricity must be interacting in some manner with the ‘force of gravitation’ to influence the length of the swings.

“In [cosmic] space we know there are billions of electron volts and we’re dealing with masses of fantastic magnitude,’ observed by Dr. Saxl. ‘If my little pendulum moving over tiny distances and with such modest voltages shows a distinct electro-gravitic effect, what forces maybe operating in space where the parameters are multiplied infinitely in both electric charge and mass?’

“Likewise in atomic structure, electro-gravitic forces may be playing a crucial role. Specifically, the apparent enormous concentrated mass of the nucleus may well be much smaller than now calculated, as a result of electro-gravitic interaction [at the sub-atomic scale]. This would be an entirely satisfactory explanation [of the atomic weak force which keeps the electrons in their orbits and] for why they do not collapse [into the nucleus].

“Dr. Saxl concluded that one possibility is that the Universe is permeated by ‘electro-gravitic force fields,’ which influence the speed of light traveling millions and millions of light years through space and produces a red shift. Thus, the universe may only appear to be expanding – though in reality it is not . . .

“Dr. Saxl’s experiments continue to shake the foundations of contemporary dogma so his fellow scientists look tactfully the other way pretending they do not exist.”

What is also important is that Saxl and his associate Mildred Allen found that their torsion pendulum reacted differently during the seasons of the year. This is just what exists with the tides, as pointed out by James Pearson and John William Lubbock:

“Moreover the heights of spring tides vary considerably at different seasons of the year. They are at maximum, i.e., the tides are highest, at the equinoxes, in March and September, when the sun is near the equator, and the moon crosses the equator at full [moon] . . . They are at minimum, i.e., the tides are lowest in June and December, when the sun is farthest from the equator and the moon at full.”

It may be argued that this only proves gravity is the cause of the tides, but as we have already pointed out above, application of gravitational theory in terms of mathematics and physics fails to explain tides. Thus, there must be something else that was affecting Saxl’s torsion pendulum other than gravity. The most unusual and significant behavior was that the pendulum suddenly changed its direction of swing during solar and lunar eclipses. Furthermore, this behavior was also reinforced and demonstrated by pendulum experiments carried out by Maurice Allais as reported by David J. Darling. In 1954, Allais:

“... decided to do a series of experiments involving a special kind of pendulum over a thirty day period to investigate a possible link between magnetism and gravitation. What he found was stranger and more unexpected.

“Allais used a Foucault pendulum which, in its original guise, is just a big weight on the end of a long wire suspended from a rotating hinge ... This type of pendulum provides a remarkable demonstration of something that happens all the time under our feet. The plane of its swing seems to change slowly and continuously, so that it completes one whole rotation every twenty-four hours. In fact, this motion is an illusion. The truth of the matter is that the plane of the swing remains constant in space while the entire Earth spins beneath it.”

As with Saxl and Allen’s pendulum, Allais’ Foucault type pendulum showed the same response to solar and lunar eclipses thus confirming their work:

“Allais used what’s called a paraconical pendulum – a short rigid version of the more familiar Foucault design. His month-long study in the summer of 1954 was a marathon of patience and endurance. Every fourteen minutes at his Paris laboratory deep underground [to avoid the Earth’s surface electric field], the pendulum was released and the direction of rotation [in degrees] measured without missing a datum point. By a stroke of good fortune part of the experiment took place during a total solar eclipse. On June 30 [1954] the moon began to pass in front of the sun ... As the edge of the shadow reached northern France, a very peculiar thing happened in Allais’ lab. At the onset of the eclipse, the pendulum’s direction of swing suddenly started to rotate backward – the swing plane lurching by a colossal 13.5 degrees. Normally a Foucault pendulum shifts its angular plane by a modest 0.9 degrees per minute. For the entire duration of the eclipse, however, Allais’ pendulum remained more than 13 degrees out of kilter. It was as if the pendulum had somehow been influenced by the alignment of the Earth, the moon and the sun. But how, wondered Allais, could that possibly be? [When the eclipse passed the pendulum returned to its normal direction of swing, as if gravity had resumed control of it.]

“Five years later, on October 22, 1959, Allais repeated his experiment during a partial solar eclipse and again watched as the pendulum swung wildly. This time the results caught the attention of the great rocket pioneer, Werner Von Braun, who urged that Allais publish his findings in English. Allais did so, in the journal Aero Space Engineering, noting ‘anomalies in the movement of the ... pendulum’ and ‘a remarkable disturbance’ during the time when the Earth, the moon and the sun lay in a line. Allais commented that the effect ‘cannot be considered as due to the disturbances of an aleatory order [chance]. Neither can it be considered as

produced by an indirect influence of known factors (temperature, pressure, magnetism, etc.). If the phenomenon was real, its cause was much more out of the ordinary.

“Perhaps not surprisingly, the Allais effect, as it has become known, was either ignored by the scientific community – as troublesome anomalies often are – or put down to experimental error. But Allais was a meticulous researcher; his experiments were well thought out, and he repeated his measurements during two solar eclipses. What’s more, his findings have been supported by others, including in 1961, three researchers in Romania [who observed these same erratic behaviors of their pendulums during eclipses] who were completely unaware at the time of Allais’ discovery.”

Significantly, there was another – diurnal periodic motion exhibited by Allais’ pendulum – a 24-hour 50-minute periodic variation. As Allais specifically stated: “These periodic components cannot be computed from the double principle of inertia and universal [gravitational] attraction, for those are approximately one hundred million times smaller.” Saxl and Allen found a similar effect on their pendulum two weeks after the eclipse when the moon was on the anti-solar side of the Earth. The gravitational effect of the moon in their pendulum’s motion was calculated to be 100,000 times too weak to produce such a result.

This brings us back to the tides. The tides also follow a period of one day and 50 minutes and are, as shown below, inexplicable in terms of gravitational law. Yet Allais’ pendulum showed an identical one-day 50-minute periodicity completely in alignment with the tides and he said “Indeed, such a periodic lunisolar effect is quite inexplicable within the framework of the currently accepted theories.” In essence, Allais’ pendulum was keeping track with the cycle of tides. This connection, of course, was far too disturbing for dyed-in-the-wool proponents of gravitational theory to accept. In effect, they had, as Irving Michelson above told us, a tidal theory that was “no theory at all,” and here, with the Allais pendulum experiments, they had a periodic motion of one-day, 50-minute motion, “inexplicable within the framework of currently accepted [gravitational] theories” that correlated with the tidal period. Rather than see or even admit this connection, the scientific community just shut its eyes and mind to his evidence.

Now, one of the problems I discussed above was the problem of why the Earth-moon system does not gradually fall toward the sun, as outlined above by Miles Mathis. I maintained that when the moon was on the solar side of the Earth, it partially blocked the sun’s repelling electromagnetic field. During the solar eclipse, this blockage is even stronger and, therefore, Allais’ pendulum, at the onset of the solar eclipse, felt an effect “one hundred million times” stronger that caused it to rotate backward by 13.5 degrees of arc until the eclipse passed. On the other hand, when the moon was on the anti-solar side of the Earth, Saxl and Allen’s pendulum exhibited a motion that was 100,000 times stronger than gravity. Clearly, there is an electromagnetic correlation between the alignments of the sun, moon and Earth that effects the Earth-moon system and keeps it from falling toward the sun correlated with the behavior of Saxl and Allen and that of Allais’ pendulums. These correlations cannot be fortuitous. Both the season effects on pendulums and the tidal-day, 50-minute period and the

alignment of the sun, moon and Earth, show up in the motions of pendulum experiments that cannot be explained in any manner whatsoever by strict gravitational theory. To recognize this evidence requires a complete rethinking and revamping of celestial mechanics that Feyerabend told us above would be too horrible to accept or, as Mathis told us, the critics of Velikovsky would rather gouge out their eyes than accept these facts.

Nevertheless, the most important experiments that show electromagnetism can create a field that actually creates motion in a body at rest was carried out by Thomas Townsend Brown. He induced motion in a kind of pendulum that was at rest that began to rotate when electricity was applied to the bobs, and strikingly the more electricity that was applied caused the hanging bobs to rotate faster, something impossible to explain via Newtonian theory or that of Albert Einstein. Paul A. LaViolette reports:

“An electrogravitic field . . . was discovered in the mid 1920s by physicist Thomas Townsend Brown and later came to be known as the Biefield-Brown Effect.

“Coupling between electrostatic and gravitational fields is predicted neither by general relativity, nor by conventional [Newtonian] field theory. In fact, Brown’s pioneering 1929 paper that first reported the discovery of electrogravity was turned down by Physical Review because of its conflict with general relativity. Because of the challenge it had posed to conventional theory, much of the research on electrogravitics has pressed forward, not in academic laboratories, and in private firms and in [governmental] classified programs outside of public awareness. Let us now briefly review some of Brown’s experimental work that this gravity control technique has been under secret development since the 1950s [when Velikovsky wrote].

“By 1952, T.T. Brown had constructed two light-weight discs capable of demonstrating how the electrogravitic principle might be applied to aviation. Each consisted of two 1-1/2 foot diameter aluminum saucers cupped on either side of a circular sheet of plexiglass. These airfoils were suspended by tethers from opposite ends of a horizontal beam able to rotate about a vertical pole . . . Electric power was fed the discs through wires attached to their edges. A wire rim at the leading edge of each disc was charged to a positive potential and the saucer body and a trailing wire were charged to a negative potential. When electrified with 50,000 volts, the saucers propelled themselves forward around their maypole at speeds of up to 12 miles per hour consuming just 50 watts of power [see figure 3 below].

“The electric potential would ionize the surrounding arc forming a cloud of positive ions around the leading wire and a cloud of negative ions around the trailing wire . . . According to subquantum kinetics, the positive cloud would form a gravity potential hill inside the disc. As increasing voltage was applied to the disc, the ion clouds would accumulate progressively higher space charges. As a result, the potential hill and well they would generate would become increasingly disparate and the gravity gradient between them increasingly steep, thereby introducing an increasingly strong gravity force on the disc in the negative to positive direction. The disc would behave as if it were being tugged forward by a heavy mass positioned beyond its positive pole.”

The concept that this presents is that the electrification of the air in the apparatus became ionized and that these different positive and negative clouds created a magnetic force that was responsible for the motion of the two discs in a circular motion. Nothing could be farther from the truth of the process that Brown’s apparatus exhibited.

LaViolette goes on to show:

“Brown similarly believed that the applied electric field induced a gravity gradient from the front to the back of the discs. Dr. Mason Rose, one of his collaborators, described their principle of operation as follows:

“The saucers made by Brown had no propellers, no jets, no moving parts at all. They create a modification of the gravitational field around them which is analogous to putting them on the incline of a hill. They act like a surfboard on a wave . . . The electrogravitic saucer creates its own ‘hill’ with it in any chosen direction . . .”

This interpretation was not acceptable and thereafter a Mr. Cady, of the Office of Naval Research, erroneously reported that the discs were nevertheless moved by the generated ion wind fields and not by gravity, hence the electricity did not alter gravity. However, Brown later went to Paris and conducted the experiment in a vacuum chamber stronger than the vacuum of space.

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38 *Ibid.*, p. 246
According to Jeane Manning, Brown then claimed “The experiment in Paris proved that the anomalous motion of my disc airfoils was not all caused by ion wind . . .”39 More than that, “This force occurred in the same fashion even when the capacitor was immersed in a tank of oil, thereby ruling out the possibility that the effect was produced by a wind of electric ions.”40 La Violette elaborates on this question thus:

“The earlier misconceptions that Brown’s discs were powered by an ion wind was finally cleared up toward the end of 1955. During laboratory experiments conducted in Paris under the auspices of a French aeronautical corporation, Brown was able to observe how his devices performed under vacuum conditions. He attached two aluminium plate gravitators to each end of a rotor arm so that their combined thrust would rotate the assembly somewhat like a fireworks pinwheel. He placed this device inside a vacuum chamber and brought the air pressure down to less than one billionth of an atmosphere. This dropped the ion wind contribution to a negligibly small value. But rather than slowing down, as skeptics expected [because there were far fewer air particles that could become ionized], his rotor sped up [suggesting that the air had acted to impede the motion of the discs]. His gravitor apparently operated far more efficiently in a vacuum. In fact, when he increased the voltage to 150 kilovolts, the rotor’s speed began to increase unchecked, reaching such a high rate of rotation that they had to reduce the voltage to keep the rotor from flying apart.

“Brown carried out additional vacuum chamber tests between 1957 and 1958 at the Bahnson Laboratories in Winston-Salem, North Carolina, and in 1959, at the General Electric Space Center at King of Prussia, Pennsylvania. Like the Paris experiments, these subsequent tests clearly demonstrated that Brown’s electrogravitic devices operated on an entirely new physics principle. Aviation Studies was apparently fully convinced of this as early as 1956, since the report states:

“‘Electrogravitics might be described as a synthesis of electrostatic energy used for propulsion . . . and gravitics . . . in which energy is also used to set up a local gravitational force independent of the Earth’s.

“The electrogravitics saucer can perform the function of a classic lifting surface – produces a pushing effect on the under surface and a suction effect on the upper surface, but unlike the airfoil [of an airplane], it does not require a flow of air to produce the effect.’

“A report entitled Electrohydrodynamics issued in March 1960 by Whitehall-Rand of Meadville, Pennsylvania gives additional details of Brown’s vacuum tests. It mentions that the electrogravitic thrust remained constant as the chamber was evacuated [of air], thereby providing further proof that the electrogravitic effect was not due to an ion wind.”41

What is also interesting is that like the pendulums of Saxl and Allais, there were periodic variations in the electrogravitic force that are tied directly to the positions of the Earth,

41 LaViolette, Subquantum Kinetics . . . op. cit., pp. 254-255.
Moon and the Sun: that is, the motion of Brown’s apparatus was reacting to these bodies’ celestial positions.

“Brown kept a sharp eye on the daily operation of his electrogravitic motor. In the course of his studies, he found that the rate of rotation of his motor was not constant, it varied depending on the time of day. Further observation revealed that its torque rose and fell according to the lunar and solar cycles. He observed similar cyclic influences in his gravitator pendulum experiments in which the total duration of the pendulum’s developed impose was seen to vary with cosmic conditions, such as the pendulum’s alignment with the Sun and moon at times of conjunction or opposition. Ruling out factors such as changes in temperature and supplied voltage, he concluded that the impulse was governed solely by the condition of the ambient field potential. He found that any number of different kinds of gravitators, operating simultaneously at very different voltages, revealed the same impulse duration at any given instant and underwent equal variations over extended periods of time.”

In every respect, the experiments of Saxl, Allais and Brown showed that there was a direct relationship between the motions of their apparatus and the celestial positions of the Earth, Moon and Sun. Each experiment correlated with the apparatus of the other experiment and all showed a correlation with the positions of the Earth, Moon and Sun. Since celestial space is a powerful vacuum, it becomes evident that the behavior of Brown’s experiments is related to the same conditions that exist in celestial space.

The point that must be stressed is that none of these phenomena are explained by the laws of gravity. Brown’s gravitators, in reality, violated these long established laws:

“He [Brown] described his belief that electrogravitic force operates relative to a unique reference frame that challenges special relativity’s notion that a force should operate in the same manner relative to any frame of reference. Moreover, he suggested that this force is reactionless when producing its forward thrust – that is, it produces its forward thrust without any back-directed recoil. He is, in effect, suggesting that it violates Newton’s third law of motion – that every action should produce an equal and opposite reaction. Dr. Patrick Cornille, who repeated Brown’s high-voltage pendulum experiment, said that Newton’s third law of motion was indeed violated.

“In 1930, one of Brown’s colleagues wrote about the gravitator to Colonel Edward Deeds, who was one of Brown’s long time acquaintances. In his letter he wrote, ‘I had had a number of scientists view the gravitator and they have all been absolutely amazed at is action, frankly stating that, whereas they see the results and the movements of the gravitator, it is absolutely unexplainable by any laws of physics that they know.”

Thus, there is unambiguous physical experimental evidence that shows that electricity affects motion and therefore affects gravity as well, just as Velikovsky claimed. These experiments have, in effect, overturned the theories of both Newton and Einstein, in much the way that Galileo experiments overturned Aristotelian physics. Furthermore, they lay the foundation for a new concept of physics and imply a new cosmology that must take electricity into account.

As reported by Richard Milton about the flight of the Wright brothers:

43 Ibid., pp. 9-10.
“Experts were so convinced, on purely scientific grounds, that powered heavier-than-air-flight was impossible, that they rejected the evidence without troubling to examine the evidence. It was not until President Theodore Roosevelt ordered public trials at Fort Myers in 1908 that the Wrights were able to prove conclusively their claim and the Army and scientific press were compelled to accept their flying machine was a reality . . .

“Professor of Mathematics and Astronomy at Johns Hopkins University, Simon Newcomb, had published an article in The Independent, which showed scientifically that powered human flight was ‘utterly impossible.’ Powered flight, Newcomb believed, would require the discovery of some new unexpected force in nature. Only a year earlier, Rear Admiral, George Melville, chief engineer of the U. S. Navy, wrote in the North American Review, that attempting to fly was ‘absurd’. It was armed with such eminent testimonials as these that Scientific American and the New York Herald scoffed at the Wrights as a pair of hucksters . . .

“What is also surprising is that local newspapers in their home town of Dayton, Ohio should have steadfastly ignored the Wrights . . . the brothers use[d] a large tract of farmland . . . for their flying experiments . . . [where] hundreds of people actually saw the Wrights airborne in their flying machine . . .

“Many of these bewildered witnesses visited or wrote to the local newspaper to ask who were the young men that were regularly flying . . . and why nothing had appeared about them. Eventually the enquiries became so frequent that the papers complained of their becoming a nuisance, but still their editors showed no interest in the story, sending neither a reporter nor photographer.

“In 1940, Dan Kumler, the city editor of the Dayton Daily News at the time of the flights, gave an interview about his refusal to publish anything . . . and spoke about his reasons. Kumler recalled, ‘we just frankly didn’t believe it. Of course, you remember that the Wrights, at that time, were terribly secretive.’

“The interviewer responded incredulously, ‘You mean they were secretive about the fact that they were flying over an open field? Kumler considered the question, grinned and said, I guess the truth is that we were just dumb,’ . . .

“The owner of the Dayton Daily News, James Cox, also admitted that ‘none of us believed the reports. [So did] the managing editor of the Dayton Journal, Luther Beard . . .’

“Scientific American . . . ridiculed the ‘alleged’ flights that the Wrights claimed to have made . . . The magazine gave as its main reason for not believing the Wrights the fact that the American press had failed to write anything about them . . .

“One way of explaining this odd reluctance to come to terms with news, even when there is plenty of concrete evidence available, is to appeal to the natural human tendency not to believe things impossible unless we see them with our own eyes [which may still fail to acknowledge them] . . . But there is a good deal more to this phenomenon than healthy skepticism. It is a refusal to open our eyes [and minds] to examine evidence that is plainly in view.”

That, I submit, is exactly what we have here with the experimental evidence presented above. Neither the scientists, academics nor editors and reporters of the mass media can acknowledge nor see how this experimental evidence deeply contradicts their gravity only belief system.

David L. Hull points out how scientists actually behave when confronted by scientific test results that contradict their theories. “What scientists actually do is . . . relevant to an activity counting as being genuinely scientific. A theory or proposition may be testable . . . [but] if those who hold a particular [scientific] view refuse to acknowledge the results of these tests, then, in principle, testability is of little [or no] consequence to the ongoing process of science.”

That, unfortunately, is a problem endemic when discussing Velikovsky’s theory that electromagnetism plays a role, in celestial mechanics and cosmology. The scientific establishments have refuse[d] to acknowledge the results of these tests [experiments], conducted by the scientists cited above. I would go further and suggest that when scientists refuse to acknowledge published experiments in peer reviewed journals that contradict their theories, they are actually engaging in pseudoscience. Their pseudoscientific behavior is the willful failure to face or acknowledge scientific evidence. This is especially true when there are so many experiments that all say the same thing and, as with Whewell’s “consilience of inductance,” to be discussed below, where different forms of evidence all jump together. Of course, they cannot admit to themselves that they are inventing fix-it-up hypotheses to “save the appearances,” that is, make contradictions fit their theory. Like a battered woman who claims she says in her marriage with an abusive husband because he loves her, sheer delusion and destructiveness is what is operating here.

In time, further historians and philosophers of science, I believe, will rave in approval about these very same issues, when the reigning Newtonian/Einsteinian paradigm is ultimately overthrown or may even present historical falsehoods to deny the evidence that clearly correlates, corroborates and is congruent with Velikovsky’s concept that electromagnetism is a real force in celestial mechanics.

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CHAPTER 3: SOLAR SYSTEM INSTABILITY

“Harmony or stability in celestial and terrestrial spheres is the point of departure of the present day concept of the world as expressed in the celestial mechanics of Newton and the theory of evolution of Darwin. If these two men of science are sacrosanct, this book is a heresy.”

Immanuel Velikovsky
_Worlds in Collision_ (NY 1950),
Preface, p. 11

The great emotional antipathy by nearly the entire scientific community, except for a few exceptional scientific personalities, who while disagreeing with Velikovsky, felt his case was strong enough, was also possible in terms of celestial mechanics, namely, Albert Einstein and Lloyd Motz. Velikovsky’s claim was that the solar system in relatively recent times was unstable. Velikovsky claimed that Venus was a newborn planet that had close approaches to the Earth and a later one with Mars while on its elliptical orbit. Venus’ close interaction with Mars, which was on an orbit closer to the Sun than Earth, dislodged Mars from its orbit which then had a number of close interactions with the Earth before it did, as did Venus settled down to a new comparatively circular orbit. This thesis was, in the words of astronomer Harlow Shapley, of Harvard, a descent into the “black arts.” This was, therefore, the supreme affront to scientific truth. Shapley and the rest of the scientific community knew the solar system had been almost eternally stable for at least four billion years or more. This, of course, was based on the mathematically precise formulations of celestial mechanics developed by Newton and those giants who followed him. To all these scientists up to the present day, the concept of solar system stability, the concept that the planets have always been in their present orbits for billions of years, was and still is the keystone in the arch of solar system celestial mechanics. If Velikovsky’s hypothesis removed that keystone from that arch theoretical concept, and if he was right, the entire edifice of celestial mechanics enshrined by Newton and Einstein would come down. Its fall was beyond possibility and, therefore, unthinkable, and still is.

While Newton could not prove or disprove solar system stability, it was his follower, Simon Laplace, who laid the foundations for that proof. To do this, Laplace attempted to prove mathematically that Newtonian theory explained the stability of the orbits of Jupiter and Saturn. It was held that Jupiter and Saturn’s massive gravitational fields were pulling them closer together, but then, for some reason, this action was reversed and Jupiter somehow caused Saturn to move farther away. It was, therefore, assumed that gravity could, for a time, bring Jupiter and Saturn to lower orbits and then to higher ones. If this was true, it was obvious to Laplace, if his equations were correct, that this would apply to the rest of the planets and prove the solar system had always been stable.

This, at least, is the scientific history that has been handed down to us. Nevertheless, Miles Mathis has reexamined this historical evidence and has come to a disturbing conclusion, namely, that Laplace never proved the stability of the Jupiter-Saturn system by employing
equations of gravity – that is, he never actually used gravitational theory to solve the problem he had undertaken. Instead, according to Mathis, he proved his case with mathematics based on non-gravitational processes. Jacques Laskar, one of the great authorities in the field of solar system chaotic motion and stability at the Bureau de Longitudes in Paris, France, tells us:

“In 1687, Newton announced the law of universal gravitation. By restricting this law, the interactions with the Sun alone, one obtains Kepler’s [three laws of planetary] phenomenology. But Newton’s law applies to all interactions [not only planets with the Sun but also with other planets]: Jupiter is attracted by the Sun, as is Saturn, but Jupiter and Saturn [also] attract each other. There is no reason to assume that the planets’ orbits are fixed in invariant ellipses . . .

“In Newton’s view, the perturbations [gravitational interactions] among the planets [with one another] were strong enough to destroy the stability of the solar system and [God’s] divine intervention was required from time to time to restore planet’s orbits to their [proper] place . . .

“The problem of solar system stability was a real one, since after Kepler. [Edmund] Halley was able to show, by analyzing the Chaldean observations transmitted by Ptolemy, that Saturn was moving away from the Sun while Jupiter was moving closer. By crudely extrapolating [through time] these observations one finds that six million years ago Jupiter and Saturn were at the same distance from the Sun [as today]. In the 18th century, Laplace took up one of these observations which he dated [to] March 1st 228 BC: At 4:23am, mean Paris time, Saturn was observed ‘two fingers’ under [the star] Gamma in [the constellation] Virgo. Starting from contemporary observation, Laplace hoped to calculate backward in time, using Newton’s equations, to arrive at this 2000 year-old observation [of the positions of Jupiter and Saturn and their distance from each other].

“The variations of planetary orbits were such that in order to predict the planets’ position in the sky, de LaLande required artificial ‘secular’ terms in his ephemeris tables [of these planets]. [But] could these [artificial secular terms] be accounted for by Newton’s Law?

“The problem remained open until the end of the 18th century, when Lagrange and Laplace correctly formulated the equations of motion . . . Lagrange wrote the differential equations, that govern the variations in the elliptic motion under the effect of perturbations by the other planets . . .

“This result [however] seemed to contradict Ptolemy’s observations from antiquity, but by examining the periodic perturbations between Saturn and Jupiter, Laplace discovered a quasi-resonant term (2λ Jupiter - 5λ Saturn) in their longitude . . .

“Laplace then calculated other periodic terms and established a theory of motion for Jupiter and Saturn in very good agreement with 18th century observations. Above all, using the same theory, he was able to account for Ptolemy’s observations to within one minute of arc, without additional terms in his calculations. He thus showed that Newton’s law was, in itself, sufficient to explain the movement of the planets throughout known history.”

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Here, then, is the form of mathematics Laplace used to derive his supposed proof of stability for orbits of Jupiter and Saturn:

“Laplace showed that the planets’ semi-major axes undergo only small oscillations and do not have secular terms [to use to prove stability]. At the same time, the eccentricity and inclinations of planets’ trajectories are also [according to Laplace] very important for solar system stability. If the planet’s eccentricity changes appreciably, its orbit might cut through another planet’s orbit, increasing the chances of a close encounter which could eject it from the solar system.

“Laplace revisited his calculations, taking into account only terms of first order in the perturbation series, and showed that the system of equations describing the mean motions of eccentricity and inclination may be reduced to a system of linear differential equations with constant coefficients. He also showed, using the conservation of the angular momentum, that the solutions of this system were quasiperiodic [that is, the motion and positions of planets repeat over time.] . . . [and that] The variations in eccentricities of the orbits are, therefore, subject to only small variations about their mean values.”

Notice, Laplace worked with the curved shapes of Jupiter and Saturn’s ellipses, their velocities and the inclinations of these planets to the plane of the Sun, the ecliptic. Laplace did not deal with the masses of these planets and their distances from one another, which is what gravitational theory requires be used to explain celestial mechanics. That is, Laplace bypassed Newtonian theory of masses and distances to solve the problem via elliptical curves, velocities and inclinations. Mathis, who brought all this to my attention, addressed this mathematical fudging by Laplace:

“What was required was for mathematicians to match the equations [of gravitational theory] to the data. Euler and Lagrange had made some headway on the problem, but it was far from solved when Laplace tackled it in 1776. His first assays were not fruitful . . . At any rate, he soon gave up on [Newtonian] mechanics and returned to a strictly heuristic and mathematical solution. That is, he did not consider the causes of the forces, he considered only their sizes. He wanted to match the math straight to the data in the modern way . . .

“Euler had at first considered only the mean elongation – the straight-line distance between the planets and the Sun. If gravity, as a straight pulling force, were the only mechanism in celestial mechanics, this should have gotten the right answer, which is precisely why these great mathematicians were stumped for so long and why Laplace [at his first attempt] was looking at an ether [solution] 30 years after Euler’s failure. Newton’s equations don’t use or support [the existence of] an ether, but the equations and theory of Newton weren’t matched by the data, so Laplace was a bit desperate. Euler next tried factoring in the eccentricities [orbital curves], but using Newton’s theory, these should not make any difference. The shape of the orbit [contrary to what Laskar claimed above] should not matter in Newton’s equations, since it is [only] the distance between the objects that determines all the forces. So Lagrange and Laplace began to look at secular equations, or, in other words, at the magnitude of the remaining [gravitational] inequities [left over when gravitational theory was applied to this problem]. Again, these should not make any difference, if Newton’s theory was correct. In fact, using

\[ \text{Ibid., pp. 54 ff.} \]
Newton’s equations should not provide us with any inequalities, since inequalities are defined as irregularities in the orbit beyond the straight [line] gravitational pulls. But Newton does not allow for this. The only way to mechanically account for these inequalities, using straight pulling forces is to assign them to still more bodies [beyond Jupiter and Saturn] like Uranus or Neptune [which are too small in terms of mass and too far away to significantly perturb Jupiter and Saturn].”

If only gravity was affecting the motions of Jupiter and Saturn, or neither Uranus nor Neptune were responsible, why was there gravitational energy, that is, inequalities left over once Newtonian theory was applied? Either there was some other near enough and massive enough body to create this inequality, or, in terms of the earlier chapter, there was another force that was operating in the solar system to push Saturn away from Jupiter, and Jupiter away from Saturn. Presently, the solution is to rely entirely on the resonance of the orbits – five Jupiter orbits are equal to two for Saturn. However, Mathis shows:

“The Modern argument is circular: a resonance is just a number relation, a mathematical outcome, and cannot be a cause of anything. The modern argument claims the resonance is caused by gravity and that the great inequality is caused by the resonance. That is not a logical line of cause. That is like saying that Jan gave birth to Bob and Jan [also] gave birth to Jim, and [hence] that Jim is the cause of Bob.”

In gravitational terms, the Sun’s gravity causes Jupiter to have an orbit of almost 12 years and Saturn to have an orbit of about 29.5 years, therefore Jupiter is not responsible for Saturn’s 29.5 year orbit and Saturn is not responsible for Jupiter’s almost 12 year orbit. The Sun is responsible for this and it is a fortuitous relationship – resonance. Jupiter did not create the resonance nor did Saturn.

Since there existed these large inequalities between what Newtonian theory required – no inequalities – Laplace had to make his mathematics explain away this margin. To do so, Laplace turned away from Newton and introduced other orbital elements for Jupiter and Saturn to remove the inequality. According to Mathis:

“Laplace’s solution is a clear fudge, because the forces between the objects, if caused by Newton’s gravity can only be a function of the distances between them. The eccentricities, inclinations and mean motions [he used] cannot have anything to do with it, much less the third and fourth power of these numbers. Laplace, like so many others, uses the calculus as a trick to allow him these higher terms, by expanding things that aren’t really expandable. What I mean is, Laplace doesn’t need to look at the equations for the orbits themselves. He doesn’t need to concern himself with curves, neither circles nor ellipses. He only needs to know the distances between his three objects [the Sun, Jupiter and Saturn], which are straight-line distances. Then he can integrate these over time. This is why Euler’s first solution [which used this form of mathematical solution] should have gotten the right answer. But by looking at curves, Laplace is able to expand the equations into an infinite series, using tricks based on Newton’s own binomial expansion [think power series]. Any curve equation can be expanded into an infinite series like this, because a curve is based on powers above 1...
“Laplace interprets these higher orders as inequalities, but they are [in reality only] terms of expansion. You cannot treat terms in the series separately, as if they have some life of their own. Specifically, you cannot assign them to unknown perturbations [between Jupiter and Saturn] or to your margins of error . . .

“This is of paramount and fundamental importance, because although Laplace may be able to match data by manipulating these terms over longer periods, in doing so he is obscuring the mechanical cause of the perturbations. Not only is he not able to show the mechanics underneath, his math acts as a heavy blanket, keeping future physicists and mathematicians from questioning what his math tells us about the field it is representing . . .

“Let me clarify the previous paragraphs. Laplace’s first trick is to completely ditch Newton’s own equations and theory. Laplace doesn’t use Newton’s equations or Kepler’s either. Why should he, since they are known to fail? No, he makes up his own equations based upon the observations themselves . . .

“If this data doesn’t fit Newton’s theory (and it doesn’t), then Laplace will have directly bypassed the theory at this point. From the very first step, Laplace has detached his math from Newton, attaching it instead to the data.”

Here, Mathis drives the nail home:

“You will say, fine, good for him. As scientists we are interested in the data first and foremost. Yes, . . . but if you have to bypass the theory on your first step, you cannot later claim to have confirmed the theory, can you? If the real observations were in strict agreement with Newton . . . Euler would have had no trouble finding a solution . . . Laplace finds a way to solve the equations by discovering the finer resonances they contain, but because his initial equations were taken from the [non-gravitational] data, he cannot at the end claim to have discovered a solution that completely confirms Newton or that proves the stability of the solar system. In fact, he has done precisely the opposite. He has proved that the three-body problem can be solved only by going well beyond Newton’s math, and postulates and theory.

“My critics will say, ‘What do you mean he attached the equations to the data? Didn’t he just create equations to contain the data, like anyone else would?’ No, look at his equations. All you have is accelerations and directional cosines. You don’t have any representation of the [gravitational] fields present, and Newton’s theory is a field theory, just as much as Einstein’s. Newton’s gravity is a mass field, since his masses determine all forces and [it is] the forces [that] determine the acceleration.”

In order to demonstrate Laplace’s error, Mathis has stripped away all the math and looked at the problem spacially. In this respect, he has outlined four positions of Jupiter and Saturn vis-à-vis the Sun. See Figure 4 below.

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5 Ibid., pp. 279-282.
6 Ibid., pp. 282-283.
The Sun in this diagram is the central black dot, Jupiter’s orbit is the first circle outside it and Saturn’s orbit the second circle outside that of Jupiter. We ask the reader to note the straight-line arrows that point at each other. These arrows reflect the pull of Jupiter and the Sun on the planet Saturn and vice versa. With this diagram in place, Mathis explains:

“With gravity as a force of attraction, and no other fields playing a part, we find that we would expect the gap between Jupiter and Saturn to be getting smaller. Because, while Jupiter is sometimes being pulled away from the Sun by Saturn and sometimes towards it, Saturn is always being pulled toward the Sun by Jupiter. I challenge you to find a relative position of the two planets where Saturn is not being pulled into a lower orbit [closer to the Sun] by Jupiter.

“In fact, Saturn could not be pulled into a higher orbit over a single differential, unless Jupiter went above it [to a greater distance from the Sun than Saturn.] In other words, the orbit of Jupiter would have to be so highly eccentric that Jupiter’s semi-major axis would have to exceed that of Saturn’s for part of their combined orbits. And even then, Saturn’s orbit would be increasing [away from the Sun] only over a span of years. It could not increase as a whole from the time of Chaldea or Ptolemy until the time of Laplace. It is clear, from the simplest analysis, that Saturn cannot go [to a] higher [orbit] due to the laws of Newton, without the influence of outer planets. But Uranus and Neptune [are too distant and too small to do this] . .

“For this simple reason you can dismiss any and all claims to the contrary, no matter how much impressive math or argument they throw at you. You cannot prove something that is [gravitationally] impossible, and if someone does [claim to] prove it, you can be sure they [sic] cheated.”

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7 Ibid., pp. 285-286.
The question that poses itself is: what is the force that is moving or pushing Saturn farther from the Sun over such long periods of time? Of course, it cannot be the gravitational perturbations of Jupiter; it has to be something else. Here, Mathis adds:

“My critics will claim that it is quite easy to imagine the gap between Saturn and Jupiter getting larger or the orbit of Saturn increasing, even given my figures. Since the orbit of Saturn is slightly elliptical, we just need to go to Saturn’s nearest approach to the Sun [where it accelerates faster and moves farther away from the Sun]. The differentials after that all show a larger orbital distance, no matter what Jupiter is doing. Yes, but that is not what Halley found, is it? Halley was not talking about a short-term increase in the orbit of Saturn, during [only] one of its 30-year cycles. Halley was talking about an increase [that grew greater] over centuries. My simple diagrams show that the only long-term change in Saturn’s orbit we would expect, as a function of a pulling perturbation from [Jupiter] is going [to a] lower [orbit]. THE ONLY PERTURBATION FROM JUPITER THAT WOULD SEND SATURN HIGHER OVER THE LONG TERM IS REPULSION. That [fact] is so clear from this first look that I can’t believe I am on this page having to say it. In no part of any long-term cycle could the orbit of Saturn, as a whole, appear to increase [outward away from the Sun and Jupiter], given gravity alone.”

In other words, Mathis’s analysis of the gravitational perturbations of Jupiter on Saturn, as outlined by Laplace, indicate that the great electromagnetic fields of Jupiter and Saturn are the only forces possible to repel Saturn’s electromagnetic field and, thus, the planet itself. The cycle works as follows: Jupiter’s great mass gravitationally pulls Saturn closer to it and the Sun over many centuries. When Saturn has reached a point close enough to Jupiter, both planets’ electromagnetic fields repel one another strongly enough so that, over many centuries, Saturn gradually moves outward while, in reaction to Saturn’s electromagnetic field, Jupiter gradually moves inward. This goes on until both planets are at a sufficient distance from one another and the cycle repeats itself. In this sense, Mathis has come to the very same conclusion as Velikovsky and I, namely that electromagnetic fields would act as a repulsive force in space at close distances. The vast implications this evidence holds for solar system stability, as well as for cosmology, are immense. He argues:

“All Laplace did is assume long-term stability of the solar system and then find a math to match the given data. But this is a double cheat, 1) because gravity, by itself, cannot explain the given curves and motions, and 2) because this assumption of long-term stability is clearly false. Just as Laplace could not have proved that Newton’s equations explain the perturbations of Jupiter and Saturn, he could not have proved stability since there is no stability. To this day, the question of stability commands much time and effort and verbiage.”

“Well, we know from observation that Saturn is, in fact, going higher, at least over part of its long-term journey. And we know that gravity, by itself, cannot account for this, which means that something else must be causing the resonance and the long-term motion. We must have gravity PLUS something else. This is why Laplace first looked at the ether. He must have known what I have just proved, and wanted to solve it without leaving Newton completely in the [dust] bin. An

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8 Ibid., p. 286. (Capitalization added)
9 Ibid., pp. 286-287.
ether would have been calculable as a straight addition to Newton, and Laplace could then hope to match the pair [of planets] to the data, truly saving Newton.”

In full agreement with Mathis, Roger Hahn tells us:

“The demonstration of the stability of the solar system was also something of a triumph, although, in retrospect, we know it was short-lived because the new tables for the positions of Jupiter and Saturn, based on Laplace’s findings, did not sufficiently match the observations . . . The issue arose because the perceived acceleration of Jupiter and secular deceleration of Saturn could apparently not be explained by Newton’s laws. If that were the case, either some other law would have to be added to celestial mechanics, or the system would, in the long run, be unstable. For a natural philosopher [a scientist] who had proclaimed his faith in a [Newtonian] deterministic universe, the situation was unacceptable.”

Basically, “some other law would have to be added to celestial mechanics” to create a stable Jupiter-Saturn system. These bodies interactions could . . . not be explained by Newton’s laws because when Jupiter goes toward the Sun, its speed is accelerated, and when Saturn moves away from the Sun, its speed is decelerated. These planets cannot move away from one another because gravity only allows the planets for long periods to pull each other closer together. In essence, Mathis’s analysis is correct. What that other law necessary for celestial mechanics is, clearly is not more gravitational theory.

The points Mathis makes are well taken and point unambiguously to a great hole in Newtonian celestial mechanics. As Dr. T. Yagoob, astrophysicist at NASA and Johns Hopkins University said of Mathis’s book:

“Physics is in desperate need of new and fresh ideas, across the board. You will find plenty of these in Miles Mathis’s book. I have not verified the results, but as far as I know, Miles is the first person to propose and begin to investigate the idea that Newton’s fundamental equation already has electromagnetism embedded within it. Such a possibility has profound implications. To quote Michael Faraday . . . ‘If you would cause your view . . . to be acknowledged by scientific men, you would do a great service to science. If you would even get them to say “yes” or “no” to your conclusions, it would help to clear the future progress. I believe some [scientists] hesitate because they do not like their thoughts disturbed.’ I [Dr. Yagoob] invite you to have your thoughts ‘disturbed’ by Miles’ book, if you dare.”

This author also invites readers steeped in traditional science and physics to have their thoughts disturbed, if they dare, by the material evidence presented in this book. Before proceeding, it must be said that there is no present-day gravitational physics that explains the long-term movement of Saturn away from Jupiter. That is, gravitational theory does not explain the stability of the Jupiter-Saturn system. But the practitioners of Newtonian theory maintain that their non-gravitational mathematics does explain the stability of the solar system. That claim is simply false. If their mathematical analysis explains the stability of the solar system, it must explain the stability of the Jupiter-Saturn system. But it does no such thing. Newtonian Law, as

10 Ibid., pp. 288-289.
11 Roger Hahn, Pierre Simon Laplace: 1749-1827; A Deterministic Scientist (Cambridge, MA 2005), p. 78. (Emphasis added)
12 Ibid., pp. 288-289.
13 Ibid., p. VIII.
the basis of solar system stability fails, and those who hold it up as criticism of Velikovsky must address this contradiction to their theory or admit that they have no theory nor the mathematics that uphold their belief in solar system stability. It is my firm belief that they will not address this overarching negation to all they hold as sacred truth, namely the laws of gravity. The point is that it is still ellipses (curves), inclinations to the plane of the ecliptic, and accelerations that are being used, and are the backbone of equations of solar system stability, not masses and distances.

It is also my contention that this negation of gravitation theory, related to solar system instability, will not be addressed by Velikovsky’s critics in full, because that has been the case from the beginning. Both astronomer Lloyd Motz, of Columbia University, and Albert Einstein looked into the question of solar system instability, and while still not agreeing with Velikovsky, each stated the following:

“On the occasion of an additional consultation I had with Professor Motz, he told me that [Waldemar] Kaempffert, who wanted to check several points concerning my theory with an astronomer, had called Columbia University and chanced to come to Motz. The latter could tell him only that he had gone carefully through the pages of the Epilogue that dealt with celestial mechanics and he could not tell him of anything methodologically wrong with my hypothesis as expressed in the Epilogue. Kaempffert left without finding a useful point to attack [the celestial mechanics] and therefore omitted the astronomical side of the story in his review [of Worlds in Collision in the New York Times].”14

The basic point is that an establishment astronomer – Lloyd Motz – understood that gravitational theory did not contradict Velikovsky, but the reviewer exhibited so much bias that he omitted this statement that was clearly supportive of the thesis in Worlds in Collision. That is, a science writer for The New York Times was told by the chairman of the Astronomy Department at Columbia University that Velikovsky’s thesis could be correct. Instead of publishing this important statement that was at the heart of the debate at that time, between Velikovsky and other astronomers, this reporter left this statement out of his article. This brings us to the problem of ethics and bias in the press when it comes to Velikovsky. W. James Potter, an investigator into news and media reporting, knows this is already a case of bias and breach of ethics:

“When we dig a little deeper . . . we find the idea of bias . . . with bias we must infer whether the story has essential elements that the journalist failed to report because those elements support a side of the issue that the journalist did not want supported. Therefore, bias . . . is a willful distortion on the part of a journalist.” 15

Henry H. Bauer’s widely referenced book, Beyond Velikovsky, discusses Motz in various places throughout his book (pp. 41-42, 53-54, 285, 287). But Motz’s statement that “he could not tell of anything methodologically wrong” that “dealt with celestial mechanics,” is also omitted, although Motz’s conclusion is vital as support for Velikovsky. But Bauer, a scientist, failed to report this because that element supported a side of the issue he did want to be known. Thus, Bauer’s book also presented “a willful distortion.” Velikovsky had been cited in Bauer’s book to have written that “The theory of cosmic catastrophism can, if required to do so, conform with the celestial mechanics of Newton.”16 Having cited this aspect of Velikovsky’s work and knowing that Lloyd Motz claimed that Velikovsky’s thesis did conform “with the celestial mechanics of Newton,” Bauer produced a biased description and distortion of the evidence at his

14 Velikovsky, Stargazers & Gravediggers, op. cit., p. 121.
command. However, this is not the end of it. Albert Einstein, while disagreeing with Velikovsky, especially about the electromagnetic fields of planets at close range overcoming gravity, nevertheless stated:

“‘I have again read . . . Worlds in Collision. It is a book of immeasurable importance and scientists should read it. . ’ [Einstein went on]

“‘I could explain everything you describe in your book on the basis of accepted celestial mechanics of gravitation and inertia.’

“‘Even the circular orbit of Venus?’ I [Velikovsky] asked.

“‘Even the circular orbit of Venus,’ he answered ‘though this would require a very unusual degree of coincidences.’”

As with Motz, critics of Velikovsky never cite this statement by Einstein which allows Velikovsky’s “theory of cosmic catastrophism . . to . . conform with the celestial mechanics of Newton.” Therefore, it is futile to expect astronomers and astrophysicists to set aside their biased belief in a gravity only theory as it relates to solar system stability and the incorporation of electromagnetic fields into celestial mechanics.

What must furthermore be stressed is that the concept of solar system instability based on Newton’s laws, even during the same time that astronomers were savagely attacking Velikovsky, was actually being undermined by authorities in that very field. For example, Dr. W. M. Smart, in 1953, according to the astrophysicist and mathematician, Robert W. Bass, writes:

“In 1953, Dr. W. M. Smart, Regis Professor of Astronomy, in the University of Glasgow, published a calculation (see his celestial Mechanics, Longman Green and Co., Ltd., and John Wiley and Sons, Inc., 1953, pp. 4, 94-95, 198), indicating that the maximum time interval over which Laplace-Lagrange-Poisson-type stability calculations can be trusted is 300 years.”

Bass goes on to cite Ernest W. Brown, an authority in the field of celestial mechanics, at his retiring Presidential address, in 1931:

“When the [time] interval has reached a certain length, small non-gravitational forces have to be included . . . When, with this fact, is placed the observational evidence of distribution of [planetary] orbits [in a resonant configuration], the first conclusion is that the original configuration cannot be deduced from gravitational methods alone from the present configuration if the interval is long enough . . .

“The extension of the time scale [for solar system stability] has had, in fact, a disastrous result in the new limitations it has placed on the possibilities of obtaining information concerning the past of the solar system. . If to this is added the opinion of [Sir James] Jeans, that the discovery of the effects of radiation [electromagnetism] requires ‘nothing less than [a] complete recasting of the theory of configurations of rotating masses; all our hardly won knowledge – both of the configuration [of the planet] and all their stability, must be cast into the melting pot,’ one wonders to what extent the present speculations as to the origin of the solar system rest on a basis of observation and calculation.”

17 Immanuel Velikovsky, Before the Day Breaks (Internet) Chapter: “The Last Meeting.”
20 Ibid., p. 38.
Brown was reporting that one cannot retro-calculate long-term circular orbits. Not only that, but the electromagnetic fields of the planets and their gravitational fields operate in the same way, attracting and repelling one another so that they continue to relax into more stable circular ones, as well. And this further understanding, I believe, will be ignored and evaded. Using strict gravitational theory, even my analysis of Bass is still valid, but the time scale for relaxation is extremely long, rather than extremely short. Eckehart Köhler well summarizes Bass’s analysis in a Vienna Circle Institute Yearbook publication. Analyzing Wolfgang Spohn’s “Laws and Persistent Inductive Schemes,” he writes:

“A most famous test case for Spohn, which is more classical, but no doubt trickier to interpret than Einstein’s gedanken experiments [thought experiments] is that of Titus’s old empirically discovered law, confirmed and made famous by Bode, of the logarithmic (‘geometrical’) distribution of planets in the solar system . . . Titus discovered the interesting fact that each planet is almost exactly twice as far from the Sun as the next closer partner . . . There was much debate about whether the nice distribution should even be dignified by calling it a law. It was unknown whether it was a regularity, as no other solar systems were known [then]. Clearly, Bode’s ‘Law’ is a great candidate for an ‘accidental law’: attitudes toward it had always been shaky; it was never clear how strongly it deserved assent, strong calls came for finding an underlying dynamical explanation for it.

“This attitude remained unchanged for several centuries because of the sketchy (or should I say, indifference to Spohn’s) ‘shaky’ acquaintance with celestial dynamics. Newton, of course, was not able to solve the famous n-body problem, whose master was required to prove that the solar system was stable. Laplace later attempted this proof, but it is now accepted that he unjustifiably rounded off the factors responsible for unstable perturbations of planetary orbits . . . Based on advances in celestial dynamics, going back to Poincaré and Newcomb in the nineteenth century, two researchers in the twentieth century, first Brown (1932), and then Hills (1970), suggested explaining Bode’s Law as representing a state of dynamical relaxation,’ meaning the solar system is at its most stable point when planets are distributed logarithmically. Ovenden (1976) proposed a ‘principle of least interaction action’ [to explain Bode’s law] . . . Bass (1974) referring to a paper of (1958) proposed a quite similar principle of ‘least mean absolute potential energy [to do the same’].”

Note that Köhler told us “Laplace . . . attempted this proof [of solar system stability], but that it is now accepted that he unjustifiably rounded off the factors for unstable planetary orbits.” Not only did Laplace fail to base his mathematics on gravitational theory, but then he rounded off the factors to prove solar system stability. That is, Laplace’s theory was not based on gravity and his mathematics was too crude to prove that concept.

Interestingly, it is still believed that by carrying out Laplace-type equations to many more decimal places, one can resolve the problem of solar system stability. That, to a great extent, is just what has happened. The mathematicians using Laplace’s approach or that of others, do not employ pure gravitational theory: William L. Harper shows:

“After the publication of his [Laplace’s] monumental treatises on celestial mechanics, there came to be very general acceptance of the solar system, as what

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was taken to be Newtonian metaphysics of a clockwork deterministic system of bodies interacting under forces, according to [gravitational] laws. The successively more accurate approximations were seen as successively better approximations to [be] an exact characterization of forces and motions of the bodies in a stable solar system in which all perturbations are periodic.\footnote{William L. Harper, \textit{Isaac Newton’s Scientific Method: Turning Data into Evidence About Gravity} . . . (Oxford, UK \textit{et al.}, 2011), p. 47.}

But this was never proved true via gravitational law. The Jupiter-Saturn system cannot be periodic on that basis. That is, the divergences of the orbits of these two planets will not converge to their original ones, or very near them, which is what periodic means, based strictly on gravity. “A repelling force is required to cause these planets’ orbits to diverge, move away from each other, while gravity will pull on them so their orbits become more convergent and not periodic. What we will meet constantly below is that periodic orbits are construed to mean solar system stability, while non-periodic orbits, where the planets do not return to their former places, is taken to mean instability.

Barry Parker describes Poincaré’s method of proof:

“Instead of pursuing the straightforward [gravitational] approach he tried a roundabout one: he investigated the orbit’s quantitatively by plotting them in phase space [which is a donut-shaped curve that incorporates all the curves and inclinations and variations of a planet’s orbit], then he examined a slice [of the donut or torus] . . . And, in the process, he discovered chaos . . .

“Even though the problem couldn’t be solved directly, it could be approximated closely using perturbation techniques until astronomers could, \textit{IN THEORY}, get [mathematical] answers to any degree of accuracy.”\footnote{Barry Parker, \textit{Chaos in the Cosmos: New Insights into the Universe} (NY 1996), pp. 155-156. (Capitalization added)}

What Poincaré obtained were mathematical approximations that only, “in theory,” were accurate. Just like Laplace, Poincaré, according to P. J. Message, used “the secular variations, powers of quantities of the orbital eccentricities and orbital inclinations.”\footnote{P. J. Message, “Formal Expressions for the Motion of N Planets in the Plane, with the Secular Variations Included and an extension of Poisson’s Theorem, \textit{“Long Time Prediction in Dynamics}, V. G. Szebehely, B. O. Tapley, eds. (Dordrecht, The Netherlands 1976), p. 279.} When we later come to Laskar, again we will discover that, in his mathematical solution to the problem, he also employed eccentricities and inclinations as a substitute for masses and distances. The entire panoply of evidence against Velikovsky was built on non-gravitational equations. In a very real sense, the mathematics has by-passed gravitational theory and replaced it with mathematical heuristic theory: the math uses the accelerations, the inclinations, the eccentricities, and whether these are periodic or near periodic – meaning stability, or non-periodic – meaning instability. It is taken for granted that the math mirrors the underlying physics and, therefore, the math has become the reality of celestial mechanics. Of course, nobody in science wants to hear that. But let us return to Bode’s law. Florin Diacu, a worker in the field of celestial mechanics, whose criticism of Velikovsky we will meet below, challenged Bass regarding the relaxation of an unstable solar system into a Bode-like stable configuration:

“In the summer of 1974, Robert Bass – an expert in celestial mechanics at Brigham Young University – published . . . what he claimed to be proof of the Titus-Bode Law. He disagreed with [John Q.] Stewart [who had argued that Velikovsky’s
celestial scenario violated this law] saying that this principle didn’t contradict Velikovsky. If some massive celestial object is trapped in the solar system, the other planets readjust their positions [to accommodate it], according to the astronomer, E. W. Brown, who, in 1931, during his retiring speech as president of the American Astronomical Society, said he saw no reason why Mars, Earth and Venus could not have [nearly] collided in the past.

“But a careful check of Bass’s proof revealed errors. He worked hard to fix them and thought he had. Still no journal in celestial mechanics accepted his article [that would give support to Velikovsky], and he began to circulate the manuscript among experts. I [Diacu] happened to be on Bass’s email list, but, like many others, I did not read his article because of its [mathematical] difficult style. One of those who did was Gordon Emslie, a physicist at the University of Alabama, who, in the summer of 2003 found a fatal mistake. Not so easily undone, Bass soon claimed to have corrected it. In the fall of the same year, I emailed Emslie asking him what he thought [of Bass’s correction]. He was still far from convinced by Bass. IN HIS OPINION, THE PROOF COULDN’T BE FIXED.”

Note how Emslie argued without a scintilla of mathematical proof that Bass was not correct and that he was “still far from convinced by Bass. In his opinion . . .” Emslie’s opinion is only opinion, “his opinion,” but it is mathematical proof of nothing. Opinion, not proof, is how this authority disputed Bass. Opinion is never superior to mathematical evidence. In the words of John Stuart Mill: “Belief [or opinion] is not proof, and does not dispense with the necessity of proof.” Bass’s proof, therefore, remains unchallenged which brings us back to Köhler’s analysis of the great authorities who Henry Bauer failed to cite:

“. . . Kolmogorov (1954) [three years after Velikovsky presented Worlds in Collision] made the momentous discovery that catastrophes in planetary systems are all too likely when he found that the minor terms in Newcomb’s series used to solve the n-body problem for planetary motion in Newtonian mechanics were, in fact, easily subject to random, unpredictable perturbations which could quickly lead to turbulence; cf. Arnol’d (1997). In the meantime, the buzzword ‘chaos’ is applied to such turbulence – also called ‘catastrophe,’ to the dismay of Shapley and many other astronomers sharing Newton’s dream of an eternally stable solar system . . . Subsequently, in the later fifties, Siegel & Moser (1971) and Moser (1973) further extended mathematical knowledge of divergent [orbits of planets], Newcomb series.

“That ‘deterministic’ systems, like those obeying Newtonian mechanics, should be subject to unpredictable catastrophes came as a real shock. But Poincaré had already discovered chaos in 1890 and prominent member of the Vienna Circle, Philip Frank (1934), who knew quite a bit about continuum mechanics, and mathematics, spelled out the philosophical consequences in scintillating detail reminiscent of the iconoclastic Mach: Even outside Quantum physics, the notion of determinism (a universal law of causality), has little practical meaning and is virtually a tautology.

25 Florin Diacu, The Lost Millennium: History’s Timetables Under Siege (Toronto 2005), pp. 33-34. (Capitalization added)
“Next came pioneering computer simulations of planetary – system evolution by Hills (1969). Wisdom (1981), finding even more advanced numerical methods and using faster computers, achieved the breakthrough of repeatedly observing chaos (or catastrophes) in computer-simulated planetary orbits, splendidly confirming Kolmogorov and putting the dream of Newton [and Velikovsky’s critics] in an absolutely stable and orderly cosmos to rest in a way most astronomers could not have previously imagined. All experts now agree that even apparently stable [planetary] orbits will occasionally experience unpredictable chaotic disturbances.”

Nevertheless, these authorities are all building their deductions from equations that are purported to be based on strict gravitational theory. They, as will be shown below, as Mathis pointed out for Laplace, built their physics on ellipses, inclinations and planetary motions, not solely on masses and distances between them. They are also based on the concept that no massive body has ever entered and passed through the solar system perturbing one or more planets and creating chaos or solar system instability. The gravitational energy in the solar system, they maintain, has never changed due to a giant planet passing through it. For example, J. J. Lissaur and D. N. C. Lin point out “these [stability] models neglect solar mass loss and the effect of passing stars . . . [whose perturbations] should shorten the lifetimes of the systems [change to instability] by several orders of magnitude.”

The question is, of course, are there planetary bodies in interstellar space that could have passed through the solar system and disturbed its configuration recently. In fact, these homeless, interstellar planets have very recently been found. As I claimed in 1999, not knowing there was a mass cut-off between giant planets and brown dwarf stars, equating these, I wrote:

“If, as presented here, stars are born from novae and supernovae . . . then tiny black holes will also be released that rapidly evolve into brown dwarf stars. The birth of such planets is like that of stars. Therefore, the galaxy will contain untold billions of such bodies all in orbit, like the stars around the galaxy and these can be captured.”

That is, I predicted, in 1999 interstellar space would contain “untold billions of such (planetary) bodies.” And no one, as far as I know, predicted that there would be found to be “untold billions” of them. And that is exactly what has been found:

“South Bend, Ind., May 18 (UPI) – U. S. and Japanese astronomers say they have discovered a new class of planets – dark isolated Jupiter-sized bodies floating alone in space far from any star.

“University of Notre Dame astronomer, David Bennett, co-author of the paper discovering the planets, are most likely ejected from developing planetary systems . . .

“Scientists estimate the total number could be 400 billion, far outnumbering main-sequence stars.”

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30 “New Class of ‘homeless’ planets found,” (Internet).
According to these astronomers, there are, at least, 400 billion of these Jupiter-sized rogue planets in interstellar space. The point germane to this discussion is that some astronomers maintain that these rogues have actually been captured and adopted by other planetary systems just as I earlier maintained. This concept was published in The Astrophysical Journal for April 20, 2012 by Hagal Perets of the Harvard-Smithsonian Center for Astrophysics in Cambridge, MA and Thijs Kouwenhoven of Peking University, China:

“New research suggests that billions of stars in our galaxy have captured rogue planets that once roamed the voids between stars.

“The nomad worlds . . . could occasionally find a new home with a different Sun, astronomers propose. This could explain the existence of some planets that orbit surprisingly far from their stars and even the existence of a double planet system.”

Philip Plait, who told us how tides operate gravitationally and was shown to be in error by Irving Michelson and Miles Mathis, has tried to determine that such rogue planets have almost no possibility of entering the solar system and creating chaos. In his article on the Internet, “Are we in danger from a rogue planet,” posted May 19, 2011, he disputes the concept proposed in The Astrophysical Journal cited above. He bases his analysis on probability:

“Basically, all we need to do is take the number of rogue planets in the galaxy and divide it by the volume of the galaxy, and that gives us the density of these planets in space: How many are there in a cube a light year on a side? If the answer is, say, 1, then we expect to have one rogue planet inside a one-light-year-wide cube centered on the Sun. So let’s see what the math tells us:

“First, there are a lot of rogue planets. In the study, they say there are very roughly as many as there are stars in the Milky Way. Let’s call it 200 billion [but the report stated 400 billion].

“Second, the volume of the galaxy isn’t hard to estimate . . . the Milky Way has a volume of roughly 2 x 10^13 cubic light years: That’s 20 trillion cubic light years!

“... Dividing then we find the density, we get 2 x 10^11 planets / 2 x 10^13 cubic light years = 0.01 planet per cubic light year.

“In other words, we’d expect to find one of these wandering planets in a volume of space encompassing 100 cubic light years. That’s a cube about 4.6 light years on a side (or, if you prefer, a sphere 3 light years in radius).

“... The nearest star, the Alpha Centauri triple star [system], is about 4.3 light years away. That means there’s a pretty good chance that, statistically speaking, there may be one of these rogue planets closer to us than the nearest star!

“That’s actually quite shocking.”

The problem with Plait’s analysis, which he left on that Internet site until 2013, is that the estimate he used was changed. The number of these rogue planets, according to Stanford News, is 20 quadrillion, not 200 billion, as Plait suggested. “In fact, there may be 100,000 times more ‘nomad planets’ in the Milky Way than Stars (Stanford News “Researchers say galaxy may swarm with ‘nomad planets.’” According to Deep Space Astronomy, an article by Walter McLaughlin and Michael manning, “A Quadrillion Points of Light,” (Internet) say:

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32 “Homeless planets may get adopted” (Internet).
33 Andy Freeberg, Researchers say galaxy may swarm with 'nomad planets' (Feb 23, 2012) (Internet).
“The article, Nomads of the Galaxy, from the study reference . . . suggests that due to gravitational forces, collisions and other chaotic and/or unknown factors, there may be as many as 100,000 ‘nomad’ planets for every star in the Milky Way that do not orbit a host star, but instead, hurtle in darkness through interstellar space. Given that there are between 200 and 400 billion stars in our galaxy, the number of such planets could be in the quadrillions.”

If we take the median between 200 and 400 billion, we have 300 billion stars in the Milky Way and 300 quadrillion rogue planets. Thus, using Plait’s cubic light year volume, we have $3 \times 10^{17}$ planets / $2 \times 10^{13}$ cubic light years = 15,000 planets per cubic light year. In Plait’s own words, we’d expect to find 15,000 of these wandering planets in a volume of space encompassing 100 cubic light years. That’s a cube about 4.6 light years on a side (or if you prefer, a sphere about 3 light years in radius).

The nearest star . . . is about 4.3 light years away. That means there’s a chance that statistically speaking, there may be 15,000 of these rogue planets closer to us than the nearest star! That’s actually quite shocking. The reason that this new number is even more shocking than Plait suggests is that, with that number of planets in the vicinity of the Sun, the chances are quite large that some of them will actually enter the solar system, become members of the solar system or pass through the solar system and both scenarios will create chaotic orbits among the planets. Plait believes it would be quite easy to see these bodies, but they can be hidden by dust, or the planets may lie well above or below the ecliptic.

Let us cut the numbers of extrasolar rogue planets from 15,000 to 1,000, then there are 1,000 planets per cubic light year centered on the Sun. If we reduce this number by half, we have 500 rogue planets per cubic light year centered on the Sun and half of that gives us 250 rogue planets centered on the sun in a cubic light year, etc. It is inconceivable that given so many rogue planets in this volume of space, and probably the larger numbers more accurately reflect them, then it can be of little doubt that they would, over time, even recently have entered the solar system and disturbed the configuration of the planets. This possibility, however, is never taken into account when modern-day astronomers and mathematicians calculate their stability equations. Like Charles Lyell, believed catastrophes are forbidden.

The real problem is that their equations, like those of Laplace, deal with ellipses, inclinations, accelerations. And they further maintain that the Lyampunov time scale, in which planets, once in unstable, elliptical orbits, take five million years to relax into circular ones is not necessarily correct. Here, Ivars Peterson shows:

“Another question concerns the meaning of exponential divergence of nearby orbits as measured by a number known as the Lyampunov exponent or Lyampunov time – [named after Aleksandr M. Lyamunov] in a chaotic system. Laskar’s solar system calculation produced a Lyampunov time of roughly 5 million years [to go to stable planetary configuration]. Wisdom and Sussman produced a value of 25 million years for Pluto’s orbit and 4 million years for the solar system.

“Although widely used as an indicator of chaos in terms of the exponential rate at which nearby trajectories diverge provides just one technical fact about the system. Whether that behavior has any qualitative implications over the lifetime of the solar system is a much more intriguing, yet largely unanswered question.

“All this remains worrisome. Sussman and Wisdom have remarked: ‘The fact that almost all long-term integrations of the solar system give [many different] divergence of [planetary] trajectories with a time scale in the range of 3 to 30
million years in physically quite different models is very striking and unsettling. Another unsettling feature of the chaotic behavior we observe in long-term planetary integrations is that nothing dramatic happens. This is compounded by the fact that [despite the efforts of Laskar and others], in no case have we unambiguously identified the mechanism [such as rogue planets] responsible for the chaotic behavior.”34

Bass, however, has shown that chaos and relaxation can take far shorter times: “Simulations of Jupiter-sized planets orbiting hypothetical stars (Fredric A. Rasio, Eric Ford, “Dynamical Instabilities and the formation of Extrasolar Planetary Systems,” Science, Vol. 274 (Nov 8, 1996), pp. 954-955 . . . demonstrate that eccentricities can be pumped up resonantly to permit near collisions (or ejection) within centuries rather than eons, have moved astrophysicist Philip Morrison (“Doing the Poincaré Shuffle,” Scientific American (Jan 1997), p. 116 and 118) to comment that ‘few orbital radii within our sun’s system remain vacant [vis-à-vis the Titus-Bode Law] where additional planets could permanently circle. . . Mercury . . . may become [the] next . . . to depart [the solar system].’”35

Notice how Wisdom and Sussman have shown that using different models but employing the same mathematical application of equations, one can obtain time scales in which chaos and relaxation develop for the solar system that vary from three million to 30 million years. That is, the math and premises can indicate totally different time scales instead of a more closely and tightly grouped one. This clearly shows that the premises with mathematics is determining the astronomical realities, not the underlying physics. When we add Bass’s mathematical extrapolation which reduces the period for instability to a few hundred years, one can see the huge discrepancy that can be obtained using the same math. Köhler, along these lines, adds:

“Now the irony: The very same numerical simulations by Hills displayed a great orderliness: Evolving planetary systems always tend strongly to satisfy Bode’s Law: No matter what initial conditions were presupposed, planets [on chaotic orbits] settle into orbits distributed according to the law! Most recently, Laskar (2000) provided a dynamical explanation for this remarkable result and Hayes & Scott (1998) discuss statistical features relating randomly selected planetary systems with Bode’s Law. All this work [contrary to Gordon Emslie, as reported by Florin Diacu, above] confirms Bass and Ovenden . . . planets will typically remain in stable orbits distributed according to Bode’s Law for long periods, but are subject to occasional hard-to-predict instabilities which, in turn, quickly ‘relax’ back into stable orbits satisfying Bode’s Law again – although the order of planets perhaps may have been flipped. It has even been worked out how Venus could have switched step-wise from an orbit between Jupiter and Saturn to its present (quite circular!) orbit inside the Earth’s [orbit].36

In other words, what Lloyd Motz and Albert Einstein presented regarding celestial mechanics as it applies to Velikovsky’s instability thesis, using what they maintain are gravitational equations, which I strongly disagree with as will be shown below: Their equations

are like those employed by Laplace. A question that follows is: Has another distant solar system been found containing several planets orbiting in near coplanar circular ones around a star that corresponds to Bode’s Law? Such a finding would give quite strong support to Bass and others who agree with him. In this respect, Michael Perryman tells us:

“The CNC system was the first known planetary [exosolar] system comprising five planets [whose orbits are] circular and coplanar . . . (Poveda & Lara, 2008); made a Titus-Bode-type fit of the five planets orbiting 55 cnc.”

At this point, it must be stressed that Bode’s Law gives only general, not precise, distances between orbiting bodies and, given different masses and electromagnetic field strengths, will be somewhat different for different orbiting systems. This is, in fact, what Martin Harwit has presented. By making a slight modification of Bode’s Law, Dermot was able to show that not only the distances from the sun of planets follow the Bode rule, but also, the distances of their satellite do so, as well, wherein Harwit writes: “Bode’s Law, which we have already mentioned Dermott (De 68) was able to show that a slightly new phrasing of this law permits us to include not only planetary orbits around the sun, but also the orbits of moons around their parent planets.”

Undoubtedly, the relaxation process, developed by Bass and Ovenden, is finding empirical support in the solar system in an exoplanetary system. Köhler states:

“Now we can no longer consider Bode’s Law ‘accidental’ at all because we now know it represents an energetic equilibrium point inherent in all planetary systems – without implying absolute stability, however! It is not absolute because it tolerates occasional chaotic disturbance when it is temporarily ‘violated’ . . . But it is universal in the sense of holding for all possible planetary systems, and all those observed up to now adhere to it. In any case, with reference to Spohn’s doxastic dynamics, we may say that those astronomers, exposed to the most recent theory, were now confronted with surprising data from a newly discovered planetary system showing a non-logarithmic distribution, they would, nevertheless, persist in believing in Bode’s Law; they would decide that the planetary system observed [in chaotic orbits] is merely undergoing a short-term catastrophe of the sort Kolmogorov showed to be all too likely.”

Exosolar systems, with several planets in them, will be at an advantage in relaxing because, not only will their gravitational fields slowly relax their elliptical planetary orbits back to circular ones, but because the planets themselves have repelling electromagnetic fields which will also push them to relax more rapidly. This planetary repulsion can be clearly understood by the work of Michael Ovenden, who discovered that planets in the solar system interact along their orbits in such a way that when they are closest to one another, they are also, for some reason, having the least interaction action distance, as well. For example, if two planets are on the same side of the sun at their closest distance to one another, one might be at its aphelion or greatest distance from the sun, while the other is at perihelion, or nearest distance to the sun. That is, they will be as far apart as possible when they are closest. The planet at perihelion will also be traveling at its fastest, the planet at aphelion, slowest. Therefore, not only will their closest distance to each other be as far apart as is possible, the time during which this closest approach happens will be very short, given one is traveling as fast as possible, the other as slow as possible in their paths. Another way this least interaction action can happen is to have the two planets orbiting on different

planes – their inclinations. Thus, when they are closest, one planet may be at its highest point above the solar plane, the ecliptic, while the other is at its lowest point below the ecliptic. As they move away from one another, they also descend and ascend more closely to the solar plane. Thus, their period of time of closest approach will also be as distant as possible. It may be some combination of these factors that is operating, but the result is the same; when planets are closest to one another, something is pushing them as far apart as possible, namely, planetary electromagnetic repulsion, so that their interaction is least interacting in space and time as possible.

Why would planets behave in this manner if there was no repelling force between them? That is why I contend that multiple planets in a system will relax far more rapidly than those with fewer planets or only one. That, too, is also why I maintain that in the solar system, with its several planets and their electromagnetic repelling fields, the Lyampunov time scale of around five million years for planets to relax into stable circular orbits is a mathematic assumption – an error.

One further point before proceeding: The only planets Velikovsky claimed had highly unstable orbits in recent times are Mars and Venus. If this is indeed the case, then these two planets should now be relaxing into less chaotic orbits and their orbital parameters should show they are still in somewhat, or near somewhat chaotic orbits. Alessandra Celletti and Ettore Perozzi point to this very fact:

“[Jacques] Laskar, at the Bureau de Longitudes in Paris implemented a fast computer to run an advanced perturbation theory that allowed him to integrate the motion of all known planets (except Pluto) over a period of 200 million years. The results confirmed an overall regularity of the motion of the giant planets from Jupiter to Neptune. On the other hand, the behavior of the inner planets – Mercury, Venus Earth and Mars – appeared to be definitely chaotic.40

Laskar, himself, admitted: After examining many factors, “this chaotic behavior gives some possible explanation for the retrograde [rotational] motion of Venus. Mars is still in a very chaotic zone . . . In an independent work published . . . by Touma and Wisdom (1993) also found the obliquity [axial tilt] of Mars is chaotic.”41 The germane point is that Venus, according to Velikovsky had a highly elliptical orbit going from Jupiter to inside Earth’s present orbit. It would have perturbed all the planets in its path or near it and these clearly would be Mars, Earth and Mercury. This evidence can also be understood since these inner planets may not be moving toward chaotic orbits, but are now relaxing into more stable ones. Rather than see this evidence as supportive of Velikovsky’s hypothesis of an inner solar system instability, the astronomers simply say that the inner planets, and especially Venus and Mars, are behaving somewhat chaotically. They refuse to consider how clearly this evidence supports Velikovsky!

In fact, Laskar admits that the inner solar system is full and that if another planet moved there, it would induce chaotic behavior.

“Maybe there was some extra planet at the early stage of formation of the solar system and, in particular, in the inner solar system, but this leads to such instability that one of the planets . . . suffers a close encounter, or a collision with the other ones. This leads eventually to the escape of this planet, and the remaining system gets more stable.”42

“The Proof” goes as follows:

“The man who could help me disprove Velikovsky’s theory of planetary collision was Jacques Laskar . . . He studied the practical aspects of the solar system and used the latest analytic tools to provide accurate planetary positions for 20 million years, both into the future and the past.

“This mapping is no easy feat . . . Nevertheless, Laskar has [mathematically] overcome the difficulties and made valid long-term predictions.

“I sent him an email message asking if he had any evidence of planetary near collisions in the past few millennia. He responded the next day. His message began: ‘Is this related to Velikovsky’s book? *Monde en Collision* had just been republished in France, and Laskar had been asked to write a review for the October 2003 issue of *La Recherche*. My question couldn’t have come at a better time.

“According to Laskar, nothing of importance has happened in this area during the last 20 million years. Chaotic behavior has been negligible throughout this time. But concerning the past 20 million years research carried out by Laskar and many others confirms the impossibility of near collisions between Mars, Venus and Earth.”

The question is: Did Laskar use gravitational theory to prove his case or did he use eccentricities, inclination and accelerations, as did Laplace and Poincaré, for their proof? The fact of the matter is that, like Laplace and Poincaré, Laskar did not use the full equations of gravitational motion, but precisely the eccentricities, inclinations and accelerations that by-passed Newtonian law. Peterson specifically tell us this:

“Instead of using full equations of motion, Laskar focused on a special formulation that spotlights gradual but cumulative changes in an orbit’s shape [eccentricity] and orientation [inclination]. He worked with equations that smooth out the recurring wiggles and wobbles in planetary orbits leaving only long term trends . . .

“By applying a similar strategy to celestial curves [eccentricities], Laskar could isolate these [non-gravitational] parts of a planet’s motion that correspond to lasting changes in key characteristics of its orbit.”

In spite of using these curves and orientations of planets to suggest stability, Laskar admitted “This differential system is a close approximation to the real solar system, and in particular, the inner solar system . . . but the exact meaning of ‘close’ is still difficult to evaluate.”

When one employs non-gravitational theory instead of “full equations of motion” to prove stability, one has removed the solution of the problem from reality. But even believing in these non-gravitational equations, Laskar cannot tell what a “close approximation” is. It is a theoretical construct that comes out of non-gravitational math.

Ernest W. Brown emphatically stated this in 1931:

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43 Diacu, *the Lost Millennium*, op. cit., pp. 36-37.
“One of the best known and most frequently quoted results is that of the stability of the distances, of the eccentricities, and inclination of the orbits of the eight major planets in the solar system.”

Repeatedly the eccentricities and inclination of the positions of the orbits of the planets in the solar system are relied on to determine whether or not there was stability in the past or stability in the future. Because this tool, that is not based strictly on gravitational theory using only masses and their separations, is the basis for all reckoning of stability, it is essentially a great fudge factor that has been swallowed hook, line and sinker by astronomers, never noticing the distinction between their heuristic mathematics and the underlying forces that should have been employed in the first place.

The great uncertainty of the stability solution which Diacu upholds because of Laskar’s analysis to disprove Velikovsky is further belied by the fact that there can be no such certainty because they are not dealing with observable entities in the past but with the probability of where planets were in the past. Probabilities are just that – probabilities – not facts of science as Peterson explains:

“Efforts to settle the question of the solar system’s stability face a serious, perhaps insurmountable obstacle. As Scott Tremain has remarked: ‘In some sense, you end up having to deal with probabilities. You can never rule anything out completely. Even if a [planetary] system is well behaved, there’s always a small chance of its wandering by some narrow path to just about any configuration.’ In other words, with a mathematical model that automatically incorporates chaotic behavior, there’s no way to prove, with absolute certainty, that something can’t ever happen.”

Diacu, however, argues that Laskar knows enough to prove his analysis is correct.

“Laskar has introduced in his model ALL the [other] observed non-gravitational effects of the PAST FEW HUNDRED YEARS to corroborate his computations he compared them with the geological. The shape of the Earth which varies according to changes in the size of the ice cap and its internal distribution, determines the inclination of the Earth’s axis and the Earth’s orbit around the sun . . . The astronomical and geological facts agree.

“All these outcomes show that the hypothesis at the foundation of Velikovsky’s chronology is flawed.”

Now Diacu has informed us that “the inclination of the Earth” is due to the size of ice caps and its internal distribution of mass. But this fails to deal with one movement of the Earth’s axis. That is, the axis of the Earth wobbles, and I pointed this out in my book, Carl Sagan & Immanuel Velikovsky, pages 224-225 where I had earlier cited R. A. Lyttleton’s work. Velikovsky pointed out this fact in his book, Earth in Upheaval. While this wobble should be damping – becoming smaller – it apparently isn’t. As John Wahr, in “The Earth’s Inconstant Motion,” Sky & Telescope (June 1986), p. 549- admits, “The Chandler Wobble is a good example of our great (though diminishing) ignorance. In truth, we don’t know much more about its origin than we did in Chandler’s time a century ago.” It is obvious that Laskar’s analysis of the Earth’s axis does not

47 Ibid., p. 259.
and cannot take Chandler’s wobble into account, except by assuming certain things. Thus, how can he be so certain about the entirety of his analysis?

As part of Laskar’s understanding of the long-term orbital elements as they relate to geology is his dependence on the Milankovitch theory that is supposed to explain the expansion and contraction of ice caps, as Diacu has told us, not only over centuries, but over millions of years. The journal *Astronomy & Astrophysics*, cites Laskar, et al., regarding this aspect of tying Earth’s axial tilt and orbit to the build-up of ice caps during cold periods and their melting during warm periods.

“A team led by Jacques Laskar . . . has released new computational results for the long-term evolution and rotational motion of the Earth. Following Milankovitch’s theory of paleoclimate that describe how major, climatic changes of the Earth are affected by astronomical events, these [astronomical] results have been employed to provide a new calibration to the sedimentary records over the 0 to 23.03 Myr [million years] geological period (the so-called Neogene period). . . . It is the first time that astronomical computations have been used to establish . . . geological chronology over a full geological period.”

This is the point made by Diacu, namely that Laskar’s analysis correlates, corroborates and is congruent with the swings in climate from ice ages to warm periods and that these are reflected in sediment records that all appear to be scientific, logical and correct. The problem is that there is clear cut evidence that these swings in climate do not correlate with Milankovitch’s astronomical theory and this was presented in Velikovskian literature which neither Laskar nor Diacu have read nor seem cognizant of nor of the scientific literature on this matter, that was presented in peer reviewed journals. Therefore, if Laskar’s correlation of the Earth’s position along its orbit aligns with the Milankovitch theory, then there should be a clear correlation between geological evidence, as measured by materials on Earth that show these ups and downs in temperature and confirm this. If, for example, a very cold period – a bathythermal – required by Milankovitch exists, say, in an ocean sediment core, but is found to be off by another temperature reading in another core that is more accurate and contradicts the ocean sediment core by large numbers of years, then that major contradiction is important. But if, say, the Milankovitch theory requires and directly predicts that one should find extremely warm periods – hysithermals – or interglacials for a certain time – and the cores contradict each other or, even worse, both the ocean sediment core and the other temperature archive together contradict Milankovitch, this becomes a momentous problem for that theory. It also becomes a momentous contradiction to the astronomical evidence of Laskar because the position of the Earth along its orbit is not only not corroborated by these temperature archives, but in total contradiction to Laskar’s astronomical analysis. The archive I am referring to is that of the Devils hole. In this respect, J. M. Landwehr, Isaac Winograd and T. B. Copen, in a letter to *Nature* about the ocean core archive that was used to support Milankovitch, say:

“We are puzzled by the table in the Scientific Correspondance by Emiliani. He rejects the conventionally used (glacial, interglacial transitions) as time markers and focuses on bathythermals (the coldest portions of glacial cycles), which he deems to be sharper and, therefore, more precise time markers. He claims that bathythermals in the Devils Hole . . . chronology occur at times when

the orbital parameters of [the Earth’s] obliquity [axial tilt] and eccentricity to the sun] are both low . . . thereby supporting the Milankovitch mechanism . . .

“We show [in a table] . . . the seven astronomical ‘low’ events that Emiliani gives . . . We are puzzled as to why Emiliani omitted [from his table] two well-defined ‘low’ events . . . and note that they do not correspond to bathythermals in either the Devils Hole or the marine chronologies. Indeed, the ‘low’ [or coldest] event occurs during a peak interglacial time [when it was warmest]. We also note that Emiliani’s designation of a ‘low’ event [for two periods] does not fit the earlier stated definition.

“Also show[n] in our table] . . . are eight major . . . minima denoting times of full glacial climate, found in the Devils Hole chronology, and the subset of six events that Emiliani gives . . . in his table . . . He does not mention the two Devils Hole isotope minima which do not correspond to an astronomical ‘low’ event.

“In comparing the astronomical ‘low’ events predicted by the specific definition with the minimal isotope events in the Devils Hole chronology, one sees that though there are four ‘matches,’ there are six ‘non-matches,’ twice when a bathythermals would be predicted but did not happen, and four times when one did occur but not during an astronomical ‘low’ event.”50

The title of the letter is “No Verification of Milankovitch,” which would more aptly be titled “Milankovitch Discredited.” Not only did the Devils Hole core archive disagree with Milankovitch, but much of it flatly contradicted Milankovitch, along with the marine core!

Walter S. Broecker, the world’s leading climate theorist, in an article to Nature, “Upset for Milankovitch” states:

“One of the fundamental tenets of paleoclimate modeling, the Milankovitch theory, is called into doubt by isotope analyses of a calcite vein [Devils hole] just reported in Science, by Winograd and colleagues. The [Milankovitch] theory, which is backed up by a compelling bank of evidence, suggests that the ice ages are driven by periodic variations in the Earth’s orbit. But the timing of the ice ages determined, with unprecedented accuracy in the new [Devils Hole] record, cannot be reconciled with planetary cyclicity.”51

Richard A. Kerr, editor of Science, published the following:

“The Devils Hole Record traced climate swings of about the same length as the marine record, but they were out of step with the variations of Earth’s orbit. Most glaringly, the carbonates indicated a profound warming trend which appeared to signal the end of the penultimate ice age thousands of years before orbital variations could have begun to melt ice. If the Devils Hole chronology was a true record of the world’s ice age, researchers would have to dump the astronomical mechanism and look for something new.”52

K. R. Ludwig, et al., write: “The Devils Hole data . . . remains a challenge to the Milankovitch hypothesis.”53

The argument raised is that the record at Devils Hole only reflects the climate in the western basin of the United States. But Winograd et al. have shown:

“Perhaps the most convincing evidence that neither local nor regional hydrologic or synoptic climatological factors are the predominant ones influencing the DH [Devils Hole] . . . signal is the strong linear correlation of this record with SPECMAP VOSTOK . . . [climate archives].

“Local or regional hydrologic or synoptic – climatological factors are improbable as the predominant causes . . .”54

“In my estimation, the New Devils Hole Chronology is more firm than another available isotopic age in this range. Nowhere else has such a high degree of concordance between – 238U and 230 Th and 230 Th – 234U ages been achieved. No other archive is better preserved. No other record has so many stratigraphically ordered radiometric ages . . . [Although Broecker was a long-time supporter of Milankovitch, he adds] one side will have to give – just to be safe – climate modelers should start preparing themselves for a world without Milankovitch.”55

The very best climate archive of climate contradicts the Milankovitch theory!

If the basis of Milankovitch does rest on marine sediment cores, then these cores should also not contradict that astronomical thesis. Nevertheless, let us take the marine cores at face value: do they fully correlate with Milankovitch? And on top of this, let us add the Greenland ice core climate data to the mix; do they correlate Ice Ages to Milankovitch? The answer is emphatically no, because Milankovitch cycles take thousands of years, their astronomical/climate cycles do not happen rapidly. Regarding this point, Tjeer H. Van Andel writes:

“The study of sediment cores from the deep Atlantic and ice cores from Greenland does not confirm the gradual transition from glacial to interglacial and back again that is implied by the astronomical [Milankovitch] cycles and partly documented by the oxygen isotope record. Instead, as on the land the response of the North Atlantic Ocean – atmosphere system looks like a series of abrupt flip-flops from one stage to another.”56

Beyond these negations of Milankovitch there is the contradiction of hemispheric glaciations at the same time in both the northern and southern hemispheres. Lynn E. Rose pointed out how this synchronous glaciation in both hemispheres contradicts the theory.

“A major puzzle for the Milankovitch theory is the apparent fact the onset, the peaks, and the terminations of ice ages have been roughly simultaneous for both . . . hemispheres, but the other [astronomical] factors that the Milankovitch theory relies upon – the orbital eccentricity, the precession, and the advancement of perihelion – all suggest that there should be long-term differences between these two hemispheres. How, then, can the status of the two hemispheres remain virtually the same? It is as if an ice age were not a merely hemispheric or a polar phenomenon, but rather a result of factors operative on a global scale!

“Broecker, ‘The Cause of Glacial to Interglacial Climate Change’ in Evolution des Atmospheres Planetairies et Climatologie de la Terre (1979), Page 175, calls this ‘a fly in the insolation ointment’. Mercer, referring to Broecker, speaks of ‘a

Fly in the Ointment of the Milankovitch Theory,’ see Mercer, ‘Simultaneous Climatic Change in Both Hemispheres and similar Bipolar Interglacial Warming Evidence and Implications’ in Climate Processes and Climate Sensitivity’ (1984), pages 307-308, KRONOS, XII:2, page 67.’

If the astronomical theory Laskar has built solar system stability on is supported by correlations with climate changes, then the Ice Ages and interglacial periods associated with them should, when there is a glacial cold period at one polar region, there should be an interglacial warm period at the opposite pole. But there are glacials at the same times at both polar regions and interglacials at other times in both polar regions. Robert Kunzig points out that this problem is without any astronomical explanation:

“The then is the question of whether waxing and waning of ice sheets in the Northern Hemisphere could, as the Milankovitch theory assumes, drive all the other climate changes that have accompanied ice ages – the cooling and glaciation of the Southern hemisphere, for example, glaciers in the Andes and Antarctica have advanced at roughly the same times as those in the north, that is, at times when the [Milankovitch] orbital calculations should have been getting a lot of summer sunlight. There is no generally accepted explanation of why ice ages should be globally synchronized if driven by [Milankovitch] orbital fluctuations.”

Alan Graham puts it this way: “Another problem [with Milankovitch cycles] is that northern and southern hemisphere glaciations are nearly synchronous . . . but because of the Earth’s tilt, they should alternate.”

Velikovsky has also discussed Milankovitch cycles in Earth in Upheaval (NY 1955), page 124, that both Diacu and Laskar have never addressed while both suggest they read Velikovsky.

“More recently, M. Milankovitch introduced a third variation to obliquity of the ecliptic to correct some of the defects in Croll’s theory. In the opinion of his critics, however, his curve of climatic changes widely upset geological dates [as pointed out by Claibourn’s Climate, Man and History . . . pp. 123-124] nor do his variables offer sufficiently effective reasons for the vigorous changes in climate [see Claibourne pages 122-123]. AND WHY WERE THERE NO ICE AGES IN THE PAST, IF THE [ASTRONOMICAL] PROCESS RECURS AT CALCULABLE INTERVALS.” (Capitalization added)

Even Milankovitch, himself, clearly understood that problem. If his theory was right and these astronomical cycles were responsible for Ice Ages in the deep past, then there should be hundreds or even thousands of Ice Ages prior to the Pleistocene. In 1941, Milankovitch addressed this question in “Canon of Special Isolation and the Ice Age Problem, Royal Siberian Academy Special Publication, Vol. 32 (1941), P. 481. Alan Graham, in 1998, echoes this problem. “In particular, it is unclear why orbital variations should [only] produce extensive glacial-interglacial cycles during the last ~ [about] 2.4-1.6 myr [million years] but not earlier.”

Not only the non-alternating glacials and interglacials at both polar regions clearly negate Milankovitch, but the equatorial regions present us with the same negative evidence. Thus,

59 Graham, Late Cretaceous and Cenozoic History . . . , op. cit., p. 39.
if there is any lingering doubt about the efficacy of Milankovitch cycles to induce major climatic changes, I will present an astronomer and climatologist who address this problem. Sir Fred Hoyle, in 1981, wrote:

“. . . Slight changes in the tilt of the Earth’s axis give only negligible solar variations at equatorial latitudes; yet the last ice age produced the great glaciers on Mauna Loa and Mauna Kea in Hawaii and Mount Elgon in Uganda. Obviously something drastic happened in the tropics for which the Milankovitch theory cannot account.”

Walter Broecker, an earlier proponent of Milankovitch, had this to say in 1997:

“An important piece of information in this regard is the state of Earth’s system during the extreme cold millenniums of glacial times. At these times, all of Canada and a major part of the northeastern and mid-western United States were covered by ice sheets. The snow line descended about 1 km [3280 feet] on mountains elsewhere on Earth. Geomorphologists have traversed the globe comparing the elevation of the present-day mountain snowlines with those for the last glaciation. . . . Everywhere from 40° S to 40° N [latitude] snowlines descended . . . Thus, the southern Andes and New Zealand’s South Island, which now have very small glaciers, had quite large ones.

“What this tells us is that somehow, [the entire] Earth was in a much colder condition during the glacial periods. To my way of thinking, no one [including Milankovitch] has adequately explained how this could happen. We now have new evidence from glacial-age corals and from glacial-age ground water . . . that the tropics may have been as much as 5° C (9° F) colder during glacial times. How could the climate of the Earth have changed so much . . . ?”

Milankovitch fits none of these climate phenomena, but Laskar and Diacu maintain the astronomical theory which correlates with none of these forms of evidence vital to its support, must be right. What is needed in each of the cases presented above is a “fix it up” ad hoc hypothesis. Not just one but an entire suite of “fix it ups.” In exasperation, I ask where is Rube Goldberg when he is so badly needed to make over Milankovitch?!

Jagjit Singh has put his finger on the hub of the issue involved with Laskar’s analysis:

“Modern philosophy proposes . . . that logic and mathematics can give ‘absolutely’ certain knowledge. But an absolutely certain knowledge in an ever-changing world is not easy to acquire. The knowledge which logicians obtain from logic is of a rather trivial kind. It is ‘absolutely’ certain because it tells us nothing at all. For logic is only concerned with deducing valid conclusions from given premises. What is inferred as the conclusion is at the very outset contained in the premises from which the deduction proceeds. Thus, if all A’s are X and B is an A, then it follows that B is X. The deduction merely reiterates what lies already in the premises . . . [It] is a tautology; that is, a formula ‘whose truth is independent of the elementary propositions contained in it’ . . . this means it is true even if in the real world the objects corresponding to the symbol A do not have the character and quality of the symbol X . . .

60 Sir Fred Hoyle, Ice (NY 1981), p. 70.
61 Walter S. Broecker, GSA Today (May 1997), pp. 4-5.
“A tautology, therefore, is that combination of elementary propositions, which are always ‘true’ no matter whether its constituent propositions are true or false.”\(^{62}\)

In the face of all the contradictions to Milankovitch, which is the premise Laskar has built his mathematics around his conclusions, has nothing to do with climate. The astronomy he maintains is built on it is simply false. He has equations unrelated to glaciations and interglacial periods.

In a real sense, Laskar’s 20 million year stability analysis is not only based on the deeply flawed Milankovitch theory, but on a non-gravitational, mathematical process that is tied to that theory. He assumed that he had the real data upon which to employ his mathematics and therefore believed he had a match with reality. But his match was in reality a mathematical solution without any real physical evidence for it. To wit, it was only the mathematics that proved his case, not the supporting underlying physics. It was a syllogism based on an unproved premise. Naturally the middle of his syllogism, the mathematics, then gave him a conclusion that was there in the Milankovitch premise. J. Moser, one of the giants in Laskar’s field, readily admits this regarding solar system stability based on mathematical solutions.

“From a physical point of view, this model [of the solar system] is obviously hard to accept, but cannot escape these conclusions, if one idealizes the problem mathematically . . . In fact, the [mathematical] idealization goes further: We are not talking about the motions of planets under realistic forces, but of the n-body problem taking into account only Newton’s force laws and referring to mass points with some smallness restriction on masses.”\(^{63}\)

What Moser is telling us is that any analysis of solar system stability is based not so much on a physical foundation but on an idealized one in which there is a restriction on the sizes of the masses involved which excludes large masses or additional forces. As Paul F. Schmidt stated in *American Scientist*: “Mathematical propositions tell us nothing about the character of nature. They are uninterpreted formalisms.”\(^{64}\) Here, also, Diacu admits that the premise determines the conclusion. “Once the initial condition is known, the [mathematical] solution is completely determined. The present predicts the future [and the past] at least as far as the mathematics is concerned.”\(^{65}\) But how does anyone know the “initial conditions” accurately? More pointedly, how does Laskar know the initial conditions that existed in the solar system 20 million years ago or even 10,000 years ago? What Diacu and Laskar are stating, in other words, is what Charles Lyell argued for in the 19th century: “The present is the key to the past.” However, Celletti and Perozzi tell us otherwise:

“The word ‘chaotic’ summarizes many fundamental concepts characterizing [sic] a dynamical system such as complex predictability and stability. But above all, it acts as a warming of the difficulties which are likely to arise when trying to obtain a reliable picture of its past and future evolution. As an example, a commonly accepted definition states that a system is ‘unstable’ if the trajectories of two points that initially are arbitrarily close . . . diverge quickly in time. This has strong implications, as small uncertainties in initial conditions . . . might [also] be consistent with completely different future trajectories: The conclusion is that we

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\(^{64}\) Paul F. Schmidt in Dewey B. Larson, *The Case Against the Nuclear Atom* (Portland OR 1963), p. 82.

\(^{65}\) Diacu, Homes, *Celestial Encounters*, p. 43.
can exactly reproduce the motion of a chaotic system only if WE KNOW, WITH
ABSOLUTE PRECISION, THE INITIAL CONDITIONS – A STATEMENT
THAT, IN PRACTICE, CAN NEVER BE TRUE.\footnote{66}

Let us recall that Laskar has told us he clearly does not know what “close” means and
that his mathematical solution is, in reality, a probability analysis. How, then, can Laskar claim to
know how “close” the planets in the past actually were when he can’t define “close” in terms of
stability? And how can he know his probability theoretical mathematical analysis proves anything
with “certainty” when Celletti and Perozzi tell us that we have to “know with absolute precision
the initial conditions – a statement that in practice can never be true.” One does not prove a
certainty with statistical mathematics, that is, probability mathematics, without other forms of
scientific proof. To be certain that the solar system has been stable over the past 20 million years,
is to claim “infallibility.” What Laskar has done is made his mathematical explanation into an
infallible, unfalsifiable fact which is essentially not a scientific hypothesis, but a conjecture taken
to be true. But he is so convinced that that probability analysis is a fact or reality that he no longer
sees any need to distinguish it from the reality he is attempting to explain.

Along these same lines, Henri Poincaré wrote in his 1903 essay “Science and Method”:
“A very small cause that escapes our notice determines a considerable effect
that we cannot fail to see, and then we say the effect is due to chance. If we knew
exactly the laws of nature and the situation of the universe at the initial moment,
we could predict exactly the situation of that same universe at a succeeding
moment. But even if this were the case, that the natural laws had no longer any
secret for us, we could still only know the initial conditions \textit{approximately}. If that
enabled us to predict the succeeding situation with \textit{the same approximation}, that is
all we require, and we shall say that the phenomenon had been predicted, that is,
governed by laws. But it is not always so; it may happen that small differences in
the initial conditions produce very great ones in the final phenomenon. A small
error in the former will produce an enormous error in the latter. PREDICTION
BECOMES IMPOSSIBLE, and we have the fortuitous phenomenon."\footnote{67}

Diacu, also citing Poincaré, sums up the situation:
“People who are interested in celestial mechanics but can only follow them
from afar . . . must experience some surprise in seeing how many times the stability
of the solar system has been proved. Lagrange established it first. Poisson
demonstrated again, more demonstrations have come since, more will yet come.
Were the old proofs insufficient, or is it the new ones that are superfluous? These
peoples’ surprise will undoubtedly redouble if one tells that one day, perhaps, a
mathematician may show, by rigorous argument that the solar system is unstable.
This really could happen; there would be nothing contradictory about it . . . It is just
that they [the equations] are only successive approximations; thus, they do not
pretend to rigorously bound the elements of the orbits between narrow limits from
which we can never escape.\footnote{68}

What, then, is left of the concept that Laskar has absolute certainty of regarding the
initial conditions that existed in the distant past in the solar system? The only absolute certainty

\footnote{66} Celestial Mechanics, op. cit., p. 83. (Capitalization added)
\footnote{67} Poincaré in Peterson, Newton’s Clock, op. cit., p. 167.
\footnote{68} Diacu, Homes, Celestial Encounters, op. cit., p. 147.
is his equations and only his equations corroborated by nothing else except perhaps more mathematics. Hilton Ratcliffe hit the nail on the head when he wrote:

“The root of the current crisis in science is that we physicists so easily and so completely believe that the mathematical component in our education endows us, in some mysterious way, with a deeper and more profound understanding of nature. I don’t believe it does. It is my firm conviction [as an astrophysicist] that nothing in astrophysics, except quantities, need be expressed in mathematics exclusively, and surely, nothing belongs solely to [an] unapproachable [mathematical] elite.”

Laskar also stated:

“Even though the idea of a chaotic solar system may be surprising, and may even upset our conception of a world build on several centuries of stability . . . it is rather the contrary that has been extraordinary, to the extent that, since Poincaré, we know that most dynamical systems are not integrable and are therefore subject to this kind of [chaotic] behavior.”

In the final analysis, Laskar has no certainty, no absolute, scientific evidence that Milankovitch’s theory supports his mathematical/astrophysical claim.

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CHAPTER 4: “THE PROOFS” OF SOLAR SYSTEM INSTABILITY IN RECENT TIMES

All the arguments up to this point that dispute Velikovsky’s scenario of solar system instability are based only on mathematical equations applied to celestial mechanics. Here it will be counter-argued that to resort to only this single scientific discipline is not sufficient as proof. The way out of this one discipline argument is to examine a large number of other scientific disciplines that provide us with “specific scientific evidence” that can be employed to test the conclusions derived from mathematics. Here it is maintained that only a complete interdisciplinary scientific approach using several sciences can determine the question of stability or instability. That is, in fact, the approach employed by Laskar when he turned to Milankovitch to underpin his equations’ validity. If the solar system has been stable over at least 20 million years, then many, many other forms of scientific evidence must fully correlate, corroborate and be congruent with that paradigm, and they must correlate, corroborate and be congruent with one another. If, on the other hand, the solar system has been unstable extremely recently, as Velikovsky maintains, these other forms of scientific evidence must fully correlate, corroborate and be congruent with that theory and each other. This, in fact, is the scientific concept developed by the British science philosopher/historian, William Whewell, in the 1800s in his book, The Philosophy of the Inductive Sciences. He maintained that only when several fields of science could be integrated by one theory and not by any other was there a scientific proof, a reality check for that theory. He called this multidisciplinary/interdisciplinary integration “Consilience of Inductions.” That is, consilience of inductions occurs when theory explains data from many different fields and unifies them. Even if a theory originally did not consider these other scientific evidences if they could be incorporated into it – taken together – they were a basis for the criterion of truth. Stephan Artmann summarizes Whewell’s:

“Voluminous work on the Philosophy of the Inductive Sciences. According to Whewell, the consilience of inductions – literally, the jumping together of [different] inductive references (Whewell 1847: 65) = […] takes place when an inductance obtainable from one class of facts, coincides with an induction, obtained from another different class. This consilience is the test of truth of a theory in which it occurs.”1 Whewell gives a reason for this truth-ascertaining power of consilience that a scientist, who inferred a hypothesis to explain one class of facts, did not pay attention to some other class of facts in making the inference – nevertheless, this second one turns unintentionally out to be explainable by the very same hypothesis ‘[…] we have a criterion of its reality which has never yet been produced in favor of falsehood.’ (Whewell 1847: 68.)”2

Whewell was speaking of gravitational theory as one of the examples, yet his concept must apply to any theory. But in spite of this interdisciplinary “consilience of inductances,” for all its strengths, it is not, nor can any theory, encompass total reality, because at no time does anyone know everything. Although it is not the sine qua non for discovering ultimate truth, it can

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1 Whewell 1847: 469.
more accurately approximate the difference between false and true theories. The great English astronomer, Sir John F. W. Herschel, was deeply attracted to this concept and stated:

“If, in our induction, every individual case has actually been present in our minds, we are sure that it will find itself duly *represented* in our final conclusion: But knowing this is impossible for such cases as were unknown to us and hardly ever happens even with all the known cases; for such is the tendency of the human mind to speculation, that on the least idea of an analogy between a few phenomena, it [the mind] leaps forward, as it were, to a cause or law, to the temporary neglect of all the rest [of the different sciences and their evidence] so that, in fact, almost all our principle inductions must be regarded as a series of ascents and descents, and of conclusions from [only] a few cases verified by trial on many … [but] the surest and best characteristic of a well-founded and extensive induction, however, is when [many] verifications of it spring up, as it were, spontaneously, into notice, from quarters where they might least be expected, or even instances of that very kind which were at first considered hostile to them. Evidence of this kind is irresistible, and compels assent with a weight when scarcely any other [theory] possesses.”

Mary B. Hesse, who has extensively examined Whewell’s “consilience of inductions,” which I call “interdisciplinary science,” has presented what I suggest is very much like the approach to the chronology of the ancient work that I have termed “forensic history.” In the four volumes of *Pillars of the Past*, that interdisciplinary scientific approach showed how many different scientific disciplines “jump together” to uphold a far shorter chronology of the ancient world than that of the established chronology or any other. This I will apply below to the theory of solar system stability and the timeline of Velikovsky’s theory. Hesse nicely summarizes Whewell as well as my approach:

“Whewell’s view of induction is one of *colligation*, or ‘tying together’ of facts by fundamental *ideas* and their particular applications as conceptions . . .

“Some conceptions constitute good inductions and theories, some do not . . . When the inductions [from many scientific fields], as it were, jump together to produce a unified coherent simple theoretical system, Whewell speaks of *consilience of inductions* and regards the conceptions responsible for consistence [correlating and corroborating it and each other] as thereby self-validating. It is impossible he thinks to doubt the truth of a hypothesis in which conceptions tie together facts that produce [a] good fit, especially when the chances of a good fit being produced by accident are very good . . . In general, false theories [like the Milankovitch astronomical theory] require a new *ad hoc* supposition for every new phenomena and become ever more complex as attempts are made to explain more data [that conflict with the theory]; true theories become more simple relative to their comprehensiveness, unity and simplicity are the signs that the true and clear conceptions of good science has been arrived at . . . The test for a good hypothesis according to Whewell can be summarized as follows:

“(1) It explains two or more already know classes of facts or laws.

“(2) It successfully predicts ‘cases’ of a *kind different* from those which were contemplated in the formation of our hypothesis.

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“(3) It successfully predicts or explains phenomena which on the basis of previous background knowledge are surprising, that is, would not have been expected to occur.

“(4) It produces unity, coherence, simplification in the total theory.

“(5) It shows that facts previously thought to be of different kinds are after all in essence of the same kind.”

Stephen Jay Gould has concluded that “consilience of inductions” underpins Darwin’s theory of evolution and, therefore, its validity is that of a true theory.

“Whenever he introduces a major subject, Darwin fires a volley of disparate facts, all related to the argument at hand – usually the claim that [each] particular phenomenon originated as a product of [evolutionary] history. This style of organization virtually guarantees what Whewell’s ‘consilience of inductions’ must become method of the Origins. Darwin’s greatest intellectual strength lay in his ability to forge connections and perceive webs of [interdisciplinary] implication (that more conventional thinking, in linear order might miss).”

In terms of astronomy and cosmology, Stephen Hawking echoes Whewell’s concept as late as 2001:

“A scientific theory is a mathematical model that describes and codifies the observations we make. A good theory will describe a large range of phenomena of a few simple postulates that can be tested. If the predictions agree with the observations, the theory survives the test, though it can never be proved correct. On the other hand, if the observations [from many scientific disciplines] disagree with predictions one has to discard the theory.”

Whewell saw his consilience of inductions as extremely important:

“By this means the streams of knowledge from various classes of [scientific] facts will constantly run together into a smaller and smaller number of channels, like the confluence of a great river, coming together from many sources, uniting their ramifications so as to form larger branches, these again unite into a single trunk. The genealogical tree of each great portion of science, thus formed, will contain all the leading truths of the sciences arranged in their due coordination and subordination.”

Lastly, on this point, William Mullen discusses Velikovsky’s hypothesis in the very same light:

“Just as all the colors of the spectrum united to make a white light, so all the disciplines in science make one mode of science. Not the least effect of a Velikovskian revolution should be to make scientists unable to forget that certain problems can be solved only if data from the most widely divergent fields are considered together. Interdisciplinary research will have to be . . . regarded not as a luxury but an essential.”

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One cannot maintain that solar system stability is a fact/reality based on one discipline—celestial mechanics—which has been shown in chapters I and II, is not mathematically connected with gravitational theory, nor with the stability of the solar system. Thus, if numerous facts from many other scientific disciplines contradict solar system stability but correlate, corroborate and are congruent with Velikovsky’s theory over and over and over again, one must bow to the interdisciplinary facts while celestial mechanics, as a mathematical expression of the $n$-body problem, at best, gives us approximations and probabilities we will discover that there are a plethora of scientific facts from several other scientific disciplines that jump together that prove Velikovskian solar system instability. Mathematical theory cannot be correct, no matter how well organized and integrated its numbers are that fit into a beautiful arrangement when these numbers are contradicted by an entire suite of interdisciplinary scientific facts.

This particularly applies to the chronology or the timing of when in the past this instability happened and for how long it lasted.

In this regard, astronomy, the “Queen of the Sciences,” has always been invoked to criticize Velikovsky as if it was perfect. John P. Playfair, as early as 1822, put the case of the dominance of astronomy over all the sciences thus:

“Astronomy is distinguished by several great and striking characters, which place it decidedly at the head of the physical sciences. The objects which it treats of cannot fail to impart to it a degree of their own magnificence and splendor; while their distance, their magnificence, the steadiness and regularity of their movements, deeply impress the imagination and afford a noble exercise to the understanding. Add to this that the history of astronomy is that which is best marked out in the progress of human knowledge. Through the darkness of the early ages, we perceive the truths of this science shining as it were by their own light and scattering some rays around them that serve to discover a few definite objects amid the confusion of ancient tradition—a few fixed points amid the uncertainty of Greek, Egyptian or even Hindu mythology. But what distinguishes astronomy the most, is the perfect explanation which it gives of celestial phenomena. This explanation is so complete, that there is not any fact concerning the motions of the heavenly bodies, from the greatest to the least, which is not reducible to one single law—the mutual gravitation of all bodies to one another with forces that are as the masses of the bodies, and inversely as the squares of their distances. On this principle Sir Isaac Newton long ago accounted for all the great motions in our system; and on the same principle, his successors, after near a century of the most ingenious and elaborate investigation, have explained all the rest.”

Lynn E. Rose has put his finger on this problem in 1974 and 1977 when he published his analysis, “The Domination of Astronomy over other Disciplines,” in the journal KRONOS, where he explains:

“Once upon a time there was a young Macedonian named Aristotle who believed that the Earth and the objects on it were radically different both in composition and in behavior from the objects in the heavens. Aristotle worked out a very complex, purely speculative theory that objects on Earth are composed of one sort of material and obey one set of laws of motion and that objects in the heavens are composed of an entirely different sort of material and obey an entirely different set of laws of motion. Furthermore, objects in the terrestrial realm are

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subject to all sorts of changes – such as coming – into – being and passing-away, or generation and corruption – whereas in the celestial realm nothing ever changes: The heavenly bodies move along forever in perfect circles on perfect spheres, with perfectly uniform speeds. By their very nature, substance, and laws of motion, the unchanging heavens are completely divorced from the terrestrial world of change and corruption. The precise and uniform speeds and geometrically perfect paths make it possible [as is done today] to calculate the past and future positions of the heavenly bodies with absolute precision, for none of the variations or indefiniteness of the terrestrial realm interferes with such calculations:

“The Aristotelian views is that the heavens are made of a nobler substance than are the humble objects on Earth and that the science that studies the heavens is therefore a nobler [more exact calculable] science than the mundane sciences of biology, geology, chemistry . . . [etc.] Thus we have the view that astronomy is ‘the queen of the sciences’. This view that astronomy is the queen of sciences has been with us for more than two thousand years; its popularity remains high especially with astronomers.”

The reason for this belief in the superiority of Astronomy is that it is based on mathematics which few people can follow. I clearly remember, when I studied geology in college, that my professor once said that geology wouldn’t be a science unless its truths could be placed in mathematical form. I sensed his feeling at that time of his discipline’s inferiority to astronomy and physics. The astronomy professor that I studied under had no such feeling, but felt that his mathematical skills were still not up to par as those others in the field. It was made clear to me and to the professors that mathematics made science true and the greater the mathematics applied not only the more accurate was the science and the more in contact that science was with physical reality. Rose adds:

“But has not the Aristotelian viewpoint been abandoned by modern astronomy? Not really. Astronomy has changed its tools and some of its terms, but not its stripes. It has only superficially emancipated itself from the circle – happy thinking of Aristotle, Ptolemy, and Copernicus. The circular has been replaced by the cyclical and the periodic, but the effect is the same; just as a combination of perfect and uniform circular motions once permitted backwards and forwards calculation of planetary positions without effective limit, so today it is claimed that a combination of precise cyclical of periodic components (with some secular ones taken into account also) permits calculations of planetary positions . . .

“The considerable success that modern astronomers have enjoyed in predicting planetary positions years in advance has eroded their caution. They forget that such predictions work out only if the present factors affecting the orbits are unchanged. If a black hole or other massive [rogue planet] body passes through the solar system . . . – those calculations and predictions will have to be done over.”

Rose goes on to explain:

“Representatives of those disciplines upon which Velikovsky’s work has had repercussions frequently says that they need not look into Velikovsky’s radical proposals because the astronomers have already shown that Velikovsky cannot be

11 Ibid., pp. 58-59.
correct in claiming the occurrence of near collisions of planets within historical
times. Thus, one of the reasons that Velikovsky has been denied an adequate
hearing within the various relevant disciplines is that those disciplines have
accepted the questions – begging arguments offered by the astronomers."

“This subalternation or subordination of the various disciplines to the discipline
of astronomy has by now become sacrosanct. To quarrel this this state of affairs
means rejecting some of the most sacred beliefs and most cherished habits of at
least a score of different disciplines at once. It means telling the established leaders
in those disciplines that the labor of decades . . . may all have to be set aside because
of the claims of an outsider. It means tackling both the astronomical queen and her
geological, biological . . . hand maidens. It takes a person of exceptional courage
and of exceptional breath and competence to dare to do this.

“Such a person is Immanuel Velikovsky . . .”

In this respect, Otto O. Binder and Max H. Findt tell us:

“‘Science today,’ write a . . . professor of philosophy at the State University of
New York, ‘is divided neatly into compartments and niches (specialties) quite
unlike the real world. The true universe,’ she continues, ‘is fused in oneness and
cannot be successfully analyzed to treated in fragmentary form.’

“If each science specialty,’ she concludes, ‘restricts itself to its own selected
subject matter with no serious regard for the relevance of other specialties and no
real effort toward synthesis’ what chance is there for any ‘coherent and integrated
master theory’ ever emerging?

“The key word is synthesis, and the plea is for an interdisciplinary approach to
a major theorizing. And this is precisely what the controversial figure, Dr.
Immanuel Velikovsky, has done with his . . . theory – shattering concepts in order
to bring forth a ‘unified’ theory crossing all scientific lines and binding them into a
whole that reflects the true oneness of the universe and its phenomena.”

I deny the single discipline approach of mathematics for the solution of solar system
stability, and, therefore, will employ Whewell and Velikovsky’s multi/interdisciplinary approach
to analyze this question.

EARTH, MARS AND VENUS: THE INTERDISCIPLINARY EVIDENCE
FOR SOLAR SYSTEM INSTABILITY

One aspect of the nature of the criticism of Velikovsky is that often those who raise
these critiques are extremely ignorant of other forms of interdisciplinary evidence outside
astronomical calculations. For example, it is important to show this, especially for an astronomer
steeped in celestial mechanics, who apparently not only failed to read Velikovskian literature, but
Velikovsky himself. In this respect, Florin Diacu states, “When Columbus, for instance, claimed
that the world was round and that sailing west, he could reach India, very few believed him.
Though he was not credible, Columbus was right.” This analysis by Diacu has long been known

12 Ibid., p. 62.
13 Otto O. Binder, Max H. Findt, We Are the Children of the Stars . . . Dr. Conrad Borovski, transl.
(Charlottesville, VA 2013), pp. 6-7.
14 Diacu, The Lost Millenium, op. cit., p. 245.
to be false and Diacu would have known this if he had availed himself of Velikovskian literature. This falsehood was pointed out in my article, “Propaganda and Scientific History, Christopher Columbus and the Flat Earth, Immanuel Velikovsky and Carl Sagan,” in *The Velikovskian*, Vol. V, No. 1 (2000), pages 87-88. There it was presented that Jeffrey Burton Russell’s book, *Inventing the Flat Earth, Columbus and Modern History* (NY 1997) that showed those who opposed Columbus well knew the Earth was a sphere. Among those who were cited on this question was the great American historian, Samuel Elliot Morrison (p. 89):

“What then becomes of the celebrated sessions of the University of Salamanca, before which Columbus argued his case and was turned down because he could not convince them that the world was round? This is pure moonshine . . . A gripping drama as [Washington] Irving tells it . . .

“Yet the whole story is misleading and mischievous nonsense . . . The sphericity of the globe was not in question. The issue was with the width of the ocean [between Europe and China] and there the opposition [to Columbus] was right.”

Lester C. Thurow specifically tells us:

“Columbus knew the world was round, but he thought that the diameter of the world was only three-quarters as big as it really is. He also overestimated the eastward land distance to Asia and, therefore, by subtraction, grossly underestimated the westward water distance [across the Atlantic Ocean] to Asia . . . Given the amount of water put on board without the Americas [existing], Columbus and all his men would have died of thirst.”

Ryan Somma further explains:

“In many American public schools, we are taught that Columbus’ journey to find a western route to India was all the more amazing because everyone at the time thought the Earth was flat . . . the reality was that the Earth’s spherical nature was a well-established fact. Aristotle knew the Earth was round. Alexandrian philosopher, Eratosthenes, had estimated the size of the Earth, and early Romans were the first to suggest the idea of a westward route to India. Columbus’ opponents [also] knew the Earth was round; however, they [rightly] believed the explorer had grossly underestimated its size.”

Some may call this nit-picking because it has nothing to do with Velikovsky’s hypothesis. The point, however, overlooked by such criticism fails to address the fact that Diacu, like so many, many others in the ever-ongoing Velikovsky Affair, never or rarely apprise themselves of all the Velikovskian literature or discuss their work with those of us who are proponents of his ideas. In Diacu’s case, the situation gets far worse because he also claimed to have read Velikovsky’s book, *Worlds in Collision*, as well as *Earth in Upheaval*. Claiming to have done so, he nevertheless wrote the following in 2010:

“In 1955, Velikovsky published *Earth in Upheaval*, in which he addressed climate change, a phenomenon he explained through his catastrophic scenario. Since average temperature are almost constant over millennia, only the ramblings of his comet, whose approach had upset the direction of Earth’s axis, could account for the discovery of frozen mammoths with undigested food in their stomachs. These animals had experienced an instant climate shift. The experts who had

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discovered rapid temperature drops in the past were proving him right. Or so he thought.

"His arguments, however, are easy to refute. The mammoth literature reveals aspects Velikovsky omitted. The frozen specimens were mutilated and rotten and their veins contained coagulated blood which suggests death by asphyxiation. Endowed with wooly overcoats and fatty bodies, mammoths couldn’t have died of cold."¹⁷

According to Diacu, Velikovsky claimed that the woolly mammoth found frozen in the Arctic muck died because when the axis of the pole shifted, they froze to death. However, Diacu never cites a single place in Velikovsky’s two books he placed in his bibliography (page 192) where Velikovsky claimed they died from cold. The reason is that Velikovsky never made any such claim. As with his Columbus-Flat-Earth presentation, “His argument . . . [is] easy to refute.” The fact of the matter is that Velikovsky claimed exactly as Diacu had that the mammoths died of “asphyxiation.” Velikovsky actually wrote in Worlds in Collision the following statement:

“The sudden extermination of mammoths was caused by a catastrophe and probably resulted from asphyxiation or electrocution. The immediate subsequent movement of the Siberian continent into the polar region is probably responsible for the preservation of the corpses.

“It appears that the mammoth, along with other animals, were killed by a tempest of gases accompanied by a spontaneous lack of oxygen caused by fires raging high in the atmosphere. A few instances later, their dying or dead bodies were moving into the polar circle.”¹⁸

Why didn’t Diacu present his evidence to his readers if, as he claims, he read Worlds in Collision? Here Velikovsky, who had a medical degree and knew that coagulated blood and other tissue in a body was evidence of asphyxiation and specifically stated the mammoths died of “asphyxiation,” were killed by a tempest of gases accompanied by a spontaneous lack of oxygen” and only after that their dying or dead bodies were moving into the polar circle.” Diacu’s account of this matter is a tragically grotesque misrepresentation like many others that have chilled Velikovskian studies for science and academia. On the other hand, Diacu states: “More personally, the Velikovsky episode was a humbling experience for me. I learned to be cautious and careful about the application of scientific theories to humanistic study . . .”¹⁹ What in scholarly parlance is Diacu talking about? His misrepresentation is simply reckless, not to say disgusting!

We must not be too uncivil with Professor Diacu since he is apparently suffering from a bad case of intellectual, scientific and moral constipation!

With regard to interdisciplinary evidence, Diacu apparently does not understand what happens to blood cells and tissues from slow freezing which is a well-known phenomenon of medical science, that is, biological science. Ivan T. Sanderson, in this respect, explains what happens to the tissues and red blood cells in frozen mammoths, namely, they were still intact, whole, that is, unburst.²⁰ If tissue cells were frozen slowly, as Diacu asserts, ice crystals would have develop in the watery plasma and grow larger and larger until they actually burst the cells.

¹⁹ Diacu, The Lost Millennium, op. cit., p. 31.
Francis Hitching reports: “Slow freezing will not leave unburst cells . . .” which is what was found in the mammoths.21 Harold Hapgood, a proponent of pole shifts, whose work Einstein endorsed, cited a paper in the journal *Science*, for September 1956, by Harold T. Meryman: “There are only two ways, according to Meryman, to prevent [cell] damage. First . . . ‘the temperature may be reduced immediately after freezing to very low stabilizing temperatures.’ The other way artificial [something not possible with ancient frozen mammoths]; it consists of using glycerin to bind water in a liquid state, preventing freezing.”22 Hapgood further cited Herbert Harris’s article about the Birdseye company’s frozen foods test in *Science Digest*.

“What Birdseye has proved was that the faster a food can be frozen at ‘deep’ temperatures of around minus 40 degrees Fahrenheit, the less chance there is forming large crystals that tear down cellular walls . . .”23

So what was the temperature drop necessary to freeze these giant mammoths and preserve their inner contents – blood – and actually stop their stomach enzymes from digesting food in them – buttercup seeds were found in one case in a mammoth’s stomach. R. Dale Guthrie reports: “An unopened animal continues to decompose after a fresh kill, even at very cold temperatures, because the thermal inertia of its body is sufficient to sustain microbial and enzyme activity as long as the carcass is completely covered with an insulating pelt and the torso remains intact.”24

“Examination of its stomach [contents] had somehow been frozen instantaneously. Hapgood had approached the Birdseye Frozen Food Company to ask how they would freeze a mammoth so that even its stomach was frozen solid and they admitted that they would find it almost impossible, or there is no known method of freezing something organic of that size so quickly. Even in the coldest deep freeze, it would take days.”25

The scientific interdisciplinary evidence of “thermodynamics” for freezing and preserving tissues of mammoths negates Diacu’s understanding. If, as he maintains, they were not frozen after death almost immediately, their stomach tissues and materials would have been destroyed. The science is unequivocal. But Diacu will not deal with this interdisciplinary evidence nor own up to this interdisciplinary “scientific fact.” And this was pointed out by me in *The Extinction of the Mammoth* (Forest Hills, NY 1997), pages 6 and 7, that Diacu clearly has not read. The point that must be emphasized is that critics of Velikovsky often never read and/or evade answering interdisciplinary scientific evidence when they have no answer. I have seen nothing about this problem from any of Velikovsky’s critics. They discuss everything else about mammoth burial and preservation except that slow freezing will never allow internal tissues to survive intact. Perhaps Diacu will surprise and inform us about this matter. The point is that the interdisciplinary sciences of thermodynamic and biology jump together to correlate with Velikovsky’s explanation for the freezing of mammoths and contradict the concept that these giants were frozen slowly. The interdisciplinary evidence upholds Velikovsky’s theory and contradicts the slow-freezing theory.

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23 Ibid., p. 260.
TERRESTRIAL POLE SHIFTS IN RECENT TIMES

“In 1825 the great French astronomer, Laplace, laid down the dictum which became almost scientific law itself: ‘The whole of astronomy is based on the invariability of the position of the axis of rotation of the Earth . . .’ The point was never proved, yet the idea that our planet’s axis could have suffered any change . . . became scientific taboo.”

Peter James, Nick Thorp, *Ancient Mysteries* (NY 1999), page 143.

“Astronomers could explain the solar system with astonishing precision using gravitational equations that could not accommodate the shenanigans of planetary bodies and many also claimed that there are an unbroken chain of eclipses going back to the third millennium B.C., excluding [Velikovsky’s] shifts in poles.”


Of course, if as Michael Gordin claims above, a precise, unbroken chain of eclipses going back before Velikovsky’s pole shift events would disprove they happened. But, what Gordin has reported as evidence is also blatantly false. Velikovsky was attacked with this same evidence by Professor John Q. Steward, not James Q. Steward, as Gordin has mistakenly named him. In *Harpers Magazine*, for June 1951, Velikovsky actually rebutted this criticism showing that prior to 700 B.C., eclipses were unknown as to their location or to the precise time they occurred or were not known to be eclipses at all. In fact, one of the greatest authorities on eclipses has written extensively about this: F. Richard Stephenson states emphatically: “However, numerous reports of both solar and lunar eclipses . . . to be investigated [are] with fair precision [only go] as far back as 700 B.C. [after Velikovsky’s pole shifts]. Regrettably, the few eclipse observations which survive from still earlier centuries tend to be of dubious reliability (Stephenson 2008). In general, either the date or place of the observation, or even interpretation of the phenomenon as an eclipse is in doubt, for these archaic records. Hence, little is known about the history of the Earth . . . prior to 700 B.C.”

This is the very same thing that Velikovsky reported back in 1951. In my book, *Pillars of the Past, Vol. III* (Forest Hills NY 2010), pages 194-213, it was also specifically shown with citations from the scientific astronomical literature that eclipse records can only be accurate no further back in time than around 700 B.C. (not to the “third millennium B.C.”), as Gordin tells us.

Gordin’s statement is blatantly dishonest! The evidence was there in the Velikovskian literature 50 years before Gordin published this. Nevertheless, Gordin withheld this astronomical

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evidence from his readers. His failure to present evidence which directly contradicted his ex-
cathedra pronouncement makes it strikingly clear Gordin suppressed evidence and thus he is no
different than all the earlier dishonest critics of Velikovsky. Therefore, his book is now part and
parcel of the never-ending Velikovsky Affair. It is also my contention that he will never admit
these facts exist nor retract this disinformation he reintroduced to the cacophony of Velikovsky’s
critics, just as did all the other critics who failed in their scholarly duty. The depth of depravity
exerted by highly educated scholars, and their failure to play by ethical rules when it comes to
Velikovsky, it seems, will never end. Their duplicity is just that – duplicity! Because of this lapse
in honesty by Gordin, those interested in Velikovskian research should not trust anything he says
about Velikovsky.

With regard to Professor Michael D. Gordin’s book on Velikovsky, I have read it and
can honestly report citing and paraphrasing Mark Twain respecting Gordin’s probity:

“Perhaps I am not a humanist but I am a first-class fool – a simpleton: For up
to this moment I have believed . . . [Professor Gordin] to be a decent person whom
I would allow to mix up with my friends and relatives. The exhibition he has made
[in his book on Velikovsky] of himself reveals him to be a scoundrel and a knave
of the deepest dye. I have been cruelly deceived and it serves me right for trusting
[such a critic of Velikovsky from Princeton University]. Yes, I do understand
figures. I can count. I have counted the words in [Gordin’s] drivel. (I certainly
cannot call it a balanced analysis), and there are exactly [thirty] thousand four
hundred and thirty-nine [words in it]. I also carefully counted the lies – there were
exactly [thirty] thousand four hundred and thirty-nine. Therefore, I leave Gordin
to his fate.”

Professor Gordin has placed my book and journals with the Velikovsky archive in
Princeton’s library. After reading this material, I suspect that my books and journal will somehow
evaporate into thin air. Perhaps I am wrong, but book burning may still be in vogue. So be it.

This stable pole dictum is again based solely on equations of gravity. Because of this,
the responses to Velikovsky that the axis of rotation has tilted greatly in relatively recent times and
even historical times as a result of celestial planetary interactions, or that the crust moved greatly,
or both occurred has been denied. These climate changes could not be due to a pole shift, we are
told, and the evidence against Velikovsky’s theory can be briefly described. For example, Arysio
Santos, as late as 2011, writes:

“According to this hypothesis – originated by I. Velikovsky [Hapgood and
others] . . . – the crust of the Earth suddenly shifted . . .

“Alas, several serious problems invalidate this theory.”

Santos maintains that a:

“Pole shift is both a physical and geological impossibility. In effect, what Pole-
Shifters do is to sorely confuse Magnetic Pole Shift with Terrestrial Pole Shift.
These are two entirely different things that have very little if anything to do with
each other. Geologically speaking, both the mantle and the crust are solid.

“Moreover, they are firmly anchored to each other so that their relative motion
is virtually impossible. Physically speaking the Law of Conservation of Angular
Momentum prevents the crust from shifting . . . from its actual position in relation
to space, more or less as happens with a gyroscope . . .

27 Mark Twain’s Speeches (NY 1910), p. 277.
“In contrast, the position of the Terrestrial Pole is dictated by the motion of the crust in relation to the mantle both of which are solid, and actually far stronger than steel in their rocky positions.

“Mountains such as the Rockies and Himalayas have ‘roots’ just like teeth do. These roots firmly anchor the crust to the mantle, more or less as our teeth are fixed by their roots to the maxillas. Even if the asthenosphere [between the crust and mantle] were molten, as some experts unduly think, these roots would prevent the crust from slipping.

“They would serve as some sort of anchor even in the presence of a molten layer of magma [but this molten layer nevertheless allows] . . . the crust [to] very slowly move . . . in relation to the mantle, as is now explained by Plate Tectonics.”

Notice how Santos maintains a “pole shift is both a physical and geological impossibility” because the “mantle and the crust are solid” and “firmly anchored to each other.” The mountain ranges, having roots “just like teeth . . . firmly anchor the crust to the mantle . . . as our teeth are fixed.” Even a molten magma layer, “as some experts . . . think, would prevent the crust from slipping.” But although moving the crust being “both a physical and geological impossibility,” the crust can still shift slowly, “as is now explicitly recognized by [the theory of] plate tectonics.” In essence, according to Santos, it is physically and geologically impossible to shift the crust, but it does shift! John white adds:

“In summary, from the scientific perspective, the question of previous pole shifts appears to be resolved in favor of a non-capsizing planet with stationary poles. Velikovsky’s case has been demolished; the evidence he offers for recent catastrophes can be explained by non-catastrophic processes . . . so with these refutations of major categories of evidence for the pole shift concept, the case for pole shifts is now virtually non-existent.”

Along these physical lines respecting pole shifts, Velikovsky cited Rev. E. Hill (1878) on which I will enlarge:

“Mathematicians may seem to geologists almost churlish in their willingness to admit a change in the Earth’s axis. Geologists scarcely know how much is involved in what they say. They do not seem to realize the vastness of the Earth’s size or the enormous quantity of her motion. When a mass is in rotation about an axis, it cannot be made to rotate about a new one except by external force. Internal changes cannot alter the axis, only the distribution of matter . . . about it [can].

“If the mass began to revolve about a new axis, every particle would begin to move in a new direction. What is the cause of this?

“When a cannon ball strikes an iron plate obliquely, the shock may deflect [it] into a new direction. The Earth’s equator is moving faster than a cannon ball. Where is the force that could deflect every potion of it and every particle of the Earth into a new direction of motion? The cannon ball is slightly and slowly deflected by gravity. But the attraction of the Sun and Moon would produce on a slightly distorted globe no effect essentially different from what they produce now. No other force exists of producing any effect at all.

“Even if geologists will give up asking for a tilt of the axis and be content with a new shape, still the mathematician asks whether they have realized the Earth’s

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size. ‘It’s deviation from a [perfectly smooth] sphere is trifling in amount.’ In what amount? In [its] figure doubtless. Were its [cross] section drawn on this page a microscope would be wanted to see the curve from a [perfect] circle. But in quantity, the deviation [of the equatorial bulge] is not trifling. The height of the highest mountain and the depth of the deepest sea [added] together would not perceptibly increase the volume of the [ca. 13 mile] equatorial protuberance. The mass of all the continents, reinforced by all the seas, would not be a fifth part of it [the equatorial bulge]. To change the Earth’s shape, this vast [equatorial] protuberance must be shifted or masked. Where is the power that can shift it, the elevation [created anywhere outside the bulge] that can mask it? . . . Take an extreme supposition. Remove 10,000 feet [almost two miles] of rock from the surface of one-half the Earth and spread it over the other half. You could not thereby bring the pole half-way to the present Arctic Circle.”

The mathematics is unequivocal as a proof that the pole cannot shift. However, it again, as with the concept of solar system stability, assumes that nothing large, like the planet Venus, came close to the Earth, gravitationally attracted its equatorial ocean bulge and set it in motion away from the equator so that the distribution of surface water moved from the equator to the polar regions. This would move the polar axis because the figure of the Earth would be massively changed with less water mass at the equator and more at regions near the poles. And the water mass would not be evenly distributed, even in the polar regions, to allow an ever greater pole shift.

Along these lines, J. L. Casti argues:

“It is a commonplace in science to offer scenarios for explanation of certain phenomena, such as the origin of life or the extinction of the dinosaurs when we don’t have a complete set of data to construct the exact circumstances of the process. However, in science, such scenarios must be consistent with known laws and principles . . . implicitly. Pseudoscience engages in explanation by scenario alone, i.e., by mere scenario without proper backing from known laws. A prime offender in this regard was Immanuel Velikovsky, who stated that Venus’ near collision with Earth caused the Earth to flip over and reverse its magnetic poles. Velikovsky offers no mechanism by which this cosmic event could have taken place, and the basic principle of deducing consequences from general principles is totally ignored in his ‘explanation’ of such phenomena.”

While Casti wrote this in 1992, he sadly failed to read the literature, even the literature by opponents of Velikovsky who addressed Velikovsky’s scenario 18 years earlier. Like Diacu, Shapley and all the others outlined in The Velikovsky Affair, he did not apprise himself of the literature and raised an accusation that was answered by one of Velikovsky’s early critics at the AAAS Symposium on Velikovsky. This concept of a pole shift was completely admitted by J. Derral Mulholland at the 1974 AAAS Symposium on Velikovsky based on scientific laws and principles:

“Are the explanations plausible? From at least one vantage point [celestial mechanics], yes indeed. If a planet-sized object were to pass close by the Earth. Then giant tides [rushing away from the equatorial regions] would be raised; there would be global Earthquakes, [lifting whole regions and lowering others], the pole

would change direction . . . Faith is not involved here. These are unavoidable consequences of the laws of motion as we presently know them. We must accept that the dynamical aspects of Velikovsky’s visions . . . are largely acceptable.”

On the other hand, creation scientist, Michael J. Oard, argues Velikovsky is wrong and writes:

“Charles Ginenthal (1997) [in his *The Extinction of the Mammoth*], provided an updated modern defense of Velikovsky’s hypothesis . . .

“Velikovsky and Ginenthal suggest that a sudden shift of the axis of the Earth . . . The warmer Siberian climate attracted migrations of mammoths. Later about 3500 years ago the axis shifted back to its present 23 ½ degrees.

“Velikovsky’s and Ginenthal’s hypothesis has . . . one fatal [problem]. A pole shift to a more vertical axis would *result in an ice age*, not a sudden warming.”

What Oard has omitted is that if there was an ice age, not a sudden warming, is that as we will see below, large trees would not have also migrated northward via seed dispersal, which is just what I pointed out in *The Extinction of the Mammoth*, happened with a more vertical pole, but more on this below.

What Velikovsky’s proponents face is not the mathematical equations for the stability of the axis of rotation, since Mulholland maintained Velikovsky’s concept is “largely acceptable.” The question is: What are the interdisciplinary scientific proofs that correlate, corroborate and are congruent with Velikovsky pole shift theory, but contradict a stable terrestrial axis? Santos puts the problem in this way:

“One should keep in mind that in science, as in everything, the burden of proof lies with the allegers [of a pole shift theory]. So it is incumbent on the proponents of Pole Shift to prove their case demonstrating the physical reality of their proposal with more than just words alone.

“Until then, we should let their case rest and be filed away in the already over-loaded cupboard of dead files or odd proposals too badly contrived and poorly argued to be accepted by science.”

The one assumption made to disprove Velikovsky’s scenario of axial shifts is that nothing large came close to the Earth in recent times. It is only the equations that are relied upon to make that case, but what does the interdisciplinary, scientific evidence say? Therefore, I will undertake to prove Velikovsky’s case “with more than just words alone” but with scientific evidence from many other disciplines. Before beginning, it must be pointed out that Velikovsky held that the mammoth and other megafauna that inhabited the circumpolar regions did not live there during the Ice Age when that vast expanse of territory was either covered by an ice sheet or was mostly a frozen tundra desert. Instead, he claimed that they lived there during an exceedingly warm period, known as the hypsithermal – 8,500 – 1500 B.C. – when it is well-known and understood, as pointed out in my book, *The Extinction of the Mammoth*, that these regions were covered by forests and grasslands. Velikovsky maintained that, in this period, the vegetation provided food for all these massive animals, so they could thrive there, and that it ended with a pole shift ca. 1500 B.C., and another in the 8th century, B.C. The first climate shift/pole shift killed the

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megafauna; the second, around 800 B.C., created the present climate conditions of our planet. If, then, as Velikovsky holds, the pole prior to ca. 1500 B.C. was only tilted slightly, say about nine to ten degrees, much less than the 23 ½ degrees tilt today, this would have expanded the temperate zone both northward and southward by about 8.5 degrees in each direction and the plants that could grow in these regions would reflect this by growing and being found there.

One, therefore, is thrown back onto the science of botany and, more specifically, plant geography. If Velikovsky is right, then the remains of temperate plants will be found growing about nine to ten degrees farther north and south of their present-day habitats. There would ineluctably have been a great expansion of the temperate zones north and south and a compression of the torrid and arctic/antarctic zones. Therefore, plants that can only now grow in the temperate zones would have been able to migrate by seed dispersal farther north and south.

If Velikovsky is right, temperate plants dated to the hypsithermal will be found around 1,000 miles north of their current global distribution, and other temperate plants’ remains or still living plants will be found about 1,000 miles south of their current global distribution. There are certain types of plants that cannot live well above the Arctic Circle today, even under far warmer conditions with the present orientation of the poles. This is not an assertion or assumption or argument based on words alone, but on well-established botanical, scientific facts which I presented in The Extinction of the Mammoth, pages 242-247, and The Velikovskian, Vol. III, No. 4 (1999), pages 78-89, and in Pillars of the Past, Vol. III (Forest Hills, NY 2010), pages 30-33 and pages 453-458 and 470ff. Therefore, with my apologies to my readers, I will present another version of these materials yet again. E. C. Pielou explains the botanical science behind the fact as to why certain plants cannot nor could not move far beyond their present boundary distribution well north of the Arctic Circle.

“An apparent obstacle to long northward and southward migration of plants is the phenomenon of photoperiodism. As is well-known, many species of plants are genetically programmed to flower only when there are appropriate daylight hours during the twenty-four hour day. There are so-called long-day plants and short-day plants . . . They cannot flower until spring advances into summer, the length of the day’ (that is, the number of daylight hours) has reached the required minimum . . . Even when spring is abnormally warm, they cannot be hurried.”

Given the present axial tilt, the periods of light and darkness on the Earth are rigidly fixed and supposedly have remained so for billions of years. Along these same lines, Paul S. Sears, of Yale University, reports:

“No single species of plant or animal . . . can transgress very far beyond its characteristic climate range unless it undergoes evolutionary changes that in turn set new limits. For this phenomenon, there are good and sufficient reasons to be found in physiology which finds for each species its range of tolerance in respect to factors of climate [photoperiodism factor], but their combination and rhythmic patterns.”

Specifically, one of the plants that does not and cannot grow far north of the Arctic Circle because it produces flowers that give rise to berries from spring to summer and because it needs specific photoperiodic amounts of light at these times is the black crowberry bush or Empetrum nigrum. J. V. Bell and J. H. Tallis’ paper, “Biological Flora of the British Isles,” Journal of Ecology, Vol. 61, no. 1 (1973), page 291, have presented the range and distribution of

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this flowering plant. All are south of the Arctic Circle except at a tiny point above it in Scandinavia. For this bush to grow about 1,000 miles north of the Arctic Circle, even during hypsithermal – 8000-3500 B.C. – when it was much warmer – requires a pole shift or plate tectonic motion or both. Nevertheless, this was just what was found by J. B. Charlesworth’s *The Quaternary Era*, vol. II (London 1957), pages 1484-1485, as I pointed out: Charlesworth “Presented evidence that a bush, the Black Crowberry, *Empetrum nigrum*, was found *in situ* on one of the Spitsbergen islands located about 1,000 miles north of the Arctic Circle. The plant had ripe berries and Charlesworth admitted that these plants ‘no longer ripen in these northern lands.’ This plant was about 15° north of the Arctic Circle and had gone through the process of sexual reproduction to generate flowers in spring, then fruit with seeds during the summer months, which would later fall to the Earth to germinate and reproduce a new plant. But above the Arctic Circle these plants today reproduce by asexual means. Yet Charlesworth claimed that the Black Crowberry found *in situ* had fruit and seed or ‘ripe fruit stones,’ this plant had to live in an environment/biome with temperate zone seasons of different lengths of daylight and night. Significantly, Charlesworth was talking about the Holocene period and, more specifically, about the Hypsithermal period from around 8,000 to 1,000 B.C. . . . [the time that Velikovsky claimed] that the poles were more perpendicular before a pole shift occurred.”

The indisputable scientific, botanical fact, as opposed to the celestial mechanical equations that have been presented as unmovable evidence for the stability of the pole is quite clear. This plant could not have grown on Spitsbergen and have flowers, fruits and ripe seeds unless, and only unless, there was a major pole shift or plate tectonic movement or both to allow this. What proponents of the stable pole concept cannot do is make this interdisciplinary scientific, botanical evidence fit their paradigm. However, it correlates, corroborates and is congruent with Velikovsky’s pole shift hypothesis. Nevertheless, this is not the only interdisciplinary scientific, botanical fact that contradicts the axial stability equations; large trees have also been found *in situ* with their roots in the ground well north of the Arctic Circle, and this, like the Black Crowberry, is a botanical impossibility with the present orientation of the poles. On this point, Edith Taylor, paleobotanist at Ohio State University, specifically states:

“The first thing we paleobotanists do is look for something in the modern records and there are no forests growing at that [polar] latitude today. We can go to the tropics and find trees growing in a warm environment, but we can’t find trees growing in a warm environment with a light regime these trees had: 24 hours of light in summer and 24 hours of dark in winter.”

I am not discussing the few boreal forests that do grow slightly above the Arctic Circle, but of forests at a very great distance north of it. Again in Vol. III of *Pillars of the Past*, page 34, I was able to cite Savelli V. Tomirdiaro, that trees also grew on the islands of the Arctic Ocean in the last 10,000 years, several hundred miles north of the Arctic Circle: “Thus, the forest growth of the Holocene optimum [the Hypsithermal] spread not only across the plains of Yakutia, but as far north as the northernmost islands [in the Arctic Ocean] of Novosibirsk [New Siberian Island] Archipelago . . .” In addition, in *The Extinction of the Mammoth*, page 136, that G. H. Denton’s

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The Last Ice Sheet (NY 1981), cited by D. S. Allen and J. B. Delair tells us that some 200 miles north of the Arctic Circle “near Disko Bay . . . last century an ancient tree with a trunk ‘thicker’ than a man’s body, was found still standing erect on a hill at an elevation of 1,080 feet (332m) by Capt. Inglefield.” Some may say 200 miles isn’t significant, but for this tree to grow there, it still had to live in a regime of 24 hours of daylight and 24 hours of night, where such trees could never grow. The Hypsithermal period ran roughly from 10,000 years ago to 3,000 years ago and, as Tomirdiaro just told us, forests grew on the New Siberian islands, which are several hundred miles north of the Arctic Circle. Astronomers must somehow explain how they grew there with the present tilt of the Earth. However, this is not the only such finding. We also have evidence of a tree rooted in the soil some 630 miles north of the Arctic Circle reported in 1857:

“Capt. Sir Edward Belcher, who in latitude 75° 30’ longitude 92° 30’ observed on the east side of Wellington Channel the trunk of a fir tree standing vertically and which being cleared of surrounding Earth [etc.] . . . was found to extend its roots into what we supposed to be was soil. [Since this finding is impossible given the stability of the polar axis]. If from the observation we should be led to imagine that all the innumerable fragments of timber found in these polar latitudes belonged to trees that grew upon the spot and on the ground over which they are now distributed, we should be driven to adopt the anomalous hypothesis that, notwithstanding physical relations of land and water similar to those which now prevail . . . trees of such size grew on such terra firma within a few degrees of the North Pole! – a supposition I consider to be wholly incompatible with the [gravitational stable axis] data in our possession, and at variance with the isothermal lines [temperature regime of 50° F annual average necessary for large trees to live].”

That tree was growing during the Hypsithermal some 630 miles above the Arctic Circle, again something scientifically, botanically impossible with the present position of the polar axis. Again, this is a “scientific fact,” again not just words alone. This is a mere drop in the ocean of evidence about trees growing in the Arctic region. For an in-depth description of materials related to the plants and animals that lived in that region, read The Extinction of the Mammoth, now on the Internet on Google Books, Kindle Books and immanuelvelikovsky.com.

Furthermore, if the pole was far less tilted, the temperate zone would have also moved south of its present position by about 1,000 miles. That interdisciplinary scientific botanical fact was also presented in Pillars of the Past, Vol. III, page 12, where Allessandra Nibbi pointed to the Professor P. Quezel in:

“His study of core samples from a limited area confirmed what many scientists have been saying for some time. At the [Hypsithermal] time of this highest precipitation, the Mediterranean climate moved southward into North Africa for approximately 1250 miles [2000 kilometers] thus bringing the Mediterranean vegetation in the Sahara as far south as Hoggar and Tibesti.”

She further claims the botanical evidence for this climate condition is dated ca. 2000-1800 B.C., well after the Sahara dried up supposedly 2300 B.C. In addition, a giant olive tree is still living in the south central Sahara dated to between three to four thousand years ago as pointed out by Robert Silverberg’s The Challenge of Climate (NY 1969), pp. 156-157. Of significance is

the fact presently that Egypt’s climate is not suitable . . . for the development of olive [trees], and thus [to have them grow there] it was necessary to acclimatize the crop [that grows there].” ¹⁴⁴ This means that for olive trees to have migrated down into the south central Sahara, the climate had to be identical to that in the Mediterranean region so olive trees would not have to be acclimated to live there. Now Velikovsky made the specific claim that the pole shift/climate shift occurred about 1500 B.C., before this time. If any living trees grow well outside oases, they would also have to date to around that period to receive the photoperiodic signals and water necessary to live. If the Sahara dried up around 2300 B.C., as textbooks and authorities claim, then the desert would have been too dry for seeds to germinate. Nevertheless, there was found a grove of living cypress trees in the Sahara far from any source of water for seeds to germinate. According to naturalist, David Attenborough: “Judging from the number of rings in their trunks, they are between 2000 and 3000 years old.” ¹⁴⁵

That is, the vegetation in the Arctic moved about 1,000 miles above the Arctic Circle, while in the Mediterranean region, it moved about 1,000 miles south, most importantly, for Velikovsky, during the very same period, the Hypsithermal. This is thoroughly in agreement with Velikovsky’s pole shift theory. That being the case, in between these two regions, I was able to show that the trees growing below the Arctic Circle and across and above the desert belts of the northern hemisphere, which today are generally treeless with only very sparse vegetation, were lush with trees, grass, etc. In the treeless tundra of Canada, Pielou tells us, during this period “much of what is now tundra was forested . . . true forest of spruce, not merely scattered trees.” ¹⁴⁶ P. Borisov states: “Forest extended right up to the Berents Coast and [temperate trees] such as oak, linden and filbert reached the shores of the White Sea. The information available warrants the assumption that on the European continent, the tundra and [stunted tree] forests – tundra zones disappeared completely [replaced by temperate forests].” ¹⁴⁷ Chester Chard, speaking of Siberia, shows that around 2,500 B.C. “the climate was warmer than today, and the vegetative zones spread north of their present limit. On the lower Lena [River near the Arctic Ocean], for instance, spruce and pine pollen several hundred kilometers north of its present range and trunks of birch trees of normal size, have been found in peat deposits.” ¹⁴⁸

At this point, I must explain that during the last Ice Age, the climate across the globe was far colder than it is at present, as we learned about in the discussion of Milankovitch astronomical cycles. Therefore, with the present orientation of the polar axis, the entire ring of lands surrounding the Arctic Circle was far colder than at present, and these forests could not have existed there, with the mammoth, etc. Yet, in the permafrost throughout this region, mammoths are found with the shattered remains of trees. If the mammoth died off before these forests grew, it would have been impossible to place all this timber in the permafrost without melting it and destroying all the fossil remains of the Pleistocene animals. In order for the forests to grow, the ground had to be warm enough for roots to penetrate into the soil. That is just what was seen and reported for the tree still standing on an island on the east side of Wellington Channel described above. But mammoths are generally found in the top layers of the permafrost of that region, as is well-known. Their carcasses and bones are found just at or below the surface. So if the forest

¹⁴⁶ Pielou, After the Ice Age, op. cit., p. 273.
¹⁴⁷ P. Borisov, Can Man Change the Climate (Moscow 1973), pp. 36-37.
grew after these Pleistocene animals became extinct and thereafter buried near the surface, the mammoth tissues would have been destroyed by bacteria and none of them would still be preserved. On the other hand, for the forests to grow and then work their way down into the permafrost with these animals, the permafrost must again melt to permit this, and again, mammoth tissues would not survive. That requires that the forest grew when these Pleistocene forms were alive and both were buried at the same time. That is, these Pleistocene fauna lived in these Arctic regions when it was warm enough for them, and photoperiodic periods allowed these trees to grow, and this again is in line with and corroborates Velikovsky’s pole shift scenario.

What of the other non-polar desert regions than the Sahara? These are presently deserts or sparsely covered by trees. For example, in the Tarim Basin of Chinese Turkestan, William Ryan and Walter Pitman show that Sven Anders Hedin, as cited in Pillars of the Past, Vol. III, page 550, says he:

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\text{“stumbled upon ‘a dead forest of sun-bleached, wind-scoured tree stumps protruding through the sand.’ At the edge of the forest were structures crafted not of stone or mud-brick, but of hand-hewn [wooden] posts and walls of reeds . . . The pictures [there] included nautical scenes of boats sailing on a vast inland lake. Further digging revealed docks for the boats and wood for their keels. Hedin wrote that this lost world}
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\text{“‘. . . was one of the most unexpected discoveries that I have made throughout the whole of my travels in Asia . . . who would have imagined that in the interior of the dreaded Desert of Gobi, and precisely in that part of it which in dreariness and desolation exceeds all other deserts on the face of the Earth, actual cities slumbered under the sand . . .’”}^{49}
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What, then, of the desert of Eastern India, present-day Pakistan? Nigel Calder shows, as I presented in The Extinction of the Mammoth, page 217:

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\text{“Discoveries of fossil pollen that an area in north-west India at the edge of the Harappan region, which is arid, was formerly a land of rich vegetation.}
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\text{“An expert in fossil pollen, Gundip Singh, from the Institute of Paleobotany in Lucknow, investigated salt lakes in north-west India and found that they were formerly fresh-water lakes [as that in the Gobi Desert], in the midst of richly vegetated land. The most interesting of the lakes in Lunkaransar near Bikaner is keep in the Great Sand of Rajasthan. Here, today, the hot, moist wind of summer monsoon delivers scarcely any rain; instead it piles up drifts of sand dunes . . . The vegetation is sparse. But dig just a few feet through the salt of Lunkaransar and you come to neat layers of mud, laid down when the lake carried fresh water four thousand years ago. And in the layers, Singh found pollen of bulrushes and sedges. The lake collected from the surrounding land pollen of grass, jamun trees, mimosa and many other species. Jamun trees need at least 20 inches of rainfall a year.”}^{50}
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What then of the Mediterranean region, especially the areas that are extremely arid today and have very few trees growing there, let alone forests. For example, Crete is a very barren island and researchers have strongly denied the possibility of forests growing there. A. T. Grove and Oliver Rackham explain this with which I strongly agree:

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\text{“A sure route to pseudo-history lies in ignoring the [ecological] behavior of plants and animals. Historians gather ancient allusions to people cutting down}
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trees, and assume these add up to a record of deforestation, as if depleting a forest by cutting down trees were the same as destroying it.”

They go on to show:

“There are two prehistoric pollen profiles in Crete, Agia Galini – a hot, dry area near the south coast – had deciduous oak, hazel, alder, elm and lime. [The other site] Tersana on the NW coast, also now a dry site, had oaks, lime, hazel and Ostyra. Hazel, alder and lime are now extinct in Crete and rare in most of Greece [to the north]. The southern limits of vegetation in effect moved at least 500 km [310 miles or 4.5 degrees] northward since the early Holocene.”

Grove and Rackham go on to show the causes invented to explain away this botanical evidence by human action or animal action fail. All in all, this is again a drop in the bucket of evidence I have presented, and it has not sunk in, nor do I believe critics of Velikovsky’s pole shift concept will ever acknowledge all the evidence I presented along these lines and publish their response in books or journals as part of the record. That would take time and cost money, something most will not spend.

These interdisciplinary scientific botanical forms of evidence, as Whewell has told us, “jump together” and are surprising because they were not all known to Velikovsky. In each and every case, the critics of Velikovsky must turn to ad hoc, jerry built explanations, while Velikovsky needs no such special pleading.

Gove and Rackham have told us above “A sure route to pseudo-history lies in ignoring the [ecological] behavior of plants and animals.” I maintain that “A sure route to pseudo-science lies in ignoring the [ecological] behavior of plants and animals.” Therefore, I will turn our attention to the ecological behavior of animals after the hypsithermal. Here, too, as with the ecology of vegetation, the evidence is unequivocal. Animals, like plants, tend to stay in habitats that match their biological needs and nature. In this regard, Velikovsky, as have others, presented us with the fact that the Wisconsin Ice Cap was skewered with respect to the north pole. This implies that the north pole was situated near Hudson Bay in Canada. Velikovsky pointed out:

“Not only are the causes of the appearance and later disappearance of the glacial sheet unknown, but the geographical shape of the area covered by ice is also a problem. Why did the glacial sheets in the southern hemisphere move from the tropical regions of Africa toward the south polar region and north in the opposite direction, and similarly, why in the northern hemisphere did the ice move in India from the equator toward the Himalaya mountains and the higher latitudes? Why did the glaciers of the Ice Age cover the greater part of North America and [northern] Europe, while the north of Asia [Siberia] remain free [of massive ice caps]?”

Velikovsky also wrote: “In a few hours northeastern America moved from the frigid zone of the polar circle into a moderate [warmer] zone; northeastern Siberia moved in the opposite direction from a moderate [warmer] zone to the [colder] polar circle.” Thus, according to Velikovsky, the American continent moved northward as the tilt of the geographical pole tipped

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53 *Ibid*.
in that direction, while Asia tipped in the opposite southern direction. America and Europe became warmer while Asia, and especially eastern Asia, became colder because of this pole shift, according to Velikovsky.

If, indeed, as the establishment scientists insist, the Ice Age ended and both the northern regions of America and Europe warmed when the ice sheet disappeared, animals that lived below the limits of the ice sheet would ecologically move northward into the new, warmer regions of these continents, especially warmth-loving species. As the vast ice sheet melted, they would all, as naturally expected, migrate northward into the vast regions of North America once frozen, where they would find the same, warmer habitat that suited their ecological needs and nature before the ice disappeared. In no case should warmth-loving animals move southward if the pole remained in the same position. However, in North America, instead of migrating north into the warming areas of the continent which were heating up, the animals, in complete contradiction to their zoological and ecological nature and requirements, migrated southward! Tim Flannery specifically informs us that in the Americas:

“Species as diverse as armadillos, tapirs, jaguars, speckled bears, llamas, ocellated turkeys and peccaries, all moved southward. This is quite a surprising pattern, for all these warmth-loving species were withdrawing from the north of the continent just as it was heating up. Just why they survived in South and Central America, while becoming extinct in the northern margins of their range is an intriguing question.”

This is not so much an “intriguing question” as a scientific, biological, zoological contradiction to the stable pole hypothesis. The only reason for warmth-loving species to migrate south is that the climate did just the opposite of what proponents of a stable pole require to explain, support and corroborate, that mathematical, astronomical paradigm that North America warmed instead, it had to get cooler when the Ice Age ended. Ice sheets do not melt away where the climate becomes cooler. If there was a stable pole, at the end of the Ice Age, all the warmth-loving animals would migrate north. The established stable pole theory cannot be upheld unless one is prepared to throw both the sciences of botany and zoology out the window. If this theory was right, then we would have armadillos tapirs, jaguars, speckled bears, llamas, ocellated turkeys and peccaries living in Mexico and well into the United States.

There is also scientific, zoological evidence that certain temperate zone species that inhabited Alaska and Canada during the Ice Age also went extinct there, but migrated and/or survived much farther to the south. This is particularly relevant to the black-footed ferret and the badger. According to R. Dale Guthrie, “Both badgers and ferrets lived in Alaska and the Yukon Territory during the Pleistocene.” R. Dale Guthrie, Frozen Fauna of the Mammoth Steppe: The Story of Blue Babe (Chicago 1990), p. 249. In his book, he presents a map of North America that shows this distribution during the Pleistocene. But today, these species thrive far to the south from the north central United States down to Mexico. Since they lived in Alaska and the Yukon during the Ice Age, and with the end of the Ice Age the land there warmed up, they should have survived there or migrated farther north to the tundra regions along the Arctic Ocean. Instead of migrating or surviving in the north, they survived or moved 1,000 to 2,000 miles south, like the armadillos, tapirs, jaguars, etc. Again, Velikovsky’s hypothesis is upheld by the interdisciplinary science of zoology.

The identical condition pertains to the horse and bison. They also lived in Alaska with the mammoth during the Ice Age apparently in great herds. Guthrie speaks of “thousands of fossils collected from Alaskan Pleistocene deposits . . . [and] found more than 95 percent were from bison, horse and mammoth.”\(^{57}\) While the horse became extinct in America, the bison survived and, like the black-footed ferret, the badger, and armadillo, tapirs, jaguars, etc., bison thrive well to the south of the tundra regions of the Arctic. If, as assumed, the pole did not change its position and the land only warmed as the ice sheet receded, bison should still be living around the edge of the Arctic Ocean. Since they could live in these regions during the Ice Age, and it is warmer now, then surely vast herds should be living in these regions. The zoological and ecological facts are unequivocal.

In essence, the various Pleistocene species that survived the Ice Age in America did not migrate north as the land warmed up with its end. They moved or survived thousands of miles farther to the south, in many cases, the exact opposite of what zoological ecology demands and thus denies that the pole was stable.

In Europe and Siberia, we encounter the opposite situation, this time with the cold-loving reindeer. In Europe, the reindeer lived as far south as the Pyrenees Mountains. As Bjorn Kurten explains: “The fact remains, nevertheless, that reindeer migrated in winter as far south as the Pyrenees at the height of the last glaciation, so that conditions can hardly have been so very different on the whole from those of Lapland in summer today.”\(^{58}\)

Along these same lines is the otter, wolverine and lynxes that also lived further south in Europe and Siberia prior to the end of the Ice Age. They lived in refuges far south of their present day habitats which are far to the north. Thus, we are told, that presently: “Otters, wolverines and lynxes [live] in northern Europe, most likely as a result of an expansion out of one southern refuge at the end of the last glacial maximum.”\(^{59}\) But when the Ice Age ended, they moved about 1,500 miles north to the edge of the Arctic Ocean. This would only make sense if instead of Europe and Siberia warming after the Ice Age, they cooled so these cold-loving animals moved north to inhabit the same climatological environment they had in central western Europe and southern Siberia. Thus, Siberia, according to Velikovsky, became more Arctic – that is, colder. Therefore, reindeer, otters, wolverines and lynxes, being cold-loving animals, would migrate ever farther north after the Ice Age ended via a pole shift. In the Americas, the warm-loving species – armadillos, tapirs, jaguars, speckled bears, llamas, ocellated turkeys, peccaries badgers ferrets, etc., moved south, not because the climate warmed, but because it cooled, as Velikovsky said, because of a pole shift. In Europe and Siberia, the cold-loving animals – reindeer, otters, wolverines, lynxes – moved north not because the climate cooled as in the America, but because it warmed. In Europe and Siberia, just the opposite happened, according to Velikovsky; it became far cooler. The reindeer and other cold-loving animals would therefore move as far north as possible to inhabit the biomes suited to them. That is, they not only live in Siberia, but over 1,000 miles north of the Arctic Circle on the New Siberian Islands and even

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further north: “Even today, reindeer reach these islands across the ice from the main body of the New Siberian Islands farther south.”

That is, today cold-loving reindeer live over 3,000 miles farther north than their European ancestors. They moved as far north as possible to inhabit the biome suitable for them. In the Americas, warmth-loving species moved south not because the hemisphere warmed, but because it cooled. In Siberia, cold-loving reindeer moved as far north as possible not because the hemisphere cooled, but because it warmed. This is indisputable evidence that there was a pole shift and is evidenced by both plant biogeography and animal biogeography. Botany and zoology prove there was a pole shift contrary to the equations of astronomy and/or physics!

Lastly, before leaving this subject, I wish to point out that as I wrote in Pillars of the Past, Vol. III, pages 34 through 46, that scientists are suggesting that celestial catastrophes have occurred in the recent past that killed off the mammoth and many other species. On page 46, I wrote, “Everything about massive pole shifts and climate that Velikovsky presented almost 60 years ago is now in various guises and being put forth by scientists . . . And this trend, I believe, will continue to grow.” Now, Gary Haynes writes about “A Bolide Impact” [that]

“A dissatisfaction with the main theories of extinction – human hunting, climate changes, hyperdiseases or other (‘grassy knoll’) theories . . . may lead researchers to seek other potential causative factors. One cause for the extinction has been proposed by Firestone and Topping (2001), Firestone and West (2005), Firestone, et al. (2007 a, b), namely extraterrestrial impact. The impact point of the hypothesized comet or meteor has not been identified.”

This trend will grow as I said above, and it has now entered the literature for the mammoth extinction. While Velikovsky is still ignored, Haynes adds, “I will not conclude this chapter by deciding which explanation for the extinction is correct. No one can do that, and no one can decide which explanation is incorrect either.”

We Velikovskians have time and as will be shown below, “Time is on our side.”

The science of botany and zoology, as these apply to ecology, contradict the stable pole concept based on mathematics, and fully correlate, corroborate and are congruent with Velikovsky’s pole shift. No amount of math can change these scientific facts. If the stable mathematical pole theory is correct, as the land warmed after the Ice Age, then all the warmth-loving species should have moved north everywhere. That we have a whole suite of warmth-loving and temperate-loving species moving south in the Americas is massive scientific evidence against the stable pole theory. Scientific facts are facts; astronomy cannot change them, nor have astronomers the right to claim their science is superior to botany or zoology. If the Earth’s axis had not moved, then with the end of the Ice Age, when these regions in North America warmed, the flora and fauna should have migrated north. There would still be badgers and ferrets in Alaska and the Yukon living even farther north. There would be armadillos, tapirs, jaguars, speckled bears, llamas, ocellated turkeys and peccaries living in the United States well up into Canada. Unable to disprove these real scientific facts, Velikovsky’s critics have only paper with equations written all over them as proof against a pole shift. Botany and zoology say that no matter what

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62 Ibid, p. 15.)
these equations supposedly show, the *real/actually known* scientific evidence repudiates and proves these equations which have nothing to do with what happened or with science or reality!

The answers to these interdisciplinary scientific forms of pole shift have not been put forth by scientists in scientific journals nor, as with so much else, the evidence that fully correlates, corroborates and is congruent with Velikovsky’s theory. There simply is no scientific answer that will make these scientific facts go away.

**THE PROOFS OF RECENT INSTABILITY OF MARS’ ORBIT**

Before beginning this discussion, what must be pointed out are the different predictions made by Velikovsky, as opposed to the astronomers regarding Mars’ surface features. Here, Velikovsky wrote in *Worlds in Collision*, pages 364-365, that Mars “...is rather a dead planet...” The ‘canals’ on Mars appear to be the result of the play of geological forces that answered with rifts and cracks...” Interactions with Venus and the Earth would create tidal forces that would leave Mars with high mountains, great rift valleys, huge volcanoes, numerous craters etc., Kenneth F. Weaver’s “Voyages to the Planets,” in *National Geographic*, for August 1970, pages 169-173, writes: “Everything in the Mariner pictures indicates very gentle slopes on Mars. There are no mountain ranges, no great faults, no extensive volcanic fields.” Patrick Moore, in *The New Guide to the Moon* (NY 1979), page 193 states, “The Martian scene proved to be utterly unlike what most people [that is, scientists] had expected. Instead of gentle, rolling plains, there were mountains, valleys, craters and volcanoes.” For more on this, see Charles Ginenthal, *Carl Sagan & Immanuel Velikovsky* (Tempe, AZ 1995): “Evidence from Mars” now available at immanuelvelikovsky.com. The astronomers were, according to astronomer Clark R. Chapman, in *The Inner Planets* (NY 1977), page 16, “In 1965, scientists and laymen alike were shocked when Mariner 4 revealed...[the] landscape of Mars.” “Shock” is the appropriate word because only Velikovsky had accurately predicted what Mars would look like. When we come to Venus, we will see the very same thing. According to Heller J. Robinson:

>“Stage five—is a theoretical prediction of empirical novelty. That is, the novelty is predicted by being deduced with the theory, and it is a novelty in the sense of never having been empirically perceived... A theoretical scientist will deduce a novelty from his theory and then various experimental scientists will test the prediction to see if the novelty appears. If it does, the theory is regarded as almost certainly true, and if it does not, then the theory is falsified.”

But, as we will see, the scientific establishment will not allow any of Velikovsky’s correct predictions deduced from his theory to be considered as valid.

There are two major questions related to Mars’ orbit: First, if Mars’ orbit changed, what is the scientific interdisciplinary evidence that proves this change? Related to this is, what is the scientific interdisciplinary evidence that proves the orbital change occurred in quite recent times? Laskar has claimed mathematical celestial mechanics prove Mars’ orbit has been stable for at least the past 20 million years, while at the same time admitting its orbital parameters indicate it may be becoming unstable, or in terms of Velikovsky, its orbit is relaxing from a recent major instability. Therefore, we must here present proofs from other fields of science that either confirm

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or deny Laskar’s or Velikovsky’s antithetical hypothesis. Where, then, was Mars prior to it relaxing into its present-day orbit? Lynn E. Rose has presented the most prescient explanation for Mars’ earlier orbit:

“I will suggest a hypothesis concerning the orbit of Mars before its encounters with Venus and Earth. The hypothesis should be checked against both historical and current theory and observation [of the planet].

“The historical material relating to the early status of Mars is summarized by Velikovsky (Worlds in Collision, p. 244) as follows:

“Mars did not arouse fear in the hearts of the ancient astrologers . . . But [only] in the ninth or eighth century; before this era, the situation changed radically. Mars became the dreaded planet.’

“Velikovsky does not attempt to describe the orbit of Mars three thousand years ago . . . But the Martian orbit at the time probably did not cross the orbit of the Earth, or even come close to crossing it, since such a Mars would have evoked periodic fear.

“Nor is it likely that Mars was an outer planet [beyond Earth] since it could hardly have played a role in the final taming [circularizing] of Venus [´ orbit]. Venus, between its near collisions with the Earth and its near collisions with Mars was on an orbit of greatly reduced ellipticity that probably never took it much outside the orbit of the Earth. So there would have been no chance for Venus to collide with Mars if the Martian orbit already lay well outside the orbit of the Earth.

“We are left with the hypothesis that Mars three thousand years ago was an inner planet.”

The point of most significance related to Mars’ orbit being closer to the Sun than the Earth is that, in such an orbit, it would have been capable of having water on its surface, and a heavier atmosphere that acted to create enough pressure for that water to flow on it. In this case, there would exist a condition almost identical to that on the Earth. Mars would have had an ocean and an atmosphere sufficiently warm for clouds to form and transport water vapor over land masses that fell as rain or snow whose action would create river systems, lakes and glaciers. It could even have had large inland seas. Therefore, let us examine what the interdisciplinary evidence is. In fact, the interdisciplinary evidence for this is overwhelming. The continental surface of Mars is covered by thousands upon thousands of river valley networks and there is solid evidence that there was an ocean in Mars’ northern hemisphere. Because this is clearly an impossibility, given Mars’ present distance from the Sun, Richard A. Kerr calls this one of the four outstanding questions of over 30 [now 50] years of astronomical research: “How could Mars – now more than 50° C below freezing – have been warm enough in its early days to have water flowing on its surface? . . .” This would scientifically be right in line with Velikovsky’s theses that Mars would have been an inner planet. Unable to cope with this finding, so contradictory to their stable solar system scenario, the astronomers and planetologists have found themselves in a double bind situation. They are damned if they maintain Mars has always been in its present orbit, because it is too distant from the Sun and therefore too cold for water to flow on its surface. Their mathematical theory of solar system stability that they accept as over-riding everything is damned because Mars would have to have been far closer to the Sun to be warm enough for water to flow

on its surface. Everly Driscoll explains the issues involved in this “outstanding question” facing astronomers:

“Mars has thrown a monkey-wrench into the way scientists study the solar
system.

“Planetary scientists compare the atmospheres of Earth, Venus and Mars and
extrapolate back to the original solar nebula to try to explain what Mars has been
in the past by looking at what it is now. . .

“The [river valley] channels are the biggest enigma. There are three types and
at least two appear to be water eroded tributaries and valleys. Some scientists
[won’t] believe it. Others, such as Paul Lowmay, of the Goddard Space Flight
Center, say the branch-like channels are ‘conclusive proof’ of liquid water. How
to explain this evidence for liquid water on Mars has become one of the hottest
issues in space science. It has stimulated all kinds of finagling and rethinking.”

The astronomer caught up in this double bind, based on their own mathematical
stability evidence, like most human beings, are forced into a never ending neurotic position of
attacking the problem that is not resolvable based on Mars’ orbit being stable. They are creating
fix-it-up explanations upon fix-it-ups, upon fix-it-ups.

**PROBLEM ONE: THE CONTINUOUSLY HABITABLE ZONE**

Scientifically, the nature of this problem has to do with a concept known as the
Continuously Habitable Zone (CHZ). This is a matter of straightforward physics, that is the
thermodynamic understanding of light and heat transport from a star, in this case the Sun, to a
distant planet that will warm it enough for it to hold and have water flow on its surface. Thermodynamics is a basic science, like botany and zoology, but in this case, it can be
mathematically expressed and thus the astronomers cannot shunt it aside nor ignore its implications
if they wish to deal with water on Mars seriously and scientifically.

The concept of a habitable zone on which water would be stable at a distance from the
Sun was originally presented by the rabid anti-Velikovskian, Harlow Shapley, as pointed out by
James Kasting, of the University of Pennsylvania:

“In a book written in 1953, the famous astronomer, Harlow Shapley, defined
what he termed the ‘liquid water belt’ as being that region in a planetary system in
which liquid water could exist at a planet’s surface.”

He goes on to say:

“The astronomer, Su-Shu Huang, then took up this topic in the late 1950s, gave
a well-reasoned . . . discussion of a variety of different issues bearing on the
habitability [zone] of planets around other stars. He pointed out, for example, that
binary or multiple star systems are less likely to harbor habitable [watery] planets . . .
And he concluded . . . that stars that are similar in mass to our Sun are most likely
to harbor habitable [watery] planets. But his most lasting contribution may have

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been his definition of the term *habitable zone*, as another synonym for ‘ecosphere’ and ‘liquid-water belt’... the... term was adopted by NASA in 1996.\textsuperscript{68}

Stephen H. Schneider and Stanley L. Thompson define it as follows:

“... [The] region [from a star] in which a planet can retain a significant amount of liquid water at its surface, assuming a suitable atmospheric pressure. The climate extremes that would prevent a habitable Earth are, then, the case [too close to the Sun where] all the water has been evaporated from the surface (runaway greenhouse) or where the Earth [is too far from the Sun] has become completely glaciated (ice catastrophe).”\textsuperscript{69}

Let us, for the moment, return to the problem of the Milankovitch theory where it was shown above that the Ice Age was synchronous in both the northern and southern hemispheres when, according to Milankovitch, they should alternate. When the northern hemisphere has an ice Age, the southern hemisphere should have experienced just the opposite – a Hysithermal. Added to that, it was shown that the equatorial regions should exhibit very little, if any, temperature change, yet that torrid zone was several degrees colder, again a phenomenon contrary to Milankovitch. The solution that has evaded everyone is that an earlier catastrophe nudged the Earth’s orbit to one slightly more distant from the Sun for the onset of an Ice Age, and it ended with another encounter that moved the Earth’s orbit slightly closer to the Sub some 10,000 years ago. That would undeniably create these climatic phenomena, except astronomers, nurtured on Newtonian/Einsteinian theory, cannot consider this any more than they can consider that Mars had an inner orbit.

If Mars was always, from the start, in its present orbit, it would have been too far from the Sun to have water. If Mars was closer to the Sun, as the science of thermodynamics requires for it to have water, then the concept of Martian orbital stability, that Laskar presented and Diacu supported, fails. Given these options, the astronomers, wedded to their mathematical theory of solar system stability over the past 20 million years, at the least, have opted to follow the stability concept and have tried to invent a number of fix-it-up processes to somehow permit water to flow on Mars, or invented ways to sculpt and erode these seeming river valley networks by other means than rainfall and runoff. They have tended to fall into a number of camps. One camp, as we will see below, assumes that all the water on Mars was frozen beneath the surface and was periodically heated by volcanic activity to cause massive flood torrents to flow across the land, known as outflow channels. Another camp maintains that Mars somehow was able to generate an atmosphere with a certain unique suite of gasses that was massive enough to generate an atmosphere with a certain unique suite of gases that was massive enough to generate a greenhouse effect powerful enough to hold enough solar heat to allow for surface water. Still another camp maintains that, even in its frozen state, water sublimes into vapor at the equatorial regions and freezes out in the near polar regions, sinks then flows southward to break forth at the surface and flow and erode river valley networks. Still another camp suggests it wasn’t water at all that carried and eroded these untold tens of thousands of river systems, but some other unique chemical solution accounts for them.


PROBLEM TWO: THE FAINT-SUN-PARADOX

There is a second enormous problem for all these theories, as most planetologists believe, that these channels were only eroded during Mars’ earliest history three to four billion years ago. The problem is known as the faint-sun-paradox. This second scientific phenomenon deals with the evolution of stars. As a newborn the star—the Sun—would have gone through a short T-Tauri stage for a million or so years, being extraordinarily bright and hot. Thereafter, the Sun grew dimmer until it was far less bright and hot than it is today and thereafter it would begin to brighten and heat up gradually over the ensuing billions of years. This phenomenon has supposedly been proved by comparing sun-like stars at various stages of their development and with the present day theory of how stars generate energy. Today, Mars has a temperature far too cold to allow water on its surface. Therefore, as one goes back into the past, the temperature of Mars’ atmosphere will become even colder because the Sun was cooler in that far distant period. Eric Burgess, as early as 1985, addressed this problem:

“Most generally accepted models of how the Sun evolved since its formation requires the assumption that the luminosity of the Sun has gradually increased. This leads to some major questions about the evolution of terrestrial planets. While a low luminosity in past ages might have allowed Venus to possess an ocean and have a relatively mild climate similar to that of the Earth today, the problem remains of explaining how the Earth avoided becoming a deep freeze planet; [in its present orbit] it receives only about half the solar radiation received by Venus. The [early] temperature of Earth should have been well below freezing . . .

“The problem with Mars is even more difficult to resolve. Today, Mars is a frozen world, yet in times past, large quantities of liquid water must have flowed across its surface to sculpt the erosional features seen today. Yet, at the time of a lower solar luminosity, Mars would be expected to be much colder than today.”

Jeffrey S. Kargel gives a more in depth description of this problem:

“The emerging vision of a once-watery Mars poses a serious dilemma. Mars is now so remote from the Sun that water is frozen solid (in equilibrium with the barest trace of water vapor), and the radiation environment billions of years ago was much worse. The Sun has steadily brightened with time, and running the clock backward make the Sun an even fainter object delivering only 70% as much heat and light 4 billion years ago as it does today. Yet, Martian geology indicates that liquid water was present [then].

“On Mars, limits to the existence of liquid surface water are from the atmospheric temperature and pressure and relative humidity, and total pressure averages 6 mbar [0.6 of one percent of the pressure that exists on the Earth’s surface] near the triple-point vapor – pressure of H₂O [such that water on Mars may exist as a gas, liquid or solid.] Thus, liquid water could exist at the lower elevation of Mars if only a warm spot could be found where ice exists. At higher elevations, under current conditions pure ice would sublimate [vaporize from ice] before it could melt. However, a doubling of total atmospheric mass – for instance, from partial sublimation of the South Polar Cap – would raise the atmospheric surface pressure above the triple-point pressure of water and this would make it possible to

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have a puddle of ice water magically emplaced across broad areas of the surface [only] at noon at the right time of year to prevent it from boiling [away].

“Temperature and ice availability is a bigger issue than pressure for liquid-water stability on Mars. The surface temperature exceeds the melting point of pure ice around the summer solstice near the equator and at middle latitudes on equator – facing slopes – precisely the areas that lack ice at shallow levels. Furthermore, the melting point is only attained for a few hours of the day, and night-time temperatures are still so cold that melting temperatures never penetrate more deeply than a few centimeters [one-two inches], where there is no ice to melt. Thus, we can be certain that in the present era, pure ice never melts at the surface except for a few drops at special places. Those special places might include, for instance, mid-latitude cliffs at low elevations where recent slump and landslides may have exposed buried ice along slopes favorable to a brief noon-time summer thaw. Such liquid water would be a mere trace technicality [sic] with no geomorphological . . . [surface channel eroding] significance. With a faint early Sun, the temperature problem is much more severe . . .”

It should be pointed out that, what the astronomers and planetologists call the “Faint Sun Paradox,” and the nature of the “Continuously Habitable Zone,” for allowing Mars to have water on its surface, are, in reality, not paradoxes, but direct contradictions to their stable solar system model. However, rather than admit these are contradictions, they are labeled as a paradox; the evidence contradicts the theory, thus it cannot be correct; instead, it is a paradox. On the other hand, when critics of Velikovsky’s unstable solar system concept suggest the evidence they present contradicts it, that evidence is a “contradiction.” They are employing a double standard of inference: Contradictions to their theory are paradoxes that will be solved in the future while “contradictions” to Velikovsky’s theory are contradictions and not paradoxes.

Let us examine how these scientists have worked for almost 50 years to turn this paradox/contradiction into a confirmation of their theory of Mars’ stable orbit and repeatedly failed to achieve this hoped for outcome.

Because the realization of this double-bind situation could be easily comprehended, the astronomers/planetologists tried to find some way around this overwhelming obstacle to surmount it, as stated above. One way was to suggest that water was not the agent that sculpted these river alley networks, but that some totally unique material or processes that mimicked rainfall water erosion created these features. Kargel, in this respect, writes:

“Anything But Water

“. . . and applied exotic mechanisms . . . known to prevail on Mars. River-like features were perhaps carved by wind; if not wind, then a liquid other than water. Erosion of channels by a condensed surface-flowing medium was evident to most researchers and to the majority of them, the most plausible substance was always liquid water. However some others sought an explanation with exotic substances. Mars could be comet-like in its volatile constituents, having ice frozen like rock, but possessing other abundant substances, even more volatile than ice [from which to form rivers, lakes, etc.] If so, Mars might have rivers of liquid CO$_2$ or alkanes – anything but liquid water! Fluidizations of impact ejecta blankets was perhaps an entertainment of trace atmospheric gas; features seeming to suggest the flow of icy permafrost actually may be sand dunes of dust blankets; the polar caps could be

99% dust with a thin veneer of frost, and so on. Proponents of such ideas tended to think of liquid water as having such narrow stability limits, and [ancient] Mars to be so utterly cold and dry, that something other than liquid water must have been responsible for the Martian landscapes. Mars, they thought, was very much like the Moon with just a wisp of atmosphere added.

“Mechanisms involving alternatives to ice and water could not explain certain features and soon fell by the wayside, but so did some of the water – and ice – related hypotheses. For instance, the wind hypothesis for the origin of [massive flooding] outflow channels failed to provide a satisfactory explanation for erosional terraces and ‘high water’ marks [observed] in Martian channels, the transport and deposition of large boulders and the chaotic nature and origin of chaotic nature and origin of collapse[ed] land of the sources of the [immense] outflow channels. The proposed eolian [wind sculpted] origin of Martian channels had no sustaining power and it withered and blew away without a sound foundation; most of these non-water ideas were soon forgotten.”

Having failed to supply non-water sources to explain the evidence, the scientists tried to “finagle” with the atmosphere and “rethink” certain gases existed that produced a greenhouse effect to allow water to flow on Mars in its early history. It was furthermore proposed that since Mars is about one-tenth as massive as the Earth, that its atmosphere would be heavy enough to insulate the surface and permit water to flow. But then, over the long eons, these gases would escape into space and be carried away by the solar wind, leaving Mars as it is today, largely devoid of a gaseous envelope. David Morrison, a severe critic of Velikovsky, outlines this scenario. As a student of Carl Sagan, who advocated a runaway greenhouse effect on Venus, Morrison attempted to transfer this theory, in part, to early Mars, to salvage the stability of the solar system:

“It is interesting that the evidence for climate change on Mars is more complete and compelling than it is for our planet, if we are interpreting this evidence correctly; Mars has suffered greater [climate] changes than the Earth.

“If Mars was once warmer than it is today, the most likely explanation lies in an enhanced atmospheric greenhouse effect. During the first half-billion years of its history, Mars presumably had a denser atmosphere of carbon dioxide, carbon monoxide, and water vapor – similar to that of the primitive Earth and Venus. If the pressure of that atmosphere were at least several bars [several times the pressure of the Earth’s atmosphere], the resulting greenhouse effect could have sustained surface temperatures above the freezing point of water. While we cannot prove the existence of these conditions on Mars, there is no reason to exclude the possibility of such an atmosphere and widespread liquid water during the first few million years of Martian history.

“Because Mars is farther from the Sun than the Earth, it has always tended to be cooler. Further, the lower surface gravity of Mars [38 percent that of Earth] makes it harder for that planet to maintain its initial dense atmosphere. Some combination of less solar energy and the escape of the atmosphere [to space] thus led to a progressive degradation of conditions. Presumably, the 4-billion-year-old runoff channels . . . record a stage in that evolution when the primitive seas may have evaporated or frozen, but rain still fell in tropical latitudes.

72 Ibid., pp. 45-46.
“[Thereafter], Mars would then have experienced a sort of runaway refrigerator effect, the opposite of the runaway greenhouse effect... Escape of the atmosphere led to surface cooling which, in turn, resulted in freezing of water and a further drop in temperature. The result is the frigid desiccated world we see today.”

Although Morrison admits “we cannot prove the existence of these conditions on Mars, there is no reason to exclude the possibility of such an atmosphere.” This theory has, in general, become the favored theory for Martian water sculpted topography. It maintains the stability of Mars’ orbit over its entire history, an absolute must for astronomers, and it has the advantage of being caused by uniformitarian processes and not catastrophic ones. In spite of its acceptance by the great majority of astronomers/planetologists, it has not stood the test of time. Careful calculations contradict the early greenhouse effect thesis for Mars. Mars’ atmosphere containing carbon dioxide carbon monoxide and water vapor, would not have been able to last. These gasses, the calculations show, would have condensed out of it quite rapidly and permanently. Therefore, much more carbon dioxide would be required to heat the atmosphere to offset the condensation problem. Secondly, where did all this extra carbon dioxide come from? By analogy with the early Earth, one can get some idea of the enormity of the problem Morrison evaded.

Rick Boling informs us:

“How can you tell what the Earth’s atmosphere was made of billions of years ago? Look at fossil dirt, say Harvard researchers.

“When geochemist Heinrich Holland did just that, he found that concentrations of carbon dioxide was 100 times greater 2.75 billion years ago than it is today. And that, unfortunately, poses a problem for scientists trying to understand Earth’s early climate.

“The problem arises from solar physics, which holds that the Sun 2.75 billion years ago was only 80 percent as bright as it is today. All things being equal, that might have been faint enough to allow vast ice sheets to advance over the continents, Holland says. Yet the geological record shows scant evidence of glacial deposits back then.

“If the atmosphere had contained more carbon dioxide...it would have kept the ice sheet at bay, despite the faint Sun, Holland says. Citing the calculations of James Kasting, of Pennsylvania State University, he says warmth could [only] have been maintained if [it was] 500 times richer in carbon dioxide than now.

“The exact chemical signature suggests that the atmosphere was 100, not 500 times richer in carbon dioxide.

“How, then, did the Earth stay warm 2.75 billion years ago? A lot more methane, another greenhouse gas, would have done the trick, Kasting says. But farther back in time, 4 billion years ago [at the time Mars is supposed to have had water on its surface], when the Sun was fainter, still the methane theory runs into problems. At that early time, the Sun was only 70 percent as luminous as it is today, so dim the oceans would have frozen. Yet the geological record reveals liquid oceans. A thousand times more carbon dioxide would have kept the oceans liquid but some scientists find that hard [or impossible] to swallow.

“A combination of more carbon dioxide and more methane could have kept the Earth warm enough too. But this poses still another dilemma. Most of the methane in today’s atmosphere is a by-product of life. Before the origin of life, where could

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the extra methane come from? Scientists have proposed some theories, all of which are highly speculative, Kasting says. 74

The same problem for Mars is of even greater difficulty. It is about half again the distance away from the Sun as the Earth. Mars would have to have perhaps two or three times 500 times the carbon dioxide Earth required to be warm enough to have liquid water. The problem is further exacerbated for Mars, as Aaron P. Zent explained:

“The warm, wet Mars hypothesis holds that a heavy atmosphere of some greenhouse gas maintained the surface temperature above the melting point of water early in the planet’s history. Radiative transfer calculations by workers including Jim Pollack at NASA Ames Research Center, in California, and Susan Pastawko, now at the University of Oklahoma, suggested that an atmospheric presence of CO₂ on early Mas equivalent to 5 bars [5 times the Earth’s atmosphere] . . . would warm the surface above zero degrees. Carbon dioxide is the favorite greenhouse gas for Mars because, unlike other candidates, it is not rapidly broken down by sunlight and is already known to be present in the Martian atmosphere.

“This hypothesis, too, has big problems. For starters, it is probably not possible to maintain a heavy CO₂ atmosphere above a surface covered with liquid water and rock. The carbon dioxide would dissolve into the water, react with ions dissolved from the rocks and precipitate out as carbonate deposits, such as limestone. This process is so efficient and rapid that it is hard to find a scenario in which a CO₂ atmosphere could survive to 3.8 billion years ago. Furthermore, massive deposits of carbonates [from this period or any other] have yet to be found.

“Even worse, recent calculations by Jim Kasting . . . show that carbon dioxide condenses high in the Martian atmosphere. Such CO₂ clouds [like those in Venus’ upper atmosphere] would reflect [a great deal of] sunlight back into space and decrease sunlight reaching the surface. When the atmospheric temperature profile is corrected for the heat of condensation of CO₂ clouds, the surface temperature drops below the freezing point. Thus, it appears impossible to raise the surface temperature above zero with a CO₂ atmosphere alone. The presence of other greenhouse gases, such as ammonia or methane, increase the warming, but they are broken down rapidly by sunlight and there is no known recycling mechanism [to reconvert the break-down products back to ammonia and methane.] 75

Kasting, himself, explains:

“Warming early Mars is a challenging problem, both because of the planet’s distance from the Sun and because the Sun, itself, was less bright. . .

“In climate calculations . . . we initially determined that this low solar flux could have been offset by a CO₂ - H₂O atmosphere with a surface pressure of about 5 bars [5 times that of the Earth]. However, we failed to account for the fact that CO₂ should have condensed in the upper parts of our model troposphere . . .

“When we revised our calculations to include this effect, we got a rather surprising result. We found it was impossible to warm early Mars with CO₂! . . . The results show that for the present [day] solar flux, Mars’ surface temperature could be raised to arbitrarily high values by adding CO₂ to its atmosphere. About

74 Rick Boling, “The Faint Sun” Earth (June 1996), p. 11.
2-3 bars of CO$_2$ would be sufficient to bring the average temperatures above the freezing point of water . . .

“For early Mars, though, the result of increasing atmosphere CO$_2$ levels are entirely different. At 3.8 Ga [billion years ago], the latest time when most of the valleys could have formed, the solar flux [to Mars] was still only 75 percent of its present value . . . and it takes us back to the question: How can we explain the fluvial features? . . .

“Couldn’t one simply add more CO$_2$ . . . and thereby make them warmer? The answer is no, for two reasons . . . at high CO$_2$ pressures and low solar fluxes, CO$_2$ . . . forms clouds of CO$_2$ ice . . . surprisingly, CO$_2$ clouds would actually have warmed Mars’ surface . . . But the process of forming the CO$_2$ clouds would [remove heat and] have helped limit greenhouse warming . . .

“A second equally important factor in limiting the magnitude of the greenhouse effect on early Mars is the effect of CO$_2$ on the planet’s albedo [reflection of sunlight by cloud cover back to space] . . . Hence, when the atmosphere pressure increases, more sunlight is scattered back into space, and the planetary albedo increases, cooling the climate [even more greatly]. Both these factors make it difficult or impossible to warm early Mars.”

Kasting tries other approaches, but admits, “It seems unlikely that it could have created a truly Earth-like climate.”

David Morrison’s thesis has no support. The gases he envisioned would act to create a greenhouse simply do not work.

All the wiggles and twistings and turnings by astronomers/planetologists to give Mars a warm environment have failed, and that is still the case decades later. Nathalie A. Cabrol and Edmund A. Grin say, as late as 2010: “Whether the early climate of Mars was much warmer and wetter in the Noachian [epoch] compared to later geological epochs is still the subject of ongoing debate.” Kargel fully admits nothing has worked: “The Mars community today, while applying more sophisticated observations and analytic tools, is not much more advanced in understanding Martian hydrology.”

To keep Mars in its present orbit and still have had flowing water on its surface, and also allowing it to have been extremely cold, and yet have river valley networks Kargel and some of his colleagues at the University of Arizona, proposed yet another hypothesis. They maintain that all the water was frozen as permafrost below the Martian surface mixed with great amounts of carbon dioxide and perhaps other frozen gases. But during periods of great volcanic/magmatic upwelling or great meteorite impacts massive amounts of hot water and carbon dioxide and water vapor were released that created brief periods of greenhouse warming that allowed water to pond at the surface and runoff as streams or great floods. When these catastrophic events ended, Mars would again cool and the water and carbon dioxide would sink into the surface and refreeze. But then this water and carbon dioxide would sublime from a solid to a gas and return to the atmosphere to be redeposited in upland regions where another volcanic/magmatic upwelling catastrophe or meteorite impact millions or even billions of years later would release another wave of liquid water.

or carbon dioxide creating another greenhouse effect to leave Mars looking as it does today. They suggest the last catastrophe may have happened 100,000 years ago. What is apparently most disturbing to their colleagues is that Kargel et al., had invoked what seems a totally catastrophic theory that occurred again and again to allow Mars, at its present distance from the Sun, to exhibit clear evidence of water erosion. They also maintain that Mars had oceans that periodically existed and disappeared at these times. Episodic catastrophism was called for in order to maintain Mars in its stable orbit for eons. Kargel explains:

“Our model of an ancient ocean and ice sheets, with an immense episode of volcanism and associated geothermal warming, which led to a thinner permafrost and catastrophic rupture of confined aquifers, causing outburst flooding accelerated by exsolution of carbon dioxide [into the Martian atmosphere], outflow [flood] channels and chaotic terrain [associated with these areas of upwelling] formed during these events, and the discharged water forming a transient ocean. The volcanic episode and flooding also caused release of CO$_2$ and other greenhouse gases into the atmosphere which underwent a sudden warming. Water was transferred globally both through the atmosphere and subsurface. Oceanic and glacial responses modified the surface in distinct ways until finally the episode subsided as CO$_2$ condensed as carbonate rock and as polar dry ice. This process is episodic and was repeated many times over Martian history, but episodes gradually decreased in vigor as the Martian geothermal heat engine decreased over time and as volatiles were eventually lost or sequestered in permanent solid reservoirs.”

The problem, of course, is where are the carbonate rocks all over the surface, or rocks coated with carbonates? As Zent has told us above, “massive deposits of carbonates have yet to be found.” James Kasting tells us there is an

“... absence of carbonate rocks on the Martian surface. A succession of different Mars orbit missions have searched spectroscopically for outcrops of such rocks, but they have never been observed, except for traces of carbonate minerals seen in the Martian dust. This has been viewed as a major puzzle for the past 30 years or more. Virtually all the proposed mechanisms for warming early Mars require that its atmosphere was rich in CO$_2$. If both CO$_2$ and water were present, why did carbonate rocks not form?”

David C. Catling and Conway Leovy express the problem thus: “Despite an extensive search from orbit, no carbonate sedimentary rock has been identified down to a spacial resolution of 100 m[eters].”

To get around this problem, it was suggested that sulfur dioxide, SO$_2$, was one of the gases to warm early Mars’ atmosphere. It, therefore, made the water into which it rains acidic. Hence, carbonate or alkaline rocks could not form in an acidic, watery environment. However, Kasting admits:

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80 Ibid., pp. 186-208.
81 Ibid., p. 176.
“...we have performed new calculations, currently under review, which indicate that the reflection of sunlight by sulfate aerosol particles, created by SO₂ photolysis [break down SO₂ to S and O₂], would more than offset any warming by the SO₂ itself. So the SO₂ hypothesis for warming early Mars appears to be incorrect.”

Therefore, SO₂ not being in the early atmosphere of Mars to warm it, could not have fallen as rain to make the surface waters of Mars acidic.

The other point I find difficult to accept is that of an ocean that was transient and episodic could disappear somehow and not leave tremendous amounts of salt rock at the surface. These too are not seen in Mars’ ocean basin. All analyses of Martian hydrology are basically substanceless, and the astronomer/planetologists are well aware that they are building fix-it-ups. Kargel, in a moment of this dawning reality, writes:

“To be fair...no one’s ideas about Mars really rallied much support, and everyone who has dared to come in from the cold [Martian environment problem] inevitably has taken a lot of heat for their bold ideas. When balanced with logic and respect, this is as it should be. The last few decades have seen a flourishing of multiple distinct concepts of Martian geology, hydrology, and climate history. There is but one Martian reality, but it remains very much a grand enigma, warranting a cacophony of intelligent wonderings. With little doubt everyone is mostly wrong, while many of us are just a little right, but we have yet to find out who these [right] people are.”

Looking over the evidence and the past 30 years of scientific analysis and bold speculation, Kargel says: “Mars was weird, Mars was wet, and something very bizarre has happened there from the ground up. This is still the million-dollar thought today.” As is often the case in science, when the evidence can’t be made to fit any of the scientists’ theories, scientists usually break into a few camps and carry on relentlessly to prove they are right and their opponents are wrong. Because there is no clear evidence, only wished thinking for a greenhouse on early Mars for millions of years to permit rain and snow runoff into lowlands to create river valley networks, lakes, glaciers, and even an ocean, Kargel and his associates have maintained that episodic catastrophic events have created all these features against the more established theory. As is the case in science, as in all aspects of life, politics and dirty-tricks have also been employed. Those in the favored theory camp being in the majority have, in some instances, because they believe so deeply [or dogmatically] that they must be right, ergo Kargel and his associates must be wrong, have behaved as Kargel states in a criminal manner because so much is at stake. Kargel tells us:

“By the early 1990s, a full Mars rebellion against the Mars establishment... was underway. Certain members of the Mars establishment labeled our group at the University of Arizona, with some humor, the Tucson Mafia. In fact, we were just a small group of faculty and students who, embracing a different scientific judgment, did not fall into the party line. From our side of the debate, while we had our small-town gang it was a few members of the Establishment (not to mention names) who behaved like La Cosa Nostra of planetology, complete with their Godfather, money, politics and occasional underhanded manner. Certain criticism

84 Kasting, How to Find a Habitable Planet, op. cit., p. 143.
86 Ibid., p. 138.
of the ideas of the Mars rebels [clearly] unfounded however a general science-based critique [of our model] was warranted, and some elements of the critiques remain valid. Mostly, the criticism was responsible scientific discourse. Key elements of the contending Warm, Wet, Early Mars [Theory and the] marine-glacial [multiple catastrophic] hypothesis will remain controversial until sky archeology [analysis of the surface from orbiting spacecraft) comes down to Earth or [more aptly] down to Mars. 87

“Our concept was heresy – and immediately assailed. A comment from one friend . . . , overheard by another, was ‘Madness, sheer madness! And so for the next few years, perhaps it was madness to go up against ‘Those who knew’ . . .

“The professional toll of the external peer response was career-threatening, but it was managed . . . Papers [supporting the marine-glacial theory] were difficult to [publish or] get through [peer] review.”88

Given this internecine infighting of the two different paradigm camps for the fluvial features of Mars by insiders, it becomes clear that Velikovsky’s hypothesis, that Mars was in an orbit closer to the Sun recently, which would resolve these problems, will not and cannot be considered. Just as with other theories, say, for example, the extinction of the Ice Age megafauna and the chronology for it, also seen through the lens of a stable pole, cannot be resolved. The three paradigms’ overkill by human predation, climate change, and interspecies diseases, will be contesting with one another for perhaps another century or two, or, in desperation, unite to produce acceptable unity, rather than a scientific proof.

To get around the criticisms of the marine glacial hypothesis, Kargel and Robert G. Strom have turned to chaos theory and its application to the axial tilt of Mars as another fix-it-up:

“Obliquity, [is] the tilt of the spin axis from its ideal position perpendicular to the orbital plane. Mars, like Earth, is now canted about 24 degrees, and that tilt changes over time. Jihad Touma and Jack Wisdom . . . discovered in 1993 that, for Mars, the tilt can also change abruptly. Excursions of the tilt axis through a range of as much as 60 degrees may recur sporadically every 10 million years or so. In addition, the orientation of the tilt axis and the shape of the orbit that Mars follows change cyclically with time.

“These celestial mechanisms, particularly the tendency of the spin axis to tilt far over, can cause seasonal temperature extremes [more heat on one hemisphere, greater cold on the other]. Even with a thin atmosphere such as the one that exists today, summer temperatures at middle and high Martian latitudes during periods of large [polar] obliquity could have climbed above, freezing for weeks on end.89

This process shares, as does the “marine glacial hypothesis, a catastrophic mechanism. Instead of periods of catastrophic volcanism or meteorite impacts, a chaotic, sudden axial tilt can trigger warming again and again. And again, these recurrent catastrophic events are far too repugnant to be accepted by the Establishment. But it does show that, at some level of thought, the idea that catastrophic events are required to resolve these problems. For example, Michael Carr, the dean of Martian studies, looking at Mars, claimed, according to Randolph Pozos,

87 Ibid., p. 179.
88 Ibid., p. 177.
“Michael Carr . . . believes a sudden disaster occurred on Mars sometime in the first quarter of the history of Mars. He has no explanation [for it]. He suspects a sudden pole shift.”

But the real question is, do these pole tilts, even catastrophic ones with the orbital parameters of Mars, allow for water to flow on its surface? In essence, Milankovitch cycles, with the aid of large pole shifts, are called upon to have Mars’ atmosphere warm sufficiently to permit water on it. The answer, based on careful analysis, according to William Sheehan, is that:

“The most interesting climatic conditions are found at the extreme values of . . . [polar] obliquity. Detailed calculations have shown that the obliquity of Mars has ranged between a low of 13° and a high of 47° over the past ten million years (since the obliquity is chaotic, it is inherently unpredictable over significantly longer periods). At a minimum of 13°, [when Mars’ pole is least tilted] permanent caps of carbon dioxide must form over both poles, and the planet must go into deep freeze. With most of the atmosphere taken out of circulation [frozen at the polar regions], the surface pressure must drop to less than a millibar, in which case there would be too little air to support dust, and dust storm activity must cease altogether. At the maximum value 47° [when Mars’ pole is most tilted], both poles would lose their carbon dioxide ice caps each summer . . . temperatures . . . would rise appreciably. More water vapor would be released into the atmosphere thereby producing still further warming owing to the greenhouse effect.

“At such times, Mars’ atmosphere would be much more massive than it is now, so that greenhouse warming might increase the global temperature another 30°C – still not enough to allow liquid water to exist on the surface.”

In essence, even with pole shifts and Milankovitch orbital changes, Mars stays frozen. Nothing proposed to resolve this problem of water on Mars, keeping it in its present orbit works. All workers in the field are deeply aware of this, but are unable to consider solar system instability.

MARS: AN INNER PLANET

If Velikovsky’s hypothesis that Mars was an inner planet closer to the Sun than the Earth for eons, it should exhibit all the evidences of its having an Earth-like climate. With a small atmosphere to hold solar heat, it would not have developed a strong enough greenhouse effect to boil away its water, but could have it flow for ages over its surface. Therefore, its climate should, like our own, be distributed into torrid, temperate and frigid zones. It should exhibit evidence that it had an ocean and inland seas that evaporated water vapor into that atmosphere, as clouds were carried over land masses and cooled and condensed to precipitate as rain and snow. The snow in the Martian spring and summer melted along with rain run-off into the surface soil/regolith forming ground water and creating brooks, streams, and rivers that flowed back to the ocean of inland seas and lakes. Velikovsky’s thesis is that these river valley networks are just that, river valley networks, like those seen here on Earth. Ann Vickery, of the University of Arizona, suggests that these were indeed generated by exactly the same processes as they are here on Earth:

“There exist river valley networks that look like terrestrial river valley networks and don’t look like any other kind of feature found anywhere else in the solar system . . . The first obvious interpretation is that these networks were formed more or less in the same way as similar terrestrial networks.”  

W. Kenneth Hamblin and Eric H. Christiansen echo this refrain: “If any of these channels had been seen on Earth, no one would hesitate to call them dry rivers.” What all this undoubtedly suggests is that Mars had an atmosphere large enough to sustain rain and snow for a great length of time, or, as we maintain, for billions of years so that rivers could flow. The evidence for this integrated hydraulic cycle, like that here on Earth, must be clear-cut, each piece of evidence, each phenomenon, must be fully correlated, corroborated and congruent with all the others based on the most fundamental geophysical constraints. The geophysical, geographical and geomorphological evidence must all fit the topography of Mars and the topography must fit this evidence.

Mars is divided into two major geophysical regimes. There is a very flat, lower basin that covers one-third of the northern hemisphere, which many planetologists suggest held a great ocean (to be discussed below). On the other hemisphere in the south, there stands, about five kilometers or three miles above the ocean bottom, a vast highland region, a vast continent. In certain respects, this is very much like the great Pangea continent on the early Earth, which incorporated all the present continents. While the Earth experienced plate tectonics that, over eons, separated these from their original origins, Mars had no such plate movements, and had one ocean and one continent from its beginning. Because there is superlative evidence on this highland mass that proves Velikovsky’s hypothesis, I have named this continent Velikovskia, the Velikovskian continent to honor him.

Therefore, this continent should exhibit tens of thousands of these river valley networks, and most of these should be located closer to the equator in the tropic and temperate zones, where rainfall from the nearby ocean would be most plentiful. At the equatorial latitudes of the Earth, rainfall occurs most often in the tropics than in the higher temperate latitudes. As one proceeds closer to the polar regions, snow should precipitate and form glaciers. Peter Cattermole, on this matter, reports: “Nearly all [the river valley networks] are located in heavily cratered regions [on the Velikovskian continent] between 30°N and 40°S.” Carl Sagan, along these same lines, writes: “We find that these sinuous channels are strongly concentrated near the Martian equator.” D. Wallace and C. Sagan, after examining spacecraft photographs of Mars’ surface, estimate that the number of individual river valleys that could be seen and estimated that these number to several hundred thousand. This location of the vast majority of river valley networks near the equator makes excellent scientific, geological sense for Mars, were it closer to the Sun.

The problem is that many of these river valleys have been degraded by erosion and mantled over with windblown dust. Over the 2,700 or so year period, Velikovsky posits that Mars arrived in its present orbit; erosion and mantling of these river valleys with dust is only to be

expected and, as we will see, was shown to be factual. On Earth, as streams age, they become broader and deeper, the main streams more so than the feeder or tributary streams. The main streams, carrying more water and abrading materials, cut deeper and wider beds than the upstream subsidiary feeders. Therefore, because the feeder streams, in most cases, tend to be shallower and narrower, one would expect there would be greater infilling and erosion than those deeper, wider ones downstream. According to Cattermole, this is exactly what has, in general, been observed. “The broad pattern of river systems consist of both degraded and pristine segments . . . The pristine segments tend to lie in downstream locations, while the degraded ones occupy upstream portions.”

Nevertheless, when geologists and geomorphologists saw these blunted, shortened lengths of these networks, and especially often, the absence of fine, upstream tributaries, they maintained this clearly disproved that rainfall generated these river-like features. In effect, they were arguing that erosion and infilling had not occurred on Mars, to any major extent, for billions of years. With this assumption, they believed they really understood that these networks were somehow carved by water coming from beneath the surface. Below, I will deal with this almost ‘no erosion’ concept.

Victor Baker, nevertheless, shows: “Some networks have a relatively fresh appearance in the Viking pictures, while others have a more degraded appearance. The cause of the degradation of these valley networks is unknown.” As one can see, degradation of narrower and shallower upstream and even downstream features by erosion is not part of the science employed to analyze these networks. It is “unknown.”! On the other hand, more openly, Thomas Mutch and his colleagues clearly understood that erosion played a role in this process. “Tributaries for Martian channels are largely absent. Where present, they are stubby and blunt, not at all like the delicate terrestrial examples. One might argue that Martian tributaries have been mantled by sediment.” William Hartmann outlines the problem and the controversy regarding these blunted and stubby tributaries.

“This idea continues to generate controversy. Others say valley networks are merely drainages created by underground sources of water creating runoff from springs or seeps. The answer would make a huge difference to our understanding of . . . Mars – if only we knew what it was.

“Michael Carr . . . was a member of the MGS [Mars Global Surveyor] imaging team and used MGS images to test whether the valley networks were caused by Martian precipitation. If so, he reasoned, the channels should branch out into finer and finer gullies, in the uphill direction, and therefore, even the highest resolution MGS images should show tiny rivulet channels in the soil. If they were absent, it should mean that the valley networks did not form from runoff of rainfall or snowmelt. In general, Carr’s survey of MGS images did not show tiny rivulets. In many cases, the images showed valley network channels ending abruptly in stubby gullies, not fine branching systems. Carr concluded that rainfall was not the culprit, and that the valley networks were formed mostly by water coming not from above but from below, out of the ground . . .

“[However,] As the accompanying photos show [not shown here] many valley networks are overlaid by smooth deposits of windblown dust and other fine material

97 Cattermole, Mars, the Story of the Red Planet, loc. cit.
98 Victor Baker, The Channels of Mars (Austin, TX 1982), p. 57
– so it is possible that the finest-scale runoff channels are missing only because they are buried or hidden by dust.”

Clearly, it is admitted, that the underlying problem inherent in these analyses, is that the scientists did not actually know whether the fine upstream channels were either eroded or mantled with dust. They held that there was no erosion and, therefore, the spacecraft images were showing them reality. As Kim Stanley Robinson, the science fiction writer points out in his Martian trilogy: Red Mars, Green Mars and Blue Mars, this kind of long distance observational analysis “called sky aerology . . . has a history going to the early satellite photos and even to telescopes . . . the canals [identified by Percival Lowell on Mars] had been sky aerology, and many more bad hypotheses had been formulated in the same way.”

The analysis that denied that erosion or mantling of fine, upstream tributaries did not account for their blunted, stubby appearances was bad hypothesis, based on limited sky aerology. In our case, there was always the possibility that these fine-scale tributaries did exist, but were either eroded or mantled by dust and, hence, rivers are not derived from underground sources, but from precipitation of rainfall and snow from above. Ultimately, the evidence that this was the case, was also discovered, surprisingly, from spacecraft images – aerology. However, these images were able to penetrate below the surface and the evidence they uncovered was that of finer and finer rivulets upstream. Nicholas Mangold, et al., in a paper titled “Evidence for Precipitation on Mars from Dendritic Valleys in the Valles Marineris Area,” report:

“Dendritic valleys on the plateau and canyons of the Valles Marineris region [near the Martian equator] were identified by Thermal Imaging System [THEMIS] images taken by Mars Odyssey [spacecraft]. The geometric characteristics [observed] of these valleys, especially their high degree of branching, favor formation by atmospheric precipitation. The presence of inner channels and the maturity of branched networks indicates sustained fluid flow over geologically long periods of time . . . Our results suggest a period of warmer conditions conducive to hydrological activity.”

Mangold and his team go on to show that these include finely grooved tributaries upstream that are buried beneath dust, just as I and others suggested:

“The plateau west of Echus Chasma . . . is covered by densely branched valleys that are frequently sinuous and extend over tens of thousands of kilometers . . . Infrared . . . images taken at night by THEMIS . . . show mainly intrinsic thermal properties of the ground . . . [river] valleys buried under loose material are outlined by variations of the thermal signal and resemble terrestrial deserts where sand covers the floor of dry valleys . . . On [one] drainage basin [noted as] G, the main valley is larger upstream than downstream close to the mouth, implying a thicker mantling at this location. With the exception of this place, most valleys have widths increasing from their sources to their mouths, as seen in terrestrial valleys. An IR [infrared] image taken during the day by THEMIS, shows that the dendritic valleys have their heads scattered at random points on the plateau . . . Hills are also gullied by small valleys with heads at the crestlines of the hills . . . These characteristics

100 Hartmann, Mars, the Mysterious Landscapes of the Red Planet, op. cit., pp. 125-126
are similar to terrestrial features of surface runoff due to atmospheric precipitation.\textsuperscript{103}

The most important point made is that:

“These characteristics are inconsistent with subsurface seepage induced by hydrothermal activity because these would not seep [out at the surface] at the crests of hills. Moreover, no valleys with theatic-shaped [amphitheater-like] heads are observed, as would be the case if [underground water had emerged and] sapping had occurred. Sapping has been invoked to explain the development of tributary canyons in the Valles Marineris region . . . such as the narrow tributary of Echus Chasma 1 to 3 km deep, that [are believed to] dissect the plateau borders. The main valleys of basins E, G and I connected the heads of tributaries, implying that these [sapping] valleys were active during the formation of tributaries, as observed on Earth . . . The contemporaneous activity [of river valley networks connected to the sapping canyons] suggests that the backward recession of tributary canyons by sapping was connected to the hydrological process existing on the plateau.”\textsuperscript{104}

Both river valley networks and large, interconnected canyons formed by sapping, occur in the very same area of Mars. The scientists understood that, since rainfall was responsible for the fine, sinuous river valleys, whose heads were at the crests of hills, then the sapping valleys existing at the same time had to also be fed by water that fell as rain. This kind of evidence continued to accumulate to the point that Kargel, because of his advocacy of temporary oceans and glacial ground water for Mars’ geomorphology, wrote:

“The sapping-only hypothesis survived intact as the favored hypothesis of the Mars community until the past year [2003]. New analysis of MOLA [Mars Orbital Laser Altimeter] data had picked out subtle valley forms that were not readily evident in Viking Orbiter or MOC [Mars Orbital Camera] scenes, and other studies have pointed out other observations or results of models that do not point fairly consistently toward a far more complex global network of small [river] valleys and a more highly dissected surface eroded by fluvial processes. Brian Hynek and Roger Phillips . . . have shown highland terrains that seem barely dissected . . . in Viking Orbiter, scenes, but that MOLA date reveal it to be intensely dissected by up to sixth-order tributary valley systems [rivers with one set of tributaries, and these have tributaries, and these have tributaries, and so on up to six]; furthermore, the geometric integration of the valley systems and their coverage over the surface appear to be dendritic fractal valley networks [numerous tributaries branching regularly upstream] caused by spatially distributed runoff as would occur most plausibly by rainfall and snowmelt. Thus, several of the chief observational bases for sapping origins and against distributed precipitation-fed runoff have been overturned at least in some areas of the planet.”\textsuperscript{105}

But there is evidence of rainfall from other regions of Mars, as reported on the Science Daily, “Evidence For Rain on Mars?” (Sept. 8, 2008) (Internet).

“These are the findings of an international team of researchers led by Ernest Hauber of the German Aerospace Center . . . who analyzed the latest image data of

\textsuperscript{103} Ibid., pp. 80-81.
\textsuperscript{104} Ibid., pp. 80-81.
\textsuperscript{105} Kargel, Mars, A Warmer Wetter Planet, op. cit., p. 243.
the Martian surface. They discovered delta deposits [where rivers flow into lakes or seas on Earth] . . .

“If the water flowed into the crater [lake] and back out again, it must have filled it up as well, says . . . Hauber. He points out that it is quite rare to see something like this on Mars: ‘In this and in a few other cases, we are fairly certain that there were lakes on Mars,’ . . .

“Maarten Kleinhans, of the University of Utrecht . . . The Netherlands . . . calculated that depending on the water volume, the [delta] deposits could have formed over a period ranging from decades to millennia. According to . . . Kleinhans, even if the water flow was very slow, it would not have taken more than a few hundred thousand years for the deltas to reach their current dimensions . . .

“Thus, there must have been precipitation on early Mars. This precipitation then flowed over the surface . . . ‘This is actually not at all self-evidence: For a long time, scientists have been trying to figure out whether the valleys on Mars were formed by ground water seepage and headward, erosion, or by surface runoff caused by rainfall or snowmelt.’ Says . . . Hauber . . . ‘Our findings also point in that direction and we are convinced that both processes [rainfall and snowmelt runoff] have played an important role’ . . .

Thus, there is evidence of rainfall on Mars, but this evidence has been fought repeatedly.

Kargel was suggesting that rainfall and snowmelt would not be the main sources of all the fluvial features observed on Mars, because his main focus was on short episodes of catastrophic water release that only periodically let these features form, and mainly by subsurface action. The finding, over various areas on Mars, of fine, sinuous river network systems forced him to suggest that there had been precipitation “at least in some areas of the planet” and, therefore, precipitation was not the sole process that encompasses the entire land surface. Because it had to take an extraordinary long time to erode these river networks, it seems clear that the entire planet had to be blanketed in a relatively thick atmosphere for that extraordinary long time. An atmosphere surely did not exist in only those places that exhibit networks and not also spread across the entire planet, and somehow miraculously it did not rain in all other regions so that subglacial waters could carve the other ones. That is the double bind for those who would deny rainfall and snowmelt runoff as the cause of all of them. The data for precipitation, therefore, has made a deep impression on the planetologist, as Kargel relates:

“Such studies have produced a strong, new interpretation trend in the Mars science community toward climate models that involve ancient heavy precipitation across the [Velikovskian] highlands. Some of the most ardent defenders of sapping, such as Michael Carr . . . have been convinced that the new [precipitation] school is the right school. Quoted in an article by Richard Kerr (Science, June 2003), Carr stated, ‘It seems more and more as if we do need precipitation.’ Accepting the studies from several recent studies, Oded Aharonson (Caltech) sums up the trend, ‘There’s been a shift [toward] a somewhat wetter Mars, implying a hospitable climate.’

“This revolution in thinking must feel like a warm community embrace to Robert Craddock and Ted Maxwell (Smithsonian Institution . . .) who have been
perhaps the only consistent, ardent expert defenders of a history of ancient long-
continued but declining rainfall on Mars..."106

Velikovskians are also warmed by this turn of events in Martian studies. If Velikovsky
is correct, the river valleys on the southern Velikovskian continent would, in general, flow toward
the great ocean basin in the northern hemisphere as the terrestrial rivers on Earth’s continents flow
to the oceans. What is quite striking is that astronomer Richard Anthony Proctor, in 1870,
conceived that this is the way the water cycle operated on Mars:

“There must be rivers on Mars the clouds which often hide from our view the
larger part of the Martian continent indicate a rainfall at least as considerable (in
proportion) as that which we have on Earth. The water thus precipitated on the
Martian continent can find its way no other way to the ocean than along river-
courses.

“As to the nature of these rivers, again, we may form conjectures founded on
trustworthy analogies. The mere existence of continents and oceans on Mars proves
the action of forces of upheaval and of depression. There must be volcanic
eruptions and Earthquakes modeling and remodeling the crust of Mars. Thus, there
must be mountains and hills, valleys and ravines water sheds and water-courses . . .
. The river courses [flow] to the ocean by cataract and lake, here urging its way
impetuously over rocks and boulders, there gliding with a stately flow along its
more level reaches. The rivulet, and from the mountain recesses burst forth the
refreshing springs which are to feed the Martian brooklets.”107

This is the thesis of Velikovsky except the end of all this occurred about 3,000 years
ago when Venus came so close to Mars, it removed its oceans, seas, river waters and atmosphere,
in a cataclysm. That is why there are no salt or calcium deposits in the north Martian ocean. They
were removed rapidly and catastrophically. This will be outlined below. For now, let us turn to
the other geomorphological formations on Mars sculpted not so much by water, but by snow that
compacted to form glaciers. As pointed out above, most of the many thousands of river valley
networks are located between the equator and 30 to 40 degrees latitude. Therefore, the glacial
terrains, like those on Earth, should be found mainly poleward beyond these 30-40 degrees latitude.
That is, in fact, the case, as Kargel shows:

“More generally, the low [equatorial] latitudes have a paucity of glacial features
that by any stretch can be attributed to glaciation. Plausible glacial terrains are
widespread, but occur mainly poleward of ± 30° and primarily poleward of ± 40°.
Though the landscape is unique in each candidate glacial region, most regions tell
the same story that is more or less consistent: A long period of ice accumulation
and flow then massive melting and stagnation of the ice sheets followed by
wholesale or partial disappearance of the ice. The story of Martian glaciation,
however, remains chronologically poorly documented, and is still unconvincing to
some critics.”108

Kargel, in fact, identified eskers, a clear indication of glaciers on the flat floor of one
of the great impact basins on the southern continental hemisphere.109 Based on all this, it appears
that the rivers are located mostly in the lower latitudes and glaciers, mainly in the higher ones and,

106 Ibid., pp. 243-244.
109 Ibid., pp. 186-208.
as expected, given these conditions, the water flowing from these is northward to the southern ocean basin, debauching there. Hartman, like Proctor, cited above, suggests this is just what happened:

“As once scientists realized that ‘dry Mars’ has abundant water . . . they began to think about Mars in terms of its climatic cycle. In particular, Stephen Clifford, a Mars geologist . . . envisioned a Martian global water cycle . . . contemplating the big picture of Martian water, Clifford started with the fact that the south [continental] polar ice cap and the southern [Velikovsky] highlands . . . are several kilometers higher than the northern [ocean] plains . . . whatever early liquid water . . . migrate[d] downhill . . . one way or another from the southern highlands to the northern lowlands . . .

“As fast as Noachian [early period] snow and frost collected on the top of the south polar ice cap, water seeped out from under the cap and crossed the uplands through underground aquifers or as rivers, ponding in craters . . . eventually flowing out onto the northern [oceanic] lowlands.

“In accord with this theory, we can see that many of the now dry river channels run from the southern uplands northward emptying on to low northern plains.”

Not only that, but where these rivers enter either the ocean, seas, or large lakes, they form deltas like those of the Nile, Amazon and Indus rivers. Neil F. Commins reports: “Mars orbiting spacecraft did report . . . river deltas . . . where water and [sediment] debris emptied into lakes and oceans . . . Some of the riverbeds include intricate, banded patterns and delicate channels meandering among flat-bottomed craters. Rivers on Earth invariably follow similar winding courses.”

One aspect of meandering rivers – rivers that bend forming large, circular curves, can only do so on plains. Mountain torrents flow rapidly and tend to cut straight channels carrying away sediments and leaving stony river beds. It takes millions upon millions of years for these torrents to wear down the mountain valleys through which they flow peneplaning and making the land flat so that the river flows slowly and in the soft sediments that it now traverses, and begins to cut wide arcs. A meandering river is a river in old age. Where we see these meandering streams, we are looking at old river valleys. Meandering streams are not confined to river deltas. Since Mars has river valley networks over much of its land surface and deltas where they enter the ocean or a lake, etc., . . . it should have peneplaned whole regions and in these, the river should meander. These great bending, curving river beds are also seen at various places on Mars . . . Jay Melosh speaks of “images of indisputable . . . meandering channels in the Aeolis Planum [Plane of Winds].”

Goro Komatsu and Victor Baker have presented images of the Nirgal Vallis on Mars with dozens of meanders similar to those observed in the Wadi Mareef in Southern Egypt. Since one cannot know the height of the Martian continent as it was in its early history, one cannot estimate how long it would have taken to peneplane some of these areas down to flat planes.

However, since Mars apparently has no plate tectonics, then the erosion over untold ages would have created a quite different set of drainage basins compared to those seen on Earth. The germane point is after eons of erosion, vast regions of the Velikovsky continent would have

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110 Hartmann, Mars, the Mysterious Landscapes of the Red Planet, op. cit., pp. 272-230.
highly chaotic drainage. This was well described by Kim Stanley Robinson in his science fiction novel, *Blue Mars*:

“The southern highlands were everywhere lumpy, shattered, pocked, cratered, hillocky, scarped, slumped, fissured, and fractured; when analyzed as potential watersheds, they were hopeless. Nothing led anywhere; there was no downhill for long. The entire south [continent] was a plateau three or four kilometers above the datum [the average altitude of the ocean basin bottom and highest points on Mars], with only local bumps and dips . . . If they poured water onto this pummeled land, they would end up with a crazy quilt of short streams, running down local inclines to the nearest rimless crater. Hardly any streams would make it to the sea in the north or even into the [high latitude southern] Hellas or Argyre basins both of which were ringed by mountain ranges of their own ejecta.

“There were, however, a few exceptions to this situation . . .”

What Mars geologists have failed to consider is that the historical pattern of drainage on a continent that has gone on for billions of years would not leave similar drainage patterns as those on Earth, with its plate tectonics, and uplift of continents, although volcanic uplifts do occur on Mars, but these are rarer events.

Lastly, on the historical geology of Mars, if it lost its water around 3,000 or so years ago, one might expect to see places where sufficient solar heat has actually penetrated a slope and sent trickles of water down it. If Mars cooled gradually, say over millions of years, the water near the surface would have found its way through porous rock or soils ever deeper below the surface. And as we will see, Mars has such rock. It would hardly be possible that at high point slopes the water table after billions of years would still lie adjacent to the surface, unless the water froze almost instantly a short time ago. Yet this melting of subsurface ice on a slope and its flow down an incline has apparently been observed:

“In 2011, NASA released a statement, along with photos, saying they have evidence that there might be ‘flowing water’ on Mars. The time-lapse shots appear to show liquid running down the rocky landscape to form long, dark flow patterns. Scientists’ best guess is that the flows are salty water which warms up just enough during the planet’s summer months to melt and slosh around on the surface . . . This is the first time that such markings have been observed changing over a short period of time.”

Kasting describes these observations by Mars Global Surveyor thus:

“It orbited the planet transmitting images and other data from September 1997 until November 2006 . . . two pictures of the same crater wall in the Centauri Montes region [were] taken 6 years apart. The light-colored streak . . . [taken 6 years later] shows evidence of recent gully formation. Here ‘gully’ is the name given to small-scale, apparently fluvial features found on the walls of some craters, as well as those of larger Martian valleys.

“Exactly how such gullies are formed is a matter of debate. Some investigators have proposed that they might be created by landslides, rather than by a flowing liquid. However, detailed analysis of the structure of the flows specifically, the fact that they tend to go around obstacles, rather than over them, argues otherwise. Others have suggested that they are formed by liquid CO₂ rather than liquid H₂O.

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But this too, seems unlikely, as liquid CO$_2$ is stable [as liquid] only above 5.2 bar pressure which, of course, is much higher than the [tiny] ambient surface pressure [on Mars]. By comparison, pure liquid H$_2$O can exist at temperatures and pressures above its triple point [where water can exist as a solid, liquid or gas] (0.01° C and 6.1 mbar pressure) [as can be found on Mars].

“The argument that the gullies are formed by the flow of a liquid is bolstered by the fact that they are found predominantly on equatorward-facing slopes located at . . . [less than] 30 degrees north or south latitude. Such slopes receive the full brunt of solar heating during the daytime, as the Sun’s rays are more or less perpendicular to the surface. This might allow subsurface ground ice to melt, although the energetics for this process are unclear . . . ”

If this happened today over the billions of years posited for the last time Mars had water on its surface, solar heat should have produced this same effect hundreds if not thousands of times and there would be no high subsurface ice left there to permit this to happen. All the subsurface ice should have melted and would have slashed its way down to the bottom of the slope and the gully markings would be deep and run from the top to the bottom of the slope. This appears not to be the case and indicates that there is still ice/water perched on high slopes, suggesting that only recently the ice froze.

Given the billions of years of surface water flowing on Mars should also be observed by the immense amounts of material that was worn off/eroded from the Velikovskian continent and deposited in lakes, seas and deposited into the Martian ocean. These materials would then have been, like those on Earth’s lakes, seas, etc., sorted by the moving water according to their mass and sizes into layers that are somewhat mineralogically different. Over time, more and more layers of sediment would be laid on top of them until the deepest strata were under such great pressures that they were cemented together to form sedimentary rock like the sedimentary layers that can be seen in the walls of the Grand Canyon of Arizona. It takes roughly a million years of such layering and pressure to produce one inch of sedimentary rock on Earth. On Mars, with a surface gravity that is 38 percent that of the Earth, the pressures needed to form one such layer would take a far greater period to compact sediment, and thus the analogy of the length of time for forming sedimentary rock on Mars would be longer than forming that same layer on Earth. This, too, must be taken into account when we deal with Martian sedimentary layering. Thus, a one mile layer on Earth would require perhaps three, four or even five times longer to solidify on Mars.

Tyler Nordgren outlines the entire process and the general time required to do this in the Grand Canyon:

“Let’s examine two of the unimaginably slow processes that made the canyon that we see today. The first is deposition [of sediments in lakes, etc.]; the rock that we see in the canyon walls had to come from somewhere . . . the bright colored layers of the canyon are the result of sediments; the slow settling [and sorting] of sand, silt, mud and minerals . . .

“Let’s do a simple thought experiment. Stop sweeping and let the sand and dust grow about your house. After one year I can imagine a layer of sandy sediments a single gram thick: 1/32nd of an inch thick (about 0.75mm), and an identical layer is deposited for every year . . . ’ In one hundred years that’s dirt three inches deep (7.5cm) and after a thousand the floor is buried nearly three feet down . . . The layer I see revealed in the canyon walls are only 5,000 feet thick (1,525m),

easily due (by our calculations) to the gentle drift of sand and sediments after only two million years.

“But the canyon isn’t made of loosely stacked sand: The weight of those layers [above] presses and compacts the sediments beneath it . . . If in our simple thought experiment we were to imagine that each layer of those loose deposits is eventually compressed to even a tenth of its original thickness, then the two million years we calculated turns into twenty million years . . .

“Consider then a second thought experiment: How much time is needed to remove the canyon’s missing mass? . . . it would take the Colorado [River] 10 million years to carve the canyon we see today.”117

That is to lay down and uncover about 5,000 feet or 1,525 meters of sediment on Earth takes roughly 210 million years. But if Mars had winds and water flowing on its surface for billions of years, not only would sediments be deposited to form layers when exposed or uncovered, these same winds and waters would erode away many of these sedimentary layers as they have on our own planet. Therefore, any estimates as to how long this process takes can give only an extremely limited range of time for the ages of these layers. On the Earth, these sedimentary layered rocks are found all over our planet in both horizontal and tilted formations. According to Lang:

“Widespread, stratified rock structures found in topographical low [regions] on Mars could have been deposited by standing bodies of water. The layered material is located in impact craters [that blew away material to expose them], on parts of the Hellas . . . basin, [perhaps an inland sea.], and on the floors of canyons in Valles Marineris such as Candor Chasma.

“Thick sequences of hundreds of horizontal regularly layered deposits are present in many places throughout the canyon . . . The layered sediments were presumably deposited and cemented into rock [like those in the Grand Canyon].”118

Kevin Noland reports, “While both Mariner 9 and Viking orbiters had photographed sedimentary layering at several locations, MGS [Mars Global Surveyor] had revealed that it is a planetwide phenomenon pointing to massive transport and deposition of material on Mars . . . past.119 He adds that “such widespread sedimentary layering . . . often spread over hundreds of kilometers [horizontally] and several kilometers in depth, the processes involved must have occurred on a planetary scale that lasted many millions of years.”120 He also points out that “whatever the processes involved, however, the identification of planetwide sedimentary layering firmly indicates that Mars was active in its past, probably involving a range of depositional processes including tectonic, volcanic aeolian [wind] and even aqueous activity over long periods of time.”121

One point must be made regarding this sedimentary process as exhibited by layers in the Valles Marineris is that no one really knows how this immense chasm, in places hundreds of miles wide and far deeper than the Grand Canyon, formed. Carl Sagan, looking at it was forced to the admission that it is “as if a third to a quarter of the whole surface of Mars were cracked in

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120 Ibid., pp. 201-202.
121 Ibid., p. 204.
some colossal, recent event that lifted [the] Tarsis [bulge]. The most spectacular of these quasi-linear features is an enormous rift valley [The Valles Marineris] . . . It [the crack] runs 80 degrees of Martian latitude . . ."\textsuperscript{122} It is suggested that the Valles Marineris was caused by Venus’ close approach to Mars. And furthermore, that the layered sediments in it were laid down by wind and not water, as in the Grand Canyon. Here Noland informs us:

“Another activity important yet paradoxical discovery . . . has been the identification of unweathered olivine [rock] layers at a depth of 5 kilometers [about 3 miles] within the walls of the Valles Marineris, since olivine is reduced to clay on contact with water such a discovery would seem to suggest that Mars was incredibly dry even during the [assumed wet] Noachian period.”\textsuperscript{123}

Planetologists have offered that the Valles Marineris was an ice-covered lake at that early time, but the olivine rock strata there suggests that Mars, like the Earth, had pluvial regions as well as desert regions throughout its history. On this Noland reports, “Such apparently contradictory evidence is an indication of both the incompleteness of our survey of Mars and of our understanding of its complex history.”\textsuperscript{124} According to Cattermole, in certain “localities the [sedimentary] deposits attain a thickness of 9 km [about 6 miles].\textsuperscript{125} That is only what can be observed, but below this level, there may, and most probably are, sedimentary layers as well, perhaps twice or three times as deep or more. Since it took about 210 million years to create the layers seen in the Grand Canyon, using the Martian measuring rod, the 9 kilometers / 6 mile depth had to take one billion, 260 million years to form, but at a slower rate than Earth, perhaps 3 to 4 billion years.

Importantly, the compression of these sedimentary materials on Mars, if compressed to one-tenth their original depth, suggest the original material on the Martian surface could have been 90 kilometers / 60 miles high. Clearly, this erosion would have lowered the entire planet to one level unless there were other forms of uplift to offset this erosion.

Beyond brooks, rivulets, rivers, lakes and an ocean existing as evidence of Mars’ watery past, there would also have been inland seas that dotted the Martian land surface. Noland reports, “Working in combination, Odyssey, Opportunity and Mars Express [space craft images] have provided unequivocal evidence of an inland sea, about the size of the Baltic Sea at Meridiani Planum, with the accretion of hematite at meters deep across the region.”\textsuperscript{126} In terms of other areas in which sediments were laid down in bodies of water, Noland shows:

“A significant development in the quest to determine the extent of water on early Mars has arisen from the first complete mineralogical survey of the planet from the Mars Express, Omega, thermal imaging spectrometer: Omega has revealed two distinctly different types of hydrated [water based], suggesting two different eras of water-based activity . . . hitherto unconsidered. As detected by Jean-Pierre Bibring and his colleagues . . . particularly minerals called philosilicate clays have been identified at numerous locations . . . The nature and pattern of the minerals across the . . . surface suggest the presence of a large body of standing water and a moist climate [allowing for rainfall] for millions of years.”\textsuperscript{127}

\textsuperscript{123} Noland, \textit{Mars, A Cosmic Stepping Stone, op. cit.}, p. 217.
\textsuperscript{124} \textit{Ibid.}, pp. 219-220.
\textsuperscript{125} Cattermole, \textit{Mars, The Mystery Unfolds, op. cit.}, p. 112.
\textsuperscript{126} Noland, \textit{Mars, a Cosmic Stepping Stone, op. cit.}, p. 27.
\textsuperscript{127} \textit{Ibid.}, p. 278
All across the Martian continent we have unimpeachable evidence for water flowing on its surface creating all the hydrological forms of geomorphology observed on Earth and minerals that tell the exact same story. Let us now turn to the northern hemisphere:

**A MARTIAN OCEAN AND GREAT FLOODS OUT OF IT**

One of the major forms of evidence for a watery Mars was the discovery of an ocean basin covering one third of the northern Martian hemisphere given the name Oceanus Borealis by Dr. Victor Baker, which means Ocean of the North. The evidence for its reality is presented by Noland:

“One of the most controversial hypotheses regarding water on Mars has been the proposal of a great ocean in the northern hemisphere in its early history. This idea gained credence during the 1980s when Timothy Parker, of JPL [Jet Propulsion Laboratory] used Viking orbital data to identify what could be interpreted as an ancient shoreline circling the planet at the division between the southern highlands and the lowlands . . . Hence the idea of a great northern ocean . . . seemed at least plausible, but closer examination by MGS (Mars Global Surveyor) and Odyssey did not support the hypothesis. First, MOC [Mars Orbital Camera] images of the supposed shoreline reveal no evidence of coastal morphology. Second, MOLA [Mars Orbital Laser Altimeter] has revealed that the proposed shoreline features do not all reside at the same elevation, varying as much as 8 kilometers from region to region. Finally, neither TES [Thermal Emission Spectrometer] nor THEMIS [Thermal Emission Imaging System] has identified carbonate sediments associated with large standing bodies of water.

“Despite this, other evidence seems to indicate that the region was influenced by water to some degree: A second inner shoreline-type feature circling around the planet sits at a single elevation around the ocean. It is also clear that river networks of the south come to an abrupt halt at the division between the south and north, while most of the great flood channels . . . flow northward into the region. Also sedimentary layering along the flood channels and across the northern lowland [of the ocean] could have been created through aqueous sedimentation. We must also remember that the lack of identifiable smudged features could be the result of weathering . . . while the observed variations in the elevation of the proposed coastline may have occurred subsequently through tectonic activity.”

Hartmann adds the following:

“None the less to assume that the MGS camera ends the [ocean] story presupposes that the guy with the biggest camera has the last word – which isn’t necessarily true. The problem is if you are too close to a thing you can’t see it. You can see the Lake Bonneville shorelines from an airplane, but if you walk over the with a 35 millimeter camera and shoot vertical close-ups from the waist level, the picture won’t reveal them. Concerned about this effect, Parker continued to examine some of the proposed Martian shorelines in additional pictures, and writing in 2002, he presented new MGS images in which some of the proposed

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shorelines look convincing after all, resembling aerial photos of the Bonneville features at similar scales.\footnote{Hartmann, Mars the Mysterious Landscapes of the Red Planet, op. cit., p. 142.}

“If a coastline truly existed around a long-lived, ancient sea, it would have had to lie at a constant elevation all the way around the sea. After all, water creates a level surface . . .

“Sediments washing into the sea from shoreline regions would form a shelf around the edge at constant elevation 3,700 meters [4,000 yards] below the mean surface all the way around the basin. Below this level the radar shows a broad [continental] shelf and [below it] a strikingly smooth basin floor. This evidence for a sea seems strong because there is no other good explanation for a coastline-like feature to be at constant altitude over distances of hundreds of kilometers.

“The hypothetical ocean below this possible coastline would have averaged 570 meters (1850 feet) deep, but reached 3 kilometers (nearly 10,000 feet depth in the [part of the ocean] basin now known as Utopia Planitia.”

If there was an ocean covering this deep basin for untold millions or billions of years, like oceans on Earth, sediments carried to it by rivers would have generally filled in the valleys and other low points on the seabed and would create large extremely flat abyssal plains. That, too, is the case, as Robert Zubin, with Richard Wagner, show that: “Among . . . discoveries has been altimeter data revealing a large basin of depressed and relatively uncratered terrain in Mars’ northern hemisphere that is flatter than anything on Earth except the sea bottoms.”\footnote{Ibid., p. 143.}

Cattermole put the case this way:

“In essence, the northern hemisphere is a vast depression, being very smooth in the mid-to- high latitudes . . . However, over hundreds of kilometers, the surface rises and falls only 50 meters [165 feet] or so. This makes it even flatter than the lunar maria, and the Earth’s Sahara Desert. Excluding the massive Tarsis Rise, all the topographical profiles obtained by MOLA [of this basin] are either flat or slope gently upwards toward the south . . . This vast flat area, which is as smooth as Earth’s abyssal oceanic plains extends across every longitude and is over 200 km [125 miles] wide in north-south extent. It has been described as the flattest surface in the solar system for which we have data’ . . .”\footnote{Robert Zubin with Richard Wagner, The Case for Mars . . . (NY 2011), p. 37.}

As with the oceans on Earth, the dichotomy between the continents and oceans are generally marked by a continental shelf on the shore and into the sea and then a steep, deep falloff that drops to the ocean floor. This steep fall off on Mars Cattermole describes as “the steepest slopes on the planet are found to be associated with . . . the dichotomy boundary, the region that separates the smoother lower third of Mars from the . . . highlands of the southern two thirds.”\footnote{Cattermole, Mars, the Mystery Unfolds, op. cit., p. 19. All these descriptions add up to an ideal reality of a Martian ocean. The shoreline is found all around the basin, at the edge of the ocean, at one elevation, as with terrestrial oceans. The abyssal plains in it are extremely smooth, like those in the Atlantic, Pacific and Indian oceans. There is a continental shelf surrounding the ocean basin with a prominent cliff that is some two to three kilometers / 6000 to 10,000 feet high in places between the coastal shelf and abyssal plains.\footnote{W. Kenneth Hamblin, Eric H. Christensen, Exploring the Planets (Englewood Cliffs, NJ 1995), p. 143.}
What should also be noted, as cited above by Cattermole, is “the topographical profiles . . . are either flat or slope gently upward toward the south. This is exactly what is to be expected if sediments carried by rivers to the sea deposited this detritus at the coast. Most of that sediment would pile up at the base of the oceanic cliff and then, by way of water action, be carried out across the abyssal plains, leaving either a very flat surface, or a very gradual slope from the edge of the continental shelf, deep southward to the more central parts of that ocean bottom. From all these points, it seems clear that there was an ocean on Mars for millions / billions of years.

In terms of sediments, it is well understood that bodies of standing water would contain appreciable amounts of certain minerals in solution. Therefore, one would expect to find these minerals in the sediments of the Martian abyssal plains, especially salts. According to Kargel and Strom, the two Viking landers that set down on the [northern plain] surface “analyze Martian soil and found it probably contained 10 to 20 percent salts,”\(^\text{135}\) According to Carr:

“The fine-grained debris close to the surface of both [Viking] sites is cemented to form a crust a few millimeters thick . . . The cement material [is] formed during crust . . . Many of the smaller-sized fragments within the field of view are also formed of duricrust, as indicated by their chemistry and mechanical properties. The crust is identical in composition to the fine grained debris except for a significantly higher sulfur content and possibly slightly more chlorine . . . It is probably a caliche like [soil or alluvium cemented material] formation with a cement of soluble mobile salts mainly magnesium sulfate and possibly sodium chloride.”\(^\text{136}\)

These are clearly materials found in ocean waters on Earth. Carr goes on to present similar mineralogical evidence of ocean clay residues, such as “carbonates . . . kieserite, calcite [and] rutile.”\(^\text{137}\) All these minerals are of oceanic origin.\(^\text{138}\) Chlorine and sodium chloride are among the most common components of dissolved minerals in ocean water. Magnesium sulfate on Earth is found in nature as a “precipitate of saline brine”\(^\text{139}\) and brine is “sea water”\(^\text{140}\) Richard C. Hoagland sums up these findings thus:

“Viking landed at two places on the planet: Chryse and Utopia, each separated from the other by almost half the planet. But – both landing sites in the northern hemisphere . . . roughly corresponding to ‘sea level’ here on Earth . . . Both landing craft would have been about two miles under water [if Mars had an ocean].

“. . . Viking had landed and sampled soil from the bottom of what would have been an ocean. To wit, [John Brandenburg stated] . . . the surprising abundance in Chryse samples, not explained by the Viking team, seems to be evidence to me that Viking was sampling stuff which had formerly been on the bottom of a salt(!) ocean. The presence of so-called ‘duricrust’ around the spacecraft, as a chemical ‘cementing process’ from salts seeping upward from below, is also consistent with this concept.”\(^\text{141}\)

Hoagland goes on to discuss these minerals noted by Brandenburg:


\(^{140}\) *Dictionary of Geological Terms, op. cit.*, p. 65.

“If you drive through portions of the Southeast, the western foothills of the Carolinas or Georgia, in particular – hundreds of miles from the nearest ocean – you’ll find mile after mile of this iron-rich, brick-red clay. It’s a very striking stark contrast to the dark green pine trees that seem to thrive on it.

“Hundreds of millions of years ago . . . this portion of the United States was under water – part of an extensive continental ‘prism’ of deep ocean sediments and muds washed off the continents themselves. In those muds were clays mixed with iron compounds, with names like ‘nontronite’ and ‘magnetite’ . . .”

These are also ocean minerals. The overwhelming problem regarding this clear evidence for a Martian ocean, is that if it was removed by uniformitarian processes, we should see either carbonate or salt flats lying all over the ocean basin. To leave these abyssal plains as they appear, the water could not have been removed gradually but catastrophically. Kargel points to this question, how that ocean after forming “could be disposed of?”

He adds: “I have quite a bit of difficulty with that concept, mainly for the simple reason: where did the water go?” Lang echoes this major paradox:

“And if Mars was once bathed in an ocean of water, where has all the water gone? Everyone agrees that water once flowed on the surface of Mars in large quantities, but the exact fate of all that water remains unknown . . .

“Water ice is locked into the residual northern polar cap . . . but it cannot explain the missing water. It now contains no more than 1.2 million cubic kilometers of ice. If liquid water could exist on Mars and the entire polar cap melted, it would create a global ocean less than 20 metres [18 yards] deep.”

He further claims that even if both polar caps melted, these would still fall far short of supplying sufficient water to fill the Martian ocean basin. The conundrum is that there is abundant evidence that Mars had a deep ocean, but there is absolutely no uniformitarian (gradualistic) method that would remove it without leaving behind vast carbonate and salt flats across the abyssal plains, where it stood for hundreds of millions of years in Mars’ ancient past. And so far as I have read, no one has explained how this gradualistic process of water removal could have occurred and not leave great carbonate and salt flats behind. Even Kargel’s thesis has water flowing into the Martian ocean at great intervals covering parts of it, yet as these gradually lost water, they miraculously failed to leave these large white deposits.

Because the planetologists are wed to their stable solar system model and uniformitarian, slow change concept, they are again caught in a massive double-bind. With Mars in an orbit closer to the Sun, but having a close, catastrophic interaction with Venus, which was then in an incandescent state, this stupendously hot Venusian body and the pull of its gravity would pull away, and/or perhaps burn away not only Mars’ atmosphere, but also whatever surface water it contained. This interaction will be fully analyzed below. In a nutshell, the Martian planetologists have no understanding of how water could have existed on Mars in its earliest period, how it actually carved all its features, nor how it all disappeared. In terms of Velikovsky’s hypothesis, Mars as an inner planet to Earth, was close enough to the Sun so that its outgassed water could flow on its surface, and could do so as long as that of the Earth. When Venus had a

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142 Ibid., p. 175.
143 Kargel, Mars a Warmer Wetter Planet, op. cit., p. 129.
144 Ibid., p. 229.
146 Ibid., pp. 267-268.
near interaction with Mars, it pulled away Mars’ atmosphere and ocean, river and lake water so that there were no carbonate or salt flats left behind.

One final topic before examining the chronology as to when Mars lost its atmosphere and water is the evidence of immense floods that I maintain nearly all but two flowed out of the ocean basin around the time just prior to Mars’ closest near collision with Venus; that tilted its axis causing the ocean’s tidal bulge water to flow from the equator over and onto the Velikovskian continent. The water masses flowed inland, eddied when they could flow no farther, gouged out the surface creating great amphitheater depressions, then in great torrents, flowed back into the sea leaving behind great alluvial aprons. Two such floods are observed to have flowed into the Hellas basin in the south which might have been a sea that had also been so moved to allow its water to flood onto the adjacent land and these also rapidly returned into it. Kargel describes outflow channels as:

“In one of the greatest finds of the Space Age, Mariner 9 and Viking Orbiters showed us immense freeze-dried river beds carved by the Solar System’s largest-ever-flash floods. Unlike dendritic highland small-valley networks, these magnificent ‘outflow channels’ start as extra-super-size features, usually at sites of massive ground collapse [or, as I suggest, ground gouged out by swirling eddies] known as chaos or chaotic terrain. Outflow channels generally lack tributaries, but instead consist of multiple braided channels . . . near the Tarsis [bulge] and Valles Marineris region [located adjacent to the equatorial region] and emptied into the northern plains especially into the Chryse Basin. Floods that were a hundred miles across in places hundreds of feet deep and running up to 2,000 miles carved canyons half a mile [2,640 feet] deep, gouged potholes and scours a hundred feet deep, and etched tear-drop shaped islands the size of Long Island. Martian Chaotic terrain at the sources of outflow channels apparently formed by rapid massive fluid withdrawal.”

While it is assumed these massive flows are almost as ancient as the river valley networks, the evidence from them holds a problem – their age. In the great alluvial fans of sediment they carried and deposited on the seabed, there are rocks that are in place that are identical to flood-rock-sediment deposits here on Earth. These rocks are left embedded in the sediments, but are tilted in one preferred direction to the direction of the flood, and are termed “imbricated” rock on Mars’ alluvial aprons, with these tilted and jumbled rocks are known as “rock gardens.” J. W. Rice, et al., describe one such rock garden in the Ares Vallis:

“Imbricated rocks are visible throughout the landing site . . . Imbrication is a fabric of maximum stability and is commonly used to indicate paleoflow direction where [rock] clasts dip [in the] upstream [direction] . . . The imbricated rocks located in the rock garden indicate flow from Ares Vallis (SE to NW imbrication.”

Nevertheless, Hartmann outlines the great problem of having billions of years old floods with imbricated rocks still lying in a pristine state:

“. . . Pathfinder science team concluded that certain groups of rocks show an imbricated structure in which slabby rocks lean against one another, it is a form typical on Earth when rocks have been tumbled into place by chaotic floods. Team

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147 Kargel, Mars, a Wetter, Warmer Planet, op. cit., p. 78.
leader Mike Golombek and others concluded that the rock seen at this site are lying just where they were deposited by the floodwaters perhaps 3,000 or 3,500 my [million years] ago. My own calculations, however, suggest that during such a long period of time, meteorite impacts would have tilled the surface like a drunken plowman churning things to a depth of a meter [40 inches] or so in which case most rocks would have been disturbed by impact effects. We haven’t resolved this discrepancy.”149

To get around this problem, it has been suggested that this rock garden was buried under perhaps a meter [40 inches] or more of sediment that protected the pristine imbricated positions of these rocks for three to four billion years and then, miraculously, the covering sediments were eroded precisely to the identical depth so that these rock gardens were uncovered and exposed. That is, erosion or detritus just happened to cover these rock gardens to a depth that would not be affected by impacts or Marsquakes shaking the surface. Then erosion did precisely the opposite: it removed the identical depth of detritus to expose the original surface that had been buried. Erosion, in this case, is doing precisely what the scientists need to do to have these floods flow three to four billions years ago. Velikovsky’s theory needs no such miraculous coincidental burial and erosional uncovering to explain the pristine positions of imbricated rock gardens. Since these megafloods flowed only a few thousand years ago, it is only natural that these rocks are lying in their pristine positions. Again, one can see how this interdisciplinary evidence jumps together with Velikovsky’s hypothesis without recourse to a fix-it-up theory. On the other hand, it can be argued that this region was unaffected by meteorite, asteroid or cometary impacts, and further never felt a massive Marsquake. However, Jonathan D. Clark points out that there are “impact eject breccias . . . at Ares Vallis . . . [which] are difficult to distinguish from impact-gardened regolith.”150 That is, the materials on Ares Vallis are those of impacts that have gardened-tuned over the soils in it deeply. Clark adds:

“At Ares Vallis, however, local preservation of apparent boulder imbrication indicates that some [how] sedimentary fabrics have persisted and that impact gardening has not completely homogenized [mixed up] the regolith.”151 However, Ian Gilmour and Mark Sephton show the Ares Vallis is surrounded by impact craters “The largest impact crater visible is 63 km [50 miles] in diameter.”152 The evidence shows the area has been impact cratered, but this being the case implies the ground had to be impact gardened, meaning the impacts mixed the soil and at the same time left impact debris on the surface as evidence of this process. The only way to have pristine imbricated rock gardens in Ares Vallis is if the flood that created them occurred after the impacts occurred, or to have the Ares Vallis coated by sediment to a depth that protected these rock gardens and then remove exactly that amount of sediment and no more to allow planetologists to find them just where they were originally deposited. This, I suggest, is not science, but hand-waving to prove a desired illusion. As we proceed, this ability to get erosion to do great improbable and impossible feats of legerdemain needed to make the Martian surface fit the impact chronology, so that it is three to four billion years old will be put forth, and accepted by that entire community, without a question of doubt.

151 Ibid., p. 386.
152 Ian Gilmour, An Introduction to Astrobiology (Cambridge, UK 2003), p. 100, Figure C.
EROSION AND THE AGE OF MARS’ SURFACE

The question of when these rivers flowed and when an atmosphere and ocean existed on Mars is the crux of the matter. While the scientists maintain all these phenomena associated with pluvial conditions on Mars formed and ended their existence at least two billion or more years ago, Velikovsky’s hypothesis required they existed in quite ancient times up to around 3,500 or so years ago. Therefore, the problem of finding a correct chronology is crucial for these two antithetical models. The way surface features are very broadly dated is by counting the number of impact craters observed in any region of a planet or natural satellite. The greater the number of impact craters in an area is interpreted to mean it has been exposed to bombardment from space for longer than areas with fewer impact craters. Nevertheless, this specification ranges broadly by at least an inaccuracy of plus or minus 500 million years. “Mars chronology can potentially be addressed coarsely through in situ analysis. Even with errors of ± 500 million years such an analysis would greatly improve our understanding of the absolute timing of key events in Martian history.”

On the basis of crater counts, the chronology of Mars is divided into three major periods with many internal smaller ones. The three major epochs, according to Hartmann, are:

“Noachian Era . . . probably lasted from the beginning of Mars 4,500 my ago to roughly 3,500 my ago, plus or minus 100 my, according to recent estimates. It was an era of active erosion intense volcanic activity, and possibly lakes and oceans. Early intense impact cratering was winding down. The atmosphere was probably denser at least in the early Noachian. There are many signs of liquid water on the surface, at least sporadically, along with massive transport and deposition of sediments by such water. The climate was significantly different, but it is unclear whether it was warmer or colder on average . . .

“Hesperian Era . . . probably lasted from about 3,500 my ago to perhaps 2,500 to 2,000 my ago with an uncertainty of around 500 my. It was an era of transition to Mars’ drier, dustier conditions. Much of Noachian water may have frozen as massive underground ice deposits, or the depth of such frozen layers grew deeper. River forming activity continued but declined. Possible sporadic local melting of the underground ice may have produced ‘breakouts’ or water, the collapse of overlying terrain and massive localized floods. Most river channels had their last water flows in this era . . .

“Amazonian Era . . . beginning roughly by 2,500 or 2,000 my ago (plus or minus 500 my) and continues to the present. It is an era of relatively modern conditions and lower rates of geologic activity. Volcanism and impact cratering continued at a lower level. Mars, in the Amazonian era, has been mostly dry and dusty, but moisture (from melted ice?) percolates among the Martian rocks, and water is occasionally released onto the surface.”

In terms of Velikovsky’s hypothesis, Mars has had two major periods in its history. The first was when it was on an orbit closer to the Sun inside the orbit of Earth. Then it had a warm climate, an atmosphere large enough to maintain water, an ocean, inland seas, lakes, glaciers, rivers with dendritic tributaries, deltas supplied by rainfall and snowfall. This period ended about 3,500 years ago by a near interaction with Venus on a cometary orbit which catastrophically

\[154\] Hartmann, Mars, The Mysterious Landscapes of the Red Planet, op. cit., pp. 33-34.
removed its atmosphere and surface water, hurling Mars into an elliptical orbit that passed close to the Earth where it lost much of its thin remaining atmosphere and thereafter relaxed into its present orbit. At that distance from the Sun, the temperature of the planet fell to the superfrigid one it experiences today. Erosion by dust storms over the past few thousands of years buried many of the smaller river valleys and left Mars in its present state. Velikovsky’s theory is not aligned nor dependent on crater counts.

Therefore, it is necessary to determine just how accurate crater counts are to determine surface ages. The point that must be emphasized is that the use of crater counts for age determination is based on a uniformitarian belief system – namely that cratering events always or almost always happen at a fairly regular rate over time. Nevertheless, Victor R. Baker presents this warning to caution us regarding this uniformitarian assumption. “The validity of absolute ages derived from crater densities has severe limitations. The rates of impacting may not have been constant, surfaces may have become saturated [with craters] and craters may be eroded shortly after formation.”

Let us, nevertheless, examine the uniformitarian manner by which the scientists have massaged that data: Clark R. Chapman, no friend of Velikovsky, clearly elucidates how the crater count books are cooked by scientists to fit their uniformitarian assumption:

The creation of scientific hypotheses involves a complex interplay of the data with scientists’ intelligence, special expertise, and assumptions. When syntheses involving different fields are required – say celestial mechanics and geology – then scientists depend upon mutual communication and faith in each other’s expertise. Philosophical assumptions and faith in the judgment of others often become pre-eminent when the questions to be resolved are complex, data are recent and only superficially examined, and implications of the answers are fundamental.

“A case in point is the recent development of an approximate ‘planetary cratering chronology’ from the hypothesized cataclysm to the present. In the absence of datable rocks from Mars and Mercury there is only one way to establish an ‘interplanetary correlation of geologic time’ that connects the relative sequence of geology on these planets to the quantities and orbits of the asteroids, comets, and other impactors have evolved since the hypothesized cataclysm. If we were to know, for instance, that there have been many more asteroids crashing onto Mars than onto the moon, then the fact that Mars has similar numbers of craters would imply it is a younger, geologically active planet. Unfortunately, we don’t know the cratering rates from planet to planet to within a factor of 10; that is, Mars may be struck by ten times as many bodies as Earth, or perhaps just the same number [or less].

“Still, Murray Soderblom and Wetherill have tried to fashion a rough chronology for Mercury and Mars in this way: first, Larry Soderblom compared the crater densities on the moon to those on Mars and wrote, ‘Because the oldest, post accretional [flat], surfaces on Mars and the moon display about the same crater density, it now appears that the impact fluxes at Mars and the moon have been roughly the same over the last 4 billion years.’

‘And, if the impact rates have been the same, then any province on Mars cratered similarly to a province of known age on the moon has a similar age. This analogy seems simple and straightforward yet, it arbitrarily excludes the possibility of differing fluxes and differing chronologies. [Emphasis added]”

[To resolve this dilemma]

“Bruce Murray carried the uniformitarian analogy over to Mercury. He observed from *Mariner 10* pictures that ‘the light cratering on the flooded plains of Mercury is similar to that on the maria [plains] of the moon.’ He drew an analogy like Soderblom’s supported by the fact that ‘similar flux histories for Mars and the moon were independently hypothesized by Soderblom.’ But Bruce Murray, who has been chief of more planetary-imagery spacecraft experiments than anyone else, realized he further needed to know the relative number of impacts on different planets. So he turned to an article by George Wetherill, a man who developed his reputation in geochemistry and geochronology but who has evolved into an expert in celestial dynamics. Murray noted that ‘relatively uniform impact flux histories throughout the inner solar system for the last 3 to 4 billion years were inferred recently by Wetherill, who concluded that the impacting objects probably originated in [highly elongated] orbits’ that would cross the orbits of all the planets. Thus, Murray concluded that a ‘straightforward interpretation’ supports a similarity in Martian, lunar and Mercurian impact fluxes.’ [This is circular reasoning.]

“Murray’s conclusion is perhaps less secure than he seemed to realize. First, Wetherill studied the orbits of many different populations of bodies that could have cratered the planets, none of which had identical impact rates on each of the terrestrial planets. But Wetherill had heard that ‘recent observations of Mars and Mercury . . . have suggested to several workers [Soderblom and Murray] the hypothesis that . . . all of the terrestrial planets have had essentially the same bombardment history.’ Wetherill particularly wanted to emphasize that, among all the kinds of bodies he studied, ‘the only bodies which [produce] a near equality of flux on the moon and all the terrestrial planets are those derived from the vicinity of Uranus and Neptune.’ He went on to conclude that they were responsible for many of the craters, thus, supporting the ‘independent’ interpretations of Murray and Soderblom. Thus, a plausible, but uncertain hypothesis seems to be independently confirmed, when *in fact the scientists are relying on each other’s ‘proofs’ of equality* in planetary cratering. In the end, uniformitarianism reigns” [emphasis added].

I have cited the above to show that scientists adhere to a philosophy which is as dogmatic as religion. As Chapman tells us, “After all, the whole structure of their science was built on uniformitarian assumptions to ask a geologist [or planetologist] to question them would be like asking a priest to be skeptical of God . . .” Samuel Glasstone, as far back as 1968, stated, “It has become clear that any estimate of the age of the Martian surface, based on crater densities, involves so many uncertainties and requires so many assumptions that the result is of little value.” Nevertheless, crater counts, for determination of surface ages on Mars, is so ingrained, that it dominates Martian planetology. Even so, Thomas A. Mutch and his colleagues point to a serious problem in the model:

“[I]f crater production and crater modification have both proceeded at constant [uniformitarian] rates throughout Martian history, then the diameter-frequency curve for each morphological type [size and depth] should mimic the curve for all

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craters. Each curve will display a critical diameter below which equilibrium is attained. Equilibrium slopes for all morphological types will be identical to the slopes for all craters, although the frequencies will be decreased. This illustrates the fact that each crater spends a fixed amount of time in a youthful, mature and old-age state. The situation is analogous to human populations. Although each person grows older, the number of persons of a particular age is constant with time – assuming that birth rate and expected lifetime is also constant.

“Martian craters do not show the parallel relationship just described. Different morphological types show frequency maxima at different diameters, and as such, deviate markedly from the distribution described by all craters. The curve can be best duplicated by a model in which there is a prominent high intensity spike in the erosion history.”

The observed crater count morphologic curve upon which the chronology of the history of the Martian surface does not reflect a clear pattern, wherein the sizes exhibit a certain constancy. To overcome this contradiction to their crater count chronology, the planetologists have invented a global “erosion catastrophe” in ancient Martian times that erased all or nearly all the smaller craters and most of the somewhat larger ones, so that subsequent impacts would make Mars’ surface age for the various regions fit in with the assumed expectations of uniformitarian cratering over great lengths of time. This is clearly a fix-it-up method and Mutch, et al., give their explanation for adopting this global erosion catastrophe. “It is easiest to imagine instantaneous blanketing of massive proportions. All craters below a certain size will be completely obliterated. At progressively greater diameters less degraded craters will be visible.”

The larger, deeper craters surrounded by higher walls partially or largely survived this erosion catastrophe; smaller ones disappeared. The problem is, when did this erosion catastrophe happen? The concept is based on a “set of specific plausible conditions” for which the erosion catastrophe’s “absolute time is uncertain.” The erosion catastrophe is required to uphold the uniformitarian history of impact cratering – a massive oxymoron – therefore it had to happen. But this is, as Karl Popper observed, nothing but tautological reasoning in a circle. Since the crater count curves do not fit the chronology of uniformitarian impacts over time on Mars, there had to be a non-uniformitarian “erosion catastrophe.” How do we know this? We know this because the “erosion catastrophe” clearly fits the uniformitarian impact crater curves on Mars!

Then comes the further question: why did the cratering catastrophe suddenly or gradually just stop? Hartmann says it did, but gives no explanation why it stopped. Evidently, conditions long ago were much more erosive, but this erosive regime . . . eventually ended, whereupon Mars entered today’s less erosive state.” If those of us involved in Velikovskian studies ever presented anything resembling this form of rationalization reasoning, we would be pilloried. Nevertheless, the crater count curves suffers from an ever greater problem that further exacerbates the situation.

Jay Melosh discusses the problem of determining whether a crater is an impactor from space or a secondary impact thrown out of the crater impacted on the surface elsewhere.

“Numerous secondary impact craters variously occurring either singly or in loops, clusters, and lines surround crater field around the crater Gratterian Mars . . . Recognizable secondary craters extend from just beyond the continuous ejecta

160 Ibid.
blanked [adjacent to the primary crater] out to distances of up to a thousand kilometers [620 miles] from their source. Close to the primary crater, secondary craters are produced by relatively low-velocity impacts and are thus irregular in shape, shallow and obviously clustered, and are often separated [from one another] by V shaped dunes . . . Farther from the primary impact [craters secondary projectiles] are larger and secondary craters are more dispersed [not in clusters], which makes them difficult to discriminate from small primary craters.

“An important controversy is presently raging about the importance of secondary craters in masking the primary flux.”

When one cannot definitively determine the difference between these long distance, secondary craters from small primary ones, because both are not found to be in clusters, and both are round and deep, not irregular in shape and shallow, then one cannot, with anything resembling accuracy, date the age of the Martian surface. This problem has, as Melosh stated in 2011, has created a “raging debate” because the stakes of the outcome for the chronology of Mars’ surface age are immense. If it cannot be resolved by scientific proofs, and not just additional fix-it-up explanations, the entire chronology of dating the surfaces of planets and satellites must change radically, a concept far too revolutionary to accept. In this regard, we are further informed that, in fact, there may be no known uniformity of the crater rates because of the problem of distinguishing primary from secondary craters.

“New studies of the Martian impact crater Zunil reveal a surprisingly large number of secondary craters. Consequently, it was argued that a similarly large number of small impact craters on the Moon could be secondaries [originally thought to be primaries]. If true, the flux of small primary impact craters on the moon might have been over estimated, which could have effects on the precise shape of the standard [crater-count curve] distribution.”

Since the crater count curves on the moon is the standard to which those on Mars and the Rest of the bodies in the solar system are gauged, then if that gauge is wrong, the entire web of interlocking curves collapses. Significantly, the author[s?] goes on to say “Current literature is contradictory as to whether the impact rate in the inner solar system has increased by a factor of two [100 times greater], stayed constant, or decreased by a factor of three [1,000 times smaller] in the last 3 Ga [billion years].” This problem for Mars is just as telling, according to H. Hiesinger, J. W. Head, III, U. Wolf, R. Jaumann and G. Neukum:

“... the 10 km [6.2 mile] diameter crater Zunil . . . found that this crater produced ~ 10^7 secondary craters in the size range of 10-200 m [11-200 yard in diameter] away from the crater. McEwen, et al. (2005) concluded that the production functions of Hartmann and Neukum (2001) over predict primary craters smaller than a few hundred meters [yards] in diameter by a factor of 2,000, similar to the conclusions of McEwen and Bierhaus (2006). McEwen, et al. (2005) concluded that crater counts . . . 1 km [3280 feet] in diameter are dominated by secondary craters and therefore do not yield reliable age determinations.”

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164 Ibid., p. 21.
What we have is that planetologists assumed that the moon and Mars had relatively similar impact rates and crater count curves, and that they could distinguish between primary and secondary craters. When it was discovered that there are round, deep isolated secondary craters appearing for all the world as primary ones, all the crater count curve estimates were called into question and it is not known if the cratering rate should be increased by 100 fold or decreased by 1,000 fold over the past three billion years. Using crater counts, M. C. Towner, et al., in a paper provocatively titled “Geologically recent water flow inferred in channel systems in the NE Sulci Gordii region of Mars,” discuss both lava are water flowing on Mars 100 million years ago, a time Mars was purported to be dry and still too cold for water to flow for relatively long distances. They state: “The age of the [lava] channels and surrounding area was estimated using crater counting to be 100 Ma. Water has appeared to have flowed for 150 km [90 miles] under the climate conditions at this time.”

The point is that the crater count can fall between 100 times greater and 1,000 times smaller. With the 1,000 times smaller rate, the water would have flowed 10,000 years ago. Such a concept is, of course, unthinkable.

Kargel has more honestly turned his back on this chronological morass stating “Most lacking now for Mars studies is knowledge of the temporal associations or sequences of the individual land forms constituting a landscape. This is a major and humbling limitation. In fact, I place very little emphasis . . . on establishment of an accurate stratigraphy and relative geochronology only because new data show that we are very far from understanding a Martian sequence of events.”

What is extremely difficult for these planetologists to discuss is the diametrically opposite positions they took as opposed to that of Velikovsky regarding the condition that would exist on the Martian surface before spacecraft could image it. The scientists could clearly observe from Earth that Mars periodically experienced dust storms that often shrouded the entire planet. And they fully understood that erosion was eating away the surface. On the other hand, Velikovsky stated quite unambiguously that Mars “. . . is rather a dead planet . . . the ‘canals’ on Mars appear to be the result of riffs and cracks . . .”

Carl Sagan presented to the world the picture of the Martian surface, as the astronomical community expected, and in opposition to Velikovsky, actually predicted: “when men arrive [on Mars] after an eight-month voyage through space, they will wander over a gently sloping landscape and enormous numbers of eroded flat-bottomed craters.”

Three years later, this expectation was reinforced by Kenneth F. Weaver who maintained:

“When men first land on Mars – as they may actually do before the end of the century – they will find rather uninteresting terrain for the most part . . . Everything in the Mariner pictures indicates, no great faults, no extensive volcanic fields, no evidence of volcanic activity. You could stand in a crater on Mars and never know it – even one that appears sharp and clear in the pictures.”

Velikovsky, no doubt made the correct prediction as Patrick Moore, again, no friend of Velikovsky, reported above, “The Martian scene proved to be utterly unlike what most people [scientists] had expected. Instead of gentle rolling plains, there were mountains, valleys, craters

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and volcanoes.” Of course, he nor any other scientist has ever admitted on this major point/prediction that Velikovsky was right and they were wrong. And this could be understood even by a layman, as Michael H. Carr explains:

“That wind erodes the Martian surface . . . cannot be doubted. We have observed storms that stir up so much dust that most of the surface of the planet becomes hidden from view . . . The uncertainty regarding wind is not whether it has modified the surface, but where and to what extent. Given the violence and frequent occurrence of dust storms, it is somewhat surprising the eolian [wind] effects are not more pervasive.”

That is, after the “erosion catastrophe” billions of years ago, these powerful planet-wide dust storms blowing frequently could barely erode the surface, just to preserve the sharply defined features observed today. In order to somehow make his clear-cut contradiction to what their chronology demanded, an explanation, or rather a scientific explanation had to be found to support it. Charles Frankel presents just how this was accomplished. The reader, however, should note how he begins by claiming the crater count chronology is a fixed datum upon which to evaluate the erosion rate, a circular argument.

“Based on crater counts, the Chryse and Utopia plains are old – probably in excess of 2 billion years – and erosion has transformed what was once smooth lava sheets into broken-up fields of rocks and boulders – some sharp and angular, while others are sanded down by the abrasion of wind-blown dust. Patches of reworked ‘mineral shavings’ collect as pockets and dunes between the rocks making up a well-mixed soil analyzed by the landing craft.

“On Earth, Lava flows break down to yield similar-looking rock fields, especially in the dry American Southwest, where we find remarkable analogs of Martian landscapes. We know from the terrestrial sites that lava fields erode preferentially along cracks inherited from their cooling history, and which vary in spacing as a function of burial depth within the flow. At the surface where cooling is rapid, cracks are closely spaced and break up the topmost part of the flow into a mosaic of small ‘cobble stones.’ Deeper into the flow, where the cooling is slower, fractures are spaced farther apart. The size of loose boulders in a lava field, therefore, indicates their depth and origin – the larger [the rocks are] the deeper – or in other words- how much of the flow was removed by erosion to unveil the boulders in question.

“If we apply this model to the plains of Mars, we can guess their erosion history. On the Utopia landing site the rocks are remarkably uniform in size – twenty to thirty centimeters [about five to eight inches] – the kind of fracture spacing one would expect to find a meter [yard] or so below the surface. Apparently the lava fields of Utopia were eroded by only a meter since their emplacement and thus this gives us a good indication of the pace of erosion on the red planet. On Earth, the action of sun, wind, and rain eats away the top meter of a flow in a couple of million years: this is the age of the lava flows in Arizona, which best resemble he Martian landscape, in overall appearance and rock size. But from crater counts, we know the Martian plains are over 2 billion years old. In other words, erosion processes

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are one thousand times weaker on Mars than on Earth – which is why the flows look so pristine, despite their age.”

David H. Harland echoes this analysis saying “Clearly, therefore, the erosional rate on Mars is considerably slower than on Earth, where a meter’s worth of erosion could be expected per million years, erosion on Mars proceeded at a rate 1/1000th that on Earth.”

The underlying problem is that the planetologists had assumed that Martian volcanism had stopped billions of years ago. Therefore, the lava boulder field on Mars had been laid down billions of years ago. But if they were laid down a million or so years ago or less, then erosion on Mars would be quite similar to that of the Earth. The scientific analogy that they had relied on would be in error and their analysis would have no validity. Nevertheless, nine years after Frankel had employed this form of reasoning, he unwittingly eroded it away by stating:

“It was once believed that Martian volcanoes had shut down billions of years ago. Close-up imagery taken by Mars Global Surveyor now show many of the lava fields to be remarkably free of impact craters, suggesting much younger ages. Several lava flows on Olympus Mons and in the Elysium basin appear to be a few million years old, a one thousand-fold reduction in age. They imply that volcanism is still an ongoing process on Mars and that more eruptions might take place in the future.”

That means the lava fields in the Chryse and Utopia plains could have been laid down a million years ago or even less and not two or three billion years ago, and the erosion had been greater than that on the Earth to uncover or erode them.

Let us, therefore, examine this erosion concept. If erosion on Mars is remarkably greater by ten times than the American Southwest, as the Chryse, Utopia plans indicate, then perhaps two meters of material were eroded from both planet’s surfaces in a million years. That means in 10 million years 20 meters [21 yards] of material were eroded away; in 100 million years 200 meters / 220 yards were eroded away, and in a billion years 2,000 meters / 2,200 yards or 79,000 feet of the Martian surface were removed. This, of course, would have removed all the river valley networks and nearly every crater and entire mountains. Mars would be just what the scientific community expected to find before spacecraft got there – a planet-wide Sahara desert!

Now, from the start, this concept of strong erosion of the Martian surface was well understood. Citing Carl Sagan, Aviation Week and Space Technology (Jan. 29, 1973), page 61, reports: “Using mariner 9 wind data, Dr. Carl Sagan, of Cornell University, calculated erosion rates assuming a dust storm peak wind of 100 mph blowing 10 percent of the time. This would mean erosion of 10 km (6.2 miles) of surface in 100 million years.” That rate of erosion would also remove river valley networks, etc. Sagan, of course, was using state of the art equations to establish the erosion rate. Of greatest significance are the wind-tunnel experiments carried out by Ron Greenley and his colleagues at NASA Ames Atmospheric Center that simulated the gases on Mars, its surface barometric pressure, wind speeds and chemical / mineralogical particle size and make-up of surface materials as reported by Viking lander data. After running their wind tunnel fans for a relatively short time, and taking measurements, “the researchers calculated that Mars

174 Charles Frankel, Worlds of Fire; Volcanoes on the Earth, Moon, Mars, Venus and Io (NY/Cambridge, UK 2005), pp. 127-129.
should be eroded at rates of up to 2 centimeters [0.8 inches] per century.”\textsuperscript{175} At that rate, in 100 million years, about 66,000 feet, or about 10 miles of the Martian surface, would be eroded. Farouk El-Baz and M. H. A. Hassan examined these wind tunnel experiments and others in their book, \textit{Physics of Desertification}, looking into all these aspects of erosion on Mars. They tell us:

“Without \textit{in situ} measurements [on Mars], the next best approach is to simulate the Martian aeolian environment as closely as possible. The various simulations can be validated partly by comparing the experiments run under terrestrial conditions with field results, then adjusting the procedure or modifying the apparatus until there is a good correlation with natural conditions. The experiment can then be [altered to] run under Martian or near-Martian conditions. Because [on Earth] not all Martian parameters (such as gravity) can be simulated, some of the final results used in the calculations must be adjusted to theory . . .

“Most wind tunnels cannot be used to determine the susceptibility of erosion of various rocks and materials because they can be run only for relatively short periods of time for Martian conditions, and the amount of erosion would be too small to be measured accurately. Several different designs of erosion machines have been used in which erosion of rocks is assessed as functions of impact particle velocity, angle [of impact] size, and composition [of the particle], all for a range of atmospheric densities . . .

“Based on the approach outlined above, values for the three parameters [(1) various particle parameters such as the velocities of particles as a function of wind speeds and heights above the surface, (2) the susceptibility to erosion of various rocks and minerals, and (3) wind speeds and frequencies [these speeds are attained] on Mars, which can be obtained from Viking meteorological measurements] required for determining rates of erosion that have been obtained and applied to Mars (Greeley, \textit{et al.}, 1981). The results yield extremely high rates of abrasion. Even using very conservative values for the various cases that can be considered, the surface of Mars ought to be reduced to a sooth plain.”\textsuperscript{176}

The author has gone on to try to consider four possible phenomena that would inhibit such high rates of erosion but concluded that none of them alone or taken together can ameliorate the level of erosion evidenced by these wind tunnel tests.\textsuperscript{177} All in all, given this level of erosion on Mars, the entire planet should have been weathered down to low rolling plains over a few hundred million years with almost nothing in the way of mountains, chasms, river valley networks, etc., with sand dunes mantling the surface. The equations used by Sagan say the same thing. Testing and experimentation lie at the very heart of science. It is the bedrock upon which scientific truth is determined. These wind tunnel experiments carried out by Greeley, \textit{et al.}, as well as others, are the only tests that actually recreated as closely as possible the conditions found on the Martian surface and proved that these river Valley network features could not be even 50 million years old, which would erode 33,000 feet of the Martian surface.

Nadine Barlow fully admits: “Laboratory experiments and numerical modeling indicate energies of these sandblasting particles are about an order of magnitude higher on Mars


\textsuperscript{177} \textit{Ibid.}, p. 185.
than on Earth because of the higher wind velocities needed to initiate saltation [sand particles jumping off the surface].” That is, the erosion on Mars is ten times greater than on the Earth.

Patrick Moore, understanding this problem, put the situation into simple, understandable terms:

“... There is a paradox here. There is no sign of marked erosion even though the Martian atmosphere is dusty, and dust – even fine dust – is highly abrasive. The channels and the craters do not look as though they have been filled up, so that they can hardly be very ancient; tens of thousands of years perhaps, but not millions.”

There is simply no escape from this evidence. What the scientists are doing is slowing the erosion with words, not evidence. Words are bandied about that Martian winds only blow materials from here to there and these have done so for two to three billion years, without a scintilla of solid experimental evidence to support these assertions. The scientific facts say otherwise. Sagan has put forth the case that scientists’ behavior is one of massive denial. “So far as I know, none of the previous [erosional] accounts of Mars – fictional, mystical or scientific – has had a word to say about this pervasive aspect of the Martian environment.”

There is now the question of finding out how Mars lost its atmosphere and water. Morrison tells us that because of the “lower surface gravity on Mars makes it harder for that planet to maintain its initial dense atmosphere.” That is, the smaller the planet the more weakly it can hold its atmosphere, and it can be removed by the solar wind from its exposure, the altitude where atoms can escape to space, or be ripped away by the solar wind. Harold Urey, prior to space exploration, calculated that Mars would lose its atmosphere in a very short period on the assumption that its exosphere temperature was 1,000° K. However, when Mariner 6 and 7 measured the temperature of Mars’ exosphere, it was discovered to be 350° K. This exosphere temperature is far colder than the 2,000° K temperature of the Earth’s exosphere. Remember Mars supposedly has always been farther from the Sun than the Earth and its atmosphere, given the faint early sun, would have been colder than it is today. Based on this data, it became rather clear, contrary to the thesis that Mars, as a small planet, would lose its atmosphere and water to space via gradual escape, had little evidence to sustain that belief. In 1975, S. I. Rasool succinctly pointed out:

“Hydrogen can escape from a planet if the planet is small ... At the temperatures known to exist in the upper atmospheres of planets, the Moon should have lost all its atmosphere gases in about ten million years ... On the other hand ... Mars ... should have lost hydrogen and helium in a relatively short time but should not have lost the other heavier gases [such as oxygen, carbon, nitrogen etc.]”

178 Nadine Barlow, Mars: An Introduction to its Interior, Surface and Atmosphere (Cambridge, UK/NY et al., 2008), p. 147.
181 Morrison, Exploring Planetary Worlds, loc. cit.,
Even before any of these measurements were taken, Sagan understood “Mars is so far from the Sun that the top of the atmosphere probably does not get hot enough to accelerate the heavier molecules to the needed escape velocity.” According to D. M. Hunten and M. B. McElroy, even over the entire history of the solar system’s 4.6 billion years, Mars would have lost to only about 2.5 meters or 8 feet of its water. Later McElroy recalculated that, at best, Mars’ carbon dioxide inventory would have been reduced by only about 10 percent over Mars’ entire history, and only about 16 feet of water escaped to space. There is really no understanding of how Mars lost its atmosphere, ocean, seas, lakes, etc. Thus, one arrives at the point that the Martian planetologist community does not know how these well-observed imprints of water all over the Martian surface could exist at its present distance from the Sun, but how its atmosphere and water almost entirely disappeared.

This brings us to Velikovsky’s hypothesis, wherein he claimed that Venus had an extraordinarily close encounter with Mars and removed its oceans, seas, atmosphere and created vast chasms and mountains, and rises over its surface. No one to date has undertaken to examine this concept. Richard A. Day, however, has presented an analysis for the theory of Zecharia Sitchin that delves into this question. Although he has a PhD in chemistry and has written about astronomy, the publishing house stipulated before printing his book, “The views expressed in this work are solely those of the author and do not necessarily reflect the views of the publisher, and the publisher hereby disclaims any responsibility for them.” Perhaps this distancing itself from the ideas that there was solar system instability in recent times, will not make this publisher lose credence with the scientific establishment, and more establishment groups will not boycott its business nor also not submit manuscripts for publication. Apparently a great deal of fear still pervades throughout the scientific community on this taboo subject, but also for publishing houses. Nevertheless, let us read Day’s analysis of how Mars could have lost its water and atmosphere by a close interaction with a body the size of the Earth, namely Venus. Though I do not subscribe to the Nibiru thesis, I do not hold such concepts in contempt. In democratic science, such an attitude is just as demeaning for those who heap scorn on other ideas. In this respect, science historian Richard J. Huggett, in an article titled, “Cranck, conventionalists and geomorphology,” points out:

“Two diametrically opposed ways of creating hypotheses can be identified. On the one hand, there is the traditional way or common sense approach . . . A guiding principle of this cozy method is that new approaches should not conflict with universal laws [such as those of gravity] or well established theories . . . [solar system instability] . . . On the other hand, there is the unconventional way. In this comfortless and uncompromising method, outrageous hypotheses are created to challenge established theories.

“To many, the appellation ‘outrageous’ to a hypothesis may imply a degree of derision. It suggests an attempt to pour scorn on existing theory. Quite the contrary viewpoint is taken here. Outrageous hypotheses challenge existing theory by suggesting alternative ideas [such as electromagnetism plays a role in celestial mechanics and denies the concept of solar system stability] that lie outside the

188 Richard A. Day, Nibiru Rediscovery, a Lopsided Mars and Ancient Longitudes (Bloomington, IN 2012), copyright page.
currently accepted range of possibilities. They are not always easy to distinguish from ‘ordinary’ hypotheses . . . but the signs of an outrageous hypothesis include a clash with the ruling paradigm. At the very least, outrageous hypotheses provide a useful counterpoint to established views and at best, they lead to the evolution of radically new ideas and major breakthroughs in thinking. For this reason, they are vital to the progress of thought and understanding [of scientific reality].”

Here, then, is Day’s analysis, except I will use Venus for Earth in its interaction with Mars:

“The Roche limit is the shortest distance from the center of an object at which a satellite can remain in equilibrium under the influence of its own gravitation and that of its primary. Assuming that the satellite is held together by gravitational attraction, G, and that it has the same density as the primary, the Roche limit is about 2.45 times the radius of the primary. Within the Roche limit a satellite would be torn apart . . . The expression for the limit was discovered by Edouard Roche in 1845 . . .

“Binary stars sometimes are close enough for one to be within the Roche limit of the other. When that occurs, material . . . [is gravitationally pulled] from one to the other (see Webbink, 1992) . . . It is not customary to think of planets in such terms because all of the planets of the solar system are too far apart for this to be considered a factor in their interaction. However, this may not have always been true.

“What would be the characteristics of such an encounter? First of all, as two dense terrestrial types of planets approach each other, the tidal forces . . . would become enormous and would far exceed the forces needed to fracture the crustal rocks. The highly viscous but fluid interiors would deform in response to these tidal forces . . . The surface fluids, the atmosphere and oceans / lakes would respond more rapidly to participate in the tidal bulge growing immensely.

“Then the smaller of the two objects, Mars, comes within the Roche limit of . . . [Venus] far more dramatic events would engulf the two planets. In the surface of Mars entering the Roche limit, down becomes up. The atmosphere would rapidly and almost completely transfer the larger planet with wind velocities exceeding that in terrestrial typhoons and tornadoes. Water in the tidal bulge would follow. Water not yet in the bulge would rush across the Martian surface which, except for the antipode of the visitor’s position, is, in effect a precipitous downhill slope in this drastically altered gravitational field. While the nearly complete transfer of the atmosphere would occur because (1) it enters the Roche limit first and (2) gas transfer could be expected in the range > 10^3 km/hr, [1,000 km = 620 miles/per hr]. The transfer of the water would be slower. Probably all the water in the tidal bulge entering the Roche limit would be transferred, but much of the remainder would remain on Mars [to sink beneath its surface]. This process would start well before the Roche limit had been breached. When the solid, tidally fragmented surface entered the Roche limit, it would begin to transfer in clouds of dust, gravel, and boulders. Many of the latter would be blocks retaining faces derived from the fractioning process.

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“Would all the Martian material within the Roche limit make it to . . . [Venus]? Obviously not. Some large fraction would fail to be accelerated enough in the relatively weak negative Martian gravitational field would not catch up with the rapidly receding [Venusian] visitor. The debris would rain down on the Martian surface in a widely distributed manner reflecting the amount and timing of the acceleration. Some of the material would end up in orbit around the red planet [to accompany it as it broke out of its inner orbit].”

Day has also drawn the same conclusion as have I regarding the greatest outflow channels, namely, that they are flows of ocean water onto the continent that reversed themselves when they could travel no farther inland, swirl in great eddies and return to the sea.

Since this transfer of most of the Martian atmosphere and water passed through space between protoplanet Venus and Mars, much of these gasses, vapors, and liquid would have encountered fierce solar radiation and ultraviolet rays and have become photodisassociated. Because these planets are only close to one another for a very brief time and are then moving away from each other at thousands of miles per second, the atmosphere and water drawn off of Mars by the pull of Venus’ gravity, and traveling at a velocity of 1,000 miles per hour, these materials became part of Venus’ atmosphere. But Mars will have lost most of its atmosphere and water which will be blown away into deep space by the solar wind. This Roche limit interaction clearly explains how Mars could lose its atmosphere, ocean, seas, lakes, rivers, etc., in the past few thousand years in agreement with Velikovsky’s theory, but still leave evidence of their existence on the sculpted surface of Mars.

If, as Velikovsky claimed, Venus passed close to Mars, it would have distorted the shape of Mars slightly creating heat deep beneath the surface and pulling materials toward the surface along a great circle arc similar to those on the moon. According to Oliver Morton, “MGS [Mars Global Surveyor] has provided the best data yet seen on the Martian gravitational field. Much of the planet seems to be in equilibrium . . . Two of the obvious basins – Argyre and Isidis – show Mascons like those seen on the Moon. So does the Utopia basin in the northern lowlands . . . The gravity data offer no obvious support for either the one – big impact idea or cluster impact idea; indeed, it seems to argue against them.” These regions indeed lie along a great circle arc on Mars. Mark Washburn admits, “Mascons had been discovered on the moon, but they hadn’t been anticipated on Mars.” Again, the interdisciplinary scientific evidence of the Roche limit for the two bodies, Mars and the Moon, that were most closely approached by protoplanet Venus, exhibit mass concentrations along great circle arcs fully in agreement with Velikovsky’s hypothesis. This scientific evidence was unknown when Velikovsky wrote, but jump together, as Whewell demanded of a valid theory.

Furthermore, if Mars did have a relatively close encounter with the Earth, many of the blocks and rocks pulled from the Martian surface would have remained in orbit around it. When Mars approached the Earth, these would have come close enough to fall to Earth or perturbed into orbits that gravitationally return to the Earth’s orbit and, thereafter, some would fall onto our planet’s surface. Monica M. Grady sums up this development:

“Early in the morning of 5 October 1815, in the tiny village of Chassigny, near Langres, Haute Marne in France, the local villagers were disturbed by the rattle of musketry and the sound of cannon-fire. Startled, they rushed to see the cause – only to find that their village had been invaded; not by retreating soldiers from Napoleon’s defeated army [by Oliver Wellington at the Battle of Waterloo], as has been their first thought, but by visitors from farther afield. What happened in Chassigny that morning was the fall of a shower of meteorite stones. So disturbed were the citizenry, that they persuaded the local doctor . . . to collect some of the stones and convey them to l’Académe des Sciences in Paris, thus preserving the material for future generations . . . We now believe that the meteorite fall of 1815 was our first recorded messengers from Mars, arriving on Earth in a storm . . . Fifty years later, quietly and with little fuss, a second visitor from the red planet arrived, landing over the remote Indian village of Shergotty, . . . (1865). The third uninvited guest was also a newsworthy event, when it arrived early on a summer morning in 1911 in the Egyptian village of El Nakhla el Baharia on the borders of the Nile delta . . . The shower of stones appeared out of a cloud accompanied by loud detonations . . .

“These eventful passages mark the start of a fascinating story of exploration of our neighboring planet. Meteorites from Mars have landed all over Earth, bringing with them information about Mars’ atmosphere, both now and in the past, about the surface of Mars and the waters that once flowed there, and the deep reservoirs of magma that form the roots of the mightiest volcanoes in the solar system . . .”

“The significant point to make is that probably several hundred meteorites fall for every one that is found. Seventy percent of the Earth’s surface is covered by oceans, seas, lakes, while high mountains and great deserts cover much of the surface. Thus, in recent times, probably a few to several thousand Martian meteorites have fallen to Earth. In terms of how long such small bodies can stay in the solar system, such as comets, although the analogy is not exact, we are informed, “No comet can remain in the Jupiter family for more than 4,000 years.” These would either be thrown out of the solar system or impact planets and their natural satellites. This means that for these Martian meteorites, similar to comets that have orbits between Jupiter and inside Mercury, will have life-times of about 4,000 to perhaps 10,000 years. Yet they are still falling on the Earth, which clearly suggests that they were ejected into space only thousands of years ago and not millions. Again, the interdisciplinary scientific evidence correlates with Velikovsky’s theory. The science of the Roche limit explains why Mars has mascons, as does the moon, along a great circle. The Roche limit science is, in reality, Newtonian science, and all these phenomena surprisingly “jump together.” The same interdisciplinary story is told repeatedly in agreement with Velikovsky’s thesis, while those of establishment scientists are repeatedly held together by fix-it-ups.

Addenda:
I want to point out how disastrous such meteorite showers can be. In Vol. III of Pillars of the Past, I pointed out Egypt had been devastated by a meteorite, as described on the Pharaoh Ahmose I’s Tempest Stela (pages 523 ff). If this happened in ancient Egypt, then it could have


happened in more modern times. For those who question that a meteorite shower can actually destroy a large area, I will describe one that happened in China during the Ming Dynasty in 1490 A.D. Kevin Yau, P. Weissman and D. Yeoman have shown, from a study of Ming records, that: “Stones fell like rain in the Ch’ing-Yang district of Shansi province . . . They struck dead several tens of thousands of people.” Others have questioned the enormity of the number of deaths and the collateral destruction, yet the authors of the paper admit the Ming document is reliable, and indicates that buildings may have collapsed to kill so many people. Let us remember Kargel admitting:

“The last few decades have seen a flourishing of multiple distinct concepts of Martian geology, hydrology and climate history. There is but one Martian reality, but it remains very much a grand enigma, warranting a cacophony of intelligent wonderings. With little doubt, everyone is mostly wrong, while many of us are just a little right, but we have yet to find out who those people are.”

In terms of Velikovsky’s hypothesis, let us see how many surprising phenomena that were discovered after 1950 have “jumped together” that clearly fit his theory and do not need fix-it-up hypotheses.

1. If the solar system had been stable for the past 20 million years, as Laskar’s non-gravitational equations, based on ellipses, accelerations and inclinations suggest, then Mars was still in its present orbit, outside the Continuously Habitable Zone, and could not have water flowing on its surface. This is a scientific, mathematically provable fact. With Mars as an inner planet to that of the Earth, it should have water on its surface and an atmosphere to hold that water, which surprisingly jumps together with Velikovsky’s hypothesis.

2. Three to four billion years ago, the time the planetologists claim Mars had an ocean, inland seas, lakes, river valley networks, glaciers, etc., the Sun was cooler by about 30 percent, and less radiation reached Mars, so water could not flow over it. This, too, is a scientific, mathematically provable fact. With Mars as an inner planet to that of the Earth, it should have water on its surface and an atmosphere to hold that water, which surprising jumps together with Velikovsky’s hypothesis.

3. The uniformitarian crater-count chronology, used to date the Martian surface, requires a fix-it-up assumption that there was an early erosion catastrophe that eroded most of the smaller craters. It further requires the fix-it-up assumption that, thereafter, erosion almost completely stopped for the following two to three billion years. This requires that the planetologists dismiss or ignore scientific equations regarding erosion rates and wind tunnel experiments, the most precise form of evidence they have, which shows Mars’ erosion is so strong that there should be no river valleys or other fluvial features left on Mars. However, with Mars on an orbit inside that of the Earth, it would have had water on its surface right up until a few thousand years ago and erosion working only for the past few thousand years that would clearly leave these fluvial features just as they are observed today. This evidence, again, jumps together with Velikovsky’s theory.

4. Since Mars was closer to the Sun and had an ocean in its northern hemisphere, its river valley networks would be created by rainfall from that ocean onto the adjacent continental land to its south. The river valley networks would number there in the hundreds of thousands, as

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198 Kargel, Mars – A Wamer Wetter Planet, op. cit., p. 181.
Sagan, above, informed us, and would tend to be located predominantly nearer the equator with fewer farther inland which is precisely what was found. Evidence of glaciers and their actions should be located farther southward, closer to the south polar region, which is also precisely what is found. This fully agrees with Mars having a similar water cycle as the Earth, while it was on an orbit inside that of the Earth. This, also, is a surprising jumping together of geophysical / geographical evidence with Velikovsky’s theory.

(5) These rivers, from rainfall and surface runoff over eons of time would have eroded and peneplaned down the Martian topography and created a chaotic drainage system which is just what is found on the Martian, Velikovskian continent. This further phenomenon, again, surprisingly jumps together with the theory that, for eons, Mars was an inner planet.

(6) Over the past few thousand years, erosion and filling in of the narrower and shallower upstream tributaries would tend to occur and leave stubby ones. The discovery cited above by Mangold, et al., that buried beneath wind-blown dust there are tributary systems that could only be explained by rainfall, and these include sapping drainage systems, proves that atmospheric rainfall and snowfall were the agents by which these systems formed. One such system had a set of dendritic tributaries that had six orders of upstream tributaries before these entered the mainstream. Velikovsky knew none of this when he published *Worlds in Collision* in 1950, but this phenomenon also surprisingly jumps together with his theory.

(7) The fact that water on a high slope was found to recently flow down into its valley, moving around rock barriers as it descended, means water is still perched at high elevations. This suggests this frozen subsurface water was left there recently, a phenomenon surprisingly jumping together with Velikovsky’s theory.

(8) The problem inherent with the uniformitarian gradual removal of Mars’ atmosphere and ocean is simply that, had this occurred, there would have been vast salt and carbonate white deposits left all over the northern ocean basin and elsewhere. But as we have seen, a close interaction with Mars and Venus at the Roche limit would remove most of the atmosphere and water rapidly and catastrophically so that salt flats and carbonate deposits could not form. Again, Velikovsky knew nothing about this particular phenomenon but it surprisingly jumps together with his theory.

(9) The ocean basin and inland seas etc. that had existed for eons would, nevertheless, even upon catastrophic removal, still contain mineralogical evidence that water existed on Mars. This is well-known to be the case, as Kargel and Strom above reported, “Martian soil . . . contained 10 to 20 percent salts.” Carr above reported the duricrust was a “formation with a cement of soluble mobile salts mainly magnesium sulfate and possibly sodium chloride.” Carr also reported oceanic clays with “carbonates . . . Kieserite, calcite [and] rutite, all ocean minerals.” Hoagland, citing Brandenburg, says, “nontronite and maghematite,” also soluble oceanic minerals, were found. There was also found “blueberries,” a form of hematite that only forms in water found on different areas of the Martian surface. All these minerals mean water existed on Mars but was removed not gradually, but catastrophically. Velikovsky knew nothing about these residual minerals on Mars, but look at how surprisingly they all jump together with his theory.

(10) The Martian ocean, upon its sudden, catastrophic removal, would still exhibit evidence of a line around its basin at the same level. If the ocean had been removed gradually, there would be hundreds perhaps even thousands of shore lines around that basin’s slopes. The fact that only a few exist requires that the ocean was removed rapidly and, therefore catastrophically. Again, Velikovsky did not know about this, but it again, surprisingly, jumps together with his theory.
(11) Over eons of erosion by water and wind, the materials on the land would have been transported to seas and the ocean, and then sorted by wave action to form layers that would be compressed into untold thousands of layers of sedimentary rock. Sedimentary rock tends to form gradually over long geologic ages. The sedimentary rocks observed on Mars in the Valles Marineris Hellas basin and elsewhere or, as Noland above told us, whatever the process involved however the identification of planet-wide sedimentary layering firmly indicates that Mars was active . . . involving arrange of depositional processes . . . over long periods of time.” This, too, points to eons of deposition surprisingly jumping together with Velikovsky’s hypothesis.

(12) The tributary rivers tend to flow toward the ocean in the north where they enter the ocean or into an inland sea where they produced deltas with fan-like distributary rivers, and the sediments they carried to the ocean formed not only sedimentary rock layers, but a vast, broad, abyssal plain across that basin. All this is aligned with Mars being an inner planet to that of the Earth, and jumps together with Velikovsky’s thesis.

(13) The catastrophic, close interaction of Mars with proto planet Venus would have tilted Mars’ axis and caused its equatorial belt of water to flow both northward and southward as great tidal tongues of water onto the Velikovskian continent, swirl in massive eddies that created chaotic terrain, and then flow back downhill to the ocean creating elongated islands and braided river channel designs on the surface. The two great flows entering the Hellas basin, known to have deep layers of sedimentary rock, meaning it contained water, where floods formed when it, too, was disturbed. Velikovsky did not now about this phenomenon in 1950, but it clearly and surprisingly jumps together with his theory.

(14) The imbricated rocks, found lying in their pristine original positions in the sediments of these stupendous outflow channels, have not been dislocated to other orientations by meteorite impacts or geological convulsions supposedly over two to three billion years. This means they came to these alluvial fans only a very short time ago. To suggest that after being laid down they were then buried just deep enough to protect them from meteorite groundquakes radiating outward for billions of years, and then the land was eroded to just the right depth to expose them, is simply too improbable. Therefore, these great floods are recent, surprisingly jumping together with Velikovsky’s theory. He could not have known any of this in 1950.

(15) The close passage of Venus across Mars would, of course, leave mass concentrations along a great circle arc, which is precisely what is found on that planet. Velikovsky, in 1950, would have no idea that these mascons would be found along a great circle arc on Mars. Yet as with all the other phenomena above, this also surprisingly jumps together with his theory.

(16) In the one area that Velikovsky did predict that Mars would be a planet wrecked by massive tidal forces, and would contain mountains, volcanoes, great rifts, he was right. The scientists, relying on their concept of solar system stability, and observing from Earth the dust storms raging for months at a time on Mars, claimed Mars would be eroded down to vast plains, covered by dunes of dust and sand. They turned out to be completely wrong but never once admitted the fact that Velikovsky was right. Given all the above, they will never be able to bring themselves to do that. As Bruce Murray stated:

“We do not understand the geological history of Mars. This isn’t just disagreement among competing theories. *There are no theories, none at all that can explain all the existing facts.* Something important has happened here that we just don’t understand.”

Jay Melosh writes in 2011:

The most intriguing aspect of Mars is evidence of fluvial activity on its surface. Ancient valley networks appear to be fossil stream valleys, some of which may have been formed by rain running off the surface. Enormous channels, cutting thousands of kilometers across the surface, imply huge catastrophic floods in the distant past, while recent gullies may indicate contemporary fluvial activity. Features suggestive of shorelines now seem to line up at the same elevation, perhaps indicating an ancient global ocean, and glacial land forms suggest that extensive icecaps once covered parts of the southern highlands [of the Velikovskian continent].

“Evidence for water now seems to be everywhere . . . Fluvial deposited sediments . . . suggest lakes on the surface, although concentrations in the same sediments indicate highly acetic sulfur-rich waters. The puzzle in all these observations is that liquid water is not presently stable on the surface of Mars. Not only is its surface too cold for liquid water, the present atmospheric pressure is below the triple point of water so that liquid water is never stable, except perhaps on hot summer days at the bottom of the Hellas basins. If Mars did once possess oceans and icecaps, where did all that water go? And if Mars was once warm and wet, how were those high temperatures maintained? . . .

“What happened to bring Mars to its current inhospitable state are major questions that remain to be answered.”

There are no answers, and there will be no answers as long as the planetologists and astronomers cling to the concept of solar system stability based on only one science, mathematical celestial mechanics. Nothing fits that theory, nor will it or can it ever be made to fit. The paradox of Mars’ surface water remains a contradiction, not a paradox, but not for Velikovsky’s thesis.

It is now nearly 50 years since spacecraft showed the world what exists on Mars, and still there is no inkling of a scientific understanding to explain what happened, when it happened and most importantly, why it happened. Given the injunction of solar system stability, the planetologists will never find an answer to the enigma that is Mars. In the words of Thomas S. Kuhn:

“Part of the answer, as obvious as it is important, can be discovered by noting first what scientists never do when confronted by even severe and prolonged anomalies. Though they may begin to lose faith and then to consider alternatives, they do not renounce the paradigm that has led them to crisis.”

Along similar lines, S. I. Akasofu writes:

“Since an old paradigm [such as solar system stability] must be fully developed near the end state, mathematical rigor can be used as a powerful arm against [a new paradigm] . . . to give an impression that imprecision is a defect of the new idea. Actually, such imprecision is almost a prerequisite for a pioneering paper [or theory].

“As new paradigm candidates begin to emerge, scientists tend to respond in a way similar to members of any other community. Here [Arthur] Koestler observed:

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‘Like other establishments, they are consciously or unconsciously bent on preserving the status quo, partly because unorthodox innovations are a threat to their authority of the paradigm, but also because of the deeper fear that their laboriously erected intellectual edifice might collapse under the impact.’

“A scientific establishment is highly conservative and will attempt to preserve the power of its ruling group against any rebels. Thus, a pioneer [like Velikovsky] often must stand alone and be independent-minded on the fringe of the scientific establishment, and perhaps be a rebel. (W. B. I. Beveridge, in his The Art of Scientific Investigation).

“During this turbulent period, called the preparadigm period, scientists get involved in passionate controversies. Eventually, one paradigm candidate gains the status of a new paradigm [hopefully for Velikovsky’s theory] because it is more successful than its competitors. The chosen paradigm will be said to be beautiful, artistically creative, imaginative, inspirational, novel, and elegant after having been treated as a crackpot idea . . .”

I believe we are presently in the preparadigm period, and that the solar system instability concept that it has shaped, will be part of the new paradigm to explain the enigmas the scientists are grappling with on Mars. To this end, there may come to the fore a solar system instability theory very much like that of Velikovsky’s in the future.

The future theory may suggest that billions of years ago Mars was an inner planet to that of the Earth whose orbit became unstable by perturbations or because a large rogue planet passed through the solar system. It, therefore, was able to have water on its surface covered by a sufficiently massive atmosphere for it to remain in its pluvial state for billions of years. When its orbit became unstable, it had a close interaction with Venus, where it lost nearly all of its oceans, seas, lakes, etc. and atmosphere. This drove Venus, then, in the throes of a greenhouse effect condition, into an even stranger one which melted the entire surface, and the interaction caused Venus to rotate in a retrograde direction. Venus boosted Mars’ orbit into one that caused it to interact with the Earth, which again, boosted its orbit to its present one, which relaxed over five million years into its fairly circular one. All this would have taken place long, long ago and would explain what is found on Mars. Of course, this would be Velikovsky’s theory, but because it happened long, long ago, it can be contended that Velikovsky didn’t realize that these kinds of events are only to be given scientific consideration if they happen, and only if they happened long, long ago (once upon a time)!

Without something like this theory, the planetologists will be forced into a never-ending, neurotic struggle to make Mars in its present orbit, to hold water and an atmosphere. And above all, they will never face the very simple fact that Carl Sagan drove home that wind erosion absolutely demands that the surface features on Mars are extraordinarily, extraordinarily young, or as Moore, above, told us, maybe tens of thousands of years perhaps, but not millions. The present theory simply does not hold water.

This long, long ago paradigm will also be based on various forms of interdisciplinary evidence presented above that, again, only fit Velikovsky’s theory. Why should so many scientific phenomena on Mars’ surface, subsurface and atmosphere all fit his theory, such as Martian meteorites on the Earth which also point to a near interaction of Mars with our planet recently? All these forms of evidence surprisingly jump together and are explicable only if these events occurred in the past few thousand years. The false mathematical claim of solar system stability,

which omits electromagnetic forces into celestial mechanics is contradicted by numerous interdisciplinary scientific facts that deny that math. Mathematician, Morris Klein, in his discussion of the problem of mathematical certainty, states that “. . . contradictions were referred to as paradoxes, a euphemism that avoids facing the fact[s] . . .”

This is just what we pointed out above. The contradictions are referred to a paradoxes because generations of astronomers / planetologists, etc., need this euphemism to avoid facing the facts – the hard scientific facts!

That is what the Martian planetologists have done when confronted by the Martian evidence that refutes solar system stability. This failure to see where all these contradictions lead suggests THAT MARS WAS VERY RECENTLY ON AN ORBIT INSIDE THAT OF THE EARTH, a profound insight of interdisciplinary science and logic! If one were to present a solution to a mathematical problem that had all the elegance necessary to prove its validity, except that certain procedures and numbers contradicted that elegant proof, no honest mathematician could accept it. Either a proof is a proof, or it is not a proof. Outside of mathematics, the scientific establishment has taken upon itself the authority to maintain that even when numerous, well understood, interdisciplinary scientific facts from numerous scientific fields contradict the mathematical theory, these are not contradictions. Since they cannot face these contradictions, they have invested a psychological escape mechanism by relabeling contradictions paradoxes. Once they bypass these many fundamental inductive negations of their theory, the contradictions will not be seen, and not being seen, they are then buried and forgotten! When scientists use a far lower standard of proof than mathematicians, they are no longer dealing with reality. This is a basic, underlying, psychological truth that they seem incapable of facing. As Velikovsky understood resistance to change is one of the greatest facts in psychoanalysis. Scientists are no different. In the face of numerous, interdisciplinary, scientific contradictions, they behave just like any other human being. That is why scientific revolutions are so intellectually, sociologically and psychologically hard to achieve. It is not the numerous forms of interdisciplinary scientific evidence that the establishment scientists will not face, so much as their intellectual, sociological and psychological ability to deny that these contradictory facts even exist.

When I first presented most of this evidence about Mars at the University of Bergamo in June 1999, which was later published as the Proceedings of the Conference, New Scenarios on the Evolution of the Solar System and Consequences on History of Earth and Man, Emilio Spedicato, et al., eds. (Bergamo, 2000), pp. 73-109, it was well received. In the audience were two professional astronomers, Tom Van Flandern, head of the U.S. Naval Observatory in Washington, D.C., and Victor Clube, of the London Observatory. Both had always treated me with respect, but with a certain aloofness because of my working in Velikovskian research. At the completion of my talk, they both got up from their chairs as if stunned by the numerous, interdisciplinary, scientific facts laid before them and came to the podium to speak to me. Van Flandern graciously said this was one of the best and most logical discussions of this subject he had heard. I turned to Clube who, though seemingly troubled, nodded his head in agreement with Van Flandern. It seemed I had penetrated their solar system stability concept and I raised both my arms, palms up and asked, “Doesn’t all this evidence clearly uphold Velikovsky?” With the underlying other question to them, “How do you answer all of this?” They did not answer; they simply turned and walked out of the auditorium, and neither they nor any other scientist has deigned to publish an answer to all this interdisciplinary, scientific evidence about Mars. It is my belief that the depth and breadth of the evidence, vis-à-vis Mars, in terms of Velikovsky’s

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hypothesis, is just too massive. None of it is in accord with the concept of solar system stability. What astronomers believe is nicely summed up by Diacu:

“No science is 100 percent exact; each of them contain approximations. But there is one science that comes closest to perfection, it’s celestial mechanics. From 1687, when Newton inaugurated this field of study until today . . . – celestial mechanics has been able to forecast the return of comets, etc.

“Velikovsky can be refuted within the framework of celestial mechanics by calculations that comprehend everything seen in nature.”

But, as has been shown above, Newtonian celestial mechanics does not comprehend everything seen in nature. It’s calculations do not comprehend the tides, nor the stability of the Earth-Moon system, nor he shapes of elliptical orbits and many other astronomical phenomena. On top of all these negations, it does not explain away all the interdisciplinary forms of scientific evidence from Mars that in each and every case correlate and corroborate each other and are congruent with Velikovsky’s theory. Will Diacu pick up the gauntlet I have thrown down to him in this book or in Pillars of the Past, Vol. IV? I hope I am wrong, but I doubt he will. He probably won’t even read these books which I have sent to him with the note that he can address my challenges in the SIS Chronology & Catastrophism Review, a neutral organ devoted to these concepts. These Martian materials presented here have been in circulation for well over a decade, and no scientist has admitted that these scientific facts exist by analyzing them in print. They may put a reference to them in their footnotes or bibliographies to bury it and then go about their business. This, sadly, is the history of the Velikovsky Affair. I have never been called upon to answer in the same published work or any criticisms of Velikovsky regarding Mars. We are outsiders. Insiders are to be listened to and answered, and outsiders ignored and even misrepresented and alas labeled crackpots.

VENUS – A NEWBORN PLANET

If, as the scientific establishment maintains, Venus was born 4.6 billion years ago, there should exist several forms of interdisciplinary scientific evidence that unequivocally prove this. If, on the other hand, Venus is a newborn planet, as Velikovsky claims, then numerous forms of interdisciplinary, scientific evidence should unequivocally prove this. As with Mars, the numerous scientific disciplines should speak with one voice that Venus’ surface geology, its atmosphere, its chemistry, its source of heat, all independently correlate, corroborate and are congruent with either of these paradigm and this must be proven unequivocally.

However, before beginning these analyses, we must examine the antithetical predictions of Velikovsky and the scientific establishment regarding the nature of what would be found on Venus. It is well-known that Velikovsky maintained that Venus was a newborn planet in the early, cool-down stages of its development. Therefore, much like the depiction of the early Earth in Walt Disney’s film, Fantasia, Venus would be inordinately hot, immensely volcanic, with an atmosphere that exhibits the chemistry of a newborn planet. In this regard, the scientific establishment presented its own concept of what Venus should be like, based on the planet being billions of years old. After Worlds in Collision, was published in 1950, the University of Arizona published a monograph titled Venus, in 1983, and presented the best science then available to

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204 Diacu, The Lost Millennium, op. cit., p. 120.
predict what Venus was actually like on which Lawrence Colin reported what was expected by
scientists based on careful consideration of what was known and why Venus should be as they
expected it to be.

“Let us consider a survey of Venus concerning the available facts and theories
existing in 1961, prior to the first spacecraft launch one year later . . . these facts
were small in number. Venus was cloud shrouded with a rich CO₂ atmosphere and
the planet emitted a substantial flux at radio wave lengths [that] . . . led to qualitative
descriptions of Venus which may be gathered into seven broad categories. [Venus
was]:

1. Moist, swampy, teeming with life, or
2. Warm, enveloped by a global carbonic acid ocean, or
3. Cool, Earth-like, surface water [and a] dense ionosphere, or
4. Warm, massive precipitation clouds of water droplets, intense lightning, or
5. Cold, polar regions with 10km [6.2 miles] thick icecaps [and] hot equatorial
regions above the H₂O boiling point, or
6. Hot, dusty, dry, windy, global desert, or
7. Extremely hot, cloudy, molten lead and zinc puddles at equator, seas of
bromine, butyric acid phenols at the poles.

“From this list, it is not obvious that scientists were even talking about the same
planet in 1961. For those who are impatient for the outcome, speculation (6)
[Venus is a hot dusty, dry, windy global desert] appears to represent most closely
what we now think [in 1983] Venus is like.”

Reinforcing this concept, Ernest J. Opik stated in 1960:
“The modern picture of Venus . . . [is] a borderless desert extending over an
area one hundred times that of the Sahara . . . [The] Sahara itself would appear a
paradise compared with the dry, suffocating dust storms raging behind the brilliant,
deceitful face of the Evening Star.”

Nowhere was it ever suggested by establishment scientists that Venus would be found
to be a volcanic cauldron, covered by immense lava flows. In fact, as late as 1989, Isaac Asimov,
the late science writer, admitted:

“For years astronomers had believed that Venus was a geologically dead place.
Although quakes, volcanoes and other activity surely wracked the planet at one
time, it seemed certain that Venus was quiet today.”

Therefore, Velikovsky’s prediction of Venus being a newborn planet was the only one
that was correct, shockingly so.

As The New York Times science editor and reporter, John Noble Wilford, states:
“The discovery that the supposed twin [planet Venus] bears little or no
resemblance to Earth came as a shock when the Magellan spacecraft, between 1990
and 1994, showed details of the planets [volcanic] surface . . . debate over the
cataclysm [responsible] still seethes in the pages of scholarly journals.”

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In the same way Mars’ surface came as a complete surprise to scientists, but was predicted by Velikovsky, the surface and its appearance shocked the scientific community.

Science writer, Henry S. F. Cooper, Jr., in this regard, says “Olympus Mons on Mars is the biggest volcano in the solar system . . . It isn’t, Venus is. The entire planet is one big volcano.” But, of course, this was in no way a surprise for Velikovsky and those of us following his ideas. What, then, was to be done about this immense support for Velikovsky?

It was only because the astronomers were so deeply imbued with the solar system stability model that they thought that Venus, being almost the same mass and size of Earth, but was somewhat closer to the Sun that it had to be a hot, dusty, dry, windy desert. The hot, dry region of the Earth are deserts, ergo, Venus, which exhibited no evidence of water, had to be a desert planet. The analogy they made with that of the Earth was their most highly regarded prediction, which the vast majority of scientists believed was a scientific fact. They were all dead wrong and Velikovsky was undoubtedly right, just as he was about Mars. The point, again, in terms of Sir Karl Popper’s criterion for the demarcation line between what is science and what is pseudoscience, depends on making very narrow predictions which, when finally uncovered, show when a paradigm is correct. Thus, when Velikovsky’s overall prediction was discovered to be correct – Venus was an immensely volcanic, hot body – his scientific and other critics who could see with their own eyes the images of Venus, simply stopped talking about this fundamental evidence that supported Velikovsky.

Instead, they changed the subject and argued that Velikovsky had not predicted a fairly precise temperature for Venus that should be expected for a real scientific theory. Now there is a basic difference between the prediction by Velikovsky and that of the establishment scientists. Velikovsky’s thesis was that the body of the planet itself was hot and he therefore maintained that the thermal readings would be extremely hot everywhere on Venus’ surface. Since the scientists held that Venus was an ancient body, it had already cooled down and, therefore, its heat came from a greenhouse effect that would be hottest at the equatorial regions and much cooler at the poles, just as is found on Earth. The two scientific predictions regarding Venus was hot say it had “5. Cold, polar regions with 10 km [6.2 mile] thick ice caps [and a] hot equatorial region above H2O boiling point” and “7. Extremely hot, cloudy, molten lead and zinc puddles at equator, seas of bromine, butyric acid phenols at the poles.” That is, the polar regions of Venus were either frozen or so cold that any water there would be frozen and any chemical compounds, such as bromines, would still remain in liquid form. The freezing point of bromine is minus seven degrees Celsius, this is 19 degrees Fahrenheit or 13 degrees below the freezing point of water. These facts no critics ever mention when they attack Velikovsky’s prediction. All their predictions had Venus’ poles at a freezing temperature, but not Velikovsky’s.

What has also been buried by critics of Velikovsky is that a scientist had presented a precise number respecting the surface temperature of Venus, the very point they had demanded and argued for. In 1978, George Robert Talbott, a physicist whose specialty is thermodynamics, carried out a fundamental calculation of Venus’ present day surface temperature derived from its earlier state as a candescent body – a body hot enough to give off light – 3,500 years ago. This is

how Professor Talbott made much of his living besides teaching. If a rock or other substance is heated to the state where it glows to candescence and is then left to cool down, there is a mathematical thermal analysis of this cooling rate that can, in general, tell how long ago that substance was candescent. Talbot started with a candescent Venus 3,500 years ago and, using state of the art methods, determined what its surface temperature would be now. Of course, Talbott’s calculations were much more complicated because he was dealing with a massive body – Venus – radiating into a hot, massive carbon dioxide atmosphere, than the simple analysis carried out in a laboratory experiment. What he discovered, to his great surprise and shock, after setting up all the possible parameters of his calculation on a computer and running the thermodynamics program, he got a very precise answer. He started with a molten, candescent Venus at a surface temperature between 1,500 K and 2,000 K, allowing for heat transfer, internally of flowing, upwelling cells of magma radiating into a heavy atmosphere, and to his dismay, Venus’s surface temperature came out to be 750 K, which is just what Venus’s surface temperature is all across the planet, not just at the equatorial regions.²¹²

Contrary to what has been gossip ed about Velikovsky not having a fairly precise estimate of Venus’ surface temperature by his present-day critics, this presentation that Venus was candescent 3,500 years ago agrees quite closely with that scientific reality. One can argue that Talbott did not know the exact composition of Venus’ atmosphere, as Henry H. Bauer did.²¹³ However, it must be understood that none of the other scientists who estimated the temperature did not know this, as well. Yet their highly erroneous predictions were acceptable as proper scientific analyses, while Talbott’s analysis, which was correct for the entire surface of Venus following Velikovsky, is considered conjecture. That is, Talbott’s work had to be suppressed for good reason. It fully upheld Velikovsky’s. Even Henry Bauer failed to mention this finding and specifically omitted Talbott’s name and the evidence of what he had shown from his “References.” This is the high-handed way Velikovsky has been treated and it has not changed. I will return to this high-handedness below regarding the runaway greenhouse effect and a critic of Velikovsky on this matter.

When it comes to the chronology of the age of Venus, we are brought back to crater counting chronology, the same type of analysis used to date the Martian surface. To explain away the incongruent findings of crater counts that failed to match the 4.6 billion year age of Mars’ surface crater curve, the scientific establishment was forced to turn to an “erosion catastrophe” to make the theory mesh with the number and sizes of craters. Nevertheless, since Venus was also 4.6 billion years old, the expectation was that Venus would have a great many craters. But the crater count and sizes again did not conform to their theory. Therefore, just as with Mars, the scientific establishment scientists were forced to erase the surface of Venus, and in this instance, they created a volcanic catastrophe that buried all the earlier craters some 300 million to 800 million or more years ago. They simply could not comprehend that they were again creating catastrophes to salvage uniformitarian cratering. That is, global volcanic catastrophes that created uniformitarian crater count curves was just another ironic oxymoron process. Lang explains the problem:

“Venus, like all planets, has been subjected to a continual rain of meteorite bombardment over the eons. The plains of Venus are uniformly peppered with

impact craters . . . A comparison of craters with the same size on Venus, and the Earth’s moon indicates that those on Venus are far fewer in number and more widely spaced from those on the Moon. At one time Venus [like Mars in the deep past] was probably as heavily pockmarked with large craters as the Moon’s ancient surface is, but the scarcity of craters now on Venus indicates that the surface we now see is much younger than the lunar surface.

“We can estimate when the lava flowed by counting the [remaining] number of craters of any given size on the plains and comparing it to the number on the moon – ignoring the smallest that are not found on Venus because [small] projectiles burn up in the thick atmosphere. The Moon’s crater record tells us the number of impact craters left on Venus [and also] tells us how many have been removed by burial under volcanic flows.

“The Magellan spacecraft has logged about 1,000 impact craters which when compared to the lunar record indicate an average surface age of about 750 million years. Estimates between 300 million and 1 billion years are possible . . .”214

Lang then adds that for some unfathomable reason, after Venus volcanically repaved itself during this far distant time, volcanism eventually slowed greatly like the “erosion catastrophe” on Mars just stopped.

“Everyone agrees that the smooth plains covering most of Venus came from volcanic floods emanating from the planet’s interior, but the experts disagree over when and how it occurred. According to one ‘global catastrophe hypothesis, planet-wide volcanism whipped the face of Venus about 750 million years ago resurfacing the entire globe and drowning any existing craters in a flood of lava.

“There are two equally likely catastrophic interpretations that cannot be distinguished. One is a single resurfacing at about 750 million years ago. The second is that there was continuous resurfacing of the planet over most of its earlier history, and that the resurfacing slowed down sharply at about 750 million years ago. In either interpretation, the planet switched over to a low rate of localized volcanism about 750 million years.”215

Therefore, just like the “erosion catastrophe” on Mars that switched over to a thousandth of what is expected, some two to three billion years ago, given the second theory of repaving, Venus experienced massive, continuous resurfacing, or a global resurfacing catastrophe occurred. Then, as with Mars’ volcanism, for some scientifically unknown reason, switched over to an extremely low rate of local volcanism for the past 750 to 300 million years. Andrew Chaikin wonders: “. . . the idea that the planet completely repaved itself and then became relatively quiescent was immediately controversial . . . What could have caused the enormous volcanic outburst . . . [and] why did the subsequent level of activity drop so sharply afterward?”216 Robert Grimm, of Arizona State University, puts the problem in his way:

“Here’s Venus going like gangbusters, and suddenly it came grinding, screeching, choking to a halt.”217

David Grinspoon puts the problem thus:

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215 Ibid.
217 Ibid., p. 135.
“We don’t know of any other planet with a surface that formed [nearly] all at once. What could have happened to suddenly wipe out all preexisting terrain? It sounds disturbingly biblical. Was God practicing on Venus? Is this catastrophic tale the true story of Venus? Is this catastrophic tale the true story of Venus?

“Less than 1 billion years ago, the geology of Venus seems to have undergone a global pulse of rapid activity and then slowed to a crawl. This is disturbing. Venus on the inside should be just like the Earth. Earth is stable and predictable. Isn’t it? A billion years ago, isn’t all that long ago in planetary time. Why didn’t Venus settle down a long time ago, as Earth did? Is there something we should know?”

Grinspoon presents this further problem about the crater erasing catastrophe on Venus:

“But if craters were mostly being covered over by lava, the new should see a lot of them partially buried beneath the plains. For example, the volcanic plains of the Moon contain craters ranging from those with barely detectable, circular outlines that have been almost completely covered by lava, to those that are almost pristine, but have lava flows lapping slightly up their flanks. On Venus, only about 4 percent of the craters are partially covered [buried] by volcanic flows, and almost none are mostly buried. This seems to rule out volcanism as a dominant process removing craters from Venus. Why on a planet smothered with volcanic features are the craters so untouched?”

The obvious answer is that there never was a lava flow catastrophe in Venus’ ancient past. Grinspoon admits this evidence “seems to rule out volcanism as the dominant process removing craters.”

This fix-it-up is what the Venus planetologists have been forced to do to correlate the crater count curves with a planet that is 4.6 billion years old. They have Venus undergo a “gangbusters” period of volcanism that “suddenly . . . comes grinding, screeching, choking to a halt.” As with Mars’ “erosion catastrophe,” that also erased its surface two to three billion years ago, suddenly switching off and screeching to a halt. The Venus crater count had carried out this special, convenient geophysical action to make the crater count fit the established theory.

Warren E. Hamilton informs us:

“The Venus of conventional interpretation . . . was wholly resurfaced mostly by plume-driven [volcanic] processes, no earlier than 1Ga [one billion years ago] and [hence] preserved no ancient features. The speculation is extrapolated from terrestrial conjectures and rationalizes away voluminous contrary evidence from Venus itself.

“Transfer of plume conjecture to Venus from Earth has little merit. Terrestrial plume speculation is based on assumptions whose predictions have been consistently falsified. The hot-mobile assumption behind young surface conjectures is also dubious.”

The entire panoply of evidence employed to explain the volcanic resurfacing of Venus is based on “speculation,” “conjecture,” “assumptions whose predictions have been consistently falsified.”

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219 Grinspoon, Venus Revealed, op. cit., p. 256.
falsified” and are “dubious.” The explanation for repaving Venus to fit the crater count age of a planet 4.6 billion years old is based on nothing but the scientists’ desire to make their long chronology fit. Frankel, using the Earth as a model, reports: “The clustering of volcanoes into fields 100 to 200 km [62 – 125 miles] wide tells us something about the supply of magma to the surface of Venus. One hundred kilometers [62 miles] HAPPENS TO BE THE ESTIMATED WIDTH OF HOT PLUMES ON EARTH AND ARGUABLY ON VENUS AS WELL.”

Since this assumption about volcanic plumes on Earth has been “consistently falsified,” how can it be scientifically applied “arguably” to Venus?

THE ORIGIN OF CRATERS ON VENUS

If, as Velikovsky claims, Venus is a newborn planet, the approximately 1,000 craters observed over its surface had to have been created 10,000 to 3,500 years ago. It can be argued that that number of impact craters makes no scientific sense at all. Yet, if Venus is so young, how were all these craters generated? Since Venus was an incandescent body recently, all its craters are actually volcanic in origin! The point is that it now behooves me to scientifically prove this! The proof must not be like the one proposed for volcanic plumes on Venus “based on assumptions whose predictions have been constantly falsified,” nor “speculative conjectures.” It must be based on a well observed, highly volcanic body that has produced the same volcanic crater forms that are found on Venus. In order to bring this scientific proof home, I now turn to a comparison of the surface craters and other volcanic aspects of these on the inner Galilean moon of Jupiter, called Io. Io is constantly being gravitationally subjected to strong internal tidal stress by Jupiter pulling it toward that planet, but the outer Jovian moons pulling it at points along it orbit outward. These constant stresses cause Io to flex, that is, to slightly bend inside back and forth such that its internal temperature rises to great levels. In order for this internal heat to escape, Io generates more ongoing violent volcanic activity than any other body in the solar system. Io’s surface is constantly changing because of this volcanic activity and, therefore, it has produced more than 100 volcanic surface craters/calderas that look for all the world like impact craters. It is an ideal analogue to what is observed on Venus. According to Michael Zelik, in his college textbook on astronomy, these calderas do not look like volcanoes: “Io’s volcanoes have a different shape from those found on the Earth, Venus and Mars. Few appear as cones and shields [shaped ones]. They resemble collapsed volcanic craters.”

Billy P. Glass writes:

“There appears to be a complete absence of impact craters at least down to 5-10 km [3-6 miles] in diameter.

“. . . More than 100 calder-like depressions up to 200 km [125 miles] in diameter have been observed. They are much larger than terrestrial calderas but very few appear to be associated with significant volcanic constructs.”

Frankel tells us: “Most calderas on Io lack an edifice [cone or shield] and are flush with the plains. Only one in ten is perched on any noticeable relief, with radial [volcanic] flows pointing down slope . . .”

The term employed to describe these caldera/craters is “paterae,” and according to Rosaly M. C. Lopes and Michael Carroll:

221 Frankel, Worlds of Fire . . ., op. cit., p. 221. (Capitalization added)
224 Frankel, Worlds of Fire . . . op. cit., p. 281.
“Most of Io’s volcanoes manifest themselves as caldera-like depressions . . . referred to as paterae . . . Unlike terrestrial volcanoes, Io’s volcanoes rarely build large topographic structures such as shields or stratovolcano-like mountains . . . Paterae are the most common type of volcanic feature on Io. Although the origin of paterae is still somewhat uncertain, they are thought to be similar to terrestrial volcanic calderas, formed by the collapse over shallow magma chambers following partial removal of magma.”

In essence, these calderas look just like impact craters seen on Venus and range about the same sizes. They go on to say, “At least 400 Ionian paterae have been mapped. Their average diameter is ~ 40 km [25 miles] but Loki . . . >200 km [125 miles] in diameter.” If these calderas on Io were created as were the craters on Venus, by upwelling chambers of magma that had collapsed, there should be other numerous aspects of these formations on both bodies that exhibit identical structures. Trudy E. Bell, in this respect, writes, “Most of the craters on Venus seem to be volcanic, rather than [of] impact origin.” This is because they have volcanic materials in them or flowing from them in the images. There should, of course, be differences between Venus and Io’s surface features because Io’s temperature is not decreasing, whereas Velikovsky suggests that Venus’ temperature is falling at a very minute rate. In addition, there will be differences in the materials each body contains which will also affect the appearance of their crater/calderas.

**PLAINS VULCANISM ON VENUS AND IO**

Both on Venus and Io, a great many of their craters/calderas are located on their plains. David Morrison tells us, “Most of Io’s calderas are not at the tops of mountains, but instead, appear to be scattered amid the plains.” Therefore, if Velikovsky is right, then Venus should also have a great number of crater/calderas dotting its plains. A report in *New Scientist* explains:

“The flat plains of Venus consist of lava . . . And an appreciable amount of heat may escape through these . . . rather than through large volcanoes and rift valleys [as on the Earth] . . .

“In the plains, the researchers found dozens of small vents, which oozed lava without forming volcanic cones. The researchers say ‘The large number and wide distribution of vents in the lowlands strongly suggest plains volcanism is an important aspect of surface evolution and attributed to heat loss on Venus.’”

Thus, there is a basic similarity that strongly suggests that Venus is venting its internal heat through plains volcanism, but the planetologists can’t conceive of this possibility.

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229 *New Scientist* (Nov. 4, 1989), p. 34.
MISSHAPEN CRATERS

Since Io possesses a thin crust floating on a bed of magma, that crust can become deformed by the different motions and pressures that magma exerts on that surface. Therefore, both Io and Venus should have a great many misshapen craters. For Io, M. H. Carr, H. Masursky, R. S. Strom and R. J. Terrile describe the crater shapes as observed by Voyagers 1 and 2: “Although most [calders] are nearly circular, they range widely in shape; some have scalloped walls, suggesting collapse about different centers, others have rectilinear outlines, and others have elongate, slot-like shapes.”

An early report from Magellan about non-circular craters on Venus was presented in The New York Times for September 18, 1990. There it was reported that a kidney shaped crater had been observed. The explanation provided to explain this unusually shaped structure was that the “kidney-shaped crater appeared unlike any other in the solar system. Perhaps an incoming meteor broke up as it passed through the dense Venusian atmosphere, causing several large chunks of material to strike almost simultaneously in an irregular pattern.”

However, over time, more and more irregularly shaped craters were observed on Venus so that the first example could no longer be considered unique. Thus, an article in Discover states: “Even Venus’ craters are intriguing. Some have strange and irregular shapes, in puzzling contrast to the round outline typical of most impact craters in the solar system.”

On the other hand, G. E. McGill, et al., report:

“An impact origin for many of these crater-like forms is doubtful. If they are not due to impact, then these features do not imply an old crust, in fact, they could be interpreted to imply youth. Many of the depressions on the surface of Venus are too irregular in plan to be due to impacts . . . and some areas seem to be pockmarked by [these] very large highly irregular depressions . . . not quite like anything on Earth.”

Most of these are smaller crater and, therefore, it is suggested that most small meteorites broke up to form them; but that is merely an assumption; these can also be interpreted as being small in size and these calderas are easier to deform because of crustal movements. For example Timothy M. Kusky shows:

“Many of the surface features on Venus indicate some crustal movement. For instance, the folded mountain ranges show dramatic evidence of crustal shortening, and there are many regions of parallel fractures. Despite these features, there have not been any features found that are indicative of plate tectonic type of process operating. Most of the structures could be produced by crustal downsagging or convergence between rising convective [magmatic] plumes . . .”

There is further evidence that the surface of Venus has been deformed by shaped areas that look like tiles known as tessera, as Suzanne E. Smrekar, Ellen R. Stofan report:

“Tessera terrains are highly deformed and thus stand out as very bright in radar images . . . They are made up of both extensional and compressional deformational

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features. Each set of lineations may represent a separate deformation event or two sets may form simultaneously if shear [side to side] deformation is involved. In some cases, the sequence of events can be determined, but more often, it is ambiguous. Tesserae occur both as isolated fragments embayed by later plains material and in major plateaus.”

There can be no doubt that Venus’ surface has undergone shifts in all directions. These, of course, will affect small areas more greatly than broader areas and give rise to volcanic craters that were originally circular to ones that are quite irregular, like those many irregularly shaped craters on Io. So far as I know, only two worlds – Venus and Io – exhibit very large numbers of misshapen craters. This, again, strangely implies that they were created volcanically under similar, not identical conditions. And we are specifically informed by J. E. Guest and R. Greeley, “Lunar craters, like terrestrial impact craters . . . tend to be circular, whereas calderas do not.”

Geophysicists have generally considered misshapen craters as volcanic structures on the Moon, Earth and Io. However, when they observe misshaped craters on Venus, they cannot accept this evident difference. They become blind to it.

Nevertheless, there is other evidence that indicates Ionian and Venusian craters are volcanic. Both bodies have molten outflows of material/magma or lava flowing copiously out of these craters/calderas. For Io, we are told:

“One of the most striking aspects of Io calderas is the associated albedo [light reflection] patterns. The floors of most are very dark and the[ir] low reflectivity of many is accentuated by bright halos around the craters . . . [Sulfur] rendered molten by heat from silicate magmas . . . may be the source of some rivers – like features that snake across Io’s surface . . . The flows from one of Io’s craters are very long, stretching for hundreds of miles.”

R. Stephen Saunders reports of one Venusian crater: “The crater’s flat, smooth floor hints that it has been flooded by lava.” Saunders also exhibits photographs / images of craters that, just like Io’s described above, with dark floors of low reflectivity and bright halos, are quite common on Venus, and then admits that: “River-like erosion features running from the largest crater in the image are as yet unexplained.” When other Venusian impact craters were found with lava running out of them, like those on Io, it was suggested, as Bruce A. Campbell tells us: “Some Venus craters have lava-like outflows of impact melt . . .” Theo Koupelis further tells us, “Most of the floors of the craters [on Venus] are flat because lava has flooded them.”

Robert Burnham writes, “All craters larger than 20 kilometers [13 miles] have interiors at least partially flooded with “lava.”

We were told above that river-like features snake across Io’s surface. Amazingly, there are also volcanic river-like flows running across Venus’s surface. Peter Grego informs us:

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238 Ibid.
240 Theo Koupelis, In Quest of the Universe, 6th ed. (Sudbury, MA/London et al., 2010), p. 219.
“Lava channels . . . Formed by the action of flowing lava and superficially appearing like dried up river beds, the lava channels on Venus closely resemble sinuous rills found on the Moon. Around 200 lava channels have been identified, most of which meander their way through lava flood fields or trickle down the sides of volcanic shields. They are often found in groups . . . they average between 500 [meters] to 1.5 km [1 mile] in width. Their lengths range between a few tens of kilometers to several hundred kilometers . . .”\textsuperscript{242}

Related to these lava river-like channels is the fact that they show the changes in Venusian topography, as Paolo Ulivi with David M. Harland Show:

“Another volcanic land form peculiar to Venus were meandering rivers made not by water but by low extremely viscous lava such as carbonite . . . which, being just barely warmer than [the] planet’s surface would have flowed for long distances and eroded deep channels . . . The largest of these Venusian rivers . . . is Baltis Vallis . . . Although only a few kilometers wide, it runs for 6,800 km and is believed to be the solar system’s largest [volcanic] channel. If it were on Earth it would run from New York to Rome! [over 4,000 miles] Although the Venusian rivers all lack lakes and tributaries, some sport other river-like features, including delta estuaries . . . in some places they run uphill where the surface bulged upward.\textsuperscript{243}

Again, there is evidence for changes both up and down, compression inward and expansion outward of the Venusian surface that affected the smaller caldera/craters more than the large ones. In fact, it has even been put forth that the lava rivers on Venus are made up of the same materials found in Io’s river-like systems, as reported by Lopes and Carroll. “Some sulfur-rich types of rock can stay molten and then [viscous] for very long periods of time. Ultrabasic or ultramafic lavas, as those that may be present on Io, are another possibility.”\textsuperscript{244} They admit, “For now, the long-lived lava flows remain a mystery.”\textsuperscript{245}

What are ultrabasic or ultramafic lavas, and when did these flow on the Earth? Lopes and Tracy K. P. Gregg inform us in their discussion of Io:

“What are these lavas? We still cannot tell for sure, but the most logical explanation is that they are similar to terrestrial lavas called ultramafic, which erupted on Earth in pre-historic times mostly billions of years ago . . . These lavas are rich in magnesium and melt at temperatures in the range of 1,700 – 1,900 K. If Io’s lavas are indeed of the same type . . . It is like having a window into the Earth’s distant volcanic past.”\textsuperscript{246}

That is, ultramafic lavas go back to the earliest lava flows that poured forth on the early Earth as it cooled billions of years ago onto its immensely hot surface. These lavas are extremely hot and to flow for hundreds to thousands of miles, they must be exuded into an extremely hot atmosphere so that they will remain viscous. This would mean that Venus’ atmospheric temperature was much hotter in the recent past than it is today. Victor E. Baker, Goro Komatsu, Virginia C. Gulick and Timothy Parker say that the rivers of Venus “require highly fluid lavas, erupted at sustained, high discharges. Unusually low viscosities are required to explain fluvial-like features. Only the most fluid lavas would be candidates. Carbonite and sulfur lavas are also

\textsuperscript{242}Peter Grego, \textit{Venus and Mercury, and How to Observe Them} (NY 2008), p. 82.
\textsuperscript{244}Rosaly M. C. Lopes, Michael W. Carroll, \textit{Alien Volcanoes} (Baltimore, MD 2008), p. 55.
\textsuperscript{245}Ibid.
\textsuperscript{246}Rosaly M. C. Lopes, Tracy K. P. Gregg, \textit{Volcanic Worlds}, op. cit. p. 136.
possibilities, though their abundance [on Venus] would be highly unusual for terrestrial planetary geochemistry. In other words, the concept that these long-lasting rivers formed from carbonite or sulfur is not supported because their abundances are highly improbable. But this indicates that these rivers formed from ultramafic lavas at far higher temperatures than exist today.

But if Venus was much hotter earlier, as Velikovsky’s theory suggests, then there was indeed sufficient heat for ultramafic lava rivers to flow for long periods and over great distances. Again, Velikovsky’s theory allows this scientific phenomenon to fit his theory quite well. That is, these rivers of lava were flowing for years in order to form deltas and estuaries, and since Velikovsky claimed Venus earlier was far hotter than today, then naturally the surface temperature would have been much, much higher, and again, this higher temperature would allow lava rivers to flow for long periods over great distances. But modern scientists have shut this concept out, and thus they will continue to struggle with “the long-lived lava flows [that] remain a mystery.” Nor can they explain these to ultramafic lava. Why are there long river-like flows only seen on Io and Venus which are both volcanic worlds? These, they fail to tie together, although the evidence is staring them in the face. Like the river valley networks on Mars that they cannot explain, the river-like lava flows on Venus are likewise inexplicable, phenomena that will continue to elude them as with so much else.

Another aspect of the craters on Venus and Io is their depth and diameters. For example, some of Venus’ craters are quite deep. Thus, Gordon H. Pettengill reported that the spacecrafts’ first altimeter reading gave a surprise he said “was discovering that a previously surveyed impact crater named Colette is more than two miles deep – far deeper than any crater seen on the Earth or any other planet.” William B. McKinnon, Kevin J. Zahnle, Boris A. Ivanov and H. J. Melosh, further inform us, “Craters on Venus are morphologically complex . . . yet they are deep . . .” On Io, we are told, “some calderas are several kilometers deep . . .” With regard to their diameters, Billy Glass reports that the craters on Io are “up to 200 km [125 miles] in diameter.” R. R. Herrick, et al., tell us that on Venus, “the largest crater [is] 268 km [160 miles] in diameter.” In essence on these two highly volcanic bodies – Io and Venus – the craters are often deep and have crater diameters that range up to very similar sizes. But this, too, is not considered by the scientific establishment as a comparable indication that both bodies formed these caldera/craters in the same way.

There is abundant evidence that shows the craters/calderas on the two most volcanic solid planetary-like bodies in the solar system are almost identical, but because of the concept of solar system stability it is assumed Venus is 4.6 billion years old, so its craters must be impact in origin, while those on Io are volcanic in origin and are dated by that stability concept. Yet Billy Glass states “the geologic history of Venus . . . based primarily on what we have learned about the other planets . . . is necessarily highly speculative. We assume that Venus was formed $4.5 \times 10^9$ y

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ago [4.5 billion years ago].” And that first assumption requires that all and every observation must always be made and forced to agree with that overriding, unproved assumption.

THE NEWBORN BABE SURFACE OF VENUS IN SPITE OF EROSION

As with Mars, the scientists had come to the conclusion that Venus’ craters were flooded over by lava from 300 million to a billion years ago and then somehow this slowed nearly to a stop over the ensuing period, to fit the crater count with a 4.6 billion year old planet. This fix-it-up nevertheless had a problem associated with it. After such fairly lengthy periods, the surface of Venus should have been eroded and buried beneath erosional materials to significant depths. Let us recall that in the above discussion of the Grand Canyon, where we were told that eroding and depositing and compacting the silt or dust or whatever that created these sedimentary rocks to a depth of around 5,000 feet, took 210 million years. In a somewhat similar way on Venus, if other processes were operating from 300 million to one billion years, the surface of Venus would be covered by about 6,750 to 16,000 feet of sedimentary rock. Even if these erosional materials were not compacted, the entire surface of the lowland plains that cover 80% of Venus’ surface would be buried at a rate of 3 feet per thousand years to about 100 million feet over 300 million years and over three times that depth over a billion years. Even at immensely slower rates of erosion the surface of Venus should be buried under great depths by a regolith – planetary soil. This was undoubtedly the expectation for Venus, just as it was for Mars. Bruce Murray reported that he and his colleagues found the “Russian close-up of Venus . . . surprising. I had presumed that its surface [would be] buried under a uniform blanket of soil and dust . . . Chemical weathering should be intense in such a hot acid environment . . . Unknown processes of topographic renewal evidently manage to outstrip degradation and burial.” Elsewhere Murray, M. Malin and R. Greeley admit “there can be little doubt that chemical weathering must be very effective on the Venus surface.” Eric Burgess, along these same lines, writes:

“The rocks of Venus undergo different types of weathering. Chemical weathering would be expected to decompose olivines, quartz and feldspar into magnesite, tremolite, dolomite and sulfides and sulfides. Mechanical weathering would be expected to disintegrate rocks by spalling and preferential chemical weathering and possibly by wind erosion.”

Burgess adds “The radar data are . . . inconsistent with Venus being covered by vast areas of windblown debris.” Based on Velikovsky’s theory, Venus has not had time to erode the Venusian surface greatly and, therefore, it should not have great depths of material covering its surface. Again, although Velikovsky could not have known this in 1950, what Bruce Murray found “surprising” about this erosional evidence that contradicted his and his colleagues’ expectations as “surprising” was in full agreement with Velikovsky’s hypothesis. That is why the scientists had concluded that Venus would be found to be a hot desert covered with sand and dust to great depths. Even if its surface was 300 million to a billion years old, it would be mantled over with a deep regolith of soil.

256 Eric Burgess, Venus, an Errant Twin, op. cit., p. 141.
257 Ibid.
Richard A. Kerr explains the disconnection between what established theory expected and what was discovered:

“The planetary geologists who are studying the radar images streaming back from Magellan find they have an enigma on their hands. When they read the [impact crater count curve] the geologic clock tells them how old the Venusian surface is they find a planet on the brink of adolescence. But when they look at the surface itself they see a newborn babe . . . Magellan scientists have been struck by the newly minted appearance of craters formed . . . “But by geologists’ usual measure these fresh-looking craters had plenty of time to fall prey to the [erosional] ravages of geologic change.”

Grinspoon puts the problem this way:

“But there is something quite strange almost unnatural about the Venusian craters. Nearly all of them are pristine, as if planted there recently. Virtually every geological feature of the planet appears brand-new, even though the surface is quite old. . .

“In effect, Venus looks much like an Earth that is arid and devoid of erosion ...

“The absence of erosion, however, goes only part way toward explaining the strangely fresh appearance of the crater population.”

Note the words Kerr and Grinspoon use to express their utter dismay and surprise at the extraordinary newness of these features: “enigma, too pristine,” “something quite strange, almost unnatural,” “strangely fresh” “all of them appear pristine,” “Virtually every geological feature of the planet appears brand-new.” Yet none of this is contrary to the theory of Velikovsky. To the contrary, all this newly minted Venusian surface completely vindicates his prediction of Venus as a newborn planet. Marcia Bartusiak, et al., encapsulates this discovery as follows:

“The biggest surprise, however, was the crispness of the landscape in nearly all Magellan images. Almost every feature seemed to be preserved in pristine condition from the time of its formation. The surface showed virtually no evidence of erosion, a fact attributed to the absence of water in Venus’ atmosphere (and to a lesser extent to the calmness of the surface winds). . . ‘The trouble with this . . .’ said one Magellan team member, ‘is that we got . . . data and it’s mind-boggling.’ Said another, ‘It’s as if we’d never seen Earth and lived on the far side of the Moon . . . It’s a whole new planet out there’.

To explain away this lack of erosion on Venus, planetologists contend that there has to be a geological process that has somehow recemented the particles of basaltic weathered rock back into a sedimentary rock that looks exactly like lava or other basaltic rocks. McGill, et al., put forth exactly this concept as a possibility:

“The radar and Venera lander observations imply that most of the surface of Venus cannot be covered by unconsolidated wind-blown deposits, bulk densities of near-surface materials are not consistent with Aeolian sediment . . . Thus present-day wind-blown deposits cannot form a continuous layer over the entire planet, but they could form patches in local depressions or in other regions that characteristically have lower mean wind velocities [so eroded wind-blown materials will accumulate]. Old aeolian sediments might be cemented; if so they

could not be distinguished from weathered igneous [volcanic] rocks. Consequently, it is possible that a layer of cemented aeolian sediments cover much of the surface of Venus. The bedrock platforms seen by the Venera 10 13, and 14 cameras may be cemented Aeolian sedimentary rock rather than primary igneous rocks.”

These researchers argue these “Might be cemented” . . . if so, they could not be distinguished and “may be cemented.” On the other hand, other scientists do not accept this explanation. Gunther Faure and Teresa M. Mensing, as late as 2007, write: “As far as we can tell, the present crust of Venus does not contain sedimentary rocks . . . Present knowledge indicates that the lithosphere of Venus is composed of volcanic and plutonic rocks in basaltic composition.” Gregory J. Retallack admits the problem of these rocks is unresolved and the theory of recementation “cannot be taken seriously.”

“Information on the chemical composition of Venusian soils was relayed back to Earth by Venera landers, which were equipped with miniature X-ray florescence laboratories. Calculations indicate that at the surface material at both sites is low in density . . . and highly porous . . . [like certain igneous rocks]. This is a surprise because the ground transmitted images . . . looks like either pahoehoe lava [lava laid down in water] or indurated ripple-marked siltstone. Also unusual is the very low electrical resistivity of the material . . . and the darker color of the loose dust compared to the lithified-looking [rock] fragments. Dry rock or dust should have a high [electrical] resistivity and dust should be lighter colored from rocks from which they formed.

“These meager data and observations are permissive of a number of interpretations, each of which is based on such a complex series of assumptions that they should not be taken seriously.”

The main points Retallack makes are that if the soils observed around the sites of Venus’ surface were derived from the rocks, they would be lighter in color than the rocks. They are not, they are darker. If the rocks and dust were dry, that is, had little water, they should have high resistance to electricity. They do not; they have low resistance to electricity. In essence, there is no direct relationship between the rocks and the soils surrounding them, which means that the rocks cannot be derived from the soils and, therefore, cannot be sedimentary rocks. Sedimentary rocks are derived from soil like materials. There is, in fact, not a single canyon or mountain on Venus that exhibits the kind of layering observed in the Grand Canyon. In spite of this, the theory appears to be the only one to salvage the volcanic appearance of Venus with rampant erosion. But if, as Velikovsky claims, Venus is a newborn planet, it should have very little soil/regolith on its surface, which is precisely what has been found. Nevertheless, nearly all the statements in the scientific literature and elsewhere say that Venus’ surface is almost completely volcanic. Lang puts it thus:

“The surface of Venus is shaped largely by volcanic activity. Its topography is dominated by massive global outpourings of lava, punctuated by numerous shield volcanoes and unique volcanic constructs, never seen before . . . craters [are] surrounded by beautiful outflows, and fractured, stretched, crumpled and split open

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261 McGill, et al., Venus, op. cit., p. 94.
by upwelling magma. Venus has more volcanoes than any other terrestrial planet. With the exception of Io, Venus is the most volcanic world in the solar system."  

Given that Venus was incandescent several thousand years ago, its magma would be filled with gas bubbles, as gas moving in and through it reached the surface. For example, Bruce Grubbs tells us: "About 1,600 years ago, lava flowed southwest from Belknap crater . . . and poured into the Tamolitch Valley. The lava is porous enough so that the McKenzie River is drained into the rock, and the bed is dry for about 2 miles, until it re-emerges . . ." Thomas Pickles on this states:

"Where lava flows are cut by erosion and exposed in cross section, flow centers are often seen to be firm and compact while both tops and bottoms of flows are slaggy, porous and rough. Part of the porosity is associated with the escaping volcanic gases, leaving tubular openings leading toward the outer surface of the hardening lava. Such openings are vesicules and the porous lava is said to be vesicular and is called scoria. Many lava fields are very porous . . ."  

In essence, the porous nature of the lavas on Venus’s surface vindicate it is the top layer of recently flowing magmas that are filled with gas bubbles which, once again, is fully in accord with Velikovsky’s thesis. Everything about Venus’ surface fully correlates and corroborates Velikovsky’s theory of a newborn planet and is only congruent with it and no other.

**VENUS’ NEWBORN ATMOSPHERE**

If Velikovsky is right, the Venusian atmosphere, like the surface features, should also be of a newborn planet. Above we were able to cite scientists who, again and again, claimed that Venus’s surfaces were brand new, as if planted there yesterday. The very same should also hold for Venus’ atmosphere. Again and again, we will see scientists say the gases found in it are those of a newborn planet. And that is exactly what they do say as we will repeatedly cite them. Grinspoon comments: "According to our current ideas about atmospheric evolution, it seems that Earth’s early atmosphere may have been a thick blanket of carbon dioxide, much like the modern-day atmosphere of Venus."  

"The total amount of carbon dioxide in Venus’ atmosphere is probably comparable to the amount the Earth would have if all the carbon dioxide in its carbonate rocks could be liberated. If the carbon dioxide in the Venusian atmosphere could be drawn down to rock, then it would leave a residual atmosphere of nitrogen with a surface pressure of a comparatively mild 3 bars [3 times that of the Earth]."  

It must be understood that the Earth did not outgas its ocean waters in the first few thousand years, but in the first 100 to 500 million or so years, as Barbara Leigh Ransom and Sonya Wainwright point out:

"It is generally agreed that most water that makes up the world’s oceans came from outgassing of the Earth during the first 500 million years of its existence." Therefore, if Velikovsky is correct and Venus was born about 10,000 years ago, it will have very little water in

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its atmosphere. William K. Hartmann and Ron Miller sum up the evidence for Venus’ newborn atmosphere thus:

“Earth probably started its existence with a first-stage atmosphere . . . This was probably blown away almost as soon as the Earth formed because of giant impacts and the solar wind gases that rush from the Sun.

“The second-stage atmosphere . . . was [of] . . . carbon dioxide (CO₂) and water vapor that fumed out of the early volcanoes . . . So Earth had a dense carbon dioxide . . . atmosphere.

“Venus still has a perfectly preserved second-stage atmosphere – an actual example of the dense CO₂ atmosphere hypothesized for the [newborn] Earth.”

With respect to oxygen, the Earth had very little in its very earliest atmosphere as Hartmann and Miller elsewhere say. “Earth’s early atmosphere, say, 4,000 my [million years] ago . . . was mostly (CO₂) and water vapor (H₂O). It had negligible oxygen.”

Venus has in its overall atmosphere the gases that would be found if it were a newborn planet about the same size as the Earth: a thick blanket of carbon dioxide a good deal of nitrogen, very little water and very, very little oxygen. Although Velikovsky did not predict these abundances, his theory fully conforms with Venus’ newborn atmosphere, but the scientific community cannot even see that this evidence completely corroborates Velikovksy’s theory. Venus’ atmosphere has the constituents of a newborn planet and the surface features of a newborn planet, but it somehow must be an ancient 4.6 billion year old body. Unable to make the model of an ancient planet fit the actual atmosphere of Venus, Colin Lawrence was driven to admit “The chemical composition of the air remains the most controversial aspect of our knowledge of the Venusian atmosphere.”

As will be shown below, the various gases in Venus’ atmosphere repeatedly contradict the theory that Venus is an ancient body but conforms completely with Velikovsky’s theory that it is a newborn planet. Let me count the many, many ways.

VENUS’ ARGON-36 AND ARGON-40 AGE

There are two forms of argon gas called isotopes found in the Venusian atmosphere. The first, argon-36, is a primordial inert gas and is part of the original primary atmosphere of newborn planets that would be blown away by the early sun when it was in the hot T-Tauri stage after it formed. Because Venus did not experience this T-Tauri stage of the sun, its argon-36 would not have been blown away or, if lost during the early period when Venus was incandescent, the gas would be vented from the planet’s molten crust. Therefore, if the scientists’ theory that Venus is as old as the Earth and Mars, it should have comparable amounts of argon-36. If Velikovsky’s thesis is correct, Venus should have vastly greater amounts of this gas. According to Pete Gwynne writing in New Scientist:

“So surprisingly large are the amounts of this gas in the atmosphere of Venus by comparison with the Earth’s, that planetologists are NASA Ames Research Center were trying to puzzle out how both planets could have formed at the same

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time – the current scientific theory. ‘This finding will force us to rethink the whole process of planet formation,’ said Thomas Donahue of the University of Michigan.

“The Argon detection, . . . overseen by John Hoffman of the University of Texas at Dallas, indicated that the Venusian atmosphere contains more than 100,000 parts per trillion of Argon-36. Earth’s atmosphere, by contrast, contains about 35 parts per trillion of the isotope and Mars’ about two hundred times less than that.”

Now if Venus was fissioned from Jupiter, as Velikovsky claimed, we would expect that there would be a great abundance of argon-36 and that is just the case. In “Atmospheric Abundance for Jupiter,” “Argon-36” is at a ratio with that of the sun that “2.5 ± 0.5.”

There is enough argon-36 in Jupiter’s atmosphere to reflect the abundance of this gas found on Venus. Velikovsky could not have known this in 1950, yet we can see that there is a direct correlation of this gas in Jupiter and Venus. Because of Jupiter’s immense mass 318 times that of the Earth, it can hold all its primordial gases so the correlation between these two planet’s gases, while a surprise and contradiction to the established theory of solar system formation, is not a surprise and is confirmation of Velikovsky’s theory. As reported in the The Washington Post, McElroy, a Pioneer Venus experimenter, gives us this stunning fact: THE ATMOSPHERE OF VENUS CONTAINS AS MUCH ARGON-36 AS YOU WOULD EXPECT TO FIND IN THE PLANET’S ORIGINAL ATMOSPHERE. Although Donahue said “This finding will force us to rethink the whole process of planet formation,” no one has come forth to rethink that process because the entire structure of solar system stability would have to collapse, and heaven forbid, Velikovsky’s ideas would have to be considered!

The second form of argon found in Venus’ atmosphere is argon-40. This gas is created when potassium-40 breaks down over time. Again, because the scientists maintain Venus is an ancient planet, it was a very reasonable and scientific idea that, whatever potassium it originally had would, over time, be outgassed into Venus’ atmosphere and would be found in amounts comparable to that of the Earth. However, if Velikovsky’s hypothesis is correct and Venus is a newborn planet, its potassium-40 would not have had sufficient time to produce argon-40 gas in amounts comparable to the Earth. Glass informs us that: “The ratio of the mass of radiogenic Ar49 to the mass of Venus is smaller by a factor of 15 to the value for the Earth.”

This simply means that Venus has over a trillion times less argon-40 than the Earth. This, of course, makes no scientific sense, as Eric Burgess tells us: “Since the abundance of potassium and potassium-to-uranium ratio are both Earthlike in the Venus rock samples so far examined, an initial shortage of potassium cannot be the reason for less {Venusian] argon-40 today.”

The planetologists are caught in a double bind because of these two forms of argon gas in Venus’ atmosphere. If, for some unknown reason, Venus outgassed much less argon-40, it barely might explain the trillion times shortage of it in the atmosphere. However, if we stop argon-40 from escaping to the surface to explain its low fraction, we also have to stop argon-36 from escaping. But, as we know, there is 100,000 parts per trillion on Venus’ atmosphere, whereas

277 Burges, Venus an Errant Twin, op. cit., p. 141.
there are only about 35 parts per trillion in the Earth’s atmosphere. No matter what one does to speed up or slow down the gas emissions from Venus, this problem cannot be resolved. As a matter of fact, there are approximately equal amounts of argon-36 and argon-40 in Venus’ atmosphere. Since, according to McElroy above, Venus contains as much argon-36 as you would expect to find in the planet’s original atmosphere,” the amount of argon-40 is also the amount you would expect to find in Venus’ original atmosphere! The possibility, or rather, impossibility, that argon-36 would equal potassium-40’s breakdown product, argon-40 is too impossible a coincidence, unless, and only unless Venus is a newborn planet endowed with these gases in their original, primordial amounts. For a somewhat broader discussion of this evidence, see Charles Ginenthal, *Stephen J. Gould and Immanuel Velikovsky*, Dale Ann Pearlman, ed. (Forest Hills, NY 1996), pp. 378-382. This evidence has never been addressed by Velikovsky’s scientific critics, although it has been in Velikovskian literature for decades – for decades!

**VENUS’ CARBON DIOXIDE AGE**

Carbon dioxide, which is 96.5 percent of Venus’ atmosphere, is not stable in the presence of solar ultraviolet radiation. Ultraviolet rays photodisassociate (breakdown) carbon dioxide into the products of carbon monoxide CO, and oxygen O₂. Once molecules of carbon monoxide and oxygen form, they do not readily recombine to reform as carbon dioxide. This action would take place in the upper and middle atmosphere of Venus where ultraviolet radiation is most prevalent and thus would photodisassociate carbon dioxide there most rapidly. Therefore, if, as the scientific establishment’s paradigm that Venus is an ancient planet, the carbon dioxide there would be completely photodisassociated and the upper and middle Venusian atmosphere would long ago have been converted to carbon monoxide and oxygen. But, if Velikovsky is correct this process has not been going on long enough to convert all the carbon dioxide to these breakdown products. U. Von Zahn, *et al.*, in a paper titled, “The Composition of Venus’ Atmosphere,” explicitly deal with this question:

“Photochemistry of CO₂. The central problem of the photochemistry of Venus’ middle atmosphere is to account for the exceedingly low abundance of CO and O₂ observed at the bottom of the middle atmosphere. In fact, O₂ has not been detected at 1ppm [part per million] level. Due to low abundances of O₂ and O₃ [ozone which absorbs ultraviolet rays] . . . solar ultraviolet of sufficient energy of photolyse [breakdown by light action] CO₂ . . . penetrates down to 65 km [39 miles above the Venusian surface] . . .

“The 3-body [3 elements or compounds] recombination reaction with rate constant Kb [based on the temperature at this altitude] is, however spin forbidden [to reform into carbon dioxide]. Consequently at typical temperatures of the Venus middle atmosphere (200 K) this [recombination] reaction has a very small rate . . . [But at this temperature] . . . oxygen is converted to molecular oxygen [O₂] . . . with a rate constant Kc which is 5 orders of magnitude higher than Kb. Neglecting for a moment the effect of trace gases in Venus’ atmosphere, CO₂, CO and O₂ are nonreactive with each other and we therefore expect a fairly rapid transition (on geologic time scales) of the CO₂ atmosphere to one dominated by CO and O₂. CO₂

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would disappear from the upper atmosphere within a few weeks, and from the entire middle atmosphere in a few thousand years.

“Indeed, these arguments describe the situation correctly for the upper atmosphere of Venus, provided we take into account also the various dynamic processes exchanging gas between the upper and middle atmosphere. The above arguments, however, fall short in explaining the observed composition of the middle atmosphere which at least close to its lower boundary is characterized by an extreme dearth of CO₂ photolysis, that is, CO and O₂.²⁷⁹

Eric Burgess asks: “The big question is why the carbon dioxide atmosphere of Venus should be so stable. It was expected that ultraviolet radiation from the Sun would convert carbon dioxide into carbon monoxide and oxygen. Once formed, carbon monoxide and oxygen should not combine again easily.”²⁸⁰

John S. Lewis and Ronald G. Prinn point out that because of this process:

“We might expect a pure CO₂ atmosphere to evolve slowly into a predominantly CO – O₂ atmosphere. The time required is roughly given by dividing the total amount of CO₂ on Venus . . . by the CO₂ column photodissociation rate . . . and is about 5 x 10⁶ years [50 million years] . . . This striking problem has long been known.”²⁸¹

That is, the middle atmosphere of Venus should have lost all its carbon dioxide in a few thousand years. But it has not! Furthermore, the entire atmosphere of Venus should have been changed from one dominated by carbon dioxide to one dominated by carbon monoxide and oxygen in 50 million years! That is, if Venus is billions of years old, its atmosphere would be primarily composed of carbon monoxide and oxygen. But the evidence clearly indicates its atmosphere is only as U. Von Zahn, et al. tells, only a “few thousand years” old. There is, however, a way to get around this problem, and that is to claim that Venus, a few thousand years ago, experienced an immense volcanic catastrophe, that not only flooded the surface with lava, but emitted immense amounts of internal carbon dioxide into its atmosphere. That, of course, would make the crater count chronology invalid so it was not taken as probable. It would also show that Velikovsky could be right in that Venus was completely molten only thousands of years ago. In fact, Yu A. Surkov, to explain the carbon dioxide levels in Venus’ atmosphere suggested exactly this: “The large quantity of carbon dioxide in the atmosphere of Venus indicates that extrusion of magmatic rock onto the surface [that added carbon dioxide to the atmosphere] took place relatively recently or is even now continuing.”²⁸²

There have been various attempts to find a chemical reaction or set of reactions that can take place at the temperatures and pressures found in Venus’ atmosphere to reconvert oxygen and carbon monoxide back to carbon dioxide. However, F. W. Taylor claims that this is not known: “Some process, as yet not clearly identified [may be responsible].”²⁸³ There is no set of chemical reactions that have been identified to salvage the theory that Venus’ carbon dioxide

atmosphere is older than a “few thousand years.” That is, the science of chemistry as opposed to solar system stability models based on mathematics shows Venus’ atmosphere must be about a “few thousand years,” a là Velikovsky!

One of Velikovsky’s predictions, that Venus would have a great deal of hydrocarbons in its atmosphere, has however, not been verified. However, one of the products of burning hydrocarbons is, in fact, the formation of carbon dioxide. After thousands of years of burning these materials, Venus, contrary to Velikovsky, would have very little in the way of hydrocarbons. But, on the other hand, burning would also generate enormous amounts of carbon dioxide. This ties in with the facts presented above that Venus’ carbon dioxide age is only a few thousand years. I will address the concept that Venus was burning recently in my discussion of “Ashen Light.”

VENUS’ SULFURIC ACID AGE AND THOSE OF OTHER ACIDS IN IT

As with carbon dioxide, sulfuric acid is also broken down by ultraviolet rays. Therefore, in a rather short time, the Venusian atmosphere should be relatively free of this acid if the scientific establishment is correct. In terms of Velikovsky’s thesis, since Venus is a newborn planet, this acid will not have been removed and should still be found in the planet’s atmosphere. Larry Esposito, *et al.*, give the explanation for the evidence of sulfuric acid in Venus’ atmosphere with which most planetologists agree:

“The results of Hansen and Arking (1971) and Hansen and Hovenier (1974) show the cloud particles to be spherical with radius [of about] \( \ldots \) µm [millionth of a meter] and narrowed the allowable range of real refractive index to \( \ldots \) [about] 1.45. With these new constants, Sill (1972) and Young and Young (1973) independently proposed that the Venus clouds were composed of droplets of concentrated (\( \ldots \) [about] 75% by weight) sulfuric acid).”

Although this does not explain the yellowish tint of the clouds, there is a broad consensus within the scientific community that sulfuric acid is a major component of the Venusian clouds. Nevertheless, Peter R. Ballinger, a researcher in organic chemistry, had this to say about the possibility of sulfuric acid surviving in Venus’ clouds from ancient geological periods, as was presented by Lewis M. Greenberg:

“It is likely that sulfuric acid would be gradually decomposed by solar radiation of ultraviolet and shorter wavelengths \( \ldots \) to give [off] hydrogen and oxygen. This process would also be expected to result in the preferential retention of deuterium . . . Because of this and other chemical reactions, sulfuric acid might well have a relatively short lifetime consistent with a recent installation of the planet [Venus] in its present orbit.”

Naturally, because of the implications of this possibility that Venus was recently installed in its present orbit as a newborn planet, establishment scientists have disregarded Ballinger, and have created processes to reunite these constituents back into sulfuric acid. Nevertheless, Andrew T. Young admits that:

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“None of the currently popular interpretations of cloud phenomenon on Venus is consistent with all the data. Either a considerable fraction of the observable evidence is faulty or has been misinterpreted, or the clouds of Venus are much more complex than the current simplistic models . . . A sound understand of the clouds appears to be several years in the future.”

If indeed the clouds of Venus are composed of sulfuric acid, then Ballinger’s analysis stands and Venus is a newborn planet, contrary to Laskar’s concept of 20 million year stability equations. However, there is another problem for any other acids surviving for billions of years in Venus’ atmosphere and interacting with the surface rock. Rock neutralizes acids. Let us recall that acids erode the surface and continually expose new rock that will act to neutralize any acids. In this respect, Ronald Greeley and Raymond M. Batson report. If water has not modified the surface of Venus, does erosion occur? “Photographs taken by Venera and Magellan suggest that some weathering and erosion does take place. The dense, hot, acid-rich atmosphere is very corrosive, so rocks are sure to be altered chemically. Sediments and other fine-grained material, at least partly weathered from rocks, are seen in all four of the landing sites where Venera spacecraft took pictures.”

Therefore, acids in the lower atmosphere of Venus will come into contact with continually fresh strewn rocks and be neutralized by them. How long will those reactions take to remove the Venusian acids? Young and Young show “Such strong acids would not survive for long in the Earth’s atmosphere; they would react with rocks and other materials and soon be neutralized.” Young and Young go on to say:

“Among the more exotic materials proposed for the clouds, only one has been detected spectroscopically. It is hydrogen chloride and it was found along with hydrogen fluoride by William S. Benedict of the University of Maryland in the spectra reported by the Connesses. Both gases are highly corrosive. When they are dissolved in water they yield hydrochloric and hydrofluoric acid. Their abundance is too low for them to be in the clouds, but that they should be present in the atmosphere at all is a surprise.”

These acids would have been neutralized billions of years ago if Venus was an ancient planet. Because these acids have not been neutralized, it indicates Venus is a newborn planet, just as Velikovsky claimed. To get around this problem, a chemical Rube Goldberg process has been envisaged whereby the acids are not only neutralized as they react with the rocks and become part of them, but then the high Venusian temperature cooks these gases out of the rocks such that they become the gases they previously were. Young and Young fully admit the process is based on assumptions. “A number of assumptions are implicit in this hypothesis: [1] that the rates of chemical reaction at the surface are high, [2] that the atmosphere and surface are in chemical equilibrium, and [3] that the effects of circulation in the atmosphere are small enough to be neglected.” When one has three assumed processes supposedly operating all three assumptions must be absolutely correct not only for the present, but for billions of years in the past, something either extraordinary or impossible.

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289 Ibid. (Emphasis added)
290 Ibid.
Sulfuric acid in the upper atmosphere will be photodisassociated by ultraviolet rays and disappear in a relatively short time. Hydrochloric and hydrofluoric acids will be neutralized by surface rocks and disappear in relatively short time. This evidence, once again, points to the newborn nature of Venus’ atmosphere.

VENUS’ NEON KRYPTON AGE

If Venus was formed at the same time as the Earth, it would have experienced a fairly similar development. It would have inherited certain primordial gases, especially neon and krypton – noble gases – that do not interact with other gases. They are stable, in that respect, and remain inert throughout the history of the planet. These are light gases and can be easily removed from a hot atmosphere by the solar wind. The closer a planet is to the sun, the stronger the solar wind becomes. This is especially important in the early period of the Sun’s evolution when it goes through a hot T Tauri stage and blows away light gases from a planet’s atmosphere. Therefore, Venus, if it was born at the same time as the Earth, would have much smaller amounts of neon and krypton than the Earth, but just the opposite situation exists; Venus has more of these primordial gases than the Earth, something that is impossible to explain if Venus was the same age as Earth. John and Walter Gould specifically state:

“Pioneer Venus showed that the atmosphere as a whole consists of about 98% carbon dioxide, 1-3% nitrogen with a few parts per million . . . of helium, neon, krypton and argon. Although the amounts of neon, krypton, and argon are small they indicate very much greater amounts of primordial neon, krypton, and argon than those found in the Earth’s atmosphere. This is currently raising problems concerning the established view of the origin of the solar system.”

Anthony Feldman further informs us in this general context:

“A recent discovery about the composition of the Venusian atmosphere has cast doubt on the popular theory accounting for the formation of the solar system. The theory suggests that the Sun and planets formed at the same time [4.6 billion years ago].

“The inner planets – Mercury, Venus, Earth and Mars – are thought to be small because the Sun drew their lighter constituents away. If this idea is correct, the closer a planet is to the Sun, the less likely there is to be lighter gases in its atmosphere. But in the atmosphere of Venus, the opposite is true. In particular, there seems to be 500 times as much argon gas and 2,700 times as much neon as in the atmosphere of Earth.

“So far, scientists cannot explain why these gases were not drawn away from the planet during the birth of the solar system . . . Further discoveries about Venus may soon force a revision of the most basic ideas about how the Sun and planets formed.”

In terms of their noble gases – neon, krypton and argon, Venus is unique. While a stable solar system, wherein if Venus was born in its present orbit, it should have less of these gases than the Earth.

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gases than the Earth. It has 2,700 times as much neon and krypton exhibits a similar tendency. There is no explanation in terms of a stable solar system that accounts for the ratios of these noble gases. But as a newborn planet, this decidedly fits Velikovsky’s thesis.

**VENUS’ WATER AGE**

Based on solar system stability, planets born in the same region or in a close enough distance to the sun, such as the Earth and Venus, should have been endowed with similar materials, especially water. Therefore, if Venus is an ancient 4.6 billion year old planet, it would have been endowed with just about the same amount of water as the Earth. But, in terms of Velikovsky’s theory, Venus, in an incandescent state, would have burned off or lost its water to space only a few thousand years ago. It would take many millions of years for volcanism to then emit subsurface water to create oceans on Venus. Velikovsky’s theory demands a dry Venus, the scientific establishment a wet Venus. If Venus had an ocean, where has it gone? This is a refrain that echoes through the literature. Young and Young tell us that:

“If one assumes that Venus once had as much water as the Earth has now, it is necessary to explain how all but one part per million of it was lost. There is a known mechanism by which a planet with abundant water could lose a large portion of it: water vapor in the upper atmosphere could be photodisassociated by ultraviolet radiation and the hydrogen [the lightest element] could be lost to space, either by thermal escape or through the influence of the solar wind. That effect, however could not produce an atmosphere so thoroughly dessicated as that of Venus. Of the water Venus has today, very little reaches the upper atmosphere and, therefore, it is not dissociated. At the present rate Venus would not have lost a significant amount [of water] in the [entire] history of the solar system.”

Even if Venus had lost its earliest water to space, volcanism that supposedly whipped away the craters would continue to emit water from its interior. The scientists claimed above that 300 million to one billion years ago Venus had immense volcanism that literally covered the Venusian surface with lava. The volcanism should have released immense amounts of water vapor into its atmosphere. Thus, the established solar system stability model, upon which Venus is said to be ancient, is contradicted by this dearth of water. William K. Hartmann explains:

“The H₂O is too heavy to escape thermally in the lifetime of the solar system. Thermal escape of H [hydrogen], produced by photodissociation of H₂O was thought to have caused the loss of H₂O from Venus. However, Pioneer discovered the [cold] 285-K exosphere [the top of Venus’ atmosphere from which atoms can escape] and calculations show that the H escape time from such an exosphere is 20 Gy [20 billion years]. So how could it and, hence, H₂O have been depleted? If the exosphere had once been heated to 1,000 K or so, the H escape time could be brought down to a tiny fraction of the age of the solar system. In any case, Pioneer

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scientist concluded, ‘If Venus ever possessed a large amount of water, it cannot have lost it by escape mechanism known to be operating now.’

Hartmann has concluded that Venus would have to have had a much higher temperature to expand its atmosphere so that hydrogen and oxygen could escape into space. But he cannot see that this clearly would fit Velikovsky’s hypothesis that Venus was recently an incandescent body and, therefore, would have lost these elements at the top of its atmosphere by a “tiny fraction of the age of the solar system.”

J. Kelly Beatty provocatively wonders, just as with Mars:

“Where has all of Venus’ water gone? Theorists have asked this question for years. It doesn’t make sense to them that a planet so like Earth in size and distance from the Sun should have 10,000 to 100,000 times less water. After all, the pair have comparable amounts of carbon dioxide and nitrogen, so the water was there at the outset, but has somehow disappeared over geologic time!”

Again, the foundations upon which Venus, as an ancient planet, are formulated by the scientific community have failed utterly while Velikovsky’s theory is well supported by this evidence that jumps together.

**VENUS’ OXYGEN AGE**

As a newborn planet, the Earth had practically no oxygen. Kirk R. Johnson and Richard K. Stucky admit: “. . . Earth’s early atmosphere contained very little oxygen.”

Therefore, if the scientific establishment is correct and ultraviolet radiation has been photodissociating carbon dioxide into carbon and oxygen and sulfur dioxide into sulfur and oxygen, and water into hydrogen and oxygen for billions of years, then Venus’ atmosphere should contain vast amounts of molecular oxygen, $O_2$. If Velikovsky is right and Venus was born about 10,000 years ago or somewhat less, it should have very little oxygen or almost none, because ultraviolet radiation has had so little time to photodissociate these gases: oxygen is a relatively heavy atom and it is difficult for so large an atom to escape to space or be driven off by the solar wind from a planet as massive as Venus. Burgess describes the problem thus: “Oxygen is also important to the question of what happened to the water. If water molecules [from a Venusian ocean] were broken down into hydrogen and oxygen, the disappearance of the oxygen has to be explained, since very little of this gas is present in the [Venus] atmosphere today. No completely satisfactory explanation is yet available for what happened to the oxygen.”

Billy P. Glass discusses the possibility that the oxygen would have combined with surface rock from oxides, as erosion wore away the surface. “Where is the oxygen? Pioneer Venus probes only detected ~ 70 ppm [parts per million] oxygen in the lower atmosphere. Some oxygen may have been used to oxidize the surface rocks; but to remove enough oxygen to account for a vanished ‘ocean’ of water would require that the outer several kilometers of rock be oxidized. This

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299 Burgess, *Venus an Errant Twin*, op. cit., p. 133.
would require an extremely geologically active planet.” Barrie William Jones adds to this analysis, that on Venus, oxygen:

“... would not escape to space in appreciable quantities and so [must] combine with surface materials which provide the only repository. However, it is difficult to believe that sufficient quantities of suitable substance could have appeared at the... surface to mop up anywhere near the amount of oxygen.

Indeed, chemical evidence from the surface – bearing gases in the lower atmosphere of Venus can be shown to indicate that the surface rocks do not contain the maximum amount of oxygen possible [to remove residual oxygen].”

The amount of new exposed rock that removed oxygen according to Glass was “several kilometers.” However, J. Kelly Beatty tells us that “remnant oxygen combined to a depth of perhaps 450 km [280 miles].” These depth of rock turnover on Venus are simply mind boggling.

The final solution was to have all the free oxygen unite with the carbon monoxide to create the vast amount of carbon dioxide in Venus’ atmosphere. But Beatty reports that Thomas Donahue admits this would take a “stochastic miracle.” That oxygen would almost exactly be equal to carbon monoxide requires a “stochastic miracle,” is a probability that is so large that it is considered impossible. The other problem neglected by this analysis is that carbon dioxide is once broken down to carbon monoxide and oxygen does not easily recombine, as shown above. None of the theories constructed to explain the dearth of oxygen in Venus’ atmosphere have any possibility of working.

The fact of the matter is that so little oxygen in Venus’ atmosphere means it is a newborn planet. In fact, in 1940, when spectroscopic analysis of Venus’ cloud cover failed to reveal oxygen but instead had immense amounts of carbon dioxide, Sir Harold Spencer Jones was driven to admit this possibility: “Venus, then appears to be a world where life [dependent on oxygen] has not yet developed... It is a world where conditions are not greatly different from those on the [early] Earth many hundreds of millions of years ago.” At that time, it was thought the Earth was a billion years old.

Related to oxygen is the question of ozone. If Venus is a newborn planet, the ultraviolet process that we described above to create oxygen would also generate ozone, O₃. That is, Venus should have a very thin ozonosphere because ultraviolet light converts O₂ to O₃ because it is so young. Accordingly, a CESA Science & Technology article titled, “Venus Express” on the Internet informs us there is a:


“Using observations of Venus performed with an instrument on ESA’s [European Space Agency’s] Venus Express [Spacecraft], scientists have detected, for the first time a tenuous layer of ozone in the planet’s atmosphere. Located at an altitude of about 100 km [62 miles], the layer is up to a thousand times less dense than the one found at the lower altitude, in Earth’s stratosphere, but both are dominated by very similar chemical reactions.”

Thus, not only does the dearth of oxygen in Venus’ atmosphere support Velikovsky’s hypothesis, but the very tiny ozonosphere does the same. At this point, it is overwhelmingly clear

302 Beatty, Sky & Telescope, op. cit., p. 139.
303 Ibid.
that the chemistry and physics of Venus’ atmosphere repeatedly says the same thing: it is brand new—the atmosphere of a planetary newborn babe. All the evidence of these atmospheric gases correlate and corroborate and are congruent with Velikovsky’s theory. If the mathematics of solar system stability is correct, why is it that every scientific evidentiary aspect of Venus’ surface and atmosphere contradict that hypothesis?

In addition, the burning of hydrocarbons in Venus’ atmosphere Velikovsky claimed “petroleum fires must be burning there.” What Velikovsky failed to realize is that over thousands of years, these blazing fires would also destroy nearly all of Venus’ oxygen. That is the burning of hydrocarbons in Venus’ atmosphere would generate immense amounts of carbon dioxide and minute amounts of oxygen. Both the carbon dioxide age and oxygen age of Venus agree with Velikovsky’s theory that Venus once had great amounts of hydrocarbons but over the ensuing thousands of years of combustion, these were destroyed to add large amounts of carbon dioxide to Venus’ atmosphere, but also deplete whatever oxygen it possessed by the same process. Critics of Velikovsky cannot and will not admit that the burning of hydrocarbons that existed in Venus’ atmosphere would, over thousands of years, create the high carbon dioxide levels and dearth of oxygen levels. And they cannot explain, as has been shown above, how Venus’ carbon dioxide has not been completely converted to produce a carbon monoxide and oxygen atmosphere. No matter which way they turn, their theories are contradicted by the gaseous content of Venus’ atmosphere. The compound gases and elemental gases of Venus all speak with one voice that that atmosphere is extraordinarily young, just as Velikovsky claimed.

VENUS’ HEAT: RUNAWAY ATMOSPHERIC GREENHOUSE EFFECT OR VELIKOVSKY’S SUBSURFACE HEAT EFFECT

The heat in Venus’ atmosphere can come from only two sources. One is the Sun, whose light falls on Venus’ clouds from above and is assumed to penetrate down to its surface. As it does so, it is converted to infrared or heat radiation. This radiation supposedly interacts with the various gases in the atmosphere and particles so that it’s escape is slowed and in so slowing, more light enters, is converted to infrared heat and raises the temperatures, and this goes on until the atmosphere’s temperature is raised to its present level. According to this established theory, this great heat has been cooking Venus’ surface for billions of years.

Velikovsky’s theory, on the other hand, posits that Venus, a newborn recently molten body, receives nearly all of its heat from below its surface, and is the reason it is hot everywhere on is surface. He predicted this in 1950. In a recent book Robert J. Schadewald, with the aid and advice of C. Leroy Ellenberger, attempted to show that others had preempted Velikovsky and also predicted Venus would be hot, so that Velikovsky could not be given priority for his prediction. In a debate at the 1974 American Association for the Advancement of Science, Carl Sagan raised this very same point turning to the work of Rupert Wildt, who predicted Venus would be almost 400 K around the normal boiling point of water. In my book, *Carl Sagan & Immanuel Velikovsky*, page 90, I was able to cite Sagan regarding this very point.

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“In 1956, a team of American radio astronomers at the U. S. Naval Research Laboratory, headed by Cornell H. Meyer, first turned a large radiotelescope toward Venus. The observations were made near inferior conjunction, the time when Venus is nearest the Earth, and when, also, we are looking almost exclusively at the dark hemisphere of the planet. *Meyer and his colleagues were astounded to find that Venus radiated, as it were, a hot object at a temperature of 300 degrees C [celsius or 600 K]. Subsequent observations at a variety of wavelengths have confirmed these observations. . . The most natural explanation of the observations is that the surface of Venus is hot – far hotter than anyone had previously imagined.**

Two points regarding this last citation are in order. The first is that Meyer did not predict Venus’ surface temperature, rather he measured it with a radio telescope and obtained a temperature value, that later radio telescoped confirmed at different wavelengths. Second, Meyer and his colleagues specifically said in 1956 is that the surface of Venus is hot – far hotter than anyone had imagined well before 1956. Ellenberger, who had evidently read this and advised Schadewald, allowed Schadewald to publish the following statement in 2008:

> “H. Spencer Jones, Astronomer Royal, wrote in 1940 the ‘Carbon-dioxide exerts a strong greenhouse effect trapping the long wave-length heat rays radiated from the surface of Venus and by preventing their escape, raising the temperature much hotter than it would otherwise be. Venus must be hotter than boiling water . . .’ Patrick Moore endorsed this opinion in his 1954 Guide to the Planet. Dr. Jean I. F. King, of the Air Force’s Cambridge Research Center . . . Venus would be several hundred degrees. These examples could be multiplied.”

Where did H. Spence Jones get this concept from? He got it directly from Rupert Wildt, who made the initial claim and which Patrick Moore also endorsed. As Steven J. Dick specifically points out:

> “By 1940, Rupert Wildt was postulating a ‘greenhouse effect’ on Venus due to the CO₂, an effect he concluded would make the surface temperature of Venus higher than 100°C, the terrestrial boiling point. Sir Harold Spencer Jones, in his influential *Life on Other Worlds*, (1940), accepted this view of a powerful ability of CO₂ to provide a greenhouse effect . . .

Thus, it is painfully clear that Sir Harold Spencer Jones got his information from Rupert Wildt, as did Patrick Moore. But this prediction by Wildt and, therefore, by Jones and Moore, is described by Meyer as being too cool because, as of 1956, he said he was “astounded” by the reading he obtained for Venus because it was “far hotter than anyone [Wildt, Jones, Moore] had previously imagined.” As for Jean I. F. King’s theoretical paper in *The Astrophysical Journal*, Vol. 24, he does theoretically derive a high temperature for the planet but he never specifies that this applies directly to Venus and the word “Venus” is not in the text. But let us be generous and accept “Venus” is the planet he was discussing; does this disprove Velikovsky’s prediction in 1950 lacks priority? The point suppressed by Ellenberger and Schadewald is that Colin Lawrence cited

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above, which was published in Velikovskian literature, said that there were two main predictions about Venus’ heat. While the “hot equatorial region [was] above the boiling point,” it was “cold [in the] polar regions, which had 10 Km [6.2 miles] thick ice caps.” In simple language, Wildt Jones and Moore claimed the equatorial region was above the boiling point of water, but that the poles of Venus were so cold that there were ice caps over it some 6 miles deep. Velikovsky never claimed the polar regions of Venus were even at the freezing point of water. Not at all; he claimed that Venus was heated from below, and hence the polar regions would also be as hot as the equator. But Ellenberger and Schadewald assiduously fail to let their readers know that cold fact!

What, then, of all the others who claimed, along with Captain Jean I. F. King, this very high temperature? Besides King, we are told “In 1956, Meyer, McCollough, and Sloanmaker deduced a [temperature for Venus’] surface of about 600K by analyzing Venus’ thermal radio-emissions.” All these figures are hot enough to melt lead and zinc, but these were all greenhouse analyses and all suffered from the identical problem that affected the work of Wildt, Jones and Moore. The greenhouse effect has greater light input at the equator and the super hot air there rises into the atmosphere, but cooled as it does so and then moves to the polar regions. This is known as Hadley cell transport. When this cold air reaches the poles, “it is freezing cold” and heavy and therefore descends cooling these polar regions. Now again, in 1983, Colin Lawrence, above, dealt with these concepts of very high temperatures à la King, Meyer, et al., and stated that Venus was “Extremely hot, cloudy, [with] molten lead and zinc puddles at the equator, [but with] seas of bromine, butyric acid and phenols at the poles.” Again, bromine becomes a liquid at 19° Fahrenheit, or 13° Fahrenheit below the freezing point of water. Again, all these others also had the polar regions in a frozen state. This, too, was in the Velikovskian literature long before Ellenberger and Schadewald criticized Velikovsky. And again, they assiduously failed to inform their readers that those who presented the highest temperature estimates or readings of radio telescopes for Venus’ heat claimed Venus’ polar regions were well below the freezing point of water! Velikovsky, of course, did just the opposite; he claimed that Venus’ surface equatorial regions were hot, the middle latitudes were hot and the polar regions were hot! No one other than Velikovsky before 1950 made this prediction! Afterward, it was found by spacecraft that the entire planet was hot. All the others except Velikovsky had Venus’ poles freezing cold!

This evidence, like all the other evidence Ellenberger and Schadewald presented, will never ever be admitted to nor ever be retracted. When people with an ax to grind, like Ellenberger and Schadewald, want to criticize Velikovsky, the evidence that actually supports him is suppressed and then manipulated to give the false/erroneous impression that Velikovsky is wrong when, in fact, that evidence actually upholds Velikovsky’s prediction about the heat of Venus. Ellenberger is again exposed for his crass duplicity and can burst over this exposure. But that will not stop him from doing this again and again and again. It isn’t clever at all, and he has not succeeded in his angry endeavors, except in his own mind, and those like poor Schadewald who fall under his influence.

To paraphrase Benjamin Disraeli, “There are three kinds of lies: lies, damned lies and Leroy Ellenberger and Robert Schadewald.”

The Velikovsky Affair simply never ends. The scientific community simply cannot own up to the obvious fact that only Velikovsky predicted, long before it became known, that “all” of Venus’ surface was hot! No part of Venus’ surface was freezing in Velikovsky’s theory, as it was with that of the scientific establishment.

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One point must be made before going on: Schadewald and Ellenberger above cited Sir Harold Spence Jones about Venus’ greenhouse effect as found in his 1940 book, *Life on Other Worlds*, but they assiduously failed to report what Jones wrote on page 170 of that book, namely, that Venus is “not greatly different from those on Earth hundreds of millions [or even billions] of years ago.” Surely they understood that the newborn Earth had almost no oxygen, but they couldn’t bring themselves to admit even this possibility.

When the planetologists discovered that Venus was hot everywhere, they changed the greenhouse effect that their mathematics and physics required the polar regions would be freezing to a “runaway greenhouse effect” to enhance their greenhouse effect. Because Venus’ atmosphere is so heavy – 90 times heavier than that of the Earth – they claimed that the materials in it were extremely good insulators of infrared heat and that this would even out the heat throughout the atmosphere from the equator to the poles. Therefore, although most of the incoming light radiation from the Sun was absorbed in the upper atmosphere and about two percent reached the surface that was sufficient they claimed, to create this runaway greenhouse mechanism. V. A. Firsoff long ago raised several fundamental problems with this concept, one of which is the following contradiction: “The sea is a perfect ‘greenhouse’ . . . none of the obscure heat fro the bottom can escape to space. But it is not boiling hot, in fact, it is not much above the freezing point.”

Murray, Malin and Greeley admit that Venus’ atmosphere is essentially a shallow sea:

> “On Venus . . . a smaller fraction of the incident solar energy penetrates the atmosphere all the way to the surface. Most of it is scattered back into space to provide the bright image that is seen through the telescope: much of the remainder is absorbed within the atmosphere. Thus Venus’ atmosphere is heated more at the top and middle than at the bottom and, in this sense, resembles more the shallow seas on Earth than its atmosphere.”

According to Glass: “The pressure at the surface [of Venus] is approximately 90 bars which is equivalent to the pressure in the ocean at 3,000 feet.” The question is, does light in the Earth’s oceans penetrate to a depth of 3,000 feet? In fact, it does and certain fish live at this depth, but amazingly they have eyes that can see at this depth because there is enough light there. According to L. I. Cohen, they have:

> “. . . bifocal vision [that] is used by a number of fish living in deep waters (about 3,000 feet). Not much light penetrates down to such depths so that the eyesight of fishes must be extra-sensitive to utilize the faint sunlight that does reach these depths.”

That is, everywhere in the ocean down to 3,000 feet sunlight penetrates and is absorbed as on Venus primarily at its upper regions. Yet, in spite of the ocean being “a perfect ‘greenhouse of this kind – . . . it is not boiling hot.” The planetologists have not attempted to explain why Venus, at its surface equivalent to a 3,000 foot shallow sea, is at a temperature of about 345 degrees Celsius, 900 degrees Fahrenheit, while the oceans and shallow inland seas on Earth, bathed in sunlight to these same depths, are all rather cold and are only warmer at their topmost layers, where most of the sunlight is absorbed. Since they are essentially undergoing the same greenhouse process, they should both be exhibiting similar temperature regimes. No scientist, so far as I know, has shown why the same mechanism – the greenhouse effect – can work so differently under the

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same or very similar conditions. This is a rather fundamental negation to the greenhouse theory. A heating greenhouse mechanism must comply with the laws of thermodynamics in both Venus’ atmosphere and the Earth’s oceans. It simply does not. Unable to accept this basic scientific understanding, scientists have been engaged in an attempt to make their runaway greenhouse appear to work. Of course, they have done this mathematically and assumed certain atmospheric processes to do this, but have failed to carry out the crucial test to resolve the issue.

To determine if the runaway greenhouse effect is the mechanism that is heating the Venusian atmosphere from above, as Velikovsky predicted, or whether the hot subsurface of the planet is the source of the heat, a probe must be drilled below the Venus surface to find the temperature gradient. If the scientific community’s greenhouse mechanism is correct, the temperature beneath the Venusian surface should cool with depth. Rock is a relatively poor conductor of heat. But if Velikovsky is right, the subsurface temperature will rise as one goes deeper. This is the crucial test by which science will determine the truth or falsity of these diametrically opposing paradigms. That most basic, simple, straight-forward test, I believe, will be put off because it will put thousands of professional scientists, and proponents of the runaway greenhouse theory into the grossly embarrassing position of finding out that they have been involved in promoting a false paradigm for most of their professional lives and their utter failure to see the contradictions to that theory that were actually right in front of them all the time will show that evidence played no role in their decision making.

Should the temperature gradient uphold Velikovsky, the scientific community has an escape mechanism to save face and still suggest Velikovsky must be wrong. The scientists can propose that Venus has undergone a massive volcanic repaving of the surface only about 10,000 or so years ago. Nevertheless, to turn to such a solution, they will then have to explain how the 900 or so impact craters on the Venusian surface got there. Should this very recent volcanic repaving concept be promulgated, the entire concept of crater-count chronology must be discarded and thus the history and chronology of the solar system’s other planets and satellites would no longer be valid. I predict, with Velikovsky, that the thermal gradient beneath Venus’ surface will be one of the greatest embarrassments to the scientific community and will be buried and hushed up like any other embarrassment to psychologically and publically avoid exposing science practitioners to the humiliation they would have to face. Remember how Velikovsky predicted the moon would exhibit a high thermal gradient – not anywhere as great of that on Venus, and how the scientific community hushed up this discovery nor ever admit that Velikovsky was right. Therefore, let us examine the elements of the greenhouse model to see if these conform to an atmosphere heating mechanism or with Velikovsky’s hot planet model.

**HOW THE GREENHOUSE IS SUPPOSED TO WORK**

David Morrison and Tobias Owen explain the mechanism by which it is accepted that Venus maintains a surface temperature of 435°C / 900°F:

“Why is Venus hot? The answer comes from a phenomenon known as the greenhouse effect . . . In a typical greenhouse the glass in the roof allows visible sunlight to enter and be absorbed by the plants and soil within. These objects heat up and radiate at infrared wavelengths just like the Earth, itself. The glass of a greenhouse is largely opaque to infrared radiation [and blocks its escape from the structure]. It acts as a color filter, letting short wavelengths [in] through [the glass]
but limiting thermal radiation [out]. Since most of the heat cannot escape the interior of the greenhouse, it warms the glass to balance the energy coming in. A similar effect occurs in a car left out in the sun on a hot day [with its windows shut].

“The gases in a planet’s atmosphere can play the same role as the glass in a greenhouse if they have the same property of transparency to visible light and opacity to infrared.”

However, the greenhouse model, even with the gases, particles and hazes, that are supposed to block the escape of heat, does not stop heat escape as efficiently as glass in a greenhouse. Here, Chapman explains the embarrassing problem:

“It was recently pointed out to embarrassed meteorologists, who have debated the relevance of their greenhouse calculations, that this effect may not be important for green houses. Outside ground warmed by the Sun heats adjacent air, which then floats upward to where the barometric pressure is less. The [hot] air parcel [at the surface] expands, cools and settles into equilibrium. Meanwhile, at the ground the warmer air is replaced by cooler parcels from above. This process . . . warms upper regions and keeps the air near the ground from getting too hot. Air on Earth begins to convect whenever the temperature begins to drop with altitude more quickly that about 6½ degrees C per kilometer [of altitude]. So except in an inversion, when the upper air is relatively warm [er than the layers below it] convection maintains the 6½ degrees C per kilometer profile, which is why mountain tops are cool. The real reason it is warmer inside than outside a greenhouse is mainly that the glass walls and roof keeps the air inside from floating away by convection . . . There is no lid on Venus and the dense carbon dioxide is free to convect.”

That is, the heat will rise more rapidly on Venus and cool it as it rises. Ralph E. Juergens cited Frank D. Drake in a review, “Radio Emissions from Planets,” in Physics Today, (April 1961), who raised the question of how strongly the Venusian atmosphere convects heat from the surface to the upper regions above it. His concept was based on the concept that radioactive materials in the crust were the source of Venus’ heat, unlike Velikovsky, who claimed volcanism is the source of that heat. “Sources of [atomic radiation as] internal heating will not produce an enhanced surface temperature simply because the conductivity of the atmosphere itself is very high compared with conductivity we can imagine for the outer portions of the planetary body, and would carry away heat conducted to the surface to quickly to allow significant rise in temperature.”

Juergens goes on:

“This is not to say that two kinds of heat are at issue. The point is that in Velikovsky’s view, Venus is a heat reservoir that was filled with heat, so to speak, only a few thousand years ago. Presumably, this heat is continuously conducted to the surface from below, and from there it is conducted into the atmosphere and ultimately dissipated into the interplanetary medium. But the process has been going on for so short a time . . .”

The germane point Drake made is that the Venusian atmosphere will conduct and carry away surface heat upward “too quickly to allow significant rise in surface temperature.” In terms of the glass structure concept, the very same argument arises. Without a wall around and over the

318 Ibid.
atmosphere to stop heat flow, Venus’ atmosphere will conduct its heat into space long before its surface became hot enough to melt lead. But in terms of Velikovsky’s theory, the heat source below the surface is molten magma, even hotter than the surface. That is why a temperature probe is so crucial to resolving this question.

In this respect, Venus is somewhat like Io, which also derives its surface heat from its interior, as shown by Robert Wayne Decker and Barbara Decker: “It is clear that Io generates and releases an extraordinary amount of internal heat – about 1.0 to 1.5 watts per square meter, some 30 times the internal heat flow from Earth.”

The temperature of Io’s surface in the near vacuum of space surrounding it is hot. It has no atmosphere to hold that heat, Venus has an atmosphere into which that heat is emitted.

ASHEN LIGHT AND VELIKOVSKY

One major aspect of Velikovsky’s hypothesis is that Venus was an incandescent body thousands of years ago, an immense body of incandescent gases. His theory suggests that these reactive chemical fires early on were so bright that ancient man saw Venus as being brighter than the Sun. However, over thousands of years, these chemical agents not only dissipated but that the brilliance of its earlier stages would begin to dim. He cited ancient peoples who described Venus as being far brighter than it is today, and listed several of these ancient cultures who wrote about this:

“It is . . . said in the Vedas that the star Venus looks like fire with smoke . . .
In the Talmud, in the Tractate Shabbat: ‘Fire is hanging down from the planet Venus’ . . .
“It is therefore not strange that the Chaldeans described it as a ‘bright torch of heaven,’ also as a ‘diamond that illuminates like the Sun’ and compares its light with the light of the rising sun. ‘A stupendous prodigy in the sky, ‘the Chaldeans called it.
“The Hebrews similarly described the planet: ‘The brilliant light of Venus, blazes from one end of the cosmos to the other.’
“The Chinese astronomical text from Souchow refers to the past when ‘Venus was visible in full daylight and, while moving across the sky, rivaled the sun in brightness.
“ . . . Assurbanipal wrote about Venus (Ishtar) ‘who is clothed with fire and bear aloft a crown of awful splendor.’ The Egyptians under Seti thus described Venus (Sekhmet) ‘A circling star which scatters its flames in fire . . . a flame of fire in her tempest.”

No other planet in the solar system is described as bright, other than the Sun. Jupiter, an extremely bright planet, as observed from Earth, is never described in this way by ancient peoples. The question is: were all these ancient cultures collaborating to report the same lie over

and over only about Venus and no other planet? That is, Venus was once a stupendously brilliant object, even in ancient historical times – in terms of the short chronology outlined in the three volumes of Pillars of the Past – long after its interactions with the Earth. Therefore, over time, that brilliance would have faded gradually as Venus cooled and its chemical and hydrocarbon fires began to dissipate. Therefore, as these processes went on, the ability of seeing these hydrocarbon fires/chemical reactions would become more and more difficult to observe. Today, its fires would be seen toward the bottom of the atmosphere as a strong glow by spacecraft that descended to Venus’ surface. Lewis M. Greenberg reported on this phenomena citing Popular Science, (April 1979), page 67:

“When four Venus probes plunged toward the planet’s surface – two in daylight and two in darkness . . .

“One instrument carried aboard each probe was a nephelometer designed to detect clouds by monitoring variations in light. Within each nephelometer was a sensitive radiometer that reacted to ever smaller changes in outside light. Those radiometers showed only gloom around the two probes dropping through darkness – until the temperature sensors failed.

“At almost exactly that instance, the radiometers detected a faint glow in the atmosphere. The glow grew brighter and brighter as the space probes left the cloud over above them.”

321 Lewis M. Greenberg, KRONOS, Vol. IV, No. 4 (Summer 1979), p. 9. (Emphasis added)

322 Kopal, Realm of the Terrestrial Planets, op. cit., p. 184.


324 Burgess, Venus, an Errant Twin, op. cit., p. 95.

The clouds exhibited only gloom and dim light, as the spacecraft dropped through “darkness.” The light glow that grew “better and brighter” was not from the light of the Sun but from some kind of surface luminescence. When one moves closer to a light source, it naturally becomes brighter. These Venus vehicles were moving away from the Sun through clouds and, thus, that light observed at the surface was not sunlight but the source of light at the lower Venusian atmosphere and surface. Kopal informs us that if Venus’ surface illumination is derived from sunlight “with increasing attitude the visibility [illumination] should improve.” What is most important is that two of the descending craft were dropping to the surface on the right side of the planet where there was clearly no sunlight. Yet Glass states: “The two Pioneer Venus probes that descended on the right side of the planet detected a faint steady glow beginning about 12 – 15 Km [7.5 – 9.5 miles] altitude that increased in intensity near the surface.”

Since that light observed on Venus’ night side could not have been sunlight, any glow on the day side was the same phenomena. Burgess suggests, “Data from mass spectrometers provided evidence for there being various sulfur compounds near the surface. This could imply that the mysterious glow came from ‘chemical fires’ on the surface of in the very hot, dense lower atmosphere near the surface.” In terms of the concept that Venus is billions of years old, it is basically impossible to have chemical fires raging there for eons; as Shane Mage long ago pointed out:

“The most striking disclosure by Prof. Donahue, however, is his statement that ‘as we approach the planet from a distance of about ten miles above the night-side, a faint glow was detected that got brighter and brighter until the probes touched down. That glow, I think, is almost literally the surface and some of the gases in the atmosphere on fire: CHEMICAL REACTIONS THAT PRODUCE
LIGHT, I think are occurring in that high temperature environment where many reactive gases were found by our mass spectrometer.'

“This picture of a ‘chemical soup’ containing ‘many reactive gases’ and ‘almost literally on fire’ supports the [Velikovsky] thesis of an extremely young Venus. If its atmosphere were many millions of years old, reactive gases would have been consumed aeons ago. Only as a newborn planet could Venus be expected to have an atmosphere still on fire.”

That is, in addition to all the other gases in Venus’ atmosphere that are those of a newborn planet, we also have chemical fires still blazing in the lower Venusian atmosphere and surface that should have extinguished themselves billions of years ago. In chemistry, reactions can only go on so long as there are materials to keep those reactions going. If Venus was billions of years old, these reactions would have been used up at its earliest development. Some may argue that Venus has too little oxygen available for these fires to burn, but this has long been known to simply be false. William Thomas Brande, as long ago as 1863, wrote:

“All ordinary cases of combustion are dependent on the combination between two or more bodies, during which sensible light and heat are evolved . . . Lavoisier believed oxygen was the universal supporter of combustion, and that there was no combustion without it. In this, however, he was in error. The phenomena of combustion are seen in some of the combinations of chlorine, bromine and sulfur with bodies . . . with regard to sulfur; if this substance is heated in a Florence flask to its vaporizing point, it forms a dark amber-colored vapor, in which thin pieces of copper foil or cuttings of copper glow and burn with great splendor producing sulphide of copper . . . These experiments . . . clearly show that oxygen is not in all cases necessary to combustion; and that the phenomena which attend it, cannot be regarded as dependent upon any peculiar principle or form of matter; they must be considered as a general result of intense chemical union.”

Greenberg adds this stunning comment: “‘I think we were looking at the fires of hell.’ Dr. Donahue ventured, ‘Whatever was there probably happens all over the planet.’” The reason that this phenomena is important is that it relates directly to the recent history of Venus as delineated by Velikovsky. Many other astronomers have reported that during telescopic observations of the dark side of Venus, they could actually see these fires that have come to be called “ashen light.” But modern planetologists have failed to connect the fires below Venus’ cloud bank with the fires of hell still raging there. Instead, they have suggested other mechanisms that could cause the dark side of Venus to glow strongly enough to be seen from Earth.

One such mechanism suggested is that oxygen atoms, when they reunite with carbon monoxide to form carbon dioxide, emit a greenish colored light. However, Michael Borgia explains, “The problem with using this as a source of the ashen light is that molecular oxygen emissions are very weak and likely undetectable with amateur telescopes, especially in such close quarters with the -4 magnitude crescent Venus.” Another theory holds that the glow is caused by “lightning flashes.” According to Borgia:

“If this is so, and if they occur in sufficient quantities, then it may excite Venus’ upper atmosphere to glow. But many scientists think this unlikely, as well. In 1998

326 William Thomas Brande, Chemistry, (Philadelphia, PA 1863), pp. 91-92
327 Greenberg, KRONOS, loc. cit.
and 1999 the Cassini spacecraft made two close flybys . . . just a few hundred miles above the cloud tops of Venus each time. If lightning strikes were common in the Venusian atmosphere, it would have created disturbances in the spacecrafts’ low-frequency radio transmissions, much the same as lightning on Earth distorts AM radio [transmissions]. No such distortions were heard.”

Others have suggested the ashen light is similar to the auroras observed above the Earth’s polar regions. But to do this, Venus must have a strong magnetic field which, thus far, has not been detected. Another concept is that the high surface temperature makes the rocks glow red and that this is responsible for the ashen glow to be seen when there are openings in the cloud cover. G. Seth Shostak reports, “even during the two-month long Venusian night, the landscape remains faintly illuminated by the eerie red glow of hot rock.” Nevertheless, this glow is apparently too faint to produce an ashen glow seen from Earth. “The rocks on Venus may glow faintly red from their own heat.” But Donahue claimed from the first that the clouds were illuminated by chemically reacting agents. Ron Williams tentatively offers, “Could there be some sort of chemical reaction in its strange atmosphere that is causing the [ashen] glow?” All these theories to escape the concept that chemical fires cause Venus’ ashen glow are being put forth because the scientists very well understand that such fires cannot last for millions of years because the chemicals for it would be used up. This undeniably indicates that, if this is the case, Venus is a newborn planet.

It was, however, in more modern times, that the ashen glow was observed, and then only with telescopes. Starting with Riccoli, in the 17th century and others, began to observe this phenomenon. After listing many early astronomers, Garry E. Hunt and Patrick Moore report:

“On 25 September and 6 November 1871, A. Winneke . . . reported the whole disk ‘the dark side bathed in a pale grayish light; quite distinct and free from suspicion of illusion.’

“After 1890 or thereabouts it seems that the Ashen Light has been glimpsed by almost every serious observer of Venus . . . Normally the Light is seen only when Venus is a thin crescent [and the rest of the planet is in darkness]. In June 1895, Leo Brenner . . . claimed to have seen during the [3/4] gibbous phase. However, the Light was again reported at a greater phase . . . On one occasion in 1927, C. S. Saxton saw the whole disk “not as a ring [around Venus’ edge] but as a very faint whiteness or mistiness against the blue sky.”

They go on to admit: “Genuine or not, the Ashen Light has been seen so frequently that it has to be explained in some fashion.” Unable to produce a theory to account for this ashen light, the concept of chemical fires suggests Venus is a new planet. Many modern astronomers have sought to say, as with Galileo’s discovery of the four moons circling Jupiter, that this cannot be real. “Coming onto modern times, there are various authorities who regard the Light as being due to nothing more than an [optical] contrast effect.” The scientists cannot and will not

329 Ibid.
334 Ibid.
335 Ibid., p. 91.
seriously consider this option. Moore’s distaste for Velikovsky goes so far as to suggest Venus’ “Ashen Light has been put down to atomic bombs on the surface of Venus. Still, even this is a sensible theory compared with those of Dr. Immanuel Velikovsky.” Here one can see the scotoma / blind spot in Moore’s mind regarding ashen light. Richard M. Baum, in a review article, nicely summarizes the ashen light:

“So with what are we faced? A fabulous fiction or hard reality? History dictates caution when dealing with phenomena at or near the limit of visibility . . . But even if the evidence is circumstantial, there is a quality about it that leaves us with intimations as yet to be recognized: the sense of a riddle wrapped in an enigma.”

The simple chemical fact that such fires are dependent on a dwindling resource of gases will not always burn with the same intensity, and as they dwindle, even go out for periods of time as Venus ages, has not been considered. Donahue’s contention that these are chemical conflagrations only fits Velikovsky’s hypothesis. At certain times, chemical gases are emitted or come together and flare up, and not at others. Baun concludes his review thus:

“What then are we to make of this phenomenon? How do we explain the considerable ambiguity of filter observations [now necessary to observe this light]? . . . Why is it visible to one observer, but not another, yet simultaneously seen by independent observers many kilometers apart? It is reported then lost, reappears only to vanish again. It is a haunted and haunting phenomenon . . . elusive and illusive . . . perhaps a vestige of truth invests the story of ashen light.”

The ancient observers of the skies documented the description of Venus, bright as the Sun, and its light diminishing over the centuries, are all in alignment with Velikovsky’s newborn planet, blazing with chemical fires. As its gases became extinguished the ashen light has become more and more difficult to observe, now requiring some kind of filter to see it. No other theory correlates with the ancient historical / astronomical records and with the science of the ages of the gases, as does Velikovsky’s theory. In time, that glow in the lower atmosphere of Venus will be reexamined and shown to be diminishing in brightness. This will be the confirmation and validation of Velikovsky’s paradigm. All the other theories are atomic bombs exploding the scientists’ explanations of this Venusian ashen light.

THE GLASS CEILING

Assuming, and in reality only assuming sufficient radiation reaches the Venusian surface, one still requires certain gases, hazes, etc., in sufficient amounts to allow visible sunlight to enter the atmosphere and penetrate to the surface but most importantly to act as the glass panes of a greenhouse to block heat escaping from the surface that rapidly enter and dissipate into outer space. Although carbon dioxide is in great abundance, by itself it will not produce the opacity necessary to generate a runaway greenhouse. Jones points out:

“Efficient trapping cannot be produced by CO₂ alone, in spite of the enormous mass of CO₂ in the Venusian atmosphere. This is because CO₂ is fairly transparent

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338 *Ibid.*, p. 329,
over certain wavelength ranges to planetary wavelengths. Radiation could escape through these ‘windows’ in sufficient quantities to greatly reduce the greenhouse effect below that which [now] exists . . . [Additional] . . . windows [can be closed to do this] by SO\textsubscript{2} [sulfur dioxide] and H\textsubscript{2}O, and by clouds [gases and hazes that] greatly increase the greenhouse effect.\textsuperscript{339}

The contribution of each of these materials to close the glass ceiling over Venus is outlined by Hunt and Moore:

“CO\textsubscript{2} is responsible for about 55% of the trapped heat. A further 25% is due to the presence of water vapor, while SO\textsubscript{2} . . . traps 5% of the remaining infrared radiation. The remaining 15% is due to clouds and hazes which surround the planet.”\textsuperscript{340}

Sulfur dioxide and the clouds and hazes that close 20% of the escaping infrared radiation are not known to remain the same, but vary from to level to level quite greatly. According to Larry W. Esposito:

“Pioneer Venus has continued to monitor these [haze and sulfur dioxide] constituents above the clouds. Over the years a remarkable discovery has emerged. Both the sulfur dioxide and haze have been gradually disappearing. By now, only about 10% of the 1975 amount remains. This disappearance has also been confirmed by the Earth-orbiting International Explorer between 1979 – 1987, and by other Earth-based observations. The haze and the sulfur dioxide are now approaching their pre-1978 values. Analysis of recent Earth-based radio observatories by Paul Steffes and his colleagues shows less sulfur dioxide below the clouds than was measured by Pioneer Venus and Venera landers which is also consistent with the decrease of sulfur dioxide.\textsuperscript{341}

It is thus admitted that the components responsible for 20% of the opacity of Venus’ runaway greenhouse have declined by as much as 90% over the clouds and, to a smaller percent below the clouds. Not knowing how much smaller this gas and haze diminishes makes it highly dubious that they are doing all they are assumed to do.

What are the clouds actually composed of to then prevent infrared radiation from escaping? Unless their composition is known, this opacity is also dubious. Glass admits their chemical composition is not known. “Speculative interpretation . . . of the clouds include: water drops, ice, frozen carbon dioxide, carbon suboxide, mercury, halite, ammonium nitrate chloride, silicate, dust particles, carbonate particles, formaldehyde, hydrocarbon droplets, partially hydrated ferric chloride and hydrochloride acid.”\textsuperscript{342}

The fact is these windows are not known to be closed or opened at all. It is basically picking and choosing the materials that are supposed to be closing these windows and further assuming that the amounts of the materials are producing the effects that will make the runaway greenhouse effect do its jobs. The entire process is anything but scientifically ascertained.

The final window that closes and traps 25% of the infrared heat of Venus’ atmosphere is water vapor. But this vapor is well-known to be virtually absent. R. Cowen reports that a:

“ . . . research team focused on a greenhouse puzzle . . . the absence of water vapor above Venus’ clouds mystify scientists because models of the planet’s strong

\textsuperscript{339} Jones, \textit{The Solar System}, op. cit., pp. 138-139.
\textsuperscript{340} Hunt, Moore, \textit{The Planet Venus}, op. cit., p. 132.
\textsuperscript{341} Larry W. Esposito, “Does Venus have Active Volcanoes?” \textit{Astronomy} (July 1990), p. 45.
\textsuperscript{342} Glass, \textit{Introduction to Planetary Geology}, op. cit., p. 310.
greenhouse effect suggest that vapor plays a key role in maintaining the warming. Researchers have looked below the cloud deck and down to the surface – and their search has come up dry...

“Evidence of a dry Venus may force researchers to consider whether other chemicals could create and sustain the planet’s greenhouse effect, said David Crisp, of the Jet Propulsion Laboratory . . . who co-authored the report.”

Every gas, haze, cloud cover, water vapor window is not only problematic, these panes of glass are broken, have cracks, holes or are missing altogether. Consider a greenhouse here on Earth with panes broken, missing or cracked or having holes in them and then holding in heat to warm the building. Try to leave a car’s windows wide open and have the heat that is created not escape. In spite of these cracks, holes and missing panes of glass in their runaway greenhouse, the scientists continue to accept that their theory is not broken. Only when they find the thermal gradient beneath Venus’ surface rises will they apply more and more heat and less and less evidence maintaining a greenhouse structure that is not there nor working, as they assume it does.

**THERMAL BALANCE**

To determine if the heat from Venus is coming from above via a runaway greenhouse, or whether it is coming from beneath Venus’ surface, readings were taken in the Venus atmosphere to compare the amount of solar radiation at every level coming into the planet with the energy at that level coming out. An atmosphere that is heated almost entirely by incoming solar energy should be reflected by the outgoing energy. There should be a very close balance between these readings. But if Velikovsky was correct and the heat is coming from beneath the surface, the amount of energy going outward would be greater at all levels than the incoming solar energy. There should be large imbalances between these readings. That, as we will show yet once again, was just what was found – thermal imbalance from all the readings taken by Pioneer and Venera spacecraft. What then were the scientists to do with these direct confirmations of Velikovsky’s theory and their own? Shockingly, they changed ALL the readings to make them fit their theory.

In business this is known as double entry bookkeeping. It is dishonest and when discovered by the government, this fraudulent behavior is punished. Double bookkeeping is used to have two sets of account ledgers. In the first set, the realities of costs and profits etc. are in their proper places. In the second set of books, these numbers are changed to reflect the reality the businessman desires that show smaller profits and avoid taxes or even suggest losses when these do not exist. With regard to the thermal balance readings of Venus’ atmosphere, the scientists were so unencumbered by any consideration of being caught that they put in the readings of thermal imbalance and then changed them on the same page to fit what they were fully aware of and that they were actually culling the data. As we will see, all the readings were changed from imbalance to balance. The first set of readings by Pioneer Venus were taken at the cloud tops. F. W. Taylor, et al., state emphatically:

“CLEARLY THE PIONEER MEASUREMENTS OF EMISSION AND REFLECTION ARE NOT CONSISTENT WITH EACH OTHER IF NET RADIATIVE BALANCE APPLIES. A source [for this additional heat] inside Venus equal in magnitude to 20% of solar input [is unacceptable and therefore]

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...is very unlikely since Venus is thought [by scientists] to have an Earth-like makeup [with a relatively thick crust], which would imply internal heat sources several orders of magnitude less than this. Also, even if such sources were postulated, it is difficult [for us] to construct a [thin crustal] model in which these fairly large amounts of heat can be transported . . . to the atmosphere via a rocky crust without . . . [the crust] becoming sufficiently plastic to collapse the observed surface relief.”

These scientists first assume Venus is as ancient as the Earth and, therefore, being “Earth-like” has a thick enough crust to stop most of that internal heat from reaching the surface. Ergo, with this assumption it doesn’t. They furthermore suggest if the crust was then, the topographical relief would collapse, which it has not. The evidence they have conveniently withheld from their readers is that the Jovian satellite, Io, emits 20 times as much heat as the Earth, has an extremely thin crust, yet has some of the highest mountain elevations in the solar system, like those on Venus. Because Io is quite small, compared to Venus, if Io were made as large as Venus, these mountain ranges would be comparable to small continents. This is a form of double entry bookkeeping science. To try to convince themselves that what they have presented is not hand-waving science – Taylor, et al., go on to explain:

“This [problem] could be avoided if the transport [of interior] heat was very localized, i.e., via a relatively small number of giant volcanoes. Although large, fresh-looking volcanoes do appear to exist on Venus . . . and the composition of the atmosphere is consistent with vigorous output from these [volcanoes], a simple comparison with [Earth’s] terrestrial volcanism [but not Io’s volcanism] shows that the volcanic activity on Venus would have to be on an awesome scale to account for the missing . . . power.”

But isn’t that just what the scientists have told us, namely that the Venusian volcanic surface is brand new, as if put there yesterday? This, of course, is simply dismissed. Nevertheless, without any proof, Taylor et al., decided to make the grand assumption that there must be thermal balance in the Venusian atmosphere and say:

“A more acceptable alternative is that the preliminary . . . measurements [are] . . . a fuller analysis of the P. V. [Pioneer Venus] . . . data – still the best in terms of wavelength, spacial and phase coverage and radiometric precision, which is likely to be obtained for the foreseeable future – is likely to resolve this puzzle. IN CONCLUSION THEN, THE BEST THERMAL MEASUREMENTS OF VENUS, WITH THE ASSUMPTION OF GLOBAL ENERGY BALANCE, YIELD A VALUE . . . THIS IS THE MOST PROBABLE VALUE.”

Taylor, et al., assumed what they had not proved, was responsible for heating Venus’s atmosphere at the cloud tops, and to escape their assumption, called this “the most probably value.” They made that choice not based on scientific evidence, but on an assumption set it up as a kind of psychological reality and admitted it was their “most probably value.” This, then, became the mantra upon which all the other readings were to be hammered into place.

What, then, did the Pioneer Venus probes as they entered deeper in the atmosphere show? If Velikovsky’s thesis is correct, not only will these exhibit readings of even greater thermal


345 Ibid., p. 658.

346 Ibid. (Capitalization added)
imbalance, but because different parts of the surface are hotter than others, they would thus vary from place to place. According to M. G. Tomasko: “Among the most accurate measurements of the temperature-pressure of the lower atmosphere of Venus [are] those made by the four Pioneer Venus . . . probes . . . The probe entry locations . . . vary . . . from Day to Night [sides giving] . . . temperature profiles.”347 These being the three most acceptable measurements of the temperature-pressure of the lower atmosphere of Venus,” clearly implies one can trust them and their accuracy. Richard A. Kerr, the editor of Science, nevertheless tells us what the probes discovered:

“When Pioneer Venus probes looked at the temperature, each one found more energy being radiated up from the lower atmosphere than enters it as sunlight . . . To further complicate the situation, the size of the apparent upward flow of energy varies from place to pace by a factor of 2, which is a disturbing discovery.”348

From NASA’s publication, Pioneer Venus, we also have the following:

“The measurements of infrared fluxes [upward from Venus] show several anomalies, the origin of which is still being debated. Taken at face value, the anomalies suggest about twice the energy upward than is available from solar radiation at the same level.”349

Because these obvious contradictions to their greenhouse model were, as Kerr said, “a disturbing discovery,” something had to be done, a fix-it-up, to make these “most accurate measurements” then become “inaccurate measurements.” Ergo, double entry bookkeeping methods were invoked, and it is admitted that these fix-it-up assumptions are correct, as with the cloudtop measurements. Tomasko states:

“The thermal flux profiles are surprisingly variable from site to site, in view of the great similarity in temperature profiles of these sites. An addition [al problem] at both the Night and North probes sites [where the temperature should be smaller], they are much greater than at the globally averaged solar net profile at low altitudes, implying a substantive radiative imbalance in the lower atmosphere. In view of the large and variable nature of these flux measurements [which contradict the runaway greenhouse effect theory], the investigators have searched for [possible] instrumental problems which could have effected measurements and have found one that could have [not did] systematically increase the measured thermal net fluxes . . . [Therefore, on the probable basis of this assumed malfunction] . . . The authors BELIEVE that they understand the vertical dependence of the flux errors, and by adjusting the fluxes to reasonable values, at low altitudes, they have derived corrected fluxes [that now fit the runaway greenhouse theory].”350

Distressed by these readings, the scientists invented a whole series of denial mechanisms to make them fit their theory. First, these were the “most accurate” but they still could be altered and “could have systematically increase the measured thermal net fluxes.” All this is based on what the author[s] “believe” so these contradictory thermal heat fluxes were made to fit “by adjusting the fluxes to reasonable fluxes.” More honestly, Kerr stated that “The much
ballyhooed greenhouse effect of Venus’ carbon dioxide atmosphere can account for only part of
the heating, and heating from other mechanisms is now in turmoil.’’

The thermal imbalance readings at the cloud tops was corroborated by the Pioneer
Venus probe reading below the clouds. However, these probes all failed to operate at about 13
kilometers or 8 miles above the surface. Based on Velikovsky’s theory, those Venera landers
that did reach the surface should, therefore, show even greater measurements of radioactive
imbalance. That is exactly what they did find, according to Seiff:

“The heating rates needed to warm the atmosphere from the Day [side Pioneer
Venus] probe to that of Venera 9 integrated over altitude . . . is 45 times the midday
solar heat absorbed at 30° latitude . . . This is also true of Venera 10, 11 and 12
data relative to the large probe data for which necessary heating rates integrated
over altitude are > [somewhat less than] 40 times the mean dayside solar input.”

Taken together, the top of Venus’ atmosphere exhibits a thermal imbalance of 15 to
20%, the middle and lower atmosphere, a thermal imbalance of around 50%, while the surface, on
average, the thermal imbalance was 40 times greater than sunlight could provide. These readings
are also in complete accord with Velikovsky’s hypothesis. The tremendous rise in infrared
radiation, as one nears the surface of Venus, is similar to the heat emitted, say, by a white-hot
block of metal, in that as one puts one’s hand closer and closer to it, the heat rises to greater and
greater levels, but at a certain point close to it, the heat rises immensely.

Because these readings were complete contradictions, and the scientists finding the
evidence so repugnant to their model, they had to do something and that something was say that
the readings could not be true, and had to be related to processes that had nothing to do with
thermal balance measurements. Seiff explains how this was done:

“It is clear that the Venera 9 day probe differences cannot be deduced by solar
heating but must be ascribed to other processes or to measurement uncertainties.”

Blinded by their allegiance to the runaway greenhouse theory, all the contradictory
thermal imbalance readings were made to fit their theory by the scientific establishment based on
a number of self-serving assumptions. Nevertheless, while knowing all these facts, they flatly
stated that the evidence must have said otherwise in the NASA Pioneer Venus publication:

“One of the primary objectives of the Pioneer Venus Multiprobe mission was to
test thoroughly the belief that the ‘greenhouse effect’ is responsible for the high
surface temperature. [After describing the measured thermal imbalance reading
described above, the authors continue]:

“Possible instrumental errors in this difficult measurement may be responsible.
A possibility is that two of the probes entered regions that are unusually transparent
to thermal radiation, but this is rather unlikely because much of the absorption [of
infrared radiation] is due to ubiquitous carbon dioxide, which makes up nearly all
the atmospheric gas. The suggestion has been made that balance oscillates around
an average state and that anomalous measurements were made during [the upswing
of] the heating phase. In spite of these difficulties in interpreting some of these

351 Kerr, Science, loc. cit.
352 Tomasko, “The Thermal Balance of the Lower Atmosphere of Venus,” op. cit., p. 94, and Seiff,
353 Seiff, Thermal Structure of the Atmosphere of Venus, op. cit., p. 226. (Emphasis added)
354 Seiff, loc. cit.
observations, the greenhouse effect, coupled with global dynamics is how well-establish as the basic explanation of the high surface temperature.”

While all the readings were diametrically opposed to their theory, they claimed these readings were not proof against the runaway greenhouse theory. In spite of all this evidence just presented and being in Velikovskian literature for decades, as presented by me in Carl Sagan & Immanuel Velikovsky, (Tempe AZ 1995), pages 310-318, and on my YouTube presentation, “Charles Ginethal on Venus,” and even by having the Sagan book reviewed in Michael Shermer’s Skeptic Magazine, Vol. 4, No. 4 (1996), page 107, David Morrison, director of NASA Ames Research Center made the false claim that Velikovsky must be wrong, saying: “But there is no net excess of energy radiated from the planet [Venus] (since the thick atmosphere effectively contained the high surface temperature. The total radiated energy was in balance with absolute sunlight . . .”

David Morrison was Carl Sagan’s student and friend and is now director of the Carl Sagan Center for the Study of Life in the Universe and former Director of the NASA Lunar Science Institute. In fact, he wrote a review of my Sagan book on Amazon wherein he wrote “This book is rather sad. The non-scientist author, like his hero, Velikovsky, just doesn’t understand many of the technical issues he writes about.” But the facts pointed out above he simply failed to address. As Professor Lewis M. Greenberg long ago told me, Morrison never answered the criticism of his attacks on Velikovsky published in KRONOS, and will obviously not retract this falsehood. To paraphrase Morrison, “His criticism is rather sad and pathetic. The scientist critic, like his hero Sagan, just doesn’t understand how to face the many technical issues he writes about that disprove his argument.” Each of the authorities cited above who understand the technical issues say as for example, F. W. Taylor, et al., “Clearly the pioneer measurements of emission and reflection are not consistent with each other if net radiative balance applies.” Or Richard A Kerr, of Pioneer Venus probes: “Each one found more energy being radiated up from the lower atmosphere than enters it as sunlight,” while a NASA publication states, “Taken at face value, the anomalies suggest about twice the energy upward than is available from solar radiation at the same level.” Seiff said that the surface is about “45 times the midday solar heat absorbed.” But David Morrison, without a shred or iota of evidence, demands “The total radiated energy was in balance with absolute sunlight . . .” Take his word for it and evidence be damned when it comes to Velikovsky. No one will dare hold Morrison responsible. In the words of Will Rogers about Calvin Coolidge, “[He] didn’t say much and when he did, he didn’t say much.” Or, in the words of Thomas H. Huxley, “Every great advance in natural knowledge has involved the absolute rejection of authority [like that of Morrison].”

Michael Shermer has also written a book titled, Why People Believe Weird Things: Pseudoscience, Superstition, and Other Confusions of Our Time. He did this in order to explain how highly educated people, as well as uneducated people, can be led to believe in weird things. However, it never seems to have occurred to Shermer that, when he published David Morrison’s piece in his Encyclopedia of Pseudoscience, and failed to report that he also knew Velikovskian literature contained the citations of scientists who presented evidence that Venus’ atmosphere was not in thermal balance, he was actually encouraging people to believe weird things. M. Scott Peck,
in his book, *People of the Lie*, explains what is wrong with Morrison and Shermer’s use of false evidence as a method of combating different concepts:

“The problem is aggravated by the fact that the public is actually eager to be guided by the pronouncements of scientists . . . We are content, even anxious, to let our authorities do our thinking for us. There is a profound tendency to make our scientists ‘philosopher kings,’ whom we allow to guide us through intellectual labyrinths, when they are often just as lost as the rest of us.

“In our intellectual laziness, we forget that scientific thought is almost as faddish as taste. . . . the current opinion of the scientific establishment is only the latest and never the last word. . .”

Virginia Shabatay explicitly points out that the behavior of Shermer and Morrison, to put forth a falsehood to the public, has an inherent aspect of duplicity. In her discussion of philosopher Martin Buber she shows:

“The presence of the lie is not new. Our time and our place are no different in this regard: the Word will go astray. In the eighteenth century the Baal Shem Tov, the founder of Hasidism – the Eastern European mystical sect of Judaism – said: ‘What does it mean when people say that Truth goes all over the world? It means that Truth is driven out of one place after another, and must wander on and on’ . . .

“And so it is in our days. When I asked myself which of the words of Martin Buber I wanted to draw on for this essay, the answer came easily for our times: his call was for the absence of duplicity, without which no wholeness of the person or relationship of community is possible. Karl Wilker says of his contact with Buber: ‘The longer I knew him, not only through his works but also face to face, the more strongly I have felt that his whole personality tolerates no untruthfulness . . .”

“Dialogue is central to human affairs, but no genuine dialogue can take place where lying occurs . . . Mistrust is brought about by many conditions, but certainly lying is one source. Mistrust injures the personal, the social and the political [as well as the scientific] realm. ‘That peoples can no longer carry on authentic dialogue with one another, Buber writes, ‘is not only the most acute symptom of the pathology of our time, it is also that which urgently makes a demon of us.’”

Knowing what they were doing but indifferent and even heedless to that duplicity, I invoke the words of Joseph N. Welch, for these surely should be laid at the feet of Shermer and Morrison:

“Until this moment, Sirs, I think I never really gauged your dishonesty and recklessness . . . Little did I dream you both would be so reckless as to do injury through falsehood to . . . [science and truth]. It is, I regret to say equally true, that I fear [these] shall always bear a scar needlessly inflicted by both of you . . .

“You’ve done enough. Have you no sense of decency, Sir, at long last? Have you left no sense of decency?”

The history of the scientific proponents of the runaway greenhouse theory has been to give the theory a presumptive status precluding the scientific requirement that it must stand or fall

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on the basis of evidence. But as has been continuously demonstrated, whatever the evidence indicates plays little or no role in the status of the theory. At every level to which the theory is examined, it fails. This problematic approach to Venus has been ongoing since scientists began to investigate that planet and has not ceased. In this regard, we turn to L. G. Young’s appraisal about how data from Venus and conclusions drawn from it by scientists has been either accepted or denied and why they have clung steadfastly to their theoretical models:

“The reasons for the slow progress in understanding Venus are threefold: observational, theoretical and psychological. On the observational side, it has turned out that spectroscopic data which have an excellent signal-to-noise ratio but low spectral resolution cannot be used to distinguish uniquely different models of the Venus atmosphere. Exceedingly high resolution spectra are required, some observations have led theoreticians astray by over estimating the quality of the data. On the other hand, some theoreticians have dismissed perfectly good observations [such as Venus’ thermal imbalance] under the assumption that the data was ‘noisy’ because conditions on Venus appear to vary on a short time scale, a situation that could not occur in their models. There has been a profusion of crude, oversimplified models which have ‘explained discrepancies between theory and observation as due to effects not included in the[ir] theory. Thus there has been a tendency to claim agreement with the observations prematurely. Finally, not only have wrong interpretations of [Venus’] data been widely accepted at various times, but some correct interpretations have been rejected for long periods of time. What interpretation was ‘acceptable’ has been colored by prejudices . . . so that major questions [such as the runaway greenhouse effect] appear to have been decided more on emotional than on rational grounds.

“In the future, it would help if observers would strive to put realistic error estimates on their data; if theoreticians would state clearly the kind of accuracy of observations needed to test their models, and if everyone would adopt a more critical attitude instead of jumping to conclusions.”

Patricia Goodson presents this telling comment: “The sciences are replete with examples of . . . events when researcher – blinded as they are by their theoretical framework – become unable ‘to see’ what is ‘right’ in front of them, ‘as they insist in searching only for the phenomena described in the theory.’” In fact, this is just what Velikovsky was accused of by Tom Margerison in a review of Velikovsky Reconsidered: “I dare say that Immanuel Velikovsky sees himself as a modern Galileo fighting a world blinded by theories that it cannot or will not look at the truth of his own hypothesis.”

Let us remember that this was precisely the accusation that was hurled at Velikovsky; namely that his prediction of the heat of Venus was not precise enough. But here Young and Young specifically tell us that Venussian atmospheric work “have led theoreticians astray by over estimating the quality of the data” while other “theoreticians have dismissed perfectly good observations under the assumption that the data was noisy” and that “there was a profusion of crude oversimplified models which have ‘explained discrepancies between theory and observation as due to effects not included in the[ir] theory.” Furthermore, “wrong interpretations of the data

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362 Patricia Goodson, *Theory in Health Promotion and Practice: Thinking Outside the Box*, (Sudbury, MA / London 2010), p. 87.
have been widely accepted” while “some correct interpretations have been rejected for long periods of time.” Finally, “what interpretation was ‘acceptable’ has been colored by prejudices . . . so that major questions appear to have been decided more on emotional rather than rational grounds.”

Every accusation laid at the feet of Velikovsky on Venus by his scientific critics are actually valid descriptions of Velikovsky’s critics.

Given these two diametrically opposing charges, let us examine which theory – Velikovsky or that of establishment science – is the one blinded to evidence; which one sees the evidence “right in front of them” and which one is blind to that evidence.

I maintain that that, essentially, is the problem. Scientists, like all other people, see only what they want to see. Their vision has been so conditioned by their theoretical outlook and reinforced by their education that it has blinded them to not see contradictions that stand directly before them. Ian Angell and Dionysios Demetis, in their book provocatively titled, Science’s First Mistake: Delusion in Pursuit of Theory, explain how this works:

“Consider the experiment made available by the Visual Cognition Laboratory of the University of Illinois. An audience is shown a 30 second video clip of two groups of three students, one [team] in white tee shirts, the other in black. Each team has a basketball that is passed between team members; at the same time each student moves around weaving between all the others. Prior to being shown the clip the audience is given some ‘patter’ about the difficulty of counting moving objects. Then they are asked to count the number of times the white-tee-shirted team passes the ball.

“On completion of the video clip, the audience is asked if anyone has noticed anything peculiar. A few will mumble yes, and they are asked not to comment. The clip is then shown again, but this time the audience is told not to count but concentrate on the middle of the screen. [What they then see is] A man in a gorilla suit enters stage right, walks into the midst of the students who are fanatically passing the basketballs, steps and faces the camera, beats his chest and walks off stage left. Most of the audience is amazed. They say it’s a different [video] clip; there was no gorilla first time round. However, it was the same clip. Until you’ve been fooled as were both authors who failed to notice the gorilla . . . it seems impossible that you could have missed a big gorilla a-mbling across the screen. But miss it you did. By concentrating on counting (as distinct from watching), even a great furry animal can just disappear while in plain sight. See – or rather not seeing – is believing . . .”

For scientists, it is the theory that controls their minds that makes it next to impossible to see clearly. Regarding the planet Venus, the planetologists’ minds are concentrating and directed to see only those elements that they were educated, or better “indoctrinated” to see. Whenever a massive contradiction appears, like an 800 pound gorilla, they fail to recognize it; it does not exist and simply disappears while in plain sight. The scientists have created what Angell and Demetis call a Delusion in Pursuit of Theory. But at a subconscious level, they did see these 800 pound gorillas and applied Freudian slip language for their observations that indicate that just below the surface, they were seeing the 800 pound gorillas – the contradictions. Let us reexamine these unconscious Freudian slips wherein they see the paradigmatic evidence they are supposed to

see but unconsciously report that they are actually seeing something else that is hidden, namely, the reality they cannot accept.

With respect to the approximately 1,000 craters on Venus’ surface that, according to the crater count chronology dating system, Andrew Chaikin above admitted that there was something strange about this chronology because “the idea that the planet completely repaved itself and then became relatively quiescent was immediately controversial . . . What could have caused the enormous volcanic outburst . . . [and] Why did the subsequent level of activity drop so sharply afterward?” Grinspoon, above, looked at the same evidence and let this Freudian comment drop: “It sounds disturbingly biblical. Was God practicing on Venus?” Like the concept of the Noachian flood on Earth, only some vast, unknown cause could have repaved all of Venus 300 million to a billion years ago. He also wonders “Why on a planet smothered with volcanic features are the craters so untouched?” Beneath the surface of their thinking they are admitting that the crater count chronology on Venus has nothing to do with that theory. Richard A. Kerr calls these craters an “enigma,” while Grinspoon calls what he is seeing “something quite strange, almost unnatural, about Venuvian craters,” and “Virtually every geological feature of the planet appears brand-new.” Marcia Bartusiak reported a Magellan team member called the surface “mind-boggling.” Or, as Kerr said, the surface was that of a “newborn babe.”

Subconsciously, the scientists are saying that the surface of Venus is not 300 million years or a billion years old, but is “pristine,” a “newborn babe,” so the scientists turn to terms like “enigma,” “strange,” “biblical,” “mind-boggling.” The 800 pound gorilla is standing right in front of them, as a brand new surface placed there yesterday. They see it but can only express it with unconscious Freudian slips.

As for the atmosphere, the same psychological mechanism comes into play, as Hartmann and Miller, above, say that while the planet is 4.6 billion years old, “Venus still has a perfectly preserved second-stage atmosphere.” That is, the atmosphere is of a newborn planet. With respect to Venus’ argon-36 age, McElroy, above, tell us, “The atmosphere of Venus contains as much argon-36 as you would expect to find in the planet’s original atmosphere.” But although he adds, “This finding will force us to rethink the whole process of planet formation,” no one can do this. The unwelcomed truth is buried in denial. The same denial is used with argon-40, which Glass tells us, “is smaller by a factor of 15 to the value of the Earth,” or a trillion times less.

In terms of carbon dioxide, U. von Zahn states that, on time scales, “CO₂ would disappear from the upper atmosphere within a few weeks and from the entire idle atmosphere in a few thousand years,” but “arguments . . . fall short in explaining the observed composition of the middle atmosphere should be made up mostly of carbon monoxide and oxygen, and in 50 million years, the entire atmosphere should be converted to these gases. But this 800 pound gorilla is not seen even though Yu A. Surkoy says it can be there if there was a massive “extrusion of magmatic rock onto the surface [that added carbon dioxide to the atmosphere which] took place recently or is even now continuing.”

In terms of Venus’ sulfuric acid age, Peter R. Balling suggests, “sulfuric acid might well have a relatively short lifetime consistent with a recent installation of the planet [Venus] in its present orbit.” This is confirmed by the fact that surface rock will neutralize acids. About this, Young and Young admit, “Such strong acids would not survive for long in the Earth’s atmosphere” and add “that they should be present in the [Venusian] atmosphere at all is a surprise.” The scientists are saying Venus is ancient, but these gases are that of a newborn planet.

The neon and krypton age of Venus’ atmosphere. As John Daintith says, there is so much of these gases and “is currently raising problems concerning the established view of the solar
system.” Anthony Feldman admits, “So far, scientists cannot explain why these gases were not
drawn away from the planet during the birth of the solar system.” But since Venus was not born
at that ancient period, these gases should not be “drawn away,” but this cannot be seen.

Regarding Venus’ water age, Young and Young told us that Venus “could not produce
an atmosphere so thoroughly dessicated.” But as a newborn planet, it would take many millions
of years for it to vent enough water to create an ocean.

For Venus’ oxygen age, Dott and Batten have told us, “It has long been assumed that
the [newborn Earth’s] atmosphere did not have free oxygen,” while Sir Harold Spencer Jones says
that Venus is so young that it “appears to be a world where life [dependent on oxygen] has not yet
developed . . . It is a world where conditions are not greatly different from those on the [early]
Earth many millions of years ago.” And, in fact, Venus appears to have just begun to develop an
ozonosphere.

All these descriptions of Venus reported by the scientists are 800 pound gorillas they
dare not see. As Velikovsky long ago discovered, bringing uncomfortable truths to the scientific
establishment’s attention is like bringing uncomfortable and unwelcomed truths to a patient
undergoing psychoanalysis. The patient refuses to see or even acknowledge these and resists
facing these realities in every possible way, even attacking the therapist for digging up these
realities. Because scientists are, in fact, just human, they, too, have been behaving just like a
neurotic patient undergoing psychoanalysis. They see the multiple forms of evidence that Venus
is a newborn planet but, at the same time, cannot admit to themselves that they see anything.
Psychoanalysis often fails because the truth the patient has buried is too painful and, thus, the
patient lashes out at the analyst, uses every form of visceral attack on the analyst, and often can
never be brought to give up the old and destructive ways of behaving. This has been the fate of
many theories; the older generation never relinquishes their theory, and future generations more
familiar with the evidence, reapproach the evidence without the visceral, emotional baggage of
the old generation. That is also why change often takes centuries to be assimilated. As Mutch, et al. said, “Today we refuse to believe that catastrophic, interplanetary collisions have warped
Earth’s history, a hundred years hence . . . will we feel the same?”

Paul Thagard, in a paper titled “Resemblance, Correlation, Pseudoscience,” gives us
this definition of pseudoscience:

“A theory which purports to be scientific is pseudoscientific if and only if (1) it
has been less progressive [in finding support] than alternative theories over a long
period of time, and faces many unresolved problems, but (2) the community of
practitioners make little attempt to develop the theory towards solutions of the
problems, show no concern for attempts to evaluate the theory in relation to others,
and is selective in considering confirmations and disconfirmations.”

When we look back over the evidence, the establishment’s theories about Mars and
Venus have “been less progressive [in finding support] than [Velikovsky’s] alternative theory over
a long period of time, and still faces many, many, many unresolved problems.” “The community
of practitioners [have] attempted [over this lengthy period] to develop their theory toward a
solution of these problems, but show no concern for attempts to evaluate the theory in relationship
to others [such as that of Velikovsky], and is selective in considering confirmations and
disconfirmations,” such as rejecting all the thermal imbalance spacecraft readings in Venus’

366 Paul Thagard, “Resemblance, Correlation, Pseudoscience,” Science, Pseudo-science and Society,
atmosphere – a clear disconfirmation; while failing to accept these same readings is “confirmation” of Velikovsky’s hypothesis. If we take Thagard’s pseudoscientific definition at face value, then established scientific theory fits the bill for what he defines as pseudoscience. Scientists will say they are getting closer to a solution, but they will be saying that decades from now and centuries from now. Or they will simply ignore the fact that they have no solutions.

THE ROTATION OF VENUS IS SLOWING

It is well-known that Venus rotates in the opposite direction to that of the other planets, which Velikovsky suggested could be the case, if all the interactions between it and the Earth and Mars had occurred in recent times. Venus orbits the Sun in 224.7 days, but its rotation about its axis is longer, 243.02 days retrograde. A recent discovery shows that Venus’ rotation is actually slowing. In an Internet site, “Scientists baffled to discover that Venus’ spin is slowing down,” by Bryan Nelson for the Mother Nature Network, filed Feb. 17, 2012, we find:

“Scientists mapping Venus’ surface with the European Space Agency’s Venus Express orbiter recently received a shock when the features on the planet’s surface appeared to have moved to 12.4 miles from where they were expected to be, reports National Geographic.

“The measurement, if correct, would seem to indicate that Venus’ rotation has slowed by 6.5 minutes – a dramatic decrease on a planetary level – compared to when it was last measured just 16 years ago . . .

“This leaves a rather large question. What could possibly be causing a planet’s spin to decelerate . . . so rapidly?

“Some scientists have speculated that Venus’ thick atmosphere and high-wind speeds could be to blame . . .

“Other scientists are skeptical. While a planet’s atmosphere has been proven to effect its rotation before, these effects are minimal compared to the degree of slowing that has been witnessed on Venus.”

What no one has considered is that as one goes back into the past, Venus’ rotation had to be even faster. That is, if Venus rotates retrograde in 243.02 days presently at the same speed-up rate in 1,600,000 years, it will be rotating in less than one Earth day, and in 160 million years it will be rotating in 1/100th of an Earth day, about 14 minutes, in 320 million years in 1/200th of a day, about 7 minutes and in 720 million years in less than one minute. This means Venus could never be as old as is suggested.

But going forward in time in about 650,000 years, Venus will be rotating not in the retrograde direction, but in the prograde direction. What could be the cause of this behavior? Here, as with my prediction of 1999 that rogue planets would exist in untold billions, I predict that as Venus’ core cools, it will become more dense. My theory maintains that the denser the body the greater the size of its magnetic field wherein I wrote, “The production of electromagnetic energy from within celestial bodies is due to the amount of collapsed matter in each body and the degree of collapse of the matter.”

Therefore, as Venus’ core cools and condenses to greater density, its magnetic field which is minute, will become larger and larger, and with that growth at Venus’ core, the planet will rotate such that it begins to spin in the prograde direction. What we

are witnessing is the development of a Venusian magnetosphere that will grow and grow and will affect its rotation and the size of its ellipse. The scientific establishment imbued with its present theory of strict gravitational mechanics will, of course, deny any possibility of this theoretical analysis.

There is a further point that must be added. All the 800 pound gorillas – contradictions to the established theories about Venus – are actually interdisciplinary forms of evidence that all “jump together” to uphold Velikovsky’s theory that Venus is a newborn planet. There are literally a great many of them and in terms of Whewell’s consilience of inductances provide solid support for Velikovsky. Their theories are, however, enmeshed in one fix-it-up hypothesis after another, the sure sign that theory is invalid. They will, I suggest, never be able to untie themselves from these problems and will enmesh themselves in even deeper thornier problems for all their working lives.

Del Ratzsch poignantly describes the problem:

“Paradigms also generate expectations concerning the results of new experiments or research, and here the fun sometimes begins. Sometimes actual observational results [like those found on Earth, Mars and Venus] are contrary to what the [stable solar system] paradigm leads one to expect. A result that is contrary to the paradigm-generated expectation is an anomaly. Normal science turns up anomalies surprisingly frequently.

“What, according to [Thomas] Kuhn, do scientists do when an anomaly surfaces? Sometimes they do not even seem to notice the anomaly, and sometimes when they do [notice it], they simply ignore it. Usually, however, [as with Earth, Mars and Venus’ anomalies] there is some attempt to show that the apparent anomaly is not really an anomaly after all; that someone simply made a mistake somewhere . . . Sometimes such attempts are successful. But sometimes they are not and the anomaly apparently stands as a fact contrary to the paradigm. Despite its being contrary to the paradigm, scientists may simply view it as being an unimportant violation of the paradigm.

“But occasionally an anomaly resists usually successful methods of solution for a long time that scientists grow uneasy. Or an anomaly may involve something so central to the paradigm that it cannot be ignored. Sometimes [as with my evidence here and elsewhere regarding the Earth, Mars and Venus] the sheer number of anomalies becomes alarming. In these cases (and perhaps others) anomalies begin to get serious attention, and the discipline may enter what Kuhn terms a crisis state.”

In this respect, Matteo Motterlini writes of the exchange of the letters between philosophers of science, Imre Lakatos and Paul Feyerabend, that he has paraphrased the following, that according to Lakatos:

“I term ‘progressive’ any [scientific] programme which predicts events confirmed by subsequent research thereby leading to the discovery of ‘new’ facts. I term ‘degenerating’ any [scientific] programme which makes no such predictions [or predictions that turn out to be false] but simply ‘saves’ data discovered by its rival.”

When we look back at all the predictions and evidence made by both Velikovsky and
the Scientific establishment regarding the Earth, Venus and Mars, what is most striking is that
Velikovsky’s predictions almost universally have been “confirmed by subsequent research thereby
leading to the discovery of ‘new’ facts,” while the scientific establishment has almost universally
made predictions that were disconfirmed by subsequent research, thereby not leading to the
discovery of ‘new’ facts. Elsewhere, Lakatos writes:

“But all research programmes I admire have one characteristic in common.
They all predict novel facts, facts which had been either undreamt of, or have indeed
been contradicted by previous or rival programs.”

He adds, “In degenerating programmes, however, theories are fabricated only in order
to accommodate known facts.” That “fabrication, only in order to accommodate known facts,”
exists with establishment scientific theories about Mars and Venus and there are dozens of them.
As Lakatos adds, “What really count are dramatic, unexpected, stunning predictions; a few of them
are enough to tilt the balance.” But there are a great many of these in Velikovsky’s program.
Even the followers of Lakatos cannot see these 800 pound gorillas. Scientists can be blind and
that galling paradigm change possibility is impossible for them to face or acknowledge because it
undercuts all they believe they know.

As presented at the beginning of this work on solar system stability, I cited William
Whewell’s concept of consilience of inductances or interdisciplinary science. We can now see
how using only one compartmentalized science, “celestial mechanics,” failed when many other
scientific disciplines are added to the mix – the synthesis. Here, George David Miller points out:

“Compartmentalization prevents students from seeing the whole. When
students are given only a focalized view of reality they become more alienated
[from reality] . . . The alienation arises on the one hand, from drawing solutions
from this compartmentalized [set] of solutions that do not work . . .
compartmentalized education retards solidarity. We only see our neck of the
woods. We don’t see how our neck of the woods interacts with other neck of the
woods . . . compartmentalized [thus] learning narrows perspectives.”

As we will see throughout the rest of this book, many other phenomena related to
Velikovsky’s theory that electromagnetism play a role in celestial mechanics have also been
summarily dismissed based solely on the concept of the specialists of gravitational theorists that
“they know” or, as they put it, ‘We Know!’ our specialty cannot be fundamentally in error,
therefore, “we know” and Velikovsky is wrong. As we have seen, this concept has failed
repeatedly on several levels to prove nor sustain what the scientists have put forth as fact to
criticize and condemn Velikovsky.

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371 Ibid.
372 Ibid.
CHAPTER 5: COSMOLOGY

Because of the failure of the scientific establishment to take Saxl, Allais and Brown’s experimental discoveries into account in their work, they have been forced to use one force – gravity – to explain various forms of evidence that appear to be in contradiction with their cosmology. This is only to be expected. If one works with an invalid theory, it follows that contradictory discoveries will be explained by that theory on a never ending scale. Yet we also hear that we may have arrived at the theory of everything, but this, I suggest, is far from being the case. Eric Lerner writes:

“Today we . . . hear renowned scientists, such as Stephen Hawking, claiming that ‘Theory of Everything’ is within their grasp that they have almost arrived at a single set of equations that will explain all the phenomena of nature – gravitation, electricity and magnetism, and nuclear energy – from the realm of the atoms to the realm of galaxies and from the beginning of the universe to the end of time . . . they are wrong . . . [Perhaps] without fanfare, a new revolution is beginning which is likely to overthrow many of the dominant ideas of today’s science, while incorporating what is valid into a new and wider synthesis.”

In this case, Lerner was discussing the plasma theory of H. A. Alfven, who wrote with B. G. Arrhenius: “We have to learn again that science without contact with experiments is an enterprise which is likely to go completely astray into imaginary conjecture.”

Velikovsky’s concept that electromagnetism plays a major role in celestial cosmology, indicates that modern cosmology is also built on an invalid theory. Because of this, I have built a cosmology based on the concept that both gravity and electromagnetism play complementary roles. Therefore, it is incumbent that I look into modern cosmology and point out the errors, paradoxes / contradictions and other flaws that plague it. Cosmology must be aligned with the numerous experiments carried out by Saxl, Allais and Brown, as well as others, to be discussed below. The Velikovsky revolution requires not only a new chronological paradigm for ancient history, but a new paradigm of cosmology. His concepts span a number of disciplines and the following discussion is intended to elucidate the breadth of Velikovskian theory and the revolution it entails.

Because the scientific community has refused to take account of the experimental work of Saxl, Allais and Brown it, therefore, has been going completely astray into imaginary conjecture[s] about cosmology. It should also be understood that when a theory is contradicted by observational evidence again and again, its proponents are driven to invent all kinds of explanations, often unrelated to reality, to make these go away. This is precisely what the ancient Greeks did to make their geocentric theory work. They had to invent invisible matter, called quintessence, that formed spheres into which the planets and Sun were imbedded so as to go in perfect circles around the Earth. They then had to invent invisible, smaller spheres imbedded in the larger ones to create epicycles so that the planets could move at various times in a retrograde [backward] direction. On top of that, they had to invent points outside the Earth around which the giant, invisible spheres circled. They piled one unknown and unseen material mechanism on top of another to make the theory work and for over a thousand years, the greatest minds in the world

accepted these artificial inventions of reality as reality. Today, because of the gravity-only theory of celestial motion, cosmology has come full circle back to the point where the ancient Greeks once stood, and scientists have been inventing all sorts of unseen and unknown materials and forces piled one on top of the other to make their gravitational cosmological theory work. In fact, I suggest, present day scientists have surpassed the Greeks in creating such inventions and have failed to recognize that they are following in the self-same footsteps of the Greeks and philosopher scientists.

One of Velikovsky’s harshest critics, Martin Gardner, has declared:

“Velikovsky . . . invents electro-magnetic forces capable of doing precisely what he wants them to do. There is no scientific evidence whatsoever for the power of these forces . . . They explain the unexplainable. But so convinced is the hermit scientist that everyone is prejudiced except himself that he can – with a straight face – belabor the ‘orthodox’ for refusing to recognize the imaginary energies.”

This, of course, completely fails to attend to the electromagnetic experiments carried out by Saxl, Allais and Brown and others. Like the ancient Greeks, who invented a new form of matter, present day scientists have also invented an entirely new form of matter known as “Dark Matter,” that no one can observe, has never been proved to exist and then they put it precisely where they need it to explain the gravitationally unexplainable, and they do so with straight faces in scientific, peer-reviewed journals and belabor those of us who refuse to accept this “orthodox” concept by refusing to recognize this imaginary matter. I say that it is simply another form of quintessence.

DARK MATTER / QUINTESSENCE

“Dark matter is the craziest idea we’ve ever had in astronomy: it appears when you need it, it can do what you like, be distributed anyway you like. It is a fairytale of astronomy.”


Gardner’s own position regarding the concept that a form of matter (Dark Matter) can exist claims “It is assumed that a vast amount of invisible or ‘dark’ matter is involved . . . Such matter has yet to be identified.” He says elsewhere “‘dark matter’ – seems required to explain the clustering of galaxies and other cosmological features.” While Gardner understands and acknowledges that Dark Matter preoccupies the minds of many scientists and is invisible, made of a substance that has never been known to exist, and exists wherever it is needed to do what scientists like, he does not insult these in the scientific community for offering such a concept to
explain their theory. But Velikovsky is derogated to the status of crank for suggesting something known to exist in space does the things he suggests. Gardner is merely another xenophobe who belittles the outsider and a clannish member of the insiders – the scientific establishment.

As with so much of celestial mechanics to be described below, the only proof for its existence is heuristic mathematics. Dark matter was postulated because gravitational theory math did not agree – or more accurately, contradicted – gravity as a force. Michael Muldowney puts the case for it thus:

“It seems that the galaxies could not have formed and could not maintain their existence with a force [or material] that we know nothing – absolutely nothing – about. This [whatever it is] . . . cannot be observed; we only know that something must be holding the galaxies together because [gravitational] physics predicts that the stars of the galaxies [moving at their speeds] should fly apart [without it] . . . mathematics tells the astronomers that it must exist. The scientists give this unknown force the name: dark matter."

Not only does mathematics tell astronomers that Dark Matter must exist, but after several decades of searching for it and not finding it, they are creating epicycles by turning to mathematical explanations. Dan Hooper writes:

“As our search has left us with no known candidate for dark matter, we must [like the Greeks] turn our attention to the purely theoretical and yet undiscovered. To do this, we will first look at a branch of mathematics that guides particle physicists through the deepest and most profound aspects of their theories.”

Tom Anderson presents this entirely theoretical explanation for why we can’t see Dark Matter. “Our universe is made up of light matter and dark matter. We and everything we can perceive using our five senses is light matter. It is as if we have our three dimensions and the dark matter only has two. Say the dark matter has only height and width, but no depth and we are at such an angle only see the dark matter by looking at its depth, which it does not have. It still has mass, it still has gravity, it still affects the dark matter of the universe. That is the only reason we know the dark matter exists. It affects the universe and we use mathematics to describe the dark matter’s size and shape and how it functions.”

In essence, because the scientific establishment has not found any physical method by which to identify Dark Matter as a real entity, they have decided that it must still exist and, therefore, it exists on the basis of it being a purely theoretical material and this can be explored, no longer on the basis of experimental discovery, but with and only with mathematics. Isn’t this precisely what the ancient Greeks did when they invented quintessence, a form of matter that wasn’t Earth, water, air or fire? Quintessence wasn’t solid Earth, liquid / water, gas / air or plasma / fire, all the real materials of their world. No, quintessence, like Dark Matter, was not a physical entity, but a theoretical / mathematical entity that had all the attributes of a physical entity without being observed, measured, demonstrated or tested. It was there only in their minds and theories of the Greeks, while dark matter is only there in the minds and theories of modern scientists.

It is only when we analyze the entire problem of Dark Matter that we understand that it is an ancient Greek cosmological / mathematical invention, refashioned today in order to explain

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the supposed breakdown of Newtonian law / Einsteinian warped space in spiral galaxies. According to Joel Davis:

“The first piece of evidence came from the work of a young Dutch astronomer named Jan Oort . . . Oort had already made a significant contribution to Galactic astronomy. In 1927, he had confirmed the earlier hypothesis of Bertil Lindblad that the galaxy is rotation . . . [and, in] 1932 . . . was following up this work on Galaxy rotation.

“Oort measured the positions and motions of a number of stars lying outside the visible disk of the galaxy. Then he used that information to calculate how much mass must lie inside their orbits to produce their observed motions. This amount is called the Oort Limit, and it is equal to about 0.03 of a solar mass per cubic light-year. Next, Oort added up the masses of the visible stars in the Galactic disk. The result was surprising: The actual mass present in the Galaxy seemed to be 50 percent less than what was needed to cause the actual movements of the stars that lay outside the visible Galactic disk. Oort added a fudge factor to correct for the discrepancy, assuming the existence of many dim and uncounted stars in the Galaxy.9

Another problem arose in the 1930s: Certain celestial motions were not in accordance with Newtonian theory.

“The first glimmer that something was amiss in astronomy’s understanding of the universe came in the 1930s. Caltech astronomer, Fritz Zwicky, an eclectic wizard of his craft, was measuring the velocities of galaxies within the famous Coma cluster and noticed that they were moving at a fairly rapid pace. He added up all the light being emitted by these galaxies and realized that there was not enough visible, or luminous, matter around to gravitationally bind the speeding galaxies to one another. Under the standard laws of celestial mechanics, the Coma cluster should [have been] flying apart, but it [wasn’t]. The situation seems paradoxical . . . Zwicky had to assume that some kind of dark, unseen matter pervades the Coma cluster to provide an additional gravitational glue.10

For four decades, astronomers did not address this problem, assuming that, in time, further observations and better understanding of the elements involved in the calculations would be presented, and the discrepancy between motion and masses would be rendered amenable to gravitational law. “But their thoughts were colored by their prejudices.”11 The problem, instead of going away, thereafter became exacerbated by further discoveries. One of the laws of planetary motion – the same for stellar and galactic motion – was established by Johannes Kepler and mathematically demonstrated by Isaac Newton in the Principia. This law states that the period of time a celestial body completes one obit around its primary or central body, squared, will equal its average distance from that central body, cubed. For example, Jupiter’s orbital period around its primary, the Sun, times itself (squared), equals its average distance from the Sun times itself thrice (cubed). Therefore, its year or period squared – 11.86223 years, times itself equals its average distance, 5.202833481, times itself cubed, or a value of 140.7125. This fundamental law should not be violated if no other force is acting in space to influence celestial motion.

9 Joel Davis, Journey to the Center of Our Galaxy (Chicago 1985), p. 197.
11 Ibid.
Marcia Bartusiak explains how this third law of Kepler’s applies to the stars in orbit around the center of the galaxy:

“By the 1970s, however, the problem of the missing mass was brought closer to home. By then, both radio and optical telescopes were beginning to reveal curious rotations in both the Milky Way and nearby galaxies which suggested that galaxies contained more mass than previously assumed. Astronomers always took it as a matter of course that stars in a spiral galaxy would evolve around the galaxy’s core like planets in the solar system whose motions adhere to Newton’s laws of gravitation. Newton recognized that the gravitational attraction between a planet and the Sun follows a simple rule of thumb: the attraction between two celestial objects is inversely proportional to the square of the distance between them. That means that if the distance between the Earth and the Sun were doubled, their mutual gravitational grip would lessen by a factor of four. Triple the distance, and the attraction would fall off to a ninth of its original strength, and so on.

“The distance between a planet and the Sun also determines the planet’s orbital velocity. “In the solar system, the planets all orbit the Sun with velocities that get smaller and smaller as they get farther from the Sun, the system’s center of mass,” explained Vera Rubin of the Carnegie Institution of Washington. “So the inner planets go fast and the outer planets go slow. That’s just a direct response to Newton’s law.”

“But to everyone’s surprise, observers discovered that galaxies weren’t acting like [a] gigantic solar system at all.

“In spiral galaxy after spiral galaxy, the Carnegie group saw that stellar material on the outer edges of a disk travels around at speeds much faster than theory had estimated. It was the Coma cluster problem all over again.”

Therefore, the stars in spiral galaxies do not follow Kepler’s law of distance cubed equal period squared. In order to do so, the stars farther from the central mass of spiral galaxies must revolve slower than stars closer to the central mass, and they simply do not do this; they travel at the same velocity. James Trefil states, “In fact, no galactic rotation curve has ever been observed to turn over and become Keplarian. All of them remain flat out to distances of 200,000 or 300,000 light years.”

This evidence is a basic contradiction of fundamental gravitational theory and implies that something is fundamentally wrong with our understanding of these matters.

“A few theorists have wondered whether these unexpected motions within galaxies . . . are actually telling us that Newton’s law of gravitation breaks down over distances of tens of thousands of light years. But this radical suggestion has not been greeted enthusiastically. When faced with the necessity of accepting the existence of dark matter or of modifying one of astronomy’s theoretical cornerstones, most astronomers will opt for the former.”

Dennis Overby states: “There could only be two explanations for such behavior. Either Newton’s laws were wrong or there was something else in the galaxy.” Lawrence Krauss describes the general feeling about questioning the unquestionable:

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At least one set of research . . . suggests that a failure of the universal law of gravity . . . [may exist]. It has been suggested that, if the force of gravity deviates from its Newtonian form at large distances, one might try to explain the flat [galactic] rotation curves without resorting to dark matter. Unfortunately, this appears to be one of those cases in which the solution is uglier than the problem. It may be slightly radical to suggest that galaxies are dominated by dark matter. But to suggest an alteration in one of the . . . known forces of nature [gravity] to explain these observations seems to me excessive.”

The one individual who took the position that the laws of gravity may be in error has an interesting story to tell. He is Mordehai Milgrom of the Weizmann Institute of Science in Rehovot, Israel. According to Wallace and Karen Tucker, who interviewed him, Milgrom suggests that astronomers were in error in applying gravitational law without an amendment to explain the rotations of galaxies: “I remember very clearly that I was struck by the flat rotation curves,” he said. “I felt strongly that the flat rotation curves are telling us something . . .”

According to the Tuckers, “Milgrom took another approach. He tried to change the laws of physics . . .

“Milgrom’s unorthodox and unpopular hypothesis is that when gravitational acceleration becomes very small – thirty million times smaller than the gravitational pull of the Sun on Earth – the Newton’s law of gravity must be modified so that the gravitational force at large distances falls off less rapidly than prescribed by Newton’s law. Specifically, he proposes that the gravitational acceleration due to an object becomes proportional to the square root of the acceleration produced by Newton’s law. That is, the gravitational acceleration is proportional to the square root of the mass of the object and inversely proportional to the distance of the object.

“The effect of this hypothesis is to substantially increase the gravitational force produced by a galaxy over distances of tens of thousands of light years. The observed rapid rotation of the outer parts of the galaxies is no longer a problem. If the gravitational force is stronger, as Milgrom maintains it is, then dark matter is not needed to explain the excessive rotational velocities of spiral galaxies . . .

“Milgrom’s modification of the law of gravity eliminates the need for dark matter. Milgrom also finds that, with his assumed law of gravity, the mass required to hold a rotating galaxy together [to keep it from flying apart] depends on the velocity of the rotation of the galaxy in a manner (mass proportional to the fourth power of the velocity) that is consistent with the observations.

“Milgrom was initially skeptical about his own work. “I was sure that within a few hours I would find something wrong with it. I didn’t, but I was sure that within a day or two I would, or a month or two. My attitude toward this in the beginning was to try to kill it.”

“Then a certain point he changed his attitude. “I simply went through all the possible things that I could think of to check it. It really worked . . .”

“Jacob Bekenstein, who is noted for his erudite contributions to such topics as the thermodynamics of black holes became interested in the idea and has since co-authored papers with Milgrom on what they call “Modified Newtonian Dynamics.”

[Milgrom states], “In many papers in which it would have been very natural to mention it, it was not. So I felt it was something people didn’t want to touch. I came to visit the Institute [of Advanced Studies, in Princeton] in September ’83 and it [the Modified Newtonian Dynamics] was sort of a taboo subject . . . I was very surprised to the point of being naïve at their reaction. I was sure it would be accepted much more enthusiastically . . . When I was at Princeton, I noticed people talking about a number of things that were unexplained. I felt I came up with an explanation. I was sure it would be [well received]. I was completely wrong. I didn’t expect their reaction . . . Since then, I have become interested in exactly how such ideas have been accepted in general in the history of science . . . I have learned that I should not have been surprised at their reaction.”

We will return to Milgrom’s work in our discussion below.

What the astronomers have done, in order to avoid questioning gravitational theory, is to invent a substance that had neither been thought to exist before nor been observed, and have it act gravitationally to accelerate stars in galaxies more rapidly or retard the motions of galaxies in clusters.

One of the methods of science in identifying crank science is to point to the following: a crank or pseudoscientist will invent a force or material that has never been known to exist and claim that it is minute but is also responsible for effects of major proportions. The force or matter cannot be seen or tested, but exists and is influential as a potent force of nature. In this respect, dark matter fits the bill of what establishment science would call crank science or pseudoscience. Yet, there are many scientists who support this concept. These scientists suggest that, in the Coma cluster, the dark matter holds back the speeding galaxies so that they cannot escape from the cluster. In spiral galaxies, on the other hand, it is arranged in such a manner that it moves the outer stars more rapidly than gravity would without this invisible weakly interacting material. It does precisely what scientists want it to do.

In order to ascertain the amount and distribution of dark matter, we must first compare the way stars in spiral galaxies should revolve in their orbits as expected from gravitational law and the way in which they are actually observed to revolve.

Figures 1A and 1B below, demonstrate what is expected due to gravity and what is actually seen:

Figure 1. MOTION OF STARS: SPIRAL GALAXIES. Fig. 1A: The expected rotation curve of spiral galaxies, based on gravitational law. Fig. 1B: The actual rotation curve of spiral galaxies. Distance in kiloparsecs (1 parsec = 3.26 light-years).

18 Ibid., pp. 195-199.
As can be easily seen, gravity requires that, as stars are situated farther from the galactic center, they travel more slowly along their orbits. The sharp rise in velocity reflects the bulge of the galaxy that contains so much mass that it rotates somewhat like a solid. However, Figure 1B shows the actual rotation curve of spiral galaxies. The part of the curved line which becomes flat shows that the speed of the stars remains the same no matter how far they are situated from the galactic center. This flat part of the rotation curve requires that the dark matter be distributed very evenly to allow stars farther from the galactic center to revolve on their orbits at almost precisely the same speed as the inner stars. This demands that

“... five to ten times more dark matter than visible stuff exists in galaxies. But perhaps more significant is the fact that dark stuff is distributed differently. (Emphasis added.) It appears to exist in an extended “halo” [globe] around the galaxy. Inside the visible [star and gas] region of the galaxy, the amount of dark matter probably roughly equals the magnitude of the visible material. Outside this region, however, the mass to light [matter] ratio can grow by over a factor of 100 at the outskirts of measured rotation curves. This is one of the many puzzles we must solve if we want to claim to understand the nature of this material. Why is dark matter distributed so much more differently than stars? (Emphasis added.) In addition, we must explain the apparent “conspiracy” that results in nearly equal levels of dark and light matter in the luminous cores of galaxies, so that, as the luminous matter drops off [decreases outward], the rotation curves remain constant.\(^1\)

Figure 2 below, shows how dark matter must be distributed in spiral galaxies:

![Figure 2: SPIRAL GALAXIES: DARK AND LUMINOUS MATTER](image)

**DISTANCE FROM THE GALACTIC CENTER**

As can be seen, the amount of dark matter increases at an evenly steady rate as we get farther from the center of the galaxy. By contrast, the curve would be reversed for the distribution of ordinary luminous matter. This greater and greater mass outward that dark matter adds to the

\(^1\) Krauss, *op. cit.*, p. 74.
mass of the galaxy causes stars situated farther from the galactic center to feel an additional gravitational tug in order to accelerate at almost precisely the same velocity. In essence, the dark matter adds almost the precise amount of mass to the galaxy at each distance farther from the center to allow for this feat of uniform stellar velocity. Figure 3, below, shows exactly how this distribution of dark matter is arranged:

![Figure 3. HEMISPHERIC VIEW: SPHERES OF DARK MATTER](image)

Concentric sphere 1 has a precise amount of dark matter in it, very uniformly distributed, which is greater in mass than in sphere 0. Concentric sphere 2 has an even greater amount than sphere 1, and sphere 3 possesses more dark matter than 2 and so on, to the last outer sphere. Of course, there are billions of such spheres going outward, in which there are greater and greater amounts of dark matter in each sphere, evenly distributed everywhere.

This, then, is the problem Lawrence M. Krauss has touched upon and posed as an enigma: gravity is a force only of attraction and this attraction of all matter requires that, as gravitating bodies or material – including dark matter – collect in a volume of space, these masses will, because of gravity, tend to form a sphere. This, of course, is suggested in Figure 3. But, of greater importance, the gravitating matter, condensing into the form of a sphere, will only do so by a gravitational process because there is no other process available to science. However, in order to form a sphere, a greater than average mass of material must collect in some region of space, which then acts as a gravitational seed mass pulling more matter (mass) surrounding it to itself. This increases the seed mass, which pulls itself by the gravity of all its material into a smaller volume of spherical shape which increases the density as well as the mass of the sphere. This more massive, more dense seed mass will continue to pull mass to itself from the surrounding, diffuse matter available, to add mass to the sphere, which then collapses inward to form a denser sphere in space.

At the end of this gravitational process, the entire mass will have formed a sphere in space with greater and greater amounts of matter (mass) concentrated at the center of the sphere than at the outer edges. This is the only way that gravity works in space to condense matter, and, indeed, all the ordinary luminous matter observed in the galaxies is arranged in precisely this
gravitational manner, with most of the stars at the core of the galaxy and fewer and fewer stars and
gas as we go outward from the center to the edge. Not only is this the way gravity works, but it is
the only way science understands that gravity collects great masses into smaller volumes of space.
To reject this process is, in reality, to reject gravity as a universal force.

Nevertheless, the distribution of dark matter in spiral galaxies absolutely rejects this
gravitational process and absolutely fails to behave as gravitational matter should. Instead, it
behaves as if there is a repulsion between itself and ordinary matter; the more ordinary luminous
matter is collected in space, the less dark matter is pulled by gravity toward it. Conversely, the
less ordinary luminous matter collected in space, the more dark matter pulled by gravity to it, and
vice versa. This fact alone should have caused the astronomers to drop this concept as
fundamentally contradictory. Instead of most of the dark matter collecting at the core of the galaxy,
as does luminous matter, greater and greater amounts collect farther and farther from the galactic
core in concentric spheres, with the greatest amount of dark matter farthest from the core of the
sphere – not nearest to it – as gravity demands.

The question facing all theorists of dark matter requires a solution to this gravitational
contradiction and enigma. Why would the very same process of force – gravity – operating over
billions of years, induce ordinary luminous matter to condense into a sphere with its greatest mass
concentrated at the center, while it causes dark matter to condense into the same sphere, with its
greatest mass concentrated at its edge? In fact, cosmologists propose that dark matter was the
original seed mass to cause luminous matter to condense into galaxies.

Eric Lerner explains:

“Long before the question of supercluster formation [formation of immense
material over immense areas of space] emerged, cosmologists realized that there is
a difficulty with forming even such objects as galaxies. [The] . . . Big Bang theory
assumes that these objects are, by gravitational attraction, from tiny clumps, called
fluctuations, in the early universe . . .

“Theorists realized that there was just too little matter in the universe [even with
fluctuations]. The less matter, the less gravity, and hence the more slowly little
fluctuations would grow into large galaxies. Thus, if the fluctuations were very
small to start with, more matter was needed to make them grow faster . . .

“Cosmologists found that this [ordinary matter in space] was not enough. They
needed a hundred times more. They calculated that, for galaxies to have formed .
. . there must have been so much matter in the universe that its gravitation would
eventually halt its expansion . . .

“This is where dark matter came in. If omega is really 1 [the omega is the
amount of matter equal to about 100 times the amount of ordinary matter known to
exist], or close to it, then gravity would act so swiftly that even a tiny fluctuation
could have grown to galaxy size since the Big Bang.”

Therefore, dark matter – being 100 times more massive than ordinary matter in a
fluctuation in the early universe – would act 100 times more strongly than ordinary matter to form
galaxies. The ironic aspect of all this is that the 100-times-more-massive dark matter, which
gravitationally pulled ordinary matter into these fluctuations or clumps, was incapable of pulling
itself into the same fluctuations with the same force. Since it is 100 times more massive than
ordinary matter, it is expected to pull this ordinary matter to itself where it clumped and form a
galaxy with most of the mass at the center. But, if it could pull ordinary matter into a galaxy with

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20 Lerner, *op. cit.*, pp. 33-34.
most of the mass at the center, why, with 100 times as much mass as ordinary matter, couldn’t it gravitationally pull itself into the same sphere with most of its mass at the center? The concept is to bereft of logic, so contradictory to the concept of gravitational action, that even a moment’s consideration of the concept of what dark matter is required to do leads to rejection of it on scientific, as well as plausible, rational grounds.

Dark matter must obey gravitational law in the same way as does all matter. To suggest that it acts gravitationally on stellar motions, but is somehow immune to behaving as all other gravitational masses behave, for some obscure or unknown reason, is simply hand-waving.

Furthermore, we are also expected to accept as plausible that dark matter can condense gravitationally, but only into concentric spheres, as seen in Figure 3, in order to cause stars farther from the center of the galaxy to accelerate at the same velocity as inner stars. Were the masses of dark matter to clump anywhere in the galaxy differently, that massive clump of matter would change the galactic rotation curves. This, of course, is not observed anywhere.

However, not only is the dark matter distributed differently than ordinary matter, but, in different types of galaxies with different degrees of curving of the galactic arms, the amount of dark matter in each type is also different. Vera Rubin, the principal investigator of this phenomenon, states,

“Comparison of Spiral A [type] and Spiral C [type] galaxies shows that, for equal luminosity, orbital velocities are significantly higher in Sa galaxies than in Sc galaxies at every radial distance [from the center of the galaxy]. This implies that Sa galaxies harbor more mass [as dark matter] per unit of luminosity than Sc galaxies do.”

Thus, the dark matter, in all known cases, condensed more greatly around Sa galaxies than around Sc galaxies. But why it did so is without explanation. However, if the magnetic fields of the two types of galaxies differ significantly, the Electro-Gravitic model I propose will explain this behavior. On this, more will be discussed below. Figure 4, below, shows the two spiral type galaxies.

Figure 4. THE TWO SPIRAL-TYPE GALAXIES. Fig. 4A: Sa galaxy with more dark matter at each radial distance in concentric spheres. Fig. 4B: Sc galaxy with less dark matter at each radial distance in concentric spheres.

One can see the lengths to which astronomers will go to avoid questioning their most fundamental concept. A few years ago, the seeming discovery of discrepancies in gravity readings had led several physicists to suggest that a “fifth force” – a counterforce to gravity – existed.

When the geophysicists argued that unseen masses under the Greenland ice cap could explain the measured discrepancy in gravity readings in the ice cap, Michael Nieto, a theoretical particle physicist from Los Alamos National Laboratory, argued, “You give him [a geophysicist] any data and he can mimic it with Newtonian physics . . . If he’s got to put a neutron star down there, he can explain it [the anomaly].” Although the “fifth force” has faded from discussion and not been validated, the same kind of device – unseen matter – is being employed to mimic celestial motions in spiral galaxies.

Halton Arp describes this concept regarding galactic rotation curves quite properly:

“Of course, most astronomers believe they know all about rotation curves of galaxies. They believe that the velocity of material in orbit is determined by the mass of the galaxy inside the orbit. But a surprising situation is then encountered. The velocity of rotation stays just about constant no matter how far from the center of a rotating galaxy one observes. In order to explain this, they have to invent unseen dark matter. But it has always to appear, miraculously, at just the right radius and in just the right amount.

Hypotheses include everything from subatomic particles like neutrinos to dark rocks surrounding galaxies, so that, as one observes outer, fainter regions, the mass continues to rise. But in actuality, postulating undetected matter is equivalent to inventing observations that do not exist in order to explain contradictions to our currently assumed physical laws . . . [namely, in this case, gravity].

“When astronomers are trained in graduate schools, one of the few laws that can be taught with any rigor and generality is the law of gravity. This offers one of the few opportunities to make a model of a galaxy. Most astronomers enter research anxious to scale the ladder of success by applying what they have learned of the world of observations. But, perhaps, we should remember the unknown sage who remarked: ‘To a man with a hammer in his hand everything looks like a nail.’”

The only tool with which astronomers have to work is gravity, to explain celestial motion. When the tool does not work, as in the case of galactic rotations, then it is made to work by inventing observations that do not exist.

Why are so many astronomers so unwilling to question this tool? Vera Rubin explains how a mind-set is produces:

“I think the students we are turning out today are incredible. Just phenomenal, but . . . they all learn the same things. They know what is practical and what is not practical and they all ask the same questions. So it’s much harder to maintain an individual style of research, I would think. It’s beaten out of you at graduate school.” (Emphasis added.)

This is why any suggestion of a different concept of celestial motion is met with such unbending hostility. The education and experience of astronomers has made it impossible for them to even seriously consider that their one fundamental tool may be deeply flawed.

The laws of gravity are, indeed, fundamental, and these laws clearly forbid the concept of dark matter as a solution to galactic and stellar motions now in vogue. There is no inherent evidence or reason to suggest that gravity breaks down over large distances, any more than there

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23 Halton Arp, *Quasars, Redshifts and Controversies* (Berkley, CA 1987), pp. 103-104.
24 Tucker and Tucker, *op. cit.*, p. 81
is a single observation or experiment to prove the existence of dark matter. The entire concept was invented in order to refuse to question what has always been taken as a given – gravity.

Is there another force, that operates with gravity to produce celestial motions, that can explain galactic rotation? I strongly emphasize that it is neither mass nor matter in space that distributes itself perfectly and evenly at radial distances from a central body, as dark matter is assumed to do. I strongly emphasize that only forces and energies are distributed radially outward, perfectly and evenly, with precise amounts of force or energy at each radial distance. Gravity and electromagnetism distribute themselves in space evenly, perfectly, radially; mass does not, as any scientist clearly understands.

Jeremiah Ostriker, who with James Peebles worked out how dark matter is distributed in space like energy, states, “What we did . . . was show that, as you go to larger and larger scales, the mass just keeps on increasing more or less linearly proportional to the radius.”

But, of course, forces and energies are what operate linearly proportional to the radius, not diffuse masses. Yet it is also admitted that:

“[d]ark matter which seems so intimately bound up with [the] origin, structure and fate of the universe, was an ugly picture in a lovely frame. Another physical force besides gravity could be needed to be invoked to explain the strangeness of the patterns that astronomers were seeing in our cosmic neighborhood. (Emphasis added.)”

Thus, at the periphery of the minds of some individuals involved in science is the awareness that forces are involved in galactic rotations. However, these individuals lack the courage to deal directly with it. This, however, is exactly what I suggest is required to explain the observations: forces, not masses.

First, let us see if it is rational, or scientifically logical, to change the laws of gravity at great distance to accomplish these galactic rotations before applying Electro-Gravitic theory. Changing gravity at great distance is the concept proposed by Mordehai Milgrom of Israel. He suggests that, when gravitational force falls to one thirty-millionth that of the Sun at the distance of the Earth, the laws of gravity break down. Therefore, stars in the galaxy feel a different gravitational tug which permits them to travel more rapidly than expected.

Now, if Milgrom’s reformulation of the law of gravity is valid, it must apply the same force in the same manner to all galaxies. That is, at a certain distance from the center of all galaxies, the stars should all move at the same velocity. This is decidedly not the case. As was stated in the first paper written about Electro-Gravitic theory.

Unlike the stars in a spiral galaxy, which generally follow orbits like that in the plane of the disk, like runners rounding a track, the stars of elliptical galaxies pursue orbits . . . inclined at a great diversity of angles. Their orbits resemble the flights of hunting sea birds, some diving and then swooping upward while others circle variously amid them. (Emphasis added.)

The stars in elliptical galaxies, at the same great distances from the center, as in spiral galaxies, where the reformulated laws of gravity are supposed to be operating, are moving at many different velocities, some more rapidly than others. Yet, they must all feel the same gravitational force that exists in spiral galaxies. If this is the case, their velocities would be uniform. But this is not the case.

26 Ibid., p. 91.
This also poses a problem for the advocates of dark matter. For stars to move in elliptical galaxies so erratically means that the dark matter in these galaxies is not organized into concentric spheres, but has formed clumps throughout; but, again, the clumps are not situated at the center of these galaxies. Thus, in elliptical galaxies, dark matter will clump, while, in spiral galaxies, dark matter will only form concentric spheres. This evidence thoroughly contradicts Milgrom’s reformulation of the laws of gravity and is a further anomaly for the concept of dark matter. The difficulty for Milgrom is fundamental and decisive. If the law of gravity operates as Milgrom suggests in spiral galaxies, it should operate in precisely the same way in elliptical galaxies to produce uniform velocities at uniform radial distances from the center, over a wide range of distance. The velocities are not uniform for the different stars over these radial distances and, therefore, the reformulated law is not operating as it is required to do. One cannot have one set of gravitational laws for spiral galaxies at great distances from the center and then have these same laws work differently in elliptical galaxies at great distances from the center. If a law of physics is a law, it must apply equally to the same set of conditions in the same way. Milgrom’s hypothetical concept, which seemingly works elegantly in spiral galaxies, utterly fails to work in elliptical galaxies.

There is another problem with Milgrom’s concept. Based on his theory, all galaxies that look the same and exist in the same type of region should also have similar rotation curves. The same also applies to all theories of dark matter. However, George Lake reports, “When these concepts were tested against the rotations of the Local Group (those galaxies surrounding the Milky Way), the rotations simply failed to correspond to the theory.”

I invite defenders of Milgrom’s hypothesis to explain this contradiction of his reformulated law of gravity.

A question that Milgrom or his supporters ought to answer is, How is one test this new concept of gravity? As far as I can determine, there is simply no means whereby the theory can be tested. The next question is, What other evidence exists to suggest that the physical laws of nature, when they become extremely weak, suddenly change? Again if a law of nature is a law, it does not change simply because its force become minute; a powerful force of gravity is in no way different from a minute force of gravity. To suggest otherwise is to say that there are two gravitational forces, which is extremely difficult to accept. And, of course, the question which remains to be answered is, Why doesn’t a reformulated gravitation force operate in elliptical galaxies as it does in spirals, and vice versa? Again, I submit that the laws of gravity are universal and are not subject to change, nor do they break down over distance. However, I do submit that an additional known force, other than gravity, is operating to affect celestial motion. The observed motions can be explained in terms of another force, a counterforce of gravity, namely, electromagnetism. Electro-Gravitic theory does not change the nature or the effects of gravity. It does not require new forms of matter, or that new forces be introduced into scientific discourse. I suggest that a known force – electromagnetism – is in operation in the galaxy, which is known to encompass all space and which is a counterforce to gravity; but, above all, it can be tested in space quite simply.

Why do stars in spiral galaxies possess orbits which are like runners on a circular track, while stars in elliptical galaxies have orbits that dive and swoop upward while other galaxies circle variously amid them? The answer is twofold. First, spiral galaxies have long arms, either relatively straight on either side of the galaxy, or curved around the central bulge or mass of stars at the nucleus of the galactic structure. According to theory, linear or long, curved celestial structures are produced by magnetic fields. The straighter the structure, the stronger the magnetic field.

necessary to generate and maintain it in space. Therefore, the spiral galaxies with the straightest arms will have the strongest magnetic fields; the spiral galaxies with the most curved arms will have the weakest magnetic fields. Elliptical galaxies, which lack arm structures and appear to have the shape of either a very thick pancake or a sphere, as well as the thickness differences found between a pancake and a spherical shape, have very little or no magnetic fields. A further difference related to the magnetic fields of these two distinct galactic types, is that the spiral galaxies – which possess galactic fields – rotate, while elliptical galaxies with little or no magnetic fields have either tiny rotational velocities or none at all.

Second, consider the type of star which comprises most of the galactic components. In spiral galaxies, the stars are young to middle-aged stars which rotate and thus have magnetic fields. In elliptical galaxies, the component stars are ancient red giants which do not rotate and thus lack magnetic fields. Hence, spiral galaxies have galactic magnetic fields and stellar components with magnetic fields. Since the fields are rotating like a giant whirlpool, the stars with magnetic fields feel the force of the galactic magnetic fields and are accelerated to move with and in the direction of the fields. That is why stars in spiral galaxies revolve around the center on relatively circular orbits. Elliptical galaxies, on the other hand, lack magnetic fields and their stellar components also lack magnetic fields. Since there is little or no whirlpool action and the stars cannot respond to what little electromagnetic field may exist, these stars respond overwhelmingly to gravitational forces from nearby groups of stars. That is why stars in elliptical galaxies move so erratically. Thus, in elliptical galaxies, gravity is the predominating force of motion; in spiral galaxies, two forces are in operation.

(At this point, I found a mistake in my analysis and have corrected it here.)

In all spiral galaxies, the central masses generate a gravitational field and an electromagnetic field. Gravity pulls the stars to the center of the galaxy, while electromagnetism is repelling the stars away from the center. If Electro-Gravitic theory is correct, it should be able to explain why stars at a certain radius from the center of the galaxy revolve around on their orbits at about the same velocity. While the two counterforce fields are emanating from the central region of the galaxy, they are dissipating at different rates. The force of gravity is declining as the square of the distance of the average sum of all the inner masses in the galaxy, while the electromagnetic field is declining to zero over five rotations of the galaxy. Since the estimated rotation period of the Milky Way is about 225,000 years, is magnetic field will become zero at a distance of about 1,125,000 light-years. However, at some radial distance outward, the gravitational field will be weaker than the electromagnetic field. In this way, even though gravity is weakening as the magnetic field, but more so.

Therefore, stars will experience, at these greater distances from the center of the galaxy, a stronger sideward push. The stars must respond to this greater sideward push by going at the same velocity, because the electromagnetic field is attenuating gradually at a steady rate. However, because gravity is declining with distance at the same time, the overall effect will be to have gravity yield generally the same pull or gravitational interaction over the entire length of the galaxy, from the radial point where the mechanism began to operate, outward.

If this analysis is correct, it should show itself in galaxies with different magnetic field strengths. A spiral galaxy with a weaker magnetic field than another of approximately equal mass, but with a stronger magnetic field, will have that radial point begin closer to the center of the galaxy and, because the masses of the galaxies are equal, the pull of gravity will affect the orbital motion of the stars more strongly. Of two equally massive spiral galaxies, with one having a
weaker magnetic field than the other, the galaxy with the weaker magnetic field will have its stars orbit around it more rapidly than will the galaxy with the stronger magnetic field.

This can be clearly seen with the two types of spiral galaxies analyzed by Vera Rubin, from the Carnegie Institute in Washington, DC. Figure 4 (See page 246) shows a general plan of the structure of a spiral A type galaxy with highly curved arms wrapped around the galactic core. The spiral C type galaxy has arms which are very moderately curved, by comparison.

A basic tenet of Electro-Gravitic theory is that electromagnetism will produce a liner structure in space. The straighter the arms of a galaxy, the stronger the galaxy’s magnetic field. Bart J. Bok states,

“It is highly probably that, although gravity is the major force controlling the orbits of stars in the galaxy, it acts in conjunction with magnetic forces in controlling the shape and movement of the gaseous spiral arms.

“Apparently these magnetic forces can preserve the spiral pattern more or less intact . . .”29

Figure 5, below, shows the way a galactic magnetic field is arranged in a spiral galaxy:

Figure 5. GALACTIC MAGNETIC FIELD IN A SPIRAL GALAXY

In order to keep the arms of a galaxy straight, the magnetic field of that galaxy must be stronger than that of a galaxy in which the arms are highly curved. To maintain a fairly straight structure in the arms of a galaxy against the pull of gravity, which will tend to disperse its constituents, requires a stronger magnetic field than that found in a galaxy where the arms are highly curved. In this galaxy, gravity is able to bend the arms around the galactic core, which again suggests a weaker magnetic field. Thus, in the galaxies examined by Vera Rubin, the galaxy with the weaker magnetic field should have its stars more forcefully influenced by gravity than the galaxy with the stronger magnetic field. This is precisely what she discovered.

The only way to determine the validity of this analysis is to conduct a particularly specific test in space, as I have outlined previously. This test, I am confident, will validate Electro-Gravitic theory. But, rather than carry out such a basic experiment, astronomers have invoked dark matter. In ancient Greece, Aristotle confronted a very similar problem when he had to explain how the Sun, planets and stars revolved around the Earth-centered universe so very rapidly, i.e., in one day. The great distances at which these celestial bodies were situated from the Earth required that they had to travel on their orbits at stupendous speeds. Aristarchus, thereafter, had, by a system of triangular analysis, mathematically shown that the Sun was at least 4.8 million miles from the Earth.30 This gave the Sun an orbital circumference of about 30 million miles. Based On Aristotle’s heliocentric concept, the Sun had to travel this orbital distance once every 24 hours, which necessitated that the Sun’s velocity be at least 1.25 million miles per hour. Planets


situated even farther from the Earth had to travel even more rapidly and the stars at the greatest
distance had to travel even faster. However, all these distant celestial bodies orbiting the Earth
had to have velocities almost proportional to their distance from the Earth so that they all
completed one revolution in almost precisely 24 hours, so as to allow their relative positions to
change, relative to one another, so very gradually. What Aristotle did to “save the appearances”
(the idiom employed by the ancient Greeks to make the data consistent with the geocentric theory),
was invoke a different kind of matter for the composition of the heavenly bodies and the invisible
spheres which moved them. This new, totally unknown matter, was completely different from all
forms of matter even known to mankind, just as is dark matter.

Aristotle termed this material “quintessence” because it was so unlike the four forms
of matter known on Earth, namely solid, liquid, gas and fire or plasma. Thus, the celestial material
was the fifth form of matter – quintessence. Quintessence was unique in that it did not interact
with the Earthly forms of matter, while dark matter is quite similar in that it is weakly interacting
with ordinary matter. In essence, quintessence did everything Aristotle needed to do and had the
properties necessary to “save the appearances” as does dark matter. It was also invisible, like dark
matter.

What is most ironic is that Aristotle also had to invoke a whole series of invisible
spheres, concentric to each other, which were centered on the Earth and made of this material, to
carry the planets, Sun, Moon and stars with them at the precise, proper velocities – just as dark
matter does with stars in spiral galaxies. Figure 3, with the galaxy removed, the Earth placed in
the central sphere, and the Moon, Sun, planets and stars placed inside each appropriate concentric
sphere, is an exact duplication of Aristotle’s geocentric cosmos. Like Aristotle’s celestial spheres,
the outer sphere dominated the motion of the celestial bodies more than the inner ones, as does
dark matter.

For over 1,000 years, this blindly-followed theory, based on an unproven concept
regarding a special kind of matter, dominated the thinking of mankind in the western world.
Today, astronomers and astrophysicists, like the scholars of yore, are emulating Aristotle by
inventing a new form of matter and placing it in concentric spheres everywhere in the universe,
where it is needed to “save the appearances” for the theory that gravity is the sole force of celestial
motion. But, as Harlow Shapley remarked, “the trained astronomers and physicists, almost to the
last man, will insist on the fallacy of Dr. Velikovsky’s celestial mechanics,”31 in which
electromagnetism plays a significant role with gravity. The astronomers and physicists have,
instead, gone back to the dark ages where scholars believed in the reality of a form of matter that
had never been known to exist, except in their minds. Rather than entertain Velikovsky’s idea that
electromagnetism plays a role along with gravity, they will argue for the reality of this modern
form of quintessence. But, this time, I suggest that it is the astronomers and physicists
who, in
turning to this dark matter concept to salvage gravitational theory by invoking quintessence, are
the ones who truly “venture into the Black Arts.”

Until Electro-Gravitic theory is tested by the astronomical establishment, its members
will grope into every conceivable nook and cranny to find quintessence of some sort or other.

John W. Campbell, editor of Analog, was asked by Joseph Goodavage, “What don’t
you like about science, or, should I say, the scientific method?” Campbell replied,

“I think the scientific method is fine, but I am reminded of George Bernard
Shaw’s comment when somebody asked him what he thought of Christianity. He
said, “I think it’s a noble doctrine. It’s too bad no one has tried it in the last 2,000

31 Velikovsky, loc. cit.
years.” It would be a great idea if the scientists would actually use the method they claim to use to determine by experiment, by testing, instead of by deciding “Well, that can be shown mathematically that it is pure nonsense. It’s impossible . . .” (Emphasis added.)

Scientists have answered Velikovsky’s challenge to the view of gravity as being only one of two forces operating in and structuring the universe via celestial mechanics not by experimentation or by testing, but by “deciding . . . that [it] can be shown mathematically that it is pure nonsense. It’s impossible . . .” This is just what Shapley did in arguing that “it is hard to argue with differential equations or with numbers . . .” Indeed it is! But the argument is not with numbers. Only by testing will it ever be known, or shown, which concept is valid or invalid. This has never been done using an experiment in space. And, if the scientific establishment has its way, it will never be tested.

The total unreality over the question of gravity and dark matter can be seen in the following: Malcolm W. Browne, of The New York Times, reports that, at a conference held to discuss dark matter – among other issues in galactic astronomy, held by the American Astronomical Society in Columbus, Ohio, an

“...astronomer insisting on anonymity sarcastically commented on all searches for hidden matter... that ‘it’s great to find more mass [dark matter] even if it’s just a drop in the ocean; sooner or later we astronomers will get the universe into the kind of shape we want.’” (Emphasis added.)

The shape of the universe astronomers apparently want is one in which spiral galaxies are surrounded by concentric spheres of invisible, weakly-interacting, mathematically-determined but experimentally untestable dark matter.

The problem of galactic rotation should not be decided on the basis of untested assumptions. Sten Odenwald suggests,

“Among the internal fields [of the universe] there may be some we haven’t yet discovered. Could the cosmological constant [that Albert Einstein proposed in 1916 as an *ad hoc* counterforce to gravity] be the fingerprint in our universe of such a ‘hidden’ field?”

Electro-Gravitic theory shows that this field is not “hidden.” Astronomers should not repeat the error committed by the ancient Greeks. They should turn away from deductive concepts, such as dark matter, and come out of their platonic cave, where the reality of their dark matter concept has led them. They should break the dogmatic, gravitational chains that bound them to live in darkness and come out into the electromagnetic world of sunlight and science to test all the theories that explain galactic rotation.

A further major contradiction to Dark Matter is the fact that globular clusters (great spheres made up of mostly old red giant stars) in the Milky Way exhibit behavior showing that they contain none of this invisible material. According to Ken Freeman and Geoff McNamara:

“Why do globular clusters not contain dark matter? The logical flow of the dark matter problem starts at the galaxy level, but for reasons astronomers do not

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33 Ibid.
34 Velikovsky, *loc. cit.*
understand, we do not see dark matter at scales smaller than galaxies. This is a puzzle, since there is no obvious reason globular clusters should not have dark matter. Large globular clusters are about the same mass as the smallest dwarf galaxies [that have Dark Matter] . . . They swim through the Milky Way’s dark matter halo . . . This is especially puzzling, because most of the globular clusters in our galaxy are among the oldest known objects in the universe and were forming at about the same time as the smallest of the dwarf galaxies, which we know consist almost entirely of dark matter.”

Globular clusters orbit on long elliptical paths through the Milky Way and also through all the other spiral galaxies in the universe that are also supposedly filled with Dark Matter. Nevertheless, as they pass through galactic regions of Dark Matter, it somehow never infiltrates them. The Dark Matter refuses to enter these massive globular clusters. This requires the unusual behavior that globular clusters throughout the entire universe somehow push Dark Matter out of the way in the direction it moves, and once past that region, the Dark Matter rushes back to its original place and original distribution within that region. This, of course, is such a unique form of physical action that it defies both physics and logic. Little of this is ever discussed in the literature about Dark Matter disseminated to the public.

Lastly, the best way to determine the amount of Dark Matter in our galaxy is to look at all the visible matter around the neighborhood of the Sun, count its mass and see if Dark Matter within this region has added any mass whatever to it. In Science Daily for April 18, 2012, there is a report on just this research in an article titled, “Serious Blow to Dark Matter Theories? New Study Find Mysterious Lack of Dark Matter in Sun’s Neighborhood.”:

“The most accurate study so far of the motion of stars in the Milky Way has found no evidence for dark matter in a large volume around the Sun . . . a new study by a team of astronomers in Chile has found that these theories do not fit the observational facts . . .

“A team using the MAG/ESO 2.2 metre telescope at the European Southern Observatory’s La Silla Observatory [Chile] along with other telescopes has mapped the motions of more than 400 stars up to 13,000 light years from the Sun. From this data they have calculated the mass of material in the vicinity of the Sun in a volume four times larger than ever considered before.

‘The amount of mass that we derive matches very well with what we see – stars, dust and gas – in the region around the Sun’ says team leader Christian Moni Bidin . . . ‘But this leaves no room for the extra material – dark matter – that we were expecting. Our calculations show that it should have shown up very clearly in our measurements. But it was just not there’ . . .

‘By very carefully measuring the motions of many stars, particularly those away from the plane of the Milky Way, the team could work backwards to deduce how much matter is present. The motions are a result of the mutual gravitational attraction of all the material, whether normal matter such as a star, or dark matter . . .

“The new results also mean that attempts to detect dark matter on Earth by trying to spot the rear interactions dark matter particles and ‘normal’ matter are unlikely to be successful.

“‘Despite the new results, the Milky Way certainly rotates much faster than the visible matter can account for. So if dark matter is not present where we expected it, a new solution for the missing mass problem must be found . . . ’ concludes Christian Moni Bidin.”

Lindley summarizes the problem thus:

“Modern cosmological theories are built on ideas that have no proven validity, if one insists on the old-fashioned standard of empirical evidence. The hope of the cosmologists is that, in the fullness of time, observations and theory will come together in one particular, neat arrangement so elegant that it will be persuasive despite the lack of solid evidence. Nothing in cosmology today encourages this hope. Simple theories have been replaced over the years by more complicated theories, which nevertheless do not work very well. Perhaps the universe really is a hugely complicated place; perhaps there are fifty-seven varieties of dark matter [as 57 varieties of Heinz products], coming from fifty-seven broken symmetries in particle physics. Perhaps there will never be a compelling simple theory of galaxy formation, and we will just have to make do with the simplest theory we can think up.”

Dark Matter is the imaginary solution to the problem of galactic rotations and its evocation is reminiscent of a radio skit presented by the old-time comic team of Bud Abbott and Lou Costello:

Abbott: “Look, suppose you were out in a boat and a strong east wind came up. What would you do?
Costello: “I’d throw out an anchor!”
Abbott: “But suppose a terrific west wind came up?”
Costello: “I’d throw out another anchor.”
Abbott: “But suppose a north wind came up?”
Costello: “I’d throw out another anchor!”
Abbott: “Hey, wait a minute, where are you getting all those anchors?”
Costello: “Same place you’re getting all that wind.”

The absurdities of Dark Matter theory as a solution to the rotation of galaxies are as inane and obtuse as Abbott and Costello’s little skit. Scientists have literally created Dark Matter out of nothing. What else has science put into space that has not been proved to exist?

SPACE INFLATION AND THE INVENTION OF THE HIGGS BOSON

The universe supposedly began when a singularity or black hole that had all the mass, electricity and space in it for some unknown reason exploded. Alan Guth received a Nobel Prize for explaining what happened next, which came to be known as “inflation.” At $10^{-36}$ seconds after

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38 “Serious Blow to Dark Matter Theories . . .” Science Daily (April 18, 2012), Front page (Internet).
40 The Abbott and Costello Program for Camel Cigarettes, NBC (January 25, 1945), (Internet).
the Big Bang, the universe expanded exponentially beyond the speed of light. It was not the matter that expanded outward, but the space that contained this matter that expanded; since matter cannot, according to Einstein, travel faster than the speed of light, the way to get the matter to expand throughout the universe was to have the space between it expand. Science writer, Marcia Bartusiak, outlines the development of Guth’s inflationary concept that was very quickly accepted by the scientific establishment because, as we will see, like Dark Matter, it was needed to make the Big Bang theory work.

“Guth did not start out to do cosmology. Working with a Cornell University colleague, Henry Tye, he was trying to determine if most current grand unification theories in physics – theories that attempt to unify the forces of nature – might give rise to monopoles (hypothetical particles of magnetic charge). The two particle physicists concluded that monopoles would be generated and proceeded to see how many might be produced in the Big Bang. So many would be created that ‘we began to wonder why the universe was here at all,’ said Guth ‘Their tremendous weight would have closed the universe back up [by causing it to implode back into a black hole] eons ago.’”

Because what they found would not allow the universe to expand to its present size after about 13.7 billion years – some way had to be found to get out of this impasse, as Bartusiak further explains:

“Guth and Tye eventually surmised that monopole production could be curtailed if the early universe ‘Supercooled’ as it expanded – [Supercooling allowed] the forces of nature in effect staying unified for a while as temperatures plunged, just as water can sometimes supercool and remain liquid below its freezing point. The notion of [there being an] inflation was encountered when Tye casually reminded Guth to check how this supercooling might affect the infant universe.

“Guth carried out the initial calculations at his home office on the night of December 6, 1979. He started at about $10^{-35}$ seconds into the universe’s birth . . . His equations told him that supercooling would endow the universe with a tremendous potential energy. A pressure contribution to gravity became so substantial that it reversed the effect of gravity, causing the tiny universe to balloon outward at a superacceleration rate for a miniscule (~$10^{-35}$ second or so), stretching space-time [with all the protomatter of the Universe contained in it outward] by a factor of $10^{-30}$ or more. When this supercooled state came to an end, its latent energy was [then] released as a fireball [of expanding heat that cooled down] that eventually cooled into the matter and radiation that surround us today.”

The reader is asked to note that all this theoretical work was based on mathematics because there is no way to observe that instance of expansion. But it was accepted because the beauty of Guth’s theory that seemed to explain certain cosmological problems.

“His scenario solved two puzzles that had long been troubling cosmologists: why the universe was so uniform (horizon problem [a uniform distribution of matter will not collapse to form stars, galaxies]) and why it was right at the brink between eternal expansion and eternal recollapse (its curvature [of space being] geometrically ‘flat’). With general relativity, Einstein showed that matter caused

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space to warp and bend... with too little mass in the universe, the curvature of space-time will never curl back up on itself; instead the universe remains ‘open’ destined to expand forever. But a certain quantity of [just the correct amount] of mass/energy – just beyond the critical density – can provide enough gravity to ‘close’ the universe, slowing down the galaxies [moving apart] and eventually drawing them back inward... Such a condition requires fine tuning. It was far more probable for the universe to be very open or [it would]... have closed up within $10^{-44}$ seconds after the Big Bang. A burst of inflation though essentially jump-starts the universe and immediately flattens its curvature, driving it naturally to the very boundary between open and closed.”

Bartusiak concludes her analysis thus:

“Inflation also explains the universe’s puzzling uniformity. Over scales of billions of light years, matter and remnant radiation from the Big Bang are distributed fairly smoothly, which has been a mystery because there is not enough time in the standard Big Bang model to obtain the same temperature and density in all parts of the embryonic universe. But the preinflationary kernel that gave birth to our universe – a trillion times smaller than a proton – did have time to blend its contents well with inflation, then stepping into maintain this uniform mixture throughout the growing bubble of space time...

“Guth’s initial approach had a fatal flaw, which he pointed out in his paper. At the end of the hyperaccelerated burst [outward], he was left with a chaotic collection of tiny ‘bubble universes’ none of which could evolve into the [present] universe... But in the following years other theorists, ... developed other versions of inflation involving other mechanisms [which] allowed any one of Guth’s many bubbles to balloon into a suitable universe. Inflation soon became an essential feature in standard cosmological models.”

This all appears to work quite nicely as a valid theory that explains how the universe went from a black hole to that which exists today. But with all the patches created by other theorists, the problem was, as a matter of fact, never actually resolved, as Scoular sums up this question:

“In spite of two decades of theoretical efforts, there is still no real theory of inflation. All inflationary predictions depend on the assumed form of the inflation potential [energy], not yet derivable from fundamental theory. Simple models include an arbitrary potential, which must [then] be fine-tuned to obtain agreement with observation. Worse, they are quantum mechanically inconsistent [non-renormalizable] beyond leading order when gravity is included. At best, the models are a ‘stand in’ effect theory for a fundamental approach still to be developed... The strongest argument for inflation is just that there is no other viable alternative.”

That is, if one accepts the Big Bang theory, there is no other alternative to go from the tiny kernel of a universe black hole to the condition of the present universe without inflation. The theory of the Big Bang requires inflation and inflation requires there was a Big Bang. What we have in reality are two assumptions each demanding that the other works and is true as assumed.

43 Ibid., p. 577.
44 Ibid., p. 578.
45 Scoular, First Philosophy... op. cit., p. 354.
Physicist Howard Georgi calls inflation “a wonderful sort of scientific myth, which is at least as good as any other creation myth I’ve ever heard.”

However, to explain the way that the protomatter in the early universe evolved to become the forms of matter we experience today containing gravity at the end of the inflationary period, somehow a particle that was a pure gravitation entity united with subatomic particles that became atoms and endowed them with mass gravity. This particle came to be known as the Higgs boson or as Leon Lederer called it, “The God Particle.” When many of the Higgs bosons exist in space they are referred to as a “scalar field,” a field filled with Higgs bosons. In this regard, Lisa Randall admits, “Nevertheless, we are fairly confident the Higgs mechanism applies to our world, since it is the only way to give Standard Model particles their masses.”

Historian of science, David Lindley, put the proposition for why inflation demands a Higgs boson:

“Inflationary cosmology has become a widely accepted piece of theorizing while remaining entirely conjectural. With the right kind of theory, it can be made to work. Some cosmologists have found even supersymmetry a bit too restrictive, and have decided that inflation is so important a theory that it deserves its very own Higgs mechanism, divorced from any real or imagined symmetry breaking in particle physics. Thus arises, in some theories, a particle called, almost as an admission of defeat, an ‘inflation’ belonging to a Higgs mechanism introduced into physics for no other reason than to make inflation work . . .

“Alan Guth meant to demonstrate that grand unification, which would, in turn, lead to a large, uniform, long-lived universe – the very thing we inhabit. But now this logic has been turned inside out: [in order] to get our universe, so the argument goes there must have been the right kind of inflation, at an early time, but neither grand unification nor (probably) supersymmetry is quite up to the task of making the right kind of inflation happen, so the true theory of particle physics must contain some additional piece [the Higgs boson] that drives inflation.”

Therefore, the Big Bang demands inflation and inflation demands that Higgs bosons unified gravity or mass with subatomic massless particles. Each phenomenon was dependent on the others. Marcelo Gleisner asks:

“Whether effective [sic] description or fundamental entities, scalar [Higgs] fields can produce the positive acceleration needed to fuel the faster-than-light cosmic expansion of [Guth’s] inflationary cosmology? If the field is away from its equilibrium state and thus under strain, it will behave like the mythic cornucopia that never stops producing fruit, [expanding or contracting], until, that is, it reaches its equilibrium, or lowest energy state.

“In Guth’s original model, the all-powerful scalar [Higgs] field that drove the exponentially fast expansion came from a theory that went beyond the Standard Model [of subatomic physics] and attempted to unify all the atomic and subatomic properties of matter: electromagnetism, and the strong and weak nuclear forces. Such theoretical constructions [that unite these forces] . . . go by the . . . name Grand Unification theories . . . Full unification would be eventually completed through

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46 Ibid.
the incorporation of gravity, the fourth and last force. Unfortunately . . . the main predictions from grand unification haven’t yet panned out. To make things worse, Guth’s original model didn’t work either . . .”

Both inflation and grand unification in Guth’s model didn’t work and, therefore, something had to be done. According to Gleisner:

“A new strategy was developed disconnecting inflation from G[rand] U[nification] T[heories]. The logic goes as follows: ‘Forget Guth’s original motivation from particle physics; given that we don’t really know what was going on during the very first moment of cosmic existence . . . let’s just assume that some sort of scalar [Higgs] field was present at the time and was able to generate the negative pressure needed to fuel inflation. Inflation is too simple and compelling an idea, it solves too many problems to be abandoned. Whatever, [unknown physical entities] drove it, it played the role of an effective scalar [Higgs] field.’”

Here, the admission is being made that the Higgs boson in the scalar field is necessary to drive inflation, but at the same time it was abandoned because no one knows what happened during the first moment of cosmic inflation. Nevertheless, some kind of scalar Higgs field must have somehow existed to create inflation because again, inflation is necessary. If we compare this analysis with what Velikovsky suggested about the orbits of Venus and Mars being circularized by electromagnetic forces, we would be doing exactly what scientists are doing with the scalar Higgs field to create inflation. “Let’s just assume” that some sort of electromagnetic energy was able to generate the force needed to fuel the changes in the orbits of Venus and Mars, whatever drove it played the role of an effective force. We argue that the idea that Venus and Mars’ orbits changed is too simple and compelling an idea. It solves too many problems to be abandoned. However, [unknown physics] drove it, it played the role of an effective repelling electromagnetic field. Velikovskians, of course, would be vilified and ridiculed for suggesting such an illogical, non-scientific theory. In essence, again, as Martin Gardner said, it is the scientific establishment that has invented a force [the scalar Higgs field] capable of doing precisely what they want it to do. There is no scientific evidence whatever for the power or existence of this force in the first moments of creation. Higgs bosons serve the function of creating inflation for the scientists . . . They explain the unexplainable. But so convinced are the scientists that they can – with a straight face – belabor those who refuse to recognize this imaginary energy!

In this respect, Nobel laureate, Martinus Veltman, shows, “The biggest drawbacks of the Higgs mechanism is that so far no evidence of its existence has been found. Instead, a fair amount of indirect evidence already suggests that the elusive particle does not exist. Indeed, modern theoretical physics is constantly filling the vacuum with so many contraptions, such as the Higgs boson, that it is amazing a person [can see through the vacuum] can see the stars on a clear night!” Scoular goes on to outline the problems of the scalar Higgs field and there are many of them and they are seriously difficult to overcome:

“Eugenie Samuel, of New Scientist, reported in 2001: ‘The legendary particle that physicists thought explained why matter had mass probably doesn’t exist. So say researchers who have spent a year analyzing data . . . at the CERN nuclear physics lab near Geneva . . . Now the calculations have been reworked, members of the Electroweak Working Group say there was no sign of a Higgs at energies up . . .”

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49 Marcelo Gleisner, A Tear at the Edge of Creation, (NY 2010), p. 87.
50 Ibid., pp. 87-88.
to 115 GeV [Giga Volts], well past the 80 GeV [Level] where it would be expected [to show itself]. That only leaves around 30 percent of possibilities. Its existence is looking ‘less and less likely,’ say Steve Reucroft . . . of Northeastern University. ‘We’ve eliminated most of the hunting areas,’ [where Higgs bosons should be found], confirms Heil Calder at CERN.

“Second, the Higgs mechanism leads to a fine-tuning problem, as theoretical physicist, Lee Smolin, explains:

‘The problem lies with the unprotected particles, which in the standard model of elementary particles mean the Higgs and the Higgs alone. It turns out to protect the Higgs from being pulled up to the Planck mass; we have to turn the constants of the standard model to the amazing precision of thirty-two decimal places. Any inaccuracy in any of those thirty-two decimal places and the Higgs boson ends up much heavier than it is predicted to be.’

“Third, according to the equivalence principle, inertial mass and gravitational mass are identical. That is, acceleration (which is related to inertial mass) can be related to inertial mass) can be interpreted as gravity (which is related to passive gravitational mass). That is, by a change of interpretation it is possible to switch between inertial and gravitational mass. Therefore, one would expect any mechanism for inertial mass to be related to the mechanism for massive gravitational mass. However, the Higgs mechanism only explains inertial mass, not passive gravitational mass.

“Fourth, the Higgs mechanism – other than providing mathematical consistency for the electroweak theory – does not provide any additional insights as Nobel laureate Martinus Veltman explains:

‘From a physical point of view, little is to be gained by proposing that the Higgs boson accounts for mass. It is not known, for example, why the Higgs field should couple more strongly to some particles than it does to others. Nor do investigators understand how the mass of the Higgs boson itself (which is not known) comes about, although it is generally presumed to be dominantly through a self-interaction with the Higgs field. In this sense, ignorance about the origin of particle masses is replaced by ignorance about particle-Higgs coupling, and no real knowledge is gained.’

“Fifth, the Higgs mechanism is introduced in an ad hoc way with its only purpose being to make the Standard Model work [what Gardner accused Velikovsky of doing].

“Sixth, whilst the Higgs mechanism explains how particles get their mass, it does not explain how the Higgs particle gets its mass.

“Seventh, the Higgs particle not only couples to other particles, but also to itself. Bound Higgs particles have lower energy than unbound Higgs particles. It so happens that an infinite number of Higgs particles have a more negative energy than the positive energy associated with the mass of all Higgs particles. As a result, when the Universe began at the Big Bang, energy would have been released by creating this bound state. However, if this occurred, than the strong gravitational effects of the bound would lead to a curved universe the size of a [British] football. This is not observed.”

52 Ibid., pp. 281-282.
While the Higgs boson only has mass it lacks electrical phenomena. In this regard, it is also unique in terms of physics, as Wal Thornhill explains:

“The ‘God Particle’ or Higgs boson was invented to explain why other particles exhibit mass. He [Peter Higgs, of the University of Edinburgh] starts with assuming the existence of a particle that has only mass and no other characteristic, such as charge. So the Higgs particle is like no other in our experience since all normal matter is composed of electric charges that respond to electromagnetic influences (Dark Matter falls into the same category). However, observe that the mass of a charged subatomic particle is affected by the application of electromagnetic forces. At its simplest . . . it indicates that mass is related to the storage of energy which a system of electric charges inside the particle . . . So how can a massive particle be constructed without electric charge? It shows the problem inherent in leaving physics to mathematicians – there is a disconnect between mathematical concepts and reality.”

Because of these many problems, Martinus Veltman writes, “One of the Higgs architects calls it a rug under which we sweep our ignorance. [Sheldon] Glasgow is less kind, calling it a toilet in which we flush away the inconsistencies of our present theories.”

The seriousness of the situation was not lost on the scientists. The problems related to the Higgs boson threatened not only grand unification theory but Guth’s inflation theory and, thus, fundamental underpinning of the Big Bang theory. Therefore, an experiment by the . . . Large Hadron Collider at CERN was carried out in 2012 to attempt to find the Higgs boson. The results were far from clear, but the scientists “felt” they “may have” at least discovered this particle, as Dennis Overby reports.

“I think we have it’, Rolf-Dieter Hauer . . . director general of CERN, said:

“Dr. Hauer and others said it was too soon to know whether the new particle, which weighs in at 125 billion electron volts [GeV], one of the heaviest subatomic particles yet, fits the simplest description given by the Standard Model, the theory that has ruled physics for the last half century, or whether ‘it is an impostor, a single particle or even the first of many particles to be discovered’ . . . For now, they are calling it a ‘Higgs-like’ particle.”

The problem with this discovery is that its voltage was calculated not from one experiment but the combined evidence of two experiments. This is not the way science operates, as physicist Aiden Randle-Conde explains:

“Why shouldn’t we combine Higgs searches across experiments?

“If neither experiment gets 5 sigma [the level at which this experiment should be confirmed] and we would like a discovery, what can be done? The next obvious step would be to combine the results from the two experiments and count the Sigma [value of both together]. Despite being an obvious next step, this is the worst thing we can do at the moment.

“The reason we have two experiments . . . looking for the Higgs boson is because if one experiment makes a discovery, then the other can confirm or refute the discovery . . . so when one experiment sees an effect, but its counterpart doesn’t, then it’s likely due to a problem with analysis. In an experiment as complicated as

53 Wal Thornhill, The Electric Universe – The $6 billion LCH Circus (Internet)
[this] . . . it’s not surprising that something subtle would get missed. Everything the hardware and software was telling the physicist was there was a bump [observed] in distribution. The easiest way to see if this is wrong is to see what [other] . . . hardware and software tell us. It turns out they disagree in this instance and we got the crosscheck needed . . .

“If we combine measurements from two different experiments we end up losing the vital crosscheck. The best way to proceed is to do a few more experiments until both experiments produce a 5 sigma [value] and see if the results [of both also] agree.”

Nevertheless, the Nobel Prize was awarded jointly to François Englert and Peter W. Higgs in physics for 2013, not for the discovery of the Higgs boson, but “for the theoretical discovery of a mechanism that contributes to our understanding of the origin of mass of subatomic particles, and which recently was confirmed through the discovery of the predicted fundamental particle by the [two] ATLAS and CMS experiments of CERN’s Large Hadron Collider.”

In essence, they were being awarded Nobel Prizes for a “theoretical discovery.” Regarding the Higgs discovery “confirmation,” the Nobel Prize Committee writes, “On 4 July 2012 at CERN laboratory for particle physics, the theory was confirmed by the discovery of a Higgs particle . . . . Two research groups of some 3,000 scientists each . . . managed to extract the Higgs particle from billions of particle collisions in the LHC.”

The Nobel Committee is claiming that this particle is “a Higgs particle,” not “the Higgs particle.” CERN, itself, admits, “This particle is consistent with the Higgs boson, but it will take further work to determine whether or not it is THE Higgs boson predicted by the Standard Model.” Amazingly, a year and a half after the “official announcement of the Higgs boson, all papers in Physical Review Letters never call it THE Higgs boson, but a “Higgs-like” or as a “candidate.” As we are told elsewhere:

“Just because something looks like the Higgs particle does not mean it is the Higgs particle. If physicists do discover a new particle, they will need to measure its numerous properties before they can determine whether it is the Higgs boson described by the Standard Model of particle physics. Theory predicts in great detail how a Standard Model Higgs particle will interact with other particles. Only after carefully measuring and testing these interactions . . . – would scientists be certain that they had indeed found the Standard Model Higgs boson. A new particle that did not act as expected would give a whole new set of mysteries to explore.”

Miles Mathis adds this further stunning contradiction to physics and reason that the Higgs boson creates, namely that it is much, much larger, more massive than the particles that it gives mass to:

“The current articles even admit the proposed particles at 125 GeV is no proof of Higgs’ theory or of a God particle or any way to give mass to matter. Mainstream physicists have simply prepared their audience by telling them . . . a large particle [found at CERN] will be proof of their theories of mass creation [after the Big Bang]. But do you think the large particle – supposing it has been found – has a

56 Aidan Randle-Conde, “Why we shouldn’t combine Higgs searches across experiments.” (Internet)
57 Close Only Counts in Horseshoes, Hand Grenades and Higgs Bosons (Internet)
58 Ibid.
59 Ibid.
60 “Ten things you may not know about the Higgs boson,” Symmetry dimensions of particle physics. (Internet)
sign on it that says ‘Higgs’? No. They have to show more than a large particle. They have to show some rational mechanism by which a large particle gives mass to smaller particles . . . How can the mass of a small particle be explained by the existence of a large particle? Isn’t that topsy-turvy and inverted? We are being told that smaller particles are composed of larger particles. And if not, what are we being told?

“In the history of physics, larger particles were always composed of smaller ones: that was the definition of ‘composed.’ A rock is composed of molecules and the molecules are, by necessity, smaller than the rock. Molecules are composed of atoms, and atoms are, by necessity, smaller than the molecules. But now that is reversed. If the Higgs theory is accepted, we will have larger particles defining the qualities and quantities of smaller particles . . . For centuries, we have been composing larger things from smaller things. That was physics. But the Higgs theory reverses this and we now have smaller things created from larger things [not that the Higgs boson breaks up into smaller particles to form them] . . . The [bigger] Higgs boson ‘gives’ mass to hadrons and leptons and so on.”

The point that must be stressed is that if there is no Higgs boson found that is predicted by the Standard Model of physics, it would mean the collapse of that entire theoretical framework. In his book, The Higgs Fake: How Particle Physicists Fooled the Nobel Committee, by Alexander Unzicker, page 116 cites David Lindley that the Higgs boson “may be as well regarded as a mathematical invention.” Martinus J. G. Veltman, in this regard says, “the only legitimate reason for introducing the Higgs boson is to make the Standard Model mathematically consistent.” Like so much else, the Higgs boson is absolutely necessary to the last hundred years of particle physics research. And, therefore, it is unthinkable that an entire field of Ph.D.s in it will, as Soviet Premier, Mikhail Gorbachev, admitted that communism, as an economic, political experiment, failed. Therefore, I believe this particle will be salvaged in some way, come hell or high water. Two citations from Richard Feynman sums up the entire concept: “It’s not because Nature is really similar; it’s because physicists have only been able to think of the same damn thing [to fit their theories] over and over again” and wherever we encounter a mess of too many problems, it’s because we stick to established methods.” Unzicker’s book “is a merciless critique of the Large Hadron Collider at CERN and of the theoretical model on which the world’s most expensive experiment is based. Moreover, with increasingly intricate techniques, particle physicists are fooling themselves with alleged results while their convictions are based on group-think and parroting.” Unzicker’s work has not endeared him to those working in the field of particle physics, and Peter Woit has responded to his criticisms by calling Unzicker a “crank.” In other words, if one challenges the accepted theory of particle physics, one must be ostracized, and name-calling is one way to accomplish this.

Today, no scientist has given the clear proof that the Higgs boson has been proved scientifically. All announcements I have seen say they “believe,” “are confident,” “almost

61 Miles Mathis, Higgs Boson Found under Big Foot’s Paw (Internet).
65 Ibid., back cover.
“certain,” “most probably have found,” the Higgs boson exists, etc. It has not been found and the scientific establishment, so desperately needs it that they don’t know what to do. After supposedly announcing the possibility of having found this particle, CERN has shut down for a few years and, thus far, has failed to replicate in two experiments independently of each other collaboration for and of the Higgs particle. It is simply amazing how scientists can be so willing to give up their scientific understandings for a theory and a particle that is so overburdened with contradictions. But, Velikovsky’s concept that electromagnetism functions as a counter force to gravity cannot have any standing, although that is the direction science is heading, as we have shown above. What else has science invented and put into space that does not exist?

**DARK ENERGY – EX NIHILO NIHIL FIT – YOU CAN’T GET SOMETHING FROM NOTHING**

Like Dark Matter, DARK ENERGY can only be known by its effect on the Universe. While Dark matter caused the Universe to contract so that stars and galaxies could condense out of the primordial particles, Dark Energy does just the opposite. It is causing the space in the Universe to re-expand and push galaxies apart from one another at an ever growing rate. As John Shacklefree describes it, “Dark Energy makes the universe [re]expand and as it [re]expands, more dark energy is created to fill the gaps – in other words, there must be something in nothing. Dark Energy is the energy of nothing – taking over more space filled with even more nothingness.”

“Something from nothing” is truly a form of “Doublethink,” like saying “war is peace.” David Weintraub has connected Dark Energy to the “Force” in George Luca’s movie series *Star Wars*: “Its energy surrounds us and binds us. Luminous beings are we, not this crude matter. You must feel the force around you here, between you and me, the rock, everywhere, yes . . . Yes . . . strength flows from the Force. But beware of the dark [energy] side.” That is long after inflation slowed the universe, it suddenly re-commenced and sped up. How did this all come about? The discovery of Dark Energy came in 1988 when observations of the red-shifts made scientists conclude that, since the time of the Big Bang, the collective gravitational pull of all mass in the Universe should have been slowing. Guth’s inflation and thus, the expansion, was becoming ever smaller in velocity. The shock came when two independent teams of astronomers discovered that instead, the more distant galaxies moving away and apart from one another ever more slowly, those that were seven billion years old had then begun to speed up and re-expand ever more rapidly. The Universe, seven billion years ago, had begun to re-inflate gradually but inexorably. What was the evidence that drove the physicists, astronomers and cosmologists to accept this renewed re-expansion? What was the evidence for this based on?

It was based on observations of Type Ia supernovae. This kind of supernova supposedly happens when a white dwarf star, about the size of the Earth, but with the mass of a star, like our sun, is in a close binary system with a normal main sequence star. The white dwarf being so dense it is unable to pull matter to itself from its nearby companion until it reaches a critical mass, known as the Chandrasekhar limit. When that limit is reached, the white dwarf star explodes as a supernova and gives off the same amount of light and other radiation as do all other

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Type Ia supernovae. Since these explosions are all generated by a unique mass, they are, therefore, identical and this can be used to determine how far away they are. It is similar to looking at 60 watt light bulbs at different distances. A 60 watt light bulb at 100 feet distance will be twice as bright as one at a 200 feet distance, given absolute clarity. Therefore, knowing their approximate distances, derived from various cosmic distance scales, and comparing their brightness ratios, the scientists believed they knew, with enough precision, how far away these white dwarf stars were when they went supernova. Regarding this, Ratcliffe points out:

“Convinced that they are [identical] standard candles, the devout [scientist] women and men measured variability in time taken by Ia SNe [SN 1a] to fade from their peak brilliance, and concluded with unseemly haste that the differences in apparent duration were not natural properties of varying explosive parameters, but indeed, the effect of expanding space. The idea behind it is that the ‘light curve’ – the graphical plot of brightness varying with time – would be the same for all Ia supernovae if they were measured locally. Measured remotely from Earth, however, the light curves are not the same, and that is unacceptable for standard candles [to determine their distance from Earth]. Explanation: because they lie at different cosmological distances, the variation in space duration must be expanding space-time, something known as ‘time dilation.’ The immediate conclusion drawn from this interpretation is that all this proves universal [re]expansion. What’s more, close examination, subject to the necessary prime assumptions and fudge factors, indicated to an astonished scientific audience that the rate of expansion was increasing. The Universe, ladies and gentlemen, is accelerating away again. So they say . . .

“The real issue here, as I understand it, is whether or not SNe [IA supernovae] rise times (the pattern caused by ebb and flow of [their] luminosity), support that contention. Here’s the rub: do the different light curves not tell us that Ia SNe are, in fact, not standard candles, and they explode differently over time in each example? That is pretty much how we would normally interpret the observational data in the absence of an overriding theoretical model that tells us otherwise. Unless the progenitor stars of supernovae are geochemically and geophysically identical, we would expect each explosion to plot a unique course on a non-standard timeframe. No one can deny that observable debris fields left after supernovae are so different from one another in so many ways that to suggest the progenitors were all precisely alike is ludicrous . . . We are asked by cosmologists to abandon straightforward physics [observed in debris fields of supernovae] and analyze what we see and measure [instead] through their spectacles . . .”

Ratcliffe also cites John Middleditch, who “links SNe directly to Gamma Ray Bursters and finds serious issues with classification of type 1A supernovae as standard candles.” He goes on to cite Tom Van Flandern’s article, “Do Supernovae Prove an Expanding Universe?”

“There is no such thing as a standard supernova . . . light curve. SN type 1A are standard candles only in the sense that their intrinsic maxima are limited to a range of a couple of magnitudes [of brightness], but this covers a variety of light curve widths and redshifts beyond that expected from Malmquist’s bias (the tendency to see only the brightest objects in any class at the greatest distances) [that

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69 Ibid., p. 167.
skewers the observations]. The correspondence you speak of appears only when brightness is inferred using assumption about the redshift-distance relation.\textsuperscript{70}

To summarize thus far we can say:
1. SN 1a light curves must be identical.
2. When measured locally, this seems to be the case.
3. However, when measured remotely in distant space, they are not fading away at equal times.
4. It is, therefore, assumed that the space in which they are exploding is expanding to correct and connect the together as identical standard candles fading away at equal times.
5. But only if we can prove that these SN 1a supernovae came from stars identical in size and chemical composition can we use them as standard candles. But this well-known to be false because their observed debris fields show clear-cut differences in brightness, expansion, and chemical make-up.
6. Because the debris fields of these supernovae are different from one another in so many ways, one cannot assume that with these differences, they come from identical exploding bodies.
7. The standard candles derived from SN 1a supernovae were created only when their brightness is inferred to be the same based on the assumption about their redshift differences.

Ratcliffe then presents the \textit{coup de grâce} to this concept:

“The death knell for use of SNe as verification of an expanding Universe was well and truly rung at the 1\textsuperscript{st} crisis in Cosmology Conference (CCC1) in 2005 by electrical engineer and mathematician, Tom Andrews. His paper on supernova light curves was called \textit{Falsification of the Expanding Universe Model and Derivation of the Hubble Redshift and the Metric in a Static Universe} . . . The compelling elegance of Tom Andrews’ approach is its simplicity. He invokes another class of standard candle, namely Brightest Cluster Galaxies (BCGs), and compares the light signatures with contemporary type IA supernovae. If the anomalous dimming is caused by . . . expanding space, then the effect should be seen in the light curves of all standard candles, not just IA SNe.

“Although they have the same hypothetical cause, curve broadening and time dilation are different in mathematical analysis [of these different standard candles]. Using two independent sets of data with a third set . . . as a basis for examining time dilation, Andrews shows that the broadening effect in galaxy light is consistent with neither the expanding universe model nor the notion of time dilation, and in fact, directly supports a static (non-expanding) universe model.

“In 2009, Andrews put his latest results on the alternative archive \textit{viXra}. The paper is entitled ‘Discovery of a New Dimming Effect Specific to Supernovae and Gamma-Ray Bursts’ . . . It contains explicit information extremely disturbing for those clinging to the idea of an expanding cosmos.

“. . . Andrews [also] invokes, in addition, light curves from Brightest Cluster Galaxies (BCGs) and Gamma-Ray Bursts (GRBs) to show that luminosity remains

\textsuperscript{70} \textit{Ibid.}, p. 168.
constant during the transient event, thus eliminating both increasing volume of intervening space and stretching of time.\footnote{Ibid., pp. 169-170.}

Here are some of the selected quotes from Andrews’ 2009 paper:

“Because type 1A supernovae (SNe) are anomalously dimmed with respect to a flat Friedman Universe model, it was a surprise to find that the brightest cluster galaxies (BCGs) are not anomalously dimmed. Recently, I found that gamma-ray bursts (GRBs) are also anomalously dimmed . . . Since the light from the SNe, GRBs and BCGs traverses the same space, the current hypothesis of an accelerated expansion of the universe to explain the anomalous dimming is disproved. The cause of the anomalous dimming must be specific to the SNe and GRBs . . . Finally, the light curve broadening effect can be used to determine if the universe is expanding or static. In the expanding universe model, a light curve broadening effect is predicted due to time-dilation for the SNe, GRBs and BCGs. Consequently, if the universe is expanding, two light curve broadening effects should [also]. However, if the universe is static, only one light curve broadening effect will occur for the SNe and GRBs. Fortunately, Goldhaber has measured the widths of SN light curves and conclusively showed that only one curve broadening effect occurs. \textit{Consequently, the expanding universe model is logically falsified.}\footnote{Ibid., pp. 170-171.}

Ratcliffe concludes:

“Tom Andrews has fired a devastating broadside into the boson of the expanding universe hypothesis. The stark simplicity of his argument simply crucifies the splinter group that came up with the idea that the Universe is undergoing an inflation renaissance. He turned their idea on its head, and used the principles of observational science to thoroughly trounce it.”\footnote{Ibid., p. 171.}

It must be pointed out at this point that the actual cause and nature of SN Ia supernovae is a theoretical construct based on mathematical modeling of the make-up of white dwarf stars, namely that they only explode when they reach a certain mass. If this is not the case and there are other models that allow these stars to explode for other reasons, then the entire theory may have no standing. Therefore, let us examine his question. W. Hillebrandt informs us:

“In principle, there are lots of problems with today’s type Ia models. They start from the fact that we do not know their progenitors. A single white dwarf accreting matter from a normal companion is [but] one option, but [two] white dwarfs merging [to explode] are a possible alternative. We do not know for sure if at the time of the explosion the white dwarf has already reached the Chandrasekhar-mass or if, at least occasionally, a helium layer on to of a C[arbon + O[xgen] white dwarf of lower mass [than this limit] ignites nuclear burning first, driving a burning front into the interior [which causes it to explode]. Another fundamental problem is that we do not know the mode of thermonuclear burning by which the white dwarf is disrupted. It could be a sub-sonic deflection wave, some kind of detonation, or a mixture of both. Given all these uncertainties, it is impossible to offer models which are essentially parameter free and [then] make firm predictions as to what a type Ia should look like, as a function of environmental parameters. In contrast, all
supernova models rely on a variety of assumptions and parameters which are then fitted to the observations . . . Moreover, . . . we are unable to settle any of the basic issues . . . [Also] systematic modifications in the appearance of type Ia supernovae could also come from different metallicities [original to the star] . . .”

All this evidence has, in general, been omitted in most discussions of these exploding stars. Michael S. Turner has concluded his paper, “Why Cosmologists Believe the Universe is Accelerating.” (Notice he does not say “Why cosmologists Know the Universe is Accelerating.”) He does not say “Know” because this expansion is based on “belief.” The nature of the belief is based on an underlying theoretical assumption based on the scientific philosophy of Sir Arthur Eddington, who believed that the test for the scientific validity of a theory is its connection to mathematical theory: “No experimental result should be believed until confirmed by theory. While provocative (as Eddington believed it to be), it embodies the wisdom of mature science. [Contradictory] Results that bring down the entire conceptional framework are very rare indeed.”

Rather than that, I maintain that no theory should be believed until confirmed by multiple forms of scientific evidence. The theory of SN 1a supernovae has been invalidated to numerous forms of interdisciplinary evidence outlined above and also below. Turner, in this respect, goes on to show:

“Both cosmologists and supernovae theorists seem to use Eddington’s test to some degree. It seems to me that the summary of SN 1a . . . goes like this. We don’t know what SN 1a are: we don’t know how they work, but we believe SN 1a are very standardized candles. I think what they mean is they have a general framework for understanding SN 1a, the thermonuclear detonation of a Chandrasekhar mass white dwarf, and have failed in their models to find a second (significant) parameter that is consistent with the data at hand. Cosmologists are persuaded that the Universe is accelerating because of the SN 1a results [they have derived from their model], and because this was the missing piece of a greater puzzle.”

The “greater puzzle” is that of making sure the Universe has a critical density or mass that would have allowed it to expand but not contract just after the Big Bang started and thereafter that expansion slowed gradually. If there is no expansion, the Big Bang theory cannot be sustained. Here, Dennis Overby explains that the “possibility is that dark energy does not exist at all in which case . . . the whole carefully constructed jigsaw puzzle of cosmology might be in doubt.” The effects of cosmic acceleration could be mimicked, astronomers say, by unusual dust in the far universe . . .”

Adding to this, John W. Moffat says:

“In ideas like mine . . . and many other cosmologists, the unexpected dimming of distant supernovae is explained by the idea of intervening galaxies, clusters of galaxies, and voids [that] form a medium like air or water through which light travels. In other words, in these models the universe is not accelerating at all: the light from distant supernovae just had a hard time getting to us, so it appears that the supernovae are farther away than they actually are. It is still a controversial


75 Michael S. Turner, “Why Cosmologists Believe the Universe is Accelerating.” p. 130. (Internet)

76 Ibid., pp. 130-131.

issue whether these models can continue to fit the supernovae data as more accurate data becomes available . . . "  

This more accurate data was presented by Raymond Carlberg and his team who have examined whether dark energy is causing the Universe to expand, as David Biello points out in Scientific American. He reviewed a new survey of evidence for SN 1a expansion by the “Supernova Legacy Survey” wherein Carlberg, after completing the analysis unambiguously stated “Our observation is at odds with a number of theoretical ideas about the nature of dark energy that predict it should change as the universe expands and as far [back in time] as we can see, it doesn’t.” Using SN 1a data and examining red shifts five years after the original observational work was done, the Supernova Legacy Survey data showed that the expansion of the Universe was not happening. That is, if the Universe is expanding the gravitation tug between say two galaxies should weaken because they are farther apart from each other over five years, therefore, the dark energy component responsible for expansion should become greater. But as Carlberg and his team admitted it simply has not changed through time. When he said “it doesn’t,” he was saying the entire concept of Dark Energy “it” “doesn’t” exist.

Ultimately, the question arises as to what this dark energy is. That is unknown, and the depth of speculation about it have all come to naught. Evalyn Gates puts the entire problem into perspective:

“Dark energy is the most compelling mystery in physics today . . . What strange phenomenon is fueling the accelerating Universe? What do we know about dark energy, the enigmatic and unexpected space time propellant . . . Uncovering the evidence for dark energy is like finding an elephant on top of a table impeccably set with the finest china and silver – adding the napkin rings no longer seems important. We stare in shock at the uninvited guest and demand to know where the elephant came from – and how it got into the room with no doorway big enough to admit it.

“The first place to look for answers to the riddle of dark energy is in the vacuum of ‘empty’ space. We know from quantum physics that empty space is not really empty, but a bubbling cauldron of virtual particles that continuously pop in and out of existence. This lively state of affairs implies that there could be an energy of the vacuum – that the zero point, the lowest energy state of the vacuum is not really zero. But when we try to calculate the size of vacuum [quanta] energy on the basis of our understanding of the subatomic particle world, we find a number that is far too large (by many orders of magnitude) [120 orders of magnitude which would tear apart every atom of the Universe].

“This is a problem, since vacuum energy is also the last place to look within the borders of our Standard Model of the subatomic world. No other explanations for dark energy use physics that is already known and understood. The evidence [or more precisely the concept] for dark energy impels us to go beyond our current model of the microcosmos in search of new physics that will give us vacuum [dark] energy of the right magnitude, or explain the dark energy with something even stranger.”

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79 David Biello, “Supernovae Back Einstein’s Blunder,” Scientific American (Nov. 23, 2005), (Internet)
There is simply no known form of physics that can explain Dark Energy, neither gravity nor quantum theory. These are the only physical theories presently known that exist to explain the nature of the cosmos and the world of the atom. Dark Energy, therefore, needs an entirely new physics concept to create vacuum energy. Like Dark Matter, Dark Energy is inexplicable in terms of the only two physics theories known. The elephant on the table simply isn’t there; it is a grand illusion, like Dark Matter and Dark Energy or, more aptly, a grand delusion. Wherever scientists have looked for evidence of these phenomena, they simply aren’t there. And all the interdisciplinary evidence regarding these entities also shows they simply aren’t there.

Like the Cheshire Cat in Lewis Carol’s Alice in Wonderland, that dissolves very slowly starting at its tail and ending with its grin, the concepts of Dark Matter, Higgs bosons and Dark Energy will, in time, dissolve. Lawrence Maxwell Krauss admitted that there is no understanding of what Dark Energy is and how it requires “some out-of-this-world ideas” to explain its existence.

“But there remains hope, in the fourth of one inexplicable crazy facet of modern cosmology that has resisted all efforts to even begin to understand . . . dark energy. The fact that empty space appears to carry an energy that is large enough to dominate the expansion of the Universe today is yet 120 orders of magnitude smaller than one would expect of conventional ideas associated with quantum physics of four dimensions, literally begs for some out-of-this-world ideas to explain its existence.”

Just look at the title of Krauss’ book: Hiding in the Mirror: The Quest for Alternative Realities from Plato to String Theory (by way of Alice in Wonderland, Einstein, and the Twilight zone.) Krauss is unwittingly suggested that the entire rubric of Dark Energy as reality is that it is: “Hiding in a Mirror,” an “Alternative Reality” found by the reality of “Alice in Wonderland” and “the Twilight Zone.” In the words of lyricist, Ira Gershwin, scientists have obtained Dark matter, Higgs Bosons and Dark Energy saying “I got plenty of nothin’, and nothin’s plenty for me.” This, however, is not the end of invisible entities scientists are putting into space.

DARK FLOW

One of the most disturbing and surprising discoveries of cosmology was made by Alexander Kashlinksy and his team at NASA’s Goddard Space Flight Center in Greenbelt, Maryland. According to Francis Reddy and Rob Gutro:

“Using data from NASA’s Wilkinson Microwave Anisotropy Probe (WMAP) scientists have identified an unexpected motion in distant galaxy clusters. [The two types are ball-shaped clusters filled primarily with elliptical galaxies made up of mostly old supergiant red stars and more open shaped clusters (not necessarily ball-shaped) made up of spiral galaxies with mostly younger white, yellow-blue white stars.] The cause [of this unexpected motion], they suggest, is the gravitational attraction of matter that lies [about 32-34 billion light years away] beyond the observable universe [that is outside the 13.7 billion light year Universe].

Kashlinsky calls the collective motion . . . ‘dark flow’ in the vein of more familiar cosmological mysteries: dark energy and dark matter. The [even] distribution of matter in the observed universe cannot account for this motion,’ he says . . .

In 2000, Kashlinsky and Fernando Atrio-Barandela from the University of Salamanca, Spain, showed that astronomers could, in essence, amplify the [kinematic Sunyaev-Zel'dovich effect] SZ term [a minute shift of microwave background’s temperature which indicates the direction the cluster is actually moving]. The trick, they found, is to study large numbers of clusters.

The astronomers teamed up with Dale Kocevski, at the University of California, Davis and Harold Ebeling . . . to identify some 700 X-ray clusters that could be used to find the subtle spectral shift. This sample included objects up to 6 billion light-years – or nearly half of the observable universe – away.

. . . The astronomers detected bulk cluster motions of nearly 2 million miles per hour. The clusters are heading toward [or away from] a 20-degree patch of sky between the constellations of Centaurus and Vela.

What’s more, this motion is constant out to at least a billion light-years. ‘Because the dark flow already extends so far, it likely extends across the visible universe,’ Kashlinsky says.

The finding [that only galaxy clusters moving toward or away from a point between Centaurus and Vela] flies in the face of predictions from standard cosmological models, which describe such motions . . .

All large-scale motion [in the universe] should show no preferred direction . . .

Kashlinsky and his team suggest that their [galaxy] clusters are responding to the gravitational attraction of matter that was . . . far beyond the observable universe . . .

According to Amanda Gefter, these “galaxy clusters [are] racing at up to 1,000 kilometers [620 miles] per second – far faster than our own understanding of cosmology allows. Stranger still, every cluster seems to rush toward a small patch of sky between the constellation of Centaurus and Vela.” The implications for the Big Bang theory are staggering, as Gefter shows, according to:

Luciano Pietronero, of La Sapienza University, in Rome, Italy, and Francesco Sylos Labini, of the Enrico Fermi Center of Rome, Italy . . . the standard [Big Bang] cosmological model is wrong, and that a different model might explain the motion of galaxy clusters that Kashlinsky found. ‘This is just another element pointing toward the fact that the standard picture of galaxy formation is not correctly describing what is going on in the real universe,’ Pietronero says.”

To date, Kashlinsky, et al.’s latest analysis, found that 1,400 galaxy clusters are part of the flow, but that “the direction of motion is less certain. Evidence indicates that the galaxy clusters are headed outward, away from Earth, but the team cannot rule out the opposite flow. ‘We

83 Francis Reddy, Rob Gutro, “Scientists Detect Cosmic ‘Dark Flow’ Across Billions of Light Years,” (9/23/08), (Internet)
84 Amanda Gefter, “Dark flow: proof of another universe?” (Internet)
85 Ibid.
detect motion along this axis, but right now, our data cannot state, as strongly as we’d like, whether the clusters are coming or going, ‘Kashlinsky states.”

According to the Big Bang theory, inflation caused the matter in the Universe to be very evenly distributed throughout it. The Cosmic Microwave Background radiation indicates that matter in the Universe – including Dark Matter – was generally quite evenly distributed everywhere. Therefore, there is nothing in the known universe that will gravitationally pull only galaxy clusters to or away from it. This attractor must, therefore, lie beyond the known Universe. According to the Big Bang theory, the Universe is about 13.7 billion years old; yet the gravitational attractor, tugging only on galaxy clusters, is some 32-34 billion light years away. Additionally, this gravitational force is unique and selective in its action; only affecting galaxy clusters, but not everything else. Gravity undoubtedly must affect the motion of all massive bodies and, therefore, since it is pulling the galaxy clusters, it should be pulling everything else to it, not just galaxy clusters, based on Newtonian Law.

In terms of Einstein, the identical problem exists. A massive object outside the Universe has warped space to cause galaxy clusters to move toward or away from it; that warping of space should do the same for all matter in the Universe. In terms of Dark Energy, all galaxies are supposedly moving away from each other and, therefore, would not also, at the same time, permit only galaxy clusters to not follow this expansion, but move to or away from a preferred area. If Dark Energy existed, these galaxy clusters should also be moving away from one another in different directions.

These clear-cut findings defy the Big Bang theory and, thus, have made the Dark Flow evidence very unwelcome for many cosmologists; and the counter evidence is that of type SN 1a supernovae, a concept discussed above thoroughly, contradicted by numerous other interdisciplinary forms of evidence. Therefore, the motions of galaxy clusters is a real phenomenon and must be explained. To understand what is actually causing these motions, I must reiterate the nature and structure of these two types of galaxy clusters that were nicely described by Ken Friedman and Geoff McNamara, who cite:

“William W. Morgan [who] ... studied a small number of nearby galaxy clusters ... and identified two types: those that are rather spread out and contain many spiral galaxies ... and [the other type of] denser clusters in which all the brightest members are either elliptical or SO galaxies and hardly any spirals other than the fainter members.

“Galaxy clusters are now defined as either regular or irregular. Regular clusters are roughly spherical aggregations of galaxies that contain mainly [old] elliptical or SO galaxies. They are rich and dense and may harbor 5-10% of the galaxies in the Universe.”

The more open clusters are non-spherical and are made up primarily of spiral galaxies which are dominated by young-type stars. Given this data, the motions of these galaxy clusters can be compared to the motions of similar clusters of stars in the Milky Way and all other spiral galaxies. That is, spiral galaxies also have two types of star clusters that are just like galaxy clusters and move with identical motions for each type about these spiral galaxies, just as galaxy clusters move about the Universe.

Let us begin with the regular spherical, globular clusters. These are like spherical galaxy clusters, both of which are dominated by old-red giant stars. The globular clusters move through the galaxy at high velocity and on highly elliptical orbits. This is well-known. For example, Robin Kerrod and Heather Couper state that “globular clusters follow a galactic path analogous to that of comets with in the solar system.”

Robert T. Dixon writes: “Each globular cluster causes it to periodically ‘dip’ into the nucleus [bulge] of the galaxy.” Therefore, globular clusters are on highly elliptical orbits traveling at high velocity around or toward or away from the centers in all spiral galaxies in the Universe. They are all moving toward or away from these galactic centers. This is precisely what the spherical galaxy clusters are also doing, except they are on highly elliptical, high velocity orbits about the center of the Universe which is 32 to 34 billion light-years distant in the direction of the constellations Centaurus and Vela. The globular clusters do not follow the orbits of younger disc stars that travel on highly circular orbits. In the same way, spherical galaxy clusters do not follow the orbits of identical galaxies, which are not traveling to and from the Universe’s center.

As for the open galaxy clusters, I maintain they were emitted from the Universal black hole and are moving away from that central region at great velocity as new stars are born from black holes, spinning to instability that gave rise to these open clusters of stars. As I pointed out, “galaxies are formed from that gave rise to these open clusters of stars. As I pointed out, “galaxies are formed from disrupted singularities . . . They should be the myriad singularities cast off by the [central] universal body . . . and are observed to be violently throwing off mass . . .” Therefore, I maintain these open galaxy clusters thrown outward from the center of the Universal singularity are generally moving away from it. Therefore, they, too, will be found to have a trajectory away from the constellations Centaurus and Vela.

Dark Flow, exists, but it is not a unique force; it is explained by Electro-Gravitic theory. The standard model of cosmology – the Big Bang theory – cannot account for this behavior of galaxy clusters while Electro-Gravitic theory does explain spherical galaxy clusters moving in the Universe as globular clusters moving in spiral galaxies. It can also explain open galaxy clusters which, I predict in time, will be shown to be moving away from the point of the distant attractor between Centaurus and Vela. What else is the universe composed of that cannot be observed, or even test for?

Lastly, since these stellar clusters are in orbit around a central point in the Universe, it suggests that the Universe, as a whole, is rotating around that same point. While astronomers, cosmologists and astrophysicists reject the concept that the Universe is rotating, this idea was presented by the great mathematician, Kurt Gödel, whose idea he discussed with Einstein while both were at Princeton, University. This concept of the Universe rotating, I presented in my work on Electro-Gravitic theory and I predict, in time, this will be discovered. As we discussed earlier, all bodies in the Universe exhibit torque/rotation. What astronomers, cosmologists and astrophysicists suggest is that all the bodies in the Universe rotate, but that the Universe, itself, does not. Accordingly, the only object in the Universe that does not rotate is the Universe. I suggest this conclusion defies science and logic.

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TYING UP EVERYTHING IN QUANTUM PHYSICS AND BIG BANG COSMOLOGY WITH STRING THEORY

Brian Green explains the nature of “String Theory,” also known as “Superstring Theory” or even “M Theory”:

“For more than half a century – even in the midst of some of the greatest scientific achievements in history – physicists have been quietly aware of a dark cloud looming on the distant horizon. The problem is this: there are two fundamental pillars upon which modern physics rests. One is [gravitational theory, as devised by] Albert Einstein’s general relativity, which provides a theoretical framework for understanding the universe on the largest scales: stars, galaxies, clusters of galaxies and beyond to the immense expanse of the universe itself. The other is quantum mechanics, which provides a theoretical framework for understanding the universe on the smallest scale: molecules, atoms, and all the way down to subatomic particles like electrons and quarks. Through years of research, physicists have experimentally confirmed, to almost unimaginable accuracy, virtually all predictions made by each of these theories. But the same theoretical tools inexorably lead to another disturbing conclusion. As they are currently formulated, general relativity and quantum mechanics cannot both be right. The two theories underlying . . . the heavens and the fundamental structure of matter – are mutually incompatible.”

Please note that Green is suggesting that none of the problems nor contradictions laid out above regarding celestial mechanics, solar system stability and cosmology exist. Gravitational / general relativity theory have been “experimentally confirmed to almost unimaginable accuracy, virtually all predictions made by each of these theories.” If that was the case, “tidal theory” should also fit, but it and many other aspects of celestial mechanics have failed to be confirmed with any type of accuracy. That is one of the disturbing features of superstring theory. It assumes scientists know everything about the macrouniverse – cosmology – and macrouniverse – quantum mechanics. Its proponents assume they can join these theories together as Green further shows:

“Can it really be that the universe at its most fundamental level is divided requiring one set of laws when things are large, and a different incompatible set when things are small?

“Superstring theory . . . answers with a resounding no. Intense [mathematical] research over the past decade . . . that this new approach to describing matter at its most fundamental level resolves the tension between general relativity and quantum mechanics. Within this new [superstring] framework, general relativity and quantum mechanics require one another for the theory to make sense.”

The point that must be made is that superstring theory is a theory based strictly on mathematics. As with Eddington’s scientific philosophy, it places a premium on mathematical solutions, rather than experimental observational evidence. In Green’s other book, The Hidden Reality . . . , he spells out how this works:

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91 Brian Green, The Elegant Universe: Superstrings, Hidden Dimensions and the Quest for the Ultimate Theory (NY 2003), p. 3.
92 Ibid., p. 4.
“In a single framework . . . [superstring theory] handles the domains claimed by relativity and quantum. Moreover, and this is worth sitting up to hear, string theory does so in a manner that fully embraces all the discoveries that preceded it. A theory based on vibrating filaments [strings] might not seem to have much in common with general relativity’s curved space time picture of gravity. Nevertheless, apply string theory’s mathematics to a situation where gravity matters but quantum mechanics doesn’t (to a massive object, like the Sun, whose size is large) and out pop Einstein’s equations. Vibrating [string] filaments and [subatomic] point particles are also quite different. But apply string theory’s mathematics to a situation where quantum mechanics matter but gravity doesn’t (to small collections of strings that are not vibrating quickly, moving fast, or stretched long; they have low energy – equivalently, low mass – so gravity plays virtually no role) and the math of string theory morphs into the math of quantum theory . . .

“String theory is sufficiently revolutionary to transcend the barriers that hemmed in twentieth century physics. Yet the theory is sufficiently conservative to allow the past three hundred years of discovery to snuggly fit within its mathematics.”

“Making contact with data, experimental or observational, is the only way to determine if string theory correctly describes nature. IT’S A GOAL THAT’S PROVED ELUSIVE. String theory, for all its advances, is still a wholly mathematical undertaking.”

In other words, string theory has no evidence from measured data, nor from experiments, nor from observations to support it. Its entire support is derived from mathematics and only from mathematics. This mathematics only evidence has driven many physicists to distraction. Quantum physicists, who believe that their theory is an accurate description of subatomic reality, do not wish to see all their hard won achievements trumped by physics that is backed up by nothing in the way of data, experiments or observations, and is supported solely by math. Cosmologists, on the other hand, do not wish to be told that their theory is to be usurped by theory lacking data, experiments or observations, but only by math.

What, then, is a superstring? According to Michio Kaku:

“According to string theory, if you had a super-microscope and could peer into the heart of the electron, you would not see a point particle, but a vibrating string. (The string is extremely tiny, at the Planck length of \(10^{-33}\) cm, a billion, billion times smaller than a proton, so all [other] atomic particles appear point-like.) If we were to pluck this string, the vibrations would change; the electron might turn into a neutrino. Pluck it again and it might turn into a quark. In fact, if you plucked it hard enough, it could turn into any of the known subatomic particles. They are nothing but different ‘notes’ that one can play on a superstring.”

All this is reminiscent, as we will see, of the unseen spheres of Aristotle’s geocentric system that carried the planets around the Earth along their orbits. Neither Aristotelians nor the scholastic scholars of Europe could explain what force caused these numerous invisible spheres to

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94 Ibid., pp. 98-99. (Capitalization added)
revolve around the Earth. Therefore, to resolve this problem, it was suggested that there was a prime mover part of the system – God – standing outside the Universe, who pushed the outermost sphere which caused all the rest of the planets to move. In a certain sense, superstring theorists have reinvented an unknown prime mover that vibrates the superstrings that are so small that they cannot ever be observed, just like electrons, quarks, etc. except through their mathematical equations. The theory of vibrating strings is also reminiscent of the “Music of the Spheres,” proposed and analyzed by Johannes Kepler. The prime mover is plucking these strings and, in a sense, is creating music across the Universe. Kaku admits this indirectly as superstring theory could explain Einstein’s theory of general relativity: “Einstein would write that his search for a unified field theory would allow him to ‘read the Mind of God.’ If string theory is correct, we now see that the mind of God represents cosmic music resonating through ten-dimensional hyperspace.”

Because no one can or will ever see these strings that are vibrating in the ten dimensions (or nine) hyperspace has brought forth criticisms from scientists that are brutal and scathing. They see this theory as non-sense. Peter Woit, a physicist at Columbia University, in his book, Not Even Wrong, states:

“As a general rule, scientific progress comes from a complex interaction of theoretical and experimental advances. This is certainly true of the standard [quantum] model . . . In the course of explanation of superstring theory and its history . . . the alert reader may have noticed the lack of any reference to experimental results [by string theorists]. There is a good reason for this superstring theory has absolutely zero connection with experiment, since it makes absolutely no predictions.”

Nobel laureate, Sheldon Glashow, castigates string theory proponents:

“. . . Superstring physicists have not shown that their theory really works. They cannot demonstrate that the standard [quantum] theory is a logic outcome of string theory. They cannot even be sure that their formalism includes a description of such things as protons and electrons. And they have not yet made even one teeny-tiny experimental prediction. Worst of all, superstring theory does not follow as a logical consequence of some appealing set of hypotheses about nature. Why you may ask, do string theorists insist that space is nine-dimensional? Simply because string theory doesn’t make sense in any other kind of space . . .

“Until the string people can interpret perceived properties of the real world, they simply are not doing physics.”

Woit cites many other eminent scientists/physicists who find string theory impossible. Strangely, the theory posits the possibility that another form of this theory may exist, called “M-theory.” João Magueijo, in his book, Faster Than The Speed of Light, writes:

“To add to its mystique, the cult leader who coined the term never explained what the M stood for. The M-theorists heatedly debate this important issue. M for mother [of all theories]? M for membrane [a concept that comes out of string theory]? M for masturbation seems so much more befitting to me.”

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96 Ibid., p. 198.
98 Ibid. p. 175
99 Ibid., p. 190.
Without the constraints of experimental evidence or a single observation to determine the limits of their mathematics, the mathematics led to numerous concepts that can only be regarded as Rube Goldberg contraptions – apologies to Rube Goldberg. Leonard Susskind, one of the major theorists of string theory, admits this:

“New possibilities kept turning up new mathematically consistent versions [of string theory] of what was [originally] supposed to be a unique theory. During the 1990s, the number of possibilities grew exponentially. String theorists watched with horror as a stupendous [mathematical] landscape opened up with so many valleys that almost anything can be found somewhere in it.

“The theory also exhibited a nasty tendency to produce Rube Goldberg machines. In searching the landscape for the Standard [quantum] Model, the constrictions became unpleasantly complicated. More and more ‘moving parts’ [like epicycles, deferents, etc., in Aristotelian theory] had to be introduced to account for all the requirements.

“Judged by the ordinary criteria of uniqueness, and elegance, string theory had gone from being [a mathematical beauty to being a Beast.”

According to Lee Smolin, the “Beast” of string theory can be understood by knowing exactly what its parameters are:

“Part of the reason string theory makes no new predictions is that it appears to come in an infinite number of versions. Even if we restrict ourselves to theories that agree with some basic observed facts about our universe, such as the vast size and the existence of dark energy, we are left with as many as $10^{500}$ distinct string theories – that’s 1 with 500 zeros after it, more than all the atoms in the known universe. With such a vast number of theories, there is little hope that we can identify an outcome of an experiment that would not be encompassed by one of them. Thus, no matter what the experiments show, string theory cannot be disproved. But the reverse also holds: no experiment will be able to prove it true.

“At the same time, we understand very little about most of these theories. And of the small number we do understand in any detail, everyone disagrees with the present experimental data, usually in at least two ways.

“So we face a paradox. Those string theories we know [enough about] to study are known to be wrong. Those we cannot study are thought to exist in such vast numbers that no conceivable experiment could disagree with all of them.

“What we have, in fact, is not a theory at all but a large number of conjectures that, if true, point to the existence of a theory. But that theory has never actually been written down. We don’t know what its fundamental principles are. We don’t know what mathematical language it should be expressed in – perhaps a new one will have to be invented to describe it. Lacking both fundamental principles and the mathematical formulation, we cannot say that we even know what string theory asserts.”

What we have is a form of matter invisible to us that is acting according to a theoretical form of mathematics that is so vast that its various forms can explain anything that invisible matter theorists want. It is massively circular reasoning. A typical form of this is explained by Smolin

100 Ibid., pp. 198-199.
with respect to the nine or ten dimension universe of which four broke off—in fact, length, width, height and time—the dimension we experience. The other six dimensions are wrapped up so tightly that we cannot observe, experience or test for them in any way. Only mathematically do they exist:

“. . . in 1985 in a very important paper written by a quartet of string theorists. They were lucky, because two mathematicians, Eugenio Calabi and Shing-Tung Yau, had already solved a mathematical problem that gave the answer. They discovered and studied a particularly beautiful form of six-dimensional geometry that we now call Calabi-Yau spaces. The four string theorists were able to show that the conditions needed for string theory to reproduce a version of the supersymmetric standard [quantum] model were the same as the conditions that defined a Calabi-Yau space . . . they showed explicitly how you could trade constants in the standard [quantum] model, such as those that determine the masses of different [subatomic] particles, for constants describing the geometry of a Calabi-Yau space . . .

“But there was an equally great problem. Had there been only one Calabi-Yau space, with fixed constants that determine the masses of different (subatomic) particles, we would have the unique unified theory we yearned for. Unfortunately, there turned out to be many Calabi-Yau spaces. No one knew how many, but Yau, himself, was quoted as saying there were at least a hundred thousand. Each of these [six-dimensional] spaces came with a list of free constants [not just one that fit the quantum theory] governing its size and shape. So there was no uniqueness [between the constants of it and the subatomic particle masses], no new predictions, and nothing was explained . . .

“On top of this, there is no explanation for how it got that way. String theory came in many other versions besides the Calabi-Yau spaces. There were versions of the theory in which the number of curled up spaces varied from none all the way up to nine [instead] of a six-dimensional Calabi-Yau space.102 On these problems, Richard Feynman comments:

“For example, the theory requires ten dimensions [nine for space and one for time]. Well, maybe there’s a way of wrapping up six of the dimensions. Yes, that’s possible mathematically, but why not seven? When they write their equations, the equations [themselves] should decide how many of these strings get wrapped up, not the desire to agree with the experiment [regarding subatomic particle masses]. In other words, there’s no reason whatsoever in superstring theory that it isn’t eight of the ten dimensions that get wrapped up and that only two dimensions, which would be completely in disagreement with experience. So the fact that it might disagree with experience is very tenuous; it doesn’t produce anything right.”103

Shing-Tung Yau and Steve Nadis add another problem to all these others. Speaking of the fields created by the Calabi-Yau manifold, they admit it would be “wreaking havoc with Einstein’s theory of relativity.”

“There’s an even bigger problem: we know that such fields cannot exist in nature. For if they did, there’d be all kinds of massless particles—associated with the scalar (moduli) fields—flying around at the speed of light. These moduli

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102 Ibid., pp. 122-123.
particles would interact with other particles with roughly the same strength as gravitons (the particles thought to mediate the gravitational force), thereby wreaking havoc with Einstein’s theory of relativity. Because that theory, as described . . . works so well, we know these massless fields and [massless] particles simply cannot be there. Not only would their presence conflict with well-established gravitational laws, it would give rise to a fifth-force [beyond the weak, strong, gravitational and electromagnetic forces known] and perhaps additional forces that have never been seen.

“So there’s the rub. Given that much of string theory hinges on compactification of Calabi-Yau manifolds, which have these moduli with their associated massless scalar fields and particles that don’t appear to exist, is string theory doomed? There might be a way around this problem, because there are other elements of the theory – things that we already knew . . .”

String theory was created to explain and unite quantum theory with Einsteinian / Newtonian theory. Yet in terms of the Calabi-Yau manifold, instead of having one unique mathematical set of constants that reflect the masses of the subatomic particles, there are an extraordinary number of these and these have different constants that do not connect to the masses of the subatomic particles. In terms of Einsteinian / Newtonian theory, string theory, using the same Calabi-Yau manifold, creates massless particles moving at the speed of light and interacting with other particles wreaking havoc with Einstein’s theory of relativity that explains the cosmos. The things string theory set out to explain, it does not; it contradicts them. Therefore, it cannot unite quantum theory with general relativity. It needs, it seems, constant fix-it-ups. In this respect, Spencer Scoular outlines these problems and then tells us what new ad hoc explanations are employed by string theorists to fix-it-up. Although his analysis is somewhat technical, it does make its point:

“[Problem 1] How do we avoid the infinities that arise in quantum field theory from the self-interaction of graviton (point) particles? [Solution] Introduce strings which are not point particles (they have length).

“[Problem 2] How do we determine the length of the graviton? [Solution] It must be no longer than the size at which space time breaks down.

“[Problem 3] How do we insure it is a theory of Everything, not a theory of the strong force? [Solution] Increase the tension of the string to give the length of the graviton.


“[Problem 5] How do we avoid tachyons (particles that travel faster than the speed of light) and include fermion particles? [Solution] Incorporate supersymmetry into string theory enabling it to be consistently formulated in ten space time dimensions.

“[Problem 6] How do we avoid weird problems with causality and breaches of conservation of energy associated with more than one time dimension? [Solution] Only include one time dimension implying there are nine space dimensions.”

“[Problem 7] How do we eliminate the extra dimension (while retaining chirality and supersymmetry)? [Solution] Assume all but four dimensions are compactified (into a Calabi-Yau manifold).

“[Problem 8] How do we eliminate five different types of string theory that arise when supersymmetry is included? [Solution] Postulate an eleven M-theory (and corresponding dualities) that unified all the theories.

“[Problem 9] How do we ensure the postulated dualities will work out consistently? [Solution] Introduce banes [membranes at the end of the strings] into a theory which are higher dimensional objects.

“[Problem 10] How do we stabilize the higher dimensions and ensure string theory predicts a positive cosmological constant [which Einstein put into space time] and not a negative one? [Solution] Wrap branes (with electric flux) around the extra dimensions (there being some $10^{500}$ different ways of doing this).\(^\text{105}\)

As for the number of dimensions, Arthur W. Wiggins and Charles M. Wynn tell us that string theories “require more than four dimensions (10, 11 and 26 are the current major choices), the extra dimensions may range from being too small to measure, within the range of current techniques, or even too big approaching infinity . . . One difficulty with choosing from among the many theories in this category is that our experience or intuition cannot be applied beyond the four in which we live.”\(^\text{106}\)

One doesn’t have to be a physicist to realize that the entirety of string theory is riddled with problems and fix-it-ups, assumed solutions. None of these fix-it up solutions can be tested except in terms of mathematics and these are all *ad hoc* to make them fix and fit the model. Smolin describes string theory and the fix-it-up solutions thus:

“Here is how string theorist Brian Greene puts it in his latest book, *The Fabric of the Cosmos*, [p. 376]: ‘Even today, more than three decades after its initial articulation, most string practitioners believe we still don’t have a comprehensive answer to the rudimentary question, what is string theory? . . . [M]ost researchers feel that our current formulation of string theory still lacks the kind of core principle we find at the heart of other major advances.’

“Gerard ’t Hooft, a Noble Price winner for his work in elementary particle physics, has characterized the state of string theory this way: ‘Actually, I would not even be prepared to call string theory a “theory,” rather a “model,” or not even that: just a hunch. After all, a theory should come with instructions on how to deal with it to identify the things one wishes to describe, in our case, the elementary particles, and one should, at least in principle, be able to formulate the rules for calculating the properties of these particles, and how to make new predictions for them. Imagine that I give you a chair, while admitting that the legs [that hold it up] are still missing, and the seat back and armrest [to lean back into and rest one’s arms] will perhaps be delivered soon. Whatever I give you, can I still call it a chair?’\(^\text{107}\)

Smolin adds this dismissive comment for those practitioners of string theory:

\(^{105}\) Scoular, *First Philosophy . . . op. cit.* , p. 63.


\(^{107}\) Smolin, *Trouble with Physics . . . op. cit.* , pp. XIV-XV.
“... If string theorists are wrong, they can’t be just a little wrong. If new dimensions and symmetries do not exist, then we can count string theorists among science’s greatest failures, like those who continued to work on Ptolemaic epicycles... Theirs will be a cautionary tale how not to do science, how to let theoretical conjecture to get so far beyond the limits of what can rationally be argued that one starts engaging in fantasy.”\textsuperscript{108}

Kaku states, “No experiment to the day picked up evidence of any higher dimensions of space beyond length, width and height.”\textsuperscript{109} I suggest that, in time, string theory will be shown to be a grand fantasy of modern science, no more real than H. G. Wells, \textit{Invisible Man}, written over a century ago: Michio Kaku explains:

“H. G. Wells’ classic novel 1897, \textit{The Invisible Man}, begins with a strange tale. One cold, wintry day, a stranger comes in from the darkness in a bizarre fashion. His face is completely covered; he is wearing dark blue glasses, and a white bandage blankets his entire face.

“At first, the villagers take pity on him, thinking he was in a horrible accident. But strange things happen around the village. One day his landlady enters his empty room and screamed when she saw clothing moving about by itself. Hats were whirling across the room, the bed clothes leaped into the air, chairs moved, and the furniture went mad, she recalled in horror.

“Soon, the entire village is buzzing with rumors of these unusual occurrences. Finally, a group of villagers gathers and confronts the mysterious stranger. To their amazement, he slowly begins to unwrap his bandages. The crowd is aghast. Without the bandages the stranger’s face is completely missing. In fact, he is invisible...

“The invisible man seeks out an old acquaintance and recounts his remarkable story... although he started out learning medicine, he stumbled upon a revolutionary way in which to change the refractive and reflective properties of flesh. His secret is the fourth dimension. He claims... ‘I found a general principle... a formula, a geometrical expression involving four dimensions...

“As with the best of science fiction novels, there is a germ of science in many of H. G. Wells’ tales. Anyone who can tap into the fourth dimension (or what is today called the fifth dimension with time being the fourth dimension) can indeed become invisible... [like the strings in string theory].

“H. G. Wells wanted to convey the idea that in a four-dimensional world we are... oblivious to the fact that higher planes of existence might hover right above ours. We believe that our world consists of all that we can see [or sense], unaware that there may be entire universes right above our noses. Although another universe might be hovering just inches above us floating in the fourth dimension, it would appear to be invisible.”\textsuperscript{110}

Kaku informs us that Wells:

“raised the key question that is today the subject of great speculation and research: could there be new laws of physics in these high dimensions? For some cosmic reason, our dimension and a parallel universe temporarily collided allowing

\textsuperscript{108} \textit{Ibid.}, p. XVII.
\textsuperscript{109} Scoular \textit{First Philosophy}... \textit{op. cit.}, p. 322.
\textsuperscript{110} M. Kaku, \textit{Parallel Worlds}... \textit{op. cit.}, pp. 182-183.
an angel to fall into our world. In the story, [The Wonderful Visit (1885)], a vicar’s gun hits an angel, who happens to be passing through our dimension] writes ‘there may be any number of three-dimensional universes packed side by side.’ The vicar questions the wounded angel. He is shocked to find out that our laws of nature no longer apply to the angel’s world. In his universe, for example, there are no [flat] planes, but rather cylinders, so space itself is curved. (Fully twenty years before Einstein’s general theory of relativity, Wells was entertaining thoughts about universes existing on curved space.) As the vicar puts it, ‘Their geometry is different because their space has a curve in it so that all their planes are cylinders; and their law of gravitation is not according to the inverse squares . . .’ More than a century after Wells wrote his tale, physicists today realize that new laws of physics with different sets of subatomic particles . . . might indeed exist in parallel universes.”

There is a profound difference between the theory of string theory and my Electro-Gravitic theory that must be pointed out. There is absolutely no experimental evidence that these strings exist, that they vibrate in the way string theory requires, or that they have different tensions on them. They are, in fact, one-dimensional. Something that does not, and cannot exist in a three-dimensional world. A line is only a representation of this one-dimensional mathematical entity. On the other hand, we have direct experimental evidence of electro-magnetic effects in the pendulum tests carried out by Saxl and Allen, Allais and the apparatus of T. T. Brown, that all moved anomalously when charged with electricity. We also have observational evidence for the operation of this. We know that electromagnetism permeates all of space; it is not hidden in unknown dimensions. Those experiments proved that gravity is affected by electromagnetic forces. So there is a fundamental scientific foundation upon which Velikovsky’s concept rests. It can be tested, as I pointed out in The Electro-Gravitic Theory of Celestial Motion & Cosmology, (Forest Hills, NY 1999), pp. 127-154, where a fully physical, mathematical experiment that can be carried out in space is delineated. The test will be again outlined below, but it does make a prediction, namely that a highly magnetized, low mass ball on a long trajectory in space will, like the pendulum experiments of Saxl and Allen, Allais and the apparatus of T. T. Brown will not follow a path, over time, expected from Newtonian / Einsteinian theory. String theory does not envisage nor offer any such fundamental experimental evidence for the existence or forces produced by these strings, nor makes a single prediction that can be experimentally tested. That is the profound difference between what string theory offers and what my Electro-Gravitic theory offers; one is based solely on mathematics, my theory is derived from Velikovsky, is based on the same fundamental empirical, testable forms of evidence science has always employed. My theory is a bottoms-up approach to science, while string theory is a top-down approach. Yet many serious scientists have been willing to give their support to this top-down theory. I suggest that my approach to science is scientific and that string theory is not. In this respect, Paul Ginsparg and Sheldon Glashow, in an article titled “Desperately Seeking Superstring,” castigate this aspect of string theory.

“In lieu of the traditional confrontation between theory and experiment superstring theorists pursue an inner harmony where [mathematical] elegance, uniqueness, and beauty define truth. The theory depends for its existence upon magical coincidences, miraculous cancellations and relations among seemingly unrelated (and possibly undiscovered) fields of mathematics. Are these reasons to

111 Ibid., pp. 183-184.
accept the reality of superstrings? Do mathematics and aesthetics supplant and transcend mere experiment? Will the mundane phenomenological problems that we know as physics simply come out in the wash in some distant tomorrow? Is further experimental endeavor not only difficult and expensive, but unnecessary and irrelevant? Contemplation of superstrings may evolve into an activity as remote from conventional particle physics as particle physics is from chemistry to be conducted at schools of divinity by future equivalents of medieval theologians. For the first time since the Dark Ages, we can see how our noble search may end, with [mathematical] faith replacing science once again. Superstring sentiments eerily recall ‘arguments from design’ for the existence of a supreme being. Was it only in jest that a leading string theorist suggested that ‘superstrings may prove as successful as God who, after all, is still invoked in some quarters as a Theory of Nature’?

Gerard ’t Hooft, in his essay on string theory, goes even further in denouncing it. “String theory seems to be telling us to believe in magic . . . To me, such magic is synonymous with ‘deceit.’ People only rely on magic if they do not understand what is going on.”

Nobel Prize laureate, Robert B. Laughlin, argues: “String theory is, in fact, a textbook case of a Deceitful Turkey, a beautiful set of ideas that [like God] will always remain just barely out of reach.” Ratcliffe, discussing Peter Woit’s book, Not Even Wrong, says in it: “he exposes the [string theory] movement as a thinly veneered religious cult, with all the negative connotations that such a description embraces.” Ratcliffe goes on to cite Robert Matthews, visiting reader in science at Aston University, who expressed the great reservations of those who oppose string theory:

“For years, there has been concern within the rest of the scientific community that the quest for the theory of everything is an exercise in self-delusion . . . It is this loss of contact with reality that has prompted so much concern amongst scientists — at least, those who are not intimidated by all the talk of multidimensional superstrings and Calabi-Yau manifolds that goes with the territory.”

For his own part, Ratcliffe adds:

“Faced with these profound absurd creations of the human psyche, poor old, wounded science takes another knock backwards . . . The great damage being done by savants, giving expression to their quest for the Theory of Everything, is twofold: one, it takes away from legitimate science many brilliant young minds; and two, at some level, it sanctifies absurdity . . .

“I am indebted to that sage of sensible science, Wal Thornhill, for the following gem: ‘We can call our universe unique. Why? Because it is the only that string theory cannot describe.’ Wal goes on to ask whether we should laugh or cry. I

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113 Ratcliffe The Virtue of Heresy, op. cit., p. 328.
114 Ibid., p. 329
115 Ibid., p. 330.
116 Ibid., p. 331.
don’t know. Sometimes science takes on the trappings of a maniacal Punch and Judy show.”117

Eric Lerner discusses the theory of everything in terms of the work of Nicholas of Cusa:
“Since reality is infinite in its complexity, knowledge can only be a series of better approximations, unifying larger realms of experiences. According to Nicholas [of Cusa], the human mind, though finite in its understanding is infinite in its capacity for understanding and in its desire for truth. ‘The eye can never have too much seeing so the mind is never satisfied with sufficient truth.’ In this sense, all leaning [or science of any time] is still ignorance – not because it is false, but because it will never arrive at the final truth. There can be no Theory of Everything.

“This open-ended theory of knowledge is the greatest possible challenge to the old concept of absolute truth, there is no final authority.”118

David Lindley puts the case against a theory of everything this way:
“The physicists . . . hope . . . that they can complete physics in the manner the ancient Greeks imagined by means of though alone, by rational analysis unaided by empirical testing. The [present day] ultimate goal in physics seems to demand, paradoxically, a return to [the old Greek way] . . . the ideal of a theory of everything. In the minds of the physicists searching for it, is a mathematical system of uncommon tidiness and rigor which may, if all works out correctly, have the ability to accommodate the physical facts we know to be true of our world. The mathematical neatness [however] comes first, the practical explanatory power second . . .

“This theory of everything will be, in precise terms, a myth. A myth is a story that [only] makes sense within its own terms, offers explanations for everything we can see around us, but can be neither tested nor disproved. A myth is an explanation that everyone agrees on because it is convenient to agree on it, not because it is true or can be demonstrated. This theory of everything [in string theory], this myth will indeed spell the end of physics. It will be the end not because physics has at last [supposedly] been able to explain everything in the universe, but because physics [like myth] has reached the end of all things . . .”119

String theorists assume, with their paradigm, that everything can be known. The hubris that underlies this belief that they can find final, omniscience is in fact a religious claim that they know and understand everything like God. It is, in fact, the antithesis of science, that claims its findings are tentative and subject to disproof and to revision and revolution. String theory embodies the view that we, here and now, are the sine qua non, the generation that has found the last, final answer to what constitutes an understanding of everything. I make the modest proposal that when scientists make such claims about having a theory of everything, they have become a religion!

117 Ibid., pp. 331-332.
ACTION AT A DISTANCE, GRAVITATIONS AND WAVES, ETC.

“That one body may act upon another at a distance through a vacuum, without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity, that I believe no man has in philosophical matters a competent facility of thinking can ever fall into it.”


Newton pointed his finger at the fact that there must be something in the vacuum of space and even in the atmosphere of planets that cause bodies to act to attract one another. This is the only way one body can affect the motion of another. Einstein, as we will see, attempted to get around this problem by warping space and, therefore, no material or force was necessary in space to communicate the gravitational force from one object to another. Einstein supposedly accomplished this feat because of Newton’s failure to explain what gravity actually is. He wrote about this failure of his physics mechanism in a letter to Richard Bentley:

“Tis inconceivable that inanimate brute matter should (without the mediation of something else which is not material) operate upon and affect matter without mutual contact . . . Gravity must be caused by an agent acting constantly without mutual contact . . . Gravity must be caused by an agent acting constantly according to certain laws, but whether this agent be material is a question I have left to consideration of my readers.”\(^{120}\)

Having failed to explain the way that gravity travels through space, Newton washed his hands of this problem because it seemingly had no answer.

“Hitherto we have explained the phenomena of the heavens, and [the tides] of our seas by the power of gravity but have not yet assigned the cause of this power . . . But hitherto I have not been able to discover the cause of those properties from phenomena, and I frame [feign] no hypothesis, for whatever is not deduced from phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult quantities of mechanisms, have no place in experimental philosophy.”\(^{121}\)

Philosopher of Physics, Max Jammer, explains that no experiment thus far has ever found this mechanism:

“. . . To the present day, innumerable mechanistic theories of gravitation have been published each trying to succeed where Newton failed. The authors of these treatises oppose the theory of action at a distance conceiving of forces of push and pull as more fundamental and basic for their explanation of the transmission of force . . .” [And] “When one reads the scientific literature in the journals and treatises of the middle of the nineteenth century, the mechanistic

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explanation of gravitation seems to have been the most engaging and promising problem of the generation. Yet today these papers, on the whole, have little importance... Their common feature, almost without exception, is the introduction of hypotheses, ad hoc, whether as to the structure of matter and the ether or as complicated undulatory motions of the ether particles. These theories, moreover, apart from being explanation of ignotus per ignotius [ignorance explained by more ignorance] and violating the principle of simplicity, propose many conceptions that from the beginning defy all experimental verification because they are devoid of epistemic correlation.”

Einstein supposedly resolved this issue with his theory of general relativity. While Einstein’s tensor equations completely complement Newton’s gravitational equations, they should, therefore, not also be contradicted by experimental reality. But as we have seen above, they are contradicted by tidal theory, and they are contradicted by the orbits of celestial bodies traveling in ellipses discussed earlier, etc. They are further contradicted by the pendulum experiments carried out by Saxl and Allen, Allais, and Brown’s saucers that moved contrary to gravitational theory when charged. The experiments clearly proved gravity could be shielded and effected pendulum motion when charged. Moreover, Brown’s experiments with charged saucers fully violates and contradicted all the concepts of Newton and Einstein because they moved in a vacuum without another body gravitationally pulling them or warping space. These experiments rather unambiguously show that the underlying physics of the motion of bodies is false. In this regard, the concept proposed by Immanuel Velikovsky and Thomas Townsend Brown that gravity is a form of expression of electromagnetism, has immense implications. Electromagnetism pervades all space, and electromagnetic waves do travel through electromagnetically filled space as is well understood from electronic communications from spacecraft, as well as from celestial bodies. Therefore, there is a force that pervades all space and travels through it. It implies that electromagnetism is responsible for gravity and carries gravity from one body to another in defiance of Einstein’s theory of warped space in general relativity theory. This, I will discuss in the next chapter on Einstein.

Meanwhile, at the level of quantum mechanics, physicists have sought a particle to carry gravity. This brings us back to placing new theoretical particles into the vacuum along with Dark Matter, Dark Energy, etc. Sir John Maddox claims: “Something has been learned. Just as the interaction between electrically charged particles is mediated by the quanta of the radiation field, or photons, so the gravitational field must be mediated by particles which are called ‘gravitons.’”

How does one know gravitons exist? Randall argues:

“How does one know gravitons exist? Randall argues:

“Quantum mechanics dictates that... there must be a particle to transmit the gravitational force. That particle is the graviton. In a quantum theory of gravity, the exchange of graviton between two objects reproduces Newton’s law of gravitation between two objects... Although gravitons have not been observed, physicists believe that they exist because quantum mechanics tells us they do.”

Paul Davies adds to this: “If it is believed that the quantum theory must be applied consistently to all physics (which is a virtually unanimous assumption) then gravity must be quantized as gravitons.” Nevertheless, Scoular shows that this concept is based on 16 assumptions and goes on to say, “Since all these arguments are based on assumptions, none of

122 Max Jammer, in Scoular, First Philosophy... op. cit., pp. 196-197.
123 Ibid., p. 309
124 Randall, Warped Passages... , op. cit., p. 281.
125 Scoular, First Philosophy, op. cit., p. 310.
126 Ibid., pp. 311-312.
them *proves*, that gravity is a force generated by the exchange of gravitons. Since there are no proofs of quantum gravity. The point, once again, for all this is that physicists have created – mathematically – a quantum particle to fit their theory of quantum mechanics to do everything they want it to do for gravitational theory.

Furthermore, if quantum theory is correct, it must also account for these gravitons mathematically. However, when the numbers are plugged onto theory, it “breaks down,” just as it did with tidal theory. On this, Randall explicitly states:

“No quantum field theory for the graviton can predict its interactions at all energies. When a graviton is as energetic as the Planck scale, quantum field theory breaks down. Theoretical reasoning demonstrates that extra graviton interactions that wouldn’t make a difference at low energies became important at high energies. If we incorrectly used a quantum field theory of gravity, ignoring the interactions that don’t matter at low energies and attempted to make predictions for extremely energetic gravitons we would conclude that graviton interactions occur with a probability greater than one – something which is clearly impossible. At the Planck scale energy or equivalency the Planck scale length $10^{-33}$ cm, the quantum mechanical description of the graviton obviously breaks down.”

An interaction between particles can only happen once at a particular time and place. But if one applies quantum mechanics to allow for gravitons, at high energies the particles hit or interact at a particular time and place more than once. Therefore, there can be no theory of quantum gravity in spite of Paul Davies’ argument that “quantum theory must be applied to all of physics (which is virtually a unanimous assumption).” Furthermore, since gravitons create gravity waves and these, too, have never been detected directly, how can they exist? Only by assumption and mathematics.

The astronomers and quantum physicists have clearly outdone Velikovsky by placing at least a dozen or more forms of particles or energies and dimension into the vacuum of space that they cannot prove exist and have, over many years, never been found. The list is as follows:

1. An ocean of Higgs bosons;
2. Dark Matter which supposedly constitutes about 24 percent of all matter in the universe;
3. Dark Energy, which supposedly constitutes about 72 percent of all matter in the universe;
4. A place beyond the Universe or a parallel Universe, about 32 billion light years away that is drawing to itself or expelling from it only the galactic clusters in the Universe but nothing else;
5. Six or seven extra dimensions in which immensely tiny string or branes exist, none of which has ever been found;
6. Calabi-Yau manifolds which wrap up these extra dimensions;
7. An unknown force that vibrates these strings;
8. Gravitons and gravity waves;
9. Supersymmetry partner particles;
10. Curved space by Einstein and expanding space by Alan Guth.

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127 Ibid., p. 312.
Irving Langmuir has termed such unknown or barely detectable particles, energies and dimensions as being a clear indication of “Pathological Science” and gives six reasons for this being so.

1. The maximum effect that is observed is produced by a causative agent of barely detectable intensity and the magnitude of the effect is substantially independent of the intensity of the cause.129

All of the above elements are either completely undetectable or barely detectable, but they are employed as phenomenological foundations of modern physics and cosmology.

2. The effect is of a magnitude that remains close to the limit of detectability.”130

All the above elements are having effects that cannot be proved to be causative to the magnitudes they supposedly are making.

3. There are claims of great accuracy.”131 These elements cannot be measured but there are claims for the great accuracy of their effects.

4. Fantastic theories contrary to experience are suggested.”132

The theories are indeed fantastic and, as noted above, scientists say they are not related to experience – meaning reality and come in numbers that run into the millions.

5. Criticisms are met with ad hoc excuses thought up at the spur of the moment.”133

The ad hoc excuses when shown to be spurious are answered with either new ad hoc excuses or not answered at all.

6. The ratio of supporters to critics rises up to something near 50 percent then falls gradually to oblivion.”134

We are still in the early stages of debates, so we cannot know the final outcome of it. Nevertheless, what we have is science run amok and in the concepts presented by Langmuir, much of modern physics and cosmology is rife “Pathological Science.” Yet Velikovsky and those proponents of his concepts are the ones practicing “Pathological Science.” These were discussed by Randall as they relate to the Higgs boson.

“A G[rand] U[nification] T[heory] has a [supersymmetric] partner that interacts through the strong force. And that particle . . . has to be extremely heavy.

“The two different related particles must appear together . . . because the weak force and the strong force should be interchangeable at high energy [during the Big Bang]. That’s the whole idea behind a unified theory – all forces should ultimately be the same . . . However, there is a big problem with the new Higgs-related particle that experiences the strong force.

“The strongly charged particle that is [supersymmetrically] partnered with the Higgs particle can interact simultaneously with a quark and a lepton and thereby enable the proton to decay – even more rapidly than the GUT [grand unification theory] would otherwise predict. To avoid too rapid a decay, the strongly

130 Ibid.
131 Ibid.
132 Ibid.
133 Ibid.
134 Ibid.
interacting partner] particle . . . – must be extremely heavy . . . Higgs partner if it exists in nature has to have a mass . . . [of] about one million billion GeV. If this particle existed but was not this heavy, you and this book would decay before you finished this sentence.

“However . . . the weakly charged Higgs particle has to be light (around 250 GeV) to give the weak gauge masses that have been measured in experiments. So experimental constraints tell us that the Higgs particle’s mass must be widely different from the mass of the Higgs partner . . . This huge discrepancy between the two masses – one is ten trillion times the other – is very difficult to explain, especially in a unified theory in which both the weakly charged Higgs particle and the strongly charged Higgs [partner] particle are supposed to have similar interactions.

“In most unified theories, the only way to make one particle heavy and the other one light is to introduce a huge fudge factor. No physical principle predicts that the masses should be so different; a very carefully chosen number is the only way to make things work. That number has to have thirteen digits of accuracy . . .

“Particle physicists call the necessary fudge fine-tuning [not culling the data]. A fine tuning is when you adjust the parameters to get exactly the value you want. The word ‘tuning’ is used because it is like tweaking a piano string to get precisely the right note. But if you wanted to get a frequency of a few hundred hertz correct to thirteen-digit accuracy, you would have to listen to it for ten billion seconds – a thousand years – to check that it was right. Thirteen digit accuracy is hard to come by . . .

“No sensible [scientific theoretical] situation depends on fine tuning . . . Yet almost any unification theory with a light Higgs particle has such a dependency problem . . .

“But the only way to get a small enough Higgs particle mass in the simplest GUT [grand unification theory] is to fudge the theory. The GUT model offers no good alternative. This is a serious problem for most models . . . and many physicists, including myself, are uncertain about unification of forces because of it.”

Above and beyond this, quantum physics, as well as string theory, are dependent on supersymmetrical partners for other particles. These are prefixed with the letter “s” for “sparticle,” and are known as sneutrinos, selectrons, squarks, or with an s added for photinos, gravitinos or winos. As with all the other invisible particles and forces placed in space, no one has ever been able to detect a “s particle” using particle accelerators. Paul Halpern informs us:

“Supersymmetry is one of the most audacious proposals in the history of modern science. Year after year since it was postulated, experiments have failed to demonstrate its existence. Accelerators have smashed countless particles, producing not a single symmetric companion in their debris. Yet many [quantum] theorists find it so compelling they can scarcely believe the world would survive without it. They argue that today’s accelerators are simply not powerful enough to do the job. No other physical theory has won so many supporters with so little

\(^{135}\) *Ibid.*, pp. 244-246.
experimental support surviving [except perhaps string theory] instead on the basis of its own mathematical beauty and internal consistency.”

Sir Roger Penrose, speaking of these missing sparticles, says: “I have to say that I am far from alone in believing that this [supersymmetry theory] looks a little contrived.”

Richard Morris adds:

“It is conceivable that we will discover that nature is not supersymmetric. No one thinks this is very likely. And if it turned out that supersymmetry did not exist, then superstring theory would have to be abandoned.”

Yet hope springs eternal in the breasts of string theorists as science writer Charles Seife shows:

“The next decade [2003-2013] will make or break supersymmetry. Scientists will confirm it finding the first supersymmetric particle or they will fail and give up the theory for good. A particle accelerator already in operation has a chance of flushing a supersymmetric particle out of hiding, and a second accelerator already under construction, is almost guaranteed to find one – if supersymmetry is correct. In the next decade, scientists will confirm a revolutionary theory that can reveal the hiding place of all exotic matter in the cosmos or they will go back to the drawing board.”

That decade has passed, but no supersymmetric particle has been detected, but that has not caused them to go back to the drawing board. Thus, we add number 11 to the above, there is no evidence of these supersymmetric partner particles.

At this point, I will again cite Martin Gardner, à la his criticism of Velikovsky, but as it relates to the invisible materials forces and dimensions that scientists have conjured up, not through experiment, but through numerous mathematical fudge factors, across the spectrum of present-day cosmology, quantum physics and string theory mathematics.

“Cosmologists and physicists . . . invent forces [and materials] capable of doing precisely what they want them to do. There is no scientific evidence whatsoever for these forces [and materials] . . . They explain the unexplainable. But so convinced are the establishment cosmologists and physicists that everyone [who disagrees with them] is prejudiced except they that can – with a straight face – belabor the [un]orthodox for refusing to recognize the imaginary energies [and imaginary material[s] and dimensions].”

Unlike Velikovsky’s concept that electromagnetism plays a role in celestial motion and cosmology, founded on basic scientific experiments, science has invented and placed several entities in space that are never found and are not there. Like T. S. Eliot’s famous cat, named Macavity, who exists, but is never there when sought:

“Macavity’s a mystery cat: he’s called the Hidden Paw.
For he’s the master criminal who can defy the law.
He’s the bafflement of Scotland Yard, the Flying Squad’s despair.
For when they reach the scene of the crime, Macavity’s not there!

“Macavity, Macavity, there’s no one like Macavity.
He’s broken every human law. He breaks the law of gravity.

136 Scoular, First Philosophy . . . op. cit., p. 323.
137 Ibid.
138 Ibid.
139 Ibid., p. 324.
His powers of levitation would make fakir stare,
But when you reach the scene of the crime – Macavity’s not there.
   “You may seek him in the basement, you may look up in the air—
But I tell you once and once again, Macavity's not there! . . .
   “Macavity, Macavity, there’s no one like Macavity.
There never was a Cat of such deceitfulness and suavity.
He always has an alibi, and one or two to spare:
At whatever time the deed took place—MACAVITY WASN’T THERE! . . .

Everything modern science has put into the vacuum of space, unlike Schrödinger’s cat, is never there when the scientists open their scientific box to examine him. Velikovsky has, by comparison, pointed to something – electromagnetism – that is everywhere in space. It is there, it was always there. Velikovsky is vilified for pointing to this real energy while modern scientists are lauded for their endless collection of Macavities that break the laws of gravity. I suggest we are really at the Queen of Hearts palace where one can believe as many as six impossible things before breakfast” such as Dark Matter, Dark Energy, Dark Flow, Superstrings, Multidimensional space and expanding space. Epicycles hold nothing compared to these.

The Velikovsky Revolution reverberates across the entire spectrum of modern theoretical scientific physics. When Velikovsky questioned the concept that gravity is the only force in celestial mechanics and that electromagnetic effects were a necessary component in this area of physics, he opened up the entire nature of what was known regarding physics in other areas and on different levels of these areas. As one can see, entire fields of physics are in crisis, although this cannot be admitted. Velikovsky’s theories call for an entirely new physics in astronomy. However, because modern cosmology is so deeply enmeshed in quantum theory and vice versa, I have endeavored to expose the depth of the contradictions that lie at the foundations of both theories. At this point, I will now turn to Einstein’s theories of special and general relativity to expose these to the same kind of analysis and criticism. I do this because Einstein’s theories are part and parcel of the modern world view of physical reality – gravity, cosmology and physics – that will be shown to defy logic and physical reality.

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CHAPTER 6: EINSTEIN AND GENERAL RELATIVITY

“When asked what he would have thought if Eddington’s expedition had not found the bending of light by the Sun, he [Einstein] said, ‘Then I would have been sorry for the dear Lord; the theory is correct.’”

Albert Einstein in David Lindley, The End of Physics, (NY 1998), pp. 11-12.

“You imagine that I look back on my life’s work with calm satisfaction [Einstein said]. But from nearby it looks quite different. There is not a single concept of which I am convinced that it will stand firm, and I feel uncertain whether I am, in general, on the right track.”


“The chief attraction of the theory lies in its logical completeness [Einstein said]. If a single one of the conclusions from it proves to be wrong, it must be given up; to modify it without destroying the whole structure seems to be impossible.”


In the citations above, we can see how Einstein’s early enthusiasm for his theory, namely that it must be correct, led to his subsequent understanding in his later years that “not a single concept . . . will stand firm” and even the uncertainty as to “whether I am in general on the right track,” is an honest appraisal of general relativity by its creator. Later proponents of general relativity cannot accept that Einstein’s later evaluation of his life’s work may not be correct. On top of that, Einstein held that if one major part of his theory “proves to be wrong,” it must be given up, because “to modify it without destroying the whole structure seems to be impossible. Therefore, to disprove Einstein’s theory, one need only show one major element of it is wrong. But if many elements of it prove to be “wrong,” then, as Einstein stated, it must “be given up.” Einstein was rather decent to Velikovsky, although others have used his words to denigrate Velikovsky, and it is, therefore, with a certain amount of regret that I undertake this critical analysis of his theory.

The first aspect of Einstein’s theory of Relativity I will deal with is that space is curved around a massive object. Therefore, a body in curved space is moving in the direction of that
curve. It feels no force. But as pointed out above, there is a fatal flaw described above by Mathis, who elsewhere writes:

“The first logical critique I made of curved space was in my article on tides. I showed that tidal theory relied completely on Newtonian forces at a distance [and not on curved Einsteinian space]. This theory is wholly dependent on Newtonian force at a distance . . . An orbiter traveling in curved space would not logically be expected to feel the same tidal forces as an orbiter traveling in a Newtonian orbit . . .

“. . . Once you introduce a second body . . ., say the Moon, [it] is also warping the space around [as does the Earth]. The warp around the moon is convex, like the warp around the Earth. Problem is the [tidal] influence is going both ways. The Moon is supposed to be causing tides on the Earth at the same time that the Earth is causing tides on the Moon. So is the space between the Earth and the Moon convex or concave? It must be one or the other. Space cannot curve two different ways at the same time. Nor can it be a vector addition of the curvatures. If two bodies flatten out the curves of the other, they also must flatten out the [tidal] effects. The curvature [according to Einstein] is both mathematical and physical. If the curve is flattened, the tide is gone. In General Relativity, the space is the field. They are the same thing. Unless Einstein meant to propose that we have an infinite number of gravitational fields interpenetrating each other with no collisions or effects, his postulate [that two bodies such as the Earth and Moon warp space to cause tides on both bodies] is a non-starter. And if this is the case, there is really no way to assign any or all of these fields to space.”

As one can clearly see, the Earth and Moon cannot both curve space to create tides on both bodies at the same time in the same direction. This, in terms of general relativity, is impossible and illogical. I want to drive home the point Mathis makes. To do this, let us examine the orbits of identical twin stars. These are binary stars that have the same mass. According to Cecelia Payne-Gaposchkin, “Identical twins [binary stars] span the entire main sequence . . . almost all have perfectly circular orbits.” The concept that bodies orbit one another in warped / curved space must also be explicable here, but it is contradicted here. Each of the identical twin binary stars are warping / curving space identically around them. At the midpoint between their orbits, this warping / curving will be cancelled out because they have the same mass. Neither of these partners should be revolving around the other in the warped / curved space of the other. Equal and opposite curves cannot reach from one partner to that of the other. So why are they orbiting each other in non-warped / curved space in almost perfectly circular orbits? There is no curved space enveloping both binaries to allow this to happen. The stars cannot orbit in their own self-same individual warp / curves. A single star in space does not and cannot be in such an orbit, according to Einstein, because its own warped / curved space leads nowhere. Based on this concept of Einstein’s, identical twin-stars should not be orbiting one another. The theory breaks down based on its own premises and on the basis of these observations conclusively negate it.

1 Miles Mathis, Another Critique of Curved Space. (Internet)
Einsteinians can’t have it both ways. They can’t have two equal and opposite warp / curves affect the orbits of these stars, and at the same time to have these self-same stars orbiting one another as if both were in the warped / curved space.

To add to this contradiction, there are also binary galaxies, called “Dumbbell” galaxies, where the centers of the masses of the partners and their dwarf galaxies are, as with identical twin stars, a point between them. At that point, their warped / curved space also negate each other. In fact, the Milky Way and Andromeda galaxy form such a system. As pointed out in the e-Study Guide for: Cosmic Perspective: . . . (Cram Textbook 2012), p. 4:

“The Local Group is the group of galaxies that includes Earth’s galaxy, the Milky Way. The group comprises more than 30 galaxies (including [28] dwarf galaxies) with its gravitational center somewhere between the Milky Way and the Andromeda Galaxy. The galaxies of the Local Group cover a 10 million light-diameter and have a binary [dumbbell] shape.”

Nevertheless, Robert Gendler tells us: “The Milky Way and Andromeda orbit each other.”

Although the shape of the orbit is an ellipse, we still face the same problem. At the center of their masses between these galaxies, the warp / curves of these galaxies cancel each other and they are, therefore, not orbiting in warped / curved space, just like identical / twin binary stars. There are untold trillions of binary stars where their center of mass is located in space between them where warped / curved space is cancelled out, and trillions of binary galaxies where warped / curved space is also located between them and cancelled out in the universe. Each and every one of these are blatant contradictions to Einstein’s theory of general relativity.

The proofs that space was warped are discussed by physicist Paul A. LaViolette:

“Contemporary physics explains gravitation on the basis of Einstein’s general relativity, which proposes that massive bodies exert their pull by warping the metric of space, but it does not explain how mass warps space. The famous Serbian-American scientist, Nikola Tesla, strongly disapproved of Einstein’s – warping assumption. In 1932, Tesla stated:

“I hold that space cannot be curved for the simple reason that it has no properties . . . Of properties we can only speak when dealing with matter filling the space. To say that in the presence of large bodies, space becomes curved is equivalent to stating that something can act upon nothing. I, for one, refuse to subscribe to such a view.’

Moreover, there is no way to verify unequivocally whether or not matter does warp space, since all the standard tests for this effect may be accounted for by alternative theories. For example, in 1898, before the development of general relativity, Paul Gerber derived a formula for the angular advance of the long axis of Mercury’s elliptical orbit in classical physics terms by assuming that gravity is transmitted by a Newtonian potential that propagates with the velocity of light. Also, the gravitational bending of starlight near the limb [outer edge] of the Sun [during a solar eclipse], another standard test for general relativity, is just as easily

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explained as a refraction effect [caused by light passing through ionized gas around the Sun which bends it like light refracted in water which bends it.]

Certain points must be emphasized in the above citation. Although Einstein posited that space could be warped around massive bodies, he could not explain, as la Violette said, “how mass warps space.” He spent his later years trying to prove how this occurs, but couldn’t and this may have been one of the reasons for his feeling that he was, as stated above, “on the wrong track.” Since the tests to prove space was warped could be explained by other theories, Einstein never really had indisputable proof that general relativity, on this count, was right. This too, may have been a source of his dissatisfaction at the end of his life. On top of that, when Velikovsky predicted, at Einstein’s suggestion, that he make a prediction, and Velikovsky said Jupiter would have a large magnetic field which was subsequently found by Bernard Burke and Kenneth Franklin in 1955, it implied electromagnetism may play a role in celestial mechanics. That would have also been a blow to general relativity, in Einstein’s mind.

Lastly, before proceeding, I pointed out, as have many others, that scientists were putting all kinds of unseen materials, forces and dimensions into the vacuum of space – Dark Matter, Dark Energy, Dark Flow, strings, branes and multidimensions. In a real sense, Einstein was also putting something that could not be seen into the vacuum of space. He said that it had the ability to curve. This, again, harks back to Aristotle and the Greek cosmologists who put curved balls of an unseen material quintessence, that was different than all other materials, to affect the motions of the planets, the Sun and Moon around the Earth. As with Tesla, above, I maintain that space has no properties.” Only matter and electromagnetism fill it, as can be seen and tested. When one decides to give space, which his no properties, properties, one has descended, as Harlow Shapley said of Velikovsky’s electromagnetic concept, into the “black arts.” Again, as Tesla said, he could not accept that “something can act on nothing” and vice versa. I maintain that “nothing can ever act on something. Newton, himself, was unwilling to go that far as Graneau and Graneau explain:

“The remarkable difference between Newton and Einstein was that for some notable exceptions, Newton adhered to his self-declared creed, hypothesis non fingo. (I do not make hypotheses) and in public he only described experimental facts and observations. Einstein, on the other hand, was proud and indeed became famous for his boundless imagination and though experiments [experiments carried out in his mind] . . . Newton struggled with the same questions, but he recognized that the truth of nature can only be found in the objective world outside the human brain. The lesson to be learned is that if one cannot directly observe a mechanism for a physical action it’s best not to conjecture.”

Einstein performed no experiments; his theory and the mathematics that flowed from it were derived from his though experiments which Wal Thornhill correctly and emphatically said “Thought experiments are not experiments.” They are not, and should be “recognized that the truth of nature can only be found in the objective world outside the human brain.”

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One aspect of Einstein’s theory of general relativity is that it is, what the observer sees is reality, as opposed to an independent reality. Here, Ratcliffe points out:

“If I were to locate and isolate one chink in Einstein’s armor that exposes his failure to produce a realistic theory, it would be this: Notwithstanding his famous debate with Niels Bohr, in which he argued for observer-independence, he did not believe (at least for purposes of his theory) that there is existence, *separate from consciousness*, that we could mutually call reality. [Einstein’s relativity required that different observers moving differently in space experienced different times and observed these as different times from realities.] That there is a world out there that does not vary with observation is anathema to Einsteinian philosophy.”

Einstein had a dream as a teenager that presaged the later theory of relativity. Ratcliffe describes it thus:

“Let me describe young Albert’s dream.

“On an invigorating mountain walk, Albert came across an expansive meadow on an Alpine farm. The farmer had erected an electric fence to divide the meadow so that he could rotate the grazing of his cattle and allow half the pasture to recover whilst the cattle enjoyed the other half. Well, that was the plan, but there were three cows there that thought otherwise. Because the battery powering the fence was defunct, all three bones had their heads through the fence buried in the rampant grass on the other side. They were quite oblivious to the approaching Albert, or more ominously, to the disgruntled farmer who was at the very moment about to connect a fully charged battery to the fence . . . Albert’s dream was marvelously well organized for easy arithmetic. All relevant distances are equal; from the farmer on the far side to the first cow, between cows, and from the third cow to Einstein in the foreground, all were the same, and were equal to the distance covered by light in one second, say. Additionally, all signal speeds were identical. The unvarying speed of light brought the images to the observers, and this was taken also to be the speed of electricity along the wire . . .

“The farmer switches on the power. A second later, the first cow gets shocked and leaps into the air. After a further second, the next cow jumps back in pain. Three seconds after switch-on, the third poor animal gets a powerful shock and faints. Let’s now compare what the farmer and Albert each saw. First, the farmer; he switches on the current takes one second to reach cow one, and the light-image a further second to travel back to him. He sees the first cow jump after two seconds. Likewise, cow two jumps after four seconds, and cow three after six seconds. Now, and this is the important part, what did Albert see? He sees all four events – the farmer hitting the switch the cows one, two and three reacting – *exactly the same time!* It’s easy enough to work out. The farmer is four light-seconds away from Albert, so the image of him switching on takes four seconds to get to our adventurous relativist. Cow one is three light seconds away, but reacts one second after the farmer sends the shock, so the image gets to Albert four seconds after

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switch-on. In other words, Albert sees at the same time as the visual of the farmer, the same goes for cows two and three. Albert sees all four events at precisely the same moment in time. For him, and this is crucial, they were simultaneous. For the farmer, they were not, they appeared to him in a slightly delayed time sequence.”

Here we have a beautiful concept of a “thought experiment.” The type of experiment that Einstein would use to explore physics. It was logical, but was it an imagined experiment with reality? Here, Ratcliffe asks in this regard:

“No we need to ask the question, as young Albert then did, ‘Who is right?’

“Einstein’s interpretation of his dream had profound consequences for humanity. He believed that, for each observer, the perceived scene was reality. For the farmer, reality was a delayed sequence at intervals of two seconds, while for Albert, reality was simultaneity. Each observer had a unique, personal reality, valid for his own frame of reference. Therefore, decided Einstein, there is no independent reality, no absolute time, and specifically, no such thing as absolute simultaneity. He completely ignores the scene as I first described it, with the switch and the cows jumping in a sequence of events, all one second apart, irrespective of whether it was seen by an observer or not. Therefore, despite his protests to the contrary, Einstein addressed in his Theory of Relativity that conception of reality which exists only within the domain of human consciousness. *It is important for us now to fully digest that for Einstein, and therefore, for the Theory of Relativity, no observer’s independent reality is entertained.* My view is this: what if an automated timer sent the electric current, and the farmer and Albert were, at that moment, holidaying in Biarritz? What would then have transpired? That is reality, something entirely unaffected by observation.”

Because observed reality is Einstein’s reality. When one observes a clock in two different frames of reference, each moving at different rates, means that time can also move at different rates. That is, it is well-known that gravity can affect the fall of a pendulum clock in two different frames of reference that are ticking away at two different rates. The nature of how clocks vary in different gravitation frames of reference is described by Hasan S. Padamsee: For pendulum clocks:

“A related consequence of Earth’s prolate shape [the Earth bulges slightly at the equator but not at the poles, like a woman’s dress that flares out as she spins] is that a $g$ (acceleration due to gravity) varies over Earth’s surface. If $g = 9.832$ m/sec$^2$ at the poles it is $9.814$ m/sec$^2$ at the equator, a small but significant effect for accurate time keeping. Since the oscillation [of the pendulum’s] period depends on $g$, a 1 meter [40 inch] – long pendulum clock set accurately at the pole loses 80 seconds per day [if set] at the equator due to the Earth’s prolate shape and the inverse square law. When Paris academician Richer went to South America . . . he found a pendulum beat more slowly at the equator than in Paris. Huygens cleared

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up only part of the mystery [by showing] the rotation of the Earth slows down the pendulum by altering the value of \( g \) due to centripetal [outward] acceleration. But Newton’s gravitational law added another contribution. A pendulum loses a total of 230 seconds (nearly four minutes) per day between the pole and the equator. Earth’s spin alone is responsible for 2/3 of the change in \( g \) with latitude, while the inverse square law is responsible for 1/3 [or about 80 seconds].”

If, as Einstein stated, what the observer sees is reality, then time is different at the poles than at the equator. This means time can slow down. A clock beating slower than another is in a time reference that is slower. Time has slowed down. A person living in that slower time frame, according to Einstein, will age more slowly than a person living in a time frame where the clocks beat faster. On the Earth, these differences are so minute that this difference is negligible. However, since gravity and inertial force are the same, according to Einstein, then a person in a space ship that is moving close to the speed of light will have a clock that has slowed immensely and, therefore, will age very little, compared to one moving, say, on the Earth. This is the famous “Twin Paradox” of Einstein. Martin Gardner, a vociferous critic of Velikovsky, who sides with Einstein, describes this thought experiment thus:

“The paradox is usually described as a thought experiment involving twins. They synchronize their watches. One twin gets into a spaceship and makes a long trip through space. When he returns the twins compare watches. According to the special theory of relativity, the traveler’s watch will show a[n] . . . earlier time. In other words, time on the spaceship will show a slower rate than time on the Earth . . . over long distances with velocities close to the speed of light, the ‘time dilation’ (as it is sometimes called) can be large . . .

“Suppose that the astronaut twin goes a distance of a thousand light-years and returns . . . would not the astronaut die long before he completes the trip?

“The answer depends on how fast the ship goes. If it travels just under the limiting speed of light, time within the ship will proceed at a much slower rate. Judged by Earth-time, the trip will take more than two thousand years. Judged by the astronaut on the ship, if he travels fast enough, the trip may take only a few decades! . . .”

Gardner goes on to explore the objections to the concept and also defend it.

“Henri Bergson, the famous French philosopher, was the most eminent thinker to cross swords with Einstein over the twin paradox. He wrote about it at some length, poking fun at what he thought were its logical absurdities. Unfortunately, what he wrote only proves it is possible to be a great philosopher without knowing much about mathematics. In the 1970s, the same objections were raised again. Herbert Dingle, an English physicist, refused to believe the paradox. Until his death in 1978, he wrote man witty articles about it and accused other relativists of being either obtuse or evasive. The superficial analysis to be given here certainly will not clear up this controversy . . . but it will explain in a general way why there is almost

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universal agreement among experts that the twin paradox will really carry through in just the manner Einstein described.

“Dingle’s objection, the strongest that can be made against the paradox, is stated this way. According to the general theory of relativity, there is no absolute motion of any sort, no ‘preferred frame of reference.’ It is always possible to choose a moving object as a fixed frame of reference without doing violence to any natural law. When the Earth is chosen as a frame, the astronaut makes a long journey, returns, finds himself younger than his stay-at-home brother [on Earth]. All well and good. But what happens when the spaceship is taken as the frame of reference [so it does not move]? Now it must be assumed that the Earth makes the long journey away from the ship and back again. In this case, it is the twin on the ship who is the stay-at-home. When the Earth gets back to the spaceship, will not the Earth-rider be the younger? If so, the situation is more than a paradoxical affront to common sense; it is a flat logical contradiction. Clearly, each twin cannot be younger than the other.

“Dingle stated it this way: Either the assumption must be made that after the trip the twins will be exactly the same age or relativity must be discarded.

“... It is true that all motion is relative, but in this case, there is one all important difference between the relative motion of the astronaut and the relative motion of the stay-at-home. The stay-at-home does not move relative to the universe." 11

Gardner asks:

“How does this affect the paradox? . . .

“Now it is the Earth that moves away, shifts inertial frames, [and] comes back again. Why wouldn’t the same calculations, with the same equations, show that Earth-time slowed down the same way? They would indeed if it were not for one gigantic fact: When the Earth moves away, the entire universe moves with it. When the Earth executes its turnaround, the universe does also. This accelerating universe generates a powerful gravitational field... Now it turns out, when all the proper calculations are made, that the gravitational field generated by the accelerating cosmos, slows down the spaceship’s clocks until they differ from Earth clocks by precisely the same amount as before. This gravity field has, of course, no effect on Earth clocks. [Since] the Earth does not move relative to the cosmos; therefore, there is no gravitational field with respect to the Earth...” 12

Therefore, in an expanding accelerating universe, there is no change in the clocks on Earth and the stay-at-home twin experiences no slowing of time, but the expanding accelerating universe “slows down the spaceship’s clocks until they differ by the same amount as before.” Ergo, the twin in the spaceship still ages less than the twin on Earth and the relativity theory is saved. It would seem Gardner has given us a neat and tidy solution to Bergson and Dingle’s challenge. Let me, nevertheless, counter this with another “thought experiment.”

11 Ibid., pp. 16-17.
12 Ibid., p. 17.
There are a set of twins, but neither stay on the Earth. A friend does, who takes part in the experiment. The twins leave Earth, going in the same direction at the same near speed of light, but significantly at two different times. The twin in the first spaceship left the Earth years ago and has just turned around to return to Earth. The second twin’s spaceship at that same time leaves the Earth and speeds off toward the first returning one. Both twins then conceive that they are in the one moving frame of reference. Thus, for the twins, the Universe is moving and not they. However, according to Gardner, the twin in the returning spaceship has the entire Universe moving in one direction, while the twin in the spaceship that just left Earth has the entire Universe moving diametrically in the opposite direction! I am, of course, using the very same logic and mathematics Gardner employed, and have shown his attempt to salvage the relativity theory fails. Just as two objects cannot occupy the same space at the same time, the Universe cannot be moving in diametrically opposite directions at the same time. In Gardner’s own words: “The situation is more than a paradoxical affront to common sense, it is a flat logical contradiction.” For relativists, I have beaten them at their own game with the same logic and mathematics they employed. It would seem impossible for this problem to get worse, but it does. Tom Van Flandern has also described this “thought experiment” using the same logic and mathematics as the Einsteinians.

He has, as the “twin paradox,” one twin that stays on the Earth while the other rockets off in a spaceship at 99 percent of the speed of light going to the star Alpha Centauri, which is four light years away. However, he has on board certain types of clocks that keep very precise time. One is calibrated to keep Earth time, as do Global positioning Systems [GPS], so this clock always tells the twin aboard the ship the time on Earth. The other clock keeps time for spaceship. Because the ship is moving so fast, it runs much slower than the GPS clock. Because the spaceship is traveling at 99 percent the speed of light, its $g \approx 7$. Or $1/7$ that of $g$ on Earth. The round trip to Alpha Centauri takes 4 years and there the ship turns around or another spaceship with a person in it just as old as the twin in the spaceship that precisely heads to Earth from Alpha Centauri. Accordingly to Van Flandern:

“The traveler has informed that only one month has elapsed back on Earth since his journey began, so by spacecraft-frame reckoning Earth time is just one month later [on the spaceship clock] than the actual departure time. For example, if the journey commenced in 2000 January, when the traveler arrives . . . the on-board GPS clock reads 2004 February. Because of the finite speed of light, the [twin] traveler cannot check the inference by direct observation. According to S[pecial] R[elativity], all these clock-reading inferences are not just illusions, but reflect the real physical time for each frame involved. So at the same time and place that an A[pha] C[entauri] resident infers that Earth time is 2004 Feb. the spacecraft traveler infers it is also 2004 Feb – a four year difference and both are correct for their respective frames.

“Then the spacecraft turns around. Nothing changes locally, but inferences about the remote time change greatly because of time slippage, which now [in the equations] has the opposite sign. Now [this means mathematically and in reality] the traveler infers that Earth time is [not 2000 but] 2008 Feb, 4 years in the future instead of the past. As a consequence the traveler will again infer that only one month of Earth time will elapse during the return journey, and all participants agree
that the [twin] traveler’s return will be 2008 March. The reveler arrives [as Einstein claimed] younger . . . than the stay-at-home.”

Again, all well and good for relativity theory, but Van Flandern then points to a fatal problem in accepting the twin paradox as being reality:

“So before commencing a journey back to Earth, let’s suppose the traveler orbits . . . [Alpha Centauri] several times. Then each time the traveler heads away from Earth. In that orbit, Earth time drops back to 2000; and each time the traveler heads toward Earth, inferred Earth time becomes 2008 . . . Now the significance of repeating this situation several times is that, as Earth time goes to 2008, many people will have died [then] and others will be born. And on each occasion that the Earth time reverts to 2000, some of the dead will be resurrected and some living children in 2008 will cease to exist in 2000 . . . Nonetheless, . . . [Special Relativity] insists that such change affects real, physical time and are not mere illusions, because the viewpoint of each inertial frame is just as valid as that from any other place.”

If we accept the “twin paradox” reality we have the impossible situation that the dead can be resurrected and the living disappear, and this can happen over and over and over. I said the problem was lethal, but I was (tongue in cheek) wrong. Like Jesus, the dead can be resurrected if one accepts Relativity Theory. Suppose we have the twin traveler go to a star about 45 light years away to a planet and circles it, then given time dilations, it would be 90 years altogether covered between the spaceship time going away from Earth around that star and people born at just the right moment would be born, live and just before death be born again to relive their lives. This, too, is an outcome of Einstein’s theory.

While all these outcomes are theoretical, the question is: has time dilation (time slowing) been proved experimentally? Here the relativists will claim it has. Nevertheless, let us examine these experimental proofs. The one great test that is presented in the scientific literature and media regarding time dilation and the “twin paradox” was carried out by J. C. Hafele and R. E. Keating. Here is some of the literature that holds it as proof of relativity theory. George F. R. Ellis and Ruth M. William write, “Time dilation gives rise to the “twin paradox . . . This feature has been observed experimentally by . . . the Hafele-Keating experiment . . .”


14 Ibid., p. 227.
us: “The phenomenon of time dilation was experimentally verified by Hafele and Keating.”

Tochiro Kinoshita writes: “Hafele and Keating . . . verified the time dilation at low velocity with an accuracy of about 10%.”

That, at least, is the story told *ad nauseum* in 300 other science publications. The experiment recreates in a small measure the “twin paradox” by having an atomic cesium clock placed on the Earth at a particular point and another cesium clock flown around the Earth. The clocks on the Earth represent the stay-at-home twin; the clocks in the airplane represent the twin who travels in space. Craig describes it for us:

“In 1971, J. C. Hafele and R. E. Keating conducted a remarkable experiment which demonstrated time dilation at even low speeds [published in *Science* for July 14, 1972, pages 168-170]. They flew four cesium clocks around the world on commercial jetliners, first eastward then westward. They discovered that on the eastbound trip the clocks lost about 59 nanoseconds [a billionth of a second] and on the westbound trip, the clocks gained 273 nanoseconds . . . This clock on the Earth’s surface [which is rotating] therefore [also] experienced a time dilation, as well. Once this is taken into account, Hafele and Keating’s results accord closely with the predictions: the predicted time difference for the clocks on the eastbound journey was –40 ± 23 and for the westward trip 275 ± 21. The verification of these predictions provides evidence that atomic clocks in motion do go slow[er than on Earth], even on commercial aircraft.”

Martin Gardner, about the Hafele-Keating experiment, tells us:

“Compared to a reference clock in Washington, the traveling clocks performed as expected [by special relativity theory].”

While Gerald Wick wrote, “the clock paradox resolved” in *New Scientist*, (Feb. 5, 1972), page 263. “Most physicists live by numbers alone and if the hat is the right size, they wear it.” But are the “Numbers” the “right size,” is the real questions. Unfortunately, the numbers are the wrong size and the hat has been pulled down over the eyes of science and reality, in a word, as we will see, how the hat was tailored to fit.

The problem, almost never discussed, is that cesium clocks are not accurate enough to perform this experiment and the test results had to be adjusted to make the raw data fit the relativity outcome. Al Kelly explains:

“Hafele and Keating did not publish the actual ‘raw’ test results (which would have let the cat out of the bag), but an amended ‘messaged’ version, which conformed to the result they had forecast. [However,] The raw data was obtained by this author by making a phone call to the United States Naval Observatory . . . This data mentioned in a reference in the 1972 Hafele-Keating paper, but that reference gave no clue as to the importance of this data or that it would contradict the published conclusions of those authors. The messaging of the data was

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obviously a case of ‘the ends justifies the means and shows that sometimes the peer review system is not as fool proof (or unbiased) as it seems.”

Here is a chart of the Hafele-Keating actual results and their published results, as Kelly presents it in nanoseconds.

<table>
<thead>
<tr>
<th>Clock No.</th>
<th>Eastward Actual Test Results</th>
<th>Bound Published Results</th>
<th>Westward Actual Test Results</th>
<th>Bound Published Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>-196</td>
<td>-57</td>
<td>+413</td>
<td>+277</td>
</tr>
<tr>
<td>361</td>
<td>-54</td>
<td>-74</td>
<td>+44</td>
<td>+284</td>
</tr>
<tr>
<td>408</td>
<td>+166</td>
<td>-55</td>
<td>+101</td>
<td>+269</td>
</tr>
<tr>
<td>447</td>
<td>-97</td>
<td>-51</td>
<td>+26</td>
<td>+273</td>
</tr>
</tbody>
</table>

Average Forecast Result: -40 +275

Kelly goes on to say:

“The forecast results were -40 going eastward and +275 going westward. You can see that Hafele and Keating did a pretty good job of making the published figures line up with the forecast results! The barefaced effrontery is breathtaking. I wonder if university texts will quietly drop all references to the Hafele-Keating tests without any stated reason and without further ado? One has already done so.”

It is interesting to note how the establishment acted toward those who brought this information to their attention. Again, Kelly is given leave to describe the suppression:

“A paper by [I.] Essen (1977) was uncovered when all the above analyses had been done . . . Essen said that his critique was submitted in 1972 to ‘a journal that had published something about the experiment, but the note was rejected.’ The journal was Nature, which had an editorial lauding of the test results and which rejected his article.

“The author of this book [Al Kelly], had a similar experience when trying to have published the current critique of the Hafele and Keating tests in a different journal. Indeed, one reviewer gave a veiled threat that the relatives of Hafele or Keating might institute a legal proceeding [to intimidate me], if such criticism was published . . . Was someone getting scared that eventually, after all these years, the bubble was about to burst . . .

Who is Essen? Kelly tells us:

“Essen built the world’s first caesium clock in 1955 and spent his life working on time and frequency measurement at the National Physical Laboratory in the UK.

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23 Ibid., p. 33.
24 Ibid.
25 Ibid., p. 277.
He eventually became director of the Time & Frequency Division. Because he was a world expert on such clocks and their accuracies, he knew what he was talking about. Even so, his studied criticism went unanswered and has been ignored ever since.”

Essen stated in no uncertain terms:
“All the experiments showed was that the clocks were not sufficiently accurate to detect the small effect predicted . . . this absurdly optimistic conclusion [by Hafele and Keating] was accepted and given wide publicity in the scientific literature and by the media as confirmation of the clock [twin] paradox.”

In a more direct manner, Ratcliffe addresses the behavior outlined by Kelly:
“Only one of the clocks (numbered ‘447’) performed steadily – what else should a clock be if not highly regular? – Yet its results for the westward flight were ‘corrected’ from +26 ns to +266 ns. That is ten times the original figure! All times for the other three clocks were similarly tampered with, and a remarkably tailored result was published to worldwide acclaim . . . The damage is done, and a whole lot of people now think that there is expert verification of Relativity where there is in the cold light of day none at all.”

Stephen Gaukroger outlines how antithetical to science tailoring results is.
“One therefore has to proceed without the benefit of any supposed clues [or theory], but there is one possible source of guidance, the experimental apparatus itself. This produces a certain range of phenomena which [can] defy explanation [of the theory] in fundamental terms, but which cannot be dismissed because the results themselves cannot be faulted. The only way is to take the results at face value and started from them . . . It is the way in which they are generated . . . that holds them together as connected phenomena and that excludes what might otherwise seem . . . to be related phenomena. The way in which the results are generated is a function of the experimental apparatus, the way in which the apparatus is manipulated and what one is able to do with it[‘s results], . . . is what is happening here can be fruitfully described in terms of . . . replacing the underlying structure that would traditionally have occupied this role. What occurs is a form of tailoring of the explanation . . . in short, a tailoring of explanans to explanadum [the theory explains the facts to be explained] thereby reversing the normal direction of inquiry.”

The tailoring of the Hafele-Keating experiment with all the altering and sewing here and there, leaves it threadbare, an emperor clad in refinements that only exist in the theoretical mind.

Nevertheless, as reported in the journal *Science*, very accurate clocks, called ultra-quantum logic-clocks, were able to show that one 12 inches above the other slowed one second in

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26 Ibid.
27 Ibid.
3.7 billion years, as compared with cesium clocks, that are off by one second Ma 100 million years. Again, the supposition is that since the higher clock slowed, time itself slowed. What is time and can it be altered by gravity or accelerations? The ticking of the clock, like a pendulum clock, can change; that is something made the clock tick slower, but because a clock ticks slower, has time changed? Time is not an entity; it is a concept. It is an illusion created by changes in space by material / physical objects from one place to another, or from one state to another. There is no other way to adduce time than by observing an object move or change. It is nothing in very the same way that space is nothing, and neither can be acted nor altered by matter or force. Until it is proved to be an entity and not a concept or an illusion foisted on space, it is still nothing. Let us, therefore, examine this concept that space and time are entities by a test carried out that pits one concept – time, against that of space. Einstein’s equations of general relativity showed that the universe must be either expanding or contracting. Einstein: equations of special relativity suggested that the faster objects accelerate, the slower time goes. This can be tested by observation of quasars. Quasars rotate and their light curves exhibit a regular oscillation. Therefore, quasars at the same distance from the Earth, with the same or closely similar light oscillations, compared with quasars in accelerating space farther away, will tick faster than the more distant ones. In both cases, the speed of light is constant. The more distant quasars should be ticking more slowly than closer ones. This is comparable to the two ultra-quantum logic-clocks, except the experiment / observation was carried out on almost 900 quasars. According to Nicole Gugliucci:

“Since the universe is expanding – and the distant quasars are racing away from us – a clock placed in one of the distant galaxies should be running slower than a clock we have on Earth. Therefore, the effect of time dilation for distant objects can be measured if we can observe the ticking clock in the distant galaxy.

“[Mick] Hawkins [of the Royal Observatory, Edinburgh] took advantage of the fact that quasars blink. This blinking, or variability, can be viewed as a ‘ticking clock.’ He used data from [almost 900] quasars monitoring programs stored on the photographic plates to measure the time scales of the blinking. Looking at the time scales for two groups of quasars, [six billion light years away] and the other even farther, [ten billion light years away], there was no measurable difference that meant no time dilation: meaning that for both groups of quasars, the clocks were [ticking] the same.

“Either the Universe isn’t expanding, as Einstein required, or time dilation, as Einstein suggested, is false.”

This is a direct contradiction to relativity theory. If the universe is expanding and accelerating, as general relativity demands, then the ticking quasars are not experiencing time dilation, and special relativity is invalid and fails. One has to give up general relativity in order to keep special relativity. But if the Universe is expanding and accelerating and time dilation is not being experienced by quasars, special relativity is invalid and fails. One has to give up special relativity in order to keep general relativity. For relativists, this is unthinkable: it is Salvador Dali’s painting of a drooping clock on a desolate landscape ticking away. The situation now for

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31 No Time Dilation for Distant Quasars? (Internet)
relativists is their surrealistic reality. The painting juxtaposes a total incongruity of reality with common sense, just as curved, expanding space and time dilation do. In fact, Dali had three drooping clocks and one that was not reminiscent of Hafele-Keating’s experiment. It is a paranoid masterpiece. Ratcliffe informs us that:

“None of the most-cited experimental support of Relativity stands up to the imposition of acceptable scientific procedural norms. The . . . Hafele-Keating experiments, as well as those done to measure the procession of Mercury’s perihelion, the binding of light by the Sun, and the effect of gravity on time (Pound-Rebka) are, at best, very ambiguous; at worst, without scientific merit of any kind at all. The much-vaulted experimental and observational verification of Einstein’s Relativity is paper-thin . . . an astonishing lack of scientific integrity has not prevented Relativity from becoming the iconic symbol of progressive scientific thought through the last 100 years.”32

Eric Baird has listed and raised questions and doubts about most of these experiments about special relativity.33 Baird goes on to explain the inherent manner by which experiment research of it has been handled:

“We’re told that Special relativity produces good results, as long as it’s used within the domain of applicability. It isn’t compelled to produce good results when used outside this proper range. This sounds reasonable.

“But what is the proper range? How do we calculate it? It turns out the proper range is determined **pragmatically** – it’s the range of situations in which . . . [special relativity] is already known (or thought) to produce good results. It’s essentially an ‘engineer’ definition, reducing . . . earlier grand statement [such as special relativity has been experimentally proved so often that its value is unquestioned] to something more like ‘special relativity is known to work very well in situations where it is known to work very well [a tautology].

“Knowing where these limits are tells where . . . [special relativity] is a useful theory for engineering purposes, but their flexibility makes it more difficult for us to judge whether the theory has deeper validity. Flexible, retroactively-defined domains encourage selectivity in how to evaluate evidence – case of good agreement between . . . [special relativity] and the available data are taken as validating the theory, while disagreements are treated, not as evidence against the theory, but as showing it is being applied inappropriately. This approach . . . [is] rotten for experimental testing, because it makes it more difficult to classify a theory as **falsifiable**. We can end up insisting that the theory is ‘doing a damn fine job’ within its movable domain and [then] forgetting that the domain has been **preselected** as the range that produces [acceptable] results. We can find ourselves saying [as do many relativists] that when an experiment disagrees with . . . [special

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relativity) it is not the fault of the theory, but the fault of the experiment (or experiments)."\textsuperscript{34}

A typical example of this behavior is the time dilation of the muon, a particle created in the Earth’s atmosphere by cosmic rays striking electrons. These have a very short life time before they decay and thus should not reach the surface of the Earth. The claim of special relativity is that, because they are traveling at \(0.999667\) the speed of light, time has slowed for them and thus they do reach the Earth’s surface, where their energies, not these particles, are detected by Geiger counters. Therefore, the muon has experienced time dilation. Regarding this experiment, Mathis explains how freely the parameters are selected that support special relativity when, in fact, these are not known:

“The muon is currently used as proof of time dilation, since without it, we are told, the muon would not live long enough to reach the surface of the Earth. The muon lives only \(2.2 \times 10^{-6}\) seconds and [thus can only travel] 660 m[eters] [410 feet] under normal circumstances. But it is thought to be produced [only] at an altitude of 15 km. It does reach detectors on the surface of the Earth or at sea level, therefore, it must be experiencing time dilation . . .

“Since they [physicists] do not know the altitude of creation, they cannot know the distance or time. [equational] Transforms have to be done on data: that is, on measurements that are directly made in experiments. But we only detect muons, or in some cases, measure their energy. We cannot and do not measure time or distance, therefore, we cannot apply time or distance transforms. The altitude of production is inferred from the energy, as is admitted.

“This is a major problem, since you cannot apply . . . [special relativity equational] transforms to an inference. You cannot find a body is [time] dilated without knowing its initial state. We do not know the altitude of production for the muons we detect, therefore, we cannot apply transforms. The current theory is circular. We [first] claim that if the muons are [time] dilated as we think they are, then they must come from a certain altitude [15 kilometers up]. And [second], that they are time dilated. The theory has no content and no possible proof. It cannot be proved, it cannot be proof of anything.”\textsuperscript{35}

The assumption is that cosmic rays create muons at an altitude of 15 kilometers, about 9 miles above the Earth’s surface. But the fact of the matter is cosmic rays actually reach the Earth’s surface. Jay S. Noller, Jane M. Sowers and William R. Lettis explain:

“There are two sources of primary cosmic rays that reach the Earth’s surface: the sun and the galaxy . . . Because most of the cosmic ray particles are charged, they are deflected by the Earth’s magnetic field.”\textsuperscript{36}

\textsuperscript{34} Ibid., p. 220.
\textsuperscript{35} Mathis, The Un-Unified Field, op. cit., pp. 192-193.
They do reach the Earth’s surface yet “cosmic ray intensity on the Earth’s surface [is] lower at the equator than at the poles.” So how does one know if the muons are created 15 kilometers / 9 miles up in the atmosphere and not a few hundred feet above the surface? In this case, proponents “preselect the range that produces [acceptable] results,” as Baird told us. They determine the altitude 15 kilometers / 9 miles and, therefore, muons are time dilated. Again, as Baird said, “This approach [is] rotten for experimental testing.” The theory determines what the unknown parameters must be and having preselected these parameters as night follows day, muons experience time dilation. To repeat Mathis: “The theory has no content and no possible proof. It cannot be proved; it cannot be proof of anything. Yet, it still presented as one of the clearest, best proofs of special relativity. Larry D. Kirkpatrick and Gregory E. Francis write, “An early verification of time dilation . . . involved the behavior of . . . muons. Muons are created high in our atmosphere . . .” Tochiro Kinoshita states: “The existence of cosmic-ray muons at ground level supports the idea of time dilation.” Raymond A. Senway, et al. put it this way: “Time dilation is a very special phenomenon that has been verified by various experiments . . . Muons are naturally produced . . . at a height of several thousand meters above the surface . . . However, experiments show that large numbers of muons do reach the Earth . . . Time dilation explains this effect.” These citations can be added to ad nauseam. There is given no hint that the experimenters preselected all the parameters to fit the theory. The public is the recipient of a massive advertising campaign to sell special relativity and especially time dilation.

Thus far, Einstein has taken the concept of vacuum space and warped it, while I and others before me say vacuum space can be filled with physical material in only three Euclidian dimensions we can see, and electromagnetic energy. In addition, Einstein has put time into space and claimed that the acceleration of material bodies causes time to slow while I and others before me maintain that time does not exist, but is an illusion caused by materials or energies changing as they either traverse space or break down by interactions with other materials or energies. The one element that did not change in any way, according to Einstein, was the speed of light. That was the one constant in the universe; it could travel through curved space at a velocity that no atom in the Universe can achieve, because to get a physical material to do that required infinite energy. Thus, the photon of light was a material that had to have infinite energy pushing or pulling it. Where that infinite energy comes from and how it works to move the photon we are never told. The photon is a thing in the Universe, among some other subatomic particles, like the neutrino, that moves at the speed of light. While infinite energy cannot move an atom to travel that fast, in spite of it being infinite, it can only move the photon to one definite and certain speed. Any challenge to that concept that nothing can travel faster than the speed of light would have to be proved and, if proved, would destroy general relativity. The speed of light was the fundamental pillar for Einstein and the relativists, therefore, any scientist whose experiments or observations challenged that concept would be destroying relativity theory and the careers of all those who had

worked in that field. One of the scientists who challenged this speed limit was Tom Van Flandern. According to Graneau and Graneau:

“A modern theoretical astronomer who deserves much admiration is Tom Van Flandern . . . who clearly recognized that many astronomical observations are not compatible with the propagation of gravity limited to the velocity of light. He updated the calculations of Pierre-Simon de La Place . . . who was the first to demonstrate that gravitational interactions had to be at least seven million times faster than what we now call the speed of light. Van Flandern used modern data to show that, in fact, if gravitational interactions involved messages between interacting bodies, then the messages must be traveling at least at twenty billion times the speed of light in order to retain the stability [of the planetary and satellite bodies] that we observe in our solar system.”

According to Van Flandern, the solar system would become unstable if gravity traveled at the same speed as light.

“Einsteinian relativists consider the speed of light to be the cosmic speed limit and as a result find this result very difficult to assimilate in their theory. It seems a small mental step from Van Flandern’s very large gravity velocity to acceptance of simultaneous remote particle interactions. La Place made this leap but Van Flandern is not prepared to take this step because of the human element and what he calls logic. Instead, he postulates by hypothesis [his own theoretical explanation] the existence of gravitons which travel much faster than photons.”

Let us take the question of superluminous velocity down to the quantum level and relate it to the electron which moves outside the nucleus of the atom and is assigned a spin. According to Youhei Tsubono: “The spin angular momentum of $\frac{1}{2} \hbar$ [the Planck constant] One electron is very light and small. So by equating the angular momentum of the spinning sphere of the electron to $\frac{1}{2} \hbar$, the sphere speed leads to more than one hundred times the speed of light.”

While saying the electron “is very small,” Tsubono is also saying it takes up space, and by adding that it is light he is saying it has mass. The electron is a real entity. According to Malcolm H. MacGregor:


“It is, surprisingly, perhaps the most overlooked, or at least bypassed, question in physics of the twentieth century. When the electron was first discovered, the logical assumption was made that its mass is purely electromagnetic, and the early models of the electron pictured it as a spatially extended electric charge distribution. However, . . . this viewpoint ran into both experimental and conceptual difficulties. In particular, no combination of purely electric and magnetic charges is stable; an electromagnetic electron would explode. Also, the self-energy that arises from the extended charge distribution, when combined with the small radius that we now know corresponds to electron scatterings experiments, leads to an electrostatic self-energy that is much larger than the observed mass of

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41 P. Graneau, N. Graneau, In the Grip of the Distant Universe . . . op. cit., p. 16.
42 Ibid.
43 Electron spin doesn’t really exist. It’s only a mathematical thing. (Internet)
the electron. Thus, it was clear within the first two decades after its discovery, and even clearer now the electron is not a purely electromagnetic entity. It must have a non-electromagnetic mass component.\textsuperscript{44}

Although the nature of this mechanical mass is unknown, it exists it seems as a strictly microscopic phenomenon that has no counterpart in the macroscopic world.\textsuperscript{45} MacGregor, however, admits the size of the electron according to “the [experimental] data are not definitive, and new experiments are required in order to clearly resolve this issue.”\textsuperscript{46} Therefore, the electron has mechanical mass and size, but because of this, a spinning electron is traveling one hundred times the speed of light, impossible in Einstein’s world. Furthermore, the electron has electrical charge. Given all these qualities, mass, size and charge, the electron as a real thing is a contradiction to special relativity. Charles E. Burkhardt and Jacob J. Leventhal discuss this quandary:

“Before proceeding with the mathematical details . . . we digress to discuss the origin of the term spin. After all, we have stated that in nonrelativistic quantum mechanics, particles are point objects, they have no finite extent. How, then, does a point spin? Of course it doesn’t, but the pioneers of quantum mechanics [S. A.] Gouldsmitt and [G. E.] Ulenbeck in this case, visualized the effects they were attempting to describe. They imagined that the electron is a spherical shell having total charge $e$ uniformly smeared over its surface, reminiscent of the model used to derive the classical radius, of the electron . . . This spinning sphere creates a magnetic moment identical with that of a bar magnet. Is this model consistent with the classical radius of the electron? No – as can be seen by equating the angular momentum to the spinning sphere to $\hbar/2$ [half the Planck constant]. Solving for the speed of a point on the [electron] sphere leads to a speed that is roughly one hundred times the speed of light . . . Thus, the manipulations [of] the classical radius of the electron . . . are suspect. Nevertheless, the concept of the classical radius remains in the physics jargon. It is the [mathematical] eigen values of the spin angular momentum that are correct as verified by observations.”\textsuperscript{47}

The only reason for changing the size of the electron to something called an eigenvalue is that it violated Einstein’s dictum of superluminary velocity. If the size of the electron was tiny enough so that the electron would not spin faster than light speed, its size would not be “suspect.” And then classic and modern quantum theory would support one another and be accepted as valid. Because this violation of light speed violates Einstein’s rule, it simply cannot be true. So, as we can see, the theory is determining what can be happening, not the classical mathematical values used to derive them. Wolfgang Pauli, who realized that the rules were being changed in the middle of the game to escape the classical model of electron spin greater than that of light, “remained

\textsuperscript{45} \textit{Ibid.}, p. 8.
\textsuperscript{46} \textit{Ibid.}
steadfast in opposition against the electron spin model.” Here John Whedbee explains the misfit of this kind of mathematics to physical reality where a body with mass does not occupy space.

“The nature of mathematics itself can be a problem . . . mathematics is essentially an abstraction. How well it functions when used to describe the physical world is unclear . . .

“A mathematical line is made up of points, which have no size and therefore occupy no space – and there are an infinite number of them, however short the line is! In the real world, a point with no size makes no sense – because it isn’t there. Neither [in the real world] is a line with only width or a plane without thickness [nor an electron with mass that does not have size]. So one cannot say that it is one-dimensional. Similarly, a flat plane has finite thickness, so it too is three-dimensional. [Only] In the mathematical world there are one-dimensional lines, and two-dimensional planes . . . each of which are made up of zero-dimensional points.”

Mathis puts it this way:

“A . . . huge problem is that the electron has a spin or an oscillation. A length is not a point. An oscillating electron must take up some space over the oscillation, you see, . . . any extension contradicts the point particle hypothesis.

“You will say that the electron is only defined as a point at an instant and that the oscillation must take time saving the math. But this is strictly illogical. First of all, a point is a nothing, and it is not clear how a nothing can oscillate. Second, an instant is also a nothing, since it is no time. Defining a particle as an instant and point is contradictory, since the definition of a particle is ‘thing.’ A thing cannot exist at no time and in no space, simply by definition of thing, space and time. Those who are defining particles like this simply don’t understand what words mean.

“As soon as we give time and space an extension, the electron begins to take up space and time . . . Therefore, the electron is not a point.”

Therefore, validation of quantum theory as a science of physical things – particles – the electron has size and spin and, if so, travels at one hundred times the speed of light, invalidating special relativity. In terms of mathematics and physical reality, there are several subatomic particles that are even smaller than atoms and all of these are also points with spin: and none of these can take up space and time; therefore, they cannot be points. Once one maintains that a mathematical entity – a point – that can only occupy zero space is not a physical reality, one has crossed the line that divides reality from fantasy.

To make matters for the restriction of physical reality from traveling beyond the speed of light, there is another phenomenon that electrons can supposedly do is namely tunnel through time to go instantaneously from one place inside the atom to another. That is, the electron can go


John Whedbee, Myths and Realities: Conflicting Currents of Culture and Science, (Lincoln, NE 2005), p. 203.

Miles Mathis, “A New Experiment Proves My Quantum Spin Equation” (Internet).
from one place to another without traversing the space in between. This is one of quantum theory’s concepts accepted almost universally by the scientific establishment. The electron’s speed, if it was a thousand times the speed of light, would still be too slow, because it still is traversing the intervening space. Niels Bohr maintained this concept which has become known as a “quantum leap” – going from point A to point B without traversing the intervening space. He argued that this was reality and scientists must accept it. He did not realize when he adopted this concept that he was harking back to medieval supernatural theological philosophy. This was a question raised by Thomas Aquinas and Duns Scotus. Aquinas wrote:

“Article 2. Does an angel, moving locally, pass through an intermediate place?

“. . . It would seem not. For whatever crosses an intermediate place must first cross a place equal to its own size before crossing a wider one. Now an angel is indivisible: therefore the former of these places can only be a point. Hence, in order to cross the whole of any intermediate place, the angel would have to arrive successively at an infinite number of points; which is impossible . . .

“Let us suppose an angel moves from A to B. Arrived at B he is no longer moving; he has changed places [like the electron]. But prior to the completion of any change, there is a process of changing. Hence the angel must have been moving at some point. But clearly not while still at A; therefore he was moving between A and B; therefore he did cross the space in between . . .

“But when an angel’s movement is discontinuous, it may happen that he passes from one point to another without crossing a place in between. This is possible.”51 Aquinas goes on to explain why:

“. . . this kind of movement – from one extreme to a given space to another immediately – is possible for an angel, but not for a body; for a body is measured and contained by place, and so must obey the laws of place in its movements. Not so for an angel: far from being subject to and contained by place, his substance dominates and contains it. An angel, then, can apply himself to a given place as he pleases, either passing through other places or not.”52

In essence, Aquinas understood and maintained that a body that had physical quantities must move from one point to another and pass through the intervening space while an angel, being a spiritual being, could decide whether he wished it or not, and could either traverse the intervening space or, like the electron, not travel that space. Niels Bohr was bringing science back to medieval theology and showed that an electron was as good as an angel, both could defy the rules that apply to all physical entities. Let us look further into this concept.

Max Planck explained that light coming out of the atom came out as discrete packets of energy called quanta. Seeing that there were several levels of these quanta, he devised a formula which fit these different levels. Niels Bohr, then understanding this, wrote formulas that allowed for these unique levels of energy but only on the supposition that when a photon struck an electron, the electron had to jump instantaneously from a lower orbit or place in the atom to another. If it moved through the intervening space, the energy would be smeared and not at only one unique

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52 Ibid., pp. 63-65.
level. He assumed that unique quantum behavior in the atom was required to explain this. But can light exhibit quantum behavior outside the atom in the observable world as well as in the atom? And can it do so with physical bodies? If there is evidence that, in the observable physical universe, where bodies are moving with respect to one another through space, show light coming from these bodies that also exhibit clear quantum levels, then the basis upon which Bohr and the entire quantum establishment bases their case is false. The fact of the matter is that it was shown that this is actually the case, as long ago as 1976. Halton Arp explains:

“In 1976, William Triffit, of the Seward Observatory reported a long, careful series of measurements of binary galaxies. These are galaxies so close together and of such similar redshifts [that determines their distances] that they are accepted as being physically associated, presumably orbiting around each other. The startling part of his report, however, was that the differences in redshifts between members of these pairs of galaxies were quantized in steps of 72 km s\(^{-1}\) [the galaxies were receding from the Earth in whole steps of velocities of 72 kms per second] . . .

“It is amazing for me to recall now the cutting jokes, the ridicule with which this result was greeted. . . Triffit had impeccable credentials and a record of serious careful research. Nevertheless, I was treated to some lunchtime conversation at Caltech in which an influential astronomer joked (well everyone laughed) about retroactively cancelling his degree. Triffit’s home institution stood by him, however, and he has continued to produce ground breaking research with patience and dignity.

“The initial aberrant result was well on its way to being buried, however, when a few years later, a rather dramatic event occurred.

“Triffit was on sabbatical in Italy and happened to be lecturing on the quantization result when a skeptical member of the class said, ‘Here is a new list of more accurate redshifts from radio measurements of hydrogen; I am sure you won’t find periodicity in here.’

“Not only did the quantization appear in this independent set of very accurate double galaxy measurements, but it was the most clear cut obviously significant demonstration of the effect yet seen. It is perhaps not very uplifting at this point to hear the lack of reaction of the astronomers who had made the measurements or the difficult in getting the significance of the results recognized and discussed. It is still a subject carefully avoided. The results were later confirmed by some optical measurements in the Southern Hemisphere and then very strongly reconfirmed again by a large number of accurate measures in the independent sample shown. . .”

“It would seem difficult, to put it mildly, to have an object with a redshift, which is due to velocity [moving away in space], and then to have this object disappear or dematerialize [like an electron which can only be at either points A, B, etc., without traversing the intervening space] when it [the galaxy] is not traveling at 72 km s\(^{-1}\)
or some multiple [interval] thereof. The quantization, in itself, therefore, establishes the existence of redshifts which are not caused by velocity.\textsuperscript{53}

Trifft, himself, pointed out some of the implications of his findings and why the scientific establishment responded with such strong, visceral animosity:

“The entire set of concepts [developed in these papers] is internally self-consistent and permits predictions which the conventional view does not even suggest. The predictions made have been verified in virtually all cases and offer alternatives to some very puzzling astrophysical problems: the mass discrepancy problem for galaxies and stellar rotational peculiarities, to name two major ones. Although not discussed specifically in these papers, the origin and evolution of galaxies by collapse [of materials in space] are also untenable, as are most, of the cosmological concepts based on the ‘expanding’ universe. In view of all the implications which inevitably follow from the discrete red shift hypothesis, it is not surprising that the idea has met extreme resistance. Nevertheless, a set of intimately related significant correlations involving massive amounts of data exists. Showing that the discrete red shift concept is inconsistent with the expanding universe . . . or quantum electrodynamics will not eliminate or explain [away] the correlations.”\textsuperscript{54}

Although distant galaxies are supposedly receding from one another or at different distances from the Earth, they could not be receding at only specific intervals of velocity. Cars on the highway are traveling at various velocities. If they were doing so in quantum amounts, as do galaxies, they would say be moving at say speeds of 10, 20, 30, 40, 50, etc. miles per hour or kilometers per hour and not at 15, 23, 36, 41, 58 miles or kilometers per hour and that they “simply disappear or dematerialize, or tunnel through time when not traveling at these intervals, as the electron cannot disappear or dematerialize when at different points in the atom. Trifft’s work was added to thereafter by William Napier and his co-worker, B. N. G. Guthrie, who continued along the line where Trifft left off, according to D. F. Roscoe:

“Napier began by using Monte Carlo methods to establish than an essential precondition for a rigorous analysis of the type proposed was the availability of a sufficiently large sample of redshifts, each with formal accuracy better than 5 km/s; anything less would result in a real signal a \( \approx \) [approximately] 36 km/s being washed out by measurement errors.

“Napier’s co-worker, Guthrie, performed a very detailed literature search to assemble a sample of 97 redshift measurements of the required accuracy – taking care to reject any that had been used by Trifft in any of his claims. This sample formed the backbone of subsequent Napier – Guthrie analyses . . .

“Since redshift determinations are routinely given in the solar frame of reference, this amounted to the need to correct the redshift in the sample for the Sun’s motion [around] . . . the galactic center. At the time, 1989, the solar vector determinations resided in a very large error box, and so Napier’s analysis had a lot of slack associated with part of it. Even so, it quickly became apparent that a very

\textsuperscript{53} Halton Arp, \textit{Quasars, Redshifts and Controversies} (Berkeley, CA 1987), p. 112

\textsuperscript{54} William Trifft in Richard C. Thompson, \textit{Vedic Cosmology And Astronomy}, (Delhi, India 2004), p. 158.
strong quantization effect emerged for estimated solar vectors anywhere inside the error box . . . Extensive Monte Carlo simulations give a probability of $\approx 10^{-8}$ for a signal like that . . . to have arisen by chance alone [about 1 chance in a billion].

“Subsequent to this initial publication, the satellite [spacecraft] Hipparchus, has been laundered which has resulted in very refined conventional determinations of the solar vector error box . . . These [were also found to] lie wholly inside the Hipparchus error box determinations.

“This analysis has been repeated on independent (although less accurate) samples . . . with similar results. Napier and Guthrie’s parallel analysis of claims for 72 km/s for differential redshifts between galaxies in groups has been similarly successful, and has equally bizarre implications.

“To summarize, Trifft’s original claims have been strongly and independently substantiated by the Napier-Guthrie analysis; this latter analysis has appeared in the mainstream literature and stands increasingly secure as Hipparchus observations continue to tighten the solar error box. Any serious thought about these two effects soon convinces one that the implications for cosmology are profound . . .”

Not only does this quantum relationship hold for the redshift of galaxies, but was also found for quasars, to be discussed below. It is called the Karlsson Effect, named for K. G. Karlsson, who discovered it. Ratcliffe explains:

“If the energy levels of cosmological light are really just a function of remoteness [of bodies in distant space] given the big bang postulates, a smooth distribution of matter in the expanding universe, then we would expect that redshift values should [be] present without digital breaks. The tabulated values would appear randomly, reflecting the suggested patternless distribution of light sources in the cosmos. If, on the other hand, redshift relates somehow to the internal energy of the source . . . , then we might expect something entirely different. Speculation aside, the [standard model of cosmology] does not accommodate periodic redshifts. Are they observed?

“The Karlsson Effect refers to certain values in redshifts of cosmological objects that appear more commonly than others. Preferred values in quasar redshifts were first detected by Margaret and Geoffrey Burbidge in 1967. Four years later, K. G. Karlsson confirmed the effect and derived a formula that constrained the periodicity. That earned him the honor of having his name pinned to an observed effect that was, in the words of [Halton] Chip Arp, ‘one of the truly great discoveries in cosmic physics.’

“Three decades later, with far more comprehensive catalogues of [cosmic object] data to work from, Doctors Burbidge and Napier published a summary of the by now overwhelming evidence for redshift periodicity entitled ‘The Distribution of Redshifts in New Samples of Quasi-Stellar Objects [Quasars]’ . . .

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“Of course, there was considerable resistance to the discovery. The upholders of orthodox law in cosmology quite naturally hoped that the effect would be local only, and they might then explain the patterns of ‘cosmic structure in the direction of the north galactic pole’ which ‘probably would have caused such effect’ (these are the words of an anonymous referee rejecting the submission of my paper on anomalous redshifts) . . . [Then cosmic] wide area surveys like the Sloan Digital Sky Survey (SDSS) soon presented ample data confirming the Karlsson effect for as far [out into the cosmos] as we are able to measure.


“The periods do exit in the SDSS data if the base value taken is the host galaxy’s redshift and not $Z = 0$ [redshift = 0] as used by the studies that [previously] found no unusual preferred [quantized redshift] values . . .

“John Harnett, of the University of Western Australia [also] found a distinct periodicity in redshifts of quasars . . .

“Although Harnett concludes that the periodicity is a selection effect and not some intrinsic property of the quasars themselves, it is, nevertheless, startling that quantisation of redshifts is so apparent in the data, yet pointedly ignored in the Standard model of cosmology.”

New Scientist, for September 16, 1971, page 612, reports the following regarding the Karlsson Effect:

“Some astronomers have claimed that the redshifts of quasars are not uniformly spread out but instead tend to cluster about certain values. It now looks as if the workers who ‘found these periodicities’ were right . . .

“Dr. K. G. Karlsson, of Uppsala University, has found no less than five [quantum] peaks at particular redshifts. These critical values at which quasar redshifts congregate form a geometric series [one level double, triple, etc. that of a certain value] and it is particularly interesting that the most recently determined redshifts lie close to one or other of these peaks (Astronomy and Astrophysics, Vol. 13, p. 333).

“Of course, one would like to know just how much these new discoveries have been influenced by the knowledge that these peaks are there . . .

“However, if Karlsson is right, and it certainly looks that way, he has found a relation between the more common quasar redshifts, particularly around [two values] . . . This can only imply a link between quasars and galaxies, because objects with redshifts as low as 0.06 are galaxies, not quasars. His results suggest strongly that redshifts are an intrinsic property of quasars and do not necessarily indicate their distance from us. Moreover, in peculiar galaxies, at least the same sort of effect occurs.”

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David Wick points to the way in which Niels Bohr derived the concept that electrons jump from one point to another without traveling the intervening space:

“Bohr’s scientific method at the time was opportunistic: he simply lifted relevant formulas from where they were available. For the dynamics of the electron’s orbit [around the atom’s nucleus], he used Newtonian mechanics. For the description of light emitted [and discrete bundles of energy], he assumed Maxwellian theory. But neither theory provided any justification for restricting [electron] orbits to discrete series, or any motivation for an electron to ‘jump’ from one orbit to another. Bohr’s model was a chimera: a quantum head grafted onto a classical body, with a tissue of ad hoc assumptions holding them together.57

When we compare Bohr’s quantum jumps with galaxies moving at discrete recessional speeds, we can see the similarity. Here, Wicks states:

“Bohr’s model was elegant, if implausible. Bohr, took Rutherford’s solar system and simply legislated flight paths for the planets. He postulated that the angular momentum of the electron around the proton can take only one of a discrete series of values. This is as natural [or unnatural] as insisting that all skaters at the ice show twirl at two revolutions per second, four revolutions per second, and so on, with all other speed forbidden. But [mathematically] it worked.”58

Galaxies and quasars exhibit light coming out of them, which is quantized, but atoms have quantum packets of energy coming out of them. The quantum physicists maintain that this can only be caused by electrons going from one point to another without traversing the intervening space. The cosmologists finding a similar quantization effect for galaxies and quasars, knowing these bodies lie at an entire range of distances that are not multiples of a certain number, refuse to accept what the quantum evidence shows. What appears to be the case is that atoms contain elements that give off quantum packets of energy without the necessity of electrons making quantum leaps. There is a sameness to the macro and micro universe that is indicated by the fact that light is quantized in both. What must be pointed to, of great significance at this juncture, is that light is an electromagnetic entity and this relationship that Velikovsky pointed to when he compared solar systems to atoms on the last page of Worlds in Collision, wherein planets can change their orbits rapidly because of electromagnetic forces as electrons change orbits in atoms. What Velikovsky was suggesting is that there is a relationship between the forces operating in atoms and in the cosmos that is the same. In a certain sense, his introduction of electromagnetism and gravity into both realms was an attempt at unification, which Einstein was working on at the end of his life. Miles Mathis has been engaged in employing both gravity and electromagnetism / charges to attempt to unite the rules that govern atoms, solar systems and the cosmos, and like Velikovsky, maintains they are counter forces to one another. As we can see, the movement of science is in the direction Velikovsky pointed to over half a century ago.

The implications of these quantized redshifts was just too much for the scientific establishment to face and there was and still is as strong effort to kill this evidence that so deeply undercuts the standard cosmological model. As Ratcliffe shows:

58 Ibid.
“In 2009, two subsequent papers by Harnett on the same subject were imperiously rejected by Cornell University’s supposedly neutral arXiv online archive database, even though they had been peer-reviewed and accepted for publication in journals. . . The crackdown on observations that might cause discomfort for the expanding universe model has become stiflingly more stringent. Welcome to the Brave New World!

“I’d like to suggest that Paul Ginsbarg’s team at Cornell are in their blatant censorship inadvertently doing us a great favour. If anyone engaged in the pursuit of pure science ever had doubts that political suppression of non-aligned results really does exist, all they need to do is take a look at how the arXiv administration treats individuals and papers that do not conform to their preferred ideology. When the paradigm eventually falls, the anonymous arXiv moderators will, to their horror no doubt, have played their part in its destruction by the very fact that they were unashamedly the vanguard of thought police defending the bastion of consensus cosmology. History has shown that the activities of those who use their power to entrench a ruling clique at the expense of vulnerable individuals who might disagree with them are not immune from public scrutiny, and are seldom remembered with fondness by generations that follow their demise. It will come back to haunt them.”

Typical of this, is the way Karlsson was treated for his discovery of quasar quantumization of their redshifts. “And Karlsson? What became of him? I’m going to let . . . Arp answer that. His dryness is legendary and makes the Gobi Desert look like a swamp . . . ‘He was rewarded with a teaching post in secondary school, and then went into medicine.’”

By keeping anything remotely connected to electromagnetism’s effects in cosmology from entering science the establishment scientists are indirectly fighting a battle not only with these new heretics, but also with Velikovsky. To allow electromagnetic effects in any way to enter into their considerations is to open yet another door to Velikovsky’s ideas. While this battle is being fought without understanding Velikovsky’s role in it is the direction cosmology and physics is heading. The resistance to the idea that electromagnetic influences redshifts has led to almost open warfare. Here, Ratcliffe reports:

“Evidence mounted up in measurement after measurement [of quantized redshifts], yet denied on the part of entrenched astronomers was resolute and inflexible. Martin Rees, who at the time directed the Institute of Theoretical Astronomy at Cambridge University, led the charge. His position was unstable! After all, his entire career in space science has been built upon the notion of universal expansion. He has written best-selling books on the subject. It would be totally unreasonable to expect him to recant and turn in both his doctorate and his knighthood just because his ideas were in conflict with observation. Notwithstanding his valiant efforts to contain the revolt, it soon became obvious beyond reasonable doubt that cosmological redshifts are quantized. To deny it

59 Ibid., p. 78.
60 Ibid., p. 204.
would be akin to contesting that the sky is blue. Yet it is denied with venom. How sad for science . . .”

Every time the evidence for cosmological quantized redshifts appears the establishment scientists believing in their hearts it is not and cannot be there, they cannot and will not see it or acknowledge it. They are like the man in Hughes Mearns’s poem, *Antigonish*, who sees it, but does not see it.

“As I was going up the stair,
I met a man [redshift] who wasn’t there.
He wasn’t there again today.
I wish, I wish he’d stay away.”

Tom Van Flandern told us, above, that gravity travels faster than light and, based on modern theory which posits that what occurs in the atom, via quantum physics, applied to the macrouniverse, something must carry gravity from one place across the vacuum of space to another place. As quantum theorists claimed that various particles in the atom exchanged particles when they interacted to hold them together or to separate them from identical ones, therefore, since this works mathematically in the atom, it necessitated that the same mechanism also worked in the cosmos. This particle became known as the “graviton.” A Wikipedia publication puts it thus in discussing the graviton:

“At present, one of the deepest problems in theoretical physics is harmonizing the theory of general relativity, which describes gravitation, and applies to large scale structures (stars, planets, galaxies) with quantum mechanics, which describes the other three fundamental forces acting on the atom scale. In particular, to the popular claim that quantum mechanics and general relativity are fundamentally incompatible, one can demonstrate that the structure of general relativity essentially follows inevitably from the quantum mechanics of interacting theoretical spin 2 [type] massless particles (called gravitons).

“While there is no concrete proof of the existence of gravitons, quantized theories of matter may necessitate their existence. Supporting this theory is the observation that all other fundamental forces [in the atom] have one or more messenger particles, *except* gravity, leading researchers to believe that at least most likely it does exist: they have dubbed these hypothetical particles *gravitons*. Many of the accepted [but not proved] notions of a unified theory of physics since the 1970s, including string theory, superstring theory, M-theory, loop quantum gravity, all assume, and to some extent depend upon the existence of the graviton.”

The book goes on to show how the graviton connects mathematics with other aspects of these other theories. Einstein’s theory of general relativity was being quantized and all of this, as with so many other concepts, was being accomplished by placing a hypothetical particle into the vacuum of space. But as we have been told above, “. . .there is no concrete proof of the

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existence of gravitons . . .” John Gribbin tells us, “General relativity and quantum mechanics are usually represented as the twin triumphs of twentieth century theoretical science, and the Holy Grail of physics today is a true unification of the two into one grand theory.64 Michio Kaku further suggests, “A quantum theory of gravity that unites [gravity] with the other forces is the Holy Grail of Physics.”65 The graviton thus becomes the Holy Grail, as Sir John Maddox offers. “Just as the interaction between electrically charged particles is mediated by the quanta of the radiation field, or photons, so the gravitational field must be mediated by particles which are called ‘gravitons.’”66

Again, as with so many other particles, forces etc. put into the vacuum of space without a scintilla of direct proof for their existence, we can now add the graviton to the list. Scoular explains the underlying problems inherent in using gravitons to create quantum gravity:

“Problem 1: First and foremost, there is no empirical evidence for quantum gravity. In particular, the graviton has not been discovered, nor is it likely to be discovered in the foreseeable future.

“Problem 2: After seventy-five years of effort by thousands physicists, a consistent theory of quantum gravity has not been discovered.

“Problem 3: In a unified quantum field theory of the forces, gravity would not be expected to be so much weaker than other forces.

“Problem 4: One of the reasons for pursuing quantum gravity is so that all the messenger particles [in nature] will be alike. However, the postulated graviton cannot be directly related to the other messenger particles [in the atom] because it has a different spin. Furthermore, the gravitational coupling constant is not dimensionless like the other forces, and gravity acts on all particles, whereas the other forces do not.

“Problem 5: Quantum field theory requires the graviton to have two degrees of freedom, whereas general relativity requires the graviton to have three degrees of freedom.

“Problem 6: [Technically difficult shows] Gravity does not conform to the same pattern of gauge theories. In particular, gravitation is associated with a dynamic symmetry group (it transforms space and time) whereas the other gauge theories [applied inside atoms] are associated with internal symmetry groups whose transformations only involve non-dynamical degrees of freedom [which do not transform time and space.]

“Problem 7: If the graviton exists, then it must interact with discrete elements of space time to create its curvature. If space time is discrete, then there is an absolute space and time [not a relative one] corresponding to the smallest dimensions of a discrete element of space time. However, absolute space and absolute time are prohibited by length contraction and time dilation of the special theory of relativity.

64 John Gribbin in Scoular, First Philosophy, op. cit., p. 309.
65 Ibid.
66 Ibid.
“Problem 8: When the general theory of relativity is quantized, non-renormalizable infinities arose in the mathematical equations making the theory meaningless. For example, physicist and author, Richard Morris writes: ‘When physicists have attempted to understand gravity as a force transmitted by the hypothetical particles known as gravitons, theoretical nonsense has been the result.’

“Problem 9: Approaches that circumvent these problems of non-renormalizable infinities – such as supergravity and string theory – have not (yet) been successful.

“Problem 10: A quantum theory of gravity characterized by the Planck mass [used inside the atom] is naively expected to predict a cosmological constant many orders of magnitude greater than that observed.

“Problem 11: The main equation of canonical quantum gravity, the Wheeler-DeWitt equation arises from applying quantum mechanics to the general theory of relativity. [However] The Wheeler-DeWitt equation does not depend on time, which makes it difficult for the equation to represent an evolving universe.

“Problem 12: Traditionally, the mainstream interpretation of quantum mechanics has been anti-realistic [such that an electron can go from point A to point B without traversing the intervening space] whereas the mainstream interpretation of the general theory of relativity has been realistic [such that bodies that go from point A to B traverse the intervening space], leading to a philosophical conflict . . ."

In addition, Einstein’s theory of general relativity is based on the equivalence principle that mass as well as acceleration are the same. Thus when applied to the graviton, Scoula adds:

“Problem 13: Based on the equivalence principle, acceleration can be interpreted as gravitation and gravitation as acceleration. Therefore, if we accelerate in a car then there are no gravitons involved. However, if we decide to interpret it as a gravitational field, then gravitons mysteriously appear. Or, equally, if we are feeling the effect of Earth’s gravitation then there are gravitons. But if we decide to interpret it as acceleration, then there are no gravitons. Or even more dramatic, if we’re in a spaceship we will be able to detect whether we’re accelerating or in a gravitational field by detecting gravitons. One way to resolve this conflict would be to state that gravitons also arise from acceleration. However, [when we do this], there is then no second entity (equivalent to the passive gravitational mass) for the gravitons from the accelerating entity to interact with. There appears to be a conflict between the equivalence principle [of general relativity] and the existence of gravitons.”

The theorists have, on the basis of mathematics, placed an unknown massless graviton particle into space that when analyzed by the rules of quantum mechanics and general relativity theories, descends into chaos. This, I suggest is always what one obtains when one creates unknown and undetectable materials or forces in vacuum space and then creates heuristic

67 Ibid., pp. 312-313.
68 Ibid., p. 113.
mathematical applications to make them seem to work. As no two objects can be in the same place at the same time, entities that do not exist, cannot mathematically be employed to correlate and unify theories like general relativity and quantum mechanics which are based on diametrically opposing foundations. Scoular has exposed this problem as it deals with gravitons. The nonsolution obtained by this approach has created a crisis (not only in this instance but) in modern physics:

The final entity not known to exist in the space vacuum, according to general relativity, is known as the “ether” or “aether.” The concept of curved space suggests that there is no need for an ether to carry gravity or radiation from one part of space to another. It is essentially the problem of action at a distance. According to Joseph P. Farrell:

“Sound could not travel where there was no medium of propagation whether it is air, strings... or whatever. And once vacuum space was discovered [something in it had to carry light and all other forms of radiation].

“Once light and other electromagnetic phenomena were discovered to travel in waves just like the acoustic phenomena of sound, science appeared to be confronted with a dilemma. Every wave phenomenon known to science appeared to require some medium of propagation, some form of matter to which the waves ‘attach’ or on which the wave could ‘ride.’ But science knew that light traveled through space which was a vacuum, and apparently devoid of matter such as we know it. Thus came the apparently rational conclusion: there had to be some form of matter, a superfine matter or ‘stuff’ existing in the vacuum as well as within the ‘pores’ of matter such as a glass of water that acted as the propagation medium for light of other electromagnetic waves. This was called, appropriately enough, the ‘aether lumeniferous,’ or light-bearing stuff... They [scientists] were thinking of light as if it were sound.”

Since light only travels at one speed in all frames of reference, a luminous body coming toward the Earth at a particular speed would not have that speed of approach added to its light; object speed plus light speed cannot exist, according to Einstein. If that same luminous body was going away from the Earth, that speed of recession would not have its speed of recession subtracted from its light; object speed minus light speed also cannot exist. Nevertheless, Einstein did adhere to a concept of the ether, but only on the condition that it was stationary under all conditions. It was like an absolutely still body of water through which light could pass, Einstein did not get rid of the ether. According to Patrick Cornille:

“The abolition of the ether concept is often credited to Einstein. This was not Einstein’s own position, on the contrary, in a conference held in Leyden’s University in 1920... he stated the absolute necessity of the ether and he was particularly clear on this point when he said:

“‘The negation of the ether is not necessarily required by the principle of special relativity. We can admit the existence of ether, but we have to give up to attribute [to] it a particular motion.’

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“‘The hypothesis of the ether as such does not contradict the special relativity theory.’

“‘From the theory of general relativity, space is endowed with physical properties; in that case, therefore, an ether exists. According to the theory of general relativity, space without ether is inconceivable because the propagation of light would be impossible.’”

Gardner explains that what “Einstein said is simple: There is no ether wind. He did not say that there is no ether; only that the ether, if it exists, is of no value in measuring uniform motion [of light].” In essence, to allow light to pass through the vacuum of space there had to be an ether by which it propagated. But that ether, whatever it is, cannot move or, if it did, it would and could change the speed of light moving through it. If light moved in the direction the ether was moving, it would gain speed. If light moved against the direction the ether was moving, it would lose speed. The question was how does one know whether the ether is unmoving or moving? More importantly, how does one test for these opposing concepts? What we also have is that advocates of non-moving ether, such as Einstein and his vast number of followers, as well as the proponents of a moving ether, are putting something else into the vacuum of space, such as Dark Matter, Dark Energy, etc. That has never been observed and demanding that it does what they want it to do, or in Gardner’s attack on Velikovsky, they are putting something into space where they need it to do exactly what they want. In my Electro-Gravitic Theory, page 1, I wrote of Descartes, “who had argued that the planets are carried around in material vortices,” and that these vortices were electromagnetic. On page two, I maintained that “an electrically charged rotating body was an antenna,” that is, electromagnetic fields that rotate. The following contains evidence for this concept and it is tied directly to the theory of the ether.

This brings us to two sets of experiments, each designed to determine if the ether exists and whether it is moving or unmoving. The first experiment was carried out by Albert Michelson and Edward Morley. Georges Sagnac carried out the second set that reproduced Michelson and Gale thereafter. The experiments were conducted to measure distortions of light waves. When a train approaches a person its pitch becomes higher, but after it reaches the listener-observer and recedes, its pitch falls lower. If one were to combine these two pitches, they would exhibit distortion, in that one pitch does not match the other. However, if the train was moving in a vacuum, there would be no pitch and no distortion of the sounds when put together. The Michelson-Morley experiment works similarly, but with light. They set up an apparatus of mirrors and a receiver to see if there was a “phase shift” when a light beam from an emitter was split and sent in two diametrically opposite directions through a series of mirrors and rejoined at a detector to see if light moving in one direction moved faster or slower than light moving in the other direction. If there was an ether that was moving with respect to the Earth then there would be a “phase shift” observed at the detector. Michelson and Morley found no “phase shift,” implying there was either no ether or the Earth was stationary. No matter in which direction the light beams were sent, the results were always the same, no “phase shift” was detected.

71 Gardner, Relativity for the Million, op. cit., p. 34.
Here, Farrell puts his finger on the problem associated with the Michelson-Morley experiment:

“. . . French physicist, George’s Sagnac . . . proposed that Michelson and Morley had measured the wrong thing at the wrong place. After all, the Michelson-Morley experiment dealt [only] with split perpendicular beams traveling in straight linear paths. But, he reasoned space is not like that. Space and the objects in it rotate. It seemed logical to assume then, that the aether rotated as well. Therefore, if one wished to detect it, one had to measure the velocity of a split beam of light in a rotating experiment . . .”

“In other words, there was a fundamental error in the way the Michelson-Morley experiment was set up.” [According to Stan Deyo]:

“‘The error of the M[ichelson]-M[orley] experiment is the test results are also valid for the case where there is an ether . . . and it is moving along with the same relative velocity and orbit as the Earth Maintains around the Sun [or emanates from the Earth and rotates with it at the same velocity].’

‘The tea cup analogy can be used to explain the error. If one stirs a cup of tea (preferably white) which has some tea leaves floating [in it or ]on its surface, one notices some of the tea leaves orbiting the vortex in the centre . . . of the cup. The leaves closer to the centre travel faster than those farther from the centre (both in linear and angular velocity).’

‘Now one must imagine himself greatly reduced in size and sitting upon one of those orbiting leaves. If one were to put his hand over the edge of the tealeaf on any side, would he feel any tea moving past? . . . No. The reason is that the motion of the tea is the force that has caused the velocity of the leaf. One could not detect any motion if both he and the tea were traveling in the same direction and at the same velocity. However, if one had arms long enough to stick in the tea closer to either the centre or the rim of the cup where the velocities were different to his own, then he would feel the tea moving faster or slower than himself (respectively).’

‘Also, if one were to spin his tea at the same time as it orbits about the centre, placing his hand into the tea immediately surrounding his leaf would show inertial resistance against the spin moment of his leaf.’

‘That essentially is the reasoning Sagnac used to set up his rotational version of the Michelson-Morley experiment. And the result was exactly what the aether paradigm predicted. Sagnac’s experiment sent in ‘the direction of spin around the perimeter of a spinning disc (for the surface of the Earth) varied from the velocity of light sent against the spin.’”

There is one further point that must be made before proceeding. Certain proponents of the ether’s reality suggest that, as the Earth either revolves around the Sun or rotates on its axis, pushes the ether along with it, creating an ether wind. They are suggesting that matter can affect an unknown material – ether – by moving through it to move like water in a tea cup. I will return to this question below. However, much later, Michelson and Gale carried out the same type of

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spinning interferometer experiment as Sagnac and achieved the same results, implying a moving ether.

Farrell adds, “Sagnac’s experiment was repeated by Gale and Michelson himself in 1925 and with the same results. And more recently, scientists have repeated it using a ring-laser system and more precise measuring method. And the results are always the same: The velocity of light is not constant.”

This caused consternation in the relativists’ camp, and Sagnac’s experiment was like so many others, suppressed as far as was possible. On this Philip Stott states:

“The experiments of Sagnac and Michelson & Gale are rarely mentioned. Until quite recently, it was quite difficult to find a reference to them. As Dean Turner pointed out, ‘one may scan Einstein’s writings in vain to find mention of the Sagnac or Michelson & Gale experiments. The same can be said of general physics textbooks and the McGraw-Hill Encyclopedia of Science and Technology . . . such an oversight constitutes a stinging indictment of professional scientific reporting. It is indeed quite difficult to get information on these experiments. They seem to be such an embarrassment to relativity that those who know [of] them would rather not say too much. Quite a number of relativity experts, however, do know about them and, when pressed, many admit that they show the Special Theory of Relativity . . . to be inadequate. Some point out that the difficulties can be explained away by working in terms of ‘Riemannian [curved] space,’ a mathematical abstraction which can be bent, warped and twisted. Since the reality which we live in . . . seems to consist of normal (‘Euclidian’) space of exactly three dimensions which are ‘flat’ (i.e., not bent, warped or twisted), these arguments are only convincing to conformal believers in Einstein’s theory – or to those so intimidated by the mathematics that they are afraid to appear ignorant if they disagree.”

In essence, relativity theory or aspects of it are employed by proponents of Einstein to make it conform with it. It is, therefore, not independent evidence that makes Sagnac, Michelson and Gale, and other experiments confirm Einstein but finding ways to apply the theory to it. Ratcliffe, citing another theorist in this field, tells us: “In the 1920s, Einstein was giving a lecture on Relativity. Professor Sagnac was in the audience, and questioned Einstein about the Sagnac effect. Einstein thought for a while and then said, ‘That has nothing to do with relativity.’ Sagnac retorted in a loud voice, ‘In that case, Dr. Einstein, relativity has nothing to do with reality.’”

That has been the response of most relativists ever since, either ignore it, as Einstein did, to paper it over with relativistic concepts and mathematics. Ratcliffe adds the following: “There is probably no experimental evidence that more convincingly undermines the basis of Special Relativity than that obtained by Sagnac’s interferometer . . . Relativists have two stock reactions to the Sagnac effect – they either completely ignore it (their favoured response) or they try with contorted mathematics to show that in some perverse way it actually supports it.”

This, however, was not the end of these experiments. The man who succeeded Michelson at Case Western University, Dayton Clarence Miller, spent several years working with

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73 Ibid., p. 121.
75 Ratcliffe, The Virtue of Heresy, op. cit., p. 279.
76 Ibid., p. 280.
an interferometer at the Mount Wilson Observatory in California with a rotating apparatus and obtained the same results as Sagnac. Einstein, himself, was aware and troubled by Miller’s findings and said, “I believe that I have really found the relationship between gravitation and electricity assuming that Miller’s experiments are based on a fundamental error.” Otherwise, the whole relativity theory collapses like a house of cards.” 77 Ratcliffe reports Einstein’s further reaction to Miller’s experiments to Edwin Slossen: “My opinion of Miller’s results is the following . . . should the positive results be confirmed, then the special theory of relativity, and with it the general theory of relativity, in its current form, is invalid.” 78 Given the enormity of this further threat to relativity theory, Miller’s experiments had to be killed and it was killed. He also used a very large interferometer that rotated and he carried out his experiments for years, keeping careful records of the results which he published in 1933, summarizing these.79 Dayton died in 1941 and his work was, as with Sagnac, largely ignored for 14 years. In 1955, R. S. Shankland, et al., wrote, “New Analysis of the Interferometer Observations of Dayton C. Miller,” in Review of Modern Physics, Vol. 27, No 2 (April 1, 1955), pages 167-178 and concluded Dayton’s research failed to impeach Einstein’s theory. James DeMeo has published a devastating rebuttal to Shankland, et al., wherein he writes:

“The very first sentence in the Shankland team’s 1955 paper began with a falsehood, now widely parroted in nearly every physics text-book, that the Michelson-Morley experiment had a null result [instead of a slight phase fringe effect]. The Third sentence in Shankland’s paper was similarly false, claiming that ‘All trials of this experiment, except those carried out at Mount Wilson by Dayton C. Miller, yielded a null result within the accuracy of observations’ [instead of mentioning Georges Sagnac’s experiment and Michelson and Gale’s experiment and others that yielded positive results within the accuracy of observations]. This kind of chronic misrepresentation of the slight positive results of many interferometer experiments, including Michelson-Morley, Morley-Miller, Sagnac, Michelson-Gale, and Michelson-Pease-Pearson, suggests an extreme bias and deliberate misrepresentation. The fact that this is a very popular bias does not excuse it. By redefining all the positive results [of differential light speed] observed by what may, in fact, have been the ether-drift researchers, as mere expressions of ‘observational inaccuracy,’ Shankland narrowed his task [of having to explain away all the data] considerably.”80

DeMeo goes on to show:

“The Shankland paper did present a statistical analysis [of only] a portion of Miller’s published 1925-1926 Mount Wilson data, concluding that his observations ‘. . . cannot be attributed to random effects, but that systematic effects are present to an appreciable degree’ and that ‘the periodic [light velocity change] effects

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80 James DeMeo, “Dayton Miller’s Ether-Drift Experiments: A Fresh Look” (Internet).
observed by Miller cannot be accounted for by random statistical fluctuations of the basic data. (p. 170). Also, the Shankland team admitted they . . . Did not embark on a statistically sound recomputation of cosmic [aspects of Miller’s] solution [that were there in the data] but rather [concentrated only on . . . local disturbances such as may be caused by mechanical effects or by nonuniform temperature distribution in the observational hut [on Mount Wilson where the apparatus was housed].’

“In short, they [fully] admitted the harmonic patterns in Miller’s data could not be due to systematic measurement error, nor result from mechanical flaws in the interferometer apparatus itself – while simultaneously admitting a disinterest in computation of any potentially validating ether-drift axis (‘cosmic solution’) from his data. These were important admissions as the suggestion is, unless they could find some other flaw [outside the apparatus] in his data, Miller had really got it right.”

That is, the data showed a relationship of the Earth’s orbit in terms of seasonal changes in the different velocities of light throughout the year, in Miller’s data that the Shankland team completely evaded and instead, they claimed the problem was that Miller had not taken proper steps to exclude the walls around his interferometer from heating up and thereby affecting certain local periodic outcomes in his data. But Miller was very well aware of this and had answered this criticism even earlier than Shankland’s team raised this thermal issue. According to DeMeo:

“Regarding possible temperature artifacts in Miller’s data, this objection was raised early on in the history of ether-drift interferometer and specifically rebutted by Miller when he was still alive. A letter exchange between Miller and Georg Joos, in a 1934 issue of Physical Review, records part of the debate, and appears one of the few published criticisms on the temperature issue Miller ever received while still alive. Miller had this to say about the problem: ‘When Morley and Miller designed their interferometer in 1904 they were fully cognizant of this . . . and it has never been neglected [in these experiments]. Elaborate tests have been made under natural conditions and especially with artificial heating [apparatus], for development of methods which should be free from this [thermal] effect.’ (Joos and Miller 1934).

Shankland and his team also ignored this evidence altogether which was vital if their critique of Miller was to have any validity but still focused their criticism on the heating of the walls around the apparatus as if Miller had not fully addressed this question earlier, and worse:

“The Shankland critique never made any systematic evaluation of possible thermal artifacts using a larger set of Miller’s data, as was done with the statistical evaluation. Instead, they appear to have ‘gone fishing’ in Miller’s data by which they could simply dismiss him. For example, Miller’s own 1923 temperature-controlled experiments were brought into discussion, where radiant parabolic heater were used to artificially create a general doubling of the size of interference [phase] fringes. Miller described these experiments:

81 Ibid.
“Several electric heaters were used of the type having a heated coil near the focus of a concave reflector [to generate higher temperature effects]. Inequalities in the temperature of the room caused a slow but steady drifting of the fringe system to one side but caused no periodic displacements. Even when two of the heaters placed at a distance of three feet from the interferometer as it rotated, were adjusted to throw the heat directly on the uncovered steel frame, there was [still] no periodic effect that was measurable. . . .[Overall] These experiments proved that under the conditions of actual observation, the periodic displacements could not possibly be produced by temperature effects.’ (Miller 1933, p. 220).”

Using heaters to see if over time these would produce the kinds of effects that he originally got, Miller had shown that the heated walls Shankland, et al. claimed were actually responsible for the periodic changes in the speed of light proved Shankland et al.’s criticisms were wrong. The reader is advised to see James DeMeo’s entire paper on the internet who concluded:

“My review of this important but sad chapter in the history of science left me both astonished and frustrated. Miller’s work on ether-drift was clearly undertaken with more precision care and diligence than any other researcher who took up the question, including Michelson, and yet his work has been written out of the history of science. When alive, Miller responded concisely to his critics, and demonstrated why he was getting larger positive results, while others got only small results, or no results. Michelson and others of the period took Miller’s work seriously, but Einstein and his followers appeared to view Miller only as a threat, something to be ‘explained away’ as expeditiously as possible . . . Einstein fast became a cultural icon whose work could not be criticized. Into this situation [in 1955], came the Shankland team, with the apparent mission to nail the lid down on Miller’s coffin. In this effort, they nearly succeeded.

“. . . [Nevertheless] There was a clear and systematic periodic effect in the interferometer data [that could not be explained away by heated walls]. The Shankland paper also confirmed Miller’s contention that this periodic effect was not the product of random errors or mechanical effects . . .

“Even though they were content to pick and choose data as they wished, they could not come up with a coherent and solid critique by which Miller’s [periodic phase interference changes] . . . could be conclusively dismissed . . . The periodic elements of his measurements persisted – the Shankland paper ignored Miller on this important point.”

What were these periodic changes Miller obtained from his data? The data of the different changes in the velocity of light occurred seasonally over the years. When he observed other data in a different season or year, it showed a pronounced similarity to earlier data gathered during the same season, but in a different year. That is, as the orbit of the Earth in space around the Sun was either slowing or speeding up, the speed was in the light in a regular pattern. The person who put this information together was Maurice Allais, whom we met earlier, who found a

82 Ibid.
83 Ibid.
paraconical pendulum responded differently when electrically charged than one that was not. In 1998, he published one of his papers, originally in French in the United States, in which he explained just what these periodicities were in terms of astronomy stating:

“The most significant parameters characterizing Miller’s eight fundamental figures are the maximum and minimum velocities [of light] . . . and the mean [or average] value of the azimuths, and their amplitudes [strengths as seen in Miller’s data] . . . of their variations around their mean value.

“Table 2 [not presented] gives the direct estimation I made graphically of these parameters through the photographic enlargement of Miller’s eight fundamental figures (original observations of running averages of Miller’s figures) and that quite independently of any hypothesis or any theoretical interpretation whatsoever.

“A thorough harmonic analysis of these parameters shows that all have a marked semi-annual periodic structure. The maximum and minimum values of the corresponding sinusoidal fitting all occur around the March 21 equinox.

“For lack of space, I must limit myself to commenting on the fitting of Table 3 of the observed data with its sinusoids for a period of six or twelve month periods relates to only one reference sinusoid with a maximum on March 21, all the correlated coefficients are relatively high. They are all the more significant as the considered parameters do not correspond to isolated observations. The statistical significance of the whole of these results for semi-annual or annual corresponding to fitting of the same function is very high and amounts to quasi-certainty.

“Thus, it may be considered as perfectly established that the observations corresponding to the four series of [Dayton’s] experiments have a semi-annual or annual periodicity centered on March 21, the date of the spring equinox, and that it is possible, through purely terrestrial experiment, to determine [from Miller’s data] the Earth’s position in its orbit . . .

“All of Miller’s observations display a very marked correlation with the Earth’s position in its orbit.”84

In other words, using Miller’s data showing the motion of the ether and its effects on the amplitude of the speed and direction of light, one could determine generally, but closely enough, where the Earth was along its orbit, its seasons, etc.

What is extremely important with respect to science is that Allais made a fundamental prediction tying together his charged paraconical pendulum experiment, with Michelson and Morley’s experiment and that of Dayton Miller, wherein he predicted:

“I believe I can make a prediction. If without interruption for at least a month, at the same place and simultaneously, observations were made of the movement of a paraconical pendulum together with optical sightings such as I made in 1958, and a repetition of the experiments of A. Michelson and A. Morley (1887) and D. C. Miller in (1925), the purpose of which was to display the movement of the Earth relatively to the ether, it would be found that the effects observed by Miller in 1925

correspond to the anomalies of the movement of the paraconical pendulum and the optical sightings [I] observed in July 1958.\textsuperscript{85}

These 1958 sightings of the Earth’s position in space showed the position of the Earth in space correlated with the movements of the paraconical pendulum. In 1998, Allais described these results. And let us remember, as cited below, that the pendulum experiments that were carried out also correlated with the ocean tides. That is, there appears to be a direct correlation of the Earth’s position in space with the height of tides, with the motions of Allais’ and Saxl’s pendulums, and with the interferometer reading of the speed of light moving through an electromagnetic ether. These connections are absolutely stunning. What is also astonishing is when Allais compared Miller’s data with the data he derived from his charged paraconical pendulum, he found that the two sets of data showed a correlation with each other, as we are told. “Allais shows that Miller’s interferometer results were positive and cohere with the anomalies found in his own experiment with a paraconical pendulum in the 1950s.”\textsuperscript{86} What is clearly self-evident is that, because both the results and data of Miller’s and Allais’ experiments cohere, and that Allais’ paraconical pendulum only exhibited anomalies when electrified, that Miller’s interferometer was picking up changes in the speed of light and its direction as that related to the electromagnetic nature of space. That is, electromagnetism in space is the ether! This, as we will see below, is not a new concept. There was another experiment clearly related to this electromagnetic effect, as told to us by LaViolette:

“... Ernest Silvertooh succeeded in measuring the one-way wavelength of light and found that, contrary to the predictions of special relativity, photon wavelength (and velocity) varies with direction... To carry out this measurement, he assembled a special kind of laser interferometer apparatus which used an array of adjustable mirrors and beam splitters to cause two oppositely directed laser beams to interfere and produce a standing wave pattern of regularly spaced bright and fringes. He was then able to determine the spacing of these fringes... He found that the fringes achieved their closest spacing of approximately one-fourth of a millimeter (one-hundredth of an inch) when the opposed laser beams were pointing along a direction aligned with the constellation of Leo. When the path of the opposed laser beams was rotated away from that heading, the fringes spread apart to greater distances. He concluded that this unique direction, in which the fringe pattern attained a minimum spacing, marked the direction of the Earth’s motion through the ether, leading him to conclude that the solar system is moving with respect to this absolute frame with a velocity of $378 \pm 19$ km/s [kilometers per second $= 245$ miles per second] in a direction of Leo. This is consistent with astronomical measurements... [that] indicate that the solar system is moving at a similar velocity... toward the southern part of Leo...”\textsuperscript{87}

LaViolette further reports:

\textsuperscript{86} Executive Intelligence Review, Vol. 25, No. 18 (May 1, 1998), p. 45.
“The existence of an ether can also be tested by the Trouton-Noble experiment wherein a charged parallel plate capacitor is suspended from a fine fiber. If there were a preferred ether rest frame, the capacitor would be expected to develop a torque due to magnetic forces arising from its movement relative to the ether. The capacitor would be expected to twist so that the direction of the electric field became aligned parallel to its movement through the ether. In the original experiment, which Trouton and Noble performed in 1903, yielded a null effect, it has been argued because the torque was too weak to observe. However, more recently, physicist Patrick Cornille has performed a modified version of this experiment in which a 500 pF capacitor made of aluminum foil and plexiglass was observed to spontaneously align in the East-West direction when charged to 70,000 volts . . .”

Kelly further informs us:

“Independently in France, the scientist Escandon (1927) did tests similar to those of Miller and got somewhat similar results. This confirmation is important . . . [because] his experimental findings was a justification of Miller’s work . . .

“In 2000, Consoli and Costanzo, in an article entitled The Motion of the Solar System and the Michelson-Morley Experiment, concluded from a detailed analysis of the original test results that the velocity of the Earth in the plane of the interferometer in the original Michelson and Morley experiment as $210 \pm 12$ km/s [$120 \pm 7$ miles per second] which is in excellent agreement with the $203 \pm 8$ km [$118 \pm 5$ miles per second] got by Miller. They concluded that the fringe shifts are a measure of the velocity of the solar system within our galaxy and not with respect to what is called the local group of galaxies . . . This paper also demolishes Shankland’s claims that Miller’s results were flawed because of temperature changes.”

Ratcliffe also shows: “In an astonishing lucid and purposeful paper entitled, ‘Revisiting the Michelson and Morley experiment to Reveal an Earth orbital velocity of 30 kilometers per second,’ [Steve] Bryant demonstrated that if correctly analyzed, the original data do indeed give the originally anticipated result. If true, Bryant’s conclusion supports the existence of electromagnetic ether, thereby invalidating Special Relativity.” Ratcliffe goes on to show the errors made by Michelson-Morley in Bryant’s paper and adds, “If one applies the same error corrections to Dayton Miller 1933 data, they yield 29.97 km/sec.”

After going through several other experiments that contradicted Einstein’s theory of special relativity that contradicted the idea that the speed of light is constant, LaViolette claims, “The evidence against relativity is now so overwhelming that we must acknowledge that we have entered a new era in which the assumptions of special relativity be considered invalid and serious consideration must be given again to the ether concept.”

90 Ratcliffe, The Virtue of Heresy, op. cit., p. 286.
91 Ibid.
92 LaViolette, Subquantum Kinetics . . . op. cit., p. 15.
The staunch proponents of relativity do not see things that way. For example, in the Wikipedia internet site, Dayton C. Miller still presents Shankland, et al.’s evidence as discrediting his work. It even presents in the references articles by James DeMeo. However, not a single word is presented that Nobel Prize laureate, Maurice Allais, has written his paper cited above in support of Miller’s interferometer experiment, nor that it cohered with his own results of a charged paradoxical pendulum, nor that he presented other papers supportive of Miller. In Vol. IV of *Pillars of the Past*, page 177, I charged that Wikipedia is “not to be trusted about anything regarding Velikovsky.” It is now quite evident that the way Wikipedia dealt with Miles Mathis’ exposure of its invalid mathematical proofs of tides due to gravitation cited above, and its failure to present Maurice Allais’ work on its Internet site for Dayton C. Miller, are clear indications that when it comes to dealing with established concepts, Wikipedia is not to be trusted. Why else would this establishment organ of science withhold from its readership the work of a Nobel Laureate on the work of Miller unless it had prepared a biased presentation against Miller. Future generations unfettered by these biases may curse these behind the scenes people for their deeply unscholarly, shameful behavior and duplicity.

But let us return to the nature of the ether. Max Born presented the concept that a it was electromagnetic in nature and wrote:

“...there was only one ether, which was the carrier of all electric, magnetic and optical phenomena. We know its laws, Maxwell’s field equations, but we know little of its constitution. Of what do the electromagnetic fields actually consist, and what is it that excites vibrations in the waves of light?

“...Maxwell took the concept of displacement as the foundation of his argument, and we interpret this visually as meaning that in the smallest parts or molecules of the ether, just as in molecules of matter, an actual displacement and separation of the electric (or magnetic) fluid occurs. So far as this idea concerns the process of electric polarization of matter is well founded, it is also adopted in the modern modifications of Maxwell’s theory, the theory of electrons, for numerous experiments have rendered certain that matter has a molecular structure and that every molecule carries displaced charges. But this is by no means the case for the free ether; here, Maxwell’s idea of displacement is purely hypothetical, and its only value is that it provides a visualized image for the abstract laws of the field.

“These laws state that with every change of displacement in time, there is associated an electromagnetic field of force...

“Maxwell himself designed models for the constitution of the ether and applied them with some success. Lord Kelvin was particularly inventive in this direction and strove to comprehend electromagnetic phenomena as actions of concealed mechanisms of force.

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“The rotational character of the relationship between electric current and magnetic fields, and its reciprocal character suggests that we regard the electric state of the ether as a linear displacement, the magnetic state as a rotation about an axis, or conversely . . . It would take us too far to count the numerous and sometimes very fantastic hypotheses that have been put forward about the constitution of the ether. If we were to accept them literally, the ether would be a monstrous mechanism of invisible cogwheels, gyroscopes, and gears intergripping in the most complicated fashion, and of all this confused mass, nothing would be observable but a few relatively simple features which would present themselves as an electromagnetic field . . .”

What all this suggests is that electromagnetism is the ether. It permeates all space inside the atom and the Universe. In terms of displacement, consider that a tiny explosion goes off in a body of water, it is carried away radially in all directions through the water medium as a noise wave, just as in air. When a current of electrons passes suddenly into a wire, there, too, the energy of the jolt sends a magnetic wave outward radially in all directions. It may well be that magnetism is the ether itself which permits electricity and light to traverse it. Thus, I have not added another particle or force into vacuum space or into the atom. In the real world, there are only massive bodies of electricity and magnetism. These bodies and forces are all that have ever been observed or measured. Everything else invented by science to permeate space, Dark Matter, Dark Energy, gravitons, etc., as we have shown above, are illusions created by science. Seeing the world through these illusions and then fortifying the with mathematics has led to the present crisis and irrationality pervading science today. Velikovsky’s concept that electromagnetism must play a role in celestial mechanics, is growing.

One may argue that magnetism cannot affect light, as I have suggested. Nevertheless, Ratcliffe shows:

“In February 2006, a paper appeared in preprint on the arXiv archive that has the potential to change a lot in the world of physics. Authored by a 13-man team of Italian physicists led by E. Zavattini, it is entitled ‘Experimental observation of optical rotation generated in vacuum by a magnetic field.’” For the first time, scientists in a controlled laboratory environment, were able to observe rotation of polarized light caused by a transverse magnetic field. The team points out numerous implications of the experiment, mainly in respect to a quantum fluctuations and properties of the vacuum itself, . . . What immediately caught my eye was that they had actually seen and measured a change of direction in light when exposed to magnetism. Maybe we’ve been on the wrong track, all of us. We see light being bent in the vicinity of a massive object (the Sun), and we automatically assume that it is because of gravitation or curved space-time, or whatever you want to call it. We seem to have ignored the fact that the Sun is also highly energetic in magnetism and electricity. Maybe we’ve been loudly barking up the wrong tree all along.”

When paraconical pendulum motions cohere with interferometric readings with the position of the Earth in space, and with Bryant’s corrections of the Michelson-Morley experiment that all give the position and velocity of the Earth around the Sun at about 29 to 30 kilometers per second, with one-way wave length frequency variations, etc., there is a great confluence of evidence that points to the fact that electromagnetism plays a major role in all these phenomena. What we have is what William Whewell suggested, as discussed below at the beginning of Chapter III. Here different classes of scientific phenomena jump together, all saying the same thing; in our case that electromagnetism affects the speed and direction of light, as well as one way frequency wave lengths, as well as the motion of a paraconical pendulum, the tides and altogether, can give the position of the Earth in space and its velocity. When Allais’ prediction, noted above is carried out, I have no doubt that it will produce unity, coherence, simplification in a total theory.” To paraphrase William Mullen above, “Just as all the electromagnetic colors of the spectrum united to make white light so all the electromagnetic phenomena of these different aspects of physics correlate to make one mode of science. Not the least effect of the Velikovskian revolution should be to make scientists relearn that certain problems can be solved only if electromagnetic data from the most widely divergent fields are considered together.”

The last aspect of Einstein’s theory to consider is the intimate way in which it correlates with the Big Bang Theory and, specifically, with the expansion or contraction of the Universe. Leonard Lederman, Nobel laureate with Dick Teresi, state: “The evolution of the universe is pretty much all contained in Einstein’s equations of general relativity.”96 Einstein’s theory demands the Universe is either expanding or contracting and this concept echoes throughout the literature. Harry Gilbert and Diana Gilbert tell us

“In 1917, just two years of the publication of General Relativity, Einstein found his equations demanded a universe that expanded or contracted. There was no ‘static’ solution . . . this result . . . ran contrary to all the [then known] scientific observations of the universe. The dilemma Einstein faced - astronomers told him: the universe that we can see all around us in the sky is essentially the same today as it was in antiquity, when pharaohs looked up at the stars . . . The General Relativity equations told him: the universe must be expanding or contracting. There can be no permanent unchanging static condition.”97

Robert M. Wald writes: “. . . that the universe is ever constant in time, that is, that the structure of the universe was always the same [size] as it is now and will always remain the same. Einstein’s equations say that this is impossible . . . – the universe must always be expanding or contracting. The notion of an ever constant static universe is incompatible with general relativity.”98 On the other hand, according to Electro-Gravitic theory, the Universe is not expanding or contracting, but is spinning, as do all objects. On this point, Kurt Gödel, as cited by Kip S. Thorne, informs us: “In 1949, Kurt Gödel, at the Institute for Advanced Study in Princeton, New Jersey, found a solution to Einstein’s equation that describes the whole universe which spins

96 Leon Lederman, Dick Teresi, *The God Particle – if the Universe is the Answer, What is the Question*, (Boston / NY 2006), p. 397.
but does not expand or contract . . . Physicists objected that our [or really their] real universe does not at all resemble Gödel’s solution. It is not spinning at least not much, and it is expanding.\textsuperscript{99}

Everything spins event...[rest of word missing in manuscript].

However, if one goes back to my essay on Dark Matter, one will find that Rosen, who discovered galactic rotation did not follow Newtonian / Einsteinian / Keplerian motion, had also earlier suggested the Universe rotated, but was so viciously attacked that she dropped the matter entirely. Everything in the Universe rotates, but not the universe itself. It is the one entity that does not rotate.

The individual who presented an entire volume presented an entire volume presenting the evidence that the Universe is not expanding but is static, is astronomer, Hilton Ratcliffe, in his book, The Static Universe: Exploding the Myth of Cosmic Expansion, which will be the main source of my presentation below. There are two explanations for the redshifts: the conventional one is that the redshift is a proof that the Universe is expanding the greater the redshift, the farther the object being observed is from the observer and the faster it is receding away. This concept is the one to which nearly all physicists, astronomers and cosmologists adhere. The other disreputable theory is that known as tired light. It suggests that light traveling through the Universe from both large and small bodies loses energy because of the masses of these bodies and/or because as it travels through space filled with gravitational and electromagnetic fields, it tires / loses energy. The point to emphasize is that unless light moving through space tires in some way, it is the only element in the Universe that is immune to the second law of thermodynamics or entropy, which requires that everything over time loses energy. Thus, not only is the speed of light held absolutely constant, but it is also constant in its energy as it leaves a body and traverses the entire universe; it never shows and it never grows tired. Along these lines, LaViolette reported that Fritz Zwicky suggested light could tire but further explains:

“Oh, actually, Zwicky was not the first to propose a tired light effect. Eight years earlier, in 1921, the German physicist, Walther Von Nernst, proposed a tired light cosmology which . . . was energy non-conserving. Nernst pointed out that in a universe of unlimited age, whether it be stationary or freely expanding, the temperature of interstellar space, [constantly heated by stars, etc.] should be continually increasing . . . Noting that the temperature of space has instead remained quite low, he proposed that light photons must lose energy to the ether as they travel through space.”\textsuperscript{100}

Of course, with a Universe with an accepted age of about 13.7 billion years, Nernst’s thesis can have no standing. LaViolette continues:

“As more distant regions of space were probed and the redshift magnitudes continued to increase, other astronomers also began to have their doubts as to whether the spectral shifts were really produced by motional effects. For example, when Hubble and Humason published their 1931 results, which projected galaxy recessional velocities as high as 7 percent of the speed of light [25,000 miles per


second], they began to refer to these as ‘apparent’ [rather than real] velocities, with the idea that the phenomenon might be due to some other cause than the Doppler effect.

“In 1935, with the apparent velocities reaching 13 percent of the speed of light [44,000 miles per second], Edwin Hubble and Richard Tolman coauthored a paper comparing tired-light and expanding-universe hypotheses on the basis of galaxy number count. They suggested that some mechanism other than expansion might be responsible for producing the cosmological redshifts, although they did not entirely rule out expansion as a possibility. A year later, armed with a much better set of galaxy number count data, Hubble wrote a follow-up paper that came out decidedly in favor of tired light.”

Ratcliffe states that: “To his eternal credit, however, Edwin Hubble was one of the rare animals who could take his hat in his hand and admit to an error of judgment, even if that selfsame error was being acclaimed as an eternal truth by his peers. Hubble remained steadfastly unconvinced that the Doppler Effect correctly explained his observations and he was at pains to declare it quite emphatically.” Why did Hubble stick to his guns on this question? He wrote an article for *Scientific American* in April 1942, offering this explanation:

“Since the corresponding velocity of recession is the same fraction of the velocity of light, the nebulae in the most distant cluster observed, if they are actually receding, will appear 13 percent fainter than they would appear if they were stationary. The difference is small but, fortunately, the measures can be made with fair accuracy. The results may be stated simply. If the nebulae are stationary the law of redshifts is sensibly linear; redshifts are a constant multiple of distances. In other words, each unit of light path contributes the same amount of redshift. On the other hand, if the nebulae are receding, and the dimming factors are applied, the scale of distances is altered, and the law of redshifts is no longer linear [but quadratic].”

That is, the light of the most distant nebulae should appear 13 percent fainter or dimmer if they are actually moving away. However, Hubble discovered that they are not 13 percent fainter, meaning that with respect to the Earth, they are stationary. Five years later, in 1947, he wrote: “. . . it seems likely that red-shifts may not be due to an expanding Universe, and much of the speculation on the structure of the Universe may require reexamination.”

To get around Hubble’s own evidence that the redshifts, if linear, required a static Universe; Michael Strauss and Daniel Koranyi presented a paper which attempted to show, contrary to Hubble, an expanding Universe did not require a linear dimming of distant nebulae, but could also be explained as a quadratic relationship. What they said was “in effect by treating the entire galaxy luminosity function . . . as a distance indicator, equivalently we can compare flux

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101 Ibid.
103 Ibid., p. 30.
104 Ibid., p. 23.
105 Ibid., p. 31.
density . . . with predictions under different redshift-distance cosmologies . . .” The problem is that “They test the redshift law using redshift law-derived data. The galaxy luminosity and flux density used in this exercise are [both entirely] redshift functions. That’s blatantly circular. No test of the Hubble, completely independent of the same law, has ever been done, to the best of my knowledge.” Put into other terms, Louis Marmet explained that even cosmologist Allan Sandage, who also tried to discredit Hubble’s linear analysis, as it relates to Richard Tolman’s requirements to test Hubble, was flawed by the same circular reasoning.

“Sandage explains that the Tolman test should be independent of cosmology, but a calculation of the absolute magnitude [brightness] of the galaxies is required to be able to classify them . . . So although the surface brightness is an absolute quantity, the identification of the galaxies (and, therefore, their absolute luminosities and diameters) is dependent on their cosmology.”

In order to know the absolute luminosities and the diameter of distant galaxies, one must know their actual distances, not their classified redshift distances. One cannot know either their absolute luminosities and diameter until one knows the galaxies’ distances from Earth. What cosmologists like Michael Strauss, Daniel Koranyi, and even the great Alan Sandage did was use Hubble cosmological redshifts to determine the distance and then claimed these distances to the galaxies only made scientific sense if the Universe was expanding, as per Hubble. The fact of the matter is that since cosmological redshifts was data based on a classification that accords with certain cosmological assumptions about its value, the interpretation of the absolute magnitude [or brightness of the distant galaxy] and also its diameters was an artifact of the classification which was, in reality, still an interpretation. It was a circularly reasoned analysis.

Worse still, is the fact that Hubble’s data did not correlate redshifts to galactic distance, as Ratcliffe points out:

“The premises established by Edwin Hubble in 1927 . . . are arguably one of the root causes of cosmology’s rampant delinquency. It seems that he was anxious to support what amounted to a foregone conclusion. In his book, The First Three Minutes, Professor Steven Weinberg is most succinct: ‘Actually,’ a look at Hubble’s data leaves me perplexed [as to] how he could reach such a conclusion – galactic distances seem almost uncorrelated with their [redshift] distance . . . It is difficult to avoid the conclusion that . . . Hubble knew the answer he wanted to get.”

In case after case, the giants of science, Galileo, Kepler, Newton and now Hubble, used theory to make the incongruent data say what they wanted it to say. Yet all this is kept from readers by historians of science and scientists themselves. How can a true picture of science emerge when unscientific behavior is swept under the rug, or swept up and buried? The face of science is buried under make-up, powder, highlights and lipstick. What we have is not a history of science, but an advertising model from Hollywood with hype to sell a falsely labeled image as a true depiction of science and scientists are no better than politicians.

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106 Ibid.
107 Ibid.
108 Ibid., p. 34.
109 Ratcliffe, The Virtue of Heresy, op. cit., p. 156.
If Einstein is right and the Universe is expanding, it should be expanding everywhere. Nonetheless, cosmologists have examined the Local Group of Galaxies, or those that are 100 megaparsecs or within 350 million light years away from the Earth and claim that at these distances, one cannot find redshifts indicative of expansion. One must look to more distant regions to observe these redshifts. Hence, the local group of galaxies exhibits no expansion, while more distant galaxies’ redshifts exhibit expansion. In simple words, since the validity of cosmology is based on the redshifts for distance, one cannot prove the redshift distances are correct unless one also finds this locally.

Moreover, we can get some idea of what the redshifts indicate by looking at the evidence of their being quantized. By using Trifft’s discovery that binary galaxies exhibit quantum redshifts that come in 72 kilometers per second, it suggests that this difference has to do with the galaxy seemingly moving 72 kilometers per second slower than another the closer of the two in space. Then we have the Karlsson effect with quasars, supposedly the most distant bodies in space also exhibiting quantized redshifts. Again, those with the lowest quantized levels are probably closer than those farther away. That is, not only does the mass of a galaxy and a quasar determine their redshifts, but their light traveling through space in attenuated quantum amounts. This, then, can only indicate which galaxy or quasar is more distant or closer, but not its almost exact distance.

However, if there are direct contradictions to the concept that redshifts are proof of recession, then those contradictions invalidate redshifts as proof of recession. In this regard, Ratcliffe, citing P. J. E. Peebles standard textbook, *The Principles of Physical Cosmology*, (Princeton NJ 1993), page 71, that redshifts are not to be found for galaxies that are members of the Local Group of galaxies writes:

“The expansion of the universe means that the proper physical distance between a well-separated pair of galaxies is increasing with time [because the space between them is expanding], that is, the galaxies are receding from each other. A gravitationally bound system [is held together by gravity and is not expanding] such as the Local Group . . . the homogeneous expansion law refers [only] to galaxies far enough apart for these irregularities to be ignored.”

Carl Sagan echoes this concept: “What we see . . . is almost exclusively redshifts, no matter what distant objects beyond the local group we point our telescope to.” Therefore, because the Local Group of galaxies, which includes the Milky Way, is tied together by gravity, it could not and should not be able to break those connections. Ratcliffe, however, explains the contradiction:

“We all know that the postulated expansion of space does not occur locally, and ‘local’ includes the Virgo clusters . . . the standard [redshift expansion] theory alludes to a threshold for expansion at around 10 Mpc [megaparsecs] from the Earth, meaning that for the first 350 million light years or so, space does not expand. Any perceived pattern in these data cannot indicate expansion, in terms of the Big Bang Theory [nor in terms of Einstein’s theory of general relativity]. [Finding a

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110 Ibid., p. 37.
redshift for the Local Group] . . . would be an utter train smash for the Hubble law if only I could find proof in the form of a published data table or graph.

“It wasn’t hard to find. It’s [also] right there in black and white on page 86 of Peebles’ book. Figure 5.4 bears the caption, ‘Test of Hubble’s law using Tully-Fisher distances.’ . . .

“The plot of the diagram shows the Hubble relationship established in the supposed redshift-distance for a sample of galaxies in the vicinity of an object popularly identified as the Great Attractor . . . it has been invoked to explain the peculiar streaming motion of galaxies [toward it] in the neighborhood. A team led by Lydon-Bell discovered in 1988 that peculiar velocities in this region are puzzlingly large around 600 km sec^{-1} for the entire Local Group, and this could only be explained by the presence of an extremely massive object somewhere in the direction they were headed . . .

“The crucial significance of this geographical location is twofold: Firstly, it is local . . . and secondly, the presence in this local of a structure massive enough to divert entire clusters of galaxies [away] from the mooted Hubble [expansion] flow is in defiance of the cosmological Principle [that the large-scale Universe is homogenous and isotropic or the same everywhere], and [this unique flow away from the direction of all other expanding galaxies in space] therefore rules out Hubble expansion in the region being observed. Despite the fact that all parties agree that the galaxies represented in the graph [of the Local Group] occupy a volume of space that is definitely not expanding. Peebles is quite clear in his conclusion . . . ‘We see that even with the anomaly [of galaxies moving] in the direction of Centaurus [beyond which lies the great attractor], Hubble’s law is quite a good description of the redshift relation.’”

Here is what this means: In the Local Group of galaxies, gravity will not allow expansion, thus it must be static. But at the very same time Hubble’s law of redshifts shows these galaxies are streaming away. That is, in the Local Group, which is static, one can find redshifts. That is, static space can show redshifts, a complete contradiction to Hubble’s law. Since there are redshifts in the static Local Group of galaxies, then the very same must also apply to distant galaxies. They are also static – not moving apart – but also display redshifts, just like those observed in the Local Group. Ratcliffe puts it this way: “There you have it. Bingo! The Hubble law shows up in nonexpanding space, and would, therefore, manifest itself in a static Universe.”

Or to put it oxymoronically, cosmologically throughout the Universe, we have static shiftless redshifts.

Another aspect of Hubble’s redshifts is outlined by Robert J. Tuttle in discussion of galaxies and redshifts and Peebles, as follow:

“The major problem lurking in . . . two Hubble diagrams [made by Hewitt and Burbidge and Peebles] is that the redshift has been accepted as a true measure of distance for galaxies, and by analogue, for distance to the quasars. The lower plot

\[\text{112} \text{ Ibid.}, \text{ pp. 39-40.}\]
\[\text{113} \text{ Ibid.}, \text{ p. 40.}\]
[in these diagrams] is for galaxies, while the upper plot is for . . . quasars. As Peebles points out [Peebles 1993], ‘If the redshifts of quasars did not follow the redshift-distance relation observed for galaxies, it would show we have missed something very significant.’ Peebles states that the controversy over the difference in redshift distribution has been resolved without stating the resolution and cites the clustering of galaxies around low redshift quasars and the gravitational lensing of high redshift quasars by galaxies well in front of the, as the basis for this resolution. But the distributions definitely do not agree with the quasar. The quasar redshifts do not match the redshift magnitude [brightness relation observed for galaxies at all. [Magnitudes or brightness should become ever smaller with a bright body at greater and greater distance.] And [thus] it becomes a problem to decide what represents distance for quasars, is it the Hubble flow [of expanding space] or is it brightness at great distances?

1. The quasar redshifts are roughly a factor often greater than for the field galaxies in this brightness range.
2. The quasar redshifts are essentially independent of the brightness, and therefore has no relation to distance . . .
3. “It is clear that the Hubble diagram for quasars is thoroughly different from that of quasars.”

There should be a clear relationship of distance if quasars show they are at far greater distances than galaxies. The brightness of both the galaxies and the quasars should also reflect this relationship. Closer quasars and galaxies should exhibit greater brightness with respect to more distant quasars and galaxies that match the Hubble redshifts they exhibit. Tuttle tells us the published evidence shows no such clear relationship which is required. The evidence Peebles raised to support Hubble redshifts as Tuttle directly stated, “The distributions definitely do not agree with the quasar, the quasar redshifts do not match the redshift magnitude [brightness] relation observed for galaxies at all.” That is, more distant galaxies and quasars can be brighter than closer ones and vice versa. The mismatch I suggest shows a total disconnection of the Hubble redshift theory to reality.

Nevertheless, Ratcliffe presents another telling, not to say devastating negation of redshift expansion. In the face of Halton Arp’s discoveries that there were far too many redshifted quasars linked by connecting long clouds of dust to galaxies and both had different redshifts, the astronomers responded with:

“Good heavens, no! . . . The quasars just couldn’t be joined to the central galaxies, they cried, it must be an illusion. The bridges [between the galaxies and quasars] are ghosts caused by optical aberrations in the telescope [just as Galileo’s critics blamed the telescopes for seeing sunspots and moons around Jupiter]. He doesn’t understand gravity. He doesn’t understand relativity. He doesn’t understand anything! It wasn’t a surprising response. In fact, it was all too typical. But the time came when Dr. Arp and his colleagues brought upon an audience full

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of these critics a pregnant and telling silence. At the meeting of the American Astronomical Society held in Texas in 2004, Professor Margaret Burbidge presented a paper that she had co-authored with Arp and several other leading astronomers, including her husband [subsequently published in the Astrophysical Journal]. It detailed the discovery of a high redshift quasar close to a low redshift galaxy. This time, though, the alignment was different in every significant way. This time, no one could argue. You see, the high redshift [more distant] quasar lay in front of the [less distant redshift] galaxy NGC 7319! There was no longer occasion to debate the veracity of [Arp’s] matter bridge [connecting galaxies with quasars]. The quasar was in the foreground [the galaxy in the background]. In that impressive gathering of astronomy’s who’s who, you could have heard a pin drop. It was a deafening silence.”

Ratcliffe continues:
“The significance of this discovery is huge. We have direct, irrefutable, empirical evidence that the Hubble law stands on feet of clay, that the observational justification of an expanding Universe is fatally flawed.”

As Vincent Buglosi writes: “Never admit anything ever.” You know, like the guy who is caught by his wife in flagrante delicto with another woman as he says to her, quoting the late comedian, Richard Pryor: ‘Who are you going to believe me or your lying eyes?’ But seeing is not believing and in spite of this direct negation of the redshift distant Hubble concept, the astronomical community has become not only blind, but deaf and dumb, as well. The Wikipedia tells us nothing about this contradiction under its heading on the Internet, NGC 7319, simply stating, “NGC is a spiral galaxy member of Stephan’s Quintet [of galaxies] located in the constellation Pegasus.”

The argument is that there is a hole through the galaxies’ stars and dust that just allows us to see this quasar which is supposedly more distant.

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115 Ratcliffe, The Virtue of Heresy, op. cit., p. 93.
116 Ibid.
No one has, however, been able to prove the quasar in front of the NGC 7319 galaxy is actually behind the galaxy. Finally, we come to the redshift problem of T Tauri stars that are almost always blueshifted. The problem is outlined by John Bally and Bo Reipurth.

“The key to understanding T. Tauri stars is the recognition that they are surrounded by disks. . . . Among other things, it was noted that when spectra of T. Tauri stars shows signs of high velocity [stellar wind] shocks associated with outflows, the emission is usually blueshifted, that is [the outflow] is turned toward the observer, whereas redshifts are rare. These shocks are likely to be generated by material moving equally towards or away from the observer, and therefore such a [blueshift] preference should not exist. But if T. Tauri stars are surrounded by disks, the [stellar wind] shocks moving away from the observer will be partly hidden, while the approaching [blueshift] shocks will remain unobstructed.”[117]

The problem is that the disks are at the rotational equator of the star and will rarely be directly in the plane of sight. These disks will be tipped at an angle to the observer, or even perpendicularly to him and, therefore, both the outgoing materials moving away or toward the observer will very rarely interact with the disk material to give either a redshift or blueshift. That is the point, as Miles Mathis shows:

As a final example of the current state of the art in celestial mechanics, let me show you a specific example from *The Encyclopedia of the Solar System*, a recent book [1999] published by NASA and the Jet Propulsion Lab with the cooperation of many of the top universities in the country. To tie the Sun to a solar disk, we are given evidence from T. Tauri stars...of roughly solar mass and they have what appear to be disks, or, to be more precise, they have a lot of dust around them. There is enough dust to obscure the stars, but it doesn’t. Why? Because it is confined to the disc and isn’t in our plane of sight. So far so good. To confirm this, we look at the emission lines created by a stellar wind. We find that these emission lines are [almost] always blue-shifted. And this is where it gets silly. For the book tells us: ‘This observation is explained if the red-shifted lines that would be associated with gas flowing away from the observer were obscured by the circumstellar disc.’ Anybody see the problem here? There are actually two problems. The first is that if the disc is not in our plane of sight, then it can’t be the cause of any obscuring of shifts, red or blue. The second, [and most important] problem is that the gas flows away from the observer is on the far side of the star [that can’t be seen]. If light from the star goes through it in order to make any emission lines then the light must be [redshifted because it is] going in the opposite direction of Earth. We can’t possibly see it. This whole theory is a comedy of basic logical errors.

“It is not the exception, either, it is the rule. A mistake like this cannot be assigned to [a] single person. This book was edited by a large committee of top-flight physicists...mistakes like that are nothing less than shocking.”

The final point on redshifts has to do with galaxy clusters. For example, the Virgo cluster is made up of mostly elliptical galaxies with old red giant stars, and here and there spiral types waft among them. All these galaxies in the Virgo cluster are at roughly the same distance from Earth and should all exhibit the same redshift. That is a given based on the Hubble law. Here Ratcliffe concludes:

“Let me conclude with a specific example of assumptions leading to distance anomalies that does not involve quasars. What I would like to do instead is bring to your attention a technique that deals a crippling blow to the idea that redshift indicates distance. The Tully-Fisher Relation [that connects the rotation of galaxies with their brightness] is one of the most solid theories in use on the distance ladder because it is based upon good physics with an experimentally verified. Here, at last, is a method that inspires some confidence. Yet it gives astonishingly anomalous results, when compared with the expectations of expansion theory.

By knowing the rotational speed of a galaxy and how bright it is, one can use that information to determine the difference between the dimming of the light as its distance away increases with what the Tully-Fisher relationship says its true brightness is. This tells us its

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118 Mathis, *The Un- Unified Field*, op. cit., pp. 143-144.
distance and its redshift. If the Hubble law is correct, there should be no disagreement between 
the redshift and the dimming of the galaxies’ light at that distance. Ratcliffe goes on to show:

“David G. Russell is a New York high school science teacher engaged in an 
ongoing, novel study of spiral galaxies in the Virgo cluster, and the Tully-Fisher 
Relationship is his weapon of choice . . .

“His purpose was not to challenge redshift distances, but rather to use them as 
part of a method to define the physical boundaries of the [Virgo] cluster. However, 
in a surprising turn of events, Russell discovered that there was a wild spread of 
redshifts for spiral . . . [galaxies] in the cluster and that just didn’t stack up against 
the Hubble law.

“It was quite astonishing. Once he had identified and confirmed which galaxies 
were physically bound to the cluster, within its gravitational sphere, he set out a 
table containing other properties of the cluster galaxies, including redshifts. He 
discovered, quite incredibly, that the swing in redshifts was remarkable, and even 
worrisome for expansion theory, that redshift values were bracketed by galaxy 
type! Expressed as recessional velocity would mean that (in Russell’s words)

‘. . . giant Sb [Spiral b type] galaxies are approaching the Milky Way with a 
mean velocity of -898 km s⁻¹ while giant Sc I [Spiral C I type] galaxies are receding 
from the Milky Way with a mean velocity of +824 km s⁻¹,’ [published by Russell, 

. . .

“Dave Russell had systematically . . . discovered that celestial objects 
confirmed to be in the same geographical neighborhood could have significantly 
different redshifts.”120

All these different forms of evidence from Hubble’s own work with nebulae, to the 
Local Group of galaxies which are static but exhibit redshifts to Trifft’s evidence that redshifts are 
quantized, to Burbidge and Arp’s evidence that a quasar of great redshift is in front of galaxy NGC 
7319, to Mathis’ evidence that T Tauri stars, where redshifts are interpreted by light on the opposite 
side of the stars moving away, which cannot be observed, is actually creating blueshifts as it passes 
through the disc of gas surrounding it, to Russell’s evidence from Virgo clusters that some of its 
spiral galaxies are approaching the Milky Way, while others are receding from it, dismantle the 
Hubble redshift law. One may argue that these contradictions cover only the examples presented 
while other redshift evidence supports the expansion theory, but that is not germane nor related to 
the point. It only takes one well-verified, well-observed contradiction to Hubble’s law to 
invalidate it, and yet, our sample above, we have five, and these are not confined to just these 
instances. There are other galaxies, other Local Groups other T Tauri stars, other clusters of 
galaxies like the Virgo cluster throughout the Universe that have the same constituents in them 
that deny the Hubble redshift law. That is, untold billions of examples exist that contradict 
established redshift wisdom. About all this evidence, Ratcliffe argues:

“Isn’t it strange how energetically devoted theoreticians tackle the problem of 
taming [redshift] anomalies? With whips, trowels, and dollops of fudge, it seems

120 Ibid., pp. 85-86.
they can get any wayward, prodigal observation back into the fold, and without raising a sweat, realign dissident interpretations with their preferred model. In their hands, square pegs and round holes are raised to an art form. Despite the clear warning of Hubble himself, astronomers succumbed to the urgent need for a way to establish remoteness in space of celestial objects, and the even sexier imperative to drive the exciting new expanding-universe model forward. Consequently, the redshift-gives-distance idea was carved into the wall of astrophysical law.

“From an independent objective point of view, the accepted explanation doesn’t even get to first base. Let me say it again – the only reason, and I mean the only reason, that such a blatantly improbable theory has seen the light of day is because the Standard Model [of the cosmology of the Universe and Einstein’s General Relativity Theory] requires it . . . whatever we decide to do, it is clear at the very least that redshift is not demonstrably proportional to distance – or recessional velocity – in all cases . . .

The Hubble law and attendant redshift-based expansion are a myth. We might even dare, in this age of . . . pseudoscience, call it a Convenient Untruth.”

Einstein’s expanding universe, based on his theory of general relativity, has so many basic contradictions, that it cannot be correct. However, in terms of Electro-Gravitic theory I have made a blunder in assuming that redshifts are only related to distance and not to expansion, and that quasars must be at the greatest distance because of their redshifts [Charles Ginenthal, The Electro-Gravitic Theory of Celestial Motion and Cosmology, op. cit., p. 29. In retrospect, and with the knowledge presented by Ratcliffe, I should have stuck to my later appraisal: “I agree, in part, with [Halton] Arp’s analysis which indicates that quasars are not always as distant as imagined. That clearly implies that galactic birth from quasars was not only an event that occurred once in the great past, but is also going on continuously; that galaxies, like stars, are being created and dying throughout the history of the cosmos.”

In an eternally evolving universe there is eternal creation and destruction of stars and galaxies. Therefore, there will be a mixing of bodies of great age such as old galaxy clusters containing mostly elliptical galaxies with some younger spiral galaxies in them. Quasars can and will be ejected from exploding active galaxies, just as Halton Arp and his associates have told us, and the connection of dust trains of material joining them is only to be logically expected. I believe my error is due to my failure to separate my revolutionary concept of Electro-Gravitic theory from my conventional understanding of the Big Bang theory. Ratcliffe’s The Static Universe, a fine book on the evidence for a non-expanding universe, has opened my eyes to this blunder, this misunderstanding and misinterpretation.

Let us nail down this question of non-expansion by assuming that quasars are at these great redshift distances, à la general relativity and the Hubble law, but that their sideward / lateral motion must be constrained by special relativity, not exceeding the speed of light. Both are Einsteinian concepts. Here, Ratcliffe reports:

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121 Ibid., pp. 87-88.
122 Ibid., p. 48.
“The illusion of remoteness can be further illustrated by examining the lateral motion of quasars projected by their redshift distances. The results are startling and must surely give grey hairs of those keenly promoting the authenticity of the Special Theory of Relativity. Y. P. Varshni, of the University of Ottawa, did the sums for three examples of quasars with well-established redshift values. . . .

“Just to clarify the point, three well-known quasars . . . are found to have lateral motions that are, respectively, 760 times, 5,200 times, and 2,300 times the speed of light . . . Surely this alone renders the redshift-distance idea worthless? The final nail in the coffin of quasar redshift-distance (as if we needed another nail) is the measurement of the speed of jets [of gas and dust coming out of quasars]. This, too, is proper [or, in a sense, lateral] motion, and is, therefore, a real effect. Over a period of 5 years, from 1979 to 1984, John Biretta, of the Space Telescope Science Institute, measured the ejection [speed] of material from the quasar 3C 345. The increase in angular separation is directly observed and measured. To translate angular separation trigonometrically into linear distance, distance from Earth to 3C 345 is required.

“. . . Let me reiterate that there is nothing peculiar about these measurements. These are first-order data, presented without modification . . . applying redshift distance to 3C 345, . . . all hell breaks loose. It turns out that 3C 345 should be around five-and-a-half billion light years away, if redshifts are to be believed. That number applied to the measured rate of angular departure means that the system is allegedly expanding transversely at a physical rate of seven times the speed of light. It matters not a whit whether we agree with the theoretically imposed absolute speed limit of [light] C; the fact of the matter is that those who propose redshift distance do so on the basis of Einstein’s Relativity, and are therefore bound to bow before the absolute barrier imposed by light speed. They cannot have their cake and eat it. At redshift-given remoteness, 3C 345 surpasses the speed of light many times over. In terms of its own founding principles, the Hubble law is unambiguously falsified by Figure 24. [not presented here] . . .

“This is but one of several examples in this book. Isn’t it strange, therefore, that the ostriches of cosmology can continue to bury their heads in the sand of abject denial? In 1999, Halton Arp told the world,

“‘Of course, if one ignores contradictory observations, one can claim to have an “elegant” or “robust” theory. But it isn’t science.’”123

One can, of course, agree that space is expanding and that these quasars are not moving beyond the speed of light, but why are the jets emanating from them filled with gas and dust, and the jets expanding only in a lateral direction, doing so at seven times the speed of light? If the space in the jets was expanding at seven fold light speed, not only would they expand laterally away from the quasar, they would be expanding in every other direction and over time the jets would not only lengthen laterally, but also vertically and in every other direction. In order to make space expand inside the jet, it must have the unique quality of only expanding in one linear direction.

123 Ibid., pp. 109-110.
direction and in no other direction. In essence, to try to salvage an expanding universe, space must expand outward in all directions, except in quasar jets, where it only expands laterally. Not only are astronomers, cosmologists and physicists curving space à la Einstein, causing it to expand outward in all directions to fit the Big Bang theory, but then somehow contort its outward expansion in all directions and have it expand in only a lateral direction in quasar jets. Here I will cite the great American poet, Walt Whitman, who wrote in *Leaves of Grass*:

“Do I contradict myself?
Very well then I contradict myself.
(I am large, I contain multitudes.)”\(^{124}\)

No matter how vast science is, no matter how fine its concepts, observations, precise mathematical calculations, it cannot contradict itself and still be science. The contradiction here is profound because we are dealing with fundamental scientific observations and scientific reasoning. Either space, as explained by Einstein’s theory of general relativity, expands in all directions, or it does not expand. To expand space in only one linear direction is a divorce from science. There is a philosophical concept known as “the law of contradiction,” also known as the law of non-contradiction” which states, “No statement can be true and false at the same time and under the same conditions.”\(^ {125}\) The same applies to science. No scientific process can be true and false at the same time. In our case, quasars cannot exist if expanding space is moving outward in all directions, while its jets, existing in the same expanding space, are expanding only linearly.

Karl Popper, in his paper, “What is Dialectic,” (1940), writes:

“But the most important misunderstandings and muddles arise out of the loose way in which dialecticians [and scientists] speak about contradictions.

“They observe correctly that contradictions are of the greatest importance in the history of thought . . . without contradictions, without criticism, there would be no rational motive for changing theories; there would be no intellectual [or scientific] progress.

“Having thus correctly observed that contradictions . . . are extremely fertile, and indeed moving forces of any progress of thought [or science], dialecticians [and scientists] conclude – wrongly . . . that there is no need to avoid these fertile contradictions . . .

“Such an assertion amounts to an attack upon the so-called ‘law of contradiction’.”\(^{126}\)

That is, contradictions lead to new theories that explain them better. In that respect, we come to the new theories, inspired by Immanuel Velikovsky, that electromagnetism plays a role in cosmology. The fact that so many contradictions exist in this field of physics pointedly suggests cosmology and the established physical theories, associated with it, must be reformulated.


Astronomers, astrophysicists, cosmologists and physicists do suggest that the ability to understand, let alone criticize their established theories by an amateur, cannot really be valid, given the arcane, technical mathematics involved. However, John Wheeler contradicts any such assumption:

“Still more uncommon, and still more needed today, is the outsider-generalist who, like Einstein, can lead the way, sure-footed, through the complex world of science and technology to goals that were overlooked or deemed impossible by most experts.”  

In this respect, Velikovsky was just such an outsider-generalist, and those of us, Miles Mathis, Wal Thornhill and I, who have followed his concepts regarding electromagnetism playing a role in the cosmos, are treading the path that Velikovsky blazed. A new physics is, therefore, needed to lead the way out of the crisis in which cosmology finds itself – even if proponents of the Big Bang theory vehemently deny any such crisis exists and say that electromagnetism plays no role whatsoever in celestial motion or cosmology. However, Ratcliffe informs us:

“The progress of astrophysics has been hobbled by a myopic inability to see across the fences separate various scientific disciplines . . . This is pointedly clear . . . in our lack of depth in electrical field theory and experimental plasma dynamics. A bit of training in these disciplines and we begin to see the Universe in a whole new light, if you’ll forgive my intentional pun. We are trained, instead, in all our schools to believe in a purely mechanical universe with no electrical potential, a place where rotational dynamics are solely the result of interaction between mass and gravity. The evidence of our eyes tells us, in no uncertain terms, that it has taken the vision of people with a solid background in electrical engineering to explain to us just how the universe is shaped and sustained by an interaction of two of nature’s primal forces: electricity and magnetism . . .”

Here we can see that an astronomer / astrophysicist now accepts and presents to the world the Velikovskian concept that electromagnetism does play a role in the shaping of the cosmos, a view that is now coming to the fore in science. In terms of these forces operating in the Universe, Ratcliffe adds:

“It requires that we adjust the way we look at the cosmos. We tend to overlook the most important features of our stellar environment without which it makes less sense. The universe is an all-encompassing electro-magnetic field with something in it. That’s a pretty simplistic way of describing the magnificent complexity that surrounds and sustains us, but at least it gets the priorities right. Anthony Peratt and G. Carroll Strait put it this way: ‘The cosmos is a vast, interconnected body of invisible magnetic fields guiding electrified streams that become visible only when they converge to spin out galaxies and stars.’ Electricity is all around us in vast quantities . . .”

Smolin writes:

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“We have two great discoveries, quantum theory and general relativity, whose unification we seek . . . I am certain that some simple idea lies hidden in plain sight that will be the key to its resolution. Admitting that progress can be held up as we await the invention of nothing more substantial than an idea is humbling but it’s happened before. The Scientific Revolution launched by Galileo and Kepler was long delayed because of the idea that the universe was divided into an Earthly and heavenly realm. This idea prevented the thorough application of mathematics to the lower [Earthly] world, while our understanding of the upper [celestial] world was thwarted by the belief that there was no need for causes of perfect heavenly motions.”

I would suggest that in modern science, that simple idea lying hidden in plain sight that will be key to its resolution, that has held up progress in science, is that the quantum world, based on electromagnetic forces and others, is divided from the cosmological world that is based on gravity. Adding gravity to the quantum world and electromagnetism to the cosmological world, is the simple idea lying hidden in plain sight.

Velikovsky wrote, as cited by Henry H. Bauer,

“‘H. N. Russell’ . . . [states ‘An atom differs from the solar system by the fact that it is not gravitation that makes the electrons go around the nucleus, but electricity . . .’] Velikovsky adds ‘Different principles are supposed to govern the motion of the planetary bodies in the macrocosm and microcosm . . .’ . . . within atoms electrical forces outweigh gravitational ones to the extent that the latter can be neglected . . . and vice versa in the case of the solar system.’

However, T. Uzer, et al., tell us in the journal Science:

“Classical and semi-classical [gravitational] methods are unrivaled in providing an intuitive and computationally tractable approach to the study of atomic, molecular and nuclear dynamics. An important advantage of such methods is their ability to uncover in a single picture underlying structures that may be hard to extract from the profusion of data supplied by detailed quantum calculations.”

These forces exist in the atom and have only been ignored by assuming the electromagnetic model explains the atom. There are others cited by Uzer, et al. that go back decades. It is simply Bauer’s ignorance, and the assumption that gravity does not affect the atom, that has been the problem, and Velikovsky is right in suggesting otherwise.

We now come to the problem I have with other electromagnetic theories of the Universe than my own. In this case, I am specifically discussing the Electric Universe theory of Wal Thornhill, along with Anthony Paratt and David Scott. They maintain that plasma experimental work in laboratories mimics galaxies and jets and a whole array of things found in the cosmos. And these were discovered by various scientists doing experiments with plasma.

The reader is asked to get this material to realize the importance of this evidence. Here Ratcliffe further explains:

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“The significance of electrical force on the cosmos is not remarkable only because of its prevalence. It is also more influential than gravity in nearly all cases because of this simple fact. The strength of the force between Birkeland current filaments is directly proportional to the reciprocal of distance. In other words, it decreases as the inverse of distance one-to-one. It’s a first power relationship. Gravity, on the other hand, decreases with the square of distance. That means it gets weaker much more quickly than the magnetic field as distance increases. It is remarkable how well this fact solves the anomaly of galaxies’ rotational speed without invoking dark matter, or for that matter, having to adjust Newton’s law of gravitation [as Charles Ginenthal in a similar manner pointed out above, discussing Dark Matter].

The problem is, according to Ratcliffe:

“It is here that I have a disturbing reservation about electrical astrophysics. As a quantitative branch of the broader discipline, it is extremely weak. Electric Universe ideas seem to be no more that – ideas. They are extremely well-founded in experiment and terrestrial observation, but then the impetus seems to peter out. It’s a great shame because there’s merit in considering the effects of electricity in the cosmos. If plasma physics and electrical field theory want to play a significant part in the physical practice of space science, then they’d better rigorously formalize their thinking. Sure, I say to them, rubbish gravity if you want. Just make sure you replace it with the kind of hard science that can send spacecraft to the other planets and beyond with eye-watering accuracy. Then you will be taken really seriously . . . Give us the numbers!”

First of all, neither Miles Mathis’ Unified Field theory nor my Electro-Gravitic theory rubbish gravity, but maintain it is real and is opposed by the counterforce of electromagnetism. While Mathis does, as a matter of fact, provide the physics, “the numbers” that back up his physics, I have proposed this experiment to be carried out in space – by sending a low mass supermagnet ball on a long trajectory to determine the way electromagnetism operates in space on a body and, from its change of orbit compared to the expectations of gravitational theory, derive these “numbers.” The positive way out of this dilemma is to keep to the scientific method of testing the experiment outlined in the Appendix of my book, The Electro-Gravitic Theory of Celestial Motion & Cosmology, to determine what the numbers are and then to do the mathematics and build the formulas that apply to it and then apply these systematically to the cosmos. In this way, I am following the words of Isaac Newton:

“In experimental philosophy [science] we look upon propositions collected by general induction [observation and experiment] from phenomena as accurately or very nearly true, notwithstanding any contrary hypotheses that may be imagined, until such time as other phenomena occur, by which they may either be made more accurate, or liable to exceptions.”

135 Ibid., p. 226.
136 Isaac Newton in Ibid., p. 341.
The experiment outlined in my book will, as Newton presented, allow for a clear observation of an experiment in space – not only a terrestrial one – to determine not only if my theory is valid, but what numbers apply to an Electro-Gravitic universe. I have written to Dr. Ratcliffe to request he read my book, to no avail. I suspect it is because of the direct exposure in my letter that I am a proponent of Immanuel Velikovsky’s ideas. What Ratcliffe was willing to extend, in terms of interest, to Wal Thornhill’s work, he was unwilling to extend to mine. Of Velikovsky, Ratcliffe states:

“... for Wal Thornhill. In his glossy booklet, *Thunderbolts of the Gods*, he declares his connection to ... Velikovsky.’ I don’t want to publicize this too much. All I want to say at this point is directed to those who, for whatever reason, are like me and find the subject of Velikovskyan catastrophism distasteful. Try to look beyond it. There’s a lot of valuable stuff there that will help us to understand the cosmos...”137

But Ratcliffe, whom I greatly admire, will not extend the same consideration to me; perhaps it would be too distasteful to consider another Velikovskyan. Nevertheless, what is becoming crystal clear is that Velikovsky’s electromagnetic ideas are being promulgated in the scientific community and, among the major proponents of these ideas who acknowledge the connection of their theories to Velikovsky, are Wal Thornhill, Miles Mathis and me – Charles Ginethal. Those rabid opponents of Velikovsky cannot stop the dissemination of these electromagnetic concepts throughout the world, try as they may. The horse is well out of the barn and shutting the barn door to stop this dissemination is well neigh futile. These concepts will spread, I believe, like wildfire through the scientific community and here and there, scientists will begin to propose electromagnetic theories that apply to the cosmos. These concepts will grow and grow in the future and cannot be stopped even by the most virulent propaganda. In the words of Victor Hugo, “All the forces in the world are not so powerful as an idea whose time has come,” which is essentially a misquote of “On resiste a l’invasion des armées; on ne resiste pas a l’invasion des idées.” The sentence in his book, *The History of a Crime*, translated “We resist the invasion of armies; we do not resist the invasion of ideas.”138

Years ago at a conference in Portland, Oregon, Henry H. Bauer said “Velikovsky will be part of scientific history, but not part of science.” It seems that the tables are beginning to be reversed. Bauer and all of Velikovsky’s critics may find that they are not only on the wrong side of history, but on the wrong side of science. The way in which scientists have mistreated Velikovsky by misrepresentation, suppression and a host of dishonorable devices will, I believe, cause future generations to castigate Velikovsky’s dishonest critics for trying to hold back science. Jason Hoyt, Mendeley chief scientist, offers: “History, I suspect, will look upon our society and practice with regards to scientific knowledge – share as we do with the Dark Ages. Each time we hold back data or publish research [against a man or his concepts] that isn’t immediately open to all [to answer], we have chosen to be on the wrong side of history.”139

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137 Ibid., pp. 210-211.
And finally, in the words of William Gladstone, regarding the burial of ideas:

“I shall not attempt to measure with precision the forces that are to be arrayed in the coming struggle. . . . You may possibly succeed at some point of the contest. You may drive us from our seat. You may bury the . . . [ideas] we have introduced, but for its epitaph, we will write upon its gravestone this line, with certain confidence in its fulfillment – “Excoriare Alliquis nostris ex ossibus ultor,” meaning ‘an avenger shall arise from my bones.’

“You cannot fight against the social [and scientific] forces which move in their might and majesty, and which the tumult of our time does not for a moment impede or disturb – those great . . . forces [that] are against you; they are marshaled on our side, and the banner which we now carry, though perhaps at this moment, it may droop over our sinking heads, yet it sooner [or later] again will float . . . borne by . . . firm hand[s]. . . perhaps not an easy, but to a certain and not too distant victory.”

Whatever the “shape of things to come may be to enlighten science,” it will be electromagnetic.

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The problems we have encountered repeatedly throughout this book is that astrophysicists, cosmologists, physicists, etc., have invented forces and materials that do not exist except in their theoretical paradigms and then they validate and vindicate their models by constructing mathematics that agree with their construct. Once one has a mathematical explication and description of what does not exist, except in the theory, it is then often assumed and believed that the theory is a recreation of the real world; their inventions are then said to correlate, corroborate and are congruent with the mathematics and the mathematics are said to correlate, corroborate and are congruent with their inventions. In that respect, those trained to employ the theory have a sense of deep knowledge of phenomena that appear are quite secure and complete.

In this regard, Sir John Herschel states:

“Admission to its [science’s] sanctuary and to the privileges and feelings of a votary, is only to be gained by one means – sound and sufficient knowledge of mathematics, the great instrument of all exact inquiry, without which no man can ever make such advances in this or any other of the higher departments of science as can entitle him to form an independent opinion on any subject of discussion within their range.”

The elitist conclusions Herschel points out: “. . . privileges having “feelings of a votary,” for only those “to form an independent opinion.” Does this not smack of arrogance? Such individuals assume that the anomalies that do exist will, in time, be explained by the same theory employing more mathematics because of deeper insights that explain away these anomalies.

This, in fact, has been a problem endemic to all theories of cosmology that go back to the ancient Greeks. According to the 20th century British historian of science, Benjamin Farrington, the Academy scholars were to present astronomy so that

“Students must by no means be allowed to hear as the old natural [Ionian] philosophers taught, that the sun and moon are lumps of inanimate matter . . . they

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will [then] pray and sacrifice to the heavenly bodies in a more acceptable spirit when they have been made to understand that they are divine beings whose motions are patterns of regularity.

“This kind of astronomy, in which natural laws were subordinated to divine principles, and in which more regard was paid to the heavenly bodies as objects of worship than subjects of scientific study, was further developed by Aristotle, systematizing the doctrines of Plato and the Pythagoreans he taught. . . . that the circular motions of the heavenly bodies are proof of their being under the control of divine intelligence . . .”

Plato, however, made a clear distinction between his ideal mathematical world, founded on reason, and the real world. Both were separate realities. In this regard, Sir Roger Penrose explains:

“In Plato’s view, the objects of pure geometry – straight lines, circles, triangles, planes, etc., – were only approximately realized in terms of the world of actual physical things. **THOSE MATHEMATICALLY PRECISE OBJECTS INHABITED, INSTEAD, A DIFFERENT WORLD – Plato’s ideal world of mathematical concepts. Plato’s [ideal] world consisted, not of tangible objects, but of mathematical things. This [ideal] world is accessible to us not in the ordinary physical way but, instead, **via the intellect. One’s mind makes contact with Plato’s [ideal] world whenever it contemplates a mathematical truth perceiving it by the exercise of mathematical reasoning and insight. The [separate] ideal world was regarded as distinct and more perfect than the material world of our external experience, but just as real . . . Thus, whereas the objects of pure Euclidean geometry can be studied by thought and many properties of this ideal world thereby derived it would not be a necessity for the ‘imperfect’ physical world of eternal experience to adhere to this ideal exactly. By some miraculous insight, Plato seems to have foreseen . . . on the one hand, mathematics must be studied and understood for its own sake, and one must not demand completely accurate applicability to the objects of physical experience, on the other hand . . .”

Plato’s world was a dichotomy of two worlds, the ideal mathematical one and the reality that did not fit this realization. Aristotle did not allow for this dichotomy; he wanted to unify the mathematics with the observed, imperfect astronomical realities so that there would be no disconnection between the ideal and real world. Sir Oliver Lodge in *The World of Mathematics*, states:

“Aristotle had taught that circular motion [at uniform speed] was the only perfect and natural motion, and that the heavenly bodies, therefore, necessarily moved in circles.

“So firmly had this idea become rooted in men’s minds, that no one ever seems to have contemplated the possibility of its being false or meaningless.”

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The theory, therefore, determined what the mathematics should prove and that is what it did. Claudius Ptolemy, in his great summation and systematic mathematical tome, *The Almagest*, employed a large array of geometrical concepts to make the theory of celestial bodies moving at uniform speeds in perfectly circular orbits correlate corroborate and be congruent with that theory. Those who later studied it were dazzled and awe struck by this overwhelming mathematically supported vision of celestial reality. Thus, those proponents of Aristotle’s cosmology, as delineated by Ptolemy, had a deep sense of the knowledge of these phenomena that appeared secure and complete – meaning perfect – and that any anomalies in time would be explained away by application of the same mathematics and theory. Olaf Pedersen describes how the *Almagest* was seen by later generations:

“There are many reasons why one should wish to read Ptolemy’s *Almagest*. As well as being a masterpiece of scientific writing, it was one major work on the scientific modeling of the celestial phenomena that survived from Greco-Roman civilization. It is our chief informant on Greek mathematical astronomy . . . and its influence shaped the astronomy of later antiquity, medieval Islam, and early modern Europe.

“But it was never easy to read. As Ptolemy says in his preface, he wrote concisely and counted on his reader to be already rather experienced in the subject: comfortable with the deductive geometry of Euclid’s *Elements*, proficient in numerical calculation involving a place-value system for fractions, and familiar with the visible phenomena of the heavenly bodies and the way they were recorded in observational reports. In Ptolemy’s own day, there were probably very few readers who could appreciate the treatise as much more than a collection of tables useful for astrological calculations embedded in interminable stretches of indigestible mathematical prose. By the fourth century A.D., two hundred years after Ptolemy, the *Almagest* had been adopted as a school text for the most advanced philosophical and mathematical students in Alexandria, and its teachers, Pappus and Theon, felt the need to help their pupils along by composing commentaries . . .”

“Reeve Robert Brenner, in his recent book on Velikovsky, *While the Skies Were Falling*, writes:

“In his *Ascent of Man*, [Jacob] Bronowski [a mathematician] wonders why the ancients preferred to look skyward in their academic pursuits rather than focusing their intellect on studying the human body. Why did astronomy precede biology? For Jacob Bronowski, the ancients should have thought that,

“The human body ought to have been a much better candidate for early systematic interest. Then why did astronomy advance as a first science ahead of medicine? Why did medicine itself turn to the stars for omens, to predict the favourable and the adverse influences competing for the life of the patient – surely the appeal to astrology is an abdication of medicine as a science? In my view, a major reason is that the observed motions of the stars turned out to be calculable,

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and from early time (perhaps 3,000 B.C. in Babylon) lent themselves to mathematics the pre-eminence of astronomy rests on the peculiarity that it can be treated mathematically . . .”

When Copernicus wrote his *De Revolutionibus Orbium Coelestium*, he, too, found it necessary to also base it on the *Almagest*, as Derek J. de Solla Price points out:

“... we need say nothing about the [first] part of the book – its first few pages – ... is concerned mainly with the thrilling philosophical arguments for mobility of the Earth. After this section Copernicus begins with the real business of technical mathematics, and at this point, the book becomes little more than a re-shuffled version of the *Almagest*. One might, in fact, call it a plagiarization of the *Almagest*, if it were not for the undisputed fact that Copernicus had no intention whatsoever to deceive. He had, however, the best of reasons for wishing his new ideas to appear, clothed in the most respectable and conservative form for traditional astronomy. It is for this reason that the essentially cosmological contribution of Copernicus duplicates not only the mathematical machinery of Ptolemy, but also the method and structure of his book. Chapter by chapter it has the same format and language, the same arrangement of subject matter with only the slightest changes, as dictated by the change to heliocentricity [Sun-centered cosmology]. Thus, the star catalogue is made to precede the sections on Solar and Lunar theory instead of following them. The *Almagest* is not an easy book to read. The *magnum opus* of Copernicus does not have that distinction beyond its first few pages. It contains a few new observations and computations based on them, but beyond that, it paraphrases Ptolemy, putting his work into a somewhat new cloak.”

The point that should be noted is that using the very same mathematics / geometry as Ptolemy Copernicus could show that the planets revolved around the Sun rather than the Earth. For over a thousand years, however, no one realized that this was possible. Furthermore, had anyone done so, he / she would have discovered, as G. E. R. Lloyd points out:

“By choosing suitable parameters, the [Ptolemaic] epicyclic model can indeed be made to yield any figure [for the movement of the planets], curved or straight, if the speeds with which the epicycle and deferent revolve are allowed to vary, and even without such variations in speed the epicycle model can . . . yield an elliptical orbit.”

It was only the Earth-centered theory, therefore, that determined how the mathematics was to be applied by Ptolemy and it was only the Sun-centered theory that determined how the mathematics was to be applied by Copernicus. This, however, is not the end of it. Ptolemy like Newton with tides, also fudged his figures, as outlined by R. R. Newton in his book, *The Crime of Claudius Ptolemy*. Samuel J. Goldstein, Jr. has summarized Newton’s work in a book review:

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“In The Crime of Claudius Ptolemy, Newton concludes that all of Ptolemy’s own observations of the Sun, Moon and planets that can be tested are fabricated. Many other observations that he attributed to other astronomers are also fabricated.

“How can these conclusions be reached? To begin with, there is perfect agreement between the observations in the tables in the Almagest . . . Thus, all the observations can be readily calculated . . .

This is what Newton showed as presented by Goldstein:

“Observations of equinoxes and solstices agree exactly with Ptolemy’s values for the tropical year [the time it takes the Sun to complete one revolution around the celestial star sphere relative to the vernal or spring equinox, or about 20 minutes shorter than the Earth’s yearly orbit of the Sun], and quoted earlier observations, and yet they have longitude errors . . . of more than a degree. Generations of scholars have searched unsuccessfully for alternative explanations for these alleged observations.”

That is, Ptolemy’s value for the length of the tropical year is off by perhaps more than a day. When these observations were made, the data of the length of the tropical year was known to within an accuracy of a few hours. It seems impossible to believe Ptolemy did not know this. Other authors add:

“Ptolemy describes a method for finding the distance of the moon, one which depends critically on the latitude for Alexandria is off by far too much. Hipparchus had determined the distance earlier, so Ptolemy knew the right answer.

“Newton examined the star catalogue and found from the distribution of the fractional parts of degrees of longitude that a constant, whose fractional parts is 40 minutes, had been added to them. The precession constant Ptolemy used, and the time span between Ptolemy and Hipparchus, give 2 degrees 40 minutes for the longitude shift that Ptolemy thought existed.

“Pedersen has pointed out that certain observations of [the] inner planets [Mercury and Venus] seem quite impossible because they must have been made in the daytime [when these planets are not easily observable to make such detailed measurements]. However, they are presented by Ptolemy, in exactly the same way he describes nighttime observations.

“Another examination of the star catalog has been made by Dennis Rawlins who supposed that there was a fixed error in the position of the equinox on the armillary sphere that Ptolemy claimed to use for observing star positions. There should also be a substantial periodic error in the measured latitudes, but none can be detected. Rawlins concluded that the longitude [of the stars] were computed [mathematically], not measured. He investigated the stars near the southern [horizon] limit of the star catalogue and those nearby but not in the catalogue. He concluded from a statistical analysis that the star catalogue is based on observation at a latitude of 36 degrees [north] made near the year 135 B.C. Both of these values

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10 Ibid.
apply to Hipparchus, and the corresponding values for Ptolemy are much less possible.

“I have recently studied the tables of mean longitudes of the sun, moon, and planets from the *Almagest* to determine when they are in agreement with modern theory. If Ptolemy were an inaccurate observer and [actually] made the tables [from his own observations], the dates of agreement would show a wide scatter about his lifetime. My results show the dates of agreement all fall between two and four centuries before his lifetime, hence he did not make the observation for the tables. Since the tables and observations agree, it follows that tables are the [mathematical] source of the observations.”

Goldstein gives a further description presented by Newton:

“As evidence for his crushing assessment, Newton begins by comparing Ptolemy’s figures for the position of the Moon at specific times with what we know it must have been. Many of the claimed observations turn out to be so wildly inaccurate; often the observations are far less accurate than similar sightings made centuries earlier. Ptolemy’s figures are out by more than a quarter of a degree. That might not seem much, but it is the equivalent of Ptolemy lining up his instruments on the edge of the Moon rather than on its center – a gross mistake even for a raw novice and unthinkable in a skilled astronomer. But significantly, these wrong measurements match almost exactly the figures predicted by Ptolemy’s own astronomical equations. Similarly, there are huge inaccuracies in his figures for the position of the Sun at different times of the year – and, again, suspiciously close agreement between the figures and the theories that the observations were supposed to be testing. Does it not seem possible then that Ptolemy juggled his results or even invented them so as to fit his theories instead of rethinking his theories in the light of the results, as a true scientist must always do for accuracy.

“On one occasion, Newton asserts, Ptolemy even convicts himself of fraud by reporting an observation that nobody could possibly have made. Attributing the observation to an earlier astronomer named Hipparchus, Ptolemy writes of a lunar eclipse that took place on September 22, 200 B.C., at 6:30 p.m. Yet we know that the Moon did not rise until half an hour later on that date. So either the original observation was a fake – and Ptolemy should have realized it – or Ptolemy himself either altered Hipparchus’ observation or invented one, attributing it to Hipparchus, a widely respected scholar, to give it credibility. Hipparchus’ own records have vanished; and since the time fits neatly with Ptolemy’s theories, Newton has no doubt about who did the faking.

“Further indication that Ptolemy was a charlatan came curiously not from inaccuracies, but from an implausibly high level of *accuracy*. Newton points out that reputable scientists recognize that a measurement of any quantity, whether in or out of a laboratory, is subject to error, which can arise because of the angle at which the person making the measurement stands in relation to the device [closer

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or farther or to the right or left] or the device itself may be slightly inaccurate. The scientific way around such difficulties is to go on making the same measurement several times and to average the results. If all measurements are done as accurately as possible, the errors should cancel each other out. Thus, the raw figures are bound to be spread out on either side of the right figure and the pattern and size of this spread can be predicted statistically. Yet so often, Newton claims this pattern is absent from Ptolemy’s calculations.

“For example, the times Ptolemy gives for the start of the lunar eclipse are accurate only to about the nearest quarter of an hour, partly because there were no precise clocks in his time, and also because the Earth casts a fuzzy-edged shadow [at first on the Moon]. If he recorded his times honestly, this impression should have meant a variation of at least a quarter of a degree in the pattern of the moon’s movements that Ptolemy calculates. In fact, however, his calculated results agree to within one-sixth of a degree. The odds that such accuracy might occur by chance are 64,000 to 1 against – a probability that looks even more suspicious when added to all the other improbably neat results in the Almagest.\footnote{“Claudius Ptolemy: Genius or Fraud?” Quest for the Past, (Pleasantville, NY 1984), pp. 180-181.}

At this point, the authors of the above citation leave little room than that to which Newton came.

“The conclusion, says Newton, is inescapable. Ptolemy started with his [Earth-centered] theories, worked them out from the data he needed to make the theories stand up, then claimed he had actually observed the necessary data. And the detailed descriptions of the measuring devices and observational methods he used, add an air of credibility to the great hoax . . .

“But if he [Newton] is right, Ptolemy’s dishonesty did as much of a disservice to him as to astronomy. For the genuine information available to a scientist, as well equipped as he was, might have been sufficient to enable him to spot the truth about the solar system: that the Earth revolves around the Sun. Fourteen centuries later, Copernicus worked this out – despite the extra difficulties imposed on him by trying to make sense of Ptolemy’s bogus figures – with mathematical techniques and measuring devices no more sophisticated than those that Ptolemy had.”\footnote{Ibid., p. 181.}

The most significant point is that this capacity to allow theory to determine the observations and data that are mathematically applied to them is not unique. As I have shown above, Galileo employed his theory to the experiments he claimed to have carried out to derive the mathematical answers to get only the answers that that theory required. Kepler also employed his theory that planets moved in ellipses to reformulate both the observations and data he received from Tycho Brahe and then carried out mathematical maneuvers to make the numbers consistent with this theory. Newton, no less, also employed his theory of gravity to apply to tides and then manipulated the data mathematically to have it prove exactly what he wanted it to prove. He did the same with other phenomena, as well as Obanian, who tells us:
“Other examples of similar fakery are found in Newton’s theoretical calculations of the precession of the equinoxes, the magnitude of the force of gravity acting on the Moon, . . . and the size of the equatorial bulge of the Earth. In all these cases, he had a good quantitative understanding of the underlying physics, but inadequate mathematical tools and/or inadequate observational data for an accurate quantitative analysis – and so he inserted fictional fudge factors into his calculations and/or cherry-picked the data.”  

Ohanian further tells us:

“The Princiia is a brilliant diamond, but it is a diamond with flaws. It is unreadable, it abounds in contradictions and inconsistencies, and it is festooned with a handful of gruesome mistakes. Some of these mistakes are outright errors in calculations and demonstrations, others are gaps in logic where Newton simply guessed what he could not prove . . . During his life time, nobody challenged these errors because nobody understood the book well enough to dispute them.”

Wolfgang Pauli also had this to say: “In the 1930s, Pauli began to treat Einstein with the same lack of respect he showed for everyone else. When Einstein constructed a new version of his unified theory of gravitation and electromagnetism, Pauli mocked him in a letter: ‘All that remains is to congratulate you (or should I rather say offer condolences?) for having joined the ranks of pure mathematicians’.” James P. Hogan sums up the problem thus:

“Mathematics is purely deductive. When something is said to be mathematically ‘proved,’ it means that the conclusion follows rigorously from the axioms of itself, a mathematical system can’t show anything as being true in the sense of describing the real world. All the shelves of volumes serve simply to make explicit what was contained in the assumptions. If some mathematical procedure happens to approximate the behavior of certain real-world phenomena over certain ranges sufficiently closely to allow useful predictions to be made then obviously that can be of immense benefit in gaining a better understanding of the world and applying that knowledge to practical ends. But the only measure of if, and if so to what degree a mathematical process does, in fact, describe reality can be actual observation. Reality is in no way obligated to mimic formal systems of symbolic manipulation devised by humans.”

Stephen Jay Gould admits: “I would say usually, theories act as straitjackets to channel observations toward their support, and to forestall data that might refute them. Such theories cannot be rejected from within for we will not conceptualize the potentially refuting observations.” However, scientist who employ a great deal of math to explicate their work cannot conceptualize that what they are doing is channeling that math into the theoretical concepts that they accept, and only those theoretical concepts that they accept. Like Ptolemy, Galileo, Kepler

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16 Ibid., p. 102.
17 James P. Hogan, Kicking the Sacred Cow: Questioning the Unquestionable and Thinking the Impermissible, (Riverdale, NY 2004), (unpaginated).
Newton, etc., they believe the theory is reality and, therefore, the mathematics reflects that reality. This is the dilemma involved: One cannot know all the data that exists in the real world that applies to any of these phenomena. Scientists who say that their theory is reality are assuming that they have all the data that applies to the phenomenon under investigation. That is equivalent to saying they are all-knowing, although they will never suggest any such thing. Once the theory is established, there is, nevertheless, the assumption of having all the relevant data, and other data is either ignored or explained away often mathematically and often tautologically.

Neither the theorist nor the mathematician realize what is going on when they do this. What they are saying is the following: We have very precise observations of phenomena, and when we apply mathematics to explain these phenomena, we have united data with math. They cannot see nor realize that their mathematics only applies to the paradigm they accept. They have not united data and math as reality, rather they have only united mathematics and a paradigm. Again, to assume this is the totality of the real world, is to assume omniscience. That is why Velikovsky was pilloried by scientists. They knew, absolutely knew their gravitational paradigm, supported by centuries of mathematical advances by giants like Newton, Laplace, Lagrange, etc., was unblemished “Scientific Truth,” and it would remain so forever. There was no deeper more religious doctrine that could ever replace their absolute conviction of absolute knowledge. None of Velikovsky’s critics, even his most friendly ones, such as Einstein, doubted that absolute conviction! None of them sought ways to test electromagnetic / mass interactions in space. And they turned their backs on the works of Saxl, Allen, Allais and Townsend Brown that supported Velikovsky.

This is precisely the reasoning and psychological / sociological behavior the scientific community has had toward electromagnetic evidence that was presented above that can potentially refute their theories: the experimental works of Saxl and Allen with a torsion pendulum have been ignored or explained away because the introduction of electricity to that pendulum created motions that refuted gravitational theory. The same applies to the paraconical pendulum work of Maurice Allais and to the experimental evidence of Thomas Townsend Brown’s work that produced motions without the motive force of gravity. In all these instances, the refuting evidence could not be admitted. Electromagnetism is forbidden in Newtonian / Einsteinian theory of motion: Ergo, it does not exist. As stated above, once a theory is accepted as established reality, it becomes impossible to refute it from within. An excellent way to see this, with respect to “unification,” (which claims both general relativity and quantum mechanics in their mathematical forms represent reality) and, therefore, can be united, is Einstein’s attempt to do just this.

However, Paul Feyerabend tells us:

“And now take the best theories of modern physics, general relativity in its most recent form and general quantum mechanics. So far, it his proved impossible to merge them into a coherent whole – one theory makes assertions that flatly contradict the other. Can we still assert that we get a correct description of reality from either of them? We cannot. We can say that both theories are useful approximations, but we have no idea what the reality they approximate looks like.”

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Because electromagnetism was left out of cosmology, and gravitational interactions are largely left out of quantum mechanics, it is, I believe, impossible to merge these contradictory theory based on their underlying physics. The only way to merge them, then, is through mathematics, as does string theory or as Einstein attempted to do in the later years of his life.

Obanian thus reports his chapter, “The graveyard of disappointed hopes:”

“The most grandiose mistakes of Einstein’s career were his several unified theories of electricity [quantum mechanics] and gravitation. For nearly thirty years, from 1926 until his death in 1955, these were the central focus of his research. They were a grand delusion – they led to papers and more papers of abstruse mathematics, but they never yielded anything of lasting interest in physics. Born described the weak point in Einstein’s work in those final years: ‘. . . no he tried to do without any empirical facts, by pure thinking. He believed in the power of reason to guess the laws according to which God has built the world.’

‘Guesswork inspired by God and unsupported by facts is perhaps suitable for theology and theocracy, but it is not suitable for physics. Not surprisingly, all of Einstein’s several attempts at unified theories were [like string theory] trash, and it is the crowning tragedy of Einstein’s scientific career that this was obvious to all his close colleagues, but out of compassion and respect for the great old man, only a few could bring themselves to tell him so. When the physicist, Lee Smolin arrived in 1979 at the Institute for Advanced Study in Princeton, where Einstein had spent his final years, he was eager to make contact with Einstein’s ‘living legacy,’ and he asked Freeman Dyson, one of Einstein’s surviving colleagues at the institute, to tell him what Einstein was really like. He got a revealing answer:

‘Dyson explained that he, too, had come to the institute [in 1947] hoping to get to know Einstein. So he went to Einstein’s secretary, Helen Dukas, to make an appointment. The day before the appointment, he began to worry about not having anything specific to discuss with the great man, so he got from Dukas copies of Einstein’s recent papers. They were all about Einstein’s efforts to construct a unified-field theory. Reading them that evening, Dyson decided they were junk.’

‘The next morning he realized that although he couldn’t face Einstein and tell him his work was junk, he couldn’t not tell him either. So he skipped the appointment and, he told me, spent the ensuing eight years before Einstein’s death avoiding him.’

Obanian goes on:

“Einstein’s publication of this junk was pathetic. He was publishing his failures and he was admitting that his theories were incomplete, but again and again, he deluded himself into believing that he was within striking distance of success. Any physicist reading his papers could see from a cursory inspection that Maxwell’s [ELECTROMAGNETIC] equations were conspicuously absent from these papers and that there was no way that they could emerge from Einstein’s mathematical

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20 Obanian, Einstein’s Mistakes . . . op. cit., pp. 300-301.
framework. But Einstein was blind to the obvious defects of his lofty mathematical creations.”

As noted above, Einstein omitted electromagnetism from his equations because general relativity was based on curved space in which celestial bodies moved. He, like all the rest of the scientific community, could not conceive that electromagnetism can affect these motions. Yet, he attempted to unite all reality, as if in some way he knew all reality, and having that reality, “he tried to do without empirical facts by pure thinking . . . to guess the laws according to which God had built the world.”

Michio Kaku and Jennifer Thompson point to the underlying weakness that made unification impossible for Einstein:

“Of course, Einstein was aware of the fact that he lacked a guiding physical principle. He once wrote, ‘I believe that in order to make real progress, one must again ferret out some general principle from nature.’ No matter how hard he tried however, he could not think of a new principle, so he gradually became obsessed with purely mathematical concepts, such as ‘twisted’ geometries, which are bizarre mathematical structures [comparable in concept, in a way, to six dimensional Calabi-Yau space] devoid of physical content.”

Einstein was a decent human being, but he assumed that at the time he lived, the two major theories of physics – general relativity and quantum mechanics – represented absolute, complete reality. That is not only absurd, but reflects a mind that thinks it is omniscient. Scientists who believe they can know everything of physical reality are likewise in the same absurd state of omniscience. Irish mathematician, John Sullivan, wrote in 1933:

“It is only now in retrospect that we can see how very significant a step this was. An entity had been admitted into physics [Maxwell’s equations] of which we knew nothing but its mathematical structure. Since then, other entities have been admitted on the same terms, and it is found that they play precisely the same role in the formation of scientific theories, as do the old entities. It has become evident that, so far as the science of physics is concerned, we do not require to know mathematical structure. And in truth, that is all we do know. It is now realized that this is all the scientific knowledge we have, even of the familiar Newtonian entities. Our persuasion that we know them in some exceptionally intimate manner is an illusion . . . the only aspects of them with which we are concerned are their mathematical aspects . . .

“With this realization, it is no long step to Eddington’s position that a knowledge of mathematical structure is the only knowledge that the science of physics can give us.”

With regard to quantum mechanics, Dr. George Talbott, a physicist and friend sent me this citation by Dr. Bohm, who called quantum physics “a system of computations,” that is a purely mathematical theory:

21 Ibid., p. 301.
22 Scoular, First Philosophy, op. cit., p. 97.
23 Scoular, First Philosophy, op. cit., p. 35.
“In fact, you must engage in logical gymnastics in order to accommodate the present views. The typical reaction of a student who studies quantum mechanics is that at first, he doesn’t understand it, and by a year or two later, he says there is nothing to understand because it’s nothing but a system of computation. At the same time they’ve got to say, no, it isn’t just that we’re discussing reality. After all, physicists would have no motive for doing the work they do if they didn’t believe that these particles are really the building blocks of the universe. So, you see, you have to engage in and become very skillful at mental gymnastics in order to sustain this myth. It’s actually not so easy. It takes several years and a lot of skill to train people to be able to do it.”

Mark McCutcheon encapsulates the problem thus:

“The goal of a new deep physical understanding of our universe may be in danger of merely becoming an exercise in mathematical manipulation of our current equations. However, this approach may be unsound, since it assumes we have correctly identified the fundamental forces of nature and simply need to rearrange our mathematical models. Yet if this turns out to be an incorrect assumption, then such an approach would only achieve a largely meaningless mathematical link between flawed models of the physical world. This approach also risks trivializing our search for deeper physical understanding into an attempt to achieve a mere mathematical goal bringing no deeper meaning. It is possible that this approach may provide some useful insights, but it may also result in little more than contrived mathematical relationship between essentially the same equations modeling the same limited physical understanding we have today.”

In other words, mathematics without observation and experiment may have nothing to do with reality, the physics seeks to capture, but because it appears to be so rigorous, it does hold sway. From a Velikovskian point of view, the following historical event is told, in which one of the greatest scientists of the world proved that solar flares containing electromagnetic energy could not ever reach the Earth and create effects on it. Stuart Clark, in his excellent book, The Sun Kings, has outlined this history. In it, he shows the long struggle of Christopher Carrington, Edward Walter Maunder and others to prove that great solar flares actually spanned the space between the Sun and Earth to create magnetic storms that caused magnetic compasses to swing wildly, give polar auroral displays in the sky, etc. The problem lay in the mathematics that showed that such phenomena, emanating from the Sun, could not possibly reach Earth. Being mathematically discredited, the entire concept was, therefore, physically impossible. Clark informs us:

“[Lord] Kelvin [Sir William Thompson] decided to bring an end – once and for all – to what he believed was scientific mumbo-jumbo. He chose to launch his assault from the highest perch in science the presidential address to the Royal Society.

“On 30 November 1842... The gathered Fellows and their guests listened as he told them that he hoped to correct fifty years in understanding the supposed

25 Scoular, First Philosophy, op. cit., p. 38.
connection between the Sun’s and the magnetic storms on the Earth. He laid the blame for the misconception at the feet of his ‘ancestors in the Presidential Chair,’ [who had gathered evidence for connecting solar flares with magnetic storms on Earth], and implied that those in positions of scientific power had misled the scientific community . . .

“. . . Kelvin . . . talked his audience through a strict mathematical analysis of the problem. He explained that since the time of Carrington’s flare [1859] and the first discussion of a link to magnetic storms, the Scottish theoretician, James Clerk Maxwell, had developed a succinct quartet of mathematical laws that described the inextricable links between electricity and magnetism. Presenting magnetic data from various observations, Kelvin made it clear that magnetic storms often exceeded the strength of the Earth’s natural magnetism by many times. He then set about calculating how much energy the Sun would need to expend in order to exert this influence across 93 million miles of space. According to Maxwell’s laws, the greatest magnetic catastrophe possible was if the Sun’s north pole suddenly became its south pole, thus reversing the magnetic field. This would send a magnetic shockwave bursting through space in all directions at the speed of light. So the energy recorded in a magnetic storm was just a tiny fraction of the true quantity released into space.

“Kelvin calculated that to drive even a moderate storm on Earth required the Sun to release in just a few hours as much energy as that radiated into space during four months of its normal shining. The thought that the Sun could do this and yet remain unchanged in appearance apart from the occasional dark spot, he considered absurd.”

The strength of the mathematics was so awesome that Maunder and his associates who lacked this skill “could see . . . [no] way of proving their conviction in the language of mathematics that Kelvin could understand. Maunder remained silent.” Kelvin was so sure of his mathematical analysis that he later wrote:

“The result, it seems to me, is absolutely conclusive against the supposition that terrestrial magnetic storms are due to magnetic action taking place within the Sun, or in connection with hurricanes in its atmosphere or anywhere near the Sun outside . . . The supposed connection between magnetic storms and sun-spots is unreal, and that seeming agreement between the period [of a solar flare with a terrestrial magnetic storm that seem to connect these phenomena] has been mere coincidence.”

All this sounds eerily like Carl Sagan mathematical proof that a planet sized body could not be fissioned from Jupiter that was the planet Venus, in Velikovsky’s theory, because it, too, would require an immense amount of energy. Herein, Sagan mathematically seeming proved that: “The total kinetic energy required to propel Venus to Jovian escape velocity is . . . easily calculated

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to be on the order of $10^{14}$ ergs, which is equivalent to all the energy radiated by the Sun to space in an entire year and one hundred million times more powerful than the largest solar flare ever observed.”

But solar flares do reach the Earth and create magnetic storms. They also cause the Earth’s rotation to slow, as Ralph E. Juergens showed in his paper, “On the Convection of Electric Charge on the Rotating Earth” in *KRONOS*, Vol. 2, No. 3 (Feb. 1977), pages 12-30. This is now well-known. But as we have seen, the mathematics that Kelvin employed had nothing to do with the electromagnetic reality that was operating.

In my title of this chapter, “Mathematics Squarely the Root of the Problem,” my poor pun, the play on the words “square root” was meant to convey the size of the problem. Keeping experimental and observational evidence out of consideration and relying strictly on mathematics for physics, I and many scientists consider this approach to be irrational, as discussed above in my presentation of string theory. The mathematics exacerbate the problem and multiply it, as does the squaring of a number, because it can be as wrong as was Kelvin’s analysis of Maxwell’s laws, as they applied. And there have been many scientists, not unfamiliar with mathematics, who have cried out against this strict reliance on it as proof of physical reality.

The first major figure to suggest that mathematics may not be the *sine qua non* of understanding reality, was, I believe, Jonathan Swift, in *Gulliver’s Travels* in the book, *Voyage to Lilliput*. Marjorie Nicolson and Nora M. Mohler explain:

“The section of the *Voyage to Lilliput*, which deals with the mathematical peculiarities of the Lilliputians, has been generally to be mathematicians... Behind the Lilliputians lay the rapidly growing interest of the seventeenth century in mathematics, embodied in the work of Kepler, Descartes, Leibnitz and many others ...

“Swift’s Lilliputians excel in theoretical learning; the abstraction of ‘higher mathematics’ are their meat ad drink. They can solve equations – but they cannot build a house, because of the ‘contempt they bear to practical geometry, which they despise as vulgar and mechanical’ [as Greek philosophers held in the ancient world].”

While Swift felt that the mathematicians of his day were like absentminded professors, his view of science and mathematics failed to take root. Since mathematics seemed to explain the cosmos with such clarity, it seemed impossible that that explanation was wrong. Therefore, for the next 200 years, astronomers and astrophysicists believed that their mathematical investigations of the cosmos were built on the bedrock of reality. Therefore, mathematics took on a life of its own in his regard. If the mathematics derived from the bedrock of reality was valid, then extrapolations based on that bedrock were also based on reality. This ultimately led to the debacle – the crisis – in modern physics that is emerging today. It was only after mathematics took the place of observation and experiment in the 20th century that members of the scientific community began to understand how mathematics had become science, and rebellion of that paradigm erupted.

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During the earlier part of the 20th century, some of these highly respected scientists made a clarion call to try to stop this anti-empirical reliance on math as a method for ferreting out reality by itself. In a certain sense, they were howling in the wilderness. Here, Helge Kragh elucidates this battle:

“This kind of rationalistic cosmophysics expounded by [Sir Arthur] Eddington, Milne and Dirac, enjoyed considerable popularity in England but was strongly opposed by empirically-minded scientists and philosophers. Herbert Dingle . . . astrophysicist at Imperial College of London, was among the first to launch a counterattack against the unbalanced à priori [pure mathematical] methods of what he called ‘Modern Aristotelians’ . . .

“Dingle accused the rationalistic camp of perverting the proper or “Galilian” [experimental observational] method of science . . . His scathing criticism was aimed primarily against Milne’s theory . . . which he felt was nothing but pseudoscience. To admit [into science] general principles not derived from experience would be the death of experimental philosophy. Dingle declared: ‘Milne and Dirac . . . plunge headlong into an ocean of “principles” of their own making . . . Instead of deduction of principles from [real] phenomena, we are given a pseudo-science of inveterate cosmology, and invited to commit suicide to avoid the need of dying. If anyone is uncertain about the place of imagination in science, let him compare Lord Rayleigh’s discovery of [the element] argon with Dirac’s discovery of the contemporary creation of the [unseen] proton which according to The Times [of London], ‘alters fundamentally our ideas of the structure of the universe and the nature of time.’ Dirac’s strongly worded objections caused a heated debate in Nature that engaged many of Britain’s most prominent scholars . . .

“In reply, Milne denied Dingle’s charges of mysticism and extravagance, which, in fact, were unfair. Milne’s ambition was rather to reconstruct physics so as to open it to the common person and he often declared his distaste for the sort of obscurity that he claimed to find in [James] Jeans. But with regard to rationalism [instead] of experiment and observation Milne saw no reason to bow ‘The universe is rational. By this I mean, given the mere statement of what is the laws obeyed can be deduced by the process of [mathematical] inference. There would then be not two creations [one of matter and energy, the other of scientific mathematical law], but one, and we would be left only with the supreme irrationality of creation, in [Alfred North] Whitehead’s phase . . . Laws of Nature would then be no more arbitrary than geological theorems . . .”

“Dingle made it clear that there was more at stake than a few mathematical physicist’s idiosyncrasies. What really alarmed him were matters of science policy and cultural standards [of what constitutes reality and science], ‘the general miasma that threatens to envelope the world of science. ‘Alluding to the dark clouds over intellectual life in Nazi Germany and the Soviet Union, he warned of the authoritarian tendencies that he saw represented by cosmophysicists: ‘The criterion for distinguishing sense from nonsense [science from pseudoscience], had to a large
extent been lost: Our minds are ready to tolerate any statement, no matter how ridiculous it obviously is, if only it comes from a man of repute and is accompanied by an array of [mathematical] symbols. . . . There is evidence enough on the Continent [of Europe] of the effects of doctrines derived “rationally without recourse to experience.” To purify the air seems to me an urgent necessity.’ Dingle had earlier criticized modern theoretical physics for being esoteric and remote, from sound scientific reasoning, features he traced to an excessive mathematization of physics. In 1934, he objected to the theoretical physicists’ portrayal of mathematics ‘as a magic wand for the few instead of the concentrated reason of all . . . It’s very name has become a mental opiate, and elementary fallacies which a generation ago would have been detected by the most ordinary of thinkers, now deceives the acutest minds which lie under its spell . . .’³¹

Along these same lines, Maurice Allais, in 1992, echoed Dingle’s clarion call: “Pseudo-theories.”

“The criterion of confronting theory with experimental data is merciless. Easy as it is, with only a pen, to work out a purely literary analysis or an abstract mathematical theory, as long as no empirical application is made, it is equally difficult to elaborate an analysis that is effectively verified by observed data. This doubtless explains the propensity of so many authors to avoid numerical confrontation except in vague and general terms.

“To test the logical coherence of a theory . . . mathematics is certainly an instrument without equal, indeed irreplaceable. But in examining certain contemporary theories in terms of the requirements of scientific method – logical coherence and conformity with observed data – we find two kinds of deviation: logical inconsistency and neglect of real phenomena . . .

“Mathematical charlatry,’ While many literary theories cannot be considered scientific, the same can be said of a great number of theories, purely logical, with no real links to facts. While mathematics is an instrument whose mastery is extremely precious, it is, and can only be an instrument. One cannot be a good physicist . . . simply because one has some ability and skill in mathematics.

“For almost forty-five years, contemporary economic [and scientific] literature had developed too often in a totally erroneous direction with the construction of completely artificial mathematical models detached from reality; and, too often, it is dominated more and more by a mathematical formalism which fundamentally represents a regression . . .

“Paradoxically, from the scientific viewpoint, incomparably more care is bought today to the mathematical elaboration of models than to the discussion of their structure, their hypotheses, and their results from the viewpoint of analysis is of facts.

“The contemporary literature offers us countless examples of aberrations which flow from neglect of the essential principle that a theory is valid only if it is in agreement with observed facts, and that the only source of truth is experience. Indeed, a large part of contemporary theoretical literature has progressively come under the control of pure mathematicians who are more concerned with mathematical theorems than with analysis of the real world. A new scholastic totalitarianism has arisen based on abstract and \textit{à priori} conceptions detached from reality; this . . . This . . . [is] ‘mathematical charlatry’ . . .

“It cannot be repeated too often for the . . . physicist, the essential objective is not to use mathematics for its own sake but as a means of exploring and analyzing concrete reality . . .”\textsuperscript{32}

In speaking of “New ideas and the tyranny of dominant doctrines,” Allais rails:

“Indeed, only through the blossoming of new ideas suggested by creative intuition and empirical evidence can science truly progress. But all real scientific progress comes up against the tyranny of the dominant ideas generated by the ‘establishment.’ The more such dominant ideas are taken for granted, the more they become [squarely] rooted in the psychology of men and the more difficult it becomes to gain acceptance of a new conception no matter how fertile it may later turn out to be. The dominant ideas, however erroneous they may end up, simply through continual repetition, by acquiring the quality of established truths which cannot be questioned [as did Velikovsky], without confronting the active ostracism of the ‘establishment’ . . .

“In science, the action of the ‘establishment’ and pressure groups is often exercised insidiously, sometimes more over for reasons entirely foreign to science, and in recent years, a dangerous tendency to politicization has developed in science and scientific research . . .

“[There is] Pareto’s statement: ‘The history of science boils down to the history of the errors of competent men.’

“The major principle of scientific discipline is to doubt what is considered true, always to be open to examine opposite opinions favorably, and to foster research which might disprove propositions one believes in. Doubt of one’s own opinion, and respect of those of others are the first condition of any real progress. Universal consent, or even majority consent, cannot be considered a valid criterion for truth . . . There is not and there cannot be any other test of the truth of a theory than its conformity, more or less perfect with concrete phenomena.”\textsuperscript{33}

In spite of all the warnings that a scientific search for reality via mathematics may lead to illusions, those indoctrinated into this approach clearly believe in it. It is as far as they are concerned the most logical and perfect of the scientific disciplines. According to Shing-Tung Yau and Steve Nadis:

\textsuperscript{33} \textit{Ibid.}, pp. 36-37.
Yet for those who appreciate the sheer force of mathematics, it can be viewed not just as a language, but as the surest path to truth – the bedrock upon which the whole edifice of physical science rests. The strength of this discipline . . . lies not simply in its ability to explain physical reality or to reveal it, because to a mathematician, mathematics is reality. The geometric figures and spaces, whose existence we prove are just as real to us as are the elementary particles of physics that make up all matter.34

What is overlooked by those who content mathematics by itself is the surest way to the truth of reality is that mathematics itself is not as they believe, without problems, inconsistencies and contradictions. The fact of the mathematical matter is that mathematics suffers from the same problems inherent in all other forms of thinking. Nigel Bruce, in The Limitations of Scientific Truth, presents just this case:

“It is unfortunate for the members of the Vienna Circle that, as they attempted to evaluate mathematics to the primary methodology of science, the absolute character of mathematical knowledge began to unravel. All mathematical systems were subsequently found to be severely flawed.

“The weak links in the mathematical chain were first discovered by the Austrian mathematician, Kurt Gödel (1906-1977). Although Gödel was initially involved in the deliberations of the Vienna Circle he subsequently sought to distance himself . . . He was partially interested in the relationship between mathematics and logic. If mathematics was to be the final arbiter of scientific truth, Gödel and other scientists wanted to prove that mathematical systems are themselves ‘complete’ – that is, every true statement of number theory can be derived from within the system itself – and ‘consistent’ – that mathematical statements contain no contradictions . . .

“To test the logical unity of mathematics, Gödel devised a coding system that could convert the symbols of mathematical logic into numbers (Gödel numbering). This numbering system allowed mathematicians to make logical statements about itself. Using this self-referential system of mathematics, Gödel made the startling discovery that all formal systems are both incomplete – in that mathematics would not be able to prove all possible truths – and inconsistent – in that mathematical theories could not even prove themselves.

“In 1931, Gödel published his findings in a seminal paper on the consistency and completeness of mathematics . . . Scholars who can understand Gödel’s First Incompleteness Theorem have attempted to translate it into less formal language (apparently with only limited success): ‘All consistent axiomatic formulations of number theory include undecidable proportions’ (Hofstadter 1979, 17), or ‘For every consistent formalization of arithmetic there exist arithmetic truths that are not provable within that formal system.’ (Casti 1996, 164). Basically what Gödel’s First Incompleteness Theorem did was show that all mathematical systems are

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incomplete because they are unable to encompass every possible truth. In other words, some things exist that we absolutely know to be true but cannot prove through the use of any mathematical system... ‘Put more prosaically, there is an eternal, unbridgeable gap between what can be proved and what is true.’ Therefore, Gödel’s First Incompleteness Theorem proved mathematically that mathematics would never allow us to apprehend all possible truths. All mathematical systems are thus incomplete.”

In addition, Bruce explains that all mathematical systems, in one way or another, contradicted themselves from within:

“Gödel was also able to show that all mathematical systems are inconsistent in that they contain [internal] contradictions. By substituting the idea of ‘proof’ for ‘truth,’ Gödel was able to introduce into mathematics the famous Epimenides Paradox. Epimenides... sixth century B.C. poet from Crete, made the paradoxical statement, ‘All Cretans are liars’: true or false, Epimenides was a Cretan, so saying ‘All Cretans are liars,’ he must be lying, however, then the statement, ‘All Cretans are liars’ must [also] be true... and so forth. Gödel took the core out of Epimenides’ Paradox – ‘this statement is false’ – and transferred it into a mathematical concept:... By doing so, Gödel was able to show that mathematical systems can contain contradictions and are, therefore, inconsistent. (This contradiction is true only of theories, not as mathematical givens, such as 2 + 2 = 4.)

“In addition to proving that mathematical systems can be inconsistent, Gödel also showed that mathematical systems are incapable of validating their own consistency. In his 1931 paper... [he] specifically addressed the consistency of mathematical systems and demonstrated that all formal mathematical systems are too weak to prove their own consistency... Therefore, how can mathematics [by itself] be used to validate the empirical observations of scientists if it cannot be used to validate its own consistency. In plain language, it cannot.”

Bruce elucidates on these findings:

“Here, then, was indeed a dilemma according to logical positivism [of the Vienna Circle]. Mathematics was to provide the absolute base on which all scientific methodology was to be built. Alfred North Whitehead (1861-1947) and Bertrand Russell, in their massive three-volume work Principia Mathematica (1910, 1912, 1927), had attempted to prove that no mathematical system – be it Whitehead and Russell’s or any other, could logically contain all the truth that the world holds.

“Based on the work of [David] Hume and Gödel, the conclusion is inescapable that absolute truth cannot be confined within the bounds of (inductive [scientific]) systems or mathematically (probabilistic) systems. At best, all that can be done with [scientific] induction or mathematics is to apprehend [only] a part of a larger

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35 Casti 1993, 153.
37 I bid., pp. 69-70.
truth that is out there [yet to be discovered]; the systems being used are simply not robust enough to capture the [omniscient] entirety of the truth. Gödel’s work clearly shows that, although mathematics might be the queen of the sciences, she nonetheless has feet of clay.”

Bruce then adds this telling explanation about inductive and mathematical truth:

“Why do we see a steady progression of scientific paradigms marching across the pages of human history? There is but one answer to these questions: The foundation of scientific knowledge is [always in some way] faulty; it is built on shifting sand of the inductive method and mathematical probability. Neither of these foundations has the logical integrity necessary to support the scientific claim of absolute truth that has been erected upon them.”

Mathematician and philosopher, Bertrand Russell, was deeply disturbed by Gödel’s work and wrote:

“I wanted certainty in the kind of way in which people want religious faith. I thought that certainty is more likely to be found in mathematics than elsewhere. But I discovered that many mathematical demonstrations, which my teachers expected me to accept, were full of fallacies, and that, if certainty were indeed discoverable in mathematics with more solid foundations than those that had hitherto been taught secure. But as work proceeded I was continually reminded of the fable about the elephant and the tortoise. Having constructed an elephant upon which the mathematical world could rest, I found the elephant tottering, and proceeded to construct a tortoise [on which it stood] to keep the elephant from falling. But the tortoise was no more secure than the elephant, and after twenty years of arduous toil, I came to the conclusion that there was nothing more than I could do in the way of making mathematical knowledge.”

“[Mathematician] David Hilbert, the most influential mathematician of the early 20th century, wrote: ‘The present state of affairs, where we run up against the paradoxes, is intolerable. Just think of the definitions and deductive methods which everyone learns, teaches and uses in mathematics, the paragon of truth and certitude leads to absurdities! If mathematical thinking is defective where are we to find truth and certitude?’

Mathematician, Brian Davis, further argues:

“My conclusion is surprising, particularly coming from a mathematician. In spite of the fact that highly mathematical theories often provide very accurate predictions, we should not, on that account, think that such theories are true or that Nature is governed by mathematics. In fact, the scientific theories most likely to be around in a thousand years’ time are those which are least mathematical.”

38 Ibid., pp. 70-71.
39 Ibid., p. 86.
41 Ibid.
42 Brian Davies, in Scoular, First Philosophy, op. cit., p. 376.
Lastly, Rudy Rucker tells us:

“The thinkers of the Industrial Revolution liked to regard the universe as a vast preprogrammed machine. It was optimistically predicted that soon scientists would know all the rules, all the programs. But if Gödel’s theorem tells us anything, it is this: Man will never know the final secret of the universe.

“Of course, anyone can say science does not have all the answers. What makes Gödel’s achievement remarkable is that he could rigorously prove this, stating his proof in the utterly precise language of symbolic logic.”

Rebecca Goldstein, in an enormously important book on Kurt Gödel, puts it this way, in a book she had read prior to entering college:

“Gödel’s findings seem to have even more far-reaching consequences [than Heisenberg’s uncertainty and Bohr’s complementary], when one considers that in the western tradition, from Pythagoras and Plato onward, mathematics, as the very model of intelligibility, has been the central citadel of rationalism. Now it turns out that even in his most precise science – in the province where his reason seemed omnipotent – man cannot escape his essential finitude; every system of mathematics [and the sciences built on it], is doomed to incompleteness. Gödel has shown that mathematics has insolvable problems, and hence, can never be formalized in any complete system . . . mathematicians now know they can never reach rock bottom; in fact, there is no rock bottom, since mathematics has no self-subsistent reality independent of human activity that mathematicians carry on.”

Morris Klein, a major authority on mathematics, describes the illusion of mathematicians dramatically:

“The developments in this [20th] century of the foundations of mathematics, are best summarized in a story. On the banks of the Rhine, a beautiful castle had been standing for centuries. In the cellar of the castle, an intricate network of webbing had been constricted by industrious spiders who lived there. One day, a strong wind sprang up and destroyed the web. Fantastically, the spiders worked to repair the damage. They [like modern-day physicists] thought it was their webbing [mathematical constructions] that was holding up the castle.”

Klein summarizes the dilemma as not particularly a mathematical or inductive problem, but rather, a problem inherent in human nature; that is, human imperfection is squarely at the root of these concepts because “mathematics is a human activity and [therefore] is subject to all the foibles and frailties of humans.”

Now, in presenting all this, I am not in any way suggesting that we do away with mathematics; it is clearly a necessary tool that allows science to “try” to capture a part of the essence of reality. And “try” is the operative word. As I and others pointed out above,

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46 Ibid., p. 133.
mathematics must be corroborated and correlated and congruent not with its own equations by and with observations, experiments, and to a great extent, the observations and experiments for many other sciences – the interdisciplinary approach that Velikovsky used. As John Herschel said, “I can hardly be pressed forcibly enough on the attention of students of nature that there is scarcely any natural phenomena which can be fully and completely explained in all its circumstances without a union of several, perhaps of all, the sciences.” His harmony of several sciences all saying the same thing together is, I suggest, the best we can do, and then apply the mathematics to that evidence. It is not a panacea, but this interdisciplinary approach can “describe” physical reality, not necessarily “fix” physical reality.

Based on Velikovsky’s interdisciplinary hypothesis, I suggest that the quest for absolute truth or ideal truth or ultimate truth, namely certainty or omniscience, is a human attempt to avoid the insecurity within us and the world around us, that owes the human race nothing! As Klein concludes:

“The plight of man is [like all forms of life] pitiable. We are wanderers in a vast universe before the devastations of nature, dependent upon nature for food and other necessities and uninformed about why we were born, and what we should strive for. Man is alone in a cold and alien universe. He gazes upon this mysterious rapidly changing, and endless universe and is confused, baffled and even frightened by his own insignificance. As Pascal put it:

“For after all, what is man in nature? A nothing in relation to infinity, all in relation to nothing, a central point between nothing and all and infinity far from understanding either. The ends of things and their beginnings are impregnably concealed from him [and her] in an impenetrable secret.’ . . .

“Montaigne and Hobbes said the same thing in other words. The life of man is solitary, poor, nasty and short. He is prey to contingent happening [such as catastrophes of all kinds].

“Endowed with a few limited senses and a brain, man began to pierce the mystery about him by utilizing what the senses reveal immediately [observations] or what can be inferred from experiments man adopted axioms and applied his reasoning powers. His quest was the quest for order [or, in Velikovskian terms, security]; his goal to build systems of knowledge, as opposed to transient sensations, and to form patterns of explanation that might help him attain mastery over his environment.”

The great lesson and most difficult lesson that I have had to acknowledge is that a human understanding of reality will always be partial and never final. I had naively believed when I began to examine Velikovsky’s theories, that somewhere along the road, there would be found “ultimate scientific truth.” Irving Wolf, of the University of Montreal, had often remarked to me that the human and scientific conditions places us inside an infinite onion, that no matter how deeply we delve, there will always remain layers of reality that lie beyond us. This is well described by Paul L. Nuñez:

48 Ibid., pp. 353-354.
“The search for deep truths about consciousness or any other complex subject is analogous to peeling an ‘infinite onion,’ a metaphorical vegetable, consisting of an infinite number of ignorance layers obscuring truths [of the macrouniverse and microuniverse]. By peeling off more and more ignorance, we approach truths at the core, but never really expect to get all the way to the center [omniscient truth]. Our metaphor follows the spirit of the scientific method in which reality is approached as a series of approximations; at no time . . . [should] science claim final[ity].”

Those who have come to the conclusion that, with Newtonian / Einsteinian theory and quantum mechanics, they have reached the bottom of reality, cannot and will not conclude, that these are temporary, approximations of truth of a series of ignorance layers in the endless peeling away of reality. John Barrow, Cambridge University physicist, uses the analogy of Russian Martyuska dolls, dolls nested inside smaller dolls to explain this:

“At present, it is fashionable to believe that there is a ‘bottom’ line to fundamental physics; a basic collection of indivisible entities obeying a small number of mathematical rules in terms of which everything else can, in principle, be described, but the world is not like this. Like a sequence of Russian dolls, there may exist an unending sequence of levels of complexity, with very little (if any) evidence of the next level down, displayed by each of them. If this is the case, then we are as far from knowing the whole story as we have ever been, or ever will be.”

For those of us who have followed Velikovsky’s ideas, he saw this problem almost from the beginning and pointed to it: “What I want to impress upon you is that science today, as in the days of Newton, lies before us as a great uncharted ocean, and we have not yet sailed very far from the coast of ignorance . . . The age of basic discoveries is not yet at its end and you are not latecomers for whom no fundamentals are left to discover.”

Ratcliffe citing Michael J. Disney, puts it this way:

“It is not likely that we primates, gazing through bits of glass for a century or two, will dissemble the architecture and history of infinity. But if we don’t try, we won’t get anywhere. Therefore, we professionals do the best we can to fit the odd clues we have into some kind of plausible story. That is how science works, and that is the spirit in which our cosmological speculations should be treated. Don’t be impressed by our complex machines or our arcane mathematics. They have been used to build plausible cosmic stories before – which we had to discard afterwards in the face of improving evidence. The likelihood must be that such revisions will have to occur again and again and again.”

Or, as Jacob wrote: “Knowledge . . . is an unending adventure at the edge of uncertainty.”

David Bohm understood this as well when he wrote:

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52 Disney in Ratcliffe, The Static Universe, op. cit., p. 22.
“If useful scientific theories are not only falsifiable, but also very probably actually false, what can it mean to seek truth through scientific research? Does not Professor Popper’s [falsifiable] thesis thus disclose a deep kind of confusion in the whole picture of science, its goals, aims, procedures and achievements?

“This problem has its roots in a certain attitude toward truth in science, which has, like the concepts of absolute space and time, and of permanent substance, become so habitual that it may seem inevitable. This attitude regards basic scientific laws as absolute truths, in the sense that such laws are assumed to hold exactly (i.e., without approximation) in unlimited domains, under all possible conditions, so they will never be subject to modification, contradiction and fundamental change. For example, before the advent of relativity and quantum theory, Newton’s laws of motion, along with the concept of space time, were regarded as absolute truths of this kind. Later many scientists probably began to regard relativity and quantum theory as ‘really absolute’ truths . . .

“Where did the notion of absolute truth come from? It is evident that, at least as far back as the Middle Ages, this notion was quite prevalent. For example, the doctrines of Aristotle were then commonly regarded as absolute truths. And, if we go back farther in time, it seems clear that there is no society known in historical records which did not accept some kinds of doctrines, or ideas as absolute truths . . .

“Thus, the notion of absolute truth is not based on facts, and can indeed never be proved by any experiments.”

Because it is of historic relevance that Velikovsky’s theory was severely rejected by astronomer Carl Sagan, who also evidently believed he had, at some level, attained a rather absolute understanding of scientific truth, the following, written by his eldest son, Dorion Sagan, is set down or the record:

“It is said that people’s weaknesses are their strengths. I guess my problem with him [Carl Sagan, my father], boils down to this: just as talking familiarly to the masses about the beauty of the cosmos . . . made him a father figure to millions, so his air of unassailable authority, 1950s-style paternalism and intellectual arrogance, made him emotionally distant . . . On the one hand, he was always ‘on stage,’ perhaps even to himself . . .

“No doubt, much of this was due to his naturalness on camera, his telegenic presence that was showcased in the very successful PBS television series, Cosmos. He was a passionate defender of the truth as he saw it, revealed by the scientific method. And he was a good scientist. He postulated that Venus was so hot because of the carbon dioxide in its atmosphere . . .

“He was in love with science and the search for truth . . .

“Many of our most intense discussions were epistemological. But I find it interesting, although it is not quite fair, since he is no longer around to defend himself, to see where my father and the truth were at variance – not only because it

shows his humanity, but also because it touches upon some of the weaknesses of the positivistic tradition to which he gave such an eloquent, consistent and ardent voice.

“The avidness with which my father attempted to protect the hallowed realm of science from the encroachments of pseudoscience was admirable . . . Had my father called into question the attitude of the Skeptical Enquirer (on whose board he served), we-are-the-knights-of-reason philosophical naïveté, as avidly as he did that of the [irrational] National Enquirer with its we-don’t-print-lies-we-just-believe-anything-anybody-tells-us stories about aliens and astrology, I suspect he would never have attained the position of moral and scientific authority that he did.

“He hated it when I claimed, with Nietzsche, that nature does not admit of any absolute objectivity, but is already always an interpretation. (And I must admit, when I said such things, I was partly playing the devil’s advocate . . .) He hated it when I spoke of the metaphorical nature of all language, including scientific discourse. Or when I pointed out the rhetorical way in which he used words like science and evidence. Don’t get me wrong: I agree that science’s habitual appeal to nature gives it the upper hand. And yet, as I tried to tell Dad, science’s brilliant practice of keeping its truths provisional and open to revision, in light of new evidence, tends to make it cocky. Scientists think they are not only above superstition and pseudoscience, but beyond any obligation to examine the all-too-human philosophical roots of scientific practice.”

Thus, it seems rather clear that Sagan felt he had absolute and final truth on his side, which allowed him to feel better and above Velikovsky, and was willing to say extraordinarily dishonest things about Velikovsky, and never ever answer the evidence presented in my book, Carl Sagan & Immanuel Velikovsky, (Tempe AZ 1995).

Again, to try to resolve this problem is to see how many different interdisciplinary areas of research, observation and evidence jump together and correlate corroborate and are congruent with the Electro-Gravitic theory I have presented to which I will now turn.

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CHAPTER 8: PREDICTION, INTERDISCIPLINARY EVIDENCE AND ELECTRO-GRAVITIC THEORY

A good theory makes bold, specific predictions that no one prior has made and, importantly, these predictions are tied directly to the theory being propounded. This is not the final word or process inherent to prove a valid theory, but when these predictions correlate and are corroborated and congruent with several interdisciplinary sciences, its validity becomes much more certain although there can never be absolute certainty. The fundamental concept of Electro-Gravitic theory, as opposed to the standard model of cosmology, is that the birth of celestial bodies of all sizes and forms is not the condensation of dust and gas that accretes to form larger bodies, such as galaxies, stars, planets, moons, asteroids, comets, etc. Electro-Gravitic theory maintains these are created from the fissioning of more massive bodies. It is maintained that active galaxies, exploding with immense energies, are black holes thrown off from a universal black hole, that spins to instability forming quasars and these, in turn, throw off smaller black holes that also spin to instability that form novas and supernovas, events giving rise to smaller galaxies, stars, planets and the rest of the cosmic bodies found in the Universe.

Regarding the concept that bodies in the Universe form from the condensation and accretion of small particles and gas to form larger bodies, Ratcliffe explains that the:

"Bottom up on the cosmic scale . . . violates the 2nd Law of thermodynamics. The second law requires closed systems (like the finite universe) to proceed, inexorably, toward higher entropy. In simple terms, the 2nd Law, expanded to its conclusion, states that, for every spontaneous interaction, the Universe becomes irreversibly disorganized, something we physicists call entropy. In 1865, author of the 2nd Law, Rudolph Clausius, put it more directly. The entropy of a closed system increases with time. The relativistic expansion of the Universe in BBT [Big Bang Theory] implies that it is a closed system. In Big Bang Theory, entropy decreases with time. I often wonder why there is such a pregnant silence on this issue." ¹

But one of the main foundations and predictions of Electro-Gravitic theory is that:

"The entire concept is based on entropy, or the breakdown of form and energy, in each instance. We begin with a highly organized form a dense lattice, and end up with a low density, amorphous globe of gas. We begin with a large mass and, through loss of mass and energy, we end up with a smaller mass. We begin with a highly rotating body and end up with little or no rotation. We start out with a body giving off highly energetic emissions, and end with a body giving off extremely weak emissions. The fundamental law of entropy is the hallmark of Electro-Gravitic theory." ²

¹ Ratcliffe, The Static Universe, op. cit., p. 158.
This concept of entropy applies to galaxies and stars. There is, so far as I have read, no comprehensive theory of cosmology that explains the evolution of galaxies and stars based strictly on entropy. This is a prediction and concept that defines Electro-Gravitic theory and separates it from all others and does so at unique, specific levels. Along similar lines, Ratcliffe states:

“No machine can be totally efficient, it cannot produce more than it consumes . . . We should, by this law [of entropy], always move (at a macro scale in a finite universe at least) toward disorder and chaos. We should see the Universe becoming ever less structured . . . The expanding universe theory postulates the direct opposite of this process – it becomes more structured and less particulate – and thereby defies the 2nd Law of thermodynamics. Let’s hear what Arthur Eddington had to say about that:

“If your theory is found to be against the second law of thermodynamics [ . . .], I can give you no hope; there is nothing for it but to collapse in deepest humiliation.”

Therefore, at the center of all galaxies, I predicted, and will outline the evidence below, that great black holes exist. I further predicted that, at the core of main sequence stars are superdense bodies that make up most of the mass of these bodies that exfoliate matter and energy from these cores. In addition, I claimed planets, etc., were also created from nova and supernova explosions and that these would be distributed throughout interstellar space and, over time, would be captured by stars from solar systems. In addition, I maintained that when the materials in an older galaxy fall into the central black hole, the process may begin again; but I now add, as per Halton Arp’s concept, that exploding galaxies fission off black holes large enough to form quasars that give birth to other galaxies. Lastly, I do not accept the concept that a black hole is a body that has collapsed to a point, but that it has dimension, albeit quite small. I maintain this because I do not accept quantum theory, and quantum theory is the basis for assuming black holes are crushed to a point.

Therefore, the basic prediction is that all the bodies in a galaxy are born via nova and supernova explosions. The standard model maintains that the causes of nova and supernova have different causes, but because there are so many problems and contradictions with the Hubble law redshift model, outlined above, that these different causes cannot be correct. In that case, Electro-Gravitic theory can be evaluated by the chemistry of bodies in the Milky Way and especially in the solar system. If planets and their satellites, asteroids, comets and dust were born via a condensation and accretion process, as the standard model suggests, the chemistry of all these celestial bodies would exhibit a chemistry that supports that contention. If, on the other hand, the chemistry of all these celestial bodies was created in the immense heat generated by novae and supernovae, they would have a chemistry that could only have been synthesized in that immense heat. In this instance, I am not discussing chemistry, but nuclear chemistry. Therefore, if Electro-Gravitic theory is correct, the nuclear chemistry should present us with unimpeachable scientific evidence that all these celestial bodies and materials were born out of these stupendous, immensely, hot, spinning to instability explosions seen as quasars or pulsars.

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However, before providing this evidence, the concepts just outlined above must be presented from the original publication of *The Electro-Gravitic Theory of Celestial Motion and Cosmology*, published in Forest Hills, NY in 1999. That date is important in terms of priority. On page 23, I wrote, “How does one get one of these universal singularities to throw off masses the size of galaxies?” I then explained, on page 24: “This universal body ejected myriad pieces of itself – other smaller singularities – and that these, at various distances from the parent body, also rotated to instability and, in so doing, evolved into galaxies.” On page 24, I presented my opposition to the standard cosmological Big Bang theory:

“The Big Bang cosmological model suggests that when that universal body disintegrated, it released protomatter, which was incredibly hot and expelled outward [as space expanded] at super inflationary velocity. Thereafter, as the protomatter cooled, it condensed into ordinary [cold] matter mostly hydrogen and helium, which gradually condensed and because of mutual gravitational attraction among the particles, gave rise to galaxies. The theory being presented suggests just the opposite [fissioning] occurred.”

In the rest of that chapter, I outline how quasars evolve to radio galaxies, to spiral barred galaxies, to spiral galaxies and then to elliptical galaxies.

With regard to the birth of stars, I wrote on page 57:

“The conclusion I draw, based on Electro-Gravitic principles, is that stellar formation is not a condensation collapse process from clouds of dust and gas, as conventional theory posits, but one of mass reduction by electromagnetic energy emission than particle emission and physical expansion of black holes. These spin to instability creating novas, supernovas, and give rise to pulsars, white dwarf stars, which give rise to the stars. I maintain that the evolution of stars is diametrically the opposite process presented in all textbooks and scientific papers. I maintain that the great, luminous supernovae and novae observed in the galaxies, accompanied by the emergence of pulsars and white dwarf stars, is not the death throes of ancient stars, but is, in reality, the conversion of pulsars or white dwarf stars, thence to protostars and then young stars. It is not star death. It is glorious star birth, just like the birth of galaxies.

With respect to there being a superdense core at the center of main sequence stars and the chemistry of these stars, I wrote pages 82-84:

“A further problem with the fusion of elements at the cores of massive stars is that these elements are actually observed in their atmospheres. One of these elements, technetium 99, is radioactive, which has a half-life of 212,000 years and is produced as a fission product in nuclear reactors. But this is also true of other heavy atoms that are radioactive, as [L. H.] Aller explains:

“Furthermore, the technetium in the S stars appears to be about as abundant in these stars as the neighboring element . . . ruthenium and molybdenum. The implication is that all these [heavy] elements were built in the S stars and that these objects have life times of about 200,000 years. How the star gets the heavy element
from the core to the surface without exploding provides an impressive challenge to theoreticians.\textsuperscript{14}

“The existence of these materials in measurable amounts in the atmospheres of these stars, represents an ‘impressive challenge’ because, if as presented, technetium, ruthenium, and molybdenum are only produced in the star’s central core, they will, by radioactivity, decay, before they can reach the upper atmosphere of the star to be observed.

“It is calculated that a photon, moving at the speed of light, striking hydrogen and helium atoms in the Sun, being absorbed and reemitted, takes 30 million years to reach the Sun’s photosphere and fly off into space. These various radioactive elements could never make this trip under these conditions in a shorter time period and, thus, would have decayed to other elements. [Tim] Ferris, in dealing with this contradiction, states:

“Had the technetium atoms . . . originated billions of years ago in the Big Bang, they would have decayed and there would be too few of them left to show up today in S stars or anywhere else. Yet, there they were. Clearly, the stars knew how to build elements beyond iron, even if astrophysicists didn’t.”\textsuperscript{5}

“According to [I. S.] Shklovskii, ‘Only nuclear reactions in the surface layers of the stars can account for the presence of technetium . . . lines in S stella spectra.’\textsuperscript{6} The problem is that the low temperatures in the stellar atmosphere . . .

“The problem with technetium . . . is a decisive problem for conventional theory, but again, not for Electro-Gravitic theory. This theory claims that these elements were released from the edge of condensed core of the collapsed matter of the star and, therefore, this core is far beneath the stellar atmosphere. The theory suggests that the core of the star is at one great density . . . of collapsed matter from which elements are evaporating at immense heat. It is further suggested that most of the outer layers of the star are not very dense, but are extremely light in density. That is, that the atmosphere above the core of the star is tenuous, not highly dense with depth. Only if the deep atmosphere outside a star’s core is tenuous can these radioactive substances reach the surface before decaying. . .

“[This] evidence . . . contradicts the conventional view of stellar energy production and directly supports the concept that deep below the star’s surface is a massive hot ball of condensed matter exfoliating hot atoms, ions and radiation into a tenuous atmosphere.”

As for planetary birth, I wrote on page 106-107: “The birth of . . . planets is like that of stars.” Thus, I maintained in 1999 that galaxies, stars and planets etc. were all born by fissioning of various sized masses of black holes that had spun to instability, exploding with immense energy and heat to produce all that we see in the Universe. The evidence that supports these unique predictions was presented by Oliver Manuel, Professor of Nuclear Chemistry at the University of Rolla, Missouri, at an astrophysics conference in Portugal in 2005 by Ratcliffe:

\textsuperscript{5} Timothy Ferris, Coming of Age in the Milky Way, (NY 1988), p. 276.
\textsuperscript{6} I. S. Shklovskii, Stars: Their Birth and Death, (San Francisco 1978), p. 144.
“What he [Manuel] had to say stunned the conference and challenged our deepest prejudice.

“It unfolded like this: Within the first thirty minutes of the conference he . . . twice . . . passed [on to] me a business card . . . On the first he’d written ‘The sun is mostly iron (Fe) with a [immensely dense] neutron star at its core . . . The sun model for all stars in the cosmos.’”

In other words, Manuel held closely, as do I, that the Sun has an immensely dense core [a neutron star] which contains most of its mass. Because it is the “model for all stars in [the] cosmos,” these other stars, (with the exclusion of old red giants, as I maintain), all have an immensely dense core. This, Manuel based on the nuclear chemistry of the Sun. There is so far as I have read, not anyone in or out of the scientific community prior to publication of my Electro-Gravitic Theory in 1999, who claimed in print that stars have an immensely dense core comparable to that of a neutron star compared to the density of the rest of the star. However, the second point that Manuel makes about the nuclear chemistry of the Sun, the planets and everything else in the solar system, is that:

“On the second [card] was ‘Henry Russell, Francis William Ashton. Nuclear packing fraction. F = (M/A-1). A is a nucleon number.’ . . . I (Ratcliffe) had to wait until Oliver [Manuel] presented his paper before a glimmer of clarity seeped through.

“‘I am not an astronomer,’ he said, ‘I am not a physicist. What’s more, I am not a theoretician. I am an experimentalist. What I’ve got to say is not a theoretical model. It is not theoretical model. It is not educated conjecture. It is measurement plain and simple. These are the facts. Do with them what you will...’

“‘My telescope is a mass spectrometer, and I use it to examine nuclides. Conventional spectral analysis of light from the Sun tells us a lot about the photosphere! If you want to know what lies beneath that layer, you’ve got to go another route.’

“Manuel was referring of course to isotopes (known in the parlance . . . as nuclides) . . . Unstable isotopes [like technetium] decay according to a well understood set of processes, hanging almost miraculously from one element into another. Because the decay rate is time-invariant for each nuclide (the half-lives are constant), the chemical sequences of isotopes form a reliable set of chronometers wherever they are found. Dr. Manuel, together with various research partners over four decades, identified and measured isotopes in Moon rock, Earth rock, meteorites, material in the Solar Wind and Solar Flares, as well as in spectral analysis of the atmosphere of Jupiter. Tantalizing clues began to emerge. In a paper published in the journal Science, at the end of 1971, Mervet Boulos and Oliver Manuel revealed that a large excess of the isotope Xe found in well gas provocatively suggested that there was hardly a difference between the Earth and that of the oldest meteorites. Were we seeing evidence of a common ancestor for all populants in the Solar System? At first, the significance of these measurements

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7 Ratcliffe, The Virtue of Heresy, op. cit, p. 190.
was lost on them [the conferees], but the Law of the Nuclides is unambiguous. The isotopes found unambiguously in sample rock and also in the stream of particles coming from the Sun were very clear in what they were telling us. And what they were telling us was shocking to anyone who had assumed the verity of the standard Solar Model, or indeed those (and that includes me) who had other ideas. A number of extinct radioactivities, and two in particular \(^{244}\text{Pu}\) and \(^{60}\text{Fe}\), could only have been produced in a cataclysmic explosion, the kind we call a supernova.\(^8\)

Although Ratcliffe and others have their reservations about this finding, it clearly and directly correlates with Electro-Gravitic theory. Although Manuel has a neutron star with a diameter of tens of miles at the core of the Sun, I propose that the immensely dense core of the Sun is more comparable to several white dwarf star diameters and or a somewhat larger condensed body. Ratcliffe goes on to explain:

“High precision analysis on massive iron meteorites – some as big as a building – taken independently at the University of Tokyo, Harvard and CalTech all show the same thing. The iron was definitely not chemically extracted from an interstellar stew of elements [that condensed] and melted into meteorites. Tracking back from isotopes indicated that they came directly from the iron-rich core of a supernova.”\(^9\)

The theory I propose, as validated by these scientific facts, suggests that the present standard cosmological model of the Universe understood as a condensation of celestial bodies from dust and gas, is upside down and backward. Because the evidence Manuel and his colleagues presented so deeply contradicted the standard model and was so shocking and disturbing even Ratcliffe had great difficulties assimilating it,

“The idea didn’t sit well with me. Despite my whole-hearted acceptance of the validity of Oliver . . . [Manuel’s] argument, it wasn’t a notion that an astronomer would readily adopt. It was simply too far outside the comfort zone, and consequently something in my gut was kicking against it.”\(^10\)

That the solar system was created by supernova explosions is perhaps or virtually impossible for establishment astronomers, astrophysicists and cosmologists to face up to. That is why it takes so long for major paradigm shifts to happen. The idea that everything known is wrong and upside down and backward is inconceivable to those trained into the established theory. Like the scholastic Aristotelian professors who were proponents of an Earth-entered Universe and would not relinquish the hold that paradigm shift held for them for a sun-centered one, which turned their world upside down and backward, so modern scientists are in the same boat. Their theoretical framework, and their allegiance to the condensation / accretion paradigm has stifled any openings to such a momentous change. As Velikovsky understood when he realized the immensity of the paradigm shift he was proposing said “They will never accept it.” He understood that what was required for such a paradigm shift “was simply too far outside the comfort zone” of scientists and that their “gut” reaction would be kicking against it. Gordon Moran explains how this reaction to an overwhelming paradigm shift operates:

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“Not all controversies can be nipped in the bud. In some cases, the nature of the subject matter is so crucial or so vast and far-reaching, or the alleged mistakes on one side are of such great magnitude that even suppression of the issue for a long time will not put an end to the controversy in all its aspects. The controversies that Velikovsky touched off took place within several different academic disciplines... There seems little doubt that the [still ongoing] attempts at silencing Velikovsky and his ideas [and proponents] were aimed at nipping scholarly discussion in the bud by preventing academic debate, thus hoping to prevent escalation to controversy...

“Velikovsky (1978) himself made some interesting observations relating to academic controversies.

“And many of those who look to acknowledged authorities for guidance will express their [gut reaction] disbelief that a truth could have remained undiscovered for so long... Never in the history of science has a spurious book aroused a storm of anger among members of scientific bodies. But there has been a storm every time a leaf in the book of knowledge has been turned over (p. 7).

“Along a similar line he quoted the philosopher Butterfield:

“‘But the supreme paradox of the scientific revolution is the fact that things which we find it easy to instill in the boy [and girl] at school... things which would strike us as the ordinary natural way of looking at the universe... defeated the greatest intellects for centuries.’ (Velikovsky 1980, p. 9.)

As I pointed out in *The Extinction of the Mammoth*, (Forest Hills NY 1997), p. 299, citing Alexander Koyré:

“...What the founders of modern science, among them, Galileo, had to do was not to criticize and to combat certain faulty theories, and correct and replace them with better ones. They had to destroy one world and replace by another. They had to reshape the framework of our intellect itself to restate and to reform its concepts to evoke a new approach to being a new concept of knowledge, a new concept of science – and even to replace a pretty natural approach, that of common sense, by another that is not natural at all.”

When one’s theory requires so great a revolution, of course it will be seen and felt through the prism of the mind and the gut emotions of the older theorists and practitioners as madness, and if it gains a foothold of acceptance in certain quarters of the vast public or even a few scientists and academics, it will be attacked with venom and its leader, Velikovsky, and those who support his ideas will have to be pilloried with scorn, vilification and ostracism, as well as a never-ending campaign to destroy these ideas and proponents of them, not only in scientific writing, in classrooms, but also in the press and the media, that become complicit advocates of the establishment. The nuclide evidence shows that the solar system could not have been formed as every establishment scientist assumes, by the slow accumulation of matter via condensation and

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11 Gordon Moran, *Silencing Scientists and Scholars in Other Fields: Power Paradigm Controls, Peer Review...*, (Greenwich CT / London 1998), p. 84.
accretion model. In spite of this factual evidence confronting them, they simply cannot follow that evidence to where it ineluctably leads. It simply suggests that the solar system formed by the fission and capture model proposed in my Electro-Gravitic theory.

This brings us to the other evidence discussed above about “rogue planets” in interstellar space. As I wrote above, “The birth of such planets is like that of stars. Therefore, the galaxy will contain untold billions of such bodies all in orbit like stars around the galaxy and these can be captured.” Although the possibility of rogue planets was conceived of around the late 1990s, no one had suggested there were “untold billions of such bodies,” and “these can be captured.” This concept was presented in *Analog Science Fiction / Science Fact*, Vol. 80, No. 4 (1968), p. 24, as a science fiction concept. In it, it is assumed that planets were captured just as the stars in the nebula were forming and the planets lost energy by “friction with the nebula” and were “captured all through a star’s history. However, the problem inherent in the early capture mechanism is significant and unresolved, as Fred C. Adams points out:

“The planets discovered in association with other stars show a surprising variety of orbits. The orbits of giant planets are often short and close to the star, at radial locations where little raw material [gases] would have been available in the beginning [of planet formation]. Astronomers are [therefore] coming to the conclusion that planets often migrate from one orbital location to another. But how do planets achieve this migration from their [more distant] birth sites to [closer] more exotic locales? Although this issue has only recently come to light, astronomers have already identified several ways for planets to change their orbits. All of these mechanisms probably operate at some level across the galaxy and enforce changes in the orbits of newly formed planets.

“Gaseous disks provide one piece of the puzzle. When giant planets form, a great deal of gas must still be present in the nebula – otherwise they would remain unfinished as smaller rocky covers. A gaseous nebula [where stars and planets form] has a natural tendency to spread out and feed a substantial fraction of its mass onto the central star. A smaller portion of the material is sent outward to more distant orbits, where it stores the angular momentum. If planets form while the nebula disk is actively transporting material inward and onto the star, then the newly forged planets can come along for the ride . . . If the disk has enough mass and the proper configuration, the planet surfs inward along with the gas. It is surprisingly easy to move a large planet from an outer orbit where our Jupiter lives, into the vicinity of the star.

“Once a robust disk accretion flow gets going, the problem is not to move the planet [inward] but rather how to stop it. The most natural result would seem to be the complete assimilation of the planet by the star. Instead, in nearly one percent of all [newly discovered] solar systems, the planet halts its inward trajectory and remains parked in a four-day orbit. Like many parking problems, this one has not been solved.”

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Therefore, once a planet starts to migrate toward its star, it will continue to do so until it falls into the star. Adams explores other ways to rearrange planets in a newly formed extrasolar system:

“Another way for planets to move around is through scattering events, which take place in a variety of settings. When planets form rapidly in a massive nebula, they are often too close together to ensure long-term orbital stability. In time, they pass near each other. These close encounters, driven by their mutual gravitational attraction, scatter them into new orbits. The smaller planet generally experiences the most drastic changes, often being ejected [to stellar space] altogether. In some [other] cases, the new trajectory can be highly elliptical, like the eccentric orbits observed in many extrasolar planetary systems. Unfortunately, the statistics don’t work out. Not all of the observed orbits can be explained this way . . .

“Passing stars and binary systems [where two stars orbit around one another] pose an alarming threat to the security of a nascent planetary system. If a binary [star] passes close to a solar system, planetary orbits can be highly disrupted, and the scattered planets may end up in highly elongated orbits. But once again, the statistics don’t work out. Only a small fraction of the observed orbits can be altered in this manner. In order for scattering to occur with decent odds, the density of the background stars must be sufficiently high, like that of young, dense, star clusters. But only about 10 percent of the stars form within these dense clusters and the remaining 90 percent of forming solar systems are unaffected by this channel of disruption.”

There is yet the problem that astronomers will not face. The fact of the matter is that Oliver Manuel and his associates have shown that the materials in the solar system are the products of supernovas, and in all the scenarios described above, the nebulae in which the newborn stars and planets formed are not in supernova explosive events. The evidence Manuel presented, nuclide chemistry, has simply been ignored to try to make the old concepts of planetary formation work. In a recent Hollywood film, Melancholia, a large rogue planet was captured by the Sun and ultimately destroys the Earth. The idea that a rogue planet may have caused devastations is still not considered by establishment scientists, but the concept is beginning to emerge. However, while the concept of rogue planets is growing, no one has even attempted to refute Olive Manuel’s supernova evidence. They continue to play with the concept that planets are born in nebulae. Until they do, they are evading real evidence and clinging to their now defunct theory of planetary formation. In terms of their own theory, they admit that the inward migration of planets will not stop them from crashing into the stars they orbit, and this problem is unresolved. Their scattering theory that planets or nearby stars can disrupt these systems, they admit, lack statistical gravitational support and, therefore, makes no sense. And again, above all, they will not deal with the factual evidence of nuclear chemistry that proves planets are born in supernova cataclysms and not from condensing accreting discs of dust and gas. It is almost an ‘evidence be damned’ attitude on their part. More correctly, this is termed “cognitive dissonance.” Dennis Coon and John O. Mitterer write:

\[15\] Ibid., p. 138.
“Cognitive Dissonance Theory:

“Cognitions are thoughts. Dissonance means clashing. The influential theory of cognitive dissonance states that contrary or clashing thoughts cause discomfort [as Ratcliffe, above, exemplified when he had to deal with the solar system created by a supernova]. That is, we have a need for consistency in our thoughts, perceptions and images . . . According to cognitive dissonance theory, we also tend to reject new information that contradicts ideas we already hold. We’re all guilty of this “don’t bother me with facts, my mind is made up . . .”¹⁶

They tell the delightful report of a group that predicted a planet would enter the solar system and destroy America.

“A famous example of cognitive dissonance in action involves a woman named Mrs. Keech, who claimed she was in communication with beings on a planet called Clarion . . . the message foretold the destruction of North America. Mrs. Keech and her followers, the Seekers, were to be rescued by a flying saucer. The news media became involved and reported on the proceeding. When nothing happened, the Seekers suffered a bitter and embarrassing disappointment.

“Did the group break up then? Amazingly, instead of breaking up, the Seekers became more convinced than ever they were right. Mrs. Keech announced that she had received a new message explaining that the Seekers had saved the world . . .

“Why did their belief in Mrs. Keech’s messages increase . . . cognitive dissonance theory? Explain that . . .”

The same applies to astronomers who hold that planets and the Sun and other bodies, gas, dust, comets, asteroids, are born from cool nebulae. They claim that these bodies are born from nebulae, but when confronted by Manuel’s supernova nuclear chemical / factual evidence, they will not acknowledge that they “suffered a bitter and embarrassing disappointment.” They, in fact, have no theory that explains how their nebular theory can be valid in the face of factual nuclear chemical evidence for all bodies in the solar system. They are, in fact, not very different than Mrs. Keech and the Seekers, only better educated. These establishment scientists, in effect, have denied science and reality. To get out of this dilemma, they can say that our solar system, and only our solar system, was born via a supernova, but that every other exoplanetary system was not born from condensation. They have no way out of this dilemma except to invoke theories that do not connect with science or reality. To beat this dead horse to oblivion, let us examine the supernova. Anthony Cooke, on his matter, reports that at the heart of supernova there is a neutron star and goes on to show that the best known studied supernova:

“Because the Crab Nebula . . . has a pulsar [neutron star] at its heart we know the explosive force that created it was a Type II Supernova . . .

“We only see the remaining torn and shattered remains relatively locally, since they are not large enough to be observed across vast distances. The prominent example is only 420” x 290” (corresponding to an actual dimension of 14 light years at its widest point), sufficient to view effectively at this range, but insufficient were it placed at a much greater distance . . . Specific elemental makeup and proportions

¹⁶ Dennis Coon, Psychology: Modules for Active Learning, (Belmont, CA 2012), pp. 651-652.
[in its surrounding cloud of gas and dust] will be determined to total solar mass, so spectral analysis enables astronomers to calculate that the original star’s mass. The ‘Crab Nebula’s’ original star has been estimated to have been on the order of less than 12 solar masses. However, a significant mystery surrounds this nebula in that insufficient mass remains [in the surrounding cloud to make up a 12 solar mass star]. To date, the mystery remains unsolved, all theories yet to be borne out by research.”  

Nothing fits the theory. There is no neutron star in or nearby our solar system. That is why Manuel said it resided inside the Sun. the Wikipedia foundation echoes this research. “A significant problem in studies of the Crab Nebula is that the combined mass of the nebula and [neutron star] pulsar add up to considerable less than the mass of the progenitor star, and the question of where the ‘missing mass’ is remains unresolved.” The additional mass must be there someplace hiding but, like “Dark Matter,” we just can’t see it. The Crab Nebula formed, as observed from Earth in 1054 A.D. It has not had enough time to disperse all its cloud content into distant space. What we observe is what exists and there simply isn’t enough matter to fit the theory. But like everything else we examined in this book, the theory is maintained as valid physics, even when, in fact, the numbers don’t add up. In mathematics, one and one equals two; while in supernova theoretical physics, the mass of the cloud surrounding the Crab Nebula plus the neutron star, does not equal “between 9 and 11 M⊙ [masses of the Sun]. Stars with lower than 8 masses are thought not to produce supernova explosions.” “Estimates [of the total mass] range from about 1-5 solar masses, with 2-3 masses being the generally accepted value. The neutron star mass is estimated to be between 1.4 and 2 solar masses.” So 9 to 11 solar masses somehow must also add up to 2-3 solar masses. Who can argue with numbers? Velikovskians are told, “Do the math.” But the shoe is on the other foot; when we do the math, their supernova theory is unsupported.

I also wrote in 1999 that brown dwarfs being Jupiter sized planets not only exist in interstellar space, but can and are captured by stars to form solar systems. “However, if it [the planetary sized brown dwarf] is moving against the electromagnetic gradient . . . and [it], therefore, must be captured in a prograde orbit!” Thirteen years later, David A. Aguilar and Christine Pullian report:


“New research suggests that billions of stars in our galaxy have captured rogue planets that once roamed interstellar space. The nomad worlds . . . occasionally find a new home with a different sun.”

This I discussed below and repeat here. That is, in 1999 Electro-Gravitic theory predicted and posited black holes at the center of galaxies that have been found; there are also

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22 CFA Center For Astrophysics, Press Release 2012-12 (April 17, 2012) Internet.
compact bodies at the cores of all main sequence stars, which has now been presented by Oliver Manuel. I further predicted rogue planets in “untold billions” that orbit around galaxies are captured by stars to form solar systems, which is now accepted by some astronomers and that all the planets, moons, asteroids, comets, dust and gases in the solar system were born from supernovas, which Manuel indisputably proved with his colleagues based on the science of nuclear chemistry. My theory predicted and/or posited each of these phenomena, the phenomena are or related and corroborated by Electro-Gravitic theory and come directly from it. Lee Smolin, in his most recent book, offers:

“The purpose of this book is to suggest that there is another way. We need a clean break [with the past theories] and embark on a search for a new theory that can be applied to the whole universe – a theory that avoids the confusions and paradoxes, answers the unanswerable questions, AND GENERATES PHYSICAL PREDICTIONS FOR COSMOLOGICAL OBSERVATIONS.”

Although Smolin’s new theory, nevertheless, accepts as fact that both quantum mechanics and general relativity theory are both correct as scientific reality, he nevertheless maintains, as he states in the title of his book, that there is a “Crisis in Physics.” In this respect, he suggests: “I am inclined to believe that just about everything we now think [of] as fundamental will also eventually be understood as approximate and emergent: gravity and the laws of Newton and Einstein that govern it, the laws of quantum mechanics, even space itself . . .” Elsewhere Smolin writes:

“I’m an optimist by nature and for a long time I fought the conclusion that this period in physics – the period of my own career – has been an unusually fallow one [with little or no progress]. For me and many of my friends who entered science with the hope of making important contributions to what then was a rapidly moving field, there is a shocking fact we must come to terms with. Unlike any previous generation, we have not achieved anything that we can be confident will outlive us. This has given rise to personal crisis. But more importantly, it has produced a crisis in physics.

“The main challenge for theoretical particle physics [and even astronomical physics] over the last three decades has been to explain the standard [quantum] model more deeply . . . New theories have been posited and explored, some in great detail, but none has been confirmed experimentally. And here’s the crux of the problem: IN SCIENCE, FOR A THEORY TO BE BELIEVED, IT MUST MAKE . . . NEW PREDICTION[S] – DIFFERENT FROM THOSE MADE BY PREVIOUS THEORIES – FOR AN EXPERIMENT NOT YET DONE . . .”

Ratcliffe cites Stephen Hawking in a . . . published sequel to his best-selling book, A Brief History of Time, and in it, he says [on page 31]:

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23 Lee Smolin, Time Reborn: From the Crisis in Physics to the Future of the Universe, (NY 2013), pp. XXIV-XXV. (Capitalization added)
24 Ibid., p. XXVI.
25 Smolin, The Trouble With Physics, op. cit., pp. XII-XIII. (Capitalization added)
“A scientific theory is a mathematical model that describes and codifies the observations we make. A good theory will describe a large range of phenomena on the basis of a few simple postulates, and will make definite predictions that can be tested. If the predictions agree with observations, the theory survives the test, though it can never be proved to be correct. On the other hand, if the observations disagree with predictions, one has to discard or modify the theory.”

Electro-Gravitic theory has made many new predictions now validated and cited above and offered two experiments. One experiment is to send a low-mass supermagnet on a long trajectory in space which should move not in accord with gravitational theory. The other experiment is to drop a highly charged body in a cryogenic vacuum and see if it falls in accord with gravitational theory or not. As Smolin adds:

“For an experiment to be meaningful, we must be able to get an answer that disagrees with prediction. When this is the case, we say that the theory is falsifiable – vulnerable to being shown false. The theory has to be confirmable; it must be possible to verify a new prediction that only this theory makes [such as my prediction in 1999 of “untold billions” of rogue planets in interstellar space, etc.]. Only when a theory has been tested and the results agree with the theory do we advance the theory to the rank of true theories.”

The crisis in quantum mechanics is summed up by Nick Herbert, as follows:

“Physicists do not put forth these quantum realities [QR] as science fiction speculations concerning worlds that might have been, but as serious pictures of the one world we actually live in: the universe outside your door. Since these quantum realities differ so radically, one might expect them to have radically different experimental consequences. An astonishing feature of these eight [different] quantum realities, however, is that they are experimentally indistinguishable. For all presently conceivable experiments, each of these [different theoretical] realities predicts exactly the same observable phenomena.

“The ancient philosophers faced a similar reality crisis. For instance, three ancient realities – 1. The world rests on a turtle’s back; 2. The world is bottomlessly solid; 3. The world floats in an infinite ocean [without specifying what was at the bottom] – led to identical consequences . . .

“Likewise, modern physicists do not know how to determine experimentally what kind of world they actually live in. However, since ‘reality has consequences,’ we might hope that future experiments, not bound by our present concepts of measurability, will conclusively establish one or more of these bizarre pictures as top-dog reality. At present, however, each of these quantum realities must be regarded as a viable candidate for the way the world really is.” They may, however, all be wrong . . .

“This book is a snapshot of the reality crisis in physics taken at a moment when that crisis is not yet resolved. Nobody knows how the world will seem one hundred

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27 Smolin, *The Trouble With Physics*, op. cit., p. XIII.
years from now. It will probably appear very different from what we now imagine. Here’s what John Wheeler, a physicist actively concerned with the nature of quantum reality, imagines when he looks into the future:

“‘There may be no such things as the “glittering central mechanism of the universe” to be seen behind a glass wall at the end of the trail. Not machinery but magic may [for now] be the better description of the treasure that is waiting.’”

Eric J. Lerner and Almeida José present at the 1st Crisis in Cosmology Conference (CCC), American Institute of Physics, (April 4, 2006), page VIII the following:

“The history of science is littered with premature statements that a final understanding of nature has been achieved. Most famously, Lord Kelvin stated that ‘all that remains for physics is the filling in of the next decimal place.’ This was in 1900, a few years before the revolution began that led to the formulation of relativity and quantum mechanics. More recently, at a CTW Cosmology Symposium in 2005, Sandra Farber concluded that the fundamental questions of cosmology have been answered and Michael Turner stated flatly that ‘there are no current controversies.’ Yet, in the two years since that symposium, cosmology has been in an increasingly profound crisis, one that inspired the conference reported in this volume.”

This symposium was followed by a Second Crisis in Cosmology Conference, CCC-2: Proceedings of a conference held at Port Angeles, Washington, edited by Frank Potter. Joseph Silk stated, “It is impossible that the Big Bang is wrong.”

Ratcliffe gives us observational evidence that contradicts the Big Bang expansion theory of cosmology. Not only is it an observation, but its value as an experiment being carried out in the cosmos is invaluable:

“The strongest observational refutation of a uniformly expanding Universe is undoubtedly the study of galaxy collisions. Dr. Curtis Struck, of Iowa State University, is one of the planet’s leading authorities on this subject, and in 1999 he published a 100-odd-page paper giving an excellent overview of a fascinating aspect of deep space astronomy. It’s a surprisingly complex issue, mainly because of the bewildering number of galactic morphologies, and this has made the systematic standard classification of [the shapes] of galaxies almost impossible. The reason for this huge array of shapes and sizes is quite simple: There is an astonishingly high incidence of collisions between galaxies, so much so that collisions are now generally considered to be an integral part of galactic evolution . . . our own Milky Way . . . [is] closing with Andromeda [galaxy] at high speed. Further, afield the cosmos is littered with impending, occurring, and subsiding collisions on every scale of magnitude and distance. . . It is a truly ubiquitous phenomenon . . .

“Practically all galaxies take part in collisions with other galaxies at some stage of their lives . . . The crucial implication, one that seriously threatens the whole notion of the expanding universe described in Big Bang cosmology, is derived

28 Nick Herbert, Quantum Reality: Beyond the New Physics, (Toronto 1985), pp. 28-29.
from one ludicrously simple fact. Every single example of a galaxy collision, without exception, his taken place between two or more galaxies that were travelling toward each other! It’s obvious. We can put it another way; the only instance where we can directly observe the relative motions of galaxies is during a collision. In all other cases, their remoteness from one another precludes the possibility of detectable motion. In other words, all observational evidence indicates that a significant proportion of the galactic population converges, and none at all show galaxies moving apart, except in those cases where galaxies pass through or past one another and diverge after the event.

“But why and how do galaxies move toward each other in such numbers. Aren’t they supposed to be moving apart? . . . The assertion made by Big Bang cosmologists that ‘everything is moving away from everything,’ or, at the very least, that most galaxies are systematically diverging from one another, is unfounded, unsupported by observation and patently inaccurate.”

Here we have the Universe carrying out an experiment at all distances and scales, that confront cosmologists with a basic contradiction, but it is not acknowledged as a counterproof to cosmological theory. Like so many other forms of evidence presented in this book, the totality of all this evidence is unacknowledged. The experimental evidence that contradicts a strictly gravitational explanation of moving bodies carried out by A. J. Saxl and Mildred Allen with a torsion pendulum experiment, or Maurice Allais’ experiment with a paraconical pendulum or Thomas Townsend Brown’s experiment with moving saucers, although published in peer-reviewed journals, and Allais being a Nobel laureate, changed their concept of reality not one iota. These experiments in the literature remain largely unacknowledged, or it is claimed the apparatus, itself, is responsible for the behavior of these pendulums and saucers when they are electrically charged, but when they are carried out during eclipses of the Sun or Moon, this explanation fails.

This is just what the Aristotelian scholastic professors did when Galileo confronted them with straightforward telescopic observations negative to their Earth-center theory. Galileo showed that neither the Moon nor the Sun were perfect bodies without blemish. The moon had mountains the Sun had sunspots. He showed that Venus exhibited phases like the Moon, which could only exist if Venus orbited the Sun. Jupiter had four moons going around it so the Earth was not necessarily the center of the Universe and there were more stars in space that could be seen except by the telescope, meaning the stars were not all attached to a single distant sphere in space, but were at greater and lesser distances from the Earth. Furthermore, he actually had his telescope tested by several professors who looked through it to a distant coastline and to ships at sea showing details that could not be seen with the naked eye, and these details were known to be matters of fact. The response of the Aristotelian scholastic professors was to suggest that the observations of the heavens were caused by imperfections in the telescope or were tricks and hoaxes, and certain of them simply refused to look through the telescope. What they saw on Earth did not apply to the heavens.

Galileo’s books were placed on the Index of forbidden books by the Church so that his evidence could not be presented. He was under house arrest for the remainder of his life so he

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could not furnish other evidence or telescopic discoveries. All this is quite similar to what happened to Halton Arp. When his observations using large telescopes at Mount Wilson and Palomar observatories produced evidence that the Big Bang cosmology may be wrong. The professionals and professors, who allotted time to astronomers to use these telescopes, simply stopped Arp from pursuing these observations, in effect, shutting down his ability to carry out his research. The more evidence he found, the worse became the case for the standard cosmological model. They were evidently so ashamed of their low-down high-handed action taken, that they omitted their names from the communication forbidding Arp’s use of these telescopes. Without these telescopes, Arp could not produce results and publish any new findings. Geoffrey Burbidge explained what this type of shameful behavior suggests.

“Those of us who have been around long enough to know that peer review and the refereeing of papers [for publication in scientific journals] have become a form of censorship. It is extraordinarily difficult to get financial support or viewing time on a telescope unless one writes a proposal that follows the [established scientific] party line. A few years back, Halton C. Arp was denied telescope time at Mount Wilson and Palomar observatories because his view program had found and continued to find evidence contrary to standard cosmology. Unorthodox papers often are denied publication for years or blocked by referees [as the Church blocked publication of Galileo’s books by putting them in the Index of prohibited works]. The same applies to academic positions [as the church forbade Galileo to teach the sun-centered theory of Copernicus].”

He goes on:

“Those whose views clash with established theories often find themselves ridiculed and denied funds and publication [as was Halton Arp]. Telescopes are meant only to confirm the established ideas and not turn up anomalous data . . . Protestors are not imprisoned [today as was Galileo who was placed under house arrest], but the [modern] inquisition can wreck their careers by censoring publications and refusing funds for research.”

Burbidge relates: “‘The ludicrous climax came about ten years ago,’ the Indian astrophysicist, Jayant Narlikar has written, ‘when Arp was denied the use of telescopes in major observatories. In the 17th century, the Roman Catholic Church condemned another telescope buff, the Italian polymath, Galileo.’ Both Galileo and Arp were using the telescope to uncover evidence of distant celestial phenomena. And in both cases, the authorities stopped them from bringing forth evidence that contradicted their theoretical beliefs. In both instances, they were doing essentially the same thing; they were suppressing dissent, they were suppressing speech and publication of evidence that they did not want the world to hear. In reality, they were doing what no one in a free society is permitted to do, deny another person the right to discover evidence and speak his mind freely. This accusation of inquisitorial behavior in modern science will be laid at its feet when their paradigm collapses as it now appears to be starting to happen. Physicist, Michael J. Disney, in a paper titled, “The Case Against Cosmology,” on the Internet, writes:

31 Ibid.
32 Ibid.
“It is argued [here that] some of the recent claims for cosmology are grossly
overblown. Cosmology rests on a very small database: It suffers from many
fundamental difficulties as a science (if it is a science at all) . . . It is suggested that
cosmological inference should be tentatively made and skeptically received.”

“Cosmology must be the slowest moving branch of science. The number of
practitioners per relevant observations is ridiculous. Consequently, the same old
things have to be said by the same old people (and by new ones, over and over
again. For instance, “Cold Dark Matter’ now sounds to me like a religious liturgy
which its adherents chant like a mantra in the mindless hope that it will [somehow]
spring into existence. Much of cosmology is unhealthy, self-referencing and it
seems to an outsider like myself that cosmological fashions and reputations are
made more by acclamation than by genuine scientific debate.” (page 6)

“However, the most unhealthy aspect of cosmology is its unspoken parallel with
religion . . . The rapt audience, the media exposure, the big book-sale, tempt priests
and rogues, as well as the gullible, like no other subject in science. For that reason
alone, other scientists simply must treat the pretensions of cosmology and of
professional cosmologists with heightened skepticism . . .

“The word ‘cosmologist’ should be expunged from the scientific dictionary and
returned to the priesthood where it properly belongs.” (page 8) Astrophysicist
Martin Lopez Corredoria, cries out:

“Cosmology today, like that in Galileo’s day, is a state-run enterprise. The
outcome is the same – dominance of science, its politics and education by a few
dogmatic ‘cardinals’ of science. So despite technological marvels, astronomy in
2009 is in the grip of a modern ‘dark age,’ ironically reflected in physically
meaningless terms like ‘dark matter,’ ‘dark energy,’ and ‘black holes.’”

Wal Thornhill adds, “It is long overdue to turn on the electric light.”

In a sense, what Arp experienced was small compared to the way Velikovsky was
treated. He is still being vilified and misrepresented by scientists, historians of science and science
writers. But, the scientific establishments want these anti-libertarian actions played down or
suppressed. Johannes Kepler was indignant at these kinds of behavior and said, “If science has to
be supported by fraudulent means, let it perish.” Agassi highlights this stating:

“My concern here is with the suppression of unpleasant evidence, not taking it
at its face value. Suppression is justified by the claim that historians of science
should promote science, not undermine it; this justification amounts to the claim
that historians of science are (self-appointed) propagandists for the cause of
science. Propaganda for any successful cause, particularly for the cause of science,
is questionable. There is a deeply inherently inconsistency in the idea of
propaganda for science, or for the sake of spreading science. Propaganda is the
opposite of providing readers with a scientific approach and of helping them

33 Wal Thornhill, *The Electric Universe*, “Astronomy has little to celebrate in 2009” (Internet)
34 *Ibid*.
35 Kepler in Joseph Agassi, *Science and Its History: A Reassessment of the Histography of Science*, (Tel
Aviv / Toronto 2008), p. 56.
acquire an historical perspective. When the item in question is science . . . substituting propaganda for it is particularly irksome . . . the practice of writing propaganda under the veil of writing history . . . of science is a menace . . .”

Neil DeRosa nicely states this connection between Medieval scholastic Aristotelians and modern scientists in this episode regarding Halton Arp:

“Not since the time of the Medieval Scholastic philosophers – the “Schoolmen,” . . . – has an established hierarchy of scholars felt so absolutely self-assured in their rightness of their beliefs and their power to impose them on the world; and never since has such smug complacency been so utterly and fundamentally misplaced, as is the case with modern observational astronomy . . .”

Imre Lakatos, the philosopher of science, claims that the problem inherent in ever getting a rational or fair hearing from the scientists in the scientific establishment is related to “elitism” which I interpret as “egotism.”

“Among scientists, the most influential tradition in the approach to scientific theories is elitism – . . . elitists claim that good science can be distinguished from bad or pseudoscience, better from worse science. Elitists acknowledge the vast superiority of Newton’s, Maxwell’s, Einstein’s, and Dirac’s achievements over . . . Velikovsky . . . and they claim to recognize scientific progress . . . In their view, science can only be judged by case law [based on the establishment paradigms] and the scientists themselves. If they are right, academic autonomy is sacrosanct, and the layman, the outsider, must not dare to judge the scientific elite . . . Only a privileged elite has the craft of science . . .

“They give this reason why the layman cannot be a judge in appraising scientific theories . . . Only they can judge their own work.”

Modern cosmological / astronomical science, I suggest, is now ripe for satire and who better to show this than the great American writer and humorist, Mark Twain. In his short but witty essay, “Some Learned Fables For Good Old Boys and Girls,” he writes:

“Once the creatures of the forest held a great convention and appointed a commission consisting of the most illustrious scientists among them to go forth, clear beyond [their known world] the forest and out into unknown and unexplored world [cosmos], to verify the truth of the matter already taught in their schools and colleges and also to make discoveries. It was the most [important and] imposing enterprise of the kind . . . ever embarked in. True, the government had once sent Dr. Bull Frog, with a picked crew, to hunt for a northwesterly passage through the swamp to the [far distant] right-hand corner of the wood, and had since sent out many expeditions to hunt for Dr. Bull Frog, but they never could find him, and so . . . finally gave him up and ennobled his mother to show its gratitude for the services her son had rendered to science. And once government sent Sir Grass Hopper to hunt for the sources of the rill that emptied into the swamp; and afterward sent out

36 Ibid., p. 55.
many expeditions to hunt for Sir Grass Hopper, and at last they were successful—they found his body, but if he had discovered the sources meantime, he did not let on. So government acted handsomely by [the] deceased and many envied his funeral.

“But these expeditions were trifles compared with the present one, for this one comprised among its savants the very greatest among the learned; and besides it was to go to the utterly unvisited [cosmological] regions believed to lie beyond the mighty forest—. . . How the members were banqueted and glorified, and talked about [in the press and by the media]! Everywhere that one of them showed himself, straightaway there was a crowd to gape and stare at him . . .

“At the end of three weeks the expedition emerged upon the great Unknown World. Their eyes were greeted with an impressive spectacle. A vast level stretched before them, watered by a sinuous [Milky Way] stream; and beyond there towered up against the sky a long and lofty barrier of some kind, they did not know what. The [ignorant ordinary] tumble Bug said he believed it was simply land tilted up on its edge because he knew he could see trees on it. But Professor Snail and the others said:

‘You are hired to dig, sir—that is all. We need your muscle, not your brains. When we want your opinion on scientific matters, we will hasten to let you know. Your coolness is intolerable, too—loafing about here meddling with august matters of learning when the other laborers are pitching camp. Go along and help handle the baggage.’

“The Tumble Bug turned on his heel uncrushed, unabashed, observing to himself, ‘If it isn’t the land tilted up, let me die the death of the unrighteous.’

“Professor Bull Frog (nephew of the late explorer) said he believed the ridge was the wall that enclosed the Earth. He continued ‘Our fathers have left us much learning, but they have not traveled far and so we may count his a noble discovery. We are safe for renown now, even though our labors begin and ended with this single achievement [that unites all science and the universe inside it]. I wonder what this world is built of. Can it be fungus? Fungus is an honorable good thing to build a wall of.’

“Professor Snail adjusted his field-glass [spectrograph] and examined the rampart critically. Finally he said: ‘The fact that it is not diaphanous convinces me that it is a dense vapor formed by the calorification of ascending moisture dephlogisticated by refraction. A few endiometrical experiments would confirm this, [to be dark matter], but it is not necessary. The thing is obvious.’ So he shut up his glass and went into his shell to make a note of the discovery of the world’s end, and the nature of it.

‘Profound mind!’ said Professor Angle-worm to Professor Field-Mouse; ‘profound mind! Nothing can long remain a mystery to that august brain’ . . .

“About noon [the next day] a great avenue was reached, which had in it two endless [anti-Einsteinian] parallel bars of some kind of hard black substance, raised the height of the tallest Bull Frog, above the general level. The scientists climbed
along them for a great distance, but found no end and no break in them. They could
arrive at no decision. There was nothing in the records of science that mentioned
anything of this kind. But at last, the bald and venerable geographer, Professor
Mud Turtle, a person who, born poor, and of drudgingly low family, had, by his
own native force, raised himself to the headship of the geographers of his
generation, said:

“‘My friends, we have indeed made a discovery here. We have found in a
palpable, compact, and imperishable state what the wisest of our fathers regarded
as a mere thing of the imagination. Humble yourselves, my friends, for we stand
in a majestic presence. These are parallels of longitude!’ Every heart and every
head was bowed, so awful, so sublime was the magnitude of the discovery. Many
shed tears.

“The camp was pitched and the rest of the day was given to writing voluminous
accounts of the marvel, and correcting astronomical tables to fit it. Toward
midnight, a demonical shriek was heard, then a clattering and rumbling noise, and
the next instant a vast terrific eye shot by, with a long tail attached, and disappeared
in the gloom, still uttering triumphant shrieks [of a passing train].

“The poor dumb laborers were stricken to the heart with fright, and stampeded
to [hide in] the high grass in a body. But not the scientists. They had no
superstitions. They calmly proceeded to exchange theories. The ancient
geographer’s opinion was asked. He went into his shell and deliberated long and
profoundly. When he came out at last, they all knew by his worshipping
countenance that he brought light. Said he: ‘Give thanks for this stupendous thing
which we have been permitted to witness. It is the Vernal Equinox!’ There was
shouting and great rejoicing.

“‘But, said the Angle-worm, uncoiling after reflection, ‘This is dead
summertime [not spring].’ ‘Ah true, true enough . . . But it is night. How should
the sun pass [this point on the Earth] in the night?’ ‘In these distant regions, he
doubtless passes always in the night at this hour.’ ‘Yes, doubtless that is true. But
it being night, how is it that we could see him?’ ‘It is a great mystery [of
cosmology]. I grant that. But I am persuaded in these remote regions is such that
we were enabled to see the sun in the dark.’ This was deemed satisfactory, and due
entry was made of the decision [by all the scientists].

“But about this moment those dreadful shriekings were heard again; again the
rumbling and thundering came speeding up out of the night, and once more a
flaming great eye flashed by and lost itself in the gloom and distance.

“The camp laborers gave themselves up for lost. The savants were sorely
perplexed. Here was a marvel hard to account for. They thought and they talked,
they talked and they thought. Finally the learned and aged lord Grand Daddy Long
Legs, who had been sitting in deep study, with his slender limbs crossed and his
stemmy arms folded, said: ‘Deliver your opinions, brethren, and then I shall tell
my thought – for I think I have solved the problem.’
“So be it, good your lordship,” piped the weak treble of the wrinkled and withered Professor Woodlouse, for we shall hear from your lordship’s lips naught but wisdom [here the speaker threw in a mess of trite, threadbare, exasperating quotations from ancient poets and philosophers, delivering them with unction in the sounding grandeurs of the original tongues, they being from the mastodon, the Dodo and other dead languages.] “Perhaps I ought not to presume to meddle with matters pertaining to astronomy at all, in such a pretense as this, I who have made it the business of my life to delve only among the riches of extinct languages and unearth opulence of their ancient lore; but still, as unacquainted as I am with the noble science of astronomy, I beg with deference and humility to suggest that inasmuch as the last of these wonderful apparitions proceeded in exactly the opposite direction from that pursued by the first, which you decide to be the Vernal Equinox, and greatly resembled it in all particulars, is it not possible, nay certain, that this last is the Autumnal Equinox”

“O—o—o! O—o—o! go to bed! go to bed!” with annoyed derision from everybody. So the poor old Woodlouse retreated out of sight, consumed with shame.

“Further discussion followed, and then the united voice of the commission begged Lord Longlegs to speak. He said:

“Fellow-scientists, it is my belief that we have witnessed a thing which has occurred in perfection but once before in the knowledge of created beings. It is a phenomenon of inconceivable importance and interest, view it as one may, but its interest to us is vastly heightened by an added knowledge of its nature which no scholar has heretofore possessed or even suspected. This great marvel which we have just witnessed, fellow-savants (it almost takes my breath away), is nothing less than the transit of Venus [across the face of the Sun]! Every scholar sprang to his feet pale with astonishment. Then ensued tears, hand shakings, frenzied embraces, and the most extravagant jubilations of every sort. But by and by, as emotion began to retire within bounds, and reflection to return to the front, the accomplished Chief Inspector Lizard observed:

‘But how is this? Venus should traverse the sun's surface, not the earth's.’ The arrow went home. It carried sorrow to the breast of every apostle of learning there, for none could deny that this was a formidable criticism . . . the venerable Duke crossed his limbs behind his ears and said:

“My friend has touched the marrow of our mighty discovery. Yes—all that have lived before us thought a transit of Venus consisted of a flight across the sun's face; they thought it, they maintained it, they honestly believed it, simple hearts, and were justified in it by the limitations of their knowledge; but to us has been granted the inestimable boon of proving that the transit occurs across the Earth's face, for we have SEEN it!”

“The assembled wisdom sat in speechless adoration of this imperial intellect. All doubts had instantly departed, like night before the lightning.”

Twain concludes his tale with the lesson to be learned:

“The expedition then journeyed homeward after its long absence and its faithful endeavors, and was received with a mighty ovation by the whole grateful country.

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39 Mark Twain, “Some Learned Fables, For Good Old Boys and Girls,” (Internet).
There were vulgar, ignorant carpers, of course, as there always are and always will be; and naturally one of these was the obscene [unlearned] Tumble-Bug. He said that all he had learned by his travels was that science only needed a spoonful of supposition [theory] to build a mountain of demonstrated fact out of . . .”

This satire of educated stupidity will, I believe, be the way the future judges those who claim electromagnetism plays no role or almost no role in celestial motion and cosmology. They cannot conceive that this is how they will be portrayed, especially for their failure to deal with the various forms of evidence presented in peer-reviewed journals and books that points to electricity and magnetism’s role in physics. According to Gerald James Holton and Stephen G. Bush:

“A year after his [telescopic] discoveries, Galileo complained in a letter to Kepler:

‘You are the first and almost the only person who, after a cursory investigation, has given entire credit to my statements . . . What do you say to the leading [scholastic] philosophers here to whom I have offered a thousand times of my own accord to show my studies but who with the lazy obstinacy of a serpent who has eaten his fill, have never consented to look at the planets, or moon, or telescope?’

“In his characteristic enthusiasm, Galileo had thought that through his telescopic discoveries everyone could see as with his own eyes, the absurdity of the [scholastic’s Aristotelian] assumptions that prevented a general acceptance of the Copernican system. But people can believe only what they are ready to believe. In their fight against the new Copernicans, the scholastics were convinced that they were surely ‘sticking to facts’ and that the heliocentric theory was obviously false and in contradiction with both sense observation [not telescopic observation] and common sense not to speak of the theological heresies implied in the heliocentric view. They made Aristotelian science their exclusive tool for understanding the observations, just as today, most non-scientists [and scientists dispute Velikovsky’s theory regarding electromagnetism, and solar system stability] make their understanding of physical theory depend on their ability to visualize it in terms of simple mechanical models obeying Newtonian laws [of gravity].

“But at the root of the tragic position of the Aristotelians was, in part, the fact that an acceptance of the Copernican theory as even a possible theory would have had to be preceded by the most far-reaching reexamination and reevaluation of their [deepest] personal beliefs. It would have required them to do the humanly almost impossible – to discard their common-sense ideas to seek new bases for their moral and theological doctrines, and to learn their science anew (which was of course what Galileo did to an amazing degree; for which his contemporaries called him fool, or worse [crackpot?], and for which we call him genius. Being satisfied with their system, the Aristotelian [schoolmen] were, of course, unaware that history would soon prove their point of view to be far less effective in the quest to understand nature.

They follow this evaluation by showing how Galileo, in his most famous book, *Dialogue Concerning the Two Chief World Systems*, published in 1632, “stressed the rational

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40 Ibid.
arguments that seemed to him to be conclusive, apart from observational evidence.”42 It was this simple explanation of the superiority of the Copernican sun-centered cosmos over the Aristotelian Schoolmen’s earth-centered system that was so strong that brought down the wrath of these schoolmen and Galileo for which he was tried and condemned and his works proscribed/censored by being put on the Index as a book that could not be read and all available copies of his book were burned. In the same way scientists and professors forced the MacMillan Company that published Velikovsky’s book, Worlds in Collision to stop printing it and burn the copies it still had. How very alike these actions are and will no doubt come out when Velikovsky’s thesis that electromagnetism plays a role in celestial motion and cosmology is accepted.

Francis Bacon well understood how suppression of new concepts in science operates and he wrote this in 1620:

“In the customs and institutions of schools, academies, colleges and similar bodies of learning, everything is found adverse to the progress of science. For the lectures and exercises are so ordered that to think or speculate on anything out of the common way can hardly occur to any man.

“And if one or two have the boldness to use any liberty of judgment, they must undertake the task all by themselves; they can have no advantage from the company of others. And if they can endure this also, they will find their industry and largeness of mind no slight hindrance of their fortune.

“For the studies of men in these places are confined and, as it were, imprisoned in the writing of certain authors, from whom, if any man dissent, he is straightaway arraigned as a turbulent person and an innovator.”43

Bacon is further cited to say:

“For if a man look carefully into all variety of books, he will find endless repetitions of the same thing varying in method of treatment, but not new in substance, insomuch, what was a question once is a question still, but instead of being resolved by discussion, it is only fixed and fed . . .

“But as the matter now is, it is nothing strange if men do not seek to advance in things delivered to them as long since perfect and complete . . . It is idle to expect any great advancement in science from super inducing and engrafting of new things upon old. We must begin anew from the very foundations, unless we would revolve forever in a circle with mean and contemptible progress . . .”44

Let us remember also that Oxford Franciscan, Roger Bacon (ca. 1214-1292), who moved forward from Aristotle and urged for experimentation [rather than deduction], a daring stance . . . cost him twenty-four years in prison.45

In this book, I have attempted to emulate Galileo by presenting observational, experimental, physical, dynamical and logical evidence that clearly points in the direction to which Velikovsky pointed. I would further argue that the problems that present day scientists cannot or will not see is because, at any period, the foundations of science are built on the shifting sands of human fallibility and limited knowledge. The seeking for a scientific theory of everything, in Velikovskian terms, is a search for security that Velikovsky saw lies in the neurotic insecurity of all human beings and drive us to seek absolute certainty and absolute truth. When it is thought to

42 Ibid., p. 54.
44 Ibid., p. 15.
be found and bolstered by mathematics for those who need to believe that they have final truth / ultimate truth when in reality it is only a partial, tentative understanding of reality that they cannot give up, their bastion. Relearning and reevaluating personal beliefs, as Holton and Bush explained, “would have required to do the almost impossible . . . and to learn their science anew . . . being satisfied with their system . . . [they] were, of course, unaware that history [in time] would prove their point of view to be far less effective to understand nature.” At any moment in history, humanity possesses only a limited amount of data. It is on this limited data that we build science. Those scientists, historians and the rest who deny this or claim they have all the data necessary to explain reality nature are no different than the religious, scholastic, medieval zealots who claimed they knew the mind of an omniscient and omnipresent deity. They do not understand nor want to understand that the pursuit of scientific truth leads, at best, to only partial truth. The uncharted ocean, as Velikovsky presciently understood, is already out there.

There is, I believe no way to stop the dissemination of the ideas presented in this book because these have already been picked up in other books throughout the world. And there will be, here and there, those professionals how will come into contact with this material and who will be intrigued and/or interested enough to further explore and expand these ideas more deeply with new tools, experiments, observations, and mathematics and develop these concepts more deeply and rigorously. As Ratcliffe, citing G. de Vaucouleurs, informs us:

“In a 1970 article in the popular journal, Science, [G.] de Vaucouleurs warned us somberly of

“‘. . . parallelisms between modern cosmology and scholasticism . . . Above all, I am concerned by an apparent loss of contact with empirical evidence and observational facts, and worse, by a deliberate refusal on the part of some theorists to accept such results when they appear to be in conflict with some of the present oversimplified and, therefore, intellectually appealing theories of the universe.’”

Lee Smolin indicates that established science only allows established theory to be done.

“This [established] system has another critical consequence for the crisis in physics: People with impressive technical skills and no ideas are chosen over people with ideas of their own partly because there is simply no way to ban people who think for themselves. The system is set up not just to do normal science, but to insure that normal science is what I done.”

“Between the early twentieth and the last quarter century, science – and the academy in general – has become more organized and professionalized. This means that the practice of normal science has been enshrined as the single model of good science. Even if everyone can see that a revolution is necessary, the most powerful parts of our community have forgotten how to make one. We have been trying to do with structures and styles of research best suited to normal science.”

It is clear that modern physicists, astronomers, astrophysicists and cosmologists have reached a dead end and are now in the throes of cognitive dissonance. Their action to stifle the concept that electromagnetism plays a role in celestial mechanics has forced them to reenact may of the deplorable aspects of the Church and the scholastists.

Miles Mathis, in his paper, “Death by Mathematics,” on the internet, goes further:

48 Ibid., pp. 312-131.
“Yes, modern physics has become a neo-scholasticism. It is the avoidance of real questions in the pursuit of trivial methodology. It is the memorization of an endless list of names and manipulations in lieu of understanding mechanics. It is the setting up in some black data hole and extemporizing on an endless string of evermore ridiculous hypotheses instead of looking at known physical problems closer at hand. It is the knee-jerk invocation of authority and the explicit squelching of dissent. It is the hiding behind tall gates and a million gatekeepers and euphemizing it as ‘peer review.’ It is the institutionalized acceptance of censorship and the creation of dogma. Grand masters like Feynman say ‘shut up and calculate’ and everyone finds this amusing. No one finds it a clear instance of fascism and oppression . . . The field is monolithic. It is completely controlled and one-dimensional. All discussion [and dissension] has been purged from the standard model[s], and all debate has been marginalized. Any non-standard opinion must be from a ‘crank’ and blacklisting is widespread. Publishing is also controlled both in academia and in the mainstream [media] . . .

“Contrary to what we have been told, contemporary physics is not blooming. It is not very near omniscience, it is not the crown jewel of anything. In fact, it is near death. It has been damaged by any number of things . . . But the prime murder has been abstract mathematics.”

René Descartes words, in 1641, well apply to the theme of this book.

“Several years have now passed since I realized how numerous were the false opinions that, in my youth, I had taken to be true, and thus how doubtful were all those I had subsequently built upon them. And thus I realized that [for] once in my life I had to raze everything to the ground and begin to establish anything firm and lasting in the sciences.”

I believe John Herschel’s words, written 150 years ago to Michael Faraday, apply to the coming “Velikovskian revolution” across all the fields of science he challenged, especially the role electromagnetism plays in celestial mechanics and, therefore, in cosmology, when Heschel said, “we stand on the verge of a vast cosmological discovery such as nothing hitherto imagined can compare with.”

No individual, no group in the sciences or the media can destroy the seeds that Velikovsky sowed from emerging from the soil where he planted them and will continue to expand and grow, no matter how influential the scientific establishment may be and no matter to what extreme ends it will go, it simply cannot stop, even by trying to co-opt it.

The work of Wal Thornhill’s Electric Universe is out in the world with that of other scientists who adhere to the electric cosmological concept. It was even picked up and discussed in Ratcliffe’s The Virtue of Heresy. Miles Mathis’ book, The Un-unified Field, is also out in the world and his website papers that contain the topics of his book have been hit well over a million times. My Electro-Gravitic Theory of Celestial Motion & Cosmology will be placed on the Internet, as will this book, in time.

To read more about various topics I have published, go to limmanuelvelikovsky.com. These can be attacked but from now on, they cannot be suppressed or destroyed by propaganda. It is too late! The seeds Velikovsky planted, over half a century ago, are germinating. Only in a

49 René Descartes, Meditations on First Philosophy, in Scoular, First Philosophy, op. cit., p. III.
static scientific society can new ideas be suppressed, but once these concepts emerge, they spread far and wide to grow and spread farther and wider. One disgruntled Velikovskian understood this and claimed the *Electro Universe* should be “killed immediately.” Consider what is being suggested. “Kill” it and do it “immediately.” Don’t give it time to be explored, to defend itself from criticism and critics. That rabid anti-Velikovskian knows what is at stake, his world view of Velikovsky. In this regard, we may soon (how soon I can’t say), come about that tests will be carried out in space, like the ones I have proposed that may cause the entire edifice of celestial mechanics to fall or be so massively amended that the Universe will be seen in what Wal Thornhill suggests a radiant new electromagnetic light. No matter how long this may take to commence, this knew scientific age, I say: “Let there be [electromagnetic] light.”
APPENDIX I: ANSWER TO CRITICS

Critics have raised certain questions and I have responded to them over time. The response to my counter arguments and evidence has been silence. Thus, I will enumerate these arguments.

The first to take up the gauntlet was the late astronomer, Earl Milton.¹ In the same journal and same issue I wrote:

“Milton’s major objection boils down to the contention that I have not faced up to Coulomb’s Law, which shows that electromagnetic repulsion is, at best, a feeble source on the planets in the solar system, when compared to gravity. The formula is devastating to the electromagnetic interactions that I propose. Nevertheless, there is evidence that the solar electromagnetic energy affects the Earth and bodies on it in spite of Coulomb’s Law . . .

“E. J., Saxl carried out many experiments with charged pendulums, one of these conducted during an eclipse of the Sun. Based on Coulomb’s Law, solar electromagnetism could not possibly affect the motion of these pendulums. But Saxl’s experiments verified apparent electromagnetic effects. Earlier in 1959, Maurice F. C. Allais had found that a paraconical pendulum changed its acceleration during an eclipse of the Sun. Later, Saxl and Allen repeated Allais’ experiment with a charged grounded torsion pendulum during an eclipse of the Sun. In these cases, the pendulums accelerated differently during the eclipses. The researchers all concluded that the pendulums had encountered a new field of energy, not gravity:

“Like Earl Milton, [even] these researchers could not accept the view [based on Coulomb’s Law] that electromagnetism from the Sun was the cause of the new acceleration, though the results clearly pointed to an electromagnetic interaction between the Sun and their pendulums. Thus, my question is: if Coulomb’s Law is applicable . . . the effects should not have occurred. What [other] force from the Sun produced these effects? I raised a similar point in KRONOS [Vol. XI, No. 3, pp. 93-94], and have never received an answer.

“To these considerations must be added the evidence of Danjon and by Gribbin and Plagueman indicating that the Earth’s rotation was slowed by strong solar flares and thereafter sped up again after these glitches. If Coulomb’s Law rules celestial motion, why did solar flares slow the Earth’s rotation? And since gravity could not speed up rotation afterwards, what did? From such anomalies as this, I have concluded that electromagnetic interactions between the Sun and the Earth can accelerate the rotation of the Earth. If I have not ‘faced up to’ Coulomb’s Law, it is because no one, so far as I know, has satisfactorily answered the glaring contribution between prevailing theory and observed fact.”²

This, then, brings me to dealing with one of the other electric models of the Universe that Milton follows. This concept has been employed to Wal Thornhill and David Talbott and followed by a great many others, namely, that stars are powered by external electromagnetic fields in space. In this respect, I pointed out:

“There are, indeed, fundamental differences between our hypotheses. One of the basic differences . . . is the source of the energy that is responsible for stellar

behavior. Milton’s [Thornhill’s etc.] source of energy is external to the stars—namely energetically charged space surrounding celestial bodies. Although I agree that space is charged, I espouse the view that its source is the cores of stars and other celestial bodies.

“From these disparate concepts there follows a second fundamental difference. According to Milton [Thornhill, etc.], stars do not age, but change from one type [of star] to another as they cross boundaries from one charged region of space to another, differently charged region; for example, a red star in the past can be a yellow star today, and a blue star in the future, as it moves from one region to another. I maintain that stars do age and that they begin their lives [on the main sequence] as blue stars, and as they lose energy, they become blue-white, white, yellow, orange and lastly, red stars, and that they age at different rates based on their masses. I further maintain that the colors of stars are indicators of their behavior. Thus, as stars age [and lose their electromagnetic repelling energy], they will tend to form clusters in the shape of a sphere. According to Milton’s [Thornhill’s etc.] hypothesis, as galaxies move from one region of charged space to another of different charge, they should also change color. For example, there are spherical clusters of galaxies occupying huge regions of space. These galaxies are ellipticals and are red in color. If a spiral galaxy should enter such a region, it, too, should [because the electric charge of space in that region creates red stars] should be composed of predominantly reds. If Milton’s [and Thornhill’s etc.] hypothesis is correct, the same type of galaxy in all parts of the universe should not exhibit somewhat different colorations and some should be completely different in coloration than nearly all others of its class. There are three main types of galaxies—spiral, elliptical and irregular. Wherever these same classes of galaxies are observed in the universe, they always have the same coloration. This evidence—one of my principle objection to [Milton and DeGrazia’s] Solaria Binaria [and to Wal Thornhill’s Electric Universe]—requires an explanation . . .”

No one to date has explained this problem that I had published in 1988. In globular clusters (balls made up of nearly all old red giant stars), one can also observe main sequence stars in that very same cluster that are not red but may be white, yellow or orange. That makes no sense. In galaxy clusters made up of elliptical galaxies that contain nearly all old red giant stars, one can observe spiral galaxies with blue, blue white, white, yellow, orange and red stars. That, too, makes no sense. Since both globular clusters and galaxy clusters are in a great sphere of space, then that space should be charged to about the same level throughout, and all the stars and galaxies in these regions should be receiving the same amount of electric energy and, therefore, should be about the same color, in these cases, red. They clearly are not. Perhaps Wal Thornhill, or any of the proponents of his Electric Universe theory, will explain this criticism away. With Electro-Gravitic theory, no such contradiction exists.

Another example is that found with binary stars. One star may be, say, a big white one, the other a smaller, a yellow one, and they can be relatively close to one another. As they exchange positions, each moving to near where the other was in their orbits, Shouldn’t they exchange color and size by being in the region that the partner inhabited? If, as Thornhill suggests, stars are powered by filaments of space electricity, when they exchange their positions in that filament the amount of power delivered to each should be equal to its partner. The smaller yellow star in the same region as the larger white one should receive more electricity and be powered up while the larger white one now in the region of the same region of the smaller yellow one should be powered

3 Ibid., pp. 20-21.
down. If, as Thornhill theorizes, their powers should be exchanged and they should periodically on each orbit be powered up and become larger and white or powered down and become smaller and yellow, what is his answer to this basic contradiction for this? There is no such phenomenon observed.

Another critic of Electro-Gravitic theory was Samuel Windsor who, like so many critics of Velikovsky, clearly did not read my work but criticized it nevertheless. As I wrote:

“He claims that my ‘theory would be more persuasive were [certain] discrepancies in logic not present.’ However, in criticizing my hypothesis for the explanation of the generation of electro-magnetic fields in celestial bodies, he is misinformed. He writes, for example: ‘If planet spin rate and orbit relative to the Sun causes an electromagnetic field [as Ginenthal offers] . . .’ The statement suggests that I claim that electromagnetic generation within planets and other celestial bodies is caused by rotation, size of orbit, or convection of material in the planet. This I have never claimed. Since a copy of my work [first] published in AEON I, issues 1, 2 and 3 was sent to [Windsor’s associate, Donald] Patten and presumably read by Windsor, I direct your attention to page 18 of AEON I:1, wherein I stated that, “production of electromagnetic energy from within celestial bodies is due to the amount of collapsed matter in each body and the degree of collapse of the matter . . . the assumption behind . . . [his] criticism is incorrect.”4

In this respect, Ratcliffe tells us, “It’s staggering (and somewhat comforting) to see how many simple patterns are endlessly repeated at every level in the universe. It’s as if there’s a style to creation, a distinct preference for . . . [certain forms]. Why? I don’t know, but it’s there . . . in the heavens above . . .”5 When I answered Windsor above, I did not mention that Electro-Gravitic theory explains these patterns for the production of electromagnetic energy in celestial bodies and that this is related to several patterns observed in the heavens above. The more massive the body, the greater is its internal magnetosphere. As I pointed out that going from the most massive, brightest stars on the main sequence to the least massive, least bright stars, their magnetospheres are directly related to their magnetospheres are directly related to their rotation, with the most massive having the most condensed matter at the greatest level of collapse at their cores and having the greatest spin rates and with the less massive ones having slower spin rates. Old red giant stars which have very little density have very tiny magnetic fields and little or no spin. White dwarf stars, immensely more dense than main sequence stars, have huge magnetospheres and rotate at tremendous speed, which pulsars at ever greater density rotate even faster. This is the pattern for all bodies in the Universe.6

And this pattern is directly related to several other phenomena of celestial bodies, as outlined in Electro-Gravitic Theory . . ., but which is completely without any clear pattern of behavior in the established theory of stellar evolution. As I pointed out:

“What the traditional theory suggests is that stars originate spinning rapidly, . . . from condensation of dust-gas clouds . . . the stars as they age, expand and slow their spin rates . . . Then they collapse into stupendously rapid rotating white dwarfs and pulsars . . . The theory also claims the stars are a typical size, but then become much larger in size, as red giants or supergiants, and then become extremely small in size. The theory claims the stars are brilliantly luminous at birth, then less so on the main sequence then . . . [they] novae or supernovae to become white dwarfs [or pulsars] that fade from blue white to red to black.

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“Every aspect of the traditional model is required to change first in one direction, then the other.”

There is no logical pattern in traditional stellar formation theory. But not a single parameter of these phenomena changes direction in Electro-Gravitic theory which I paraphrase again.

“We begin with a highly organized form, a dense lattice, a black hole that evolves to a pulsar, that evolves to a white dwarf, that evolves to a main sequence star, that evolves to a low density amorphous globe of gas, a red giant or supergiant red star. We begin with a highly massive body [a black hole that evolves to either a less massive pulsar or white dwarf star, that evolves to less massive main sequence stars, that evolve to less massive red giants or supergiants. We begin with a body with high energetic emissions that evolve to bodies with ever weaker energetic emissions to old red giants or supergiants giving off extremely weak emission.

Windsor also criticized me contending that the satellites of planets subject to the same electromagnetic fields should also rotate as do the planets. I respond that the satellites do not rotate because “The satellites of the planets closest to the primary will be under the influence of tidal force [strong gravitational pull from the planet that overcomes electromagnetic repulsion to spin].” That is, most of the satellites of planets are often hundreds of times less massive than the planet they orbit. Therefore, the gravitational pull of the planet will cause any bulge it has to lock onto the planet and not allow it to rotate. This is well-known.

All these phenomena jump together in Electro-Gravitic theory. The pattern is clear and direct and it follows the law of entropy, which Ratcliffe demanded.

There was another critic who challenged Electro-Gravitic theory and who I will answer here in depth. Neither he nor any of the scientists he contacted ever responded to the facts I raised regarding electromagnetic interactions between celestial bodies that exhibit a clear and direct pattern of behavior in their celestial motions. The critic, C. Leroy Ellenberger, claimed that the Earth’s rotation does not change seasonally as it is further or nearer to the Sun. In my response, I stated:

“The fact of the matter is that the rotation of the Earth does change seasonally, and this change repeats itself from year to year. Just after perihelion [when the Earth is closest to the Sun], the Earth rotates slowest, and after aphelion [when it is farthest from the Sun], fastest by .001 second. (See McGraw Hill Encyclopedia of Science and Technology, 1982, Vol. 4, p. 35.) Though this variation is small, it is not explained by gravitation.”

While this may be explained by assuming that, since the Earth is closer to the Sun the day must be longer, there is clear evidence that electromagnetism affects the Earth’s rotation. This is well outlined in Volume IV of Pillars of the Past, page 540, where in 1981, D. Djurovic’s “Solar Activity and Earth Rotation,” Astron Astrophys, Vol. 100, pp. 156-158, showed a correlation of the Earth’s rotation with well-known solar sunspot variation periods of 0.5, 3.3, 6.6 and 11 years. In 1982, F. Carter et al., “A Comparative Spectral Analysis of the Earth’s Rotation and Solar

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7 Ibid., p. 124.
8 Ibid., paraphrased and enlarged.
11 Ibid., pp. 105-106.
Activity,” Astron Astrophys, Vol. 114, pp. 388-389 measured solar activity and emphasized a possible relationship with the Earth’s seasonal rotation. In 1983, D. Djurovic, “Short-Period Geomagnetic Atmosphere and Earth Rotation Variations,” Astron Astrophys, Vol. 118, No. 1, pp. 26-28, studied 3 and 4 month rotational periods of the Earth and solar activity and showed that there is a correlation of georotation with solar behavior for these short periods. It is well-known that the Sun oscillates up and down some ten kilometers periodically every 160.1 minutes. G. P. Pil'nik, in “Multiple Waves in the Earth’s Diurnal Rotation,” in Soviet Astronomy, Vol. 28, No. 1, pp. 112-114, showed that this solar oscillation of 160.01 mins. was reflected in changes in the rotation of the Earth in 159.56 mins. All this I presented in 1995 in Carl Sagan and Immanuel Velikovsky, (Tempe AZ), p. 148. Neither Sagan nor anyone else has answered.

Because the Earth’s rotation varies, based on electromagnetic effects, the position of the Moon during eclipses must also vary and it does. Velikovsky, in his debate with John Q. Stewart:

“... quoted Simon Newcomb, the great American mathematical astronomer on this very problem of lunar motion as checked by ancient eclipses:

“'I regard these fluctuations as the most enigmatic phenomenon present by celestial motions, being so difficult to account for by the action of any known causes, that we cannot but suspect them to arise from some action in nature hitherto unknown . . . It would be natural to associate them with the Sun’s varying magnetic activity and the varying magnetism of the Earth.'”14

When the Earth is closest to the Sun, the amount of the solar electric current (the Birkland Current) is stronger and slows the Earth’s rotation. As Ralph Juergens showed, solar flares directed at the Earth slow its rotation.15 When the Earth is farthest from the Sun, the amount of the solar electric current is weaker and slows the Earth least. This pattern is unmistakable. But I went on to show:

“A more substantial change occurs in the orbit of the much larger planet, Jupiter, as indicated in the following article titled “Query Newton’s Theory,” appearing in the Science Newsletter, Vol. 75 (1959), p. 291.

“'Jupiter sometimes appears to be ahead where it should be sometimes behind. The difference changes regularly with time through a complete cycle once every 12.4 years. The magnitude of the effect is small. Jupiter never gets out of placed in its orbit by more than 600 miles . . . The cycle in which Jupiter departs from its predicted position has repeated every 12.4 years for the past 160 years. This is slightly longer than 11.9 years required for Jupiter to revolve around the Sun. Since the two time periods are nearly equal, the error may be considered due to a steady but gradual change in the shape and orientation of Jupiter’s orbit. However, there is at present no known reason for such a gradual change to occur.’”16

With respect to the circularization of orbits is a short period of time, I wrote:

“Ellenberger has stated, : ... nothing known to science even hints at the effect Velikovsky needs [to circularize orbits] (KRONOS X:3, p. 13) . . . Here, then, is the 'hint' Ellenberger has missed respecting the rapid circularization of orbits required by Velikovsky’s scenarios.

“Since the same principle would apply to the orbit of stars, it is significant that configuration of orbits is the one consistent factor distinguishing young binary

14 Velikovsky, Stargazers & Gravediggers, op. cit., p. 217.
16 Ibid., p. 116.
systems from older systems. As reported by Ivars Peterson (Science News, Oct. 29 '88, p. 281):

"'Within a million or so years after their birth, young binary systems appear almost indistinguishable from their mature brethren. The only systematic difference noted so far is in the shape of certain orbits.'

"'When young stars have a period of less than four days, their orbits are circular. Binaries with longer periods . . . are highly elliptical . . . In old binary systems, the dividing line between circular and eccentric orbits is roughly 10 day.' . . . (Emphasis added)

"When a new system of binaries is born in which both stars orbit each other in from 5-9 days, the orbits of the two stars will strongly tend to be elliptical; however, by the time the stars have aged onto the main sequence, the orbits of both stars will become highly circular. Once a binary system is formed, it will stay together through the eons. Yet every newborn binary system, like the one just described, will inexplicably change its orbit from an elliptical to a circular one. Moreover, stars larger than the Sun do this in a few thousand years (See G. O. Abell, Realm of the Universe, p. 376) within the strictly gravitational framework Ellenberger has espoused, this demonstrable situation must appear as an absurdity."17

Here we have stars going from elliptical orbits to circular ones in a FEW THOUSAND YEARS, JUST AS VELIKOVSKY’S THEORY DEMANDS. If stars can be circularized in a few thousand years, of course it strongly implies that planets can also go from elliptical orbits to circular ones in the same period. I left a specific number of questions that required answers namely:

1. Why does the Earth’s rotation periodically and systematically slow down, then speed up with each orbit of the Sun?

2. If the Sun is not charged, why does it send a current to the Earth along magnetic lines?

3. Why did the motion of Saxl’s charged pendulums vary from that of uncharged or grounded pendulums and show seasonal effects comparable to the changes in the Earth’s rotation?

4. If magnetism is so inconsequential an influence on magnetic stars, why do highly magnetic Ap stars and weakly magnetic Am stars behave so differently with respect to the evolution of binary systems?

5. If only one force-gravity effects the motions of stars, why do billions of stars [in the Milky Way] change their orbits from elliptical to highly circular ones in only a few thousand years, as they age from newborn to main sequence stars?"18

Ellenberger, to his credit, did respond, but what he offered exposed to deep poverty of his knowledge and research. In the same issue of AEON, Vol. II, No. 2, I responded in a full answer to his criticism, which will now be presented. But before doing so, I must point out Ellenberger in a review of my book, Carl Sagan & Immanuel Velikovsky, called me “clueless” and writes, “At pp. 143-347 the work of André Danjon and Edwin Saxl, respectively is discussed . . . Ginenthal ignores my article, “Saxl’s Pendulum” in AEON, II.2, 1990 in which it was explained . . .” What Ellenberger failed to tell his readers is that I dealt with Saxl’s work that Ellenberger presented in the same issue.

Here, then, on the following pages, is my response to his criticism which he did not tell his readers existed. In a word, Ellenberger has become a propagandist.

17 Ibid., pp. 117-118.
18 Ibid., p. 118.
1. THE CIRCULARIZATION OF ORBIT

C. Leroy Ellenberger’s reply to my earlier response to him exhibits a good deal of heat but very little light with respect to the evidence. The anti-philologistic remedy—the evidence—strongly contradicts his arguments, and in many instances was readily available to him had he only taken the time to consider more closely and prudently the issues that he raises.

Ellenberger claims that I do not understand Velikovsky’s prediction, or advance claim that the Earth’s geomagnetic field will be found to reach far into space while retaining its strength. This is a simple matter. All that Ellenberger had to do in order to understand the thrust of my argument was to read the sentence he cites in the context of the paragraph in which it is placed. That paragraph clearly discusses the relationship between the bow shock of the Sun’s magnetic field and that of the Earth with which it interacts. In fact, I prefaced my statement regarding Velikovsky’s prediction with the following question: “Will a small ball of iron in space of that magnetic strength [i.e., 0.3 gauss] produce a field extending away from itself thousands of miles?” I cannot see how I could have expressed the nature of Velikovsky’s claim more plainly—that, at great distance from its origin, the Earth’s magnetic field remains powerful enough to produce a bow shock against that of the Sun’s, with the Van Allen Belts doing the same against the solar wind. This clearly explains my statement, and Ellenberger would have understood it if only he had cared to do so. Meanwhile the question remains unanswered: Will a small 0.3 gauss iron ball in space generate a magnetic field, producing the phenomena associated with the Earth’s magnetosphere, extending away from itself for thousands of miles? This point Ellenberger chose to ignore.

The answer to the above question relates to Ellenberger’s accusation that I drew the wrong assumption concerning his statement that “nothing known to science ever hints at the effect Velikovsky needs.” Needless to say, he was alluding to Velikovsky’s concept re the propagation of magnetic fields in space. Nevertheless, this concept is not unrelated to Velikovsky’s theory of the Solar System, particularly with respect to major changes in the orbital parameters of proto-planet Venus. Although I have taken the concept out of the narrow arena in which Ellenberger raised the issue, the question remains germane and thus requires an answer. If billions of binary stars change their orbits from elliptical to circular in only a few thousand years, then it may also be possible for proto-planet Venus to have done the same.

In order to dismiss the question concerning why these binary star orbital changes occur, Ellenberger offers the concept of “subtle changes.” This simply will not do. Ivars Peterson cites an astronomer who remarked that such large and rapid changes in the orbits of binary stars is “telling us something about the evolution of orbits” and that “something has to be making that happen.” All The “subtle changes” that Ellenberger invokes have apparently already been taken into consideration and found wanting. Is that not why this orbital phenomenon has appeared so enigmatic to astronomers? The subtle effects concerning this phenomenon are indeed treated in the literature. But the question of why stellar binary orbits change is still unanswered.

F. H. Shu and S. H. Lubow state:

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19 See pp. 57 ff., this issue.
“We see therefore that despite considerable progress in the past two decades on the problem of circularization and synchronization of close binary stars difficulties still remain. In this regard, we note that the subject of tidal evolution retains appreciable uncertainty.”

The problem becomes exacerbated because tidal forces can be calculated and circularization of orbits should not only occur in stars with period of less than 10 days but also in all binaries with orbital periods of less than 100 days. In discussing binary stars with periods of 10 to 100 days, Helmut Abt states that: “... the change in the distribution [of close and distant binaries] cannot be explained simply by taking away half of the eccentric orbits, but must also involve a decrease of eccentricities among all binaries. This is consistent with the well-known fact ... that the binaries with the shortest permitted periods tend to have nearly circular orbits.”

Thus, for short period binary stars, the problem of circularization is far from solved. Ellenberger’s “subtle changes” should greatly circularize the orbits of all these binary stars but, for some inexplicable reason, they do not. Furthermore, according to Abt, when binary stars with periods of less than 100 days reach the red giant stage, having meanwhile lost most of their electromagnetic energy, “the periods and other orbital elements will change.” This, again, supports the electromagnetic concept we have proposed.

As for James Warwick’s calculation of gravity vs. magnetism with respect to magnetic stars, Ellenberger once again calls upon these same “subtle effects” to explain the fact that highly magnetic Ap type stars tend to be overwhelmingly single while the weakly magnetic Am type stars tend to be almost 100 percent spectroscopic binaries.

There are only three models that explain how binary systems form: The capture model; the fissioning of stars into two or, more rarely, three; and the birth of stars in orbital proximity to each other. If magnetism was such an inconsequential force, then all of the “subtle effects” would come into play and the nature of the distribution of the types of binaries found among other main sequence stars would also be found with the Ap and Am types. In other words, main sequence stars have a distribution of binary types in which they have close and also distant partners as well as single stars all of the same type. There is no explanation for the Ap-Am phenomenon except that large magnetic fields are responsible for Ap behavior, with smaller magnetic fields being held responsible for the Am behavior. In fact, M. Floquet has already come to the conclusion that “The magnetic fields seem to play an important role in the relation between binarity and the Ap phenomenon.” It thus seems that at least one scientist is willing to look at the facts without being afraid to note where they might lead.

In the meantime, what are Ellenberger’s “subtle changes” concerning the rapid orbital change of binary stars from elliptical to circular and the difference in binary distribution between Ap and Am stars? He does not explain how these “subtle changes” operate with respect to these conditions, nor does he cite a single source concerning these phenomena in support of his accusations. He has not answered the questions put to him, nor squarely faced the facts In essence, he has explained nothing concerning these matters.

2. ELECTROMAGNETIC FIELDS

Ellenberger has further requested that I produce a calculation to prove that electromagnetism is responsible for the binary distribution of Ap type stars. Warwick has already attempted this calculation but his results, indicating that electromagnetism cannot be responsible for binary distribution, are not supported by what is actually perceived. How can the calculation be correct when its results are contrary to the facts? A theoretical calculation is of no value unless it is backed up by observation. Wallace and Karen Tucker allude to such thinking as “flipping the usual procedure of the scientific method on its head. Instead of using observations to support a theory, they are using a theory to say what the observations must be.”

In his footnote, Ellenberger states that “contrary to Ginenthal, magnetic fields have not been detected on A stars whose ‘m’ stands not for ‘magnetic’ but for ‘metallic.’”

It should be pointed out that nowhere in my writings have I ever suggested that the “m” in “Am stars” stands for “magnetic.” This is Ellenberger’s own straw man, set up to be knocked down.

Now let us look at the statement offered by H. A. Abt: “Observations have shown the Ap stars possess magnetic fields of several thousand gauss averaged over the surface, while the Am stars have fields of several hundred gauss averaged over the surface.” In my previous discussion of Ap and Am stars, I cited a work edited by R. C. Cameron as one of my sources. That work offers a list of 91 magnetic stars made up primarily of the

Ap type but also containing a few Am stars as well. This list includes some Am type stars with magnetic fields. Star #11 is an Am type with a field of -260 gauss. Star #19 is an Am type with magnetic fields of -420 and +375 gauss. Star #27 is an Am type with a +570 gauss field. Star #47 is an Am type with a +500 gauss field. Star #61 is an Am type with a -500 field. It is this source that led me to some of the statements I made about Am stars. This information was reported as confirmed by respected astronomers in a reputable publication. By contrast, the Ap stars in the above mentioned list show even larger magnetic fields.

Ellenberger now informs me that, according to Wolff, “magnetic fields have not been detected in Am stars.” Wolff herself cites others who have re-examined these stars and who have failed to confirm the readings originally published. In a personal communiqué, however, Wolff has admitted that whether or not Am stars possess magnetic fields cannot be ascertained by present methods of measurements. I would hardly think that this constitutes actual proof that Am stars lack relatively strong magnetic fields. One of the obstacles in all this concerns the actual difficulty in detecting stellar magnetic fields in the first place. Elsewhere, Wolff writes:

Unfortunately, other effects such as stellar rotation and turbulence—random motions of the gas in the stellar atmosphere—may broaden spectral lines by more than the splitting produced by the magnetic field. In this case, the individual Zeeman components overlap one another and cannot be seen or measured as distinct lines. For this reason, magnetic

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fields can be measured only in those stars with unusually large magnetic fields or small rotation and turbulence.

Detecting stellar magnetic fields can be extremely difficult …

With modern techniques, the smallest magnetic field that can be measured in stars is 20 to 50 times larger than the magnetic field that the Sun would appear to have if it could be viewed only in the same way that stars are observed. Given this limitation, it is perhaps surprising that any stellar magnetic fields have been found at all …\(^{32}\)

One of the differences between Ap and Am stars is that nearly all Ams occur in close relationship to companion stars while, according to Wolff, only 3 Ap stars are known to have orbital periods of less than 8 days. Close binaries would, of course, have a great deal of surface turbulence which would make their fields more difficult to detect.

One must also keep in mind that the Sun goes through a 11-year magnetic cycle and that such cycles tend to amplify the appearance of the Sun’s magnetic field only during certain times because there are many more magnetic sunspots that can be observed. It is therefore reasonable to conclude from this that other stars have similar magnetic cycles at which times their magnetic fields would have a greater chance of being detected. These fields may well have been observed but it would require a precise knowledge of their magnetic cycles for them to be observed again and thus have the phenomenon confirmed.

Am stars are given the “m” designation because, like all “Peculiar” stars, they have an abundance of unusual elements, not found in other stars, indicated in their spectra. It has proven extremely difficult to account for these peculiar abundances. In 1971, O. Havnes and P. S. Conti accounted for these elements by suggesting that their strong surface magnetic fields can serve to accrete them. As they wrote:

It is suggested that these [A type peculiar] stars have selectively captured atoms from the interstellar medium by its interaction with the rotating stellar field. Atoms which approach the vicinity of the star are mainly ionized. The light [weight] ions are deflected by the magnetic field while the heavier ions penetrate deeper into the field and come closer to the star. During this approach a further ionization can take place whence the ions may be captured by the magnetic field. Being captured, these ions go into quasi-periodic orbits where they spiral along the magnetic field lines.

The ions are reflected near the magnetic poles due to a mirror effect. A diffusion mechanism gradually transfers the ions from the magnetic field to the stellar surface around the magnetic poles. Our model successfully predicts the great enhancement of the rare Earth, the moderate enhancement of the iron group and silicon, and the deficiencies of helium and oxygen observed in magnetic stars. The concentration of the rare Earth elements to the magnetic poles follows naturally.\(^{33}\)

It thus appears that the surface abundances of “Peculiar” stars are very well explained by their having high surface magnetism. In fact, on the very same page of Wolff’s book that Ellenberger cites, Wolff herself acknowledges that “strong surface magnetic fields are


an obvious mechanism for producing preferential accretion of specific elements.” Hence there is indirect evidence that these stars possess relatively strong surface fields.

Does this evidence refute Electro-Gravitic theory? Not at all. For example, there is one type of Ap star for which more than half have shown no detectable magnetic field. Yet E. F. Borra, et al., state that “surprisingly, more than half the helium-weak stars observed by Landstreet and Borra (1982) are not detectably magnetic even after several observations, and thus have fields of no more than 3–500 G [gauss].”34 This is what I have claimed for A stars.

In fact there is another type of Ap star—the Ap (Hg, Mn) class—for which no magnetic fields have been detected.35 It must, however, also follow that the magnetic field of the Ap (Ht, Mn) should be smaller than the fields of the highly magnetic Ap type stars. Hence, like the Am stars, they should form many more short period binaries. In this respect, George Preston has stated that “Am and [Ap] Hg, Mn stars, rather than the magnetic CP2 [i.e., chemically peculiar] stars are preferentially formed in short period binaries.”36

It is on the specifics of stellar behavior that the Electro-Gravitic theory ultimately rests. Neither the behavior of these Ap (Hg, Mn) or CP2, nor of the Am types, in any way contradicts the theory. In fact in 1984—one year after Wolff’s publication—P. Didelon stated that, “Severny found a field of 55± 5 gauss in ∞CMa, which is a marginal Am star.” In addition, the classical Am stars 68 Tau (HD 27962) and 15 Vul (HD 189849) seem to be “weakly magnetic stars”.37 On page 73 Didelon list 3 Am stars with possible magnetic fields of -400, -580, and -230 gauss.

All this evidence relates to the fact that the celestial bodies with the strongest magnetic fields—the Ap stars, pulsars, and white dwarfs—also tend to be strongly single or have distant partners when in binary systems. This pattern of high magnetism with singularity is not discussed by Ellenberger. To deal with this phenomenon, he would have to deal with the theory on its own terms. All that is required to falsify the Electro-Gravitic theory is one celestial body behaving contrarily to what the theory demands. If the theory is fundamentally wrong, there should be innumerable celestial bodies that would deny its validity. That, for over a year, no one has been able to point to one such body lends support to the concept proposed.

3. SAXL’S PENDULUM EXPERIMENTS

In order to dismiss the Electro-Gravitic concept and its reliance on pendulum experiments, Ellenberger claims that, using the short and the long version, he can discredit E. J. Saxl’s experiments. Here I claim that Ellenberger’s statements have little merit because he paid not the slightest attention to either his own sources or to mine. True, he cites Saxl’s paper in Nature and that of Saxl and Allen in Physical Science.38 But Ellenberger ignored the evidence I presented concerning solar eclipses in my response to

Earl Milton. In the body of my remarks, as well as the footnotes I supplied, I also cited the additional comments of Maurice Allais. Ellenberger ignored Allais’s papers and concentrated his arguments on the first of Saxl’s experiments—that reported in Nature (1964). By ignoring the data presented in the later Saxl and Allen work as well as that of Allais, he was able to give the impression he had strongly refuted the evidence when, in reality, he has barely dealt with it. Since he did refer to Saxl’s and Allen’s 1971 work, why did he not also refer to that of Allais? This is asked especially in view of the fact that, in part, Saxl and Allen conducted their experiment in order to check Allais’s work and specifically cite Allais in the body, conclusion, and footnotes of their paper.

Ellenberger states that: “Despite its name, a torsion pendulum is not a pendulum.” In the work he cites we are told that, in experiments that tested gravity, the “detector is almost always a torsion balance.” Hence it seems to be the apparatus that most scientists in this field find well suited to test gravity. Because of this, coupled with geoelectric and atmospheric effects, we are told by Ellenberger that “no credence can be placed in the idea that Saxl’s experiments represent a valid challenge to Newtonian gravity.”

Allais’s apparatus, however, was not a torsion pendulum; it was a ball pendulum—i.e., a real “pendulum, suspended on a ball and resting on an anisotropic support.” It was swung back and forth, up and down, over a period of 14 minutes, then started again during a 27 day period. It was thus a pendulum clearly designed to test gravity. Additionally—and please note—Allais’s pendulum was not electrically charged. The several electrical effects that Ellenberger invokes, therefore, pertain to its motion only if these effects influenced the pendulum gravitationally. In discussing the difference between Saxl’s pendulum and “conventional Kater-type pendulums,” Ellenberger notes: “This distinction is important because these other instruments are designed specifically to measure g and Saxl’s pendulum is not.” If Allais’s pendulum, which measures gravity, is “important” to Ellenberger and should be taken into account, why did he then fail to report it and its results?

Allais’s paraconical pendulum measured the effects of the total solar eclipse of June 30, 1954. It produced the very same results that Saxl and Allen found for their pendulum re the solar eclipse of 1970 as reported in their 1971 paper. In both experiments, the greatest changes in the motions of the pendulums occurred between the onset and the midpoint of the eclipse. Since both results were the same, it is quite clear they were measuring the same force that affects a body in motion or, more aptly, the motion of a body, because Allais’s pendulum abruptly changed the plain of its oscillation not just its amplitude.

There were other diurnal periodic motions discovered by Allais’s pendulum—a 24 and 25 hour periodic variation—which was also detected by Saxl’s and Allen’s apparatus. As Allais specifically states: “These periodic components cannot be identified with those due to gravitational effect of the Moon and Sun, such as they may be computed from the double principle of inertia and the universal [gravitational] attraction, for those are approximately one hundred million times smaller.” Allais also recorded these same results with his pendulum when it was operated 57 meters (about 188 feet) underground. Saxl and Allen found a similar effect on their pendulum two weeks after the eclipse when the Moon was

42 M. F. C. Allais (Oct. 1959), Ref. #22, p. 54.
on the opposite side of the Earth. The gravitational effect of the Moon on the pendulum’s motion was calculated and found to be 100,000 times too weak to produce such results. When the Moon was on the antisolar side of the Earth, it could not affect the ionosphere in the same way as during an eclipse; nor could surface electricity affect Allais’s pendulum 188 feet underground. Allais succinctly states that the behavior of his pendulum cannot “be considered as produced by an indirect influence of known factors (temperature, pressure, magnetism, etc.).” Although, because of its nature, Saxl’s and Allen’s torsion pendulum will not measure terrestrial gravitational effects, it is nevertheless an excellent type of pendulum for measuring effects from the Sun and Moon. The reason for this is that while the pendulum is always at nearly the same distance from the center of the Earth, the orbital distance of the Earth and Moon constantly changes, on a seasonal basis, with respect to the Sun. Electromagnetic fields emanating from these bodies can interact with geoelectric and geomagnetic fields and also with the fields of the charged and/or unchanged pendulum. If this is so, then these effects should originate in the Sun and show a clear correlation with solar activity. The Earth possesses an electric current called the fair weather electric field. It exhibits a double diurnal periodicity that was closely followed and correlated with the two types of pendulum’s diurnal motions.

Solar activity with diurnal variations of the Earth’s currents. The amplitude increase as activity on the Sun measured by sunspot number increases … There are seasonal changes in this diurnal variation and also closely correlated with sunspot number.45

What is clear is that, in very large measure, solar activity controls the action of the geoelectric field. A seasonal variation that tends to repeat itself over the years is therefore also controlled by the varying distance and position of the Earth to the Sun.

What then of the ionosphere and geomagnetic field? As we are informed:

Short-time fluctuation in the Earth’s magnetic field (micropulsations) that fall within the approximate period range of 0.2-600 seconds per cycle … occur almost continuously as a background noise. Amplitudes depend on latitude, solar activity, frequency, local time, [and] season.46

And:

While the mechanism of their generation is not completely understood it appears that micropulsations are generated by the magnetohydrodynamic effect through the interaction of the solar wind with the main [geo]magnetic field and atmosphere of the Earth …47

We are also informed that:

The ionosphere shows important geographic and temporal variations; the latter include regular diurnal, seasonal and sunspot-cycle components and irregular day-to-day components associated mainly with variations in solar activity and atmospheric motion.48

46 Ibid., Vol. 6 (1982), p. 174. (Emphasis added)
47 Ibid.
It thus seems clear that solar activity is, in great measure, responsible for variations in the geoelectric and geomagnetic fields and the ionization of the Earth’s atmosphere.

Now Ellenberger states that “change in the pendulum’s period closely parallels the changes in the rate of ionization during an eclipse.” And also: “The Earth’s fair weather electric field is known to vary daily and seasonally as does the reported performance of Saxl’s pendulum.” However, all these changes are correlated with solar activity. Therefore, when Ellenberger concludes that “Saxl’s result are best explained in terms of the vagaries of atmospheric electricity,” he has completely ignored the role played by solar activity. Saxl’s and Allen’s, as also Allais’s, pendulums were really responding to changes on the Sun that initiated these electric and magnetic changes on the Earth. Instead of negating the influence of the Sun’s electromagnetic field in affecting pendulum motion on the Earth, the evidence thoroughly supports this concept. The question is: Do these changes correlate with changes in the Earth’s rotation?

4. SPACE SHEATHS AND LIGHTNING DISCHARGES

Ellenberger also appeals to the evidence of space sheaths to show that the Sun’s electrical field could not affect that of the Earth. But we have presented evidence that when there is increased sunspot activity, the Earth’s electric field increases. The cause of this behavior is not yet completely understood but the changes we have suggested concerning solar activity and its influence on the Earth are clearly demonstrated by the fact that increased solar electricity transmitted to the Earth results in increased geoelectric currents. During periods when the Sun generates large solar flares that transmit more solar electricity to the Earth than normal, there occur all kinds of electrical phenomena which cause radios and teletype machines to go haywire and even light bulbs to flicker. Although no one fully understands how the Sun’s electric field accomplishes this, it is known that the sun’s electricity does penetrate into the Earth’s atmosphere.

Since charged bodies in space would be shielded from each other by the formation of space sheaths, Ellenberger wishes to know how solar electricity could penetrate the magnetic sheath boundary to enter the geomagnetosphere. On this subject, Hannes Alfven has written:

Theoretical and experimental evidence indicates that the usual magnetospheric models may need essential modification. Theoretically it has been concluded that the low-density magnetospheric plasma, in contrast to an ideal magnetofluid, may support strong electric fields even along the magnetic field lines. This can profoundly influence the penetration of interplanetary plasma. Laboratory experiments show that a plasma can penetrate much close to a terrella [magnetized ball] than what would correspond to the magnetosphere boundary in closed magnetosphere models.49

This evidence is supported by recent in situ measurements at the magnetospheric boundary itself. B. Hultqvist, et al., state that “New observational results obtained by means of PROGNOZ-7 in the dayside boundary layer of the Earth’s magnetosphere” indicate that “magnetosheath plasma elements penetrate into the boundary where they act

as generators of an electric field.” It thus seems clear that solar electricity does penetrate the geomagnetosphere from where it can be conducted to the surface of the Earth.

Ellenberger also assumes that the amount of electricity found in the Earth is much too low to induce the effects postulated by the Electro-Gravitic theory. Martin Uman informs us that “The total negative charge on the Earth is … of the order $10^6$ C.”

The point that must be emphasized is that one million coulomb charge found in the Earth does not cause the Earth to rotate. It is the sun’s magnetic field, impinging on that of the Earth, as based on theory, that causes the rotation of the Earth. The charge in the Earth determines, at its varying distance from the Sun, how much electrical charge maybe conducted to the surface of the Earth. All that needs to be accomplished is to show that this occurs and that the rotation of the Earth correlates with this electrical interaction.

An idea of how much voltage is conducted to the Earth can be determined through the study of lightening. Although it is thought that lightning is an electrical discharge to the Earth from the clouds, it is actually a discharge from the Earth to the Clouds. The average voltage of a lightning bolt is about 10,000 volts but higher discharges of up to 250 million volts have been measured.

Lightning occurs throughout the world, and it is estimated that 1800 storms producing 100 flashes per second are in progress at any given moment. On a per day basis the Earth experiences 44,000 thunderstorms which produce over 8,000,000 lightning flashes.

One hundred flashes per second at 10,000 volts per discharge is equivalent to 1,000,000 volts discharged every second of every day. A large percent of these discharges are from the Earth to the clouds.

Kendrick Frazier gives a clear exposition of the charging and discharging of the Earth. “The basic idea,” he informs us, “leads all the way back to the prominent Scottish Physicist C. T. R. Wilson.” Five years after he perfected his cloud chamber which is used for the tracking of nuclear particles, and for which he won the Nobel Price, “Wilson proposed the existence of a global atmospheric circuit.”

The idea is this. The earth’s atmosphere lies between two electrical conducting plates. The bottom plate is the solid surface of the earth, which readily conducts electrical current. The top plate is the ionosphere, the layer in the atmosphere beginning about 70 kilometers (40 miles) up, where significant quantities of the atoms have become ionized, converted into electrically charged particles. The ionization is caused by interactions of both cosmic rays from outside our solar system and ultraviolet radiation from the sun on the atoms in the atmosphere. The result is that this entire shell of the atmosphere can conduct electricity.

Thus Wilson realized that a global electric current, which is not sometimes referred to as the Wilson circuit, must exist. Current flows upward from thunderstorms to the ionosphere, across the shell of which it travels horizontally. The current returns to Earth through pockets of fair weather, flows along the Earth’s surface and up again to

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55 Ibid.
thunderstorms. According to Frazier, it is now generally agreed that it is the thunderstorms which provide “the answer.”

The sum total of the thunderstorms in progress on earth is the electrical generator that supplies current to this circuit. The thunderstorms maintain the earth’s electric field. If thunderstorm activity were for some reason to stop all over the world, the earth’s electric field would fall to near zero in less than an hour. This is an unlikely happenstance. A common estimate is that there are from fifteen hundred to three thousand thunderstorms in progress on the planet at any given moment.

One of the first clues to this global circuit was recognized more than fifty years ago. It was then noticed that the daily variation in the intensity of the fair-weather electric field is not tied to local, but to universal, time. It was thus apparent that this variation was not induced by local causes but by some common mechanism that acted almost simultaneously to affect the electric field and current all over the world. The belief that thunderstorms were the source of this current received further support when it was discovered that global current variation correlated with afternoon and evening thunderstorms over the continents. A readily identifiable pattern emerged that tied these variations to the irregular distribution of the continents as they rotated with the Earth in and out of the susceptible time for afternoon and evening thunderstorms.

Then in 1950 scientists used aircraft to fly directly over the tops of thunderstorms and survey the electric current. They found a positive current averaging a little more than half an amp flowing upward in the clear air above the storms. This has been confirmed many times subsequently …

How is all this related to the Sun? Reinhold Reiter and William Cobb have demonstrated that, within one day following solar flares, there is a rapid increase in the global circuit current. Ralph Markson has speculated that this is due to “energetic charged particles” emitted by the flares. It is these particles that “directly ionize the atmosphere.”

The above speculation was confirmed by Bruce Edgar of the Aerospace Corporation. Mapping and counting the distribution and number of lightning strokes as observed from space through satellite photographs, he was able to deduce that “solar flares do increase thunderstorm activity, particularly if multiple flares are involved.” There thus appears to be a correlation that strongly indicates that electricity from the Sun travels to the Earth and plays a major role in the emplacement of charge on the planet.

5. CHARGE, DISCHARGE, AND THE EARTH’S ROTATION

At this point it seems only proper to quote Ralph Juergens who stated:

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56 Ibid.
57 Ibid.
59 Ibid.
60 Ibid. (Emphasis added)
It is interesting … to note that Booker, in a straightforward work on the fundamentals of electrical science, stresses the fact that electric charge placed on a rotating flywheel increases its polar amount of inertia. The presumption, of course, is that the charge is that the charge is converted as the flywheel rotates and thus constitutes an electric current. It follows that electric charge added to the earth and convected by is rotation must increase the planet’s polar moment of inertia.

Now should this happen—should appreciable, unaccustomed charge emplaced on the Earth, other conditions aside—the law of conservation of angular momentum must come into play. The increase in polar momentum of inertia must be accompanied by a decrease in angular velocity of rotation, such that the product of the two remains constant; this is what the law says. Increase the Earth’s electrical charge, and the length of its day must also increase.62

Juergens also stated that any excess charge acquired by the Earth “during an extraordinary event”—such as a large solar flare—will “presumably” dissipate “into the environment” in a very short time following the event. “Grounded” to the “interplanetary medium,” the Earth must “almost immediately” begin to shed its excess charge. Its spin rate must then increase.63

This was precisely what transpired, as reported by Danjon, in 1960, as also by Plagemann and Gribbin, in 1972. Large solar flares aimed at the Earth temporarily slowed its rotation. And this correlates precisely with what is described above.

Let us now recall that solar activity is correlated with diurnal variations of the Earth’s currents and that the amplitude increases as solar activity increases. When sunspot activity is greater than usual, the electrically charged surface environment increases. Although the fair weather electric field increases, does it discharge as much of this charge? Apparently not. The Earth holds a larger charge during sunspot maximum. As explained by Frazier:

The second [electric solar] effect is long-term. It involves the obstruction effect on galactic cosmic rays by the solar wind. Remember that the upper atmosphere is conductive primarily due to ionization by this galactic cosmic radiation—high energy particles from deep space travelling near the speed of light. At times of especially strong solar wind, the abundance of cosmic-ray particles reaching earth’s atmosphere diminishes and the atmosphere becomes slightly less conductive.64

Ralph Markson of MIT has carefully analyzed solar wind data, obtained from a series of satellites, as well as the electrical potential in the upper atmosphere, through the use of aircraft. His estimate of the variation in the ionosphere’s potential was derived “from 120 such soundings.”65

The result of these comparisons? Clear confirmation of the solar wind effect in reducing the electrification of the atmosphere. The electric potential in the ionosphere had a variation of about one third above and below the average. When solar wind velocity was high, the voltage in the ionosphere was low. When solar wind velocity was low, the voltage in the ionosphere was high. These changes could be seen from one day to the next. The

63 Ibid.
65 Ibid.
same inverse correlation was seen between values of solar wind and the flow of cosmic
rays reaching the Earth. The high-velocity solar wind apparently does reduce the current
in the atmosphere by lessening the amount of ionization from cosmic rays.

Long-term measurements of a similar nature were conducted by D. E. Olson of the
University of Minnesota through the utilization of high-flying balloons from 1966 to 1977.
The more than 30 “soundings” that were derived through this method indicated that the
maximum values of atmospheric current coincide with the minimum of the sunspot cycle,
while the minimum current coincides with the sunspot maximum.66

There thus seems to be a “value” which determines how much electric charge can leave
the surface of the Earth during this long-term solar cycle. The electric charge emplaced on
the Earth’s surface, which is at a higher amplitude during sunspot maximum, cannot be
efficiently discharged because, at this time, the electric potential of the atmosphere is
reduced. The charge on the Earth therefore increases. Conversely, the electric charge
emplaced on the Earth’s surface which is at lower amplitude during sunspot minimum can
be discharged more efficiently because, at this time, the electric potential of the atmosphere
is increased and the electric charge on the Earth decreases. All that remains to be shown
is that this charging and discharging is correlated with the Earth’s rotation—to which we
shall now turn our attention.

In order to dispute that the interaction of the terrestrial and solar electromagnetic
fields are in conformity with Electro-Gravitic theory, Ellenberger argues that the “systemic
milliseconds fluctuations in l.o.d. (length of day) are related to solar and lunar tides and
seasonal atmospheric flows.” What Ellenberger forgets is that my theory is based on both
electromagnetic and gravitational interactions and that both these forces would naturally
influence the Earth’s rotation. Because the Earth’s rotation is slowest in March and not in
January (i.e., at perihelion) when the Earth is closes to the Sun, Ellenberger concludes that
my mechanism is flawed and thus without support. This is not so because there are major
variations in the Earth’s fair-weather electric field that occur between December and
March. Thus we read:

But another remarkable feature appears [in the Earth’s geoelectric field] after having
shrunk in December, the hodographs [that record the strength of the field] are [with some
exceptions] suddenly blown up in January, shrink again in February, have a markedly
shriveled appearance in March, but are well expanded again in April.67

Whatever is happening on or in the Sun to produce this seasonal anomaly on the Earth
is not known or understood, although plausible explanations are suggested. But what this
behavior implies is that the electromagnetic interactions are much more complicated than
the theory has allowed for. Although unexpected, these seasonal changes, culminating
with the Earth rotating slowest in March during the largest change in the terrestrial field,
actually lend support to the theory, because all through March charge is building on the
Earth to cause its rotational velocity to slow.

Indeed, there are very good reasons behind my conclusion that gravitational
phenomena, which, according to Ellenberger, affect the earth’s rotation, are of secondary
importance. Besides Danjon’s, and then Gribbin’s and Plagemann’s findings, there have
been other observations and measurements which indicate that the Earth’s rotation is

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66 Ibid.
related to solar activity. A chart presented by Gribbin\textsuperscript{68} presents data from 1820 to almost 1980. What this chart shows is that whenever the Sun was more active, the earth’s rotation slowed down and the day lengthened.

In 1981, D. Djurovic showed a correlation of the Earth’s rotation with well-known solar variation periods of 0.5, 3.3, 6.6, and 11 years.\textsuperscript{69}

In 1982, F. Carter, \textit{et al.}, measured solar activity and emphasized a possible relationship with the Earth’s \textit{seasonal rotation}.\textsuperscript{70}

In 1983 Djurovic studied three and four month terrestrial rotational periods and solar activity, showing a correlation between georotation and solar behavior.\textsuperscript{71} Thus the very chart that Ellenberger suggests should be consulted shows that the 30 to 40 day variation in georotation is paced by solar activity.

It is well-known that the Sun oscillates periodically up and down some ten kilometers every 160.01 minutes. B. M. Vladimirskij, \textit{et al.}, have correlated this 160 minute solar pulsation with the 160 minute micropulsations in the geomagnetic field.\textsuperscript{72} G. P. Pil’nik has also shown that this solar oscillation of 160.01 minutes is reflected in changes in the rotation of the Earth every 159.56 minutes.\textsuperscript{73} How could the vagaries of the wind produce these changes

Each of these studies resoundingly illustrates that long and short term variations in the Sun’s activity are reflected in corresponding changes in the Earth’s rotation. From this I conclude that the gravitational effects on georotation that Ellenberger has presented are merely secondary effects that impinge on these well measured and well observed solar electromagnetic effects on the Earth’s rotation.

Before proceeding with the rest of my reply, permit me to briefly reiterate the evidence concerning this point. Solar activity has been correlated with geoelectric and geomagnetic field variations as well as with atmospheric ionization. It has also been correlated with the motions of charged torsion and uncharged paraconical pendulums, but, most significantly, it has been correlated with long and short period variations of georotation. It is impossible to believe that all these correlations are strictly gravitational effects when, in fact, the electromagnetic interactions indicate they are dominantly electromagnetic. The congruent inter-relationship between solar activity and all these phenomena is precisely what one would expect to find explained in a valid theory. Such a theory should exhibit a systematic and symmetric relationship among all these various interactions, which the Electro-Gravitic theory does. I therefore maintain that the evidence completely supports the concept of Electro-Gravitic theory.

\textsuperscript{69} D. Djurovic, \textit{Astronomy & Astrophysics}, Vol. 100 (1981), pp. 156-158.
6. THE VARIATIONS IN JUPITER’S ORBIT

Ellenberger claims that regular variations in Jupiter’s orbit may be related to the collective action of the outer planets and, perhaps, to planet X. Alternatively, these variations may be due to planetary residual. None of these explanations account for Jupiter’s behavior. This behavior is quite different from the residuals relating to the planets from Mercury to Neptune in that Jupiter’s variation is of precise period and of very short duration. Planetary residuals tend to increase. Jupiter’s orbital variations, on the other hand, display a cyclical repetition of +600 and the -600 miles every 12.4 year period.

Had Jupiter been in a 12.4 year resonance with the outer planets, they would be affected by Jupiter’s gravitational pull every 12.4 years. This is certainly not the case. Nor can Planet X be the cause of Jupiter’s variations because then it would also have to influence the planets beyond Jupiter in some similar fashion. According to R. M. Dicke and R. Krotkov of Princeton University, who presented this evidence, “No clear indication of a similar effect has been found in the other outer planets, Saturn, Uranus and Neptune …”

The wobbling of the Earth platform cannot be used to explain Jupiter’s variations either. Such a wobbling would result in finding the same 12.4-year variation in the orbits of all the other planets which is most certainly not observed. On this point, Ellenberger’s suggestions lead nowhere. Jupiter’s unique behavior is not explained by gravitational theory. This is a phenomenon which again suggests that another force is at work. Although I doubt that Ellenberger will ever accept the several phenomena discussed here, and elsewhere, as evidence in favor of electromagnetic interactions between celestial bodies, I maintain there is no other known force to do the job.

To give Velikovsky his due, it should be remembered that, although he was unaware of the evidence concerning Jupiter’s anomalous orbital behavior, he sent a memorandum to Professor H.H. Hess at Hess’s own request in September 1963 that is closely related to the subject. In that memorandum, Velikovsky asked that space researchers should conduct “precise calculations … as to the effect of the magnetic field permeating the solar system on the motions of [Jupiter] which is surrounded by a magnetosphere of an intensity, presumably 10^{14} times that of the terrestrial magnetosphere. “This,” he stressed, “is basic to the impending re-evaluation of electromagnetic effects in celestial mechanics.” Furthermore, as Juergens pointed out:

In April 1964, an announcement by radio astronomers of evidence that the planet Jupiter suddenly changed its period of rotation made front page news. The correspondence between the rotational period of radio sources and the rotational period of the body of the planet is entirely inferential, but the time of sudden change noted for the radio sources coincided with a similar change in the period of rotation of Jupiter’s red spot.

After this was published, I received a letter from Ellenberger saying that he would “never deal with me in print again.” This was highly unscholarly because, if he did indeed have evidence to refute me, here was an outlet to present counter evidence. As with Velikovsky’s critics who failed to address his responses to them and that of proponents of his theory, Ellenberger trod

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74 W. R. Corliss, to C. Ginenthal, Feb. 27, 1989, personal communique.
77 Ibid., p. 74.
the same path. This seems to be endemic with critics of Velikovskian scholarship.

The last critic of Electro-Gravitic theory was the late Eric Crew. He has written a review of my book, Chronology & Catastrophism Review. Crew was a mathematician who wrote:

“Judging by the number of references to the scientific literature listed (278 in 132 pages of text …) … Charles Ginenthal has read more astronomy than most professional astronomers .. I did not find this theory as impressive as the factual contents [in it …] …

“As to the theoretical items, I immediately found statements which were inexplicable to me. One was that an electrically charged rotating body emits two magnetic fields: a radial field and a tangential field which weakens to zero over five rotations of the body … The reference to this (p. 2) was not a standard physics textbook which I was not able to check. An electric charge would be mainly on the surface of a conducting body so the rotation would produce the equivalent of a solenoid with current flowing around the axis of rotation producing a magnetic field, leaving one pole and entering the other. I am baffled by the idea of a tangential field and why it should disappear after five rotations.”

The word that Crew left out of his thinking that caused him so much bafflement was on page 2. Here I stated, “an electrically charged rotating body was an ANTENNA that emitted two magnetic fields.” An “antenna” can act as a receiver or an emitter, as do those at radio stations. The stronger the charge the farther away they reach. By failing to see that I was discussing an emitting “antenna,” which was there in the text. Crew injected his own misunderstanding to it. None of this is arcane and neither was it without a physics basis. Radio station engineers are fully aware of this basis in physics for this and never confuse an antenna with a solenoid, as did Crew. In fact, I learned about this from a radio engineer named James Alsop, who ran the radio and television station at Nassau Community College at the time I wrote the theory. The book itself states, “The elementary dipole forms the basis for any antenna current of constant magnitude.”

What we are told is that a rotating charged dipole like the Earth, the Sun, etc., is an antenna which emits electric and magnetic fields. The book goes on to explain, “when distance r [radius] exceeds 5 wavelengths, as is generally the case in radio applications.” The point being made is not as Crew misunderstood, that the field falls to zero on the surface of the antenna or the surface of the dipole, but rather it traverses space radially from the antenna, at the speed of light and after five rotations of, say, the Earth or Sun. At this distance outward, the field falls to zero or is negligible. An antenna emits an electric and, therefore, a magnetic field. In the cryogenic (super cold) regions of space, these magnetic fields oppose each other like that of the Earth’s magnetosphere opposed by the larger solar magnetosphere is pushed away from that of the Sun. In this regard, Crew argues:

“He [Ginenthal] assumes that magnetic fields meeting in the super-cold environment of space, repel each other. The low temperature of space only has meaning if heat is radiating away from matter in space. Magnetic fields can neither absorb nor radiate heat, so I do not know why the temperature of matter should

79 Ginenthal, The Electro-Gravitic Theory of Celestial Motion & Cosmology, op. cit., p. 2. (Capitalization added)
81 Ibid., pp. 1-2.
make any difference to their response in space.”

Again Crew failed to discuss the very evidence I presented on page 2 of my book that explained this by the use of an experiment that was carried out and widely reported in *The New York Times*. It specifically told Crew:

“With respect to the attractive and repelling forces of magnets, I … learned that superconducting bodies which emit magnetic fields generate only repelling ones. In *The New York Times* for September 20, 1988, page C1, an article showed that cryogenically cold, superconducting bodies repel. Two superconducting materials were actually suspended below a magnet in air! The article stated, ‘As long as the chip stays cold enough, it will stay suspended.” See Figure 1 below:

Figure 1:

![Diagram of magnetic field and superconductor](image)

The evidence could not be clearer nor plainer; how Crew failed to see this or acknowledge this is truly baffling. This second failure on his part to deal with evidence in the very text of my book exhibits, I must say, a very callous disregard for evidence.

Another criticism Crew raised is related to the size of magnetic fields in the Universe and also the galaxies.

“The section on galaxies refers to ‘the magnetic field of the Universe.” There are all manner of magnetic fields of planets and stars but they rapidly diminish with distance and it is difficult to see how there can be a significant universal magnetic field. The late C. E. R. Bruce used to say that many professional astronomers postulated a value for this supposed field and made complicated and fanciful theoretical deductions which are not based on accepted physics. Unlike his neglected claims about cosmic electrical discharges. On p. 7 Ginenthal states that ‘In a remarkable manner it can be observed that the greater the magnetic field of a celestial body the greater its rotational velocity.

“I suggest this should read ‘the greater the rotational velocity of an electrically charged body the greater is its magnetic field.”

Here Crew has omitted the concept I claim creates the magnetic field of a body, as I noted above, wherein I wrote, “The production of electromagnetic energy from within a body is due to the amount of collapsed matter in each body and the degree of collapse of the matter.” (page 9) Again Crew simply ignores what I write and presents what he believes. He, of course, failed to note that the larger more dense bodies, as I outlined, explicitly show this. That is, the denser

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the body and the more collapsed the matter in it shows a clear and direct correlation with its speed of rotation. Why didn’t Crew at least cite this essential material in his critique? He, in fact, never discusses how torque is created by gravity, something that gravity does not do; it only pulls matter directly to itself.

Crew brings to the fore C. E. R. Bruce’s about how “Bruce . . . claims that the electromagnetic compression in the galactic discharge channel causes matter to condense into stars and that earlier universal discharge caused matter to condense into a string of galaxies.” This would only make sense if an experiment was created that actually condensed a ball of solid matter several inches or feet in diameter here on the Earth, not a ball of ionized matter. Those in the camp of the Electric Universe have to produce such a ball of solid matter, (not just hypothesize one) in an imaginary laboratory in order to be taken seriously. Their thought experiment is not an experiment.

It seems clear that Crew, if he read my book as he stated, was blind to what it contained, similarly to Ellenberger and the others. The one thing they all seem to have in common is the idea that magnetic fields have nothing to do with celestial motion, and, therefore, there was no need to look into the evidence deeply. Since they assumed beforehand that they knew for a fact that electromagnetism does not affect the motion of bodies, they did not pay attention to the evidence that showed it did.

This attitude was clearly employed by nearly all of Velikovsky’s critics, and goes on to this day. What has been of great interest to me was my attempt to have my theory tested in space. I had written to four space agencies and their responses certainly show that they suffered from the same attitude as my critics. I first contacted NASA and received an address to send my space experiment to, which I promptly did and awaited a response. None came for months. When I wrote to that address again, I discovered they had lost my material and I sent the a second set. For this I did receive a response. It was a form letter, unsigned, saying they were not going to perform the experiment. Apparently, no one there took my proposal – on The Electro-Gravitic Theory of Celestial Motion & Cosmology – seriously, nor did I have the prestige to warrant any consideration for that proposal. I must admit I was not surprised, since I was asking this agency to question Newton and Einstein’s theories by testing them. Placing a super magnet on a long trajectory in space outside the Earth’s magnetosphere and finding it did not follow Newtonian/Einsteinian theory must have seemed inconceivable to those who read the physics proposal being presented, and they simply returned it with a form letter – “Thank you, but no, thank you.” There was nothing to do so I wrote to the Japanese space agency and they were kind enough to respond. I received a handwritten note which explained that electromagnetic equations would not affect a supermagnet’s motion in space. The note was signed in Japanese and was quite polite. But what was overlooked was that my test was to “test” these equations. As the first part of the Appendix, pages 134-135 stated:

“The electrical permittivity of magnet permeability of ‘free space’ are handbook values used daily in electrical engineering. Once vacuum permittivity is measured, the associated permeability is fixed and the inverse of the square root of their product is the free space velocity of light. It is commonly assumed that permittivity and permeability in remote space are constant and equal to the handbook values. It is also commonly believed that both magnetic and electrical field intensities are negligible and unvarying as functions of spacial position as long as the electromagnetic sensing apparatus is in remote space, far removed from any planetary or other source. It is further assumed that the constant of gravitation, the so-called ‘proportionality constant,’ relating gravitational attractive force to the

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84 Ibid.
Newtonian product of masses divided by the square of the distance separating the mass centroids, is totally unrelated to electrical quantities such as electrical charge. Since inertial navigation, celestial mechanics and the dramatically successful control of the trajectories of space vehicles do not require use of any electrical terms, this final assumption appears to be above educated criticism.

“Our proposal consists of a practical design of measurements and computations, using both electrical engineering and celestial mechanics, TO DETERMINE WHETHER THE ABOVE-SPECIFIED ASSUMPTIONS ARE VALID. The theoretical basis of our proposal comes from several sources, the most important of these being the research of Sir Arthur Stanley Eddington, in his *Fundamental Theory*. The practical basis of our proposal will be apparent in the experiments we have designed, which are described with complete working examples. In particular, we specify a detailed qualitative and fully practical method of measuring shifts in both magnetic field intensity and magnetic permeability, and distinguishing between these two shifts so that one can know if one or both are occurring as functions of remote space position.

“The experiment, which uses working computations in celestial mechanics, may be summarized as follows: A highly magnetized vehicle is sent on a trajectory in remote space in which the magnetic field of any planet is negligible. The magnetic field should be of the order used in magnetic resonance imaging. The computations of celestial mechanics allows us to know the trajectory anticipated due to celestial assumptions. Signal analysis allows us to track the actual trajectory of the vehicle . . . WE WISH TO SEE IF THE CLASSICALLY ANTICIPATED AND ACTUAL TRAJECTORIES ARE IDENTICAL WITHIN THE MARGINS OF ERROR ALLOWABLE IN MODERN CELESTIAL MECHANICS.

“Unless these or similar investigations are made, it is merely an exercise in debate to establish a popular scientific opinion. One can argue, for example, that the rate at which signals are propagated from space vehicles to the Earth indicates that the free space permittivity and permeability hold throughout ‘empty space’ has no physical properties, and so on. But Eddington, who was certainly as aware as any physicist today of the meaning of the gravitational constant derived it (gamma) from scalars and electrical quantities. No one is arguing about the Cavendish Experiment or about the routine affairs of space guidance. Our proposal is designed only to encourage and describe experiments with accompanying data processing calculations, yielding knowledge, rather than debates, on the electromagnetic properties of ‘space.’” (Capitalization added)

It would be similar to saying we know electricity cannot affect the motions of Saxl and Allen’s torsion pendulum or Thomas Townsend Brown’s charged apparatus and thus they did not behave as they did. If one knows something it is impossible to question it, especially a scientific truism which is actually an assumption.

The third space agency, that of Israel, responded by writing to me to say it could not afford to carry out this experiment. The letter did not evaluate the proposal and that was that. However, the European Space Agency did take a good look at my proposal, and the head of that agency, unnamed here, had the experiment analyzed and, without so much as presenting any evidence, gave it a failing grade, evidently because nothing could contradict Newtonian/Einsteinian theory. Dr. George R Talbott, who actually wrote up the proposal, and allowed me to be named on it, sent this letter to the former head of NASA’s space navigation team, who had left that agency asking what was wrong with the proposal. To Dr. Talbott’s and my surprise, this scientist said there was nothing wrong with it, that politics was the great governing
rule in modern science and was the reason he had left NASA where he claimed politics ruled over science.

As noted above, Newton and Einstein have become scientific icons and they were never going to be toppled, if the scientific establishment had anything to say. Nothing was going to change that. Just imagine the Wright brothers proposing to Simon Newcomb, the greatest American physicist of the late 19th and early 20th centuries, that their heavier than air craft could be tested by him and those who could do so. What they would have probably received in response to their proposals was that the equations of Newton – spelled out to them – forbid this and, therefore, their flight proposal was of no value, should not be undertaken, and/or was a failure as a scientific proposal. Now I am not comparing myself to the Wright brothers, but I am saying scientists do not behave scientifically when presented with proposals that can overthrow all they hold dear. It is a massive monstrous falsehood that scientists are different than the rest of humanity when it comes to facing the possibility of being shown they are dead wrong. A scientific theory must be capable of being empirically tested so that it can be confirmed or disconfirmed. Those who oppose Velikovsky’s electromagnetic hypothesis have never actually tested it in space, but claim he and I and those who support the concept that electromagnetism affects celestial motion and, therefore, requires a new cosmology, will continue to prove us wrong with words and equations on the assumption they are right, ergo, we are wrong.

It is a human drama played in the past, the present and doubtless in the future. When a scientist creates a theory, it becomes a living entity for all those schooled or, more aptly, indoctrinated into it. It takes on a life of its own for these scientists and they cannot and will not relinquish it, even if, in the end, it brings down their house. Here Bronowski describes and explains how it occurs:

“We all know the story of the sorcerer’s apprentice; or Frankenstein, which Mary Shelley wrote in competition with her husband and Byron; … In these stories, someone who has special powers [like scientists] … conjures a stick or a machine to do his work for him and then finds that he cannot take back the life he has given it. The mindless monster overwhelms him; and what began as an invention [or in science, as a theory] to do … work ends by destroying the master with the house [or institutions that promulgated the theory].”

Every theory of science that becomes accepted by the vast majority of scientists goes through stages like life. There is a struggle to give birth to the theory and when it is accepted, there is joy in the new life, the new way of seeing the world through new eyes and a new mind. It grows to maturity when the vicissitudes of life, other scientific concepts challenge it, and for a time, it prevails, but eventually – and eventually may take centuries or millennia – it will succumb and die, and everything done to keep it alive will fail. As it is with life, so I suggest, it is with scientific theories. Those that bring them into the world love them, but, as time goes on, new data and new minds see the world in a different light, and a struggle for existence and survival ensues. Theories must be changed or the capacity to find new knowledge will die for a time until that new theory emerges and the cycle begins again. This is a bitter pill to swallow; to know all we know is not “all” and may, in time, become a Frankenstein. I believe we Velikovskians are only at the beginning of this struggle, which will continue on into the future, long after we are gone. It is the nature of life and, as I see it, the nature of science. No generation is omniscient; we all have our theories with unknown or unrecognized fallacies. In this sense, science and scientists, at some level, are subjective, but they never fully realize this inherent truth.

APPENDIX II: THE THEORY OF TIDES, A MORE TECHNICAL ANALYSIS

The following analysis is that presented by Miles Mathis cited above. The point he makes is that, when we get into the physics using the mathematics of Newtonian theory, that the contradictions of the behavior of the actual, observed, measured ocean tides become discernible. The following, in a technical analysis, must therefore contain mathematics which many readers will find difficult to follow. Because these are based on a good knowledge of mathematics, I will, as far as possible, omit the equation/mathematical aspects of this evidence. But for those interested in seeing this highly technical material, they can avail themselves of it by going on the internet and entering the following: Miles Mathis, The Trouble with Tides.

There, the entire paper can be read and one can find the mathematics outlined by Mathis. In this way, the general reader and technical reader can examine for themselves the in-depth approach Mathis has presented. Here, the concepts of tidal theory will be juxtaposed to the math and allow the non-mathematical reader to understand the failure of gravitational theory to illustrate that that theory does not explain tides. That is, since the actual behavior of tides does not follow Newtonian theory, the theory cannot be the full nor the correct understanding of the forces operating to lift tides. If the theory was correct, as most scientists believe, the mathematics that supposedly works everywhere else in the Universe, should also describe the tides precisely or nearly precisely. Not only must the masses and positions of the Earth, Moon and the Sun accord with Newton’s laws, but so must the tides, as these are derived from the masses and positions of these bodies. All these in a valid theory should correlate, corroborate and be congruent with each other. However, as will be shown below, they simply are not. No one, so far as I have gathered, except Miles Mathis, has explained and written a physics/mathematical model that incorporates electromagnetism/charge to do so. That this gaping hole in gravitational theory exists and has resisted resolution for over 300 years since Newton fudged his explanation of these matters, has caused none of the establishment scientific analysts and theorists to realize that this indicates that another force in nature is operating. As with every other contradiction to gravitational theory outlined above, establishment scientists have not only failed to grasp the enormity of these contradictions, and have refused to accept the fact that these contradictions exist, indicating that they have an allegiance to false or, more accurately, incomplete theory. To acknowledge this, of course, opens the door Velikovsky stepped through long ago, meaning they will have to acknowledge Velikovsky!

Mathis writes:

“Tidal theory is one of the greatest messes in contemporary physics … We know ocean tides are caused by the Moon, since they follow lunar cycles. But are they caused by the Moon’s gravity? Let’s compare the Sun’s field to the Moon’s field at the Earth.

“As = force on the Earth by the Sun
Am = force on the Earth by the Moon
As = Gm/s² = .006 m/s²
Am = Gmm/r² = .000033 m/s²

“[From this] The sun has a much stronger gravitational effect on the Earth, if we look strictly at [gravitational] field strength, since if the Moon had a stronger gravitational effect [to lift tides] we would be orbiting it, not the Sun … it seems like [from the pull of gravity alone] we should be experiencing Sun tides that utterly
swamp out Moon tides. By the math above, Sun tides would be about 180 times as great as Moon tides, making the Moon tides invisible. They would [then] follow the movements of the Sun overhead [and not the Moon].

“Gravitational forces follow the inverse Square law [which weaken at the square of the distance. A body twice as far from another will feel 2 square the force of gravity or four times less gravitational pull, three times farther away 3 square the force or nine times less gravitational pull.] But tidal forces are inversely proportional to the cube of the distance The Sun’s gravitational pull on the Earth is 179 times bigger than the Moon’s because of its much greater distance, the Sun’s tidal effect is much smaller than the Moon’s (about 46% as strong …).” Mathis, *The Un-Unified Field*, op. cit., pp. 153-154.

That is, if we employ the same equations used to explain tides via the cube of the distance, solar tides should be about 46 percent as large as the lunar ones. In shoreline places, where the Moon, say, raises a tide of 40 feet, the Sun, as it moves overhead at the same shoreline, should raise a tide of about 18.5 feet and together, when both the Sun and Moon are overhead or nearly overhead, a tide, based on both their gravitational pulls, should be 68.5 feet. Of course, no such tidal effects are observed; so how can gravitational theory equations used to derive the tides by the Moon be correct when the theory requires a solar tide 46 percent that of the Moon to be operating? This is only part of the reason that “Tidal theory is one of the biggest messes in contemporary physics.” Mathis then asks:

“How was this ‘inverse cube law’ derived? According to a University of Washington website:

“‘Tidal forces result from imperfect cancellation of centrifugal [center fleeing] forces a distance L away from the center of gravity of the system and have the form $F_t = GmML/R^3$.’

“Other websites agree. Here is one that is especially funny considering everything.

“‘So the gravitational attraction of the Sun is 178 times greater … [than] the Moon. But how can that be? We all know the Moon is more effective at producing tides than the Sun. There is a simple explanation for this and it’s not that we have been lied to! It is only the proposition of the gravitational force NOT BALANCED by centripetal [center pulling] acceleration in the Earth’s orbital motion that produces the tides.’ [Capitalization added]

“Two major problems here. One, the gravitational force cause the centripetal acceleration. [Therefore] There can be no lack of balance [between] gravity and its centripetal force. As for the gravitational and centrifugal [center fleeing] forces, although they are caused separately, they cannot cancel since both tend to create tides. In fact, most physics books and websites use a summation of centrifugal effects and gravitational effects to create tides even without circular motion and circular motion would create tides even without gravity. So the two [gravitation and centrifugal forces] are additive. There is no possible cancellation. In the way that is assumed above.’

Here Mathis explains:

“Besides, the Earth is not feeling a centrifugal effect from the Moon, since the Earth is not orbiting the Moon. Even … orbiting a barycenter, it still would not be in circular motion about the Moon. Therefore, the tides on the Earth could not be an imperfect cancellation of centrifugal forces and gravitational forces even if these

\[1 \text{ Ibid.}, \text{ pp.} 154-155.\]
forces were in opposition. There are no centrifugal forces on the Earth directly caused by the Moon since there is no angular velocity around the Moon.”

Mathis then goes on to show that the inverse cube rate formulation used to calculate tides is actually an inverse square law in “poor disguise.”

“Secondly, the math above is dishonest. If we look at the Sun/Earth system, then the center of gravity of the two bodies is so close to the center of the Sun that it makes no difference. The Earth has almost no effect on the Sun. Therefore, the distance L is just the radius R, and the equation is the same as \( F_1 = Gm \frac{MR}{R} \).

“That is not an inverse cube law, it is an inverse square law in poor disguise.

“A much better explanation of the inverse cube law is supplied by Wikipedia:

“‘Linearizing Newton’s law of gravitation around the center of the reference body yields an approximate inverse cube law. Along the axis through the centers of the two bodies, this takes the form \( F_t = 2Gm \frac{MrR}{R^3} \).’

“‘Linearizing’ means differentiating the equation with respect to R, so that this new equation represents a change in the field rather than the strength of the field. Despite being weaker, the field of the Moon changes more quickly. This causes a greater difference from the center to far or near edge. Another way to express this without differentiation is: \( a = GM[\frac{1}{R^2} - \frac{1}{R} - \frac{r}{R}] \). Where R is the distance between objects, and r is the radius of the gravitating object. They tell us the equation is approximately equal to \( a = GM2r/R^3 \), giving us an inverse cube law …

“Once again, it appears that this must take the Sun’s [tidal] effect beyond the Moon’s effect on the Earth.”

Since the inverse cube law employed to calculate tides is so like the inverse square law to calculate gravitational interactions between bodies, it means that the Sun should affect the Earth’s oceanic tides even more greatly than 46 percent described above. Using these equations, Mathis was able to calculate that the Sun “does not take us over the effect from [that of] the Moon, but it takes our number for Sun tides up to 67% of the Moon tides.” Therefore, if a tide by the Moon along a shoreline is 40 feet, the Sun as it moves overhead should raise a tide of almost 27 feet and together when both the Sun and Moon are overhead or nearly overhead they should raise a tide of 67 feet. Of course, no such tidal effects are observed. And again, how can gravitational theory equations used to derive tides by the Moon be correct when that theory requires a solar tide 67 percent that of the Moon to be operating? This, again, is a further reason that “Tidal theory is one of the biggest messes in contemporary physics.” Mathis concludes this part of his paper thus:

“This means that all the standard model math fails. The mainstream has been publishing false equations. I assume they know they are doing this, since the holes in the equations are so big. Using the wrong radius is a huge error, one that is difficult to explain away as an oversight. It would have to be an oversight of many decades, involving thousands of specialists.”

It is with all this material that Mathis confronted the experts on Wikipedia in late 2005 which caused them to remove all of the mathematical equations regarding tidal theory.

Finally, this brings us to the use of gravitational theory as it relates to the barycenter for producing tides that Philip Plait used to explain to us above how this works. He had no doubts or reservations about how applying gravitational theory to forces related to the barycenter proved the validity of Newtonian theory. I must comment beforehand that the depth of Plait’s ignorance on this matter as a fully trained astronomer is staggering! However, to do justice to this question,

\(^2 \) Ibid., p. 155.
\(^3 \) Ibid., pp. 155-157.
\(^4 \) Ibid., p. 159.
\(^5 \) Ibid., p. 160.
I must perforce employ Mathis’ highly technical/mathematically in-depth analysis for which I apologize to the non-mathematical reader. Let us remember that Plait said directly above, “This means that the Moon and the Earth are actually orbiting in between the two bodies as if all the mass in the Earth-Moon system is concentrated. This point is called the center of mass, or technically the barycenter … Someone standing under the Moon on the Earth’s surface would feel the Moon pull [upward as does the water in the ocean] … But the person on the far side of the Earth feels less force toward the Moon … a positive force in the other direction, away from the Moon.” But Plait has failed to prove this via mathematics which is understandable for two reasons: His book is aimed at laymen interested in science and also he did not do the math properly, he would find that using the barycenter to explain the tides, that math shows that the barycenter tide equations create tides so big that they would overwhelm the tidal effects of the Sun by 40 times and of the Moon by about 60 times. Here, to drive the last nail in to the coffin of tidal theory, I must perforce employ mathematics and I apologize to the non-mathematicians again, but here the relevant equations cannot be ignored. Mathis writes

“Another major problem with tidal theory concerns its use and misuse of the barycenter. The barycenter is the center of gravity of the Earth/Moon system, which both bodies are said to orbit. Feynman was one of the most famous to suggest that the Earth has a non-negligible tide created by orbiting this barycenter. Is this true? Let’s do the full math:

\[
\begin{align*}
R &= 4671 \text{ km} \\
v &= 2\pi R/t \\
t &= 27.32d = 2360448s \\
v &= 12.43 \text{ m/s} \\
R + r &= 11042 \text{ km} \\
R - r &= -1707 \text{ m} \\
v_o &= \text{outer velocity} = 29.39 \text{ m/s} \\
v_i &= \text{inner velocity} = 4.54 \text{ m/s} \\
a &= 3.31 \times 10^{-5} \text{ m/s}^2 \\
a_o &= 7.82 \times 10^{-5} \text{ m/s}^2 \\
a_i &= -1.2 \times 10^{-5} \text{ m/s}^2 \\
\Delta a_o &= 4.51 \times 10^{-5} \text{ m/s}^2 \\
\Delta a_i &= 4.51 \times 10^{-5} \text{ m/s}^2
\end{align*}
\]

“We certainly do find a significant effect from the Earth orbiting its own barycenter. In fact, it swamps all other effects. It is 40 times as great as the gravitational effect from the Moon and almost 60 times the total effects from the Sun. However, Feynman was wrong in one very important way. The effect doesn’t just raise a tide on the far side of the Earth from the Moon; it raises an equal tide toward the Moon. Feynman obviously didn’t know what to do with that negative radius. But as you can see from my diagram, it produces a positive tide. You must follow the steps of the math I did previously, and if you do it exactly, you find that you must subtract \( a_i \) from \( a \), to achieve the proper differential. As vectors, they are pointing in opposite directions, so you subtract a negative, which is the same as addition: \( \Delta a_i = a - a_i \).
“The barycenter falsifies the entire standard analysis, since it would swamp all effects from the Sun and Moon. You cannot include effects from the barycenter, since they cannot be made to fit the data. And you cannot fail to include effects from the barycenter, since current gravity theory demands a barycenter. This is called a failed theory [because it must include effects from the barycenter as gravitational theory requires] but gives highly inaccurate, ergo, invalid results.

“Some have tried to squirm out of this by telling me that since the barycenter numbers are equal, forward and back, the tide is a constant and the other tides can be stacked on top of it. But this is illogical. The numbers show the barycenter tides equal front and back: they do NOT show an equal tide all the way around [the Earth]. The barycenter is a discrete point, and there is a vector pointing from the center of the Earth to the barycenter. This gives the barycenter tide position and direction on the surface of the Earth just like any other tide. In other words, it would create heaps [of water]. That is what my illustration shows. The math and the illustration do not show equal heaping [of water] in all directions. All points on the ocean would not swell equally and at the same time. Therefore, if we had a barycenter tide, it would be quite obvious. It would create huge swells and it would swamp all other tides …”

Every single attempt to make gravitational theory physics via mathematical computation has failed to correlate with the actual tides. Using pure gravitational theory, it was discovered that the Sun, which is immensely more massive than the Moon, would at its great distance from the Earth generate tides that are 46 percent as great as those generated by the Moon. This entails that if the Moon creates a tide of 40 feet in height, the Sun would create a tide of 185 feet high. When one changes the gravitational inverse square law to an inverse cube law to weaken the Sun’s tidal effects so it does not produce a 46 percent tide that of the Moon, the theory still does not work; it fails. It fails because, as Mathis shows, the inverse cube law is an inverse square law in disguise and when the proper equations are employed, the Sun would generate not a 46 percent tide that of the Moon, but a 67 percent tide that of the Moon. When we explain tidal theory

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by the gravitational barycenter of the Earth-Moon system, we get neither a 46 percent tide nor a 67 percent tide that of the Moon, but a tide that is 40 times greater than the gravitational effects of the Moon and 60 times greater than the gravitational effects of the Sun. Using a lunar tide of 40 feet, in the 46 percent analysis, the solar tide would be 18.5 feet that of the Moon, and this is not seen. Using a lunar tide of 40 feet, in the 67 percent analysis, the solar tide would be almost 27 feet that of the Moon, and this, too, is not seen. Using the correct barycenter gravitational tidal theory, a lunar tide of 40 feet is 40 times greater, that is, it would be 1,600 feet high! On every level of analysis of tides employing gravitational theory, the theory fails, just as Michelson, above, told us!

The history of the correct tidal theory has never been explained. Supposedly, Aristotle threw himself into the Aegean Sea because his understanding of physics did not and could not explain the tides. Galileo invented an explanation of tides to prove the Earth rotated and the waters of the seas sloshed back and forth creating tides, but he did not explain why these tides paced themselves with the Moon’s motion. Kepler understood the Moon had something to do with the tides, but had no explanation for this pacing. Newton invented and employed gravitational theory to explain the tides, but he had to fudge the data to make it conform with his theory. Since the time of Newton, every other physics attempt to explain tides by gravitational theory has failed utterly. Oceanic tides should correlate with atmospheric tides. They don’t. Einstein’s theory of general relativity cannot explain the tides because the Moon cannot recurve the space it is orbiting, in that it is supposedly curved by the Earth’s mass. The French astronomer had it right, as stated above, when he called the study of tides “the tomb of human curiosity,” and Irving Michelson, above, admits to this day, “if we rely solely on the relevant physical principles, consisting of nothing more than Newtonian mechanics and gravitation, we are, to this day, unable to decide whether high tide occurs when the Moon is in the meridian, of whether the exact opposite, low tide, is more nearly correct,” and that “competent experts” have “condemned” it “as being no theory at all, but only a mass of doubtful assumptions obstructing scientific progress.”

I began this book with a discussion on tides and end it with an analysis of tides. Why has tidal theory, as Michelson said above, that “the only consistent feature of our knowledge of tides is its failure to confirm reasonable [Newtonian gravitational] hypotheses”? The resounding answer he gave is that gravitational theory, as employed by “Laplace’s doctrine still remains as the cornerstone in the baroque structure of monolithic ocean tide theory … as the unquestioned tidal model base.” The theory I have proposed, on very general grounds, based on gravitational attraction and electromagnetic repulsion, or Miles Mathis’ theory, based solely on charge, cannot be tolerated by the scientific establishment Why? As Michelson stated above “Rival theories have been assigned to the [scientific] Index Expurgatorius without exception.”

The reason is obvious. Once one allows that the motions of ocean masses can be moved by a force other than gravity, the game is over. If that other force can explain the motions of huge masses of water, it can also move other huge masses as well: planets, satellites, stars, galaxies, comets. To admit electromagnetic forces into celestial mechanics requires that everything known about and assumed to be correct with that theory must be swept aside and recreated by a new physics. I pointed out in Pillars of the Past, Vol. III, page 554, citing Jacques Berlinerblau, that the introduction of a new theory has the effects of a tidal wave. To paraphrase his statement to fit this evidence of tidal theory, I say:

“One of the most daring acts is the challenge one poses to the standard gravitational theory used by physicists, astronomers, astrophysicists and cosmologists is this … It means that one reanalyzes celestial mechanics and events in space which a community of scientists have already explained to their satisfaction. Tinkering with gravitational theory by adding an electromagnetic repulsion to it is dangerous business, for scientists often unquestionably have
accepted this theory and base their research on it. Subsequent generations of researchers predicate their findings on those who have unquestioningly accepted the reigning system and so on. Accordingly, when a heretic correctly replaces their theory, a scientific domino effect occurs whereby one aspect of the theory collapses only to discredit a subsequent aspect of the theory, and so on. As far as celestial mechanics is concerned, an attack on its foundations is an ‘unparalleled act of aggression.’ The revision is not seen from the perspective logic, reason, and evidence, but as an act of aggression.” [Paraphrased from Jacques Berlinerblau, Heresy in the University . . . (Piscataway, NJ 1999), p. 49.

The collapse of tidal theory by the introduction of counter force – electromagnetism – ineluctably leads to the collapse of other aspects of celestial mechanical theory that are based on it, such as, as Michelson stated above, the “Apsidal motions of binary star systems . . . Deceleration of the Earth’s rate of rotation evidenced by the secular accelerations of the Sun, Moon and planets . . . and numerous others.” Thus, Earth-Moon system stability theory comes into question for a reanalysis based on electromagnetism as well, and this has consequences for solar system stability as well, and on and on.

When Velikovsky pointed out in 1973 that tides were not related to gravitational forces, I believe that very few of his critics, as well as many of his proponents, understood the great rift that existed in tidal theory, including this author. Now that the nature of the failure of tidal theory has been exposed, it indicates that the problem/contradiction is that there must be some force other than gravity responsible for lifting billions of tons of water every moment of every day for billions of years, as spelled out in physic/mathematical detail by Mathis. Will this have any effect whatsoever on Velikovsky’s critics? Will they come to grips with this evidence and fully recognize the magnitude of the evidence that supports Velikovsky regarding tidal theory and respond by presenting scientific factual evidence to refute these facts – not only on this tidal matter, but on all the others presented in this book? The answer is clearly no! We saw just how Wikipedia responded when Mathis proved their physics/mathematical assertions about the nature of tides was false. Rather than correcting the evidence, these university authorities withdrew their physics/mathematical evidence and replaced it with illustrations to give the false impression that there was no trouble with tidal theory. So too, Velikovsky’s critics, who almost never deal with counter evidence presented by Velikovsky, me and other proponents of Velikovsky, will continue to avoid the uncomfortable facts. This behavior has been the clearest indication that Velikovsky is on the right track. The failure of Velikovsky’s scientific and other critics to deal with or even give consideration to evidence that clearly destroys the concepts and evidence they used to attack his theory, is the surest sign that they have nothing with which to answer him, and that they intend to continue to avoid our evidence forever. That, I humbly suggest, is the clearest proof that they are not just dishonest, but that they are pseudoscientists, to the core, for which evidence plays no role.

Furthermore, Velikovsky’s critics, for all their presumed rational sophistication, show that they are unable to change when faced with reality and admit to the worst. This intransigence is an indication of a mindset obsessed by the desire to protect their scientific beliefs rather than follow evidence and science. They seem unable to ask themselves to seriously consider what they are doing and how what they are doing will be judged by history. Surrounded by like-minded elites, they believe their reputations are secure and will always be protected and defended by these same elites. Therefore, this book, like my others, is addressed to the public because the scientific, academic and media elites have largely abdicated their role to act with responsibility, as well as with measured reason. They simply cannot speak about our evidence, but pass over it with silence. That has been their legacy. In the face of evidence, they have responded to that evidence with
silence or misrepresentation. It is not the silence of one who does not know, but of one who does know and remains silent, one who has stopped thinking
INDEX

AAAS, 16, 66, 67, 125
Abell, G. O., 411
Abt, H. A., 413, 414, 416
Adriatic, 9
Aeolian, 200
Aerospace Corporation, 421
Aharonson, Oded, 154
Ahmose, 180
Akasofu, S. I., 184, 185
albedo, 145, 196
Alfvén, H. A., 238
Allais, Maurice F. C., 76, 77, 330, 331, 332,
334, 363, 370, 371, 394, 406, 417
Allen, D. S., 129
Allen, Mildred, 73, 75, 394
alluvium, 163
Almagest, Olaf Pedersen, 357, 358, 359,
360, 361
Alpha Centauri, 98, 302, 303
Amazonian, 167
Anderson, Tom, 240
Andrews, Tom, 268, 269
Angel, J. R. P., 42
Angell, Ian, 232
Antigravity, 62, 80, 81
anti-philologistic, 412
antisolar, 25, 26, 27, 56, 418
aphelion, 30, 31, 32, 35, 56, 101, 409
Apsidal, 17, 23, 55, 437
Aquinas, Thomas, 314
Arago, Francois, 17
Arago, M., 13
Argon, 203, 204, 209, 233, 369
ARGON-36, 3, 203, 204, 233
ARGON-40, 3, 203, 204, 233
Aristotelian, 6, 81, 117, 279, 385, 394, 401,
402
Aristotle, 6, 9, 69, 76, 116, 117, 119, 253,
254, 277, 297, 356, 357, 358, 378, 402,
436
Arp, Chip, 317
Arrhenius, B. G., 238
Artmann, Stephan, 113
Ascension Island, 20
Ashton, Roger, 58
Assurbanipal, 219
astronomers, 6, 8, 11, 23, 27, 42, 43, 48, 53,
58, 59, 60, 64, 65, 92, 93, 95, 96, 97, 98,
99, 101, 102, 104, 117, 122, 129, 135,
136, 137, 138, 139, 141, 143, 145, 184,
186, 188, 189, 214, 221, 222, 240, 241,
242, 243, 244, 247, 248, 249, 250, 253,
254, 255, 256, 266, 270, 273, 275, 289,
315, 318, 320, 336, 337, 342, 343, 347,
349, 350, 359, 368, 385, 387, 388, 389,
390, 391, 395, 403, 412, 414, 425, 426,
427, 436
Astronomia Nova, 28
Astrophysical Journal, 98, 214, 343
astrophysicists, 6, 42, 63, 93, 254, 275, 350,
355, 368, 383, 403, 436
Attenborough, David, 130
A-type, 65
Aviation Week and Space Technology, 174
Azore, 20
Bahnsen Laboratories, 80
Bailey, V.A., 64
Baker, Dr. Victor, 161
Baker, Victor E., 151, 156, 168, 197, 198
Ballantyne, Robert Michael, 22, 23
Balling, Peter R., 207, 233
Bally, John, 344
Baltic Sea, 160
Barometric, 13, 174, 218
Barotropic, 20
Bartusiak, Marcia, 200, 233, 241, 242, 258
Barycenter, 16, 26, 33, 432, 433, 434, 435,
436
Baryshev, Yuri, 72, 73
Bass, Robert W., 93
Basu, Baidyanath, 45
Batavia, 13
Bathythermal, 105
Bathythermals, 105, 106
Batson, M., 208
Bauer, Henry H., 92, 190, 351, 353
Baum, Richard M., 223
BBT, 380
Beatty, J. Kelly, 211, 212
Beccaria, 14
Bekenstein, Jacob, 243
Belcher, Capt. Sir Edward, 129
Belknap crater, 202
Bell, J. V., 127
Benedict, William S., 208
Bentley, Richard, 287
Bergson, Henri, 300
Berlinerblau, Jacques, 436, 437
Bibring, Jean-Pierre, 160
Bidin, Christian Moni, 256, 257
Big Bang theory, 247, 258, 259, 263, 270, 273, 274, 275, 347, 349, 350, 382
Bimodal, 65
Binaries, 55, 65, 66, 295, 411, 413, 415, 416
Bode, 94, 95, 100, 101
Bongard, Max, 208
Bonazano, 23
Borgia, Michael, 221
Boroson, 160
Brown, Ernest W., 93, 103, 104
Brown, T. T., 80, 284
Brown, T.T., 78
Brown, Thomas Townsend, 78, 288, 363, 394, 429
Browne, Malcolm W., 255
Buber, Martin, 230
Burbidge, Geoffrey, 317, 395
Burgess, 140, 199, 204, 206, 211, 220
Burke, Bernard, 297
Burkhardt, Charles E., 312
Burnham, Robert, 196
Bush, Stephen G., 401
buttercup, 121
butyric, 188, 189, 215
Cabrol, Nathalie A., 145
Calabi , Eugenio, 280
Calder, Nigel, 131
Cameron, R. C., 414
Campbell, John W., 254
carbonates, 106, 144, 146, 163, 182
Carnegie Institute, 253
Carol, Lewis, 272
Carr, M. H., 195
Carr, Michael, 148, 151, 154, 193, 194
Carr, Michael H., 173
Cassini, 222
Casti, J. L., 125
Catling, David C., 146
Cattermole, Peter, 150, 151, 160, 162, 163
celestial cosmology, 238
CELESTIAL MECHANICS, 3, 8, 429
Celletti, Alessandra, 102
centripetal, 18, 29, 30, 31, 36, 40, 56, 300, 432
Chadwick, Andrew John, 9
Chaikin, Andrew, 189, 191, 233
Chaldeans, 219
Chandrasekhar, 266, 269, 270
Chandrasekhar-mass, 269
Chapman, Clark R., 136, 168, 169
Chard, Chester, 130
Charlesworth, 128
Chasma, Echus, 152, 153
Christiansen, Eric H., 150
circumnavigation, 303
Clark, Jonathan D., 166
Claudius, 357, 358, 359, 361
Clifford, Stephen, 156
Clube, Victor, 186
CO2, 141, 144, 145, 146, 157, 188, 203, 205, 206, 214, 223, 224, 233
Cobb, William, 421
Cohen, I. Bernard, 8
Cohen, L. I., 216
Einstein, Albert, 73, 74, 78, 84, 92, 93, 100, 255, 276, 294
El-Baz, 175
electrohydrodynamics, 41
electromagnetism, 6, 14, 15, 18, 20, 21, 28, 34, 35, 37, 38, 42, 55, 56, 57, 58, 60, 63, 64, 65, 71, 72, 78, 83, 91, 93, 177, 237, 238, 250, 251, 252, 253, 254, 260, 266, 284, 288, 292, 293, 297, 319, 320, 332, 335, 336, 349, 350, 351, 352, 362, 364, 365, 401, 402, 403, 404, 406, 409, 414, 428, 430, 431, 437
Eliot, T. S., 292, 293
earth, 86, 90, 288, 324, 325, 326, 328, 329, 330, 331, 332, 333, 334, 335, 337
Euboa, 9
Euler, 86, 87, 88
exoplanets, 52, 53, 55
Exoplanets, 52
expanding-universe, 338, 347
exponential divergence, 99
Expurgatorius, 17, 436
Extrasolar Planetary Systems, 100
Farber, Sandra, 393
Farouk, 175
Farrell, Joseph P., 324
Farrington, Benjamin, 355, 356
Faure, Gunther, 201
Fekel, Francis C., 45
Feldman, Anthony, 209, 234
Fernando Atrio-Barandela, 273
Feyerabend, Paul, 72, 236, 349, 363
Feynman, Richard, 265, 280
Findt, Max H., 118
Firestone, 135
Firsoff, V. A., 216
Fleming, Christopher A., 9
Floquet, M., 66, 413
fluctuations, 56, 108, 247, 329, 335, 410, 423
fluvial, 145, 148, 153, 154, 157, 181, 184, 197
Ford, J. Glyn, 9
Ford, Joseph, 72
Francis, Gregory E., 310
Frankel, Charles, 173, 174
Frankenstein, 430
Franklin, Benjamin, 14
Franklin, Kenneth, 297
Freeman, Ken, 255, 256, 274
Freudian, 63, 232, 233
Friedman, Ken, 274
Galileo, 9, 11, 64, 69, 70, 71, 81, 222, 231, 339, 342, 351, 361, 362, 386, 394, 395, 396, 401, 402, 436
Gardner, Martin, 239, 261, 292, 300, 304, 321
Gates, Evalyn, 271
Gaukroger, Stephen, 306
gauss field, 414
Gedalin, Michael, 48
Gefter, Amanda, 273
General Relativity, 18, 19, 37, 295, 336, 347
gocentric, 6, 238, 254, 277
geomagnetic field, 412, 418, 419, 424
geomagnetosphere, 419, 420
gophysical, 150, 182, 192
Gerber, Paul, 296
Gershwin, Ira, 272
Gilbert, Diana, 336
Gilbert, Harry, 336
Gilluly, James, 11
Gilmour, Ian, 166
Ginenthal, Charles, 2, 100, 126, 136, 179, 205, 229, 347, 352, 353, 406, 408, 409, 426
Ginsparg, Paul, 284, 285
glaciations, 107, 108, 110
Glashow, Sheldon, 278, 284, 285
GLASS CEILING, 4, 223
Glass, Billy P., 193, 198, 211
Glasstone, Samuel, 169
Gleisner, Marcelo, 260, 261
Goldberg, Rubie, 109, 208, 279
Goldhaber, 269
Golombek, Mike, 166
Goodavage, Joseph, 254, 255
Goodson, Patricia, 231
Gordin, Michael D., 122
Gordin, Michael D., 6, 122, 123
gorillas, 232, 234, 236, 237
Gould, Stephen Jay, 115, 362
Gouldsmith, 312
Grady, Stephen M., 179, 180
Graham, Alan, 108
Grand Canyon, 158, 159, 160, 199, 201
Graneau, 294, 297, 311, 328
graviton, 37, 40, 281, 288, 289, 321, 322, 323
Greco-Roman, 357
Greek, 6, 63, 116, 240, 253, 286, 297, 356, 357, 358, 368
Greeley, R., 196, 199
Green, Longman, 93
Greenberg, Lewis M., 93, 190, 207, 220, 229
greenhouse effect, 139, 142, 143, 145, 146, 149, 185, 189, 190, 214, 215, 216, 217, 224, 225, 227, 228, 229, 231
Greenland, 107, 249
Gribbin, 406, 422, 423, 424
Gribbin, John, 322
Grimm, Robert, 191
Grin, Edmund A., 145
Grinspoon, David, 191, 192
Griv, Evgeny, 48
Grove, A. T., 131, 132
Gullick, Virginia C., 197
Guth, Alan, 257, 260, 289
Guthrie, R. Dale, 121, 133, 134
Gutro, Rob, 272, 273
Gwynne, Pete, 203
Habitable Zone, 52, 138, 141, 181
Hafele, J. C., 303, 304
Hafele-Keating, 303, 304, 305, 306, 308
Hahn, Roger, 91
Halley, 85, 90
Hamblin, W. Kenneth, 150, 162
Hamilton, Warren E., 192
Hansen, 207
Hapgood, Harold, 121
Harland, David H., 174
Harland, David M., 197, 202
Harper, William L., 94, 95
Harris, Herbert, 121
Hartmann, William, 151
Hartmann, William K., 170, 203, 210, 211
Harwit, Martin, 101
Hassan, M. H. A., 175
Hauber, 153, 154
Havnes, O., 415
Hawaiian Islands, 20
Hawking, Stephen, 115, 238, 391
Hayes, 100, 176
Haynes, Gary, 135
Hebrews, 219
Hedin, Anders, 131
heliocentric, 253, 401
helium, 176, 209, 269, 382, 383, 415, 416
Henon, Michael, 68
Henry, Gregory W., 45
Herbert, Nick, 392, 393
Herschel, Sir John F. W., 114
Heschel, 404
Hess, H.H., 425
Hesse, Mary B., 114, 115
heuristic, 27, 86, 95, 104, 240, 323
Hiesinger, H., 171
Higgs, Peter W., 264
Hilbert, David, 374
Hills, 2, 94, 97, 100, 121, 122, 127, 152, 205, 284, 382, 386
Himalaya, 132
Hipparchus, 317, 359, 360
hypsithermals, 105
Hitching, Francis, 121
Hoagland, Richard C., 163
Hoffman, John, 204
Hofstadter, 372
Holland, Heinrich, 143
Holocene, 128, 132
Holton, Gerald James, 401
Hooper, Dan, 240
Hovenier, 207
Hubble, Edwin, 338, 339
Hugget, Richard J., 177, 178
Hugo, Victor, 353
Hunt, Garry E., 222
Hunten, D. M., 177, 188, 198, 207, 226, 227
Huxley, Thomas H., 229
Huygens, Christiaan, 73
hydrofluoric acid, 208, 209
hydrogen-bonding, 20
hydrologic, 107
hydrology, 145, 147, 181
hydrothermal, 153
Hynek, Brian, 153
hypsithermal, 126, 127, 128, 129, 130, 132, 139
Illeging, V., 66, 180
imbricated, 165, 166, 183
Imbrication, 165
Indonesia, 13
inductions, 113, 114, 115
Inglefield, 129
Inquisition, 70
interferometer, 327, 328, 329, 330, 332, 333, 334
interglacial, 105, 106, 107, 108, 110
interstellar, 48, 51, 52, 53, 57, 97, 98, 99, 337, 381, 385, 387, 390, 392, 415
Io, 174, 193, 194, 195, 196, 197, 198, 202, 219, 226
ionospheric, 20
Isostasy, 19
Ivanov, Boris A., 198
James, Peter, 122
James, S., 28, 29
Jammer, Max, 287, 288
Jastrow, Robert, 8
Jaumann, R., 171
Johnson, Kirk R., 211
Jones, Barrie William, 212
Jones, H. Spence, 214
Jones, Sir Harold Spencer, 212, 214, 234
Joos, Georg, 329
Jowett, B., 355
JPL, 161
Judaism, 230
Juergens, Ralph E., 64, 218, 368, 410, 421
Jupiter, 36, 37, 38, 49, 51, 52, 59, 64, 69, 73, 84, 85, 86, 87, 88, 89, 90, 91, 95, 97, 98, 100, 102, 180, 193, 204, 219, 222, 241,
297, 342, 367, 384, 387, 390, 394, 410, 425
Kaempffert, 92
Kaku, Michio, 277, 283, 322, 365
Kargel, 140, 141, 145, 147, 148, 153, 154, 155, 163, 164, 165, 172, 181, 182
Karlsson, K. G., 317, 318
Kashlinksy, Alexander, 272
Kashlinsky, 273
Kasting, James, 138, 143, 145, 146
Kaula, 51
Keating, R. E., 303, 304
Kelvin, Lord, 334, 393
Kerr, Richard A., 106, 137, 200, 227, 233
kilometer-sized, 48
kinematics, 26
King, Captain Jean I. F., 215
King, Ivan, 66, 68
King, Jean I. F., 214
Kinoshita, Tochiro, 304, 310
Kirkpatrick, Larry D., 310
Klein, 134, 375, 376
Klein, Morris, 186, 375
Kleinhans, Maarten, 154
Koestler, 184
Köhler, 59, 94, 96, 97, 100, 101
Kolmogorov, 96, 97, 101
Komatsu, Goro, 156, 197
Kopal, 220
Koranyi, Daniel, 338, 339
Koyré, Alexander, 70, 71, 386
Kragh, Helge, 369, 370
Krauss, Lawrence M., 243, 246
krypton, 209, 233
Kumler, Dan, 82
Kunzig, Robert, 108
Kurt Gödel, 275, 336, 372, 375
Kusky, Timothy M., 195
Lagrange, 85, 86, 111, 363
Lakatos, 236, 237
Lakatos, Imre, 236, 237, 397
Landsberg, P. T., 303
Landstreet, D., 42
Landwehr, J. M., 105, 106, 107
Lang, Kenneth R., 50
Laplace, 17, 84, 85, 86, 87, 88, 89, 90, 91, 93, 94, 95, 97, 99, 101, 103, 122, 363, 436
Laplace-Lagrange-Poisson-type, 93
Large Hadron Collider, 263, 264, 265
Laughlin, Robert B., 285
LaViolette, Paul A., 62, 78, 80, 296, 337
Lawrence, Colin, 203, 214, 215
Lederman, Leonard, 336
Leibnitz, 368
Lemmonier, 14
Leovy, Conway, 146
lepton, 290
Lerner, Eric, 238, 247, 286
Lettis, William R., 309
Leventhal, Jacob J., 312
Lexall, 59
Lin, D. N. C., 97
Lindblad, Bertil, 241
Lindley, David, 257, 260, 265, 286, 294
Lindzen, Richard, 14
Lindzen, Richard S., 13
Lissaur, J. J., 97
Lloyd, G. E. R., 358
Lodge, Sir Oliver, 356
Logan, Robert K., 69, 70
logic-clocks, 306
Lopes, Rosaly M. C., 193, 194, 197
Lopez-Corredoria, Martin, 318
Los Alamos National Laboratory, 249
Lowmay, Paul, 138
Lubbock, John William, 75
Lubow, S. H., 412, 413
Lucknow, 131
Ludwig, K. R., 106
luminosity, 140, 248, 267, 268, 338
Lyampunov, 99, 102
Lyampunov, Aleksandrov M., 99
Lyttleton, R. A., 104
Macedonian, 116
MacGorman, D. R., 14
MacGregor, Malcolm H., 311, 312
macrouniverse, 276, 321, 377
Magellan, 188, 189, 191, 195, 200, 208, 233
Magnesium, 163, 182, 197
magnesium sulfate, 163, 182
magnetars, 46
magnetometer, 20
magnetosphere, 27, 38, 61, 236, 408, 412, 419, 425, 426, 428
Magueijo, João, 278
Malmquist, 267
Mammoth, 69, 121, 126, 127, 128, 129, 131, 133, 386
manifolds, 281, 285, 289
Manning, Michael, 98
Manuel, Oliver, 383, 384, 388, 391
Maran, Stephen P., 52
Mariner, 136, 138, 159, 165, 169, 172, 176
Markson, Ralph, 421, 422
Marmet, Louis, 339
Masursky, H., 195
mathematical charlantry, 371
Mathis, Miles, 18, 24, 29, 59, 60, 63, 77, 84, 91, 98, 264, 265, 295, 313, 319, 334, 344, 350, 352, 353, 403, 404, 431, 436
Matthews, Robert, 285
Mauna Loa, 109
Maunder, 366, 367
Maury, Lieut., 13
Maxwell, James Clerk, 63, 367
Maxwell, Ted, 154
maypole, 78
McCutcheon, Mark, 73, 366
McElroy, M. B., 177
McEwen, 171
McGill, G. E., 195
McKenzie River, 202
McKinnon, William B., 198
McLaughlin, Walter, 98
McNamara, Geoff, 255, 256, 274
megafloods, 166
Melosh, H. J., 198
Melosh, Jay, 156, 170, 171, 184
Melville, George, 82
Menzel, Donald, 64
Meryman, Harold T., 121
Message, P. J., 95
Meyer, H., 214
Michael Carroll, 193
Michelson, A., 331
Michelson, Albert, 325
Michelson, Irving, 16, 59, 77, 98, 436
Michelson-Morley, 325, 326, 328, 333, 336
Middleditch, John, 267
Milgrom, 243, 244, 250, 251
Milgrom, Mordehai, 243, 250
Mill, John Stuart, 96
Miller, D. C., 331
Miller, Dayton, 328, 331, 333
Miller, Dayton C., 328, 331, 334
Miller, George David, 237
Miller, Ron, 203
Millikan, Robert, 62, 328
Milne, 369
Milton, Earl, 406, 417
Milton, Richard, 81, 82
Ming, 181
Mitterer, John O., 388
MOC, 153, 161
Moffat, John W., 270, 271
Mohler, Nora M., 368
MOLA, 153, 161, 162
molybdenum, 382, 383
monograph, 63, 187
Monte Carlo, 316, 317
Moore, Patrick, 136, 172, 176, 214, 222, 223
Moran, Gordon, 385, 386
Morley, A., 331
Morley, Edward, 325
Morrison, 142, 143, 176, 194, 229, 230
Morrison, David, 142, 143, 145, 194, 217, 218, 229
Morrison, Philip, 100
Morrison, Samuel Elliot, 119
Moser, J., 110
motor, 41, 81
Motz, Lloyd, 84, 92, 100
Mount Elgon, 109
M-theorists, 278
M-theory, 278, 282, 321
Mulholland, J. Derral, 125, 126
rotational axis, 46, 54, 65
Rubin, Vera, 242, 248, 249, 253
Russell, Bertrand, 373, 374
Russell, David G., 346
Russell, H. N., 351
Russell, Jeffrey Burton, 119
Rust, W. D., 14
ruthenium, 382, 383
Sagnac, Georges, 325, 328
Sandage, Alan, 339
Sanderson, Ivan T., 120
Santos, Arysio, 123
Saturn, 50, 51, 59, 73, 84, 85, 86, 87, 88, 89, 90, 91, 95, 100, 204, 425
Saunders, 196
Saxl, 74, 75, 76, 77, 80, 81, 238, 239, 284, 288, 332, 363, 394, 406, 411, 416, 417, 419, 429
Saxl, Edwin, 73, 411
Saxton, C. S., 222
Scarpa, Riccardo, 239
Schadewald, Robert J., 59, 63, 213, 214, 215
Schneider, Stephen H., 139
Scholium, 9, 11
Schroedinger, 293
Schumacher, Arnold, 20, 21
Scoular, 18, 73, 259, 261, 281, 282, 283, 288, 292, 322, 323, 324, 350, 365, 366, 374, 377, 404
Scranton, Laird, 15
SDSS, 318
Sears, Paul S., 127
Sediments, 162, 208
Seife, Charles, 292
Sekhmet, 219
self-interaction, 262, 281
self-referential, 372
self-validating, 114
semi-diurnal, 14
semi-major, 35, 86, 89
Senway, Raymond A., 310
Sephton, Mark, 166
Settle, Thomas, 70
Severyn, 416
Shankland, R. S., 328
Shansi, 181
Shapley, Harlow, 10, 16, 84, 138, 254, 297
Shermer, Michael, 229
Shklovskii, 214, 383
Shostak, G. Seth, 222
Shu, F. H., 412, 413
sideward/tangential, 30
Siegel, 96
signal-to-noise, 231
Silk, Joseph, 393
Silverberg, Robert, 129
Singh, Gundip, 131
six-dimensional, 280
Slossen, Edwin, 328
Smart, W. M., 93
Smithsonian, 52, 98, 154
Smolin, Lee, 18, 21, 262, 279, 351, 364, 391, 403
Smrekar, Suzanne E., 195, 196
Soderblom, 168
solenoid, 426
Sonoma State University, 15
Sophocles, 63
Soviet Union, 369
Sowers, Jane M., 309
space-time, 258, 259, 267, 335
special relativity, 81, 304, 307, 308, 309, 310, 312, 313, 324, 325, 332, 333, 347
SPECMAP, 107
spectroscopic, 45, 55, 65, 66, 212, 231, 413
spiders, 375
Spitsbergen, 128
St. Helena, 20
STABILITY-INSTABILITY, 3, 24
stationary-wave, 21
Steffes, Paul, 224
Stephenson, Richard, 122
Steward, James Q., 122
Steward, John Q., 122
Stewart, John Q., 410
Stofan, Ellen R., 195, 196
Stott, Philip, 327
straight-line, 31, 70, 86, 87, 89
Strait, G. Carroll, 350
Strauss, Michael, 338, 339
Strom, R. S., 195
Strom, Robert G., 148
Stucky, Richard K., 211
subatomic, 249, 260, 263, 264, 271, 276, 277, 280, 281, 284, 310, 313
subquantum, 78
SULFURIC ACID, 3, 207
sulfur-rich, 184, 197
Sullivan, John, 365
sunspots, 342, 394, 415, 421
superacceleration, 258
supercluster, 247
supercooled, 258
supermagnet, 352, 392, 428
supernova, 266, 267, 268, 270, 381, 385, 388, 389, 390
superstring, 18, 276, 277, 278, 280, 284, 292, 321
supersymmetric, 280, 290, 292
Sussman, 99, 100
Swift, Jonathan, 24, 368
Sympson, Richard, 24
synoptic, 107
Talbott, Dr. George Robert, 189, 190, 365
Tallis, J. H., 127
tangential, 30, 31, 32, 34, 40, 41, 56, 61, 426
Tarim Basin, 131
tarsis, 160, 162, 165
Tassoul, Jean-Louis, 46, 65
tau Scorpii, 42, 43, 44, 47
Tauri, T, 209, 344, 346
tautology, 96, 109, 110, 308
Taylor, Edith, 128
Taylor, F. W., 206, 225, 229
Teerikorpi, Pekka, 72, 73
telegenic, 378
teletype, 419
temperate zones, 127, 150
tensor, 30, 40, 41, 288
Teresi, Dick, 263, 336
Terre, 107
terrile, R. J., 195
Thagard, Paul, 234
THEMIS, 152, 161
thermonuclear, 269, 270
Thompson, Jennifer, 365
Thompson, Sir William, 366
Thompson, Stanley L., 139
Thorne, Kip S., 336, 337
Thorp, Nick, 122
three-component, 20
Thurow, Lester C., 119
TIDAL THEORY, 3, 9
tired-light, 338
Titus-Bode-type, 101
Tomasko, M. G., 227
Tomirdiaro, 129
Tomirdiaro, V., 128
Tompkins, Peter, 22
topographical, 159, 162, 163, 226
torque, 39, 40, 41, 42, 47, 48, 50, 51, 52, 53, 57, 60, 81, 275, 333, 428
torques, 40, 53
totalitarianism, 371
Touma, Jihad, 148
Towner, M. C., 172
trajectories, 86, 99, 110, 429
transforms, 309, 322
Trefil, James, 242
Trifft, William, 315, 316
triple-point, 140
Triton, 53, 54, 55, 58
Tsubono, 311
Tsubono, Youhei, 311
Tully-Fisher, 341, 345, 346
tundra, 126, 130, 133, 134
Turkestan, 131
Turner, Dean, 327
Turner, Michael, 393
Turner, Michael S., 270
Tuttle, Robert J., 341, 342
Twain, Mark, 123, 397, 400
Ulenbeck, 312
Ulivi, Paolo, 197
ultramafic, 197, 198
ultra-quantum, 306
unfalsifiable, 111
Un-Unified Field, 18, 25, 30, 34, 36, 40, 73, 87, 309, 345, 432
Unzicker, 265
Uranus, 51, 87, 89, 169, 204, 425
Urey, Harold, 176
Uzer, T., 351
Valles Marineris, 152, 153, 159, 160, 165, 183
Vallis, Baltis, 197
Van Andel, Tjeer H., 107
Van Flandern, Tom, 7, 48, 49, 51, 186, 267, 302, 303, 311, 321
Varshni, Y. P., 348
Veltman, Martinas J. G., 265
Veltman, Martinus, 261, 262
Venera, 200, 201, 206, 208, 224, 225, 228
Vickery, Ann, 149, 150
Viking, 151, 153, 159, 161, 163, 165, 174, 175
Visual Cognition Laboratory, 232
Von Braun, Werner, 76
Von Zahn U., 205, 206
VOSTOK, 107
VULCANISM, 194
Wagner, Richard, 162
Wainwright, Sonya, 202
Wald, Robert M., 336
Wallace, D., 150
Warwick, James, 54, 64, 65, 413
Waters, Aaron C., 11
waterspouts, 22, 23
Weaver, Kenneth F., 136, 172
Weissman, P., 181
Welch, Joseph N., 230
Wellington, 129, 130, 180
Wells, H. G., 283
West, 128, 135, 333
Westfall, Richard, 10
Wetherill, 168, 169
Wheeler, John, 350, 393
Wheeler-DeWitt, 323
whirlpool, 42, 252
Whitehead, 369, 373
Wick, David, 319
Wiggins, Arthur W., 282
wiggles, 103
Wikipedia, 18, 19, 23, 46, 47, 52, 55, 321, 334, 343, 390, 433, 437
Wildt, Rupert, 213, 214
Wilford, John Noble, 188
Wilker, Karl, 230
William, Ruth M., 303
Windsor, Samuel, 408
Winneke, A., 222
Winograd, 106, 107
Winograd, Isaac, 105, 107
Wisconsin, 132
Wisdom, 97, 99, 100, 102, 349
Wisdom, Jack, 148
Wittenberg, 22
wobbles, 103, 104
Woit, Peter, 265, 278, 285
Wolf, U., 171
Wolff, Sidney C., 44
Wofford, A.O., 11
Wright brothers, 81, 430
Wynn, Charles M., 282
X-ray, 44, 68, 201, 273
Yakutia, 128
Yau, Kevin, 181
Yau, Shing-Tung, 280, 281, 371, 372
Yeoman, D., 181
Young, Andrew T., 207, 208
Young, L. G., 231
Zahnle, Kevin J., 198
Zavattini, E., 335

Zubin, Robert, 162
Zwicky, Fritz, 241, 337
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