THE BURNING OF TROY

AND OTHER WORKS IN QUANTAVOLUTION AND SCIENTIFIC CATASTROPHISM

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METRON PUBLICATIONS PRINCETON, N.J., U.S.A.

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To

Eugene Vanderpool

Friend of the Agora of Ideas

FOREWORD

Entering a sparsely occupied and generally unknown region of thought is like moving into a new land. The vistas are fresh, the soil unbroken. One wishes to settle down, put in roots, build a house, raise a family. Yet the very restlessness that carried one to the frontier will not subside. There is an opportunity to do everything, it seems; the whole world attracts one and is in need of attention. So it often happens that an erratic and mobile existence evolves. An energetic spell of construction ensues; a cabin is built, animals are bred, a garden is grown, a mate is enticed, a stone wall begins to go up. Then the winds blow, the wild animals pass heading upland, the rising sun beckons and the moon waxes nervously full. Off one goes, leaving the finished things, the half-finished work, freeing the pigs, and letting the roots wither. Now it is a new sight very day, a spring discovered, a strange bird and animal, a day fishing, a day hunting, a day in the hollow of a tree with a pain. The wonders of the region spin unendingly with the vault of heaven. One is not fulfilled, but then one was not fulfilled before: such is the curse and its thrilling clutch upon the pioneer.

I had thoughts akin to these while preparing this book. It contains pieces from everywhere, notes and essays, topics vigorously attacked and promptly abandoned, because one is moved by a different wondering. The earliest piece, concerning the mind of scientists, was written decades ago, the last piece just the other day. Some of the work reminds me of an abandoned plot of frontier land: if only a person had stayed there, he could have built a life upon it, as neat as a Swiss chalet. And is the world not built upon the stable creations of centuries? Yes -- but also upon the scouting parties, the forays, the fantasies.

My friend Gerd Roesler came from Germany to an island of the Aegean, to Stylida on Naxos, and I came there too. And there was none on the wild promontory and he wrote his Master's thesis on the geology of Stylida, and years passed, and he wrote his Doctoral thesis on the geology of the whole island, but after all of that he comes back and builds a house next to mine, which

has stood alone all the while except when I might be there. Knowing much more of geology than I, to him the promontory was very old, whereas to this natural philosopher, it seemed very young. So we stand upon it side by side, and I say to him, "You see, Gerd, Stylida is young, even by your evidence." And he replies: "No, Alfred, these rocks are millions of years old... but maybe..." and he laughs, for he likes the feeling of the frontier, too.

TABLE OF CONTENTS

Foreword

1. The Quantavolutionary Scan

Part One: Historical Disturbances

- 2. The Burning of Troy
- 3. The Founding of Rome
- 4. Micah's Ark
- 5. The Catastrophic Finale of the Middle Bronze Age
- 6. Updating Schaeffer's Destruction Inventory
- 7. Nine Spheres of Venusian Effects
- 8. The Obliteration of Human Signs
- 9. Ancient Astronauts

Part Two: Geological Issues

- 10. Indians of Illinois
- 11. Ice Cores of Greenland
- 12. A Failed Excursion to the Caves of Aquitaine
- 13. The Latecoming Olduvai Gorge
- 14. Athens Quakes

Part Three: Working of the Mind

- 15. Comptinology and Tohu-bohu
- 16. Sandal-straps and Semiology
- 17. Making Moonshine with Hard Science
- 18. Holy Dreamtime in Wonguri Land
- 19. The 'Unconscious' as a Literary Revolt Against Science
- 20. O.K. Origins
- 21. Jupiter's Bands and Saturn's Rings

Part Four: Polemics and Personages

- 22. Marx, Engels, and Darwin
- 23. Religion and Education
- 24. The Outlook of Scientists
- 25. 'Scientific' Reporting
- 26. Eulogies to Three Quantavolutionaries

Part Five: Communicating a Scientific Model

- 27. A Cosmic Debate
- 28. Syllabi for Quantavolution
- 29. I.Q.: A University Program
- 30. Past, Present, and Future

CHAPTER ONE

THE QUANTAVOLUTIONARY SCAN

The nature that offers itself to our view, which includes the solar system, the earth, and the biosphere, assumed its present form in a series of sudden leaps, occurring over short periods of time. So goes the theory of quantavolution. Besides the idea of sudden leaps, other principles are basic. First the original source of great changes in the nature of the earth and man has been in the skies. Second, the latest period of time, roughly the holocene period, say 14,000 years, has witnessed catastrophes. Third, the great changes of recent times have created modern humans. In sum, nature and mankind have been recently catastrophized and transformed by forces of exoterrestrial origin.

Science is full of controversies. It thrives upon dispute. Catastrophists are far fewer than uniformitarians, but they are, if anything, more disputacious, both amongst themselves and with others. Those who interpret natural history by the "sudden leap" of quantavolution or catastrophe may not accept even one, much less all three of the aforesaid principles.

For instance, one of the greatest current catastrophists, the geophysicist Melvin Cook, has treated a broad range of problems in the fossil record, movement of continents, radiodating, and atmospheric changes without resort to comets or other exoterrestrial forces. Another, Donald Patten, a geographer, makes it quite clear that his work is related to and supported by Christian theology. The most famous catastrophist, Immanuel Velikovsky, did not challenge the presumption that mankind is very ancient; although unfriendly to Darwinism, he might well disagree with some of the mechanisms and interpretations of human events that I have proposed. He would probably disagree as well with other theories connected in my opinion necessarily with the catastrophic model. These three examples could be multiplied.

A practical difficulty faces a student of general quantavolution in that its materials are nowhere properly indexed as such and no special library of the field exists. Until lately, it has been the unwritten rule in scientific journals to "tone down" any indications of catastrophism in articles and especially in titles. Still I have come upon many hundreds of relevant items. They emerge mostly from conventional sources of science. A smaller number are centered upon quantavolution, with the appropriate perspective, and these are found in only several special magazines or in old scientific sources. One moves among the conventional literature with a practiced glance, like an archaeologist spotting bitty shards among tons of debris.

William Corliss publishes at Glen Arm, Maryland, a quarterly scan of anomalistic material, "Science Frontiers", often quantavolutionary it so happens. Thus, examining a list of fourteen items, which he chose for Number 15, Spring 1981 -and these are only a fraction of the works published around the time -- my brain was twitched by every one of then, and I would like the reader to see how these raw twinges first enter the mind:

- "Ancient Basque inscriptions are identified by noted 1. expert on the so-called Mechanicsburg Stones of Pennsylvania." Yes, Basque dwellers of the Tethyan Sea, fringes of Atlantis, survivors of 6000 B.C., see Chaos and Creation. (NEARNA Journal)
- "Agriculture was not a step forward in human development." Yes. Why plant when you can reap without sowing. Probably a response to ecological stringency; humans could plant immediately; cultural hologenesis. (Science)
- "New discoveries of buried and changed Stonehenge 3. stone configurations." Cf. changed and variant stone and temple orientations also in Mesoamerica. Earth tilts involved. As sky changes, orientations change. (Nature)
- 4. "Continental crust found 450 miles west of Gibraltar." Possible Atlantis material, sunk and left behind by rapidly rafting land masses moving both sides of the Rift, perhaps in the Saturnian deluge period. (Baltimore Sun, AP)

- 5. "Distant galaxies resemble near galaxies." Yes, cf. *Solaria Binaria*. Short time. No "Big Bang." (*Science News*)
- 6. F.E. Segal on "tired light." Light not tired. Just Busy. Gravitation very tired, needs to be re-tired. (*Nature*)
- 7. On "free quarks." Not only are "fractional charges…almost as unnerving as irrational numbers," but so too the ideal of infinite regression (or progression) in the 'size' of events: "man is the measure of all things" -- hardly. (*Science*)
- 8. "Do bacterias think?" Everything thinks, "Higher organisms, cf Homo Schizo, conduct more elaborate transactions with the environment (and internally) to achieve "the thinking effect". (*Psychology Today*)
- 9. Quick evolution: quantavolution of immunological systems, in re Ted Steele's studies. Functions of organisms have their own bio-time, time not absolute. Life-career (birth to death, etc.) is subjectively concept of the dominating ego, cf. *Homo Schizo*, momentarily in charge: the trapped soul? How free is it if it is in a paraelectric frame? (*New Scientist*)
- 10. Cf deep thrusting and folding burial concept in M. Cook's *Earth Models*, also my *Lately Tortured Earth*. Deep is *very* deep, perhaps embracing the surface (including exoterrestrial) origins of Soter and Gold's erupting, abiogenic, natural gases. *(Geotimes)*
- 11. Iceland a meteorite crater, according to Whipple, with high iridium at Cretaceous-Tertiary boundaries. Cf. galloping continental drift in *Chaos and Creation*. Was the C-T boundary laid down yesterday in the chaos of Earth parturition and Moon eruption and escape? (*New Scientist*)
- 12. "The Novaya Zemlya solar mirage" is likely, along with many such early phenomena of the disordered skies, to sponsor some fine animistic legends of the heavens. (*Physics Today*)

- 13. *In re* admitted "ice-ball fall in England," page C. Fort's comparable cases. Electrical fashioning of balls, see E. Crew's new essay. (*J. Meteorology -UK*)
- 14. Lorber's work on an intelligent human with 1/10 normal brain matter fits Homo Schizo theory, where I develop the concept of humanness being largely independent of the large brain but a product of self-awareness, of the fearful loss of instinctual integrity. (*Science*)

The Society for Interdisciplinary Studies (London) publishes *Workshop*, containing quarterly annotations of a score and more of titles relevant to quantavolution studies. Thus, the eye catches the following points of the varied list of Volume 5:1 (1982).

- 1. New 700 B.C. Martian period tablet: "The natural order of things somehow has gotten reversed and the response of the high gods, the Shaddayin, is to turn day into night." (Bull. Amer. Schl. Orient. Res.)
- 2. More material on the Thera disaster (of -1100?) and the confusion of dates. Tsunamis devastate Greece and the Near East.(*Bib. Archaeol. R.*)
- 3. Reviews special issue of *Frontiers of Science* on Velikovsky's work.
- 4. The disputed case of Prof. A.C. Arp, who faces shutdown of project because he believes quasars are close, not exceedingly remote, relative to our galaxy. (*Daily Telegraph* report 9 March 1982).
- 5. Critique of N. Hembest's attack on 3 different theories of rapid (i.e. catastrophic) shifts of Earth's poles. (*The Unexplained*, magazine).
- 6. Some birds (e.g. Japanese quail and zebra finches) are unexpectedly in-breeders, not out-breeders, contra "need" for genetic variability. (New Scientist).
- 7. Two newly spotted asteroids make total of 40 on Earthcrossing orbits, ergo potential encounters. (*New Scientist*).

- 8. Soviet Venera 13 and 14 results show solar radiation is absorbed by Venus at 60 km and the clouds are mostly sulphur. How can "greenhouse effect" work with these conditions? Implication: Venus heat is internal. (Aviation Week and Space Tech.)
- 9. Viking Orbiter pictures heavy meteoric, volcanic, and erosional effect on Mars, with possible meandering dry river systems. (*New Scientist*). Was Mars once (lately) biophile?
- 10. Review of "Burt Scandal" (BBC radio 4) on ethics and prestige of scientists.
- 11. Controversy over evidence of "plate tectonic" continental drift without continents on Venus (Venera 14 findings) (BBC, *Science in Action*).
- 12. On the temperature extremes endurable by dinosaur's eggs. (New Scientist, Corriere del Ticino)
- 13. A primitive "precursor" of the even-toed hooved animals (pigs) is now revealed to be of a different family (mouse deer), so another "missing link" is gone. (*New Scientist*).
- 14. Jurassic find in China exhibits an earlier line of mammals that may have evolved and extincted 30 million years earlier than accepted beginnings of present mammalia. (*New Scientist*).
- 15. The Eocene-Oligocene boundary is marked with extinctions, microtektites and high iridium levels of exoterrestrial event. (*New Scientist*).
- 16. Gravitational Constant may be changing, as applied to changing lunar orbit (*Astrophy. J.*) Is one more Absolute deteriorating?
- 17. Venus and Earth have different origins, or Venus had no potassium or lost its argon-40. (*New Scientist*).

- 18. Well-preserved Carboniferous Age fossil deposits near Glasgow, both marine and terrestrial, with confused sedimentation (*Nature*)
- 19. Source of earthquake lights in rock friction discharges (*New Scientist*).
- 20. Soviet Kola peninsula Bronze Age settlements contemporary with Mediterranean, with utensils and paintings, slate trade with far-off points. (*Soviet Weekly*). Possible polar shift or drastic (exoterrestrial) climate changes.
- 21. High proportion of Late Minoan Cretan copper artefacts made from Greek, not Cypriote, copper. (*Nature Science*). Culture shifts, or copper mine discoveries.
- 22. Density of wood in tree rings can indicate outer space events and exact weather data. (Soviet Weekly).
- 23. Reviews listed of Clube and Napier's *Cosmic Serpent* as indicating mood of scientific reception system *re* catastrophes.
- 24. Work of J.W. Follin on possibility of 4 billion year old solar system as a binary (report in *Memphis Commercial Appeal*).
- 25. Ophiolites (from oceanic crust) found in mountain sediments suggest catastrophic oceanbed lava extrusions buckling to form mountains. (*Scientific American*.)
- 26. Lack of texts -700 to -750 and erratic texts of mid-second millenium in Babylonian otherwise accurate Babylon records in R. Stephenson studies. (*New Scientist.*)
- 27. Low-density comet impact blamed for Tunguska 1908 event (U.S.R. & D. Associates, *New Scientist*).
- 28. Meteroid impacts (5 to 10 km diam.) may have created various large basaltic oceanic plateaus. (*Nature*.)
- 30. Comets now observed frequently to impact on Sun. (*New Scientist*).

- 31. High anomalous magnetism and radioactivity detected at megalithic sites may indicate ancient man had sensing devices for astronomical constructions. (*New Scientist.*)
- 32. Lunar rock magnetism without lunar magnetic field raises questions of origins of rock. (New Scientist.)

Most of the items were culled from conventional scientific sources such as the *New Scientist* and *Nature*. A much more extended, regular survey is obviously needed; still, that limited and antagonistic sources should provide access to so much relevant quantavolutionary material is noteworthy.

The eye the catastrophist (this quantavolutionary of primevalogist) is trained to see a record of natural destruction in the history of nature and man. Others, trained in uniformitarian ways of thought, will try to explain the same sight by gradual processes, or be oblivious of it. Niagara Falls, whose turbulence soothes the doubts of honeymooners, excites the catastrophist. For it cuts back into its source by a certain footage each year and this permits us to measure how long its gorge has been growing. Apparently only several thousand years have passed since the Great Wisconsin Ice Cap suddenly melted to create the Great Lakes and their Niagara outlet towards the sea. The age of the Falls has been reduced by 300% in consequence. But perhaps a great deluge and flooding created the lakes and a great earthquake the rift of the St. Lawrence River.

Let us continue our noting of some relevant studies, going back in time for a few years. On January 6, 1977, the *New York Times* reports the detection of a quake on Mars. One asks, for the hundredth time, "How can seismism shake celestial bodies that have supposedly been undisturbed and cooling off for billions of years?" The inconstant Sun? A recent encounter?

The eye notes an article in the newspapers of early 1976: a Soviet scientific expedition has moved into the territory of the Tunguska (Siberia) meteoritic explosion of 1908 where a flourishing new kind of forest has sprung up and new species of plants have been seen. The catastrophist thinks, "This explosion

has been long on my mind. If it had maintained its path for minutes longer before striking St. Petersburg (now Leningrad), the capital of the Russian Czars would have disappeared in heat and dust. The heat was fierce, in thousands of degrees; no wonder odd biological phenomena have occurred. But why the absence of a crater? Was the meteoroid actually an explosive gas cloud, and was it a gas cloud that blasted Sennacherib's great army besieging Jerusalem in 687 B.C.?"

In 1975 Soviet astronomers detect X-rays emanating from planet Saturn. X-rays signify a very recent explosion, a nova event, on a star. In a small nova, one that does not disintegrate the body completely, the shell blasts off, and the wounded body bleeds these rays for thousands of years. The quantavolutionary thinks: "Mythology from several places reports that Saturn, the planetgod, flew into a fiery rage...Velikovsky in 1965 wrote Harry Hess of Princeton, to urge that Saturn be studied for the emission of x-rays." And what a truculent monster appears to be the son of Saturn, Jupiter, upon examination by spacecraft.

In 1974 the astrophysicist Robert Bass demonstrates mathematically that the structure and motions of the solar system cannot be presumed to be stable even to one thousand years. Bass is a catastrophist. He is also sympathetic to biblical creationism. The quantavolutionary reads him carefully. "Will Bass lead me astray out of enthusiasm, or into the Promised Land? Will any uniformitarian arise now to challenge him, to prove his equations wrong, to defend what is after all the heart of the uniformitarian position, that the solar system is stable because the laws of Newton and the mathematics of La Place claimed them to be so?"

In 1974 oceanographer Cesare Emiliani of the University of Miami published results of core drillings showing that the Gulf of Mexico had filled with fresh waters from tremendous recent flooding and speculated that the event may have been tied to the sinking of Atlantis, with both occurring around 11,500 years ago. The catastrophist conjectures about the fresh waters of the Gulf of Mexico. First, they could be the floodwaters of the suddenly destroyed ice cap, an inconceivably great deluge, perhaps tied into the practically complete resurfacing of the earth about 11,500 years ago.

In 1974 the chemist John Anderson reports experiments indicating that radiocarbon activity, the chief present method of dating back to 50,000 years ago, was neither random nor constant. If the isotopes of radioactive carbon, for reasons yet unknown, decay sporadically or eccentrically, may not the method be unreliable?

In 1973, chemist Harold Urey, a Nobel prizewinner, conjectures that a cometary encounter with Earth could explain the abundant tektites from extra-terrestrial sources that are strewn about the world. Several scientists have collected and studied these small glassy stones and estimate their amount in the billions of tons. Since time immemorial the Chinese have called them "pearls of the dragon" and collected them. And Urey thought that the cometary collision might have annihilated the dinosaurs.

The dinosaurs looked like the Chinese dragon. Perhaps Urey is right in principle, wrong in time. Quickly the quantavolutionary puts on the cap of a mythologist. All heavenly animals (the Zodiac for instance) represent recognizable species; perhaps the most ancient men knew dinosaurs by sight. Thus the peculiar revolutionary vision, like that of a surrealist painter, contorts time and form, then settles down to give battle over the evidence.

In 1973, the geologist Derek Ager of Swansea College (Great Britain) writes that "the history of any one part of the earth, like the life of the soldier, consists of long periods of boredom and short periods of terror." Elsewhere he says, "the periodic catastrophic event may have more effect than vast periods of gradual evolution." He think that "for the ultimate control, sooner or later, we must face the possibility of an extraterrestrial cause, though in most geological circles one seems to be expected to blush when doing so." The catastrophist understands the dilemma of Ager: he longs to test his intellectual weapon, but the minds and materials of 150 years of science are constructed to refuse the test.

In the same year, 1973, I am reviewing, from the revolutionary perspective, evidence about the famed "Burnt City" of Troy. I concluded that neither the torch of the invader, nor accident, nor

earthquake, nor a single volcano had suddenly scorched and collapsed the famed Troy IIg. Multiple volcanic venting and extra-terrestrial electrical encounter had to be invoked to explain the observed facts and myths. Uniformitarian methods of a century had failed to identify the problem precisely and permitted not a whisper about the high energy expressions of catastrophes.

In 1972 the engineer Ralph Juergens announces his theory that the solar system was an electrical system operating on galactic fuel. Particles from the Milky Way bombard the sun, building up a heat that sends out the sun's radiance. (Concurrently, experimenters announced the failure to detect the sun's presumed neutrino output from its supposed atomic furnaces.)

The theory of Juergens poses a dilemma to catastrophists. Velikovsky adhered to the nuclear-furnace theory. He did not feel the need for Juergen's theory to win the war for catastrophism. C.E.R. Bruce and Eric Crew in England were catastrophists as well, whose interests, as pioneer and disciple, were in extending the discussion of cosmic electricity. They, too, disagreed with Juergens. Again, the quantavolutionary worries about the stultification of connections and internal disagreements.

But when Juergens publishes two articles on electrical types of destruction found lately on the Moon and Mars, the catastrophists agree and applaud. The electrical ravaging is by cosmic lightning and probably happened within the past several thousand years. Juergens general theory is held in abeyance. (It is, incidentally, accepted by me, and is used and extended by Earl Milton and me in the model of Solaria Binaria.)

In 1970 the palentologist D.J. McLaren, in a presidential address to his colleagues, reviews the wholesale extinction of species at certain times, and then ventures that a heavy meteoroid explosion should be introduced by way of explanation. Following an explanation of the effects of what I have since termed a "catastrophic tube,", he remarked, "this will do." He would have pleased George Cuvier, who for a century has entered the textbooks as "the father of fossil paleontology" but "unfortunately a badly mistaken catastrophist."

In 1968 René Thom publishes his first paper on the topological mathematics of catastrophe theory. After eight years, the less specialized media, such as the *Scientific American*, described his work. Actually, Thom is concerned with describing symbolically and graphically the basic types of ways in which situations build up and come crashing down.

In 1966 the geo-physicist Melvin Cook lays down a barrage of arguments against accepting uranium-lead, potassium-argon and other techniques for the dating of older ages. As a catastrophist, his accomplishments are numerous; none, to my knowledge, has so competently analyzed the overwhelmingly authoritative techniques of radio dating that have come to dominate geological, astrophysical, and archaeological dating.

In June 1956 the *New York Times* reports that the temperature of planet Venus, newly measured by radio astronomers, exceeded the boiling point of water. Studies increased in number; so did the estimated heat. When finally in the 1960's and later the space vehicles of the USA and U.S.S.R. reached Venus, they found a globe whose surface temperatures hovered around 925d. But in 1950, Immanuel Velikovsky had published *Worlds in Collision*. There he described Venus as hot to the point of candescence. He reasoned, mostly from ancient sources and legends, that it had ejected from Jupiter's region burning. Further, its erratic course through the skies had involved it in heat-provoking encounters of the second and first millennia B.C. with Mars, Moon, and earth.

In 1953 geologists Alan Kelly and Frank Dachille propose the island of Bermuda to be the focus of a giant meteoritic explosion in recent times. Their work, if known, would have stimulated among a small circle of scholars an interest in discovering impact craters around the world. (It should also have stimulated the writers of the 1970's who were excited by the mysteries of the "Bermuda Triangle.") Between 1950 and 1955 Velikovsky published three of his celebrated works. In 1963, I prepared a special issue of *The American Behavioral Scientist* on "The Velikovsky Affair." It analyzed the reasons why scientists generally were refusing to hear of theories and evidence contradicting the uniformitarian paradigm. If there is any lesson

to be taught from this *cause célèbre*, it is this: "You must be ready to consider conflicting theories. You cannot stand rigidly in the face of contrary evidence. You cannot be mass-minded and call yourself a proper citizen of science."

In 1950, the German paleontologist Schindewolf tied exoterrestrial impacts and radioactivity directly to the main periods of biological extinction and creation.

I could move, too, into the 1940's, when Claude Schaeffer assembled massive proof of a set of concurrent destructions of Bronze Age civilizations by natural causes. I have found many sources of quantavolutionary thought and studies ranging farther and farther back in time; often they are inaccessible to most readers and buried from sight inasmuch as they are not referred to in modern literature. A large job of recapturing them is before us. Indeed one could recede for thousands of years back to the now faintly heard primeval voices that are fossilized in bone, stone, pots, and oral myth.

In concluding here, I wish earnestly that my readers will turn to my books without the preconception that studies of catastrophes must be science fiction, or a work of the occult, or a defense of Biblical literalism. I do not criticize adversely such works, some of which I admire; it is simply that they are different. My books should be read and judged form the standpoint of a cosmogonic model of quantavolution that is derived from a growing body of scientific studies in various fields and a review of the most ancient as well as of the most recent sources.

Just as an archaeologist reconstructs a pot from a few shards, and a paleontologist an animal from a few bones, we have to reconstruct a general history from the rare "treasures that have come down to us", as Aristotle said. I ask not for belief but for consideration. I seek for open thinking upon another model in the competition for the best design of the sciences and humanities.

This said, let us take up a study of "The Burning of Troy," a work which I began, as I mentioned above, in 1973. The idea came to me while on the Island of Naxos. I was reading Schliemann's famous story of how he found the Treasure of

Q-CD vol. 11: The Burning of Troy, Ch. 1: The Quantavolutionary Scan 20

Priam on top of a wall, and I exclaimed to myself, "What a strange place to bury a treasure!"

Part One

HISTORICAL DISTURBANCES

CHAPTER TWO

THE BURNING OF TROY [1]

Scientists probing the subsoil in their attempts to build up the record of prehistoric and ancient humanity have paid little attention to ashes and other evidences of high heat and conflagration that they have encountered. We would agree with Claude F.A. Schaeffer who wrote in 1948 that "Our inquiry has often been made difficult by the rarity in most reports of observations on beds as a nuisance or of little interest"[2]. The recent excavation of settlements of Minoan times, buried beneath or affected by the tephra of the exploded volcano of ancient Thera-Santorini, did posses the broader perspective that Schaeffer sought. Marinatos and others introduced research on the far-flung effects of the disaster. Heezen and Ninkovich discovered a layer of ash on the south-eastern floor of the Mediterranean Sea that they could ascribe to the Santorini explosion. Charles and Dorothy Vitaliano followed up with analyses of tephra from scattered locations on Crete and elsewhere [3]. The search and testing are continuing. Still, the Thera case is exceptional, and even yet far from complete. The ash coverings of settlements have rarely been analyzed. We speak of overall calcination, and not so much of the bones of hearths that have lent evidence of the ecology, cuisine, and religious ceremonies of early human groups.

Overall calcination has sometimes, with less than complete evidence, been interpreted as the work of torch-bearing invaders. For example, James Melaart uses the convenient phrase "Whether by accident or by enemy action" to describe the destructive combustion of Troy IIg [4]. Earthquakes, too are invoked with some frequency, although a determination that a fire is an effect of an earthquake is by no means simple. On rare occasions, where there exists a historical record such as Pliny the Younger's description of the eruption of Vesuvius in 79

A.D., volcanism is admitted and may lead ultimately to excavation. There are still other possible causes, as we shall see.

The contention of this paper is that reports of past excavations should now be reviewed with a revised set of questions. Moreover, and because of the ultimate inadequacy of the information typically contained in them, it is suggested that a new interdisciplinary calcinology be devised and carried into future excavations and the testing of soils and debris generally. The rich experience afforded by the excavations of Troy can serve to expose the problems that justify a new approach. Afterwards, we can define in a preliminary way the body of techniques that needs to be assembled and developed.

THE "BURNT CITY" OF TROY

In some exciting passages, which have unquestionably been among the most widely read of all archaeological writing, Schliemann describes how, in May of 1873, he uncovered "The treasure of Priam," King of Troy during the war between the Greeks and Trojans. (Neither his identification of the Treasure as Priam's nor of the City as the Troy of Homer is at issue here, and therefore these problems are passed over lightly.)

Schliemann reports [5] that the "Trojans of whom Homer sings" occupied a stratum of debris "from 7 to 10 meters, or 23 to 33 feet, below the surface. This Trojan stratum, which, without exception, bears marks of great heat, consists mainly of red ashes of wood, which rise from 5 to 10 feet above the Great Tower of Ilium, and the great enclosing Wall, the construction of which Homer ascribes to Poseidon and Apollo; and they show that the town was destroyed by a fearful conflagration." He calls this ruined level "the Burnt City," and others have used his phrase since then.

The large slabs of stone leading down to the plain from "The Scaean Gate" for 10 feet were so weakened by heat that they crumbled upon exposure, though farther on the slabs continued hard and intact.

"A further proof of the terrible catastrophe is furnished by a stratum of scoriae of melted lead and copper, from 1/5 to 1 1/5

inches thick, which, extends through the whole hill at a depth of from 28 to 29 1/2 feet." Several visiting geologists and a construction engineer gave this opinion, and all concluded that large deposits of these existed at the time of the city's destruction.

Schliemann continues: "That Troy was destroyed by enemies after a bloody war is further attested by the many human bones which I found in these heaps of *debris*, and above all by the skeletons with helmets, found in the depths of the temple of Athena; for, as we know from Homer, all corpses were burnt and the ashes were preserved in urns. Of such urns I have found an immense number in all pre-Hellenic strata on the hill."

Then he says: "Lastly, the Treasure, which some member of the royal family had probably endeavored to save during the destruction of the city, but was forced to abandon, leaves no doubt that the city was destroyed by the hands of enemies. I found this Treasure on the large enclosing wall by the side of the royal palace, at a depth of 27 1/2 feet, and covered with red Trojan ashes from 5 to 6 1/2 feet in depth, above which was a post-Trojan wall or fortification 19 1/2 feet high."

Schliemann spotted the Treasure through a protruding copper article. "On the top of this copper article lay a stratum of red and calcined ruins, from 4 3/4 to 5 1/4 feet thick, as hard as stone, and above this again lay the above-mentioned wall of fortification (6 feet broad and 20 feet high) which was built of large stones and earth, and must have belonged to an early date after the destruction of Troy."

With his knife, he first withdrew this small copper shield, then a copper caldron with handles, then a copper plate to which a silver vase "had been fused ...in the heat of the fire"[6]. Next came a copper vase, a bottle of gold, a cap of gold and then other vessels of pure and alloyed metals, wrought and cast-copper, silver, gold, electrum. There were useful objects, ceremonial objects, and daggers, battle-axes, and lance-heads. Various weapons had "pieces of other weapons welded onto them by fire."

"As I found all these articles together, forming a rectangular mass, or packed into one another, it seems to be certain that they were placed on the city wall in a wooden chest ... such as those mentioned by Homer as being in the palace of king Priam. This appears to be the more certain, as close by the side of these articles I found a copper key about 4 inches long, the head of which resembles a large safe-key of a bank. Curiously enough this key has had a wooden handle; there can be not doubt of this from the fact that the end of the stalk of the key is bent round at a right angle, as in the case of the daggers."

Schliemann conjectures on the scene:

It is probable that some member of the family of King Priam hurriedly packed the Treasure into the chest and carried it off without having time to put out the key; that when he reached the wall, however, the hand of an enemy or the fire overtook him, and he was obliged to abandon the chest, which was immediately covered to a height of from 5 to 6 feet with the red ashes and the stones of the adjoining royal palace...[7].

That the Treasure was packed together at terrible risk of life, and in the greatest anxiety, is proved among other things also by the contents of the largest silver vase, at the bottom of which I found two splendid gold diadems..., a fillet, and four beautiful gold ear-rings of most exquisite workmanship: upon these lay 56 gold ear-rings of exceedingly curious form and 8,750 small gold rings, perforated prisms and dice, gold buttons, and similar jewels, which obviously belonged to other ornaments; them followed six gold bracelets, and on the top of all two small gold goblets [8].

Finally, Schliemann adds, "The person who endeavored to save the Treasure had fortunately the presence of mind to stand the silver vase, containing the valuable articles described above, upright in the chest, so that not so much as a bead could fall out, and everything has been preserved uninjured" [9].

Schliemann says that death was risked in hastily retrieving the Treasure. Like many another digger, he was preoccupied with artifacts and architecture. And indeed there seemed to be nothing in the literature than a Greek-set fire. Furthermore, he was already reading the ancient story of the burning of Troy into his

findings. He "knew" what he would find. So did the world of readers.

But there are puzzling aspects to his account. First of all, there is the immensity of the blaze. Can the burning of a stone and wood town of 5,000 or so inhabitants produce a bed of ashes that may have amounted to 15 to 20 feet on its first fall? For we read that it was reduced to several feet of thickness and was so hard that a huge stone wall nearly 20 feet tall could be built on top of it afterwards. And the whole area was so completely buried that the walls of the subsequent settlement were planned and built in complete ignorance of the orientation of the walls and passageways below. "The more recent walls run in all directions above the more ancient ones, never standing upon them, and are frequently separated from them by a layer of calcined debris, from 6 1/2 to 10 feet high" [10]. The depth of the ashes is all the more impressive when it is observed that they formed on top of a wall. Then or afterwards, some part of the ashes would fall or drift or be blown off the top of a wall. And why would the bearers of such a Treasure, if they had even half a minute of time, leave the Treasure on top of a wall when they might at least have tipped it over onto the ground, and then fled?

The ashes are spoken of as "red Trojan ashes," "ashes and stones" that buried the city, "mainly red ashes of wood." How thick a layer of ashes does a hand-burnt ancient city dissolve into? What kinds of heat would have been generated on the average outside and within houses? The answers are not now known, but might well be discovered.

Craig C. Chandler writes that he has "never seen 'red ashes of wood' in natural fires, and the term sounds much more like a distillation residue than a combustion residue"[11]. With the suggestion of a distillation, the remote possibility of an early invention of "Greek Fire" intrudes. This presently unknown, highly volatile and intense weapon was possibly of petroleum plus an accelerant, and was used by the Byzantines against their enemies for centuries. But this was more than two millennia later. Further, "Greek Fire" would not account for the huge amount of ashes.

A completely wooden and overstuffed contemporary house will leave no more than ankle-deep ashes when it burns to the ground, and then only on its own foundation. A flourishing natural forest and the ground cover is estimated to provide 200 tons organic matter per acre [12]. When reduced fully by heat, it will give up 160 tons of water, gases and other compounds to leave 20 tons of carbon residue and 20 tons of oily distillates. Further reduced to fine cinder and ash, it would weigh less and have less volume. If spread over an acre, the residue would amount to perhaps a pound per square foot; its height could scarcely measure 6 inches in its freshly fallen state. Chandler has pointed out that forest fires of the greatest intensity do not consume more than a fraction of the living material, producing perhaps 3 tons per acre of ashes. "This is an amount about 10 times as great as the fertilizer you spread on your lawn in the spring ... Ash residue from the burning of a city is measured in inches, rather than feet"[13]. And we seem to be faced at Troy by perhaps 15 feet, or 30 times as much ash, even allowing for no wind to blow the cloud of city ashes off the citadel onto the plain and for no drift off the top of the city wall.

But, to proceed, if the city were under tight siege, would not the Treasure have been carefully packed and readied for any emergency? Would it not perhaps have been buried in a safe place or carried off to a friendly town? Schliemann assumes that a Trojan custodian was transporting the box. He discovered what appeared to be a copper handle. Would not at least two persons have carried it? It was heavy. Moreover, several guards and priests would have been assigned to accompany the porters on their urgent mission. The key to the box was found, but it may have been placed inside the box; its presence does indicate haste, or else it would have been kept by a keeper of the keys or by the chief of the little group of movers and would have vanished with him.

If the "Greeks" were in hot pursuit, as Schliemann implies, would they not have caught up with the Treasure and carted it off? It would have been laid down by its porters, who would have fled for their lives. Would the "Greek" warriors have set such a blaze that they were frustrated in one of their primary objectives in capturing the city, to loot it of its valuables? Conquerors try not to burn a city before they loot it. Other

treasures and valuables were located by Schliemann. Apparently the "invaders" were in some part, at least, frustrated in one of their most enjoyable missions by conflagration. We might assume that other treasures were indeed found and carried away. Their neglect of the deposits of lead and copper, an unconscionable dereliction, is puzzling; lead and copper supposedly ran in streams over the city grounds.

Schliemann found no bones or warrior's equipment at the site of the Treasure save for a small copper shield, which may have been in or on the chest. Indications are, unless his search was incomplete, that the porters separated themselves physically from the Treasure in a great hurry and that the "pursuers" were blocked from reaching it. Unlike the ashes with which Vesuvius buried ancient Pompeiians and from which Fiorelli in 1863 ingeniously extricated their images by injections of liquid plaster, the ashes of Troy were apparently hot. They fused and welded exposed metal objects. The wood chest had disappeared. Any humans would have been incinerated and would have disappeared like the box, but they would at least have left their buckles and arms, and possibly teeth or long bones.

Why did the porters try to go over the wall, instead of through the gate? Schliemann suggests that the "Greeks" commanded the gates. Possibly.

But now we wonder whether, in fact, there were any Greek invaders climbing out of their famous Wooden Horse and reinforced by their returned comrades. For Schliemann does not find typically "Greek" (Achaean) utensils or weapons; therefore the conflagration could not come sometime after the foreigners had occupied the city and mingled their artifacts with those of the Trojans. Also, we should be inclined to deny that any invaders of any type were present. We are aware that contemporary scholarship assigns Schliemann's Troy to a period long before the "real" Trojan War. It is now called TroyII and Troy VIIa is the "real Troy," in one leading opinion [14].

A half century after Schliemann's work, a University of Cincinnati expedition returned to the site of Hisarlik. They explored painstakingly the area, employing the best archaeological techniques that the state of the art and the typically modest funding could provide. Apart from their extensive work on the other levels, the Cincinnati archaeologists, under the leadership of Carl Blegen, examined closely the ruins of the Burnt City-Level IIg by their code. The debris over the whole site is deep, yet less deep that the debris atop Schliemann's Wall.

The stratum of Troy IIg had an average thickness of more than 1 m(eter); it consisted mainly of ashes, charred matter, and burned debris. This deposit apparently extended uniformly over the great megaron and across the entire site, eloquent evidence that the settlement perished in a vast conflagration from which no buildings escaped ruin. This is the 'Burnt City' of Schliemann ...

In all areas examined by the Cincinnati Expedition, it was obvious that the catastrophe struck suddenly, without warning, giving the inhabitants little or no time to collect and save their most treasured belongings before they fled. All the houses exposed were still found to contain the firescarred wreckage of their furnishings, equipment, and stores of supplies. Almost every building yielded scattered bits of gold ornaments and jewelry, no doubt hastily abandoned in panic flight.

Most of the famous 'treasure' recovered by Schliemann may now be safely attributed to Troy IIg...[15].

Thus writes Blegen (1963) and the evidence behind his words stacks up in several large printed volumes and a considerable archive. Blegen continues, seeking to explain the destruction:

Whether the disaster was brought about by enemy action or by accident cannot be certainly stated, though there are considerations that point to each of these alternatives. If the city had been captured and razed by conquerors, some of the luckless inhabitants would surely have fallen victims to the attack, and an excavator might expect to find in the ruins remains of human skeletons. So far as is ascertainable in the archaelogical records, we have actually only one instance in which a fragment of a small adult skull was definitely found in the stratum of Phase Ilg. Schliemann mentions the skeletons of "two warriors" with bronze helmets, found in the burnt layer; but the stratigraphic position is not certified, and the helmets later turned out to be fragments of a bronze vessel. One might therefore conclude that the occupants of the town escaped. On the

other hand, if an invading army took the city it would surely have thoroughly looted the houses before putting them to the torch; and few if any 'treasures' of gold and silver would have been left for archaeologists to recover. But again a counter-argument might hold that if all or most of the citizens had run away to safety, they would surely have returned sooner or later to recover the treasures they had left behind. Their failure to do so can only be accounted for by assuming that some powerful deterrent prevented their returning. What actually happened to bring about the burning of the whole establishment is still an unsolved mystery, but it is a fact that Troy II was totally destroyed' [16].

The mystery remains, and the range of speculation is both limited and expanded. We are compelled to put aside the Schliemann reconstruction as a rather complete fictional tale. In doing so, we are led to the alternative that some huge natural force ruined Schliemann's Troy. Enemy forces had not shown a gradual "intent" to destroy Troy, else the Treasure would have been packed and readied for transport. The disaster did not begin by slow degrees, else it would have permitted exit by the main gate. Or perhaps, to avoid panic or disorder, the Treasure was being sneaked out of town.

Might it have been an earthquake followed by fire? There are few indications of fallen stones. It would not have been these that prevented the Treasure from being carried out the Gate of the city. Although the scene that we are reconstructing was not created by a great earthquake, a mild earthquake may have occurred. If it did, it had not prompted the government to abandon the town up to this last moment of disaster. Valuable objects were strewn on the floors of numerous homes. The evidence from "the depths of the Temple of Athena," where bones and skeletons were found, is ambiguous: people, sensing an earthquake, flee from the crashing roofs and walls of their structures. A large quantity of bones was found in the debris of, and next to, adjoining apartments [17]. Were these people trapped and buried by the quake? Possibly. Or did they die of heat or suffocation and were their bones preserved freakishly while most bodies were quickly consumed by intense heat?

The main event may have been a sudden fall of ashes that began as a light warm shower and then developed into a heavy downpour of hot material. The fall would have incinerated all organic material except those people, plants and animals that were already in deep refuge where they suffocated and were later buried. It would have melted all exposed supplies of metal and partially exposed metal parts. Within a space of hours the city would have been covered and its life ended.

There would have been no survivors or enemy awaiting outside to reoccupy the destroyed city, excavate it, collect its treasures, enjoy its strategic location [18], and carry on or provide a substitute for its culture. If there were, they would have been blasted, drowned in ashes or suffocated by gases while the city disappeared before their eyes.

The destroyed setting does not support a firestorm, such as incendiary bombs, dropped en masse from airplanes, inflicted upon the cities of Dresden and Hamburg in World War II. There the ash levels were insignificant, because "firestorm winds scour the burned area clean" [19].

The setting suggests the action of Vesuvius in burying Pompeii and Herculaneum, the one in falling cinders and ashes, the other in towering lava flows. It was the falling ash and gases that buried and suffocated the people whose images were recovered seventeen hundred years later. Some had chosen not to flee and took refuge in their houses; others could not flee; still others were drowned in ashes while in flight. Pliny the Elder was gassed to death as he stood, miles away, directing a rescue operation.

The destruction wrought by the explosions and collapse of the islet of Krakatoa off Java in 1883 was done largely by tidal waves [20]. Although many persons were burned severely and succumbed to exhaustion in the hot ash-laden and gas-polluted air, the fall of ashes was not great enough to bury houses. The fall-out colors are not well-described; at least white, gray, black, brown, green, and red material was mentioned.

Examining the territory around Troy (modern Hisarlik), we find no active or extinct volcanoes [21]. Mount Ida, famous in Homer, is 30 miles to the Southwest of Hisarlik. It is not reported as an active or extinct volcano. At 30 miles of distance,

in order to have caused an ash-rain that would bury Troy, it would have had to explode in successive bursts of fury, exceeding the Krakatoan and Vesuvian (79 A.D.) disasters.

The Thera-Santorini explosion of late Minoan culture occurred hundreds of miles away in the South Aegean Sea, and is not synchronized [22]. In any event, although it might have generated waves capable of battering the coastline of northwest Asia Minor, its ash-fall would probably not have reached so far and so heavily. Ninkovich and Heezen seem to have found that the overwhelming fallout of Thera ash occurred in the Southeastern Mediterranean Sea.

Yet geologists might consider whether internal earth stresses could have induced not only the familiar cone volcanoes but also fissure eruptions, which, no matter how voluminously eruptive, leave little evidence for the unsuspecting eye once they have become extinct. A geologist might then search for some scars and volcanic products on the modern landscape.

It is well to remind ourselves that Homer, in describing at least one Trojan war, has Mt. Ida behaving in peculiar ways when the gods of heaven enter the battle of Greeks and Trojans:

"From high above the father of gods and men made thunder terribly, while Poseidon from deep under them shuddered all the illimitable earth, the sheer heads of mountains. And all the feet of Ida with her many waters were shaken and all her crests, and the city of Troy, the ships of the Achaians" [23].

The underworld god shrieked in terror and leapt from his throne at the prospect that "Poseidon might break the earth open." And Hera laid such a dense fog upon the battlefield that none could see to engage. There is a terrible fire over the whole scene that "first was kindled on the plain" and parched it and burned the dead warriors, then turned to the river, boiling it and its tributaries. Hera, wife of Zeus, ordered up tempests from seaward to fan the flames, which another sky-god and also volcano god, Hephaistos (Vulcan), had started. All of this bespeaks volcanism with accompanying earthquakes, and possibly fissure volcanism too.

Here again, we should remind ourselves that a) the site of the "real Troy" may not be the Hisarlik site, b) there may have been several wars over the site through the ages, c) the war of which Homer sang was possibly an image of several partially idealized wars, and d) the final Homeric war probably occurred, if Velikovsky's reconstruction is followed (which eliminates the Greek Dark Age), in the late eighth and early seventh centuries. Troy IIg therefore existed at an earlier time, and we are quoting here passages regarding the landscape, nature forces, and effects of a later age or composite of ages. The date of destruction of the "Burnt City" is not at issue here.

The ancients were adamant concerning the activities of the great sky gods. Hence a look into the skies for the cause of the burial of Schliemann's Troy is not unreasonable. But will it be only for the effects of remote volcanism? An anomalous detail demands attention: Schliemann mentions that the stones of the road out of the gate had been heated to the point of disintegration but, a few feet further out, the stones continued in good condition. The natural force seems here to have been selective, destroying by heat the crown of the hill, but sparing at least this part of the plain around. Alternatively the outer stones may have been relaid at a later period, or the first fires may have consumed the city premises alone, with the ash-fall coming later. Or again, at the Vitaliano's suggestion, should we return to an attacking force that heaped fires before the wooden gate to force an entrance; too, they may have hurled or shot many fiery brands at the gate. The total context is indeed important to bear in mind, whatever its complexity.

Lightning can be hot and selective and may focus upon elevations. Ancient lightning and fire have received little attention from archaeologists and geologists. E.V. Komarek, Sr. writes, "I believe that the reason we have so little information on ancient fire scars or lightning streaks is that apparently no one has searched for them" [24].

Seneca, the Roman author, has a character in *Thyestes* begging Jupiter to bring disaster upon Earth "not with the hands that seek out houses and undeserving homes, using your lesser bolts, but with that hand by which the threefold mass of mountains fell …These arms let loose and hurl your fires"[25]. Could there

have been a qualitatively different kind of Jovian thunderbolt playing about the world in mythical and prehistoric times? A ramified bolt of hundreds of strokes is not impossible to imagine. The myriad lightning and fire effects in the Krakatoa disaster are worth recalling, but these occurred within a radius of a few kilometres [26]. The mysterious melted copper and lead, alluded to above, which covered a large area, according to Schliemann, might have originally been deposits that contributed to the attractiveness of the site for lightning discharges.

They form a "stratum of scoriae, which runs through the greater part of the hill, at an average depth of 9 metres(29 1/2 feet)." Were they stored by the Trojans or were they "welded scoriae (Schweisschlacken)" of volcanoes; that is, fragments carried up by the powerful blast of expanding gases, ejected in a molten state, and solidifying after falling with a smacking sound back to the ground? — "upon impact, they are squashed out flat, and are welded together where they fall" [27]. Volcanoes are not known to eject such scoriae to any considerable distance.

Still another possibility needs to be added: a meteoric fall or shower, Homer's "divine-kindled fire of stones." If a large meteor had passed nearby without crashing, its immense heat would have consumed and raised into the sky the ashes of countless trees and the dust of exploded and cyclonized fields. But the people appear to have had warning, however brief.

A veritable deluge of meteoric particles from outer space, as from a large comet's tail, might produce and contribute to combustion and burial. A cometary or planetary near-encounter, and resulting fall of gases, hydrocarbons, burning pitch, and stones, of course, is Velikovsky's "first cause." Even metals (again the layer of copper and lead) have been reputed to fall. Such events are unknown to modern experience but are indicated by ancient legends from many places [28], and by various geological and biological phenomena [29].

We cannot ignore the Biblical sources that speak of "fire and brimstone (sulphur)" such as that which wiped out "the cities of the plain." The Cincinnati team writes in several places of the greenish-yellow discoloration characteristically found in the debris of streets and other once open areas [30]. Was this brimstone?

The clays are curious. Area 210 of the city shows much disintegrated clay and debris, plus pots, but no signs of burning. A house of Square A3-4 is in ruins "covered by a mass of clay more than 0.50 meters thick, which has turned red from the effects of internal heat"[31]. The roofs were of clay and wood, but the depth is remarkable and so is the color. Is there more than one kind of clay in the ruins? Is this the same "red" that Schliemann reports as "the red ashes of Trojan wood?" For that matter, is it part of the omnipresent red dust that Velikovsky pursues through early references from numerous cultures in connection with the planet Venus [32]?

At this stage of research, one craves evidence that the rude Achaeans were quite stupid but were geniuses at setting great fires from above. Or that all excavators exaggerated in their reports. Barring these explanations, the evidence speaks, or rather, whispers faintly, on behalf of a regional multiple volcanic explosion of gases, hot scoriae and ashes, some element of which rained down suddenly and heavily upon Troy, burning, burying, and baking. The Treasure of Priam would be buried atop the wall where it had been placed as its bearers cast a final despairing glance upon the abysmal world on all sides.

One should be warned, however, that a theory of concurrent regional plinian eruptions would call up a search for causes of a more fundamental kind. Volcanism on a grand scale is another word for general catastrophe: What force can roil up the mantle and wrench around so much of the crust of the Earth at a single moment of time?

A NEW INTERDISCIPLINARY METHOD

The mystery of the "Burnt City" of Troy will soon be a century old, but its solution may be within grasp. It can now be reviewed in light of substantial advances in empirical technique and general additional and spectacular theories. The latter are provided most forcibly by Claude Schaeffer and Immanuel Velikovsky.

In 1948, Professor Schaeffer, who had excavated at Ras Shamra-Ugarit, published a treatise on comparative stratigraphy of the Near and Middle East during the Bronze Ages of the second millennium B.C. He incorporate the work of many predecessors, including the investigators of Troy-Hisarlik, into a theory that a sequence of fires and earthquakes had destroyed Bronze Age civilizations concurrently, several time over, in the vast area stretching from Troy and Egypt to Persia, and even beyond into China. Similar phenomena are recorded for Etruria (Tuscany), Meso-America, and elsewhere [33] and might someday be synchronized. At the time of Troy IIg, reports the *Cambridge Ancient History* (I:2, 406), following in Schaeffer's footsteps, three-quarters of the settlements of western and southern Anatolia were permanently destroyed.

Although he is a catastrophic revisionist, Schaeffer has not gone deeply into causes. He demonstrated the hard evidence of universal destruction. He invoked earthquakes followed by fire, or where earthquakes were not in evidence, simply enormous calcination. He exculpated invaders as the destroyers of civilization in many instances, even though he employed conventional terms such as "the Peoples of the Sea" that are used to explain the abrupt termination of many civilized communities. He can point often to disturbed and unsettled human elements who came upon the sites afterward.

(Significantly, Blegen had already shown that a new cultural element did *not* succeed Troy IIg; the Troy III culture was closely related [34]. This is remarkable because the calcinated debris of Troy IIg was never dug out and was probably unknown, yet the debris of the old city was strong enough to become the foundation of the new city walls.)

In his command of the natural sciences involved and their interweaving with ancient sources and psychology, Velikovsky has excelled all writers on questions of catastrophe. Working independently, he published in 1950 his account of universal destruction of the second half of the second millennium. He asserted that heavy seismic disturbances and devastating flames consumed the same ancient civilizations. But, with the aid of ancient legends and documents, he insisted upon the role of overall volcanism, heavy meteoric falls, and as "first cause," a

derangement of the planetary system that brought down upon the earth the proverbial "wrath of the gods," not only Olympian gods, but Hebrew, Egyptian, Babylonian, Olmec and other gods [35].

Unfortunately, for twenty-five years, the assemblages of ideas and facts of Schaeffer and Velikovsky, "an extraordinary polymath," in the words of the late Columbia University classicist, Moses Hadas, were subjected to unscientific vilification. Schaeffer, Professor at the Sorbonne and a renowned excavator, has been hardly cited for his *magnum opus*. Few scholars have been ready to confront the anomalies of their own findings. One exception was Spiridon Marinatos, who plunged to his death in 1974 at the famous site of his work. His excavation of the Minoan culture of Thera-Santorini, from beneath the effects of the plinian explosion of the island, called international and interdisciplinary attention to the destruction of a critical portion of Mediterranean civilization.

But Blegen of Cincinnati was also an exception; he was disposed to a cautious empiricism, but was piqued by the strange events that had befallen Minoan and Mycenaean civilization. In the voluminous published records of the Cincinnati expedition, we find the following lines:

"A large collection of earth samples was also made this year. (1937). Specimens were taken from all strata of all main layers in the principle areas of digging, and the number of small bags thus collected exceeded 400. They were shipped to Cincinnati for scientific examination by specialists in geology and botany" [36].

When, in 1974, we discovered this passage, we made inquiry, only to find that the sample had never been analyzed. The long period of World War II had intervened. Personnel left, never to return. Other interests took priority. The samples rested in their cloth bags in the attic of McMicken Hall at the University of Cincinnati. Finally, in 1975, material from the bags was provided to Professor George Rapp of the University of Minnesota for eventual analysis. This material will serve for the first calcinological testing of the causes of the destruction of Troy-Hisarlik. It will perhaps form the basis of testing also the more

general theories advanced as to the causes of the destruction of many ancient civilizations.

What questions should be asked of these humble sacks of debris, and, by extension, of all similar samples to be drawn from other destroyed settlements? In other words, of what should consist the science that investigates ancient destruction by combustion -- call it "calcinology," perhaps?

We may address this question either by taking up one by one the theories as to the origins of the combustion, or by taking up the techniques for the investigation of combustion. In respect to the theories, one would inquire into the possibilities of one or a combination of accidental fire; "the invader's torch"; Greek Fire; seismic-caused fire; explosive local volcanism from fissures or now extinct cones; fall-out of tephra from remote, perhaps general, volcanism; ramified lightning; petroleum (bitumen, asphalt, naphtha) rain, non-volcanic and extraterrestrial; and gas explosion in the atmosphere, terrestrial or extraterrestrial by origin.

In respect to the techniques, one would speak of ambiance induction; artifact analysis; comparative historical deduction; thermal-visual examination; morphological examination; electron scanning microscopy; chemical mineralogical tests; thermoluminescence tests; tests for paleo-magnetism. Inasmuch as individual techniques may dispose of more than one theory, it may be best to proceed by offering a few words concerning their relevance.

Fundamental to pursuing all causal alternatives is a careful inductive study of the ambiance of combustion. Whether performed on records of past expeditions or upon a setting itself, a skeptical and fully alert reading or examination is required. We have entertained too close a circle of interests and hypotheses; the Trojan record shows this. So do hundreds of other excavation reports.

First of all, an interdisciplinary group of scientist must set standards and criteria for entering upon a testable location. Conventional archaeology has certainly proceeded far along these lines, but new parameters need to be added, taken from geology and meteorology, as for instance, the effects of wind and the strength of building materials. The camera that has come to play an important part in contemporary investigations needs to be aimed at the hypotheses, so to speak. The pioneering work of the engineer, C. Lerice, in magnetomatic and radiotropic anterior probing of subsurface forms is worthy of generalization to standard practice. Standards for measuring depth of debris, original and actual density of calcination, percentage of ash content, and architectural and object deformities should be set up. Pre-selection and logging of samples should be systematically done in the manner of the Cincinnati expedition of 1937.

The analysis of artifacts is sometimes conducted as part of a treasure hunt. To this day, objects from the Treasure of Priam have not been studied carefully to determine whether they have been fused by heat or by oxidation. Objects are described as they are found but not to the extent that a specific set of hypotheses is applied to each object as to how it might have been placed or dropped, or slipped, or fallen as a result of direct or indirect natural causes.

Nor has an inductive, comparative, historical method been always conscientiously pursued. A single anomaly in a closed layer may be worth more to science than a golden chalice. To dismiss the anomaly as an "impossible" intrusion, a "similarity", and "forerunner" is all too common practice. The attempt of the University of Cincinnati expedition to reconcile the anomalies of location of their carefully uncovered sherds in the face of the conventional Egyptian-anchored chronology is a case in point. "The discovery of these 7th-century sherds 'in several areas in the strata of Troy VIIb1 stratified below layer VIIb2', which is supposed to represent the 12th century, "presents a perplexing and still unexplained problem." [37]. Fortunately the selfrestraining, objective empirical techniques of the expedition simply stood even against an authoritative chronology at a later date. One goal of calcinology is to establish a frame of analysis that can be transferred from one excavation to another both to interlock events and to serve eventual critiques of received versions of the comparative development (and destruction) of civilizations.

I should place in the same category of historical comparative method the application of mythology. Dorothy Vitaliano, pursuing a strict uniformitarian theory, has nonetheless exemplified the necessary marriage between myth and geology that research properly demands; to her, myth serves as a clue to past events, especially when they are extraordinarily forceful [38]. Sometimes, as in the case of Troy, there are direct myths describing events overtaking the site. In other cases, myths may be transferred from other times and places as hypotheses.

The examination of bones found in circumstances of combustion may well be expanded. Paleosteology ordinarily does not address itself to the degree of heat to which human remains have been subjected, or whether the heat was searing or slow. For example, a separate volume in the Cincinnati *Troy* series, its other merits aside, does not answer questions relevant to the sudden destruction of the city [39]. How much heat reached the people whose skeletons remained? Would the heat elsewhere have erased entirely any humans and animals? Contemporary arson experts can transfer their "know-how" to such queries.

Contemporary fire experts and combustion chemists can also contribute useful principles for the visual examination of thermal effects. A high sensitivity to variations in color and texture is still not a prerequisite for professional archaeology. Conversations with persons concerned with combustion problems come around repeatedly to unanswerable questions of color, stains, textures, bubbles and cracks.

The morphology of combustion environments would deal with terrain features that might have altered, of for that matter remained significantly unaltered, in the course of the destructive combustion. Earthquakes uplift and crack the earth. Volcanic and seismic fissures leave different traces. Lightning can burn and dig distinctive fissures as well.

It would be useful to perform core drillings in the hinterland of destroyed settlements to discover whether the ash trapped about the ruins is also present in some natural lowland areas of slow deposition, removed from human habitations. Recently, for example, the Athens *Metro* project tested the subsoil to a depth of 20 meters in 228 locations for the purpose of planning subway

construction. Archealogical finds were noted and covered over, but the ordinary corings were not handled properly for the analysis of combustion or other natural phenomena. Almost all samples show "Athens schist," a vague term for sandstone, siltstones and the like; most of the preserved cores are disturbed and eroded by water used in the drilling [40]. (The rock cores, incidentally, show highly intense fracturing near the surface.)

Unfortunately, oil exploration does not concern itself with logging the cores brought up from the near subsurface of wells during the drilling [41]. It may be possible in the future to make a cooperative arrangement with petroleum geologists to provide such data. Apart from its usefulness to social and natural history, near subsurface samples may reveal chemical and morphological peculiarities of areas overhanging oil pools, such as distillates of hydrocarbons indicating surface origins. (Again, this would appear to be an appropriate scientific response, as there are frequent references in myth to rains of sticky substances from the sky.)

This conjecture leads naturally to inquiry into the composition of shales, clays, and soils found in connection with ancient destruction. An analysis of "samples that cover depositional chemical environments ranging from continental and coastal soils to marsh and subtidalmarine deposits" of recent ages had disclosed complex polycyclic aromatic hydrocarbon assemblages (PAH) with "a high degree of similarity in the molecular weight distribution of the many series of alkyl homologs"[42]. This PAH is carcinogenic and mutagenic. The soils sampled were from widely separated locations on and off the New England coastal region. Forest pyrolysis and atmospheric transport was suggested. A search for other nonbiological organic compounds was indicated. The cause of such an immense fire is conjectural, as is indeed the postulate of the fire itself.

Are we so swollen with pride that we cannot review Ignatius Donnelly's *Ragnarok* (1883) and not gain from it at least a doubt as to the origins of some of the world's clays? Clay is conventionally assigned to sedimentation or decomposed structural material, without inquiring as to possible volcanic or other sources. Yet a geological walk along many a Greek island

beach may pass across deposits of pumice dust and of gray clay that visually suggests bentonite. Donnelly claimed a cometary origin for a heavy rain of fire and gravel that destroyed part of the globe and most of mankind. What does the new geology say to this? At least in regard to calcinated settlement debris and top open area subsurfaces nearby, what is called for is an increased resort to professional morphological, visual, and tactile examination, then to chemical mineralogical tests, and also to electron scanning microscopy.

Reference was made earlier to the extraordinary layer of copper and lead scoriae found by Schliemann in the burnt city. Is this mined ore, purified metal, or ore in a natural state? The origins of metals are not a settled matter. There is too long a stone age, too ready an access to ores, too abundant a mythology to relax in the arms of conventional theory.

Sample tests are generally inexpensive and well structured; they require only small amounts of material, often only a gram. But of course, the sampling technique is critical and a manual of instructions for sampling calcination with a mind to covering all hypotheses raised by this paper is a task for the future.

The idea that thermo-luminescence, radiocarbon, potassium-argon, and fission-tract dating techniques can be applied to combustion studies with good effect is natural but perhaps overly optimistic. Of course, calcinology is interested in dating inasmuch as one of its aims is the establishment of concurrences in destruction; if two spatially separated combustion processes point to the same or related causes, then their dating will not only confirm their relationship but will also permit a more secure dating of other sites where similar combustion but insufficiently related artifacts and structures are discovered.

Thermal effects encountered on calcinated sites play a large role in permitting age-determinations (as in thermoluminescence tests and fission-track dating) by providing a basal date from which calculations of age may be made, and in obscuring chronology by contaminating burned substances through mixing, as in radiocarbon dating. However, it will be of interest to apply long-term dating techniques such as the potassium-argon method if only to check whether the test gives an impossibly old date to a

recent volcanic event. Where uranium minerals have been used to give color to artifacts of glass, the fission-track technique may provide reliable dates and a check on radiocarbon dates. If an artificial glass is subjected subsequent to its manufacture to combustion temperatures of over 600 degrees centigrade, the fission-tracks may be partially or entirely erased, permitting the date of the new calcination to be determined from the tracks now present. Tracks in volcanic glass should date the eruption that produced it. Extra-terrestrial microtektites lend themselves also to fission-track dating and can be searched for in ruins [43].

Tests for radiation levels of the debris are indicated because of the possibility that the destruction may have involved atmospheric or air-transported agents. For instance the radiation levels would vary from the norm if lightning had struck or a meteoric pass-by had greatly raised temperature levels. Lightning effects may also be indicated by magnetization of metal pieces; for this reason and also to determine whether a change in the magnetic pole had occurred, supposing a catastrophe to have been widespread, the then-exposed rocks should be tested for abnormal magnetism, and ceramic sherds of successive levels should be tested for the same and for possible reversal of direction from one level to another.

As the gamut of tests and procedures is subjected to the concerted attention of scholars of relevant fields, it may be expected that a system of producers and a battery of tests will evolve -- simpler, easier to employ, practicable given the conditions of archaeological exploration. The resultant research and testing would possibly confirm that archaeology and geophysics have overlooked some significant part of the absolutely small fund of ancient data. At that point, not too far away, we may begin to speak of a new subfield of science called paleo-calcinology.

And when this task is finished, we might turn to another new subfield, which beckoned us temptingly even as we tried to concentrate upon calcination, paleo-seismism. Here the implication is that the Mercalli scale may be quite inadequate to denominate thrusting, folding, and crustal rising and falling that may have occurred in the time of man, and that the present awareness of settlement sites is merely fractional; much more

may have disappeared or is effectively hidden so as to lend a false perspective to the human story.

Also paleo-diluviology, the study of ancient floods and tidalism. And still another, paleo-meteorology, a study that would include the great winds that can sweep away everything down to bed rock, given the slightest faltering of the earth's rotation, or the passage of any substantial material from outer space through the atmosphere. Part of the total task, we seem to be saying, is to separate ancient real occurrences from ancient myth. The larger task is to distinguish real ancient catastrophism from literal theology, not to denigrate theology but so as to recognize catastrophism for what it did to shape man and his environment.

POSTSCRIPT OF NOVEMBER, 1983

The author's interest in the calcinology of Troy led the University of Cincinnati authorities to propose an investigation of samples of debris that had been stored for many years at the University. Generous grants were obtained from several foundations and in 1982, the Princeton University Press published Supplementary Monograph 4 of the University of Cincinnati Excavation at Troy, under the title of Troy: the Archaeological Geology, by George Rapp, Jr. and John A. Gifford. The present author, whose own research proposal had failed to receive support, was not consulted at any stage of this work. However, since his original memorandum, on which the preceding article was based, had been made available to the investigators in the very beginning and he had called their attention to the possibilities residing in the neglected samples, there may have resulted some effect on what was done in the investigations.

If so, it is not notable in the book just cited. The book does not state its hypotheses. Its tests discovered only that in almost all samples, whatever the level, a reed (arundo donox) occurred; the finding lacks significance since the reed is used in making bricks. In sample number 81 (p. 130) of Phase IId, burned earth was analyzed to revel charcoal, bone, and pelecypod fragments. There appears to be nothing of further interest to calcinology proceeding from the entire investigation. The soil samples were not, however, exhausted, and a future investigation is still

possible, hopefully by means more sophisticated than those described in the published work. The senior author, without serious defense of the thesis, seems to support earthquakes as the cause of destruction. ('...one earthquake of Richter magnitude greater than seven to affect the Troad about every three hundred years.' (p. 46)).

Notes (Chapter 2: The Burning of Troy)

- This paper is an expanded version of one that was first presented on June 18, 1974 before the international symposium -- Velikovsky and the Recent History of the Solar System -- held at McMaster Univ., Hamilton, Ontario, and was published in Volumes I:4 and II:1 of *Kronos* magazine. The author is wholly responsible for the theory and presentation of this report. He wishes to acknowledge his obligation, however, to a number of persons who kindly supplied information and advice as he was preparing it. Among them are: C.C. Chandler, Director of Forest Fire and Atmospheric Sciences Research, U.S. Department of Agriculture, Forest Service; Arthur Brown, Geological Engineer, Technical Consultant, Athens Metro Project; Ruben G. Bullard, Department of Geology, Cincinnati Bible Seminary; J.L. Caskey, Professor of Archaeology, University of Cincinnati; Dr. Howard W. Emmons, Karman Laboratory of Fluid Mechanics and Jet Propulsion, California Institute of Technology; John Greeley, Professor of Physics, University of the Bosphorus; Billie Glass, Associate Professor of Geology, University of Delaware, Newark; W.A. Hans, Engineer, Fire Protection Department, Underwriters Laboratories Inca; John Gnaedinger, President, Soil Testing Services Inc., Northbrook, Ill; Jorg Keller, Professor of Mineralogy, University of Freiburg, West Germany; G. Marinos, Director, Department of Geology and Paleontology, University of Athens; Dr. Charles D. Ninkovich, Lamont-Doherty Geological Observatory, Palisades, N.Y.; Dr. Gerd Roesler, Consulting Geologist, Naxos, Greece; Eugene Vanderpool, Archaeological Photographer, American School of Classical Studies, Athens; Eddie Schorr, Archaeologist, Houston, Texas; Dorothy Vitaliano, Associate Professor of Geology, University of Indiana, Bloomington, Ind.; Dr. Immanuel Velikovsky, Princeton, N.J.
- 2. Claude F.A. Schaeffer, *Stragigraphie comparée et chronologic de l'Asie Occidentale* (London: Oxford U. Press, 1948), p. 7.
- 3. J.W. Mayor, Jr summarizes the work of Marinatos and Galanopoulos in "A Mighty Bronze Age Volcanic Explosion," XII *Oceanus* (Woods Hole, Mass.), 3 April 1966, and *Voyage to Atlantis* (New York: Putnam's Sons, 1969). Christos Doumas

summarizes the latest "official" theory of the succession of events at Thera in *Antiquity* XL VIII (1974), 110-15, plates. Also, cf. D. Ninkovich and B.C. Heezen, "Santorini Tephra," *Colston Research Society Papers*, 17 (1965), 415-53; the papers of J. Keller, D.L. Page, and C. and D. Vitaliano in *Acta of the First International Scientific Congress on the Volcano in Thera, Greece, 1969* (Athens, 1971); and C. and D. Vitaliano, "Volcanic Tephra on Crete," *Amer. Jrnl. Archaeology*, Vol. 78, no. 1, Jan. 1974, pp. 19-24.

- 4. IX Anatolian Studies (1959).
- 5. This and the following quotations are from pages 16-17, 348, and 325 of H.Schliemann, *Troy and Its Remains* (1875).
- 6. *Ibid.*, p.330. Schaeffer, op. cit., 223-4, claims that he saw no evidence of *flame-exposure* (*feu d'un incendie*) on the objects exhibited at the Berlin Museum from the treasure, and suggests chemical fusion. Also, radiative heat would be an alternative to "chemical fusion" if one must be sought.
- 7. Schliemann, *op. cit.*, p. 333.
- 8. *Ibid.*, pp. 334-5.
- 9. *Ibid.*, p. 340.
- 10. *Ibid.*, p. 302; cf. p. 347. The walls and gates of ancient cities had usually an orientation to the cardinal directional points. The "de-alignment" of successive Trojan escarpments is itself cause for suspecting and investigating a possible reorientation of the hill.
- 11. Communication of March 7, 1984. Bruce V. Ettling and Mark F. Adams accelerated combustion of woods, cotton cloth, and plastics by hydrocarbons (fuel oil, gasoline, could be etc.) and discovered by gas chromatography that accelerate hydrocarbons could be distinguished from the natural hydrocarbons in the char. ("The study of Accelerate Residues in fire Remains," N.D. offprint, Washington State University. College of Engineering Research).

- 12. Allan O. Kelly & Frank Dachille. *Target: Earth, The Role of Large Meteors in Earth Science* (Carlsbad, Calif.: the authors, 1953), p. 192.
- 13. *Loc. cit.*
- 14. Blegen, *Troy and the Trojans* (London: Thames and Hudson, 1963), pp. 161-4. Troy IIg is presently dated to ca. 2200 B.C. by the conventional chronology.
- 15. *Ibid*, p. 69. There is a contradiction here with fin. 13, as to how many bones were found.
- 16. *Ibid.*, p.70.
- 17. *Op. cit.*, p.17.
- 18. It is well to stress that an influential school of experts on Troy consider the Trojan War(s) to have been essentially a struggle for the command of the Dardanelles, through which heavy commerce funneled. Cf. Emile Mireaux, *Les Poems Homériques et l'Histoire Grecque*, 2 vols. (pairs: Albin Michel, 1948), ch. II, XIV, *et passim*. A strategic city that had to be put to good economic use might be thoroughly destroyed, short-sightedly, and another later on built upon the site. Even if this were true of Troy VII, would it have been also true of the earliest Troys, a habitual shortsightedness?
- 19. Chandler, *loc. cit.*
- 20. Rupert Furneaux, Krakatoa (1964).
- 21. Communication from Prof. Jorg Keller, Institute of Mineralogy, Univ. of Freiburg, June, 1974.
- 22. Israel M. Isaacson (E.M.S.), "Some Preliminary Remarks about Thera and Atlantis," *KRONOS* I, 2 (Summer, 1975). pp. 93 ff.
- 23. *Iliad* (Lattimore trans., 1951), p. 405.

- 24. "Lightning and Fire Ecology in Africa," Proceedings Annual Tall Timbers Fire Ecology Conference (April 22-23, 1971),473-511,475.
- 25. Quoted in I. Velikovsky, Worlds in Collision (N.Y., 1950), p. 218.
- 26. Furneaux, *op. cit.*, 73, 97, et passim.
- 27. A. Rittmann, *Volcanoes and Their Activity*, trans. by E.A. Vincent (1962), pp.12-13. 218.
- 28. *Worlds in Collision*, especially "The Hail of Stones," "Naphtha," "Ambrosia," "Rivers of Milk and Honey," "Samples from the Planets."
- 29. Harold Urey, "Cometary Collisions and Geological Periods," 242 *Nature* (March 2, 1973), p. 32; Velikovsky, *Earth in Upheaval* (1955), 147-53.
- 30. Troy (Princeton, N.J.: Princeton U.Press), Vol. 1, 325, 363.
- 31. *Ibid.*, p.373.
- 32. Cf. Worlds in Collision. 48-51, "The Red World."
- 33. CF. Nicola Rilli, *Gli Etruschi a Sesto Fiorentino* (Firenze: Tipografia Giuntina, 1964). Also, Michael D. Coe R.A. Diehl, and M. Stuiver, "Olmec Civilization, Veracruz, Mexico: Dating of the San Lorenzo Phase," 155 *Science* (1967), 1399-1401 (the authors report that many pieces of asphalt litter the excavated ruin level). F. Wendorf, *et. al.*, "Egyptian Prehistory," 169 *Science* (18 Sept. 1970), no. 3951, pp. 1163, 1169 and figure 1, speak of widespread brush fire in reference to a bed of ash in the Nile Valley. Geologist Louis Lartel, in his first studies of Cro-Magnon man near Les Eyzies-de-Tayec, Dordogne, in 1868 uncovered five archaeological layers covered with ash. And so forth.
- 34. *Op. cit.*, p. 700.

- 35. E. C. Baity, "Archaeoastronomy and Ethnoastronomy Thus Far," 14 *Current Anthropology* (October, 1973), 389-449.
- 36. Vol. I, p. 17.
- 37. I. M. Isaacson, "Applying the Revised Chronology," *IV Pensee*, no 4, 5, p. 14, quoting C. W. Blegen, *Troy*, V.IV, 1, p. 158.
- 38. Legends of the Earth (Bloomington: Indiana U. Press, 1973).
- 39. J. Lawrence Angle, *Troy: The Human Remains* (Princeton, N.J.: Princeton U. Press, 1951).
- 40. Site visit with Arthur Brown, Geologist and technical consultant, Athens Metro Project, September 11, 1974.
- 41. Communication of April 24, 1974 from K.F. Huff, Manager, Exploration Division, Exxon.
- 42. M. Blumer and W.W. Youngblood, "Polycyclic Aromatic Hydrocarbons in Soils and Recent Sediments," *Science* (April 4, 1975), p. 53.
- 43. W. Gentner, B.P.Glass, D. Storzer and G. A. Wagner, "Fission Track Ages and Ages of Deposition of Deep-Sea Microtektites," 168 *Science* (17 April 1970), 359-61.

CHAPTER THREE

THE FOUNDING OF ROME

For some time now, the founding of Rome has been accredited to truculent Latin rustics lost in the miasma of VIII century history. The more glorious legend of its establishment by Homeric heroes, particularly Aeneas, prince of Troy, has been in abeyance. However, in the light of recent theory and newly uncovered fact, the two stories can be blended in to a credible account. To suggest the new history is my purpose here.

To begin with, I would allude to two larger ideas, which we shall be carrying into the Italian setting. One is the increasing probability that a period of over 400 years of accepted chronology around the Mediterranean world did not exist and should be stricken from the record. These are the so-called Dark Ages of Greece, which were placed in the historical record in the first place to correspond with four hundred years of Egyptian chronology that were also non existent. "The Aegean prehistorians", writes J. Cadogan, "have no choice but to adapt themselves to the Egyptologists"[1].

This may seem still to be true to most ancient historians, but a generation ago Velikovsky, in his book *Ages in Chaos*, knocked out the Egyptian centuries at issue and, following his cues respecting the Greek Dark Ages, I. Isaacson (Schorr), the *Review of the Society for Interdisciplinary Studies* of England, the journal *Kronos*, Velikovsky himself, and even the present writer have worked to close the Greek time gap.

Hence, it is possible now to connect Cadmus of Thebes with Akhnaton, the butning of Pylos with the destruction of Troy, to tie together in fact a number of natural catastrophes and movements of people that Claude Schaeffer had coordinated in time, and that could readily be slipped down by four hundred years into the VIII century. For Schaeffer's inventory of

destroyed sites of the XIII century "Peoples of the Sea" period reveals that these settlement were succeeded by towns of archaic Greek, Greco-Roman, or other much more modern settings not older than the VIII. century.

The case of Troy, so close to our subject here, is especially instructive about the pseudo-time gap. As J. N. Sammer sums up the evidence [2], Troy-Hisarlik VIIb was the last Bronze Age city of the famous site. There followed a Greek town of the VII century or later; no deposits intervened. Furthermore, there was an abundant continuity. Gray Minoan pottery was found in Troy VI, Troy VII, and the Greek Age Troy. The forms of settlement were identical in the Late Bronze Age (supposedly the XII Century) and the -700 or later Greek settlement. A Late Bronze house was obviously used by VII century Greeks. Beset by the dogmas of Egyptian chronology, scholars such as Blegen and Coldstream resorted to the excuse of an abandonment followed by contamination in a mixing of debris.

In Egypt this was the time around the pharaoh Ramses III, on whose temple of Medinet Habu relating to the year 8 is recorded the "Invasion of Sea Peoples," that "They were coming while the flame was prepared before them, forward toward Egypt" [3].

Fire "before them" is not metaphor but refers probably to the innumerable cases of destruction by fire at this time, a fire which may have been from fierce earthquakes, volcanism, and exoterrestrial sources, which desolated many peoples and sent them out as marauders and colonists. Or so it is argued in a number of places, and it is precisely this kind of general ecological destruction encountered in VIII and VII century history that helped to confuse the dates by seeming to cause "Dark Ages" of barbarism, depopulation and continual movement and strife of peoples. Hence, the second point about the background of Rome is that the town originated in a turbulent period when the war planet Mars, Homer's "bloodstained stormer of walls," became a top god in Troy and not by coincidence in Rome.

The latest consensus may be expressed in the words of F.Castagnoli: [4]

Archaeological excavations have opened up new prospects: the considerable documentation of evidence of the Late Bronze Age (particularly in the zone involved directly with the legend such as Ardea and Lavinium) and the Mycenean imports in Southern Etruria, and between Reatino and southern Umbria, has reinvoked the thesis (for some time cast aside) of a true historical reality adumbrated in the legend; joined to this suggestion is the hypothesis that various manufactures of the oldest Latium civilization reflect Cretan models and finally the theory that the Latin language reveals Mycenean traces. In consequence, the coming of Aeneas to Latium my not be an artificially created myth, but instead, in a certain sense, a tradition, that is, the echo of real occurrences, the arrival of Aegeans in Latium during the period of the Trojan War.

This certainly does not go far enough to suit our views, but will do for a start.

At the magnificent bimillennial exposition honoring Virgil in the beautiful setting of the Campidoglio in Rome in 1981, the heroine was the famous sculpture of the wolf of Rome, suckling Romulus and Remus. A small boy listened while his father explained: "She nursed the orphans, and Romulus then founded Rome." The wolf was fashioned alone in ancient times, possibly by an Etruscan master, and the twins were added only several centuries ago. The wolf of Rome and the Mars-Ares of Aeneas' may not have been far apart.

Already in antiquity and possibly based upon the word of Herodotus alone, the Trojan wars had been placed in remote antiquity, the XII and XIII centuries. When the Romans came to deal with this date, they found that their tradition of Romulus as founder of the city proper in the VIII century (753,747, etc) was impossibly disconnected with the Trojans, who now seemed to have disappeared four centuries earlier. Thereupon at the end of the III century B.C., Q. Fabius Pictor, a Roman writing in Greek, first (to our knowledge) bridged the gap by inserting an Alban line of Kings: but a more recent quotation from him (see below) seems to contradict this reputed view. In contrast, Ennius and others connected Aeneas and Romulus directly, as grandfather and grandson.

F. Castagnoli tells us how skepticism discounted the tradition:

The Trojan origin of the Latins was already put in doubt in the seventeenth century by the humanist Philipp Cluever, a rigorous critique of philological aspects begun in the middle of the Eighteenth Century (Niebuhr, Klausen, Schwegler, etc.); principally upon their work has been based the interpretation of legendary material accorded by most historians of ancient Rome.

It is understandable that since the Romans had not been able to stabilize the history of their origins, the legendary part would fall prey to the new scientists who were bent upon sharpening their tools against superstition.

Later on the strong interest of the Etruscans in Aeneas was exposed. Also presented was the theory that Greek writers had created the legend. But then, after Mycenean connections had been liberally displayed in the archaeology of Italy, the notion of archaic elements corresponding to the myth grew up. More recently Latium has come under exploration, including especially Lavinium.

In the *Iliad* (302-8), the god Poseidon saves Aeneas from being killed by Achilles so as to preserve the house of Dardanus, beloved of Zeus, whose head will be Aeneas and also Aeneas will be king of Troy with many generations to follow. Hera adds that Troy must be substituted. So went the logic behind the legend.

But of course there was more than nonsense in the *Iliad*. In the years when Virgil was writing the *Aeneid*, Properzio publicized him, announcing that he would revive the armed exploits of the Trojan Aeneas and the wall built upon the Lavinian strand. "Take yourselves back, Roman and Greek writers! There stands hidden something greater than the *Iliad*."

In the middle of the VIII century, Ilioupersis of Arctinus and Miletus spoke of the secret flight of Aeneas from Troy up Mount Ida. Later the Homeric hymn to Aphrodite promises Aeneas a kingdom with a glorious future, a Troy restored. In the VI century a coin of the city Aineia on the Chalcidean peninsula displays Aeneas in flight from Troy, whence to found this same settlement.

That Aeneas went west appears for the first time in the fragmentary record in a table of the Capitoline Museum illustrating the work of Stesichorus of the VII century. In one scene Aeneas leaves through a Trojan gate; in another, Aeneas, with his father, Anchises, son Ascanius, and companion Misenus board a ship *eis ten Hesperian*, "toward the west." Anchises carries the sacred idols.

A direct connection of Aeneas with Latium appears a century later, at the end of the V century, with two Greek historians, Ellanicus of Lesbos and Damaster of Sigens. The story also appears of the burning of the Trojans' ship by their womenfolk, and of the naming of Rome after the Trojan heroine Rome, ringleader presumably in the affair.

The story told by Greeks (and no Roman history in Latin is known until much later) is seen in Italian perspective about 300 B.C. when the historian Timaeus of Tauromenium attests to sacred Trojan relics preserved in a sanctuary of Lavinium. Several decades later, the poet Licofronius, depending upon Timaeus, confirms him and details on the existence of the legendary Lavinium.

About the same time, Q. Fabius Pictor was writing his history. A recently discovered and fragmented inscription says only this about him:

He enquired into the arrival of Hercules in Italy and (?) the alliance of Aeneas and Latinus ...Not (?) much later Romulus and Remus were born [5].

Thus contrary to his reputed view, Pictor (or Pictorinus as the inscription has it) carries Aeneas in the VIII century. The mention of Hercules is not queer. In *The Disastrous Love Affair of Moon and Mars*, I review the legendary ties between the good-man figure Hercules and the god Ares-Mars, and place the sons of Hercules, the Heraclids, as the invaders of Greece in the VIII century, at Pylos, for example, where they fight against the Pylian kinsmen of the young Nestor, later famous as an old warrior of the Trojan War.

Another case implicating Hercules-Mars and the Heraclids reminds us of the Roman case. It is introduced by Desborough in his book on the *The Greek Dark Ages* [6].

Temenos was one of the three Heraclid leaders who with the Dorians seized the Peloponnese, according to the conventional Greek chronology at the end of the twelfth century. He had a grandson called Rhegnidas, who gained control of the little town of Philius; this would be not much later than the middle of the eleventh century. This event, as we are told by Pausanias, resulted in the departure to Samos of the leader of the opposition party in Philius, Hyppasos; and Hyppasos was the great-grandfather of "the famous sage Pythagoras." Pythagoras should then have been living at the end of the tenth century, and so one might think, one has an admirable Dark Age situation: until, that is to say, one discovers that Pythagoras belonged to the middle of the sixth century, a difference of no fewer than three hundred and fifty years.

The Heraclids are evidently of the eighth century.

In the superior guidebook to the Bimillenario Virgiliano at the Campidoglio in Rome, 22 September to 31 December 1981, we find the major leads needed to connect *Enea nel Lazio* to the larger Mediterranean framework of time and events.

Hundreds of archaeological discoveries are displayed and all of the sites excavated until now are described. The distinguished editors and authors do not speak of a "Dark Ages" in Latium or Italy. They act nevertheless as if they existed. Therefore we find that when all the artifacts can be grouped by centuries they concentrate into two groups , the first from the XI to XIII century B.C. and the second from the VIII century to the end of the Republic.

The archaeological record of contacts between the Aegean world and Tyrrhenian Central Italy are few and difficult to interpret. Presently one treats with seven fragments of pottery and five fragment of bronze coming from the areas of Luni sul Mignon, San Giovenale, Monte Rovello, and Prediluco-Contigliano none of them coastal...It is almost impossible to assign them precise form and the decoration is too generic to permit all but the broadest dating [7].

Not only is there an absence of imported articles over the centuries between the supposed time of Aeneas and the time of the founding of Rome, but indigenous discoveries of the period are also rare (and, we argue, perforce non-existent). Hundreds of dates and artifacts mark the Bimillennial Exposition. Perhaps only a dozen are slipped into the period between the XI and VIII centuries. The earlier objects and dates are of Italian provenance; the later ones are heavily Greek.

The earlier period carries Central Italy into late Bronze and the beginnings of the Iron Age. The cultural uniformity of southern Etruria and Latium is called total already at this XI century boundary. Iron tools of Aeneas are attested to. And then, following the "Dark Ages", there occurs an outburst of production and trade.

The king and cities of Virgil become then historical realities only when figured in the early Bronze Age: it is on the other hand certain that their origins need be sought in that crucial period, the Late Bronze age [8].

The arrival of "Aegean" people in the XIII Century, writes one authority, Renato Peroni, should have inaugurated a process of elements deriving from various fields of human activity, beginning with the material culture.

Yet of all this, in the archaeological sources related to the period of Latium that interests us, there is not the slightest trace. It is hard to imagine a cultural continuity, in ceramics for instance, greater than that which is presented during these centuries [9].

Peroni, after expressing grave doubt that one could have an invasion and occupation without cultural impact, though that is what archaeology seems to reveal, repeats that in the XIII to XI Centuries (and significantly for our argument he terms the XI "less developed") "the cultural uniformity of southern Etruria and old Latium appears to be total."

What else can he say, so long as he believes the long chronology inherited from the Egyptologists: "The literary sources and archaeological evidence permit us to assign the destruction of Homeric Troy to the XII century. The Latium of the 'saga' of

Aeneas is therefore of the period contained between the Middle Age of Bronze (XVI - XIV Century B. C.) and the first phase of Latin civilization (X Century)" [10].

He goes on to survey the town sites occupied in the late Bronze Age, and finds a continuity of occupation going into the age of iron, such as Ardea, Ficana, Pratica di Mare, and Acqua Acetosa Laurentina. This in itself is remarkable, considering the lapsed centuries and the absence of cultural remains of the long period of time.

Also remarkable is the evidence that between the end of the Bronze Age and the beginning of the Iron Age the number of inhabited places of Erturia dropped by four fifths [11]! At the same time, the underpopulated regions of Latium and Sabina held their own and increased slightly their settlements.

"So rapid a process of depopulation (in some cases occurring violently, in others voluntarily abandoned) and the incorporation of the population in a few proto-urban centers will make way, in its turn, to the mechanisms of formation of a complex society, even of a 'stratal' type, at the beginnings of the Etruscan nation." Meanwhile, the Latins were beginning to accrete settlements.

This scenario of Peroni suits exactly our theory of a period of natural catastrophes and survivors occurring in the VIII century. One age disappears into another without evidence of transition. As in Greece the culture reverts to survivorship; strife is rampant. The Trojans arrive amidst a general desolation and disorganization, gain a foothold without difficulty even welcomed in a way, and begin to expand and to found new towns, among them Rome.

In Southern Italy and Sicily a similar set of events is occurring. The scholar's "Dark Ages" myth prevails. After the mid-XIII Century, writes L.B. Brea, "a real Dark Age set in only to be brought to an end five centuries later with the Greek colonization of Sicily and Southern Italy." Before it set in, there had been much trade with the Mycenean century and a flourishing civilization. However, we find that the city of Gela was established by a warrior from Troy in 690 B.C. We also note

that at Agrigento and Segesta artwork in Mycenean style was practiced at both of the interfaces of the Dark Ages. Further, dome-shaped Mycenean *tholos* tombs were closely alike across the imagined 500-year gap. And that at Morgantina excavators founds a Greek fort constructed just above and on top of a destroyed Mycenean level.

Virgil has Aeneas landing in Latium, at the mouth of the Numicus river (Sol Indiges, Troia and by today's name Fosso di Pratica). The hero, desperate to feed his men, chase an animal for distance of all 24 stadi (4440 meters) and comes upon a herd of pigs on a hill. He sacrifices them there and founds the town of Lavinium. The names and distances between the two given by Virgil are exact today [12]. Titus Livius remarks on the name, Troy, given to the place of landing. The Trojan altars were said to be still there at the end of the pagan era, by Pliny the Elder and Dionysius of Halicarnassus, the historian.

At Lavinium, named for Aeneas' wife, Dionysius visited in the I century B.C. There he witnessed relics supposedly of Aeneas held in a sanctuary and tomb dedicated to the Trojan hero [13]. The preservation of the relics and the identification of the tomb might well have been impossible if they have originated in the XII century; it is more plausible that they had lasted from the VII or at least until the time of Timaeus of Tauromenum about 300 B.C., who saw them. Recently, the "tomb of Aeneas" has been uncovered and placed in the VII century, with remodeling into shrine occurring in the IV century [14].

Dionysius describes a round temple at Lavinium that housed the idols of the Trojans, which seems to have been emulated in the round temple of Vesta and the Penati of the Roman Forum. The small Lavinium temple is replicated on a coin of the Emperor Antonius Pius.

Aeneas probably rested in several places on his way to Latium, in Asia Minor, Macedonia, Crete, Carthage, and Sicily. Apollo's oracle at Delos told him to seek the lad of his ancestors and this was taken by his father, Anchises, to mean Crete. The refugees did go there, finding a desolate and abandoned settlement. They began to settle down but were beset (significantly) by a natural disaster that made further consultation with Apollo necessary.

Luckily, a second trip to Delos was not required because voices authorized by Apollo urged them to find the true place of their origins, and they set sail for the West [15]. Anchises could not remember Italy, hence had not been born there, but recalled that certain ancestors had come from there, Dardanus and Iasius, and had been Olustrians or Italians.

On the way to Italy, they stop at Carthage, which is, says Virgil, still under construction by Queen Dido, who has fled with her supporters from a berserk brother who ruled Phoenicia. Here we encounter a chronological problem; to be sure it is not a matter of centuries but of a generation. Dido is best placed at -804 or -803, before the dates which we accept for the Trojan War(s), which may have occurred over most of a century, at which time Aeneas would most likely have left Troy. Moreover, the dates assigned traditionally to Romulus, a grandson of Aeneas, are -772 (-771) to -717, and to the founding of Rome -747 or thereabout.

Either Aeneas left upon an earlier sack of the city, or someone related to Aeneas and therefore confused with him visited Dido. The stop itself was not unexpected. There appears to be a non-Greek connection that binds in alliance the Trojans and their Thracian and Anatolian friends, the Carthaginians, and the Etruscans. Etruria, said Herodotus, was settled by Anatolian Lydians before the Trojan War [16].

But who might have visited Carthage and could be mistaken for Aeneas? Philistos and Appios clearly give 50 years before the Trojan War as the date when Carthage was founded. Timaeus gives -814 and Josephus independently gives -826. Yet Carthage's earliest archaeological remains afford specimens of Greeks material ascribed to the last quarter of the VIII century, presumably -725 to -700 [17].

Were the Phoenician and Trojan refugees in motion a century apart? Not according to Virgil, obviously, who describes a torrid love affair between Aeneas and Dido. And not according to the traditional dates for Romulus and the founding of Rome; if Aeneas abandoned Dido at the turn of the century, he could have grandfathered Romulus at the appropriate moment, about -772.

Arie Dirkswager, in an unpublished manuscript lent the author, offers a solution. He suggest that the king of Tros who founded Troy then moved to Italy where he founded Etruria and gave the Etruscans his name, about -815. It was he who knew Dido! Then later, the refugee party led by Aeneas would join its kinsmen about 747 B.C., when Troy burned.

However, although we also view the Etruscans and Trojans as related, we see a later date for the Trojan wars finally to end, and one has to place Romulus and the founding of Rome into the very end of the VII Century.

We are perplexed now and have exhausted our meager supply of information. The most plausible suggestion I can afford is that the Trojan Wars were several until the city's final destruction (and we cannot confirm the site of Hissarlik - Schliemann's discovery - as more than a frontier post in the struggles). Given the practices of those times, an age of colonization and restless wanderings having begun, Aeneas, Prince of Troy, led his party of refugees out at an early stage of the wars (which Homer combined into one for literary effect and from amnesiac causes), did visit Dido at the turn of the century, and so history picks up with Romulus and the founding of Rome in the middle of the next century. We are introducing one doubt in order to relieve ourselves of several. And we should be grateful if some brilliant scholar carried down the whole scenario by another century to place it squarely in the catastrophic VIII and VII centuries.

We have relieved ourselves of several notions: that Virgil was only glorifying Rome by mythmaking; that the "Dark Ages" existed Italy between -1200 and -700; that Aeneas and Troy were of the XII Century; that Aeneas and Romulus were fictional characters; that were was no significance to Mars and the Wolf of Rome; that he Etruscans were long settled in Italy and were a natural and continual foe of the new Latins; that the Romans were a simple farm folk who took well to fighting; and that in the VIII Century natural conditions were normal.

We understand better why the exasperating gap between Aeneas and Romulus was created: the need to integrate chronology of diverse cultures by basing it upon what was believed to be the nearly perfect chronology, the Egyptian; the scholarly skepticism

of all legend until recently, especially when wolves and feral infants are tied to the mythical package, not to mention the hallucinogenic pantheon; the seeming circular confirmation of Etruscan-Greek-Roman interrelations; the ignorance and neglect of great natural disasters, such as Aeneas encountered in Crete; alternative explanations of the Dark Ages such as long-drawn-out climatic changes, restless northern tribesman, and normal decay of civilizations; the injection of artifacts and personages falsely into the gap of time; and the vanity of Roman noble families who had attached themselves genetically to the fictitious personae of the noble line of Alba Longa extending back to Lavinium, including even the Caesars.

We surmise, by way of contrast, that Aeneas was a Trojan noble, active around -800. He left a beleaguered Troy in an early stage of successive sieges, founded settlements in several places, eventually in Latium, near Etruscan relatives, and among a disastrously weakened native population.

A prompt acculturation and cultural homogenizing began, catalyzed by the disorganizing effects of a turbulent nature. His daughter Elia mothered Romulus (and one fantasizes that his godmother was Roma who led the female party which burned the Trojan ships to prevent further wanderings). The heavens were producing some of the disasters, and the planet Mars was connected with them to the point that the god could be the godfather to Romulus who eventually joined him in a cyclonic episode. The wolf of Rome was the symbol of Mars. The experience of Italy was being replicated throughout the world in those times; many peoples were practically destroyed; many new towns were founded. The Mycenean civilization was wrecked, so too the Cretan, so too many another including the Siculian of Italy and Sicily. The Bronze Age lurches abruptly into the Iron age.

Notes (Chapter 3: The Founding of Rome)

- 1. An extension of remarks at a conference of the Canadian Society for Interdisciplinary Studies at Lake Kashagawigamog, Ontario, August, 1983.
- 2. "Dating the Aegean Bronze Age without Radiocarbon," 20 *Archaeometry* (1978) 212.
- 3. W.F. Edgerton and J.A. Wilson, *Historical Records of Ramses III* (Chicago: U. of Chicago Press, 1936), 53; While J.H. Breasted (*Ancient Records of Egypt* (1906), IV, 37-8) translates "They came with fire prepared before them, forward to Egypt."
- 4. In *Enea nel Lazio: Archaeologia e Mito* (Milano: Fratelli Palombi; 1981), 5.
- 5. R.M. Ogilvie, *Early Rome and the Etruscans*, New York: Humanities Press, 1976, 16.
- 6. London: Benn, 1972; Malcolm Lowery provides this instance in I *Soc. Interdiscip. Stud.* 1 (Jan. 1976) 16. I cite another in *The Disastrous Love Affair of Moon and Mars*, "Crazed Heroes of Dark Ages."
- 7. Enea nel Lazio, 107.
- 8. Alessandro Guidi, in *Enea Nel Lazio*, 94.
- 9. Enea nel Lazio. 87.
- 10. *Ibid.*, 88.
- 11. *Ibid.*, 92.
- 12. *Ibid.*, 157.
- 13. *Ibid.*, 158.
- 14. P. Somella, Rediconti 44: Atti di Pontificio accademia di Archeologia (1971-2), 47-74; Enea nel Lazio, 157-8, 172-7.
- 15. Aeneid, III, 94-6 (Humphries trans.) pp. 64, 66.

16. *Histories* I, 94, (80-1 in the Penguin ed., 1954).

CHAPTER FOUR

MICAH'S ARK

Velikovsky persuasively traces the ruins of Baalbek to the ancient seat of a fine city constructed during the reign of Solomon [1]. Baalbek, too, was the second capital of Dan. "The Danites, migrating to the north, took with them Micah and his idol, and it was placed in Dan of the North." (3.14) The Oracle of Micah probably was set up in the "house of high places," a temple that was built at Dan by Jeroboam "to contest and to surpass the temple of Jerusalem." (3.15) The oracle remained in high esteem at least as late as the fourth century of the present era, when Macrobius in his *Saturnalia* wrote of Baalbek: "This temple is also famous for its oracles." (3.14) The Emperor Trajan questioned the oracle in the year 115.

Velikovsky's notes, compiled by Jan Sammer, show two more indications of what the oracle might have been. Of Baalbek-Dunip-Seti's Kadesh, "the place is known as Yenoam ('Yahweh speaks') which refers to the oracle." Then , "Yenoam-Dan (Yehu probably introduced the cult of Yahweh at Dan). Yenoam, read in Hebrew, could be interpreted as "Ye [Yahweh] speaks..." Writes Sammer: "Velikovsky evidently saw in the name a reference to the oracle of Dan." I agree, and Yehu might be interpreted as a form of Yahweh.

But Velikovsky did not proceed to identify the oracle further, although this would have strengthened his case all around. In my book on *God's Fire: Moses and the Management of Exodus* there occur the following lines:

We hear that on one occasion the Ark was duplicated by a young man named Micah in his home, a surprising occurrence, reminiscent of claims that the nuclear bomb can be home-made. The lad's mother was quite proud of him; she had consecrated her silver for the purpose (*Ju.* 17:3) He made a graven image, a molten image, an ephod, a

terraphim, and hired a priest. Nothing untoward occurred save that men from the tribe of Dan descended upon the household and carried away the ark and its Levite attendant. Later we learn that the true Ark was kept at Shiloh, whence it was occasionally employed.

I owe the realization that Micah's image was an ark to J. Ziegler (YHWH, 34-35). He points out that mere images of material are common in ancient Jewish household; that the word which is translated "image" as in "any standing image" comes from the word "neck," hence refers to any arrangement or instrument capable of discharging an ark, that Micah needed both insulating carved wood and metallic sides, that is, both "a graven image and a molten image" to fabricate his ark. Ziegler perceives that the first and second commandments go together, expressing the absolute preference for Yahweh followed by the prohibition of graven images, by which is meant any competitive presentation of the divine who was displayed on the true Ark.

The Danites, after stealing the image (ark), erected it in the capital of the country that they had savaged. "And they kept the carved image of Micah ..., all the day that the house of the God continued in Shiloh," an obvious reference to the prototype "true" Ark of the Covenant that rested at Shiloh for a long time.(*Ju.* 18:13)

Hence a functioning Ark, an electrical apparatus that has been described elsewhere (Ziegler, *op. cit.* A de Grazia, "Moses and his Electric Ark," *Midstream*, Nov. 1981), found a home in Baalbek, where appropriately, it was mounted upon a hill site. There, in the years of declining terrestrial discharges, it might still on occasion approach the norm of activity that its prototype (then in the temple of Solomon at Jerusalem) displayed during the Exodus under the direction of Moses.

In Velikovsky's article, the "thing" is an "oracle," an "image," and an "idol," vague terms applied to the Ark in conventional Biblical exegesis. Too, they are terms that the editors hostile to the Northern Kingdom would use to avoid suggesting that something approaching in shape, intent, and functions the most sacred Ark would be operative there, or anywhere else. The oracle of Micah was also called "a voice ...from Dan" by

Jeremiah, and "voice" was a term used literally and liberally in regard to the presence of Yahweh on the Ark.

The "oracle of Micah," or Micah's Ark, lends authenticity and credibility to Velikovsky's reconstructions of the history of Baalbek. Some fifteen years ago, during a rambling conversation that took in the crises over Lebanon, Velikovsky fixed me with a confiding gaze and said: "Baalbek was part of Israel. I have never published it because it might cause trouble." He felt that such proof would be made the basis for a claim to Lebanon by Jewish extremists. He was complex; here he was a man of peace; but usually his scale of demands paralleled or even advanced beyond those of incumbent rulers of Israel.

The complexity of his character is involved in the oracle of Baalbek, too. We note his statement about Jeroboam, who built the "house of high places" at Baalbek-Dan and had built the Jerusalem walls under Solomon; "before becoming king of the northern kingdom he lived as an exile in Egypt. He introduced the cult of the calf in Dan."

Velikovsky despised any Jewish minion of a foreign power. Nor did he like the "Golden Calf." He acknowledged its enduring presence in Hebrew religious history, opposing it to the "superior" abstractions of Moses Yahwism. Velikovsky did not see the Ark as a functioning electrical machine, and merely grunted in response when, a year before his death, I mentioned to him that an electric Ark was a feature of my manuscript of Moses. Two years earlier, I had raised the subject of Ziegler's book *YHWH* and it was obvious that, although he had received it, he would not read in it.

Probably he saw, in the image of the calf, which was the only ritual image turned up by the Baalbek excavations, a synopsis of Baalbek Dan's dedication to the apostasy of Jeroboam and the Ten Tribes, a taboo-guarded subject in Jewish tradition. In sum, Velikovsky probably regarded the Ark of the Covenant as a mere holy litter, in the modern scholarly conception of bedouin ritual apparatus, and may have assumed, with embarrassed haste, that the oracle of Micah related to the worship of the calf and embodied its image, whereas most likely the oracle was the Ark of Micah and preceded Jeroboam's assumption of power in

Baalbek; it was infuriating to the southerners, who later on supplied the editors of the Bible.

Notes (Chapter 4: Micah's Ark)

1. III *Kronos*(1981-2) nos.2, 3.

CHAPTER FIVE

THE CATASTROPHIC FINALE OF THE MIDDLE BRONZE AGE*

(* A paper presented at the IX Congress of the International Union of Prehistorical and Protohistorical Sciences, Nice, 1976.)

Catastrophes are defined as large-scale intensive natural disasters. All the world's religions are founded upon original catastrophes. Indeed, so obsessive is the connection between catastrophes and gods, that human cultures, even the most scientifically advanced ones, refused to turn over the study of catastrophes to science. As a result, science and scientific history made their way after 1840 in defiance of the very idea of catastrophes, that is, of a quantavolutionary as contrasted with an evolutionary primevalogy. Quantavolution promises, as I would like to illustrate here, an ability to penetrate some prehistoric and historic problems that have caused confusion in uniformitarian, gradualist, evolutionary theory.

We are dealing here with a large area of the Earth, and with 2500 years of time. We should guard against defining catastrophe by some measure that turns out to be a mere uniformitarian statistic. The incidence of catastrophe between 3500 B.C. and 1000 B.C. must be much greater than the incidence of the past 2500 years, an equal length of time, to support my thesis. That is, we should add up all the Vesuvius and Krakatoa eruptions, the Caribbean hurricanes and Kansas cyclones, the Siberian meteoroid falls, Swiss avalanches, sinkings and risings of town harbors, Yangtse and Mississippi River floods, frozen Baltic winters, prolonged Saharan droughts, etc. Then convert the intensity and rate of these events into 2500 year averages. Then, further, if these recent indicators appear to compare 1 to 1, or even 1 to 2, with the Bronze Age indicators of the expression of high natural energy, perhaps the thesis

should be abandoned... And many scholars would be pleased to confirm that the human record has been uniform, gradual, and linear, instead of catastrophic and cyclical. Furthermore, they would feel that the technological progression "from stone to bronze to iron ages" had some essential meaning, or that a sociological progression "from hominid, to hunter-gatherer, to pastoral, to agricultural, to industrial" also has meaning. They would further be reassured that the great gods that succeeded each other on the altars of ancient cultures were only the typical occasional results of the human pastime of inventing new gods whenever normal life routines were disturbed by the tides of fortune or war.

But suppose the incidence of catastrophe is 1 to 3, or 1 to 5, or 1 to 100, comparing the modern age with the Bronze Ages! Then the catastrophic or quantavolutionary thesis will be nailed upon the door leading to ancient history. If it becomes reasonably apparent that the Bronze Ages exhibited high energy expressions and effects in multiples of 2, 3, 5 or a hundred times the expressions and effects of high energy in recent years, then all fields of ancient history and ecology must undergo change. Many cultures would have been caused to disappear in natural disasters. Human nature may have acquired the character of desperation. Personal behavior and institutional practices may have become suffused with the effects and expectations of intense traumas. In short, the world of natural and social history becomes a different world and had better be studied differently.

Let us look briefly, then, into the middle of the second millennium B.C., that is, some 3500 years ago. (Because there is some confusion of chronology and much controversy about it, I shall mention dates between 1700 and 1400 B.C. and venture an opinion later respecting their simultaneity and succession.) Did the events so dated happen at the same time or not?

I shall commence by paying homage to Claude Schaeffer. For it was he who, despite onerous preoccupations during the French War of Liberation, assembled and analyzed the mass of data which was finally published in 1948 under the title of *Stratigraphie Comparée et Chronologie de L'Asie Occidentale*, *IIIe-IIe millénaires*.

In this great work, he compared some 40 important archaeological sites in the Near and Middle East for evidences of sudden destruction. And he found, without fail, that there had appeared several levels over a period of thousand years when destruction seemed simultaneously to descend upon Bronze Age cultures.

His general conclusions were several:

- 1. Certain outstanding events... struck simultaneously a definite number or even the totality of urban centers of Western Asia... Not only is this conclusion persuasive as originally inscribed, but many locations can now be added to the doomsday list.
- 2. The catastrophes struck six times: roughly, about 2350, 2100, 1700, 1450, 1365, and 1235 B.C.
- 3. "The various countries of Western Asia affected by the perturbations reacted according to their own resources. Now these varied considerably, sometimes from one region to another, as a function of the climatic and geographic situation. Thus the chronology of the layers deposited during the periods of real stability between the great crises may present a deviation from one site to another. That is, nevertheless, never considerable and hardly ever exceeds fifty years." Even this discrepancy may be due to errors in dating the material uncovered.
- 4. The perturbations of cultures were caused by natural catastrophes, often giant earthquakes and fires, rather than by the hand of man. Cultural ruptures only rarely were caused by human elites, but "by atmospheric cataclysms or other calamities, such as earthquakes ... We perceive as yet only imperfectly the initial and actual causes of certain of these great crises. We put ourselves here expressly *en garde* against a generalization of the seismological explanation."
- 5. Long-enduring hiatuses or lapses followed the destruction, as after 1700 B.C.: "In all the sites examined up to now in Western Asia, a hiatus or period of extreme poverty causes a rupture of the stratigraphic or chronological sequence of the layers around

1700 B.C., and revival began only around 1550 B.C., 150 years later."

John J. Bimson, reviewing "the Conquest of Canaan" in the time of Joshua, finds in the records of excavation half a dozen destroyed settlements beyond those reported by Schaeffer in Palestine alone - Arad, Hormah, Gideon, Hebron, Hazor, et al. All went down in violent conflagrations. It is noteworthy that Bimson, on the say-so of Epstein, excludes Megiddo, holding that there was no break between Middle Bronze and Late Bronze ages. In this case, Schaeffer is in contradiction: "The stratigraphic picture of Megiddo shows an interruption of occupation between 1650 and 1550 B.C. The excavators report a variety of remains from the Recent Bronze Age, subsequent to 1550, and of remains from the Middle Bronze Age, antecedent to 1650, in the zone of contact of the two layers." There do not seem exceptions to this world-wide disaster which so many scholars have perceived in their own digging but are blind to overall.

6. Cultures were transformed in the times that followed the disasters. Many movements of peoples occurred. Economies changed. Some sites were abandoned entirely.

Also working during World war II, carrying on in New York as a journalist and psychoanalyst far from his home in Palestine, was Immanuel Velikovsky. In 1950, after rejection by eight publishers, his *Worlds in Collision* appeared, followed shortly thereafter by *Ages in Chaos* (1952).

Like Schaeffer, Velikovsky reported the universal destruction of settlements in the Exodus period, which he assigned to around 1450 B.C. So all that Schaeffer says happened about 1700, Velikovsky says happened about 1450. We resolve the dating discrepancy in favor of Velikovsky. The two scholars are discussing the same set of events that brought the Middle Bronze Age to an abrupt and terrible end. Both inculpate natural catastrophe as the general cause, and relegate the usual causes of change in recent times (leadership, weather, inventions, wars) to a minor causal role.

Unlike Schaeffer, Velikovsky introduced a first cause, a comet that he identified as the erratic proto-planet Venus, which has a hundred names around the world. This comet, said he, first closely encountered the Earth in the mid-second millennium. Granted this single ultimate cause, Velikovsky could support strongly the theory of the simultaneity of the catastrophes, which Schaeffer espoused.

Velikovsky further asserted that the set of disasters repeated itself, in reduced degree, at intervals of about 52 years, as the comet dropped its tail and assumed a more circular orbit. When it *did* approach, extreme religious celebrations were inaugurated in places as far apart as Palestine and Central America, celebrations that continued until recent times and were invariably connected with planet Venus. The disasters on Earth diminished, then, until the 8th century B.C., when a new deviant celestial force began to play upon the Earth and a new and heavy set of disasters began. Also unlike Schaeffer, Velikovsky wove voluminous legendary, mythical and geological material into the fabric of proof offered by archaeology.

Spiridon Marinatos and the island of Thera (Aegean Sea) is another part of the mid-second millennium story. As early as 1939 Marinatos began to publish theories of the destruction wrought by the explosion of the volcano of Thira upon Minoan civilization. Minoan culture, centered in Crete, promptly and abruptly declined. Not only Thera itself but many places of the Aegean and Eastern Mediterranean were badly hurt by the extensive fall-out, hurricanes, and tsunamis from the explosion of Thera sometime after 1750 B.C. Isaacson, however, whom I follow, ascribes the Thera disaster to the Tenth Century, B.C., perhaps in the years of King David.

A part of the debate over the dating of this event has been occasioned by the expectation of some scholars that this one explosion could carry the full responsibility for all the human and ecological changes occurring over a large area in the midsecond millennium. My opinion is that, both at the same time as the Thera disaster and before and after it, a multitude of other natural forces were unleashed, adequate to explain the total hiatus found over a great region and for a long time.

Velikovsky was not the first to point to a comet as the instrument of destruction. I would only pause to mention others here -- William Whiston (Isaac Newton's disciple) in the 17th century; the brilliant young Nicolas-Antoine Boulanger in the 18th century; the American politician, utopian, and scholar, Ignatius Donnelly in the 19th century. Although they may not have been preoccupied with the Bronze Ages as such, there is no doubt of the proximity to the Bronze Ages of the events which they describe.

More modern (in the 1920's) is the case of F.X. Kugler. Kugler was a Babylonian scholar and astronomer of the top rank. His last book, on the Sybilline star battles and the Phaeton myth, is a tour de force. In it, as Malcolm Lowery has shown, are the conflicting moods of one who dogmatically accepts primordial catastrophes of creation and the Noachian flood, but who is stubbornly uniformitarian otherwise. Kugler, studying the hysterical lines in the poetry of the Sybilline oracle concerning the battles among the stars (which describes a shifting struggle among the animals of the Zodiac), concludes that this must be considered a metaphor.

However, he crosses the bridge to scientific catastrophism in his analysis of the myth of Phaeton. This, he argued, embodies a factual event of the mid-second millennium when "one and the same stream of meteors passed over Africa (in particular, Ethiopia) and the Aegean, producing respectively great fires and violent flood waves." Kugler, it seems, strives to limit the Phaetonic catastrophe as severely as he can, while allowing the grave reality.

A number of Soviet, American, and Bulgarian students are delving into the area of the Black Sea, with the mid-second millennium as one possible breaking point. Oceanographers of Woods Hole, for example, date to something over 3000 years ago a heavy precipitation of organic material in the cores that they have drawn from the bottom of the Black Sea. In my opinion, this is a layer of sudden death.

Regarding the region to the South, Robert Adams (who holds a triple interdisciplinary position at the University of Chicago) is urging a shift of archaeological and anthropological perspective

from the individual site to a pattern of sites. No longer is the paradigm to be the single urban center, he says, but rather zones of cultural interaction that "will require work in many countries and over many decades." He finds, for example, "a major westward shift in the Euphrates system of channels as a whole during Kassite times." That is, perhaps in the mid-second millennium, there occurred a "dark age," "a population nadir." He finds hundreds of unknown sites to plot. Regions of culture disappear, reappear, switch places.

In their Central Asian work, apart from the Black Sea simultaneities already mentioned, Soviet researchers have noted widespread destruction. In a popular but authoritative book, the linguist Alexander Kondratov writes, "In the middle of the second millennium B.C. the ancient cities in Southern Turkomenia declined and were abandoned by the inhabitants. The South Turkomenian civilization perished at about the same time as the proto-Indian, and the reasons are still unknown."

The case of the proto-Indians of Mohenjaro, Harrappa, and a vast area besides is well-known, if not well understood. There is one theory that they lived so well off the fat of the land that their economy declined and they were extinguished. (This strange theory reminds me of the long-accepted idea that the magnificently equipped Magdalenian hunters of France, after flourishing beneath mountains of ice, gave up everything when the ice melted, because their reindeer prey left the area.)

Yet another theory about proto-India is quasi-catastrophic, Robert Raikes holding that natural dams formed and then broke, swamping the Indus cultural centers. The formation and collapse of natural dams can truly create great destruction; in the State of Washington Scablands case, the scenario has also been well worked out by geologists. However the timing of this special proto-Indian dynamic of catastrophe is significant. Why not later? Why not today? Why were these floods coincidental with a world that was in the throes of general destruction?

Further, the proto-Indian related cultures were widely diffused and most of them would not have been affected by the special flood dynamic referred to. It is most unlikely that such a great civilization of vast extent, with its city-planning, excellent cuisine, fine arts, and decimal numeration would succumb to swamping by mud, or for that matter to desperate invaders, themselves probably survivors of some northern sectors of the universal disasters. Further, Raikes has mentioned recent disasters of meandering rivers (but no culture has been destroyed). I suppose then that the conviction that catastrophe struck the proto-Indian cultures before the Aryan incursions occurred is correct.

Perhaps this was a time of great flood in Northcentral Africa or both flood and sudden desiccation. Who tipped or cut into the basin of the historically known Lake of Triton, said by Aristotle to be separated by a narrow belt from the Sea? The Lake may have been so large as to permit the luxuriant development of the Saharan region and its culture. Great rivers, including the Niger, flowed into it then. If Triton did burst into the Mediterranean, a Tyrrhenian flood catastrophe that destroyed western civilization may become a viable hypothesis.

The playful girlhood of goddess Pallas Athena (the Greek planet Venus) on the shores of Triton is suspicious. It was said that she accidentally killed her playmate Pallas and took the name herself in remorse. This same Pallas, however, is in another story a monster whom the notorious virgin goddess dispatched when he attempted to rape her. Even more, this Pallas is elsewhere identified with Typhon, the dragon and would-be destroyer of the world whom Zeus finally struck down in the middle of the second millennium. Pallas Athena was present in this episode, too, in the form of the protoplanet Venus, now tailless or without a phallus, by the loss of Typhon.

In Italy and Sicily at this time, abrupt cultural transitions are commonly reported, although none has conducted a survey of destruction levels. At Lipari, for instance, a totally new culture (the Ausonian) entered upon the scene. At Prato, in Tuscany, the Villanovan ruins, themselves separated from the Etrusco-Campanian period by "a colossal fire," to use Nicola Rilli's words, are based upon yet another enormous bed of ashes. I suspect that this bed may be tied to the mid-second millennium, but the question requires much more study.

Surveys are needed for the Western Mediterranean area and Northern and Central Europe generally. An abundance of legends of catastrophes is offered, and the shadow of catastrophe hangs heavily over prehistory. Vast forests may have swept into or been drowned by a Baltic Sea formed at this time. Offering themselves for mid-second millennium construction and abandonment are hundreds of megalithic monuments throughout the vast area. The astronomical interest of these peoples is now proven. But, even if one is not a psychologist, one cannot think it is normal for people to cut and lug 100-ton stones to do a job that a few sticks of wood would accomplish -- watching the Sun and Moon. I think that around this time, in despair and disgust, the survivor custodians of Stonehenge may have given up their job.

Suggesting a need for oceanographic archaeology are the legendary sinkings of lands mentioned in Eastern contemporaneous records, and in later classical and medieval sources. Where located and explored, as with Pharos at the head of the Nile, "the greatest seaport of the Bronze Age," according to R. Graves, the question of the date of the submarine tectonism that sank the city remains. Off Cornwall, England, even a log has been recovered from the depths.

Rilli, to take another example, believes that the Etruscans were related, if not descended from, the culture of a sunken central region of the Tyrrhenian Sea. In 1971, B.C., Heezen and others reported in *Nature* magazine upon the evidence of continental crust that lies foundered beneath the Tyrrhenian Sea. Of course, the dates are impossibly divergent.

Across the Atlantic, we need not believe that the mid-second millennium was peaceful. The Olmecs, as William Mullen of Princeton University reported, relying on Michael Coe, appear to have been deep in trouble, floundering in ashes, tar, and destruction. Apart from the still flimsy archaeological evidence, there exists a mythology, well introduced in the analyses of Velikovsky and Mullen, that appears to treat of this disaster. In the southern part of the Valley of Teotihuacan, 28 occupation levels of an abri stretch from 1500 AD back to 10,000 B.C. The only great interruption, according to Richard McNeish, happened between about 2300 B.C. and 900 B.C. This is a wide

gap, but obviously no one there seemed to be in a culturally creative mood in the mid-second-millennium.

Both Schaeffer and Velikovsky attempted an appraisal of the Chinese condition. Both allude to mid-second millennium floods and earth movements which marked the practical destruction of one Chinese civilization and the beginnings of a new system of society. In my opinion those sinologists who take the evolutionary position that this break marked the transition from a legendary society to a historical society are wrong. The break separates two highly distinctive societies and ages; the Chinese "Bronze Age" bursts out with the Shang dynasty after 1500 B.C.

Apparently, the atmosphere was not a silent witness to the global events of this period. There appear to have occurred remarkable deviant ingestions of Carbon-14 by organisms of this time, as disclosed in statistical studies by P.E. Damon, A. Long and E.I. Wallick, and analyzed by G.W. van Oosterhout. If you had died in this period, the likelihood that your anniversary would be correctly celebrated by Carbon-14 today, supposing your bones were nicely preserved, is very low. The likelihood is high that any two readings of Carbon-14 for organic death happening around then will very greatly. This indicates, at the least, fluctuations of atmospheric nitrogen, or cosmic or solar particles, or carbon dioxide (or all of them) beyond uniformitarian norms.

All such fluctuations, one may be warned, are themselves possible reflections or opposite deviations. That is, we cannot say that the several forces causing atmospheric deviations or aberrations were tending in the direction solely of the increased deviation. A cloud of CO will act to age a living thing for future tests and a cloud of cosmic particles will act to young it for future tests. The same organism in its lifetime can become not only much "younger" but also much "older," depending upon the inconstancies of its Carbon-14 intake; it can thus falsely line up uniformly with the Carbon-14 "constant" owing to contradictory inconstancies.

We may conclude, I think, that the mid-second-millennium was a period of serious atmospheric perturbations. The chemical measuring device seems to agree with the mass of legends about the catastrophic events of the mid-second millennium and may even underestimate their atmospheric effects.

Perhaps now I have inventoried enough evidence of devastation throughout the traditional region of the Bronze Ages and indeed over most of the world. The Middle Bronze finale composed a period of catastrophes certainly over twenty times as heavy as the past 300-year record shows, perhaps hundred times greater, perhaps much more. Even in the works cited, not to mention a hundred lesser compendia, more evidence might be adduced. I am inclined to convert the hypothesis into a challenge. No stratigraphic column, whether geologic or archaeological, can fail to show evidence of natural destruction dating from the middle of the second millennium.

BROADER CONSIDERATIONS

I shall rest the case for the mid-second-millennium catastrophes and move on to address additional issues.

First, I would stress one implications of the works cited. Earthquakes were only a part of the devastations wrought by natural forces. Schaeffer sensed this. The Middle Bronze Age civilizations and their counterparts throughout the world were too highly developed, organizationally and technologically, to have been overthrown by earthquakes alone, even if one could identify tectonic forces of the deep Earth that would strike to the tops of the Richter and Mercalli scales. The long hiatuses of cultures and the depopulation reported upon all sides suggest intense heat (causing death, plagues or vermin and disease), hurricane winds and tsunamis that can exterminate the biosphere, and an atmosphere often poisoned by volcanic and extraterrestrial particles and gases.

Second, if the *identified* destruction is plausible, probably an equal or greater amount of *unidentified destruction occurred*. Hurricanes of 250 miles an hour strip a land and all man-made works down to bedrock. Great tsunamis, such as are caused by huge earthquakes and meteoritic passthroughs of the atmosphere, do the same. Lava flows can cause the sudden deep burial of the surface. So can heavy tephra showers, not to mention the heavy burning rains of naphta that are carried in

various legends. If land can rise by kilometers, as is known, so can it sink, carrying forever from view what its surface contains.

Third, the clustering of disaster between the claimed dates of 1750 and 1450 points to a centralization of the cluster in time. This we shall know when the various claimed dates are brought into closer order. One thing is sure: the dates can only move *towards simultaneity* not away from it.

Such general simultaneous havoc strengthens the argument for celestial encounters as the first cause. Therefore, when one such as Velikovsky steps forward with the most persuasive kinds of legendary testimony, this testimony must be cast in the balance. If catastrophe on a grand scale occurs, and if all the voices of the age name the sky as its source, and if much of their behavior is organized around attempts to obey, placate, and predict the skybeings, it becomes reasonable to incorporate *astral* events in attempting to explain the events of the age. In a flashing epigram, Friedrich Nietzsche once wrote: "to the sage as astronomer: as long as you still experience the stars as something 'above you,' you lack the eye of knowledge."

When archaeologists strike a destruction level hovering around the middle of the second millennium, they are probably looking at a global event, a cultural fracture, a movement of peoples, religious revival and suppression, revolutionary regimes, despair, spectra terribilem (on earth and the sky), pandemonium, economic wretchedness, heavy atmospheric pollution, death on all sides.

To sum up, by my reckoning, the Bronze Age of the mid-second millennium experienced natural catastrophes on a scale inconceivable today. Hundreds of cultures were destroyed and their survivors were few in numbers.

The broad scale and intensity of the disasters, when aligned with much direct testimony, send us looking into the skies and then to the chain of earth-air-fire-water events that follow.

A SCHEDULE OF CATASTROPHIC AGES

What happened at the end of the Middle Bronze Age happened earlier and later. It is likely, for example, that the first dynasties of Egypt began on the relaxing slopes of a disastrous period, which brought new human cultures out of the West and South into the surviving neolithic milieu of the Nile Valley. The suggestions of catastrophe at the end of the Old Kingdom are likewise numerous. These extended straight through the Old Bronze Age, Neolithic and end on the Paleolithic, into the Ice Ages and therefore throughout the Holocene which may one day be defined, at about 14,000 years in length, as the Period of Catastrophes. On the more recent side, the catastrophes extend through the Recent Bronze Age and into the Iron Age of the Eighth and Seventh Centuries B.C.

Are we not therefore compelled to take up a new classification of the ages? I should say 'yes.' The present divisions should be reordered and renamed. Putting aside the absurd local categories in the hundreds, the division by metals is poor on five counts: it is parochial; misleading; presumptuous; non-anthropological; and undynamic. Actually various ancient classifications offered by writers such as Hesiod and Ovid are at least as useful. They furthermore introduce cycles of creation and destruction with each age, and sometimes a long linear or spiral development running through the cycles (that is, progress). Nor do I see any superiority in the optimistic, linear, evolutionary schemes of Fraser, Morgan, Engels, Spencer, and the others who perceived a rational technological sequence moving from hominid to contemporary mankind.

In dividing historical time, cultural change is the most logical concept to use. Where do the points of maximum cultural change occur? It appears that these points coincide with natural catastrophes. Lesser points of change can be connected with minor or localized catastrophes. Only afterwards come the uniformitarian periods, even with their brilliant episodes of Akhnaton's Thebes, of Periclean Athens, of Augustian Rome, of Medici Florence, Elizabethan England, or the France of the Enlightenment.

Since ages must be arranged, let them be arranged by peaks of change that correlate then with peaks of catastrophism. Since ages will be given names, let them perhaps be named after the sequence of great gods, those anthropomorphized expressions of disaster. For when the human race was cast down, it was from the natural forces; and the forces of nature originated from the skies; and these forces were called gods and as such invaded the mind and history. But to the scientific community, sensitive to its public image, an Age of Mars or an Age of Venus may be embarrassing. Whereupon we may resort to Roman numerals and speak of Holocene I, Holocene II, and so forth. Whatever the nomenclature, a revised conception of ancient times is in prospect.

Nevertheless I would suggest that we use the theological approach to fix our sights and ask "What gods ruled when?" If a certain god ruled during a certain time, and the same god flourished at the same time in different areas, then the same age could be distinguished in its natural and human condition by the nature of its god. From the blessed gods, all good things flow, just like Homer sang, so all the sciences would achieve inspiration and rejuvenation from a theological division of the ages.

If a revival of interest in catastrophe occurs, the sciences of palapsychology, pala-politics, pala-theology, archaeoastronomy, geology, and history need to reexamine many of their findings an theories. The methodologies employed in ancient studies require both intermeshing and invention. An ideal archaeologist needs to know something of psychology and geo-physics, anthropology and astronomy, the history and science of human management. (I could make the ideal even more impossible, but why go on save to underline the need for interdisciplinary cooperation.) Claude Schaeffer, a generation ago already, was writing: "We have often had to deplore the absence, in the reports of excavations, of all information relative to these layers considered unprofitable by the searchers." (That is, the layers of destruction.) David and Ruth Whitehouse have recently published an Archaeological Atlas of some 500 sites around the world. There are, of course, a great many more. These sites are mostly reported with the same lack of attention to such details as Schaeffer refers to. Were these reports to be scrutinized as he examined the Middle East reports, we would be already envisioning some five hundred man-years and woman-years of reading and analysis. It would be well worth the effort. A masterpiece of catastrophic analysis could possibly emerge, for example, from a review of the rich paleolithic-neolithic materials of the caves and sites of Aquitaine. Nevertheless, it is to be hoped that future archaeological technique will make such laborious information-retrieval unnecessary. This would surely occur if the revolutionary dimension were carefully provided for in the designs and operations of archaeology and human geology.

The question all can ask together is: "What happened so as to destroy and reconstruct past worlds?" The question is the foundation to quantavolutionary primevalogy, as opposed to evolutionary primevalogy. It seeks its evidence and benchmarks in the genesis and destruction of cultures.

CHAPTER SIX

UPDATING SCHAEFFER'S DESTRUCTION INVENTORY*

[* A summary of Professor Shaeffer's findings and notes of a research proposal to extend his work. A memorial to Professor Schaeffer (1898-1982) by Geoffrey Gammon occurs in V The Society for Interdisciplinary Studies Review 3 (1980-1), 70. The sites studied by Schaeffer and a map of them is contained in his work of 1948, Stratigraphie Comparée and this author's Chaos and Creation (1981).]

In concluding his massive inventory and analysis of strata of destruction in Bronze Age settlements, Professor Claude Schaeffer of the University of Paris wrote as follows:

The great perturbations which left their traces in the stratigraphy of the principal sites of the Bronze Age of Western Asia are six in number. The oldest among them shook, between 2400 and 2300, all of the land extending from the Caucasus in the North down to the Valley of the Nile, where it became one of the causes, if not the principal cause, of the fall of the Egyptian Old Kingdom after the death of Pepi II. In two important sites in Asia Minor, at Troy and Alaca Huyuk, the excavators reported damage due to earthquakes. Under the collapsed walls of the buildings contemporaneous with the catastrophe, the skeletons of the inhabitants surprised by the earthquake were retrieved. However, in the actual state of our knowledge, it is not possible to say to what extent the earthquakes are the direct cause of the disasters which, at a date situated between 2400 and 2300, fell upon so many of the countries of Western Asia.

We are better informed in that which concerns the second of the great perturbations which in the order of time shook all of the Bronze Age civilization in Western Asia. In Anatolia, these brutal and sudden events struck fatally the brilliant centers of Troy III, of Alaca Huyuk famous for the riches of its royal tombs, and Alishar I B and of Tarse.

As to the nature of this third great perturbation, registered in all of the countries of Western Asia at the end of the Middle Bronze Age, and whose effects, in certain regions, were prolonged into the midst of the Recent Bronze period, we are reduced, in the actual state of our knowledge, to hypotheses. In most countries occupancy suffered a notable reduction, in others sedentary occupancy was replaced by nomadic. In Palestine and the island of Cyprus the situation appears to have been complicated by epidemics; collective tombs without durable offerings and apparently established with a certain haste were brought to light in the necropolises of the end of the Middle Bronze Age and the beginning of the Recent Bronze Age. Calamities of the same nature appear to have caused the eclipse of the Hittite empire from 1600 on in round figures. Persia and Mesopotamia in their turn then went through a severe crisis; likewise in the North, the countries of the Caucasus; our study has shown that here too there is no continuity between the civilizations of the Middle Bronze Age and of the Recent Bronze Age.

This brilliant period of the Middle Bronze Age, during which flourished the art of the Middle Kingdom in Egypt and the refined industrial art of the Middle Minoan, and in the course of which the great commercial centers such as Ugarit in Syria enjoyed a remarkable prosperity, was ended between 1750 and 1650 by a new catastrophe, equal in severity and in scope to the two preceding perturbations.

However, around 1450, a new perturbation, the fourth since the middle of the third millenium, struck Western Asia, particularly the Mediterranean regions. Evidently less severe than the preceding ones, it was accompanied by revolts in Syria and in Palestine, resisted by Thutmose III and subdued by Amenhotep II.

A century later, around 1365, mean date, in the time of the reign of Amenhotep IV or Akhnaton, an earthquake of great violence ravaged several cities on the Syrio-palestinian coast as well as in the interior of the countries. In Asia Minor also the urban centers (Tarse and Boghazkeui and Troy) suffered damage in the same period. This fifth perturbation is very distinctly marked in the stratigraphic sections of most of the sites explored in these countries.

From about 1250 or 1225, the sixth and last great catastrophe fell upon the civilizations of the Bronze Age in

Western Asia. Vast ethnic movements are launched again of which one, probably the most important, proceeds across the Syrio-Palestinian corridor and along the coast toward Egypt.

Professor Schaeffer then searches for causes and assigns the greatest weight to natural disaster, and not necessarily purely seismic disturbances.

Our inquiry has demonstrated that these successive crises which opened and closed the principle period of the third and second millenia were not provoked by the action of man. On the contrary, compared to the amplitude of these general crises and to their profound effects, the exploits of conquerors and the machinations of statesman at that time appear modest indeed.

In the 1970's the present author was introduced to Professor Schaeffer by Mr. René Roussel, then an inspector of air navigation system for the French government and an exchange of letters and meeting followed. Dr. Schaeffer expressed a willingness to collaborate and to supply the study with later materials of the period 1945 to 1975 from his own archives. I applied for support to the National Geographic Society, without success. There follows now the statement of the proposed study. The data to be obtained is to be found in the great libraries of the world and it is hoped that an institute or department of archaeology will undertake the task.

The project aims to inventory all excavated sites of the Mediterranean-Middle East (4000 to 600 B. C.); to scan their reports for indications of destruction by earthquake, volcanism and cultural periods or phases; to plot the sites on a seismic and geological background map of the large region: to test the hypothesis that all existing ancient settlement of the period 4000-600 B. C. were destroyed by concurrent natural disasters at points in time conventionally denoting the various Bronze Ages; and to publish the results.

The materials of research are those contained in Claude Schaeffer's published work and archives, which are being made available to this project, and the many excavation reports contained elsewhere and obtainable by library research mail requests, and personal contacts. The data will be collected and systematically reported in manual and electronic form, and the subsequent analysis should provide a firm quantitative base on the degree of correctness of the hypothesis of the destruction of ancient civilization at significant time intervals by natural forces.

CORRELATING NATURAL DISASTERS

The reformulation of the Schaeffer Hypothesis can be summarized as follows:

- A. All excavations in the Near and Middle East of the period 4000-600 B. C. will show levels of heavy destruction.
- B. The levels of destruction are correlative.
- C. The levels of destruction will have counterparts outside of the Near and Middle East here particularly the East and West Mediterranean.
- D. Natural Disasters are demonstrable.

Phase 1

- 1. Review and updating of the same 40 sites as presented in Schaeffer's *Stratigraphie Comparée*.
- 2. Transfer to new standardized format.
- 3. Preparation of a list of all excavations performed since 1945.
- 4. Search the excavation reports for levels of destruction and categorize them as:
 - a. no evidence of destruction levels
 - a1. Unsearched and not definite
 - a2. Demonstrably not destroyed

- b. levels of destruction
- b1. Concurrent with those previously reported in SC.
- b2. Not-concurrent
- 5. In every case, Determine where possible whether naturally caused or provoked
- 6. Merge data.

Phase II

- 7. Determine the quantitative degree of correctness of the reformulated Schaeffer Hypothesis in all of its parts.
- 8. Write a narrative of the findings
- 9. Accompany the narrative of findings with
 - a. an up-to-date map of the Mediterranean-Middle East exhibiting *fault lines* as shown by NASA satellites, zone of modern *seismic intensity*, and the *location of excavated* sites plus
 - b. a differentiation of the mapped sites according to how many of the presumed destruction levels they actually reveal at the critical culture points. For example Troy shows all levels, and would be so symbolized on a map.
 - c. a supplementary plotting on a separate map, of all natural destruction levels that are not correlated with the presumed *major* destruction levels and of *missing* levels of destruction adverse to the hypothesis.
 - d. an appendix of all sites reported upon (and of those either unreported or lacking data).
 - e. a simple constructed Index of conformity of findings to the hypothesis.

- f. an Appendix of techniques of discovering and reporting destruction levels and their causes.
- g. photographs of selected destruction levels showing ashes and calcination (Troy, Tuscany, Alaca Huyuk, etc).

Phase III Theoretical Discussion

- 10. On the character of the natural disasters implicated.
- 11. On the exceptional or anomalous cases of verified concurrent non-destroyed sites, if any.
- 12. On chronological problems exposed in the study, and their possible solution.
- 13. On the degree to which excavation leader have responded to the challenge of Schaeffer's Hypothesis since 1948 (30 years).
- 14. On the implications of the findings.
 - a. for the study of the rise and fall of civilization.
 - b. On the comparative study of religion.
 - c. On the causes of sudden, significant cultural changes.
 - d. On the possibility that the boundaries of the Neolithic, Chalcolithic, Bronze and Iron Ages have been basically determined by natural forces.

In applying for foundation support, the word "exoterrestrial" or "extraterrestrial" was not mentioned. Now, with the publication of *The Lately Tortured Earth*, it should be more apparent than before that the destructions of the Bronze Ages could have been produced by several causes, acting together and initiating in celestial disturbances. Other regions of the world too will lent

themselves to an enhanced comparative analysis, especially in the U.S.S.R. and Meso America.

CHAPTER SEVEN

NINE SPHERES OF VENUSIAN EFFECTS*

(* This paper is an edited version of a talk to a meeting of the Society for Interdisciplinary Studies, London 26 April 1980. The help of Mr. Peter James on important points of material evidence is gratefully acknowledged.)

Whether from timidity or misapprehension, hypotheses of general destruction about 3500 years ago are felt to be based upon scraps of evidence from scattered and often unreliable sources, whereas their conventional counter-theses are solidly founded. To the contrary, as I shall maintain here, the evidence from this period points to an extraordinary destruction in culture and nature. I shall offer nine propositions to this effect, adjoin an example or two, and challenge anyone to present and defend an opposing case. Seven of the propositions govern large special areas of science. The balance cover all areas of knowledge.

Since the total effect produced many great changes, and the effect in each field was also large, I do not hesitate to give them the name of quantavolutions. Quantavolutions are abrupt, intensive, large-scale changes, and contrast with evolutionary changes which are, as they say, drop-by-drop and point-by-point. The time, about 3500 years ago, was that of Exodus. The catastrophe of the Exodus is described in detail in *God's Fire* and *Ages in Chaos*.

I.

We begin with astronomy and physics. We speak of calendars, reports of sky bodies in action, legends of the gods, sky-struck human behavior of the period. We say of the Astrosphere: "No available record of astronomical events from anywhere presents

astral, planetary, or solar movements as unchanged or uniformly changing from before that time to afterwards."

When Velikovsky's *Worlds in Collision* appeared in 1950, many a critic leaped at it claiming that eclipses of the times before 700 B.C. were known and hence the skies had been orderly for long before then. Over the years he and his supporters put to rest this claim. No such historical record exists; there is no anomaly present.

Other critics were discovering in Stonehenge and other megalithic constructions an astronomical orientation that went back to the New Stone Age and is still valid. This is not so. Dr. Euan MacKie wrote about his investigations: "In the 16th or 15th centuries B.C. a second period of crisis began during which the dressed bluestone setting was dismantled, and joints on its stones battered off where possible, and most of the sockets for a new circle of bluestones were dug. This project was abandoned before completion.." Again no anomaly.

A corollary of our first Proposition says that no calendar based on the present solar year or lunar cycles is available that comes from the period before 3450 B.C. or thereabouts. However we find a severe challenge. Hastings in 1910 wrote that "the Egyptian calendar [amounting to 365 days] appears throughout the whole of its history. However far back we may trace it, we cannot reach the moment of a change in it."

Malcolm Lowery stresses the anomaly in correspondence to *Zetetic Scholar* (3/4, April 1979, p.60):

To cite a case in point: according to Egyptological authorities, monuments from Old Kingdom Egypt unimpeachably and unequivocally record a year consisting of twelve thirty-day months plus five days of the year; and this 365-day year is confirmed by students of other Near Eastern civilizations.

His footnote reads:

"Two references must suffice here (a) Hastings: *Encyclopaedia of Religion and Ethics* (Edinburgh, 1908-1926), II (1910), p. 93: "As it has just been described [with

a year of (3 x 4 x 3 x 10)? 5 days] ... the Egyptian calendar appears throughout the whole of its history. However far back we may trace it, we cannot reach the moment of a change in it." (b) Helck/Otto (eds.): Lexikon der Ägyptologie (Wiesbaden, 1975), III, 298, article: Kalender by J. von Beckerath: "Auf der Grundlage eines [unregelmassig 12- bzw. 13-monatigen] Lunisolar ahres wurde in Ägypten schon fruh ein... Kalender... geschaffen, der aus unveränderlich 365 Tagen bestand. Er war nach dem Vorbild des natürlichen Kalenders in 12 Monate zu je Tagen eingeteilt, wozu noch 5 Zusatztage (Epagomenon) kamen."

An attack from Peter Huber in the same issue (p.67) reads:

Another one [problem with Velikovsky and his followers] is that they tend to repeat the same, clearly wrong assertions ad nauseam (for example, the 360-day year mentioned by May is a fairytale, it has no more physical reality than the 360-day year nowadays used in interest calculations).

Several days before his death, Velikovsky indicated to me his impression that we had only to answer one ultimate source for these statements, a single ancient document, and Malcolm Lowery and Christoph Marx helped me locate it in Breasted's *Ancient Egyptian Texts*. It is a business contract mentioning an addition of five days to the year of 360 days. Until this matter is thoroughly investigated and rebutted, it stands as an anomaly.

A most common expression of critics is that the orbits and behavior of the planets, including Venus, were known before - 1500 and are the same as today's. This has been shown to be untrue, much to everyone's surprise. The records are not there, nor can they be retrocalculated, for this would beg the question. Venus has been shown to have been perceived and observed to take an eccentric course that is compatible with the behavior of a comet. This finding, along with those mentioned above and in many other works beyond recitation here, tends to confine strictly and cast into doubt the 365 day year anomaly mentioned above.

II.

The *Atmosphere* seems intangible as a source of evidence for events of 3500 years ago, but in fact much evidence of atmospheric turbulence is available. A rationalistic and literal interpretation of the Bible at the time of Exodus reveals high electrostatic levels, high radioactivity levels, dense and persisting cloud covers, high carbon content in the air, oppressive darkness and falls of a spectacular type -- quail, manna, barads, fire etc.

We are entitled to say, "There were radical disturbances and some lasting changes in atmospheric electricity, radioactivity, temperatures, winds, climates and solar radiance in the mid-II Millennium." Radiocarbon dates for the years involved require adjustments of serious consequence, as Suess and others have disclosed. The prevailing view that the Exodus was a gambol of truant slaves or a return of some bedouins to their ancestral desert is absurd and useful to divert attention from how bad conditions really were. The Jews were operating in the middle of catastrophe; there is no anomaly here.

III.

The *Geosphere* was disturbed. The world was shaking. Rivers were stopped and changed their courses. Mountains were moved. We are obliged to hypothesize: "Every geophysical feature or process in the world capable of exhibiting the effects of continuous stress will show that such stress occurred around - 3500." Here we share problems with conventional students of Holocene geology: what tests can pinpoint geological events in time -- radiocarbon dating, possible chemical changes in rocks and soils, changed stratigraphy and morphology that can be tied to historical or protohistorical events?

So when we read a contrary statement in the *Encyclopaedia Britannica* to the effect that the Euphrates River bed was unchanged over many thousands of years, we must juxtapose to this a statement by R. Adams, for instance, that there occurred in the mid-second millennium "a major westward shift in the Euphrates system of channels as a whole during Kassite times." And when Robert Raikes, a quasi-catastrophist, theorizes that

giant mud dams formed and broke and flooded out the Indus River civilization of this time, we have to carry his argument farther and, viewing the tremendous destruction throughout northern India and the bases of the Himalayan Range, insist upon a much more universal disaster than the mud-barrier floods. We have Sagan in his "An Analysis of *Worlds in Collision*," Scientists Confront Velikovsky, p. 66:

But the claim that there were extensive lava flows and volcanism involving "all volcanoes" is quite another story. Volcanic lavas are easily dated and what Velikovsky should produce is a histogram of the number of lava flows on the Earth as a function of time. Such a histogram, I believe, will show that not all volcanoes were active between 1500 and 600 B.C., and that there is nothing particularly remarkable about the volcanism of that epoch.

How does this anomalistic claim stand against the evidence of volcanism put forward in my *Lately Tortured Earth*, against the finding of Phoenician vases embedded in lava dated to 3500 years ago, against the plinian explosion of Mt. Rainier in America dated concurrently? Not well. Volcanism was not behaving normally. Velikovsky was speaking loosely and deductively, meaning all volcanoes must have erupted if the Earth paused and a great attractive celestial body was close. Elsewhere, insofar as the data allowed, he spoke in statistical language, foreshadowing the vaunted histogram. When Sagan says "volcanic lavas are easily dated" he is mistaken, even on the premises of radiochronometry. My own position is that many volcanoes were initiated, many fissures opened, all active volcanoes erupted, and furthermore a great many eminences erupted electrically.

More difficult to dispute is the claim that recent ice cores drilled from beneath the Greenland Ice Cap pass through the midsecond millennium with an extraordinary appearance of debris, but not enough to suggest world disaster. I shall have to deal with this anomaly in a future study. (See below.) The cores by the way are not showing other expected effect around this time anyway. Oceanographic theory has a drastic drop of catastrophic proportions in the ocean levels of the age. Could there have been a great freeze, a deluge, a breaking into new basins such as the North Sea and Baltic Sea (actually in both cases indicated)? Or

could the land have risen around and below the seas -- just as disastrous an event?

IV.

"Every biological species underwent radical change around 3500 years ago in numbers, habitat, behavior or genetics:" such would be our fourth proposition, concerning the Biosphere.

There is much evidence regarding numbers -- including human destruction as for instance among the Israelites and Egyptians, also much concerning changes of habitat, abandonment of settlements, changes in behavior. Ovid is not to be believed when he said that the passage of Phaeton at this time burned the Earth and turned Africans to black from the heat, but it is not unbelievable that so many of the non-black peoples of Africa were destroyed that the continental population noticeably blackened after the event. Those who deny marine disasters can of course rely upon the absence of datable fossil events, but there are mammoth destructions datable to the time, and a Woods Hole Oceanographic Expedition to the Black Sea uncovered a general layer of coccoliths that occurs at the -3500 level and could not simply have died normally and drifted to the bottom en masse. The ancient historian Josephus said that nature, in a revolution, produced "mutations in the bodies of men, in the earth, in plants, and in all things that grow out of the earth." There is little fossil evidence yet uncovered from the period or most of what there is has been assigned to later or earlier times or ignored or is of current species. Apparently "very fresh" fossil mucks have been found, but the assignment of dates to them has progressed little.

V.

The situation is different when one turns to the Ecosphere, the human settlements. Here the evidence is abundant, and has been presented in a number of works discussing every region of the world. Europe, the Mediterranean, the Near, Middle and Far East, and Meso-America provide evidence. Every advanced civilization suffered destruction, whether in China, Africa, the Causasus, Anatolia, Crete, or elsewhere. So we add the hypothesis: "No human settlement in the world escaped heavy

destruction from natural causes in the midsecond millennium." I discussed this proposition with Professor Claude Schaeffer two years ago, and he agreed with it. Hundreds of sites that he had not included in his massive volume on comparative stratigraphy might now be added. A corollary of this proposition, which is also related to the one on astrophysics, is that "No religious temple that was built before about -3500 and rebuilt afterwards shows the same astronomical orientation afterwards as before." Peter Tompkins, for instance, carries a diagram in his work on the Great Pyramid that shows four different historical orientations of the Temple at Luxor, one of which was probably at the end of the Middle Bronze Age. René Roussel has written a report (unpublished) showing that a rupestral temple at Ouadi es Sebous (Upper Egypt) was oriented to different winter solstices before and after -3500. A disaster occurred to the temple in between; great fire damage and layers of ash are to be seen.

VI.

We can call the human documentation (the oral and written records, of the mid-second-millennium period) a kind of history and coin the following hypothesis regarding the "Historisphere":

"All legendary or contemporary historical accounts from any people in the world which discuss events of, or attribute events to, the mid-second-millennium mention a general and natural disaster."

Much of Greek myth centers upon catastrophe-born Pallas Athena, upon Hephaestos and Dionysus. The Books of Moses center upon the Exodus disasters. The Vedas of the Hindus focus upon momentous natural events at the time of their main descent upon India from the North, which time has been generally accepted as mid-second-millennium.

The Ipuwer papyrus which conforms rather closely to the Biblical Exodus account appears to be datable to the end of Middle Bronze, hence confirms our thesis. Ancient pagan accounts of the doings of Moses, often unfavorable, as often agree that plagues and natural destruction were occurring then.

Are there exceptions? None that I know of. Only evolutionary modern writers have presumed a benign history covering this period, and I await any contradictory thesis referring to any document or legend. I await the *uniformitarian anomaly*.

VII.

The seventh thesis, the *Anthroposphere* or cultural sphere, says: "Every culture complex in the world changed radically in mid-second-millennium." Here we refer to social organizations, religions, and modes of life.

We know that the Egyptian Middle Kingdom underwent the political and social traumas of a takeover by the Hyksos. Most often, as Schaeffer has shown, "sedentary occupancy" of an area "was replaced by the nomadic." In Persia, Mesopotamia, and the Caucasus, he writes "there is no continuity between the civilizations of the Middle Bronze Age and the Recent Bronze Age."

A recent corollary of our hypothesis number 7 is this: "No god of before mid-second-millennium B.C. remained without change of status or family change or serious incident."

Zeus found a new daughter, Athene, and what a daughter she was! The Hindu goddess Devi conforms to all appearances with Athena, with the same violent entrance upon the skies and the human mind.

Yahweh appears and explains to Moses, rather unconvincingly: "I am the same god of your fathers, but different." "Not different enough," replied a great many Jews and they insistently chased after Baal - represented in the young Baal-bull.

Can any scholar offer an unchanging religion for this period: I think not. Certainly, if so, it would be an *anomaly*.

VIII.

At this point, I am prepared to assert that all major spheres of existence have been incorporated into a quantavolutional scheme of the mid-second-millennium: astrosphere, atmosphere, geosphere, biosphere, ecosphere, historisphere, anthroposphere.

Let us then generalize a Holosphere, that which contains all modes or forms of existence, and offer an VIIIth proposition, thus:

"All spheres of existence change together by a mutual interaction in the mid-second-millennium," or conversely,

"No major quantavolution in any special sphere occurs independently of quantavolutions in other spheres."

The Exodus case represents the best studied and perhaps the most documented history of the times we have, and, viewing it, we can confidently say:

"When all spheres are quantavoluting, then the whole world is involved and the cause is universal."

The forces at work are so strong and transactional that we may add an event to the workings of the Astrosphere:

"There can be only one necessary and sufficient cause of the quantavolutions of the mid-second-millennium, and that must be a large-body encounter with Earth; by definition it was a cometary encounter, if a comet is considered as any substantial body pursuing an elliptical or changing orbit."

The challenge is to be phrased thus:

"Nothing but a god-like comet could have produced the quantavolutions of 3450 ± 60 B.P."

IX.

There occurs, then, a Ninth Proposition. It concerns the subsequent history of effects of the Quantavolution of Venusia: the present-day lingering of the tail of the flattening logarithmic curve of the catastrophe. We can call this the Neosphere.

"Every institution, behavioral pattern, and natural setting that exists today, if its history is complete, will reveal an inheritance of specific effects from the Venusian Quantavolution of -3500."

"Arabia Felix" - Happy Arabia - of 3500 B.C. is a waste of sand with vast fields of stones and hundreds of dry stream beds resting upon layers of petroleum.

Zvi Rix wrote extensively on the sexual complexes derived from the human experience with Venus. Nicolas-Antoine Boulanger related basic human problems to the everlasting fear of a great comet.

Moses was a reconstructor after the catastrophe of Exodus. The Jews gave in to Moses or got out of Judaism. Jesus Christ was the child of mosaism and of the morning star (as W. Sizemore and others are showing in a book underway). Islam is more mosaic than Christianity is.

The Iranian mosaists are telling the other Islamic mosaists that they must kill the Jewish mosaists; and the Christian mosaists and Russian Stalinist mosaists are urging a similar business upon themselves and others. And American mosaists are contemplating nuclear war a) because they believe god is on their side b) god will take them into heaven.

But the Cambodians, Indonesians, Ugandans, Vietnamese, Chinese, have no Moses; and flutter toward the same candle flame of destruction.

What I am finally saying is this:

Because of the lingering effects of past catastrophes mankind has long been in the business of producing catastrophes in order to recapture the madness of ancient disasters. Wars, aggression, suppression, compulsive and punitive behavior are connected with the primordial past. It is as if we are congenitally convinced that good comes only from greater evil -- to roast a pig we must burn down our house.

The psychological de-programming of the catastrophized mind is still a little-understood process. Both the morale, and the rational invention of means, for moving directly to good without the intercession of great evils are very weak currents or motifs in contemporary civilization.

But, to an existentialist and pragmatic mind, there can be no alternative to trying. We must keep trying. Like Sisyphus we must push the great rock of reason up the mountain, time after time, prepared always to see it fall, until one day, who knows, *mirabile dictu*, whether by invention or luck, the rock will stay fixed up there and we shall have surcease from our labors.

CHAPTER EIGHT

THE OBLITERATION OF HUMAN SIGNS

The conventional scientist says to the catastrophist:

"How convenient it is for your purposes to place your catastrophes just out of reach of true history, tantalizingly so. Is it so that the falsity of your views cannot be proven, that your assertions can remain forever in the limbo of seductive fable?"

The answer is another question:

"How is it that your accuse me of something for which I am not accountable? You ask me to provide records of an event whose great force was exercised precisely in the destruction of those records? Does this not make our scores even?"

Both feel frustrated, but perhaps become a little more sympathetic, too.

Nearly every work dealing with prehistory and antiquity must lament the paucity of evidence. If there is pride in this study, it comes from having made so much out of so little -- a jaw fragment, an arrowhead, a doll, an artificial pile of stones, etc.

Under *evolutionary* primevalogy, there seems to be little need to build lament into a *missa solemnis*. If the human past was developed modestly and uniformly, a sigh over the incidents that destroyed or silted over a single site is enough and then on with the work. And so forth at whatever sites turn up. For instance, if it is believed, as Childe has said and most have agreed, that paleolithic mankind began in the British Isles with a few hundred souls, that a few hundred more dwelt there thousand years later, and so on, primevalogy might as well proceed as usual with the question of obliteration of evidence.

On the other hand, if quantavolutionary theory is postulated, then a different attitude and approach are called for. Every sign of human presence in the distant past has to be taken as a survival of one in a thousand or even a hundred million events that had the potential of surviving to this day for the shovels and eyes of the primevalogist.

Furthermore, the perspective in which the residue or remain is viewed has to be radically altered. It is looked upon as strange aberration, something of an event that had a rare quality to it in addition to its bare survival, something that kept it from being obliterated along with millions of like events from the eyes of the future. It must have had a marginal quality, some special features to augment its chance of survival, and therefore is rarely to be considered typical *prima facie* of its culture.

The revolutionary primevalogist must also become a macromorphologist of the earth, while the evolutionary theorist can and indeed is impelled to rest with micro-morphology. The former has to look at whole areas, regions, even the globe itself, asking where the centers of human activity may have been and what might have happened to them. She or he makes different demands upon geology.

"Can you tell us," she queries, "what quantities of what material were moved, how, from where to where, from what elevation to what new elevation or depression in an area of such and such dimensions and where, if at all, would indications of settlement exist, and, if indicated, what would be the chances of detecting matters of importance, considering the capacity for obliteration of the forces involved?" The complex question is bound to elicit productive answers sooner or later. And, or course, accidental macroscopic primevalogical discoveries do occur s when cliffs fall away and streams erode canyons or coal mines are dug.

But meanwhile one should have at least some conception of the possibilities that what one has discovered micromorphologically is likely to represent but one-millionth of what was there. Or, to invert the issue and specify a hypothetical situation: assuming a population of a half-million persons in Britain in the year 12,000 B.C., what reasons can you give for the fact that only a few scattered stone tools and bones will confront the scientist of

today who is working with conventional theories at the present "state of the art?"

To answer the question, one must tell what has been discovered in the nature of remains and legends of this period. Then one must say what kinds of events would reduce "then-time" surface evidence to "now-time" surface evidence. Afterwards, one queries the likelihood of such events, matching present evidence with the proposed history.

If the resulting theory is as plausible as or more plausible than the evolutionary theory, then, of course, it must be pursued, and similar inquiries launched in other macromorphological settings. A first procedure then could be to see what is left in Britain of its hypothetical 12,000 year old culture.

Whereupon one continues by conjecturing upon the events necessary to destroy beyond rediscovery the hypothetical British culture of 12,000 years ago.

After much reading and discussion, I came to realize some years ago that there was no simple checklist of kinds of disaster - all the forces, chemicals, and conditions that can destroy the biosphere. But before I came to realize it, a long time passed when I could not even think of the need for one; I could not ask the question. In modern times, both because of specialization and because disasters on a large scale are unusual, theory in its primitive form of simple questions and basic classification is missing. Frank Lane's The Elements Rage turned up as a rare and valuable discovery, because he uniquely takes up a fairly full list of disastrous natural forces, one by one. From that position, I could go on to offer a general classification in Chaos and Creation of super-disastrous forms and, by the time I was writing The Lately Tortured Earth, I could think easily of a set of very heavy, "cosmic" mega-forces interacting as such and with a given biosphere, atmosphere and lithosphere.

High-energy forces and chemical outbursts reach toward the extermination of evidence of a biosphere. Low-energy uniform and gradual forces also tend to exterminate such evidence. The truth of the past thus remains for us in the evidence of niches where high-energy forces acted but were not totally destructive -

- mountains that were not leveled, elevations by-passed by cross-tides, humans buried swiftly in a clay that quickly hardened, and so on.

If at the time of Stonehenge about 3500 years ago there were a million people in Britain (for they were building other sites as well and carrying on the chores of living), and if we find no sign of them, either we have not searched very well, or there was some catastrophe that erased all signs. The very existence of the megaliths does, however, discount the notion of complete disaster -- there were no Washington Scablands barrier-bursting floods, or giant oceanic tsunamis or Biblical overturning of mountains.

And of there were a few utensils found, as there have been, and even more remarkable, a few bones (unfortunately yet not found), we should say that certain forces such as atmospheric and chemical ones may have occurred - an icy climate may have come and gone, a great flooding may have happened, a devastating fire may have fallen from the sky, and so on. Now these actors, too, might be eliminated from consideration, and we might end up with an historical view that Stonehenge has been relatively peaceful and insofar as it represents the Earth, the Earth has been likewise peaceful. Of course, some force toppled some huge stones, and several stones have disappeared, or have they?

This shows what I mean: there must exist, and we need it, some manual for quantavolutionary appraisal of sites and regions, a set of 1001 questions to ask and the kinds of answers to expect. Since we have nothing like this Field Kit of Quantavolutionary Questions, we scarcely realize that there is anything to ask about. It took a long time for science to work itself up to a set of questions about Stonehenge and we have hardly yet broached a full array of them. So when we ask how many people lived in Britain 12,000 years ago, we find that we have no intellectual tools to address the question; we lack the 1001 questions that follow the leading question.

One would think that we might find a model to consult in paleontology. But the field has not gone far beyond associating some life forms with some rock strata and not even this is done with full microscopy and chemistry on computerized data banks. The leading question, "How many species have existed at a given point in time, or ever, or even at a given place and point in time?" is not well-answered. Estimates of all the species that have ever existed have been argued on figures around 200,000 up to some 20,000,000. That's like asserting that there may be half a million people living in Canada, but then again there may be fifty million of them. We need to have surveys of what existed before, in order to learn what and how much was obliterated.

CHAPTER NINE

ANCIENT ASTRONAUTS

Seeing that humans are very different from primates and yearning to stress that difference without the help of current religion, many people have taken an interest in the idea of the "ancient astronauts"[1]. Popularized especially by Erich von Daniken, and given intellectual respectability more recently by Robert Temple, the view maintains that primitive "backward" humans were visited by anatomically compatible beings from outer space, and taught the arts and sciences, including finally an enduring reverence for the visitors as gods.

Most sets of myths do include a belief that god-heroes walked the Earth in early times [2]. They are connected with the skies. Some early signs and pots bear sky-references. Evidence accumulates, too, that the earliest civilizations were far more sophisticated than scientists believed until recently. All of these are connected with the suspected foreign visitors by the theory of ancient astronauts.

The idea is not catastrophic (although scholarly catastrophists fear it will be catastrophic to the reputation of their work). It enlists catastrophes merely as a convenient means of explaining why the evidence of visitations is almost totally lacking: it has been buried or destroyed.

Moreover, the idea is eclectic. Much of the material that finds its way into the writings about "ancient astronauts" consist of exotica ("Did you know that...?" and "Believe it or not, but..."), or of questions aimed at needling archaeologists and prehistorians about their many anomalies, oversights and unknowns.

Catastrophists and uniformitarians alike usually reject the theory indignantly. Von Daniken himself is excoriated for his meanderings, his lack of logic, pretentiousness, vagueness,

unscholarly innuendos, and profit-taking in the market of ideas. Still it seems odd that scientists such as C. Sagan, who earned fame and fortune in part from writing science fiction, should denounce the analogous efforts of others. At the least, Von Daniken's work is like the newspaper comic strips, which get people to buy the newspaper, encountering thereupon whatever else it may contain in the way of information and ideas.

In any event, humanoid development in other planets or areas may have been possible in recent ages. We know the climates and resources of Mars, Mercury, and Venus today. They were probably quite different even a few thousands of years ago.

It is even possible to imagine that foreign astronauts, highly advanced, would have foreseen the doom of their planet and taken off for a habitable place (a favorite theme of science fiction). Or they may simply have undertaken a routine exploration and been stranded and assimilated, or taught and disseminated peculiar human qualities, and exited forever.

There exist, further, infinite possible combinations of genes of which only a few have been exercised to create life on Earth as we know it. It is conceivable, but quite unlikely, that parallel developments of being and existence could occur in isolation, one development (the foreign visitor) ahead of the other (potentiated primitive *homo*).

The chances of two assimilable races developing independently are practically nil, despite the narrow band of evolutionary choices referred to earlier. They are rendered nil when the timing factor is considered: in all eternity, why did the two races converge at the moment when man was ready for everything except reflective thought? Although it is true in a sense that "everything is miraculous," it is false that therefore every highly improbable idea must be true.

And, even if the improbable were accepted, and a fully technologized modern type of human developed elsewhere, one would still have to explain their evolution. If backward Moonmen had existed and surrounded our landing craft on July 20, 1969, and had been impregnated culturally and otherwise by

our doughty astronauts, the Moonmen's descendents would still have to figure out how the astronauts evolved.

Those who flirt with the idea of ancient astronauts are justifiably critical of the absence of evolutionary explanations for the great leap from pre-culture to culture. But being dissatisfied with existing evolutionary theory does not permit one to believe in all far-fetched substitutes. The "ancient astronaut" is too much like the "magician's rabbit, pulled from a hat."

It is also true, as von Daniken insists, that the early humans were sky-watchers. It is fundamental to catastrophic theory that this be so. But the gods that were watched for were not his godheroes. They were the displays of natural forces as perceived by an aroused, deluded mind.

There is no evidence, anywhere and earlier, of a human skill of powered machine that goes beyond the technology employed during the "Old Bronze Age" of Egypt. These would not have been paraphernalia typical of a hypothetical culture that travels through space. It is conceivable that machine civilizations, now completely destroyed, may have existed on Earth millions of years ago, (although we are arguing in *Solaria Binaria* that these millions of years have not existed in Earth's history); but even this idea will not advance the question of whether living culture inherited advanced techniques.

The famous Peruvian Nazca ground patterns may not be fully understood; but if "aeronautical direction-finding" is contained in them, it is more suited to a Piper Cub plane than a space vehicle. They may have been laid out under instruction from heat-lofted balloons or from look-out points on heights. Theoretical geometricians could also achieve the patterns, and may have ordered them along the lines of meteorite falls. All ancient monuments -- megaliths, pyramids, temples -- were sky-oriented; the Nazca lines may have followed star-lines, also.

There remains a possibility that only the theory of Solaria Binaria permits. I mentioned this theory in a talk to the Society for Interdisciplinary Studies in London in 1975 and have since developed the model in collaboration with Professor Earl R. Milton. It calls for a binary system of the Sun and Super-Uranus,

electrically connected by a pulsing axis of fire and enveloped by an electromagnetized tube reaching between the binary partners and providing a vast intervening space with a viable atmosphere for planetary and biological genesis. The breakdown of Solaria Binaria occasioned the set of catastrophes that originated and imprinted homo sapiens.

The rotating magnetic tube that enveloped the planets in the age of Pangea on Earth endured for a long time. Hence the planets would have shared an atmosphere, and might possibly have engendered similar life forms. Passage from one planet to another would have been possible without highly specialized airborne vehicles. It is also possible that several planets were grouped close together. Something like the "Piper Cub" plane just referred to would not appear so ludicrous. For the vehicle would not have to cross through "outer space."

If the "ancient astronauts" theory were true, and adapted the scenario of *Solaria Binaria*, the knowledge of genetics and evolution gained in field studies of earthlings would not have been wasted. It can be transferred to the exoterrestrial location that had produced the visitors, because both on Earth and on the other planets within the plenum of the solar system the same atmospheric and hence life conditions would prevail.

Then one may go on to conjecture that these intelligent beings from far away were human in a way that was related to the hominids of Earth, but had progressed much farther along. And that these ancient astronauts, coming upon the hominids of our Earth, bred with them [3]. The resulting strain, now dominant on Earth, with both astronauts and hominids having disappeared (bred out), would be the homo sapiens schizotypus that is described in *Homo Schizo I* and *II*. However, the present author, despite his attempts here to rationalize the idea of "ancient astronauts," regards the slight evidence behind it and its logic as disposed sufficiently of within the scenario of his Quantavolutionary Series.

Notes (Chapter 9: Ancient Astronauts)

- 1. The literature is large. A scholarly work to be recommended is Robert Temple's *The Sirius Mystery*.
- 2. See Joseph Campbell's collection and analysis of *The Hero of a Thousand Faces*.
- 3. A suggestive legend is carried by H. Bellamy in *Moons*, *Myths and Man* (1936) p. 269.

Part Two

GEOLOGICAL ISSUES

CHAPTER TEN

INDIANS OF ILLINOIS

June 14, 1974

To: Professor Howard Winters
Department of Anthropology
New York University

From: Professor Alfred de Grazia

Dear Professor Winters:

Thank you for the materials on the S. Illinois digs at Modoc, Riverton, Koster (et al), and the U.S. Corps of Engineers surveys on Southern Illinois. I am returning them herewith, since I shall be leaving for Greece soon, but I would like to talk to you more about them before leaving, if that is possible.

My problem was this: the stratigraphic work of Schaeffer and others show heavy ashes and calcinated debris from natural disasters over "Old World" settlements and cities, ending the Old, Middle, and Recent Bronze Ages; that is, effectively terminating these civilizations. Therefore, the "New World" in some likelihood would show the same. If, however, the stratigraphy of American Indian settlements of the Mississippi Valley is continuous and shows no catastrophic effects between, say, 3,000 B.C. and 600 B.C., then the hypothesis of world-wide catastrophe is disproved. (The same would hold for Meso-America, which I am not considering here.)

Catastrophes are indicated by effects of violent flood, wind, fire, and material fall-out. Hence I examined your materials for evidence of such effects.

First I considered cases without reference to carbon dating, which in all cases produced dates during and before the mentioned critical period. I note the following:

- 1) The strata in all cases involve very narrow bands of settlement, measurable in inches. For instance, the Modoc case is said to move one foot per 1,000 years (in the earliest period) to one foot per century in the latest. But the question arises whether we are dealing with short-term values. The cross-sections show only thinly settled camping materials; nothing indicated the presence of women and children.
- 2) The fauna and flora remain unchanged throughout the period of several millennia, even from 9,000 B.C. The same mammals, fish, birds, nuts, and vegetation characterize all periods with frequency distributions that could be annual or irregularly annual. One wonders, then, too, about the Indian campers whose successive waves occupied a great stretch of time.
- 3) The technology scarcely changes. Even the mix of material does not radically alter.
- 4) The area in general is subject to flooding even nowadays. The stratigraphies show effects separating older layers of artifacts an hearths from newer ones; that is, silt, loess, and clay. Again these are in thin layers.
- 5) The area generally exhibits frequently strata of lignite and coal near the surface, which is mined farther north. These can be scenes of catastrophic combustion (See e.g. State Coal Circ. 332, table 5,3 and Francis, COAL, new ed.)
- 6) The stratigraphy of the area in general permits the hypothesis of catastrophic swirling cross-currents of flood occurring in a short period of time (i.e. weeks or centuries), depositing in rapid succession thin layers of loess, silt, clay, and organic matter that are noted everywhere. Whereupon in a late period, after the

catastrophes, human occupancy resumed in periods of resettling of the landscape and regrowth.

- 7) The descriptions of the limestone "foundations" that underlie the more evident material are typically vague. Limestone, I imagine, could signify a conglomerate of sudden sediment soaked by heavy floods and solidified by heat [electricity] and pressure.
- 8) The settlements are sunk into the same "alluvial" material that they rest upon. That is, the pit sides, except for the ploughed area, contain the same material layers as the bottom projections of the pits up to a certain rock depth. Hence, unlike the sites of the Near East, apparently nature was building up as rapidly as the human settlements were accruing. That is, either the land mass was building up enormously, or the occupancy of the sites was exceedingly thin, or was sinking or dug in. If the first, 30,000 years would have built up an extensive plateau.

Therefore, I ask myself (and you) the following questions:

- 1) Apart from the superposition of artifacts, is there any proof of a succession of ages?
- 2) If a succession of ages is granted, is there any proof that more than a century or two of occupancy were involved?
- 3) Could not the occupancy take the typical form of returning to a site, clearing the brush and grass to a clay and pebble base, and thus digging in the site over a period of time under a couple of centuries?
- 4) In view of the major catastrophic hypothesis, might not catastrophe in the central Mississippi Valley region take the form of devastating floods and fire, wiping out most of the biosphere? The old biosphere would be represented in the near surface lignite, fusain, and coal deposits where flood waters and tides, driven by wind and surface plate movements, would dump the burning debris, cool it by flooding and bury it with successive waves of

sand and silt dragged from other mostly denuded surface areas. In a few years, a new growth would occur overall, but evidences of antediluvian human occupancy would be totally absent. Also absent, of course, would be any calcinated debris of settlements, and in this area of America, any huge aqueous intrusions or lava flow.

If this set of questions is answered in a way tending to support the possibility of neartime catastrophe, that is, between 3,000 and 600 B.C., then there still remains the defiant evidence of radiocarbon dating.

These data, as given, are often irregular and sometimes conflicting. At Modoc, for instance, Stratum 3 which goes from 15.3 feet (below the ploughline?) to 22.3 feet moves from 3314 B.C. to 9246 B.C. or 6,000 years more or less in 7 feet (with one gross anomalous reading). This seems excessive for a "continuous occupancy" site. I cannot conceive of any kind of settlement building only about one foot per thousand years. (I knew the American Indian was a great natural recycler of materials, but this is too much, especially since the occupants were carelessly dropping their hard-worked stone implements all about.)

Radiocarbon dating is known to present three types of problems. The first involves stratigraphic techniques of sampling and cleaning, that is, selection malfunctions. These can be serious and amount to a general bias in a set of cases.

Another C14 problem is presented by water-soaking. Water is known to wash out C14 and produce great age even for young organisms. The materials of Illinois Indians were frequently flooded and therefore may give old readings.

A third is in the atmospheric mix and flux that builds up the Carbon-14 residue in the organism to the point of death. Here the difficulty lies with the factors creating Carbon-14, the flux of cosmic particles and the density of the earth's atmosphere. The geo-physicist, Melvin Cook, argues in a fully detailed quantitative study, that the carbondating method in itself gives us an atmosphere that is only 12,000 years old. ("Carbon 14 and the Age of the Atmosphere," *Creation Research Society*

Quarterly, June 1970.) Apart from this, it is apparent that carbondating as a test begs the question of an inconstant atmosphere. That is, like so many tests, the IQ for example, it tests itself.

All of this leaves us, don't you think, with thermoluminescence tests, if the antiquity of the Illinois Indians is to be proven, and then not for pre-ceramic periods?

CHAPTER ELEVEN

ICE CORES OF GREENLAND

There is a certain grim quality to the confrontation of uniformitarians and catastrophists. The antagonists prowl in the jungle of natural history seeking the one definitive test that will finally discomfit and silence the other. If only the evolutionist could show that some major change in the world has come about with exquisite gradualness -- the ice ages, new species, the ocean basins -- then the opposition might be forced into silence. Just as relentlessly the quantavolutionary stalks among the events of history searching for the one indisputable catastrophe that has introduced a major change in the natural world -- a wholesale simultaneous extinction of species, a brush with a large comet, a meteoroidal crash, a deceleration of the Earth, or some similar expression of great effective force. Each must avoid the thrust of the other, even if it is blindly delivered in the course of an "empirical study" whose deadliness to the opposition was not originally intended.

Such would be the study of ice cores of Greenland and Antarctica. Their purpose is multiform; a Danish group of glaciologists writes: "Ice cores have become an important tool in geophysics and atmospheric chemistry. Langway (1967) first perceived the great and many-sided aspects of extending physical and chemical analyses of snow and ice to what Crary (1970) calls: 'the thin dimension' of glaciers, thereby adding time to the parameters considered. In a more recent paper, Dansgaard and others (1973) listed the potentialities of polar icecore and bore-hole studies relevant to glaciology, meteorology, climatology, geology, volcanology, atmospheric chemistry, cosmic and solar physics, and 14C dating"[1].

No mention is made of the small group of catastrophist scholars shuddering at the brink of the bore-hole, but it happens that if the ice core were to demonstrate the regular passage of a long stretch of uneventful time, quantavolution would simply have to surrender its claims to serious scientific consideration.

The glaciologists begin their investigations with a natural pastiche:

All kinds of fall-out from the atmosphere, including airborne continental dust and biological material, volcanic debris, sea salts, cosmic particles, and isotopes produced by cosmic radiation, are deposited on the ice sheet surface along with the snow.

The passage of time, it appears, has little effect on the frozen material, except by tiny regular increments:

> The snowpack is gradually compressed into solid ice with small cavities containing samples of atmospheric air. In the coldest areas of the ice sheets, the impurities remain in the ice as indicators of the chemical composition and physical condition of the atmosphere at the time of deposition. Nothing is added, nothing runs off or is displaced, and no chemical reaction takes place; in fact, the composition of the ice layers changes only by decay of radioactive impurities and by extremely slow diffusion processes in the ice crystal lattice.

> The ice layers sink into the ice sheet in an undisturbed sequence with continuous horizontal stretching and consequent thinning; in areas with no melting at the bedrock, the ice layers approach zero thickness close to the bottom.

The results, though complicated to obtain, produce marvelous evidence of historical conditions.

This is why, under favorable conditions, an ice core obtained by drilling through an ice sheet can be used to establish continuous and detailed time series of many geophysical and chemical parameters reaching several hundred thousand years back in time: the carbon dioxide concentration in the atmosphere; climatic changes in terms of accumulation rate and, with certain reservations, surface temperatures; the chemical composition of the atmosphere; volcanic activity and its cooling effect in the troposphere; fallout of cosmic dust; and the cosmic radiation flux [2].

The implications of this work has not escaped the nervous eye of the quantavolutionist. One student, R. G. A. Dolby, writes:

The Earth's upper atmosphere is convected downwards in the polar regions, and with it some of the finer extraterrestrial dust that falls on our planet. A proportion of this is deposited on the snow falling on the ice caps of Antarctica and Greenland. Thus, samples of the extraterrestrial material are trapped with other atmospheric dust in successive levels of the ice and snow that have built up the ice caps. In recent years, deep holes have been drilled through this thick ice, and the cores of the holes extracted, to provide a continuous record of what was in the atmosphere over many years. The interesting question arises: could this record be made into an empirical test of Velikovsky's idea?

According to Velikovsky, large quantities of cometary material fell upon the Earth in a number of catastrophes, the most recent being nearly 2700 year ago. Some of this material would have reached the polar ice caps, and should still be present at the appropriate depth in the cores that have already been collected. It is simple matter to study the cores carefully for signs of this material. To the best of my knowledge, the only significant nonaqueous material reported is a certain amount of dirt in six layers up to 0.5 mm thick of the Byrd Station Antarctic core, at depths between 1300 and 1700 meters. This dirt was tentatively identified as volcanic ash, and attributed to eruptions from volcanoes less than 300 kilometers away [3].

Another perplexed correspondent, C.L. Ellenberger, writes:

I have heard some fantastic intellectual gymnastics from people trying to refute the Greenland core evidence... With them [the ice cores] we have a chance to observe a dust layer(s) and/or volcanic acid layer(s) that one would expect to be significantly thicker or more concentrated than those which are known to have been produced by large, single, historical eruptions [4].

Hitherto, analogous technologies have threatened, namely varves, and dendrochronology, carbondating, soil quantavolutionaries have learned to coexist with them. In at least the first two instances, the catastrophic event may itself adjust the hands of the geological clock, while in the third case, the trees to provide the data are limited in space and time.

Setting up Mother Nature to count out past time has inspired other technologies rather less close, and sometimes more helpful than threatening to catastrophists. The rates of growth of coral and of stalagmites and the cutback of waterfalls come to mind. Because they are an example, but also because they may bear upon the ice bore-hole issue, the studies of Richard F. Flint and F. B. Taylor (1963) may be mentioned. Speaking of two late Wisconsin Ice Sheet invasions of the St. Lawrence region, Flint turns to the date of formation of the Niagara Gorge. Retrocalculating the current rate of recession of Horseshoe Falls, Taylor claims that the present flow channel was freed between 3000 and 3500 years ago. The time is surprisingly recent.

It happens that the Greenland ice core exhibits some dust concentration around this time; -1390 ± 50 is given. The connection is made with an explosion of the volcano of Thera-Santorini in the Aegean Sea, in the early Late Bronze Age. Are the breaking of a new Niagara channel and the Thera explosion connected? Conceivably, for, after all, hundreds of extraordinary and catastrophic events seem to cluster around the middle of the second millennium B.C. [5]. If the ice core of this period shows only a modest increment of dust, no more than is revealed by a dozen other known incidents of the past 4000 years as measured in the core, then little in the way of disaster would have struck upon the Earth at a time that practically all quantavolutionaries regard as a moment of worldwide destruction, most probably exoterrestrial in origin.

Several stations have been boring into the ice caps of Greenland and Antarctica; bedrock has been reached in both continents. Annual or close to annual series of ages achieving 100,000 years have been claimed for the cores. One core, already referred to, drilled at Camp Century, Greenland [6], exhibits the following characteristics on its test of "acid rain" fallout.

 1390 ± 50 BC. This is the only signal exceeding 2.6 uequiv H⁺Kg⁻¹ between 1100 and 2700 BC, and we therefore interpret it as being due to the large eruption of Thera (Santorini) in the Aegean Sea, which is generally agreed to have been of the same magnitude as that of Tambora (1815). The tephra production has recently been estimated

at more than 28 km³ (13 km³ of dense rock equivalent) [7]. This unusually large eruption has been radio-carbon dated at 1720±50 BC on the calibrated radiocarbon scale... However, archaeological evidence from the excavation of the Minoan settlement near Akrotiri on Santorini strongly suggests that the island was inhabited least up to 1500 BC judging by Egyptian pottery style chronology; it was apparently abandoned shortly before the eruption, and in good order because no valuables have been found nor people killed by the heavy ash fall (10-40m). The discrepancy between the datings may be partly explained if the organic material used for the radiocarbon dating were partly built up by radioactively dead carbon-dioxide exhausted from the volcano before the eruption (an effect which has been observed recently). Our dating around 1400 BC supports Marinatos' theory of a causal connection between the Thera eruption and the decline of the Minoan civilization centered on the island of Crete. The dating can be further improved to ± 10 yr, if and when a deep Central Greenland ice core becomes available.

Since the date assigned, -1390, confronts a radiocarbon date of -1720, a 340-year difference, the authors say that the destroyed Akrotiri settlement lasted until -1500 "judging by Egyptian pottery style chronology." Apparently they are prepared to throw carbondating to the wolves; even so, granted Velikovsky's reconstructed chronology of Egypt, which is achieving some acceptance among younger scholars, this will not suffice, because the Thera artifacts at the time of destruction now move down to about -1000. Several centuries of discordance would be excessive, given the evidence that the ice-core method is accurate within several percentage points. Either the method is rendered unreliable by the time that history loses its specificity, or carbondating, conventional dating and reconstructed dating are wrong.

We cannot know whether there may have been other large volcanic disturbances that are not recorded in the same ice core. Icelandic volcanism is certainly overrepresented because it occurs not for away. The Antarctic cores reflect only volcanism of some several hundred kilometers distance. The Greenland record will not readily signal disturbances unless worldwide or above 20? south latitude. Krakatoa (1883) and Tambora (1815), two large Indonesian blasts seem to have registered with acid fallouts. Mt. Mazama, Oregon, seems to be responsible for a strong signal assigned to -4400±-110 years.

Perhaps because it lacked an acid effect, the great exoterrestrial intrusion of Tunguska (Siberia) in 1908 is not signaled in the core; it seems to have produced no sharp deviation in the tests of oxygen isotope extremes, or in dust micro-particles, or in acid rain. Since this blast was more powerful than others that did register, and since it raised enough dust to darken the skies for a long period of time, its absence from the lists is strange. Furthermore, Tunguska's blast produced nitrogen oxides in the Earth's stratosphere that lowered the Earth's temperature 0.3? C for a decade (1908-18)[8]. The unusual gases and temperature drops should have affected the O¹⁸ measure for those years as well as provided ample microparticles for an exhibition of deviance.

Nor are climatic crises such as the Maunder Minimum (1645-1715) noticeable in the published record of the cores. In this case, a "Little Ice Age" around the world has been attributed to a cessation of sun spots. The period should evidence itself in the ice core in some manner. Nor can we locate unusual years around the times conventionally assigned to the end of the Upper Paleolithic cave culture of the Dordogne, although the general view is that the people of that Age were forced to follow their animal quarry to cooler northern regions. The enormous quantities of ice could not disappear while the Greenland ice cap was still picking up its usual ration of new ice each year.

In 1982 we read of the Soviet discovery of well-developed Bronze Age settlements in the Kola Peninsula, about the same latitude as the Greenland drill sites, with materials (slate) imported from far to the South [9]. Velikovsky pointed long ago to the discovery of human artifacts beneath the huge hecatombs of mammals and trees jumbled en masse in the Fairbanks District of Alaska; he reported, too, the hills of smashed bones on the islands of New Siberia, product of very recent events, and the findings of paleolithic, neolithic, and bronze age settlements in northeastern Siberia. The coasts of the Arctic Ocean permitted well-developed cultures in early historical times; metallurgy was practiced at Yakutsk "to make axes, beautiful bronze tips for the spears, knives and even swords"[10]. "Organic vestiges in the

drift of the last glaciation have been found to be of a radiocarbon age pointing to a time 3500 years ago" [11], while the ice appeared to be advancing about 10,000 years ago and therefore the last ice age decline or collapse must have occurred more recently. If this last figure were valid, and compared with the muddled ice of the "last glaciation" assigned 20,000 years in the ice core, most of the ice core would be foreshortened by 50%, throwing of all historical and prehistorical calibrations. Be it as it may, the chief problem is the undeniable occurrence of geophysical activity quite incompatible with the radiometric, microparticle indicators varve. and of the Greenland glaciologists.

Nuclear blasts of recent years do put in an appearance. Why is it then that remote events are apparently prevented by wind patterns of the upper atmosphere from carrying signals to Greenland? A cyclonic explosion large enough to expel material from the Earth into space might not send dust the great distance to the Greenland ice cap, but I doubt this.

The most remarkable feature of the ice core records is their uniform quality. Could this be a "defined" hence spurious uniformity? Precipitation of water and oxygen isotopes, climate, and underlying rock temperatures are surprisingly constant over thousands of years. "Post-glacial" times show "surprisingly stable accumulation conditions"[12]. The 800 top meters of the Camp Century core count off 4000 years with uniform temperatures. No other climatic indicator on this planet shows such a uniformity.

Microparticle concentrations do alter substantially with "the end of the Wisconsin glaciation;" they "suggest high storminess and/or atmospheric turbidity at that time"[13]. Considering that Greenland was so-named not only because Eric the Red was hustling immigrants but because he found the land more verdant than today, the waxing and waning of pollen signals should have by now prompted another technique of validating the use of ice varves in setting up a time scale. A continuous series of annual (or decennial) pollen density rates have not been published, to my knowledge.

The Greenland scientists report concentrations of volcanic activity in this latest millennium and in the millennium from -6000 to -7000. This does not conform to the impressions left with us by ancient history and geology. The first millennium and the second millennium B.C. were both marked by very heavy volcanism so far as legend and archaeology can be depended upon, and heavy disturbances may have been almost continuous before then.

The Danish group speaks of a dry period 18,000 years ago in the ice core period [14]. In other places [15] it marks dusty turbulence, but not in the dry period. Why does not the dryness raise dust in noticeable amounts? And why does not precipitation in dry years contain more microparticles than in wet years?

The Greenland core ends in many meters of debris, which may or may not originate from a grinding of the bedrock; it may be a settling of debris when the undermost ice diffuses and spreads out leaving the debris behind, or turns to water and seeps out. In the Antarctic, the lowest meters constitute a shallow lake, rendered so perhaps by the pressure of the ice sheet alone.

Or is the pressure supplemented by warmth emanating from the rocks below? And is this temperature constant? Does an ice cap melt from the top or from the bottom, or both? Does it glide off and calve from the top or the bottom? Most scientists will agree that ice is disposed of from below. If such is the case, the time measured by different cores will probably be affected by the conditions of the Earth - the depth of the crust, the proximity of mantle magma intrusions, the stresses and strains horizontally suffered by the ice.

Will dust and particles descend in a given column faster over time than the original ice varve to which they pertained? Probably so, because of greater density and hardness. This may be the source of the bottom debris, but the bottom debris may not be so immobile as we conjectured above and may be moving out laterally at a faster rate than its bulk presence would indicate.

An accelerated rate of bottom removal would only make the core younger and the present ice age longer than the scientists believe. Instead of registering the 100,000th year at the bottom, hundreds of thousands of years may have slipped away, and only the latest 100,000 years is present in the core. That is, provided the years are registered accurately.

But the core is measured annually for hundreds of years at the top, and then in averages for the balance of the core. The statistical projection may depart far from the reality. The curve adopted to portray the rate of thinning of varves in the first hundreds of years will take very different shapes with only slightly different initial assumptions and observations. Also, the warmer the base of the core, the younger the core averages above.

The Greenland cores have been synchronized to some extent by the investigators, and they are well aware of the serious discrepancies that begin to appear, and of how at one slice a core will signal an event that is not signaled at what should be the corresponding slice of a second core. That is, local conditions on the Greenland ice cap itself, operating in what is logically the most uniform of environments, will occasion salient differences between presumptively equivalent crosssections. If this is happening within Greenland, how well can Greenland register events around the world? Not even the Laki (Iceland) eruption of 1783 correlates. This immense disaster registered high at the Crete drill site in acid fall-out but at best feebly at the Dye 3 and Milcent drill sites. The incongruity demands a satisfactory explanation.

Some small and large parts of each core are defective for analysis, for various reasons. The defects do not, in the investigators' opinion, occur because of external events destroying the validity of the rest of the cores, and we must accept their judgment in this regard. But suppose that there occurred a severe temperature rise over the whole of the cap and much of the ice melted and flooded away, and upon their remnant was founded a new progression which endured for a thousand or even three thousand years; would not this catastrophe go unnoticed in the ice core, and the remnant be dated as a regular recession from rates calculated from the

layering of the new ice? Is this not very similar to a typical problem of unconformity in stratigraphy?

Again we turn to the unreal niceness of the rates of accumulation and the neatly descending diminishing varves. The oxygen 18 isotope, annually giving us a high and low of its deposition as the year cycles from warm to cold, seems like a measures too good to be true. Is it possible that the measure works only in those years that have a high and low between certain limits, and that when the limits are exceeded, one way or the other, the ratio no longer registers? Is it possible indeed that the O¹⁸ ratio is defining, rather than measuring, temperatures?

And what is true of the ice may be true of the measuring instrument. Why should the oxygen 18 isotope be constant in vapor of the atmosphere (apart from normal temperatures that affect whether it falls or does not fall)? Would not cosmic and solar storms, and everything else affecting the atmospheric gases tend to disturb the measuring gas, too? The O¹⁸ uniformity may be both judge and executioner of time and occurrences. The heroically investigators have endeavored stabilize irregularities of the isotope signal by checking microparticle density, varve thickness, and acid content against the gas test, and one can observe in their efforts the progression of the common sense idea of varves into a nightmare of adjustments, extrapolations, complex indices, and averages. No articles can contain and describe for the outsider all the reassurances that he may need and should have; good faith and the objectivity emerging from teamwork will have to be involved.

The anxiety of the external critic is augmented by the inattention of the literature to seeming contradictions of the type previously alluded to, the studies of glacial conditions elsewhere which indicate decisive events that somehow should be called forth from the ice cores-cases like Niagara Falls, for instance. Another example would be a study of the late ice-free period off of Labrador, when a considerable flora grew on the land nearby at 21,000 carbon-14 years B.P., and where postglacial vegetation had hitherto been dated at 8,000 to 10,000 years B.P.[16]. Other examples would be the massive recent deposits and arctic human communities referred to earlier.

There have been severe recent climatic changes, say most glaciologists, natural historians, and historians of ancient cultures. It is inconceivable that these are not, in one way or another, sometimes if not always, registered in ice cores of 100,000 years of age. Climatic and disastrous events would clump together at times, guaranteeing a more effective signal to be registered in the ice; Tunguska would be only a single instance of this. That the proven inconstancy of solar storms, hence of particle bombardment of the atmosphere, would not affect O¹⁸ concentration in atmospheric vapor from one year to the next and from one century to another, is highly unlikely.

Walter Sullivan of the New York Times, himself author of a formidable treatise on geology, Continents in Motion, reported directly upon the Greenland drilling expeditions (August 9, 1981). He describes the physical set-up at Dye 3, a multinational effort with scientists of five nations as participants, that has drilled 6600 feet to bedrock. He writes:

> Like the North Sea drilling platforms, it is a community on stilts, with extensive living quarters, dining facilities and recreation rooms. Every few years it is jacked higher on its stilts to keep it well above the accumulating snow.

Bemused by their predicament, I inquired of Mr. Sullivan on August 20, 1981:

Perhaps you can solve this puzzle which has occasioned some friendly arguments hereabouts. If the stilts of the living quarters of the scientists have had to be raised considerably since the project began, because of the accumulation of snow, say 10 centimeters of snow [actually the true fall is more], and this 10 centimeters represents at the same time a compression downward of the ice (that is, it is a true rise in the altitude of the ice cap) would not, at a uniform rate of precipitation, the ice cap of, say, 2 kilometers depth, have been built up from bed rock in 20,000 years?

Sullivan replied on Sept. 10, 1981 that "the station's true elevation above sea level does not change substantially," for "The snow accumulates; Dye 3 is jacked up; and the ice beneath it flows away toward the coast." Also, "Central Greenland has probably been covered with ice considerably more than a million years, but the older ice has long since gone out to sea as icebergs."

For the moment, it may be that the altitude of the camp remains the same, although this may be difficult to measure from "8700 feet above sea level." This means that roughly every decade about 100 centimeters moves out toward the sea. But this bottom 100 centimeters represents many hundreds of years. All of this ever-worsening bottom record is finally destroyed each decade.

A warming period with high precipitation might wipe out long stretches of time, younging the entire core, fattening the top layers and pressing out larger sections of the bottom, even while the total column length might remain the same. The action might proceed rapidly, under certain meteorological conditions. Even though the recent period of several centuries might be wellmarked, the lower sections of the core would be uninformative. But as we have seen, there do exist problems with the recent sections.

I have implied that the altitude has not been measured, or at least precisely measured, within the limits demanded of the problem, that is, over several decades and in centimeters. All glaciologists are divided into three parts: those who say the ice caps are growing, those who say they are diminishing, and those who say they are constant. If it happens that the cap is here growing, and has grown by an average of a meter per decade, then the drilled core will be only 20,000 years old or less, which would suit short-time quantavolutionists well.

I cannot think that the glaciologists, so apparently scrupulous in their methodology, have calculated coefficients of correlations between the a) ? (O¹⁸) and b) particle and c) varve-thickness measures of the cores drilled at the several Greenland sites. Yet I have not come across them, and my cursory ocular inspection leads me to fear that the correlations are low, perhaps even to the point of insignificance. But these measures are themselves complex indices and the several variables that compose them also require correlation. Multiple correlation techniques need to be applied.

If the correlations are absent, but can be raised to significance by grouping annual varves into decades, or even centuries, then some claims of ice core glaciology will be damaged but the large claim that interest us, from our radical perspective, will possibly remain strong, namely, that no worldwide catastrophe involving atmospheric contamination can have occurred over the past 20,000 years. If this single claim is or were to be firmly established, it would have to be concluded that glaciology has eliminated the theory of recent quantavolutions in natural history.

Has this claim in fact been established on scientific and empirical foundations? The more regular that glacial history in Greenland is portrayed by the tests, the more a critic is inclined to see some major and fatal flaw in the system. It is too early to take a final position on ice core chronometry, and incomparably more research into the matter would be required than is presented here. As with sedimentary varves and tree rings, a great confidence must be devised upon the investigators, or the outsider must be guided hand in hand through the process to appease his doubts; some of the greatest catastrophists have been persuaded of their views by intimate contact over long periods of time with the morphology of the regions of their work-the Utah deserts, the Sierra Nevadas, and so on, yet they are not believed by most scientists.

Meanwhile, every interested scholar will take up his position in terms of his interests, biases, and hopes. Acting as one of them, the present writer must shepherd his own flock of theories. These contemplate a world history that experiences a half-dozen major quantavolutionary episodes over the past 14,000 years. During this period of catastrophes, Greenland would have been severed on all sides from a Pangean land mass. It would have been deluged by ice, then overrun by tides, then subjected some 6000 years ago to another deluge of ice. Much of the ice (and snow) would have originated exoterrestrially. Cataclysms are pictured that would build a kilometer of ice in a short time. Many successive waves of snow and ice, whirled about, as pure and free from dust as outer space itself, would have plunged upon Greenland. Would some semblance of a calendar of the years finally remain to be manifested when, on top of it, two thousand fairly regular years succeeded, lending a false conception of what lay below? Probably.

Notes (Chapter 11)

- Hammer et al., "Dating of Greenland Ice Cores by Flow Models, Isotopes, Volcanic Debris, and Continental Dust," 20 Glaciology, 82 (1978), 3.
- 2. W. Dansgaard et al., 218 Science 4579 (24 Dec. 1982), 1273
- 3. Unpubl. note of August 1977. Cf. II S.I.S.R. 2 (1977) 31; *Soc. Interdisc. Studies R.* 4 (1980), 82.
- 4. Letter of Sept. 20,. 1983.
- 5. See I. Velikovsky, Worlds in Collision, Part I, A. de Grazia, Chaos and Creation, and V. Clube and W. Napier, Cosmic Serpent, together with other studies of the same writers and numerous other authors, cited in these texts and in the pages of the S.I.S.R., Kronos and Pensée magazines. See also Part I, here above.
- 6. C.V. Hammer, H.B. Clausen, an W. Dansgaard, in 288 Nature, 20 Nov. 1980, 233.
- 7. New Scientist. Sept. 2, 1982, 620.
- 8. Soviet Weekly. June 26, 1982.
- 9. Earth in Upheaval, "Supplement: Forum Address," (1953).
- 10. *Ibid.* 287, citing studies of Suess, Science, Oct. 24, 1952.
- 11. Glaciology, 20.
- 12. *Ibid.* 12.
- 13. *Science*, March 15, 1976.
- 14. Glaciology, 12, e.g.

15. G. Vilks and P.J. Mudie, "Early Deglaciation of the Labrador Shelf," 202 *Science* (15 Dec. 1978), 1181-3.

CHAPTER TWELVE

A FAILED EXCURSION TO THE CAVES OF AQUITAINE

When the Ninth Congress of the International Union of Prehistoric and Protohistoric Sciences announced an excursion to the paleolithic sites of Southwest France, I joined up. It was September 1976.

The Guidebook of the Excursion was admirably executed and was prefaced by a motive for the excursion: "In the first place, to return as a pilgrimage to the sources of the science of prehistory; to see or revisit these world-renowned sites, which have given their name to the great epochs of Prehistory: Abbevillian, Acheulian, Mousterian, Aurignacian, Solutrean, Magdalenian and so many others of the Mesolithic, Neolithic, and Protohistory." What's in a name? - something of national pride, I fear. Who dares to question "the great epochs of Prehistory?"

My personal motives were sinister, as is discoverable in a journal entry upon arrival at the Hotel Terminus in Bordeaux, August 30.

I go to the Hotel Terminus, whose dignified greystone mass juts out from the trystone facade of the station. It is quiet and polished at the reception. "I am a day early but am reserved for tomorrow night with the archaeological group." No problem with the room. But no archaeological group is expected. "Wait," says the pretty receptionist to the handsome assistant-manager. "There is a letter here about a Monsieur Halloway, from an archaeological society." (I wonder whether it is the anthropologist Halloway.) I know at least that something will be happening with the tour. "Please ask Mr. Halloway if he might phone me when he arrives."

My room is broad, tall, and old-fashioned. The hotel was built to outlast the recent growth of the city. When I draw the long draperies and throw open the large windows, I am just above the melee of the railroad station. A paradisiac room for an urban sociologist. I am content. I feel like working immediately. I clear the little mirrored table, pour out a glass of Glenfiddich's whisky, and begin to leaf through my folders, stopping at a point where it occurs to me to write down the kinds of questions I must be asking myself and others throughout the field trip through the country of the famous prehistoric caves. I copy them here.

- 1) Is superposition the same everywhere?
- 2) How clear are the separations of "cultures"? Nearly always very sharp and clear? Sometimes very sharp and clear? Only occasionally very sharp and clear Never very sharp and clear
- 3) At how many sites are: all cultures represented? 'x' cultures represented?
- 4) Are animal remains found? In what % of the caves? Are human remains found? In what % of the caves?
- 5) Are C14 dates compiled from 'x' caves? and available?
- 6) Has any K/A [Potassium 40-Argon 40] dating been done? Where?
- 7) Any other radiochronology, e.g. on ceramics?
- 8) What is the substance of "sterile" layers inside a cave? Why formed? Do these layers correspond to ash or in the same type of material outside the cave? (Where can I find statistics of the caves? Dating (absolute) of the reported 5 ash-levels around the Cro-Magnon dig?)

So the questions. But these are only a beginning. For several years, I have wondered who these people of the caves where? Where do they belong in time? Are they truly a presence that ranges from 5,000 to 15,000 to 30,000 or even 100,000 years in age?

What created the caves? Opened them up? Sealed them? Opened them and sealed them repeatedly?

What natural forces were playing about the world outside? The caves must have been used and disused while the last ice age came and went.

The great paintings. Were they to celebrate the presence of animals or pray for their return? Where are the heavens represented in the caves? Could some of the animals be a zodiac of the caverns?

I begin once more to riffle my pages. I am unprepared for the trip. This summer, until now, I have been writing of other subjects, related to ancient catastrophes - on schizophrenia among the first humans, of sudden destruction of cultures in the Middle Bronze Age, of the science of catastrophes. Now and then I would come across some mention of the cave country of France, of Spain, of grottoes of Africa and Italy, of the great Choukoutien cave of pithecanthropus in China. I know of ice caves as in America where ice lies deposited between layers of lava and schist, and melts very gradually over thousands of years. Why are none of the caves of Aquitaine 'ice caves'? The ice was near.

But I know nobody - neither expert guides nor "congressistes," as the group of us are called. I have found no geological map of the area: how can I ask questions, or ask the all-important critical follow-up questions without sub-surface and contour information? I have not read enough about the caves to be more than a sponge of information, too little to be a cross-examiner.

The telephone rings. It is Halloway, just arrived. He is pleased to know, too, that someone besides himself has appeared on the scene. He is from Providence, from Brown University, a classical archaeologist. We arrange to have a drink together in half an hour. I take a hot tub bath, rearrange my tangled jumble of possessions, and walk down the broad stairs of the foyer to meet him. There I note a puzzled couple, and hear the receptionist clerk saying to the man: "You are not by any means the first of this archaeological group of which we know nothing."

Halloway appears. About 40, bearded, sturdily built, bespectacled. We shake hands. "Let's try the competition across the street," I suggest. We go to the bar-restaurant of the Hotel du Faisan, and order Pernod. He is just in from the States, changed planes in Paris. Tired. He will go to bed directly. He has been digging in Southern Italy for several years, an early Bronze site particularly, where metal and pots are cooked on platforms of vitrified rock that they made. There is an abundance of ash. I inquire where the ash comes from. "From their work. When it got too high, they

built another platform." "Any signs of a level of destruction?" "None," "Why did they stop?" "The work simply stopped. We don't know. Maybe if we dig up the area around we may discover why." We pay 12 Francs and leave. I return to my room, glance through Whitesides' Archaeological Atlas for a while, and descend to the Buffet-Restaurant of the train station. A vegetable soup, merlu fried with lemon, crème caramel, bread, wine (Bordeaux, of course). I discover I can see faces in the distance distinctly better with my bifocal glasses. This is a surprise. My eyes are getting old. To bed, quite tired, at 11:30. The Atlas drops from my hands.

The next day I bought for the trip a Masson geological guidebook to Western Aquitaine and a camera. Back at the room in the evening. I am writing: "'Why did they have to close the caves at Les Eyzies?' And the answer, as often as the question: 'The pollution of the crowd was destroying the images.' The heat, the torches - I recall one beautifully printed book saying something about thousands of sweating bodies and the vanishing images. What of the sweating caves themselves?

"Do caves not sweat? Stalagmites, stalagmites. An image in paint. Who can seal it in a wet tube of dripping walls and clay bottoms for 10,000 years and find it intact afterwards? I can understand the images carved into rock, but the paint that outlives them and the paint laid on flat - what preserves it? There must be good answers. Geologists and specialists on paints have visited the caves by the hundreds. How stupid I am not to figure out why! Just as I felt stupid when I stood at a headland day before yesterday, at St. Jean de Luz, and watched belts and streams of thinly laminated rock plunging crazily, tortured at all angles, into the sea, which rushes at them, foaming. What manufactured these fine layers in the dozens and then pushed them negligently over the sea like a jumble of tissue, like rolls of toilet paper?"

Within three days, I gave up the idea of an extensive account of my observations. At 11 p.m. September 3rd, I am writing in my journal at Périgueux:

Three heavy days and two bad nights have brought me to think that I shouldn't continue. Nothing ever works out the way that is expected. When the mind lacks coherence, everything lacks meaning. When the environment is confusing, it is difficult to be coherent. Why be so abstract when the simple fact is that I have been struggling for three

days merely to keep pace with a group that is moving all the time with little sense of itself through strange country and unanticipated petty troubles of existence. The beds have been bad, the meals poor, the bus-riding tortuous and prolonged, the days of forced company ranged around the clock... What is the writer to do?

But most of all, the prehistoric times as they are advancing towards me from Aquitaine are a rough and dismaying array whose frightening aspect makes me want to retire from the fray.

In 3 days, we have ridden hundreds of miles, inspected 3 caves (I have gone into Lascaux today), 4 sites, 22 cuts, and spotted a number of caves, sites and cuts from the halted or moving bus. In addition we have visited three museums. Sets and trays of paleolithic or later artifacts march through my head in silent columns.

The people of the group are of greater interest, what they say, who they are. It is pathetic, in a way, to watch the paleolithic age scholar with his or her miserable accumulations of evidence and desperate concentration as if by specialization on the edge of a blade one can pierce the gloom of the birth of mankind. I am imitating them as well as I can, gazing fiercely at the cobbles and chips, hoping, too, for the Message.

Sporadic entries followed, but in the end I was left with handbooks and notes and questions, whereupon we all lost ourselves in the melee of the great Congress at Nice. There was nothing left but to reminisce. I was overwhelmed by the organization, the discipline, and the assuredness of the Masters of the Caves. I do not see how any individual, unless he could lead a precarious double life over a decade of time, could treat with the Ideology of the Caves. Lacking access and resources, an outsider could only work with the printed materials, a few visits, and a deductive theory bringing to bear the general materials of archaeology and geology.

Could not some authoritative scholar, long versed in the intricacies of Aquitanian archaeology, emerge in due course to say, "Dear colleagues, we must review and reevaluate the conventional theory of the Upper Paleolithic." Impossible, sociologically impossible. One would have to reverse his spin of perspective and contemplate a strange new model. Then, once

persuaded of its utility, he would need to persuade others to listen to him, obtain resources for seemingly absurd research, and hold onto his job - not likely!

To compose a new theory of the caves, one must consider the origin of the caves. Could they have been quickly formed and folded in the orogeny of the Massif Central and the bursting of hundreds of volcanoes in the Holocene, even while the great Atlantic cleavage shoved Europe to the East? Heat and steaming waters can form caves quickly, and so the interesting natural sculpture within the caves, as I noted in our visit to the caves of Oxocelhaya and Isturitz.

Does any animal besides man penetrate into these grottoes? What geologically explains the great variety of forms? Different floodings and temperatures? The impossibility of any informed layman or ordinary scholar gaining much from visiting the caves. Bronze Age is found in the cave at Isturitz. Each chamber looks as if done up by a distinctive decorator. Red and black paint on the walls still from Paleolithic, little black horses. (Humidity constant? Young?) Stalactites make different sounds when struck. Any evidence that they were used as producers of sound? Recall: guide ("untrained") who made anthropomorphic figures out of every calcite formation. Recall: the glass cases where hundreds of objects were arranged "technologically" with no indication of where they were found, how originally, etc. (Compare with taking 2 congresses and by putting all Republicans in the first and all Democrats in the second, you show that a pure Republican was succeeded by a pure Democratic age.) All the hoopla (the comic strip ascendancy of man from Neanderthal to Cro-Magnon, etc.)

At Eyres-Moncube, we come upon the Gisement of Pennon, dug out by Professor Thibault, who explains it to us. He is:

very confident, certain in his modes of expression, polite, direct, says when he rarely doesn't 'know.' Shows occasionality of use of this site. Maybe used as a flint-cutting site. Again deposits of sand that could be laid in a week or 100,000 years, followed by occupation, then another huge deposit contrast, another occupation... No hint of catastrophism among the 45 people... Time calendar not even discussed by anyone so far... Interest is general, attention good, but questions almost entirely factual and answers accepted. No controversy. Is this science: maybe

so. Some complaint about not enough manpower to dig. Not one mention of skies. One American, expatriate in Canada, says unusually, 'Why did these people use the caves?' Practically no interest in psychology. No talk of institutions. I probably initiate (stimulate) one half of the total volume of psychological or theoretical talk, now here, now there, often walking off, never completed. Desultory.

As we near Lascaux, I jot down a nearly undecipherable note, written on the bus.

I notice how often 2 or more (or all) of belts of deposits in Aquitaine look exactly alike save for a slight color and grain change. If you don't peer at it, it looks like a huge subsoil of the same sand (except here and there are stones). Yet they are dated even in a single profile as far apart as Holocene, Pleistocene, Quaternary, Tertiary and maybe even earlier. (And of course Riss, Wurm, Mendel I, II, III, and all of that, in between). Strange! Highly improbable.

At Lascaux:

Whenever calcite grains capture color they hold it. When the powdered rock is painted it has lost the paintings. Thus Case A: Bottom half of horse clearly and nicely painted, little affected... top half has disappeared, "because it is on calcacerous stone but not on the calcite like the lower half is." Quite persuasive. But what does this indicate about time? Two factors are involved in question whether a color will be preserved: the surface (calcite or not) and the pigment (whether organic carbon as in oil smoke or inorganic as in earth-oxide colors).

At the overhanging Gisement of Micoque:

Almost no assemblages are in order, and could be disastrous. Lots of open air digs. More than caves. Everywhere in Dordogne you dig you find some paleolithic artifacts. Never cases of reversed superposition of cultures: one is always earlier (below) other according to the progression. Sometimes contemporaneity, causing concern, but, to repeat, never true *bouleversement*... No tectonic *bouleversement*.

Settlements occurred even during the cold glacial periods, as at Aschenheim during Riss II. Different types of limestone form in different caves. I was watchful for signs of ashes. Very little reported or to be noticed. Where, in one place, carbon flecks were noticeable amidst clay sands laying over a silt bank and solid reddish soil, there occurred white bones on the same level. The carbonized bits could have been percolated from an occupancy location, or wind-blown or carried in by a flood that swept in and dispersed hearth ashes, or they dissolved into a soil. No systematic testing of soils for organic carbon content seems to have been done. In one case a 20 X 20 meter area carried an 8 inch band of carbonization; it is explained as the effect of many hearth fires, which I accept.

It appears that peat is heavily deposited in Aquitaine. How would this peat relate to Mackie's study of a peat deposit about half a meter deep over a megalith otherwise dated at about 800 B.C.? Neolithic farmsites are found under bogs of peat in Ireland. Over 10 meters of peat formed in the Holocene and is found below the river valley of Eau Claire. Another river running parallel runs on top of a peat bed of the same proportions.

La Cluna abri-cave contains a one-meter level of Mousterian culture stuffed with bones of different species, including large mammals. Mousterian sites often end with blocks of animal and human bones *mélangés*. Magdalenian sites were usually smashed up sooner or later by seismic disturbances, or so it is believed.

A scholar present told of the extinct volcano, now Laacher See, 80 km South of Bonn. It lacks cone or crater lip. Over 100 extinct eruptive sources of same type are found in the same region. Laacher is said to have exploded during the Allerit Period, around 11,000 B.P. Deep tufa is scattered around and to the East as far as Thuringia. A band of carbonized vegetation in the coastal area of the Netherlands is placed at the same time. We have only begun to fathom the fire remains of the Paleolithic. At Langerie Haute, for instance, a meter of ash rests on top of the Upper Magdalenian culture, coinciding, it is believed, with the very end of the Ice Age.

I note (Sept. 7) that the excavators do not find materials of recent times, and it would seem that after Magdalenian VI, the sites were abandoned. Upper Magdalenian is loaded with doubts and controversy. Some experts see sub-periods when others do

not. Magdalenian III, IV, V are often clumped together; some argue this is an effect of seismism, others that warmth may have cracked and caused rock overhangs to fall. Water action, too, is blamed. But also some say there were no plural periods.

The walls of Ruffignac contain two groups of mammoths marching towards each other. They exhibit a fine sense of order, a disciplined composition. Elsewhere a parade of mammoths is overdrawn by serpentine lines. At Ruffignac, all corridors are very soft and wet, both floors and walls. One senses big water nearby. If in historic times, as reported, a flood covered the first kilometer of the cave up to the ceiling, a larger earlier flood would have swamped the whole tunnel complex and wiped out all artwork.

I make note that an anthropologist from the University of Massachusetts speaks doubtfully of an arrangement of a circle of crystals and a triangular display of the skulls of a deer, bison and horse uncovered at Nice. He says that this same site contained post-holes to support shacks, which postholes remained unchanged over 100,000 years except for small movements here and there. I questioned the time, saying that it was impossible for such a composition to remain unchanged for longer than a few hundred years. A physical anthropologist from Cornell asserted that people made the same kind of tools for 100,000 years or more, citing the Acheulian. I disputed this as well; he agreed with me on the first, which concerned Pont d'Ambon, though not the second. The psycho-sociology of invention would lead me to doubt that the strongest conservatism can prevent technical adaptations to the forces of the environment. Technology may often change faster than prayers.

The trip continues and I jot down another note:

The Pont d'Ambon site can be critical. A stream runs parallel to the bluffs, quietly, slowly, 100 yards away. No allowance here or in numerous other gisements for violent inundations from time to time. Yet, considering that the period is said to occur here from 12,300 to 9300 = 2800 years, more or less, river floods must have occurred 50 to 100 times, enough to wash out the place. (Heavy climatic changes were said to be occurring.)

The best defense is that originally the stream was deep and not until the whole shelf was filled up and abandoned in 9640 B.P. did any flooding of significance occur. We discussed this question, some saying that the river started as a "V", but then it would have been caused by a catastrophic flash-flood to begin with, which in any event would slowly fill with sediments and broaden. But it is narrow. On the objection I thought they might raise, that the stream might have been farther away, the land rises on the other side gently. Further the men of the shelter would wand to be close to the water, so the stream would not change that much. Further, if a stream did change its course, it would do so in the course of catastrophe that would have inundated the living or occupation site. One said that this area might have been spared glacial flashfloods or heavy drainage, but I doubt this and, furthermore, heat and humidity, by pollen tests, indicate watery climate part of the time.

In sum, there are grounds for believing that the neat-appearing stratigraphic profile at Pont d'Ambon may testify to a rapid succession of a few seasons with stages of Magdalenian and Azilian occurring with different occupants carrying the "latest" stone chippings. The "climates" vary remarkably but may be erratic seasons; the flora and fauna change, but so they will change even now from year to year. The correlations among all four - technique, climate, flora and fauna are quite poor. There is a considerable mixing of artifacts as well. The dates are based upon five radiocarbon tests done on unscorched deer bone.

Over a thousand years (half the whole time) seems to have slipped away between the earliest two strata of the Azilian levels: erosion? abandonment? never existed? The absolute dates are probably far too old, to my way of thinking, which views radiocarbon as having little knowable association with the passage of time before 3000 years ago. With due caution for what may happen in the laboratory, the relative dates may be significant, but there is one contradiction in dates among the five possible ones, and the Azilian and Magdalenian periods are so close as to overlap when allowance is made for error (i.e. 12130±160 and 12340±220).

The lack of profuse material deposits of the Upper Paleolithic would be explained by the hunting-gathering complex, which seems to permit only a few inhabitants and these usually on the move. Still, where are the permanent settlements of the age? We cannot believe that the cave-users were dwellers therein; else they would be very neat housekeepers (and, in fact, what material exists is strewn about in disorder). How deep is 1000 years of an average Near Eastern tell? How deep is the typical thousand years of paleolithic occupancy? No answers are given to these answerable queries.

Despite arduous labors of classification, the cultural divisions of the Upper Paleolithic are not absolute, and may not hold out much longer, especially as the geographical areas studied expand toward Asia and Africa. The Solutrean may be contemporaneous with Magdalenian, with, it has been suggested, the tools developed by horse-hunters especially. Some tools (including Levallois bifaces) that are classified as Mousterian (Neanderthal) penetrate the kits of Upper Magdalenians.

I resort to my journal:

The typical stratification of an excavated abri, cave, or open site permits various wash-outs and wash-ins of material, and gaps of flooding, of quick "decade" or "century" pollen and faunal changes. The reason why this short-term stratification is ignored or neglected is that C14 dates of charcoal and bones generally produce "acceptable" dates from 9000 B.P. to 18,000 B.P. for these strata. From the earliest level, say 15,000 to latest, say 10,000, there are 5000 years of time to account for in the strata and hence they are regarded as long-term deposits, rather than short-term ones.

Many of the papers and discussions of the IXth Congress centered upon the climates and ecologies of the various hominids and men. Talk of 'warming' and 'cooling', of interstadials, of Wurm I and II, of moist and dry, consumed much of the week's work and hundreds of papers. Then came 'shards,' and them came dates, which are intended to bring order to the discoveries but, like climatic schedules, are a source of confusion in themselves.

The chronologists and the stone-flake classifiers are preponderant elements of a profession that has few findings with which to work, and a deep suspicion of theory. Prehistorians prefer to study coprolites rather than human thought. They are like pollsters who, by getting rid of anomalous, misunderstood, or complex responses, present the public as speaking in "baby

talk." When it comes to fields of megaliths weighing tons, they go so far, under great pressure from a few cranks, as to believe that early man wanted to find the solstices and equinoxes and plot the Moon's course, but hardly attend to the question of motives underlying the movement of great stones. But the megaliths of Stonehenge and Brittany are a better measure of the fearful memories and expectations of their builders than of their astronomical skills.

The excursion ended at the Congress of Nice, subject of my last note.

September 13, 1976

French domination of the field of prehistory is especially evident in the grand trappings of the IXth Congress whose name is emblazoned in giant letters upon thousands of posters around Nice as if it were a World's Fair or at least the Cannes Film Festival.

The field was taken up by the French a hundred years ago when the rest of the world ignored pre-history, thought it was amusing (as with the American Indians) but not a great discipline, or was deficient in all field research areas of historical science (as e.g. Thailand, India) and relied upon legends.

But the concentration of leadership means the concentration of concepts and their imperialism in many places where they are perhaps inapplicable. Written during a thoroughly boring grand reunion in the Hall of the Parc d'Expositions. 1/5 of the 3000 people is listening, the rest gaze here and there, listen absentmindedly, think of other matters, talk to their neighbors or as I, read and write. There are 21 on the high, semi-circular rostrum. 2 hours are given over to it. I was able to be only 30 minutes late.

The Program is intimidating. Hundreds of papers are listed, among them mine. Yet calculate the time per paper permitted, and it comes to 3 minutes each. Obviously some will not have come to Nice, others will scarcely cover the sub-titles of their talk, some will cling fiercely to the rostrum, some will summarize for others. The usual main function of coming to meet one's kind is rather poorly provided for because the residences are widely separated and as yet I've not seen the central "hall of encounters" that should be the central focus of all such conventions. [Later I

concluded that the vast list of papers was an effective method of helping hundreds of scholars to get a vacation from their repressive governments, to boost their local reputations, and to qualify for travel funds and foreign exchange.]

The Congress ended, I posted a score of volumes of preliminary reports to America, I met Dr. Elizabeth Ralph, Director of the Radiocarbon Dating Laboratory of the University of Pennsylvania Museum of Natural History, and we went home together.

Princeton, September 18, 1976

Elizabeth Ralph told me among many things, that:

- a. She thought Velikovsky was difficult and wrong.
- b. That the Ramses C14 dates of 13th century from at least 3 types of material disproved him and that there were 19th dynasty 7th century readings.
- c. That she almost lost her job in the fracas over doing some tests for Velikovsky (those were the ones that FOSMOS of which I was President authorized circa 1970 but Bruce Mainwaring carried on all the negotiations and asked all the nasty questions in his sweet way.) I doubt this but she was scared by her boss Rainey, I suppose, as well as the unusual excitement over the matter of testing Velikovsky's stuff. She is a tough, durable woman, masculine, straight-talking. Like just about everyone in the controversy vs. Velikovsky, she is not as fully informed as she thinks nor understands all the branches of logic involved.
- d. I raised question after question with her during the 12 hours we were altogether on the ground and aloft, eating, drinking (she drank a lot) smoking (ditto) and talking. I wasn't arguing, which is useless, but finding out what this remarkable woman knew about many questions that bothered me. Most, of course, she couldn't answer. It was important, I think, that she liked my rough sketch on an Air France route map of the outlines of a Hudson Bay Crater (Chubb Islands as the center), a second circle of lakes and water all around the center of Chubb Islands, including the Great Lakes and Great Slave Lake, etc. She had no objections either to my theory of all-around midsecond millennium destruction.

- e. She said, in answer to my question about magnetometers, which she has employed in Greece and elsewhere, that they aren't too useful and are useless where ash and pumice are measured. There must be metal in the rock to take a direction after the melt, so she wasn't able to do much on Thera with Marinatos.
- f. She said that for political reasons, that is, the insistence of Marinatos, they've held off their latest Thera measure for years, because it was $1650 \pm$ while he was convinced of its being $1450 \pm$. I know the Thera dating is in confusion, quite apart from this incident.
- g. Yet Elizabeth said in answer to my careful questioning that all their dates were published, for better or worse, even if they did not turn out well for the investigators. (I cannot believe this, as see above [with Marinatos].) She takes several runs on every date and if they aren't close to their average, she throws them away and starts over again. "Throws them away" bothers me, although at the moment I cannot stop to pursue the effects of the logic of throwing things away.
- h. She says all labs do the same, publish all in the carbondating mag, including British Museum, of which we have contrary evidence (Mainwaring's report).
- i. I asked her whether she knew of the old article by Folghereiter that showed Etruscan vases with South-North clay-iron filings orientations instead of North-South, which would be expected if baked in the Northern Hemisphere. This is a sharp proof of magnetic reversal of the Earth for some period of time in the 8th and 7th centuries B.C., and was uncovered and advanced as such by Velikovsky.

Elizabeth says yes, but unfortunately kilns are stuffed with vases so as to bake more ceramics and conserve heat. Therefore, a vase might have been baked on its head.

Yesterday I had a two-hour visit with Velikovsky in the course of which I asked his opinion of the matter. He replied that the direction of the vase in baking can be told by the glazing which drips a little in the time before it hardens. Very well. But did the glazing occur in a simultaneous baking with the clay or might the ceramic body have been backed earlier and then heated a second time for glazing perhaps at a lower temperature. This is a neat and important little problem. If one absolute case may be proven of a vase

that was baked upright and acquired an opposite orientation magnetically, then we have an important proof of 8th-7th century troubles. For, as I explained to Ralph, the magnetic reversal, important in itself, would also be an effect of causes with huge other effects.

With luck, this study might take a week.

- 1) Restudy the articles of Fohlgereiter and Mercanton (see citation in Velikovsky's work).
- 2) Read Monley's *Science News* (Penguin, 12, 1948 or 9) report on magnetism on vases.
- 3) Consult experts unless one or more of these are perfectly precise in handling the glaze-sequence problem.
- 4) Conclude:
 - a) Further experiments on vases needed, or
 - b1) All OK for Velikovsky
 - b2) Problems in glazing, or
 - b3) Problems in position, or
 - b4) New problems

Then conclusions: How long does it take for the magnetic field to reverse itself, and were vases dated accurately, and when did it reverse itself to the present?

Incidentally, if this test were performed with a large number of vases from the Neolithic to present, a sample of each culture should have a modal group that is logically positioned to show the N-S axis, and this axis would be presumed to change when the modal axis changed. This might be one way of resolving the Etruscan vase mystery. (Velikovsky said Mercanton, who praised Folghereiter, was Director of the Meteorological Observatory at the University of Lausanne.)

It appears in retrospect now that my excursion to the Caves of Aquitaine was a failure, yet the experiencing of it and its sequel were successes, if doubts of my own mind and the minds of others are thrown into the balance. Almost nothing of importance can be said of the Paleolithic that will stand up as fact, and almost nothing that I can add as constructive counterfact can be proven, either. Conventional and quantavolutionary scholars dispute in a darkness like that of the caves. But we

caught for a while the exciting sense, around us, of another, an ancient contest, between vast, marvelously ornate natural sculpting and determined, hard-lined drawing by tight, defiant human minds.

CHAPTER THIRTEEN

THE LATECOMING OLDUVAI GORGE

In September 1976, I happened to meet Ofer Bar-Yosef, Ernst Wrestler, and other archeao-anthropologists from Israel on an excursion through the caves of Southwest Aquitaine. There I learned of the work that had been done at Ubeidiya, a location two and a half hours' drive from Jerusalem. Stekelis, who died in 1967, had brought in Louis Leakey to examine the site, and they got the idea that the Olduvai and Ubeidiya remains were closely related. Yet the latter were placed well under a million years while the former was considered a million years older. For sixteen seasons the Israelis had been on the site, but work had been suspended now for two years.

I was impressed; then and now; with the probability that the East African Rift, including Olduvai Gorge, was connected in time with the Dead Sea-Syrian Rift via the Red Sea. Therefore cultural contemporaneity, I ventured to say, had also to be watched for along the whole length of the Rift. My further speculations about the extreme recency of human beginnings along the Rift were mentioned diffidently and heard with some amusement.

In 1983 the Ubeidiya scholars emerged in *Nature* magazine with a reevaluation of their hominid remains; they redated them to coincide in time with some of the oldest of the African Rift hominids. Having gone this far, I expect that one day they will go farther and will have to claim that all along the Rift, the hominid sites, "oldest" in the world, must be brought up to the Holocene, perhaps only 14,000 years ago. Earlier in the same year, I had been considering the radiometric datings along the Rift and wrote in my journal of my doubts:

March 10, 1976;

Bones of humans are destroyed by weathering, animals, and disasters - fire, flood, hurricane. Bones are preserved by burial in dry tombs or sand, and by dry ash or tuff at low heat.

? All Rift burials and findings are from fall-out or quick wash flood and dry-out (i.e. volcanism or flood.)

Dating by K/A [Potassium 40-Argon 40] in Rift questionable *in re*:

- 1. Erraticism of some of dates.
- 2. Choice of small grains with more argon because more surface ratio to volume and therefore older dates since argon from air contaminates surfaces.
- 3. But younger dates may come from escape of argon at near melt temperatures following flow or fallout.
- 4. Questionable behavior of potassium.
- 5. Averaging may be used questionably.
- 6. Fudging and rejection unjustifiably of "impossible" dates; "reasonable" choice is unreasonable.
- 7. Superposition over short term can be achieved by an atmospheric condition of initial high argon content which is absorbed by first-laid rocks and then as successive rock layers are laid down (or sediments) the argon in the atmosphere is escaping and therefore less and less proportionally absorbed, giving upon test a gradient of pseudoage from bottom to top in seeming accord with super-positioning.
- 8. ?? Were accepted test results all reported and all blind, all from same size specimens and sampled by same procedures?
- 9. Regardless of age gradient of tests, tests give old readings. Since 0 argon is found on new deposits and some argon on 3000 and 36000 year old (???) deposits, how can it be said that the argon test is inapplicable to under 1,000,000 y? Such tests should be highly erratic.

- 10. Is K/A a test of the amount of argon in atmosphere at time of deposit?
- 11. Couldn't argon 40 be exuded from K 40 by earthquake and intruded into volcanic lavas and kept there as these cooled, giving them long ages? Yes.

If "trace elements" rise to the top of the Earth's crust, and if "daughter" concentrations follow suit; if "trace elements" are essential to methods of measuring rock ages; if rocks are igneous; if igneous flow (fissure or cone) proceeds by erupting lavas from the top rock melt layer, then the next to the top layer of melt, et seq., - then, radiodating will show old dates at bottom of the column, and younger dates as measurements move up.

This is as expected and found. *But* the layering could occur in a *very short time* set of eruptions and evidence a series of old ages in some kind of proportions because the daughter traces will be most abundant in the lowest samples and decline progressively as the samples are taken from lower in the plasma melt.

Addressing himself to that part of the African-Red Sea Rift which stands on the continent, R.B. McConnell argued a 2.7 billion year age for its beginnings and limits severely the changes of recent times [1], compares it with the Rhine Graben and Baikal depression. I have linked all three with the simultaneous world rifting or fracturing of only a dozen millennium ago.

With such old dates, McConnell has to confront a general opinion nowadays that the rift system of the oceans (and, by inference and otherwise, land) is no older than 200 million years. Moreover, the great rifts of the world, oceanic and terrestrial, seem to have been in motion as part of a world system. Spreading in widely separated regions show similarities, including correspondences even when discontinuities are compared [2].

Gregory, an early explorer of the African Rift Valley, dated the vast diatomite deposits of the lakes to the Miocene Period. But Louis Leakey found hand axes embedded in the lake deposits and therefore called them Pleistocene [3].

Olduvai Gorge appears young to the geologist's eye. All of East Africa seems so, too. The Victoria Falls and Zambezi Gorge seem very young. Suppose the Falls to be of the same age as Niagara Falls; this would place a spectacular bit of Africa within reach of 3500 years of age. A quantavolutionary view of geology tends to bring more and more features more and more together; the Earth's surface tends to be hologenetic and is seen in holistic perspective. Olduvai Gorge could have been created during the Bronze Age of Egypt.

Willis speaks of a geologist's (Combe's) knowledge allowing him to tell that pebbles of tin ore found in the Kafu River came from "downstream" instead of upstream, because the course of the river had been reversed as a result of the great rifting.

Since the pebbles could not be of ancient origin, the story bespeaks the recency of the change and of the Rift.

Flint, in his *Glacial Geology* (p. 523), refers to the Rift as late Pleistocene. S. Cole discusses some of the material in a manner to support skepticism: the near total confusion of climatic periods (52 and chap. 2); the unreliable use of advances and retreats of lake sands to date Rhodesian cultures (53); the great tectonic changes of the Pleistocene; the fact that neither neolithic nor bronze ages have been found in Africa; the astonishing slowness of culture change (million years of the same handstone); the great destruction of mammals notable in Olduvai beds I and II, then separated by "a million years."

She says (113-4) that Olduvai Gorge "assumed its present form, with narrow floor and steep sides, in Post-Pleistocene times, when erosion cut right down into the Pleistocene deposits, thereby exposing the great series of sediments seen today." Erosion, however, does not "cut right down;" Olduvai Gorge split open quickly, hence the "narrow floor and steep sides."

Cole, like L. Leakey and others, have a way of speaking of "people cultures," "industry sites," "living floors," and "living sites" for the hominids, making one wonder whether they had tile floors and awnings. A uniformitarian image is thus purveyed, and one is led to think in terms of extremely gradual sedimentation as creating the scene. Yet the australopithecine

(1959) Zinjanthropus' skull "had been broken by expansion and contraction of the bentonitic [i.e. volcanic] clay in which it lay, 22 feet below the top of Bed I, which at this point is about 40 feet thick; but the bones had not been distorted in any away, and even such fragile pieces as the nasals were recovered." (117-8) And she remarks that three or more relatives were found on Floor I and 4 meters away with "a worked bone tool." She surmises that the hominids lived upon the tortoise and catfish of the shallow waters at hand (120-1).

Legbones were found standing upright; this seems impossible, given the undisturbed condition of the clay encasement, unless the long period of "sedimentation" were in fact the ash fall of a single day. "Coarse vertical rootmarkings are common in many of the tuffs..." (III, p. 11). About one-fifth of the strata contain them. They also carry through beds of sediment, evidencing other instants of high production to create the geological column above the earliest hominids. Elsewhere, in Homo Schizo I., I have spoken of the human traits of australopithecus. A perplexed discussion has long centered upon the "people culture" of Leakey's first-found hominids, and much effort has gone into depriving him of his human qualities, to Australopithecus Bosei was probably the maker of Olduvai implements, of a "two-million year old" circular stone barrier of the lowest level of Bed I [4], a selective cracker of animal bones, with a "frequency of implemental patterns of behavior" [5].

Bed II rest conformably upon the older Bed I. Yet "a million years" has passed. Conformity suggests continuity and absence of a gap in time, and an absence of natural catastrophe. But both are evident. The fossil assemblages connote disaster. Groups of mammals and primates or people do not congregate voluntarily to await death. An elephant skeleton without a skull was found. The method and motive for separating the two are found in natural forces. The hominid finds are not nicely segregated by time gaps (see v. III, 229, 234).

Strange to say, a toe bone, possibly human and modern, was found in Upper Bed I (Tuff If), belonging to an "upright, bipedal, hominid possessing a plantigrade propulsive gait." (p. 230). Many years later, modern footprints of a three person-group were found at Laetoli by Mrs. Leakey. These go towards

establishing the humanness of australopithecus, or else a most embarrassing confusion of time has occurred, and australopithecus consorted with humans; the latter is possible, if all artifacts were made by beings other than australopithecus.

Dr. B. Willis published in the 1930's two books which treated of the African Rift system. He remarks, as is well-known, upon the foundation rocks exposed throughout East Africa, where they are intruded or covered by volcanic products. Sediment are lacking or thin. He asks, where does the great melting below the surface that lifted the continent come from [6]? To my way of thinking, the melting came from the immense catastrophic push of the Atlantic Ocean cleavage that moved the African crust eastwards and from an accompanying expansion of the Earth. The plateaus rose. Then the great arch cracked and dropped, forming the Rift valley. Inasmuch as the Atlantic cleavage veered East and shot up a northern branch, and this fracture cut off Madagascar and India from the African continent, the Eastern rim of the new African format could accelerate into the widening basin, and hence an auxiliary fracture, not so deep, the Rift Valley, opened; in effect, it dropped between the steep plateau walls. Volcanic products are everywhere and in all forms, ash, lava, tephra; Olduvai gorge was cut through many strata of volcanic emissions.

Willis writes of meeting Louis Leakey, then of merely local fame, and J. D. Solomon, a colleague, at Lake Elmenteita in 1919. "They even think he [man] may have witnessed the later developments of the rifting to which the valley owes its character. If so, we shall have to change the time scale, either by hurrying geologic processes or by greatly prolonging the stone age of man's evolution" [7]. The latter course has been taken [8].

Yet since Olduvai Gorge fractured open after hominids and hominoids were already on the land and long buried in the area, the catastrophic event must have been witnessed by humans. Considering the topography, the Gorge is directly connected to the Rift; it is 370 feet deep; about 40 strata are identifiable in some 300 feet of depth, averaging thus about 7 feet per stratum. The fossils are found embedded in the cliffs on both sides of the gorge; the fossil beds are sandwiched between lava flows on

both sides; the oldest fossil bed is termed Bed I, the youngest Bed IV.

Alternative possibilities are weak: if the Gorge came first, then hominids of successive ages dug themselves into the cliffs, taking care not to disturb the lower strata as they climbed up to dig into their proper superposition. Or the Gorge may have been a small stream valley, was settled by hominid I, then lava poured over one lip, filled the valley, and covered the opposite rim, while on other occasions, volcanic fall-out layered over the whole, and in both cases the stream washed away the valley deposits; hominid II came in while the stream was cutting away the valley deposits, but then the whole process repeated itself four times until today.

A third possibility is that the area was heavily settled. Then volcanic eruptions brought in ash and lava and caused evacuation of the biosphere, except for rare trapped remains. New settlements occurred, and then by the same means, Bed II occurred and was covered; and so on. Then came the rifting and gradual erosion and exposure. Gradualism contradicts evidence brought out here. And what kind of volcanic system is it, which covers the region but conveniently lays down a blanket every quarter of a million years and is resting in between-times?

By far the most plausible explanation for Olduvai Gorge and its contents is successive, heavy rainfall, floods, lava streams, and ash falls, occurring over a period of a few centuries. Human types moved in and out, chancing sudden destruction and quick burial here as anywhere else. Finally the risen plateau ruptured, Olduvai being a local incident in a global frame. The climate turned dry, the volcanoes became more peaceful, soda springs hissed harmlessly and began to expire, the surviving mammal population gathered near the remaining sources of water, as did the surviving and incoming humans.

To sum up, I would make several points. General quantavolutionary evidence of recent global transformations supports a short-time or microchronic view of Olduvai Gorge and its biosphere outcroppings. Potassium-argon datings support the conventional macrochronism but they are discordant and may be basically flawed. Numerous geological and paleontological

indications support microchronism. The recent claim of equal age for rift remains in Israel adds support, although both these and Olduvai remains should be moved up, not back, in time. The Rift, hence the Gorge, split open late enough for human legends to carry down a report of the events.

Notes (Chapter 13: The Latecoming Olduvai Gorge)

- 1. The reference here may be to a passage from Curtis and Everden, in Louis Leakey, p.91: "...the few volcanic sanidines of historic age dated by us have yielded ages inconsistent with the concept of zero argon content at the time of eruption. Both the 1912 eruption of Katmai and the 1304 eruption of Ischia yielded zero potassium/argon ages. Also dates of late or post-Pleistocene event have given reasonable ages. A late Gamblian tuff from Lake Naivasha in Kenya gave 28,000 years and a prehistoric post-glacial pumiceous rhyolite done near Mono Lake, California, gave 5600 years..." However, two paragraphs later, they report a possible 11,000 year feldspar (sanidine) gave them datings of several hundred thousand years.
- 2. 83 Geol. Soc. Amer. Bull (Sept. 1972), 2549, at 2565.
- 3. Heirtzler, Dixon, Herron, Pitmann and Le Pichon, "Marine Magnetic Anomalies, Geomagnetic Field Reversals and Motions of the Ocean Floor and Continents," 73 *J. Geophysical Res.* (1968), 2119-36.
- 4. Sonia Cole, *The Prehistory of E. Africa* (London: Weidenfeld and Nicolson, 1964).
- 5. L. Leakey naively compares his "fort" to those erected by the Okombambi tribe today (vol. III, p. 24), a two-million year old tradition!
- 6. P. V. Tobias, *Olduvai Gorge*, vol. 2 (Cambridge U. Press, 1967).
- 7. Living Africa, 289. And see his East African Plateaus and Rift Valleys (Washington, D. C.: Carnegie Institution, 1936), publ. n 470.
- 8. *Ibid.*, 270.
- 9. It is instructive to compare the processes of science that moved toward the acceptance of Olduvai hominids of great age and the rejection of Calaveras man in California, as reported in W. H. Holmes, "Review of the Evidence Relating to Auriferous

Gravel Man in California," *Annual Report of the Smithsonian Institution*, 1898-9, 419-71.

CHAPTER FOURTEEN

ATHENS QUAKES*

(*Part of article appeared in The Athenian Magazine, April 1981.)

They left without paying their bills, but that is not why the waiters hurried after them. At 22:53 hours of this evening of February 23, 1981 a strange deep bassoon called the patrons of Philippo's Taverna to attention, and seconds later they found themselves altogether swaying like a ballet, their faces turned on in the unique poseidonian awe of earthquake recognition, and some were jostling at the door even before the lights went out. Once outside, there were those who hurried to their children, those who walked the middle of the streets towards home, and those who stood about in the little open plateia exclaiming at the marvel of Athens' first earthquake. Several sheets of lightning played over the scene. A car drove agitatedly by the human clots on the street, bewildered, one driver shouting: "Has there been a coup?" The failed Spanish coup had been the topic of the day. Shortly another tremor vigorously nudged the city, but it was the last until hours later and, by then, many Athenians had left town in their cars. Others cowered in their autos during the night; the plateia were crowded; so too the seashore; but most people lay nervously in their own beds, hoping for surcease.

The tremors were counted in hundreds over the next several days. Only the most sensitive people - and animals - could detect them. One woman - no doubt there were others - exhibited a surprising ability to feel trembling that no one else could sense. (It would be useful to investigate scientifically this acute sensitivity.) The next day, one could park anywhere and the ordinarily crowded center of Athens was empty of workers, a sort of class B movie setting of a city struck by plague.

The Athenians who took flight behaved like true Spartans. These doughty ancient warriors, who flinched at no army whatever, would invariably be sent flying home at the rumble of an earthquake. It amounted to a psychological complex. The Hebrews, for instance, had the reverse complex. They might actually time their assaults with shaking of their enemies as witness the battle of Jericho where Joshua's men paraded around the town until the walls came tumbling down and they might rush through the breaches.

Ancient precedents were not the verbal currency of these several days, however. One heard only that "Athens has never had an earthquake." Well, almost never, and never in this generation. No matter that, in the times of its founding, Poseidon, god of the sea and of earthquakes, wanted to take over Attica, and you know what that means. Pallas Athene had other ideas, and Zeus lent her a helping hand, so Athens survived.

But Plato's Criton tells us that Solon was told by the Egyptian priests that, once upon a time, his Athenian ancestors lost an army that was struggling for the control of Atlantis when that fair land sank in furious trembling beneath the waves. This was fixed at 9000 years before, but possibly the years had been shorter in an earlier age - since a cosmic disaster, a comet or meteoroid, can both cause catastrophic earthquakes and slow down the movements of even a planet.

More and more, the archaeological evidence would indicate that earthquakes were anciently more terrible, not only in Greece but in Thrace and Anatolia and all over the world in fact. As Helen Churchill Semple's book on ancient geography argues: "If earthquakes would break the nerve and nullify the life-long training of Spartan troops, there must have been abundant reason."

Ambrayses was able to trace 3000 earthquakes of the Eastern Mediterranean since Christ's day, and perceives little change in frequency or intensity. So it appears that there were in the founding of Greek civilization great seismic eras, but that the seismism has petered out over the ages. Rome, to take another example, which presently is as "free" from earthquakes as

Athens, had a couple of hundred in one year according to the encyclopaedist Pliny.

Plato also tells us that the fresh water springs that once flowed on the acropolis were blocked forever by an earthquake. Pliny and Plato lacked a Mercalli or a Richter scale, so it is hard to say how strong the early quakes really were. The Mercalli scale is the common man and the politician's scale. It provides as scale markers the sensory perception that accompany the different degrees of trembling.

The Richter scale was all that we heard about. It registered 6.6 and 6.3 at the epicenter below the northeast waters of the Gulf and Corinth, and a lot of other jiggles that duly engraved themselves upon the turning paper drums of the seismic instruments in Greece and around the world. What does 6.6 means? It means that Southern Italy's extra point months before was not just worse; it was many times worse - as if you moved not from 99F to 100F fever but from 104 to 105, whereupon your mind and body begin to fall to pieces.

Registers of intensity around 6.5 means that many structures will be destroyed at the surface below which the rocks are slipping and sliding, and less damage will occur as one moves out along the same rocks and the rocks with which they are connected by origin or proximity. Those nice circles that are drawn around epicenters do not means much; the area of spread should have been a splotch of many measurements at specific locations. Nor was the graph with its kind of fever chart useful to people; but to feed the public craving for "hard data" the newspapers publish these.

Perhaps Athens may be protected by its peculiar schist, a rock that has millions of cracks, all in fact tiny fractures that have their own slip and slide patterns. So that Athenians are provided with a kind of cushion that sends shocks flying in every disorderly direction and has space to take up shock as well. If the city were glued to the bedrock that was the prime mover, it would have suffered more extensive damage. As for the origins of this Athens schist itself, I think that it must represent an age when the ground below was in a continuous grinding torment of electrical and mechanical churning at high temperatures.

Earthquakes are frequently a time to placate gods, go to war, and change governments. For a while we shall see not only a brisk commerce in plastering and selling bric-a-brac, but also a certain heightened religious enthusiasm. Something of this religious feeling must be behind the notion bandied about that the Mother Earth of Attica was rejecting the body of onetime Queen Frederika from burial in its soil (an event which had taken place only days earlier), an idea actually foreshadowed by one newspaper, although unaware of the imminence of the earthquake. Such absurd ideas can spread easily; an unscrupulous party might readily persuade an unsophisticated third of the Athenians of its relatedness.

The quake was a tragic but local event; none will be swooping down upon hapless Greece like the sons of Herakles during the huge earthquakes that ended the Mycenean culture. War is not in the offing.

Blaming the government is another matter. The communists have already declared that the government was forewarned of the quake to the very day by the seismic station at Uppsala, which was "99%" sure, according to certain dispatches. We can doubt that this "information" was provided or providable. That an earthquake or a set of them will soon occur is hardly a useful prediction, but is more likely the prediction that was provided. These paranoid rumors of "what others knew and we didn't know" were produced largely out of the inferiority complex many Greeks have about foreign expertness and at the same time fed upon the complex. (The American military's radio station, by the way, was almost totally useless for information and advice despite the urgent need felt by tens of thousands of English-speaking persons in the area.)

True, too, a science of earthquake predictions is slowly developing. Successful prediction within a day or two can occur, as in Mexico recently, this by an American scientist practicing for the momentous earthquakes building up along the San Andreas fault in California, where the San Francisco Bay area is at stake. But for every one such, there are numerous incorrect expert predictions. We can also be sure that, like election prediction by sample surveys, the predictions will not be able to

go beyond 90% in accuracy as to the general time and place, and less and less accuracy as the moment of the quake arrives, until, of course, the dogs begin to bark and the birds take flight.

What can the government do? In one way, the state is more secure if earthquakes cannot be predicted. It is not a matter of incompetence alone. Imagine a 90% sure prediction for the long-range and the short-range of a 7-intensity quake in the Athens area, something now quite unattainable. Regarding the long-range, would you build a permanent vacant tent-city for three million people? And if so, where? And provide it unceasingly with its blankets, cots, freshwater, canned rations, toilets and medical supplies? Or would you rebuild Athens to withstand a 7-intensity tremor? Or would you design a new city to replace a ruined Athens, perhaps the only solution for many of Athens' urban problems, allowing, say, that three million people will live in tents or go home to No-where until it is finished?

And it is well to bear in mind that none knows how intense earthquakes can be; the measuring and reporting systems are less than a century old. I can hear the voices now: "I told you we should have built against a number 8, not 7, quake." And they would flaunt a study in *Science* magazine. (Or, "we should evacuate at the prediction of 6, not 7.")

In the short run, the curse of predictability is no less. Suppose you could march the population out of Athens in an orderly fashion upon receipt of an expert opinion that tomorrow or the day after all hell will break loose. Will the people resist? What essential services will be risked to remain in the city -- police, fire, water, light, bulldozers, building maintenance engineers, army units? Who will evict those who remained in the city from their quarters in the houses of others who are returning? Who will compensate businesses that must close down, some suffering damage, others very little?

Then what if the earthquake does not happen? Who wants to decide at what point to order everyone to return? Something like that occurred in Guadeloupe, in the French West Indies, a few years ago: a volcano was about to explode, said various experts, and half the people were sent to safe locations upon order of the prefect. The volcano did not oblige and ever since then the

French have been arguing over the decisions and the restitution of losses in agriculture, business, and tourism. Too, should people be forced to leave, even if they swear to take all responsibility upon themselves? Can children be left to abide by parental decisions; can the injured then be left to scream from beneath the debris?

No doubt, steps can be taken to minimize damage and deaths: public education should go hand in hand with predictibility. A code of disaster behavior should be enacted and taught to the whole people.

European and American media were talking about the Attic quake right away. In France, where demonstrations had been held against building a nuclear power plant very near a major Alsatian earthquake fault, the media, which are controlled by the government, restrain their own coverage, especially in emergencies. In peaceful periods, it is best not to build up fears that can turn quickly into panic. But, in the crisis itself, prompt and full information and advice should be the policy. Much can be on ready-to-play tapes to begin with, approved, say, by a parliamentary commission engineers, political scientists, social psychologists, and seismic scientist. The same commission could be convened immediately upon the emergency to oversee the diffusion of instructions; if the commission holds public confidence, it can lessen the dangers of panic and of senseless orders.

The problems are so grave, in sum, that only deliberately partial procedures can be followed before, during, and after an earthquake crisis. Poseidon is tricky, cruel, implacable, surprising and infinitely destructive; human foresight and reactions can adapt to him but not prevail over him. He is no respecter of persons, no more than Yahweh. The Pharaoh's son and the slave's as well were struck down in the Passover before Exodus. The clients of the Hilton Hotel and Neofaleron cheap rooms sway in the same ballet.

Someday it may be possible to explode or grease the faulting rocks threatening the earth. Meanwhile, one might take comfort in the thought that the risk of being harmed by nuclear missiles is thousands of times greater than from an earthquake. And what is being done bout that?

Click here for the next section of this book

Part Three

WORKINGS OF THE MIND

CHAPTER FIFTEEN

COMPTINOLOGY AND TOHU-BOHU

Comptinology (from *comptine:* French for nursery rhyme, hence the study of same.)

Even a small child will sometimes chant a nursery rhyme and afterwards think, "where did it come from?" "Oh, it's very old," says the mother. It is indeed very old. No one knows where it came from. The child grows old and has passed the song to others. There are variations. Beginning two centuries ago, they have been printed and the oral tradition is helped in maintaining itself in a bureaucratic world. Stories like "Sinbad the Sailor" go back and back until we discover that the dynastic Egyptians possessed them. The longest lived *comptines* go back to the cycles of chaos and creation.

Although the temptation is strong (and it is conventional to succumb to it) to believe that nursery rhymes evolve over great lengths of time, this may not be the case. It may rather be that nursery rhymes begin shortly after a set of events, to put the population, the young and thereafter unconsciously everyone, into a mood of dreamwork, letting life go on in a community of memories, without heavy religious ritual every time a disturbing line of thought occurs. The rhymes are a friendly mocking of the sacred.

Religious chants began even sooner, right away with humanization, we think, and within a generation the mocking fantastic nursery poetry commences. We are helped to maintain this theory by adhering to a larger theory, which is that mankind as such is young, and came about in a prompt hologenetic quantavolution. We do not feel that a nursery rhyme builds step by step over a hundred thousand years as the possibilities of song dawn upon an ape-person.

The story of Chicken-Licken (alias Chicken-Little, Henny-Penny) comes to mind. Beginning with a frightened chicken, pelted from above by a seed or drop, a procession of barnyard animals forms, led by the conviction that the sky is falling just as the chicken claims, and moves along seeking the protection of the king, personifying authority or a god, fearful lest a wicked force, sometimes a fox, should eat them up (as he does in some versions) or hopeful that a wise owl should explain the fear away (as it does in an 'enlightened' American version). That the fox is an ancient Mars symbol, and the owl an ancient symbol of Minerva-Athene suggest that some very old mental process may be repeating itself. The story of Chicken-Little is told from Finland to Tropical Africa and from Central and South Asia to Ireland. It is entitled "The End of the World" in Kennedy's Fireside Tales of Ireland.

I have jotted down in my journal, on several occasions, reflections of this sort and take leave to transcribe several entries here:

Naxos, 10 April 1978

One of my favorite nursery rhymes went: "Hi diddle, diddle,
The cat in the fiddle,
The cow jumped over the moon.
The little dog laughed to see much a sight,
And the dish ran away with the spoon."

This pure nonsense probably bears meaning with every line.

- 1. Hi=High. Or, Hey=Pay attention! Diddle = diddle the unconscious, play with the mind. The line cues into what follows.
- 2. Cat associated with music, humming, electricity, purring, "cat gut", static electricity of cat's fur, cat's eyes, etc.
- 3. Cow = Cometary Venus, passing over Moon in the period 3500-687 B.C. Note: Violin cow-shaped.
- 4. Little dog = fox = wolf= star = Mars = lupus Romanus; laugh = cry = disaster and also Mars wanted Moon.

5. Dish and spoon = Leyden jar with center rod = overelectrified, juggling, diddling movements. Also comet with its tail.

There are far too many associated symbols and actions here to be mere nonsense or coincidence. When the small child delights in it or is fascinated by it, as was I, he a) loves the rhyme and rhythm, b) the images conveyed c) but are these enough for such old and widespread, and obsessively appealing jingles unless some deep upsetting memory is also being "diddled"? |Diddle" has an unknown origin and a long history, most meanings centering around shaking, turbulence, sex, fiddling (violin) *cf. Ox. Eng Dict.* I recall English mothers and nannies telling little boys not to diddle (their penis): "Stop diddling!" "Hi" is probably "Hey" and pronounced "hay" but I'm not sure it's always so and been so, many dialect possibilities of either. The "Hey-day" is the most sensational of days, the peak day of some series of days.

Two months later the journal adds:

Ziegler [Yahweh [p. 85 re last line on Breton fire ritual woman singing: "Leave your spoon in the bowl for the fire is rising." May be an allusion to the ark-box and charging pole [of the Exodus, see my Moses book]; electrical conditions are charging up, building up, and time is propitious to rituals on mountain-tops. Also women in Greece jump over the flames of kindled bonfires crying "I leave my sins behind me." Compare with "Cow jumped over the Moon" (Sinn) [Babylonian word for Moon.]

The sexuality of the poem is subliminal. Compare, for example, the bowl and spoon, the Leyden jar, and the *lingam* and *yoni* of ancient Hindu symbolism. The fear and delight of the first experiences with the Leyden Jar (see Heilbron's history of electricity and *God's Fire*) can be associated with unconscious sexuality, the "female" and "male" electrical connections used today. Electrical twinges have been associated with pleasures of masturbation and ejaculation since ancient times. The mountaintop orgies of Bacchus were associated with the relative ease of inciting electrical discharges there. "Diddle" has an unknown origin and long history. Although the *Oxford Dictionary of English* based upon etymological principles does not extend sexual meaning to "diddle" (out of prudery) the connotation is present in the rhyme and the usage is indestructible.

Giorgio di Santillana and Hertha von Dechend talk in *Hamlet's Mill* (287) of Tammuz, the grain-god aspect of Osiris, the Saturn of Egypt. A festival of mourning over his death marked the opening of the Egyptian New Year. The holy event lasted through millennia; lamented was the god who was cruelly killed by being ground up between millstones. The authors were reminded of the rhyme of John Barleycorn (a name in American folk stories that is synonymous with the drinker of whiskey, that is, grain-spirits drinker):

They roasted o'ver a scorching fire The marrow of his bones But a miller used him worst of all For he ground him between two stones.

Journal, Florence, December 23, 1980

Ami cooked a fine dinner for us at Joe's and Laurie's tonight, Marco joining us. Leeks wrapped in bacon stewed with white sauce, roast pork, rape. Fruit. Laurie whipped up a hot *zabaglione*.

Twice today we talked of the taunting childhood tune, GGEAGE, GGEAGE, GE, GE, GEC. This is sung while dancing around. All stop. Clap hands. Fall down.

Ring around the rosey, Pockets full of poseys, Ashes, ashes, All fall down.

It looks as if we have another catastrophic theme.

A sky body erupts in a ring-like glow, possibly Sun takes on an aura, or Moon, or comet.

Pockets, pouches, collection, pocks [the pustules of an eruptive disease].

A *rosa* is a bloomlike sore in German, said Ami. A posey, read Joe somewhere, was a festering sore of the fourteenth century bubonic plague [He is Deg's nephew, Alfred III, and Professor at St. John's College; his wife is Laura Haskell.]

Ashes fall from the sky everywhere.

The ashes fall down, the plague, and the people fall down dead.

I think, too, of the recent theory of astronomers Hoyle and Wickramasinghe regarding the source of plagues (and life) from outer space, independently contrived by Milton and myself in *Solaria Binaria*.

Stylida, Naxos, January 5, 1981

Day before Epiphany. The village is on holiday between Sunday and Epiphany. Twelfth Night - Wotan rides his eight-legged horse. Presents are given tomorrow, not for Christmas. The Feast of the Kings come bearing gifts to Christ. Feast of the Wandering Star over Bethlehem. Befana (Italy) is an old witch.

What is happening? What happened? In November is All-Souls and All-Saints Day. All who died in catastrophe are resurrected. Why not now? Are there two discoordinated holiday periods upon the subject of the explosion of Saturn, the brilliance of Jupiter, the coming of the Flood? Forty days before Christmas is Advent. The Flood lasted 40 days. This is a mourning and penitence period before coming of Christmas - why, so that expectation and frustration of want of a savior is celebrated. And recall the Pleiades' connection with November, remnants of the old god, celebrated by many far-separated peoples in these days.

Christ Jesus is apparently Saturn (Osiris) and Jupiter and possibly Thoth-Christ Scientist) and Venus (see Sizemore and Meyer: *J.C.*, *Morning Star*) all accommodated into one character. The celebrations are rationalized and spun out by Christian thought. Never mind the searches for a falling star in the presumed days of Christ's birth: whatever little surprise a meteor might have presented us, the real presence was Saturn, Jupiter, and Venus in their climactic appearances.

Journal, Trenton, 15 September 1982

At breakfast Ami reads to me from Le Petit Robert, so big that it shakes the frail table when she opens it. "Tohu-bohu" in French means chaos. It comes from the Hebrew "tohu oubohou,.. chaos, or the primeval chaos which precedes creation." Nice.

CHAPTER SIXTEEN

SANDAL-STRAPS AND SEMIOLOGY

The neophyte comes upon the word "catastrophe" and feels proud to discover within it the Greek words *kata* (down) and *aster* (star), so "failing stars" is heralded as the origin of the word. Not so, say our betters: the Greek words within it are *kata* and *strophe* (turning) and refer to that part of an ancient drama in which occurs the *denouement*; the plot, having reached its culmination, descends, often precipitously.

In a plea for the innocents, I would suggest that what we know of Greek etymology is based upon late sources. We know only several hundred words of Minoan and Mycenean, *catastrophe* not among them. Homer and Hesiod do not employ the word, and they are the earliest of our Greek sources.

I am fortified in my opinion that *catastrophe* originally meant disaster (*dys-aster*) by more than this lack of sources of early Greek usage. There is a common tendency in linguistics for people to put two words together ungrammatically and against the ordinary rules for linguistic construction. Hence, three meanings might arise independently and join, since their cognition and perception are close, viz., down-crashing star, huge disaster in general, and the disaster emulating collapse of the plot of a tragedy.

Benjamin Whorf, in *Language, Thought and Reality*, p. 261, exemplifies how commonly in linguistic behavior "a pattern engenders meanings utterly extraneous to the original lexation reference," to wit: "the word 'asparagus,' under the stress of purely phonetic English patterns..., rearranges to 'spargras'; and then since 'sparrer' is a dialectical form of 'sparrow', we find 'sparrow grass.' Another case would be the transformation of *Kohlsalat* into *coleslaw* and even, most recently, into *coldslaw*.

We turn to France for an English etymology, wondering at the word 'martinet' as in the sentence "Her father was a martinet." In Webster's and then in Robert's French Dictionary we discover that a *martinet* in the fourteenth century appears as a bird, then a chandelier, and by 1743 we find it to be a whip used on children, while in the seventeenth century there lived a French army officer, Martinet, who was a strict disciplinarian, whence the usage of the word today.

Let us recall the book of Cohane on *The Key* with his several basic words, all god-words, divine, and most likely astral in original reference, og, enah (or hawa), ala, and aza among them. The Black Magellanic Cloud is the name for the seemingly starless patch in the Milky Way near the Southern Cross. The British sailors called it the 'Coalsack' and, coming then from a land of coal, it is understandable. One may choose, says Cohane, and I agree, between imagining "coalsack" to derive from "coal" and "sack", or to think it may be remotely related in the dim past to 'Quetzalcoatl' (the planet Venus). For "...the ancient Mexicans believed that it was through these huge 'empty' spaces that Zoutem-que and his band of fallen angels arrived on this planet." All but the "t" element of the Mexican word is present, as we read Oc/Hawa/Ala/Aza/Ok or Ocoalazock which sounds like "Coalsack" out of Newcastle. The fallen angel is our Latin Lucifer as in the Bible, who is specifically the planet Venus; and we need not here explain that we have in mind the catastrophic events provoked by cometary Venus in the midsecond millennium B.C., who was not only Quetzalcoatl as savior, but was also a frightful all-destroying god to the Mexicans.

We shall not proceed much farther here. A study of reversals of letters might be rewarding (I wrote "rewording" and scratched it out). Thus I think that the word "Mkl" who is Michael the Archangel and a Hebrew identity for Cometary Venus, may also be "Mlkh" in reverse, who is Moloch, the godfigure dreaded by the ancient Hebrews. And so Python (the dragon killed by Apollo) and Phaeton (the solar figure who was struck down by Zeus to save the burning up of the Earth) and Typhon (the monster dragon also struck down by Zeus) who is tied closely to the cometary-Venus of the mid-second millennium, and who is also Typhoon, the storms of South Asia and Hurracan, the great

wind god of the original Americans. But, to refer to *The Disastrous Love Affair of Moon and Mars*. Typhon is also the *Pallas* portion of Pallas Athene, the great Athenian goddess, who is Hephaistos, whose name Robert Graves says means *hemerophaistos* (he who shines by day), related to *he apaista*, (the goddess who removes from sight) who is none other than Athena.

Transmogrifying words is a continuous and eternal human exercise, often performed unconsciously under disastrous stimulation. As agitation creates invention, anxiety creates words; the greater the fear the more words - but the more of catatonism, too - fear of words, being stuck upon words, avoiding words.

Recently two quantavolutionaries engaged in a dispute, the one Editor of the *Review of the Society for Interdisciplinary Studies*, Malcolm Lowery, a linguist, the other Zvi Rix, a contributor to the Review and a physician. Rix became over the years the greatest authority on that symbol of "divine life" and of many religious apparitions, the *ankh*, the circle resting upon crossarms and vertical stroke, thus:



By virtue of intensive research, Rix had established that the ankh was not only a widespread symbol, a religious symbol of wide dedication, but also a manifestation of androgyny, that is, a representation of the female vulva and the male phallus, and furthermore was securely identified with a cometary form, especially Venus, with ominous indications that the comet being discussed was a head that had dropped its tail, the victim of this accident being not only the two-sexed god concerned, but also the Earth on which the tail in the form of Phaeton, Typhon, Lucifer and Pallas descended with disastrous consequences.

Lowery, the Editor, partly out of deviltry and partly out of pedantry, pulled Rix up sharply. Citing dictionaries of hieroglyphic Egyptian, he could say that "the evidence of Egyptian script makes it unambiguously clear that when an Egyptian scribe drew an 'ankh' he, at least, was in no doubt that

he was drawing a sandal-strap (somewhat stylized)"[1]. This constraint upon the word excited Dr. Rix into a reply that explained how Lowery was "putting the cart before the horse," and that "the original meaning was substantially modified and moderated when terror-stricken humanity managed to analogise these catastrophe-laden prime ideograms to similar-sounding phonetic writings and spellings of less frightful character and of much later development"[2].

The present writer defended Rix, with his complaint, and specified that the castration-image of the dissevered comet, fully apparent in legends of Typhon and associated events, would readily descend into a sandal-strap, for the word "foot" is in psychiatric semiology a frequent substitute for repressed thoughts and words about the phallus. Moreover, the sandal-strap binds securely the foot, thus, in reverse imagery, to keep it from falling off like a comet's tail.

I would add another speculation, too far removed etymologically, perhaps, to take seriously, that the English word "ankle" had once to do with the word "ankh" and for the same reasons, and if one speaks of "ankle-strap" one might as well be speaking of "sandal-strap."

When I explained this remotely possible connection to Anne-Marie Hueber, who is expert in Allemanic (Swiss) German, she remarked that this language possessed a word "anke," now obsolete, meaning "butter." We pondered this until it occurred that the German word "butter," the same as in English, could be confused phonetically with 'boot' or "foot," possibly by a Hun invader or an early Christian missionary, and, once again, we should be on the track of the "ankle-strap" and its connotations.

The same line of thought led me to a story that I had once heard, of how the bread called Pumpernickel had been named. It seems that the party of Napoleon Bonaparte had stopped at an inn on one of his journeys through Germany and food was served him. Napoleon tasted the proffered sour brown bread and handed it to an aide saying, "C'est bon pour Nicole," this being the name of his horse. The uncomprehending but flattered host announced that such was the name of his bread in French and so it would be

called thereafter. (Should this story be untrue we are permitted the Italian expression, "Se non é vero, é ben trovato.")

The heart as the seat of love and soul is not Greek or Roman by origin, but Christian. The Greeks and Romans were fully and explicitly phallic [3]. The Christian heart, it need no retailing to modern folk, is and has been for long a motif to be found in a great many paintings and is referred to in many prayers. The cult of the Sacred Heart of Jesus originated in the Seventeenth Century with the counter-reformation texts of the ecstatic nun, Marguerite-Marie Alocoque.

In searching for the origins of this shape, the heart, one is led ultimately to a most common symbol of prehistoric man, the female vulva. The sign is often an inverted triangle. As such, it abounds in ancient caves and collections of ancient artifacts. That the ancient vulva had religious significance as great as that of the Christian heart is relatively certain. An abstract of a recent article reads "A carved limestone object found in the East Gravettian [Upper Paleolithic] site at Bodrogkeresztur, Hungary, has been identified as a uterus symbol. It may also be a lunar calendar"[4]. Lunar signifies Aphrodite the goddess of love in later times and also the Mother-God and Mother-Earth.

What can we do but to explain what every scholar in a sense already knows: the eternal vulva, origin of life and source of affection, was simply inverted by Christian thought, into the more abstractly identified heart as the origin of life and love. The triumph of Christianity, sexless in the origin of its god and sexless in the stern teachings of Paul of Tarsus, required the abandonment of the old symbol and did so by converting it to the new.

Humans are not always deprived of control over word-making and word-meanings. George Kaufman the playwright once wrote a line for Groucho Marx - I am not sure of the exact words. A man calls down for hotel service: "I'd like my ice water." Groucho replies: "Send up an onion: that'll make his eyes water." If we could only know how many words began so, unless horrified by the implied blasphemy, we should be continuously amused. Playing with words helps a language to

grow, especially subconscious play, accompanied by subconscious laughter - relief from anxiety, that is.

Notes (Chapter 16: Sand-straps and Semiology)

- 1. II SISR (D. 1977), 33.
- 2. *Ibid.*, 32.
- 3. Cf. H.M. Westropp and C.S. Wake, *Ancient Symbol Worship: Influence of the Phallic Idea in the Religions of Antiquity* (London: Curzon 2nd ed., 1875); John Allegro, *the Sacred Mushroom and the Cross*.
- 4. *Science* (20 August, 1965) 855-6.

CHAPTER SEVENTEEN

MAKING MOONSHINE WITH HARD SCIENCE [1]

Professor Irving Michelson wrote a little piece of "hard science" (his term) called "Scientifically Speaking..." and subtitled "19-year Lunar Calendar Cycle: Accurate Adjustment to 365 1/4-Day Civil Calendar" [2]. A Greek named Meton of about 432 B.C. is credited with having discovered the 19-years repetitive coincidence of lunar month and tropical solar year. Michelson said that Meton's "discovery of the 19-year cycle presupposes precise knowledge of the length of the lunar month as well as of the solar (tropical) year of 365.2421988 days, to the second-decimal accuracy at least." He then claimed that such evolved knowledge would have taken observation of so long a period of regular celestial motions that no catastrophe could have occurred, as the Velikovsky circle believed, in the seventh or eighth centuries. The present writer addressed an ironical reply to these ideas in a related journal.

A comment on Irving Michelson's column "Scientifically Speaking..."

With all due respect to Professor Michelson, I cannot understand the rationale behind *Pensée's* having allowed him (or anyone else for that matter) to pretend to be "Scientifically Speaking..." It is a usurpation of authority, and an implication that other contributors to *Pensée* have written unscientifically. "Science" is exhibited in a work itself or in a judgment rendered afterwards upon it; it is also a propaganda term when employed in Professor Michelson's usage. The phrase "hard science" adds insult to injury.

But rather than continue along this vein, I should like to turn to the substance of Professor Michelson's arguments. They are misleading and moreover incorrect. They are also irrelevant to Dr. Velikovsky's theories, which they strain to affect.

Michelson says that "hard science" comes into being when the moon's revolution is measured to the accuracy of an eight-digit number. But eight digits can be attached to an IQ score, an automobile license, the average height of Americans, the temperature of a frying pan, a tonal harmony in music, a rhythmic sequence of Indian dance, and so on. And if we proceeded to an accuracy of ten digits, or twelve, we might find the moon revolving a bit irregularly, which a genial mechanism such as Professor Michelson might trace back to an old disaster.

The important questions are what the number means and what purpose it serves. In the present case, we are held to believe that this eight-digit number will be shown to (a) have been used or discovered by a Greek named Meton about 432 B.C., or (b) have been known to the ancients at a time when catastrophes are alleged to have involved the moon in changed behaviors. Neither of these is demonstrated, and indeed, Michelson indicates later on that both implications are unnecessary to his story of Meton. Michelson further presumes that 250 years are not long enough for a changed lunar month to be noticed or calculated, but offers no argument on the point.

What Michelson *does* ultimately argue is that by 432 B.C. (255 years after the presumed Mars disaster), a four-digit lunar cycle calculation would have been sufficiently accurate to permit the design of a 19-year calendar involving an intercalation of moon and sun, granted of course, the sun's 365.25 figure was known (as he takes for granted and I would not oppose) and provided that anyone cared about the mater.

This is a useful line of inquiry, no matter how deviously pursued. It can help us understand what was going on in those days.

What was going on? I hope that I may be forgiven for presenting some fictional excerpts from the recently recovered journal of Kakrates, research assistant to the astronomer Meton, the Hero of the Golden Letters of 432 B.C. (Incidentally, I doubt that any Olympic games of that year were held in Athens, as Michelson says, unless some athlete hurled a discuss awfully far.)

EXCERPTS FROM THE SPURIOUS JOURNAL OF KAKRATES

Tablet? . My friend Mikelson and I were drinking a bit heavily last night and I bet him that I could produce a good all-purpose calendar without the resources of a holy temple at my disposal. From a window of my house, I can see a skinny tree on the eastern horizon that I can use for orientation.

Tablet? . I have observed the sunrise every day. I noted that after 365.25 days (or was it 365.24 or 365.26?)[3] the rim of the sun peeks up at the edge of the tree again from the left or north side. I was cheered because I caught the cycle so closely (I didn't touch a drop of wine the night before). Hence I continued.

Tablet? I watched for another cycle, and then another. It does appear to be 365.25 alright. Meanwhile, I have learned that various watchtowers and astologers in Thebes, Syracuse, Memphis, etc. re getting the same effect. Some of them take this game seriously. If 365.25 is not observed perfectly, it can certainly be inferred from statistical averaging. I haven't told Meton what I'm doing yet, but when I told him of my concept of averaging, he smiled and patted me on the shoulder. He is busy with city planning. I could bring his associate, Euktemon, into the picture, but why complicate matters?

Tablet? . I have also been observing the moon-days from the opposite windows of my house, as it sets in the bay. The new moon turned out to repeat its appearance 12 times plus a tenth less than 11 sun-days in the time it took the sun to touch back upon the tree. I subtracted the 10.9 days from 365.25, and got 354.35. To get an average month, I divided this by 12 and got 29.53 days. Suppose I distribute the 11 days among the months, giving half-days to seven and one and a half days to 5 months. I'd have a workable calendar! I shall do something later with that little lost time, maybe spread it over the years. Some of my politician friends have become excited by the game and chipped in funds to hire a diligent research assistant to help with the sightings. The watchtower and astrological societies from here and there confirm that their instruments give the same readings. (I am glad that I entertained several of these chaps at Selena's taverna during the last Olympics.) Anyhow, it averages out. One phenomenal Chaldean with sophisticated equipment (I hear he foretold the death of the king's mother-in-law)

reported that he got 29.5306 with averaging. Wow! Six digits! But who needs it. It's just pedantic overkill.

Tablet ? . (I wish I could afford papyrus.) Now I added up three solar years of moon-cycles and discovered that 37 cycles came within a little over four days of matching perfectly. Carrying out the arithmetical calculations further, I got rid of practically all of the four-day fraction in 19 years. Much more refined observations would be needed to improve this cycle. As it stands, even though I have not based it upon observations for a full cycle, I can see that it will give enough accuracy for centuries. The days will not perceptibly march ahead of each other over a person's lifetime, or even over the lifetime of a kingdom.

Tablet? . I mentioned that I can match the sun and moon cycles almost exactly on a 19-years base to the politicians in Selena's taverna, and they are going to make a political issue of the Calendar. Others said, though, that the idea is politically impractical; a 19-years "year" that means nothing will bring only ridicule. I said, however, that maybe I could please the priests and cultists by getting the artist Petty to draw illustrations for each month using the Roman vestal virgins as models. This must have been what Mikelson meant when he mumbled something about "pretty-girl calendars," no doubt a Socratic slip of the tongue [4]. It won't work, they said; these soft-heads want a year for the sun, a year for the moon, a year for the seasons, a year to begin with the bacchanalia, or the saturnalia, solstices, or what-not. And, of course, the archons like to have the years named after their period in office.

Tablet? . I must find a way to appease the priests and cultists. They don't like the idea of automatic calendars (the damned humanists). Maybe I'll intercalate days by the magic number of seven. I'll figure out a common denominator and then decide what to do with the extra time. Just as the festival and political calendars do nowadays, I'll take care of the half-day problem by alternating 29-day and 30-day months. Then, to take care of the surplus of days, I'll put in an extra thirteenth month of 29 days (the cultists will like that 13-business); placing it in the years 3,6,8,11,14,17, and 19 will give us the magic number 7, the number of moving celestial bodies (I'll call them "eternal" since everyone likes the word.) It also sets well with the 7-stringed lyre. Mikelson has left town and I can't collect on the bet.

Papyrus? . I'm in trouble. The priests won't buy my 19-years calendar. All this talk of late about "an emerging

power elite of secular science and politics" doesn't stand up when the fortune-tellers start demonstrating on the street. They are pressuring Meton to stop my moonlighting. He pointed out to them that an issue of academic freedom was involved. Privately, he gave me to understand that the results of my work have to be published, of course, in his name. He also insisted that I begin the year on the summer solstice and that I count months by full moons. Moreover, we must wait for a full 19-years cycle to prove my contentions. Mere prediction is not enough. Fortunately, some far-sighted statesman has given Meton a research grant sufficient to set up an observation post with a panel of three assistants (with myself in charge), and a few other amenities, including a site-visit to Jerusalem. I put a brass stake by the tree and bought a donkey, but now visit the research station mostly to pay the assistants and check out the tree (fortunately, it scarcely grows at all and one of the assistants keeps the dogs away).

...Here occurs a long time gap in the journal...

Papyrus? I wonder why other Greeks haven't climbed aboard the wagon? Everyone still acts as if they didn't need an automatic and standard calendar and now we're moving into the 19th year. The other day I actually saw a priest of one kind or another taste the soil to see whether spring had begun - with a crowd around him. At least they don't sacrifice humans anymore to get the crops going. Are scholars afraid to tackle the problem? Haven't the times been ripe for invention? The priests are always yapping against "taking the human element out" of calendars. (their human element!).

I suppose that I should have confessed in the beginning that the Chaldeans and Egyptians knew all of this. But it was pure patriotism that motivated me to suppress the information. The Greeks must pretend to invent everything. Especially the Athenians. They would have killed the project if they had thought foreigners had beaten us to the results. Anyhow, this is all a problem for psychologists and political scientists - the soft science guys.

Papyrus? Finally! After 20 years. Everyone professes to be amazed. Our party is in power. The Athenians are ablaze with patriotism. They praise Meton all over town. They are certifying my formula in golden letters on a prime wall location! In Meton's name, of course. That will impress the watchtowers and astrological societies - their President in Gold Letters! He has authorized me to give them all free

tickets to the Olympic Games. But not to that Barbarian who had the gall to write him, "Meton, stop reinventing the wheel. The Chinese have used your cycle for 100 years, and even the seven intercalations." Not to mention that anonymity from Egypt who sent him a tablet with just the obscenity "A" inscribed on it.

Tablet? The gold letters are staying up, but the opposition is too strong. Meton's calendar will not be adopted after all. They claim that they will check things by the formula from time to time. Why do they do this? For as long as anyone can recollect, the skies have been perfectly regular and before that, well, forever. Yet these unscientific idiots pretend that they have to take their measure every day and every month to be sure things are the same - as if the skies would fall if these nitpickers turned to more important problems - like better housing, exclusion of aliens, etc.

...end of Kakrates' journal...

Since I was dubious of Kakrates' work, I asked a living historian of science about the matter. This was Professor Livio Stecchini, who is an historian of science and has done much work with ancient calendars and measurements. Professor Stecchini believes (as, in fact, do I) that Meton knew all the while that the solar year was 365.25 and the lunar month about 29.5 days, for Stecchini shows, in the following paper, how readily Meton might have concocted the Metonic cycle, getting the .03 by chance, and then how Callippus and Hipparchus improved upon it.

Meton was probably offering a simple formula from his stock of astronomical knowledge to some people who were interested in routinizing and mechanizing the calendar. It was ordinary applied scientific research and consultation. To demonstrate his formula (or, better, to replicate the foreign experience for Greek eyes) one would need only "poorboy" techniques. The Athenians, agree Meritt, Pritchett, and Neugebauer, did not follow the Metonic cycle, and Meritt says that the Athenians did not tie their months to lunar observations but followed a rule of convenience with alternate 29 and 30 day months and an occasional check upon the Moon and Meton to prevent the calendar from wandering too far astray. Moreover, the four-digit stability of the moon's revolution, which had been in effect for a

couple of centuries, could have been proven out in a few years, and had nothing to do with when the last destabilizing encounter involving the moon had taken place. Finally, I leave it to others to make fact out of my fable in the Meton case, that is, to show how politics determines practical sciences in calendar-making as in other areas.

Notes (Chapter 17: Making Moonshine with Hard Science)

- 1. Adapted from *Kronos* (Fall 1975) 52-6. L.C. Stecchini elaborates on the matter in the same issue, p. 57. See, as supporting sources: *Encyclopedia Britannica* (1973) edition), "Calendar," Vol. III; Benjamin D. Meritt, *The Athenian Calendar in the Fifth Century* (Cambridge: Harvard Univ Press, 1928); Benjamin D. Meritt, *The Athenian Year* (Berkeley: Univ of California Press, 1961); William K. Pritchett and Otto Neugebauer, *The Calendars of Athens* (Cambridge: Harvard Univ. Press. 1947).
- 2. *Pensée* (Winter 1974-5), 50-2.
- 3. Editor's note: for convenience, the fractional numbers that Kakrates used have been converted to the modern decimal system wherever they occur in the journal.
- 4. Editor's note: the mistake was not Mikelson's. A tablet has come to light disclosing that the slip was made by another taverna habitué, a scribe and a copyist.

CHAPTER EIGHTEEN

HOLY DREAMTIME IN WONGURI LAND

Towards the Napier Peninsula of Arnhem Land in Australia, there dwell a native people of the stone age, whose singing is the most developed of their arts. They are of the Wonguri linguistic group of the Mandzikai clan.

Their traditional songs are rich in myth and often very long. They are arranged in groups to form particular cycles. Although complete in itself, each song is related to a central theme. It reconstructs some event or portrays some happening of the traditional post.

There are sacred and secular song cycles, songs known only to the men or to the women respectively, or those of interest where both sexes join in and children take part. There are sacred ceremonial songs, secret songs, of the women, camp songs, love magic songs, children's songs. There are gossip songs and mourning songs, and songs for every event in a person's life.

Nearly all songs, even when... they are presented by one particular man in any given area, are for the collective entertainment or well-being of the whole community; and it is in this respect that we can observe one of their main functions, the bringing together of all or a section of the people for the purpose of expressing and renewing tribal unity and cohesion. The majority of songs, too, are correlated with ceremony and ritual, with dancing, and the use of certain objects, which explain or represent the events related in the songs.

There are secular and sacred song cycles but all partake of holy myths. Ronald M. Berndt, in reporting a classical Wonguri song, the Moon-Bone Cycle, writes that it is a secular version of some sacred songs of the moity, incorporated in a larger cycle for age-grading ceremonies.

It is in the sacred version that the full myth is explained, and the totemic beings and their actions are sung. In the Moon-Bone Cycle given here, the whole myth is viewed, so to speak, in retrospect.

If a sacred song cycle had been chosen much more discussion would have been involved, owing to the nature of religious concepts, to the extreme length of these cycles and to the fact that the majority of words in each song need extensive commentaries... The sacred singing (which we cannot discuss here) relates episodes of the Moon's adventures in the same region; these songs bring into perspective the concept of the Eternal Dreamtime.

In the dreaming period, the period where the utmost past and present are united, the Moon who was "one of us," lived with the Dugong, his sister the sea-cow, who was also one of us. The whole region was flat and became flooded in the wet season. There was a large clay-pan here and

the Moon, after making it, lived here, and later it became his reflection. Here the Moon and Dugong collected lily and lotus roots (which were to become the Evening Star). One day when the Dugong was collecting these edible roots, digging them out with her tail, the leech bit her. She returned to her brother and said: "This place is too dangerous for me, the leeches are always biting me. I like this country but the leeches spoil it for me. I am going out into the sea, where I will turn into a dugong."

"And what shall I do?" asked the Moon.

"Why, Moon, you can stay in the sky; but first you must die."

"But I'm not going to die like other people," the Moon answered.

"Why do you not want to do that, brother?" asked the Dugong.

"I want to die and come back alive again," he told her.

"All right. But when I die, I won't come back and you can pick up my bones."

"Well, I'm different," the Moon said. "When I die, I'm coming back. Every time I get sick I'll grow very thin; then

I'll follow you down to the sea, and I'll go with you a long way out into that sea. And when I'm so thin that I'm only bones, I'll throw them away into the sea and die. But after three days, I'll get up again and become alive, and gradually regain my strength and size by eating lily and lotus roots."

"All right, brother," the Dugong answered. "You can stay in the sky, it is better for you."

The author resumes the tale: "At the same place of the Moonlight and of the Dugong, a little after the Dugong and Moon went out to sea, a large fight took place between the Totemic Beings." As the Kangaroo-men were living around the clay-pan, collecting lily and lotus roots, a Rat-woman gossiped to them that other men were coming to spear them, and went about "setting one group against the other for no reason at all." Each began to distrust the other. They began to dance wardances and kill each other with spears. "Many of these Totemic Beings were killed, and they were unable to become alive as the Moon does; they followed the pattern the Dugong had set." They say that women today gossip like the Rat woman did, and start fights.

So the cycle of songs begins and goes on; both single words and songs are repeated frequently so that the whole cycle is rarely completed in one evening. "On such occasions, the song man becomes the teacher of a small group of men who are of his own particular clan and linguistic group. Stories relating to the songs are discussed, meanings are explained and the arrangement of words in a song taught by constant repetition." Sacred "inside" terms and "power names," as well as alternate and composite words occur in the songs, and what follows is a set of self-descriptive songs.

The Moon song is begun; the people camp in the area of the Moon and Dugong. They store their clubs as if preparing for the great battle of the Dreaming Period. They construct carefully shade coverings worthy of their important headman who is related to the Totemic Beings of the past. They gather like clouds and they work and rest. Then they venture onto the clay pan looking for roots and disturbing the birds there. The kangaroo-rats leave significant trails on the clay. Ducks come to leave eggs. The people dive into the waters for lotus and lily

roots. The leeches loosen themselves and fasten to people. Prawns are burrowing all about. Tortoises swim. Berry-laden vines spread across the waters. Then night comes and the Moon rises and reminds them of the whole story (already told) of the Moon and Dugong. The Evening Star or Lotus Bloom rises and sets, held by its stalk to the place of the Moon, to whom it owes its attachment to the billabong or clay-pan. The song goes:

Now the New Moon is hanging, having cast away his bone: Gradually he grows larger, taking on new bone and flesh. Over there, far away, he has shed his bone: he shines on the place of the Lotus Root, and the place of the Dugong, On the place of the Evening Star, of the Dugong's Tail, of the Moonlight clay pan...

And Berndt says, "At the rising of the New Moon and the Evening Star the wooden 'trumpet' is blown, the singing sticks are beaten and the songs begin; the shuffling steps of dancing women are heard..." The Holy Dreamtime has begun. The group is now where it was in *those* days, *illud tempus*. Those were the days of creation, when, with intimations of catastrophe, the Moon and Venus rose into the sky, prompting the first human beings to war amongst themselves. Myth, music, and dancing begin to sublimate the otherwise unforgettable grave early events.

CHAPTER NINETEEN

THE 'UNCONSCIOUS' AS A LITERARY **REVOLT AGAINST SCIENCE***

(* In 1978 the author sought support from the U.S National Endowment for the Humanities to pursue a line of research that is described here. The application was unsuccessful, but its theory appears to be worth publication, and it is to be hoped that a more sympathetic reception will follow, and possibly that another scholar may take up the theme.)

The final success of the uniformitarian over the catastrophist paradigm in the mid-19th century signaled a class of scientific restraints upon literature. Writers had to conform to a demanding science that viewed the universe as ordered and regular, old in time, only slowly and evenly changing, with a retired God, if any, with species evolving gradually in competition, and with a mankind who was mechanical and determined even though the greatest product of nature. Sudden, violent, miraculous, heroic, and divinely inspired events were reduced to a negligible place in the causative processes of the world.

Of fiction writers, some conformed to the new consensus. Their novels accordingly changed to slow and gradual process of realistic character development or a sociological account without striking change at beginning or end. But literature of the occult, of science fiction, and of mystery developed too. Most impressive of all was a literature of the inner mind and especially of the unknown and uncontrolled unconscious mind, that grew to a peak one generation after the uniformitarian triumph. In the preceding two generations the concept of unconscious arose in mystical form, was given philosophical definition by the Romantics, and then formed into a science by Freud and others.

Thus, the greatest writers, such as Dostoevsky, Mann, O'Neill, Proust, Pirandello, Gide, Joyce, and Kafka, were granted a scientifically rationalized ballroom of the literary unconscious within which they could work out a number of dramatic and stylistic forms that were blocked in the external world by uniformitarian principles of science. Present indications are that the pressures of literature together with new scientific discoveries are eroding the uniformitarian paradigm and a breakout into new forms of literary and scientific behavior is imminent.

Such is the thesis here: the concept of the unconscious in literature is postulated as a reaction to the uniformitarian paradigm in science. The study intends to demonstrate that the psychological concept of the "Unconscious" originated, developed into its present form, and functioned in part so that creative writers (among others) might cope with certain upon literature burdensome restraints imposed by Uniformitarian (U) scientific viewpoint that triumphed over Catastrophism (C) in the early nineteenth century.

That is, the Unconscious is not explainable merely as an accident of the history of psychology, nor as a necessary, pure scientific discovery coming at a certain stage of scientific development. Nor was it a mere conceit of the intellectual salons. The concept of the Unconscious was, perhaps with all of these, the product of an unconscious alliance of psychiatry and literature aimed at accommodating the new consensus of science. Specifically in literature, its a highly useful tool of the more intelligent writers who had to adjust their dramatic forms to a rather incompatible and unbending scientific scheme. The Unconscious was, almost literally, a means of their finding Lebensraum after being evicted from the heavenly and earthly spaces of pre-uniformitarian times.

The survival-service provided by the scientific theory of the Unconscious itself developed unconsciously. To this day, although there is a general appreciation of the scientific and literary value of the Unconscious, there appears to be no awareness of its role in the unceasing interplay between the science and humanities.

Actually, the hypothesis might be extended, in a modified shape, to cover other forms of expression and knowledge, such as the plastic arts or areas where a subtle appreciation of human relations is demanded, such as political science and anthropology. In these areas, not to be dealt with here, as in the literature of the novel, the Unconscious played its double role as an expediter of adjustment between "the two worlds" of sciences and humanities, and as an intellectual and literary tool.

Nor shall we dwell upon the study of the occult, of science fiction, of "lost worlds," of catastrophes, or of "last survivors;" nor such changes in form as the lengthening and the "scientizing" or "sociologizing" of the novel, nor changes of substance such as the decline of the divine and tragic hero. In relation to the great scientific transformations, we deal only with the concept of the Unconscious, not with the broad spectrum of literary and intellectual changes.

As applied to literature, the Unconscious aided and abetted writers to manipulate time and space freely, to achieve sudden leaps and "catastrophes" in plot, and to reintroduce "gods and devils"; such maneuvers had formerly been readily licensed, but were no longer allowed if one wished to be considered a "serious" writer under the Uniformitarian regime. One was under pressure to conform to the Uniformitarian paradigm (or model, or Weltanschauung, or word-view, or ideology, or beliefsystem). How the accommodation of literature to science was accomplished is to be shown by a general historical analysis and an intensive study of the "unconscious" as employed by eight great authors. The hypothetical Table of Contents that follows this memorandum may help to clarify the purposes and procedures of the proposed research and serve as a guide to the commentary that follows. But before going into details, a statement of the significance of the project is in order.

Any illumination that the project may bring to the great particular works under analysis can be considered of some significance. The possibility of success here lies with the methodology (see below) which is expected to evolve in the course of study. We have applied the method of content analysis to materials so diverse as open-ended responses of Americans to questions about their politics, to description of hundreds of

budgetary programs of the federal government, and to the varied output of enemy propaganda in wartime. We should, at a minimum, answer questions such as the following: (Addressed to a particular author) What fraction of his work occurs within the Unconscious frame? How does he move the "plot" within this frame? Is the Unconscious a substitute for, an imitation of, and a contradiction of "reality"? How does he handle transitions into and exits from the Unconscious? Do climaxes occur in or outside of the Unconscious? In how many respects are the rules of the U paradigm obeyed in the exo-Unconscious material? (Of all authors) Do they establish a consistent and complete map of the Unconscious? Does the map conform to the "scientific" map of the Unconscious used by Freud and other psychiatrists? In sum, what generally have the writers achieved in putting across their messages, in movement, in style, in dramatic excitement by the use of the concept of the Unconscious?

In a more general sense, the project has importance for understanding the genesis of the concept of the Unconscious, which may have been the crowning achievement of the human mind in the century, 1850-1950, and which may be a principal and still unappreciated source of the relativity physics of Einstein and the indeterminacy principle of Heisenberg and thence of the breakdown of Newtonian physics. (Schlipp, 1951) I intend to suggest such possibilities.

That the study postulates flatly that unconscious forces entered into the development of the concept of the Unconscious itself is not without significance. Scientific concepts, like ordinary parents, have a way of saying "Do as I say, and not as I do." In the very beginning of the period under study, Wilhelm von Humboldt, that incredibly active and resourceful explorerscientist, coined the term "Weltanschauung" and "claimed that the science of a certain period was always unconsciously determined by its Weltanschauung." (Ellenberger, 1970, 201) This idea, which I originally obtained in 1939 from Karl Mannheim's *Ideology and Utopia*, pointed me towards my first book, Public and Republic (1948, 1951), which demonstrated the unperceived connections between Weltanschauung (for which, read paradigm or ideology or world view) and surprisingly specific devices of political representation in

American history (such as proportional representation and universal suffrage).

In developing its hypotheses, the study can uncover more fully the important transactional role that Freud played in the interfaces of the sciences and literature. By insisting on the scientific character of the Unconscious, in the face of disbelief, opposition, and rebellion, he built bridges among the three worlds and maintained their defenses until a generation of thinkers and writers had crossed over them.

The historiography of ideas here proposed may make some contribution methodology (see below). If the proposed "hard" component of the method - involving standardized content analysis of some 40 volumes and auxiliary materials contributes to the final conclusions, which will depend substantially upon more conventional (no matter how delicate) methods of ideological analysis, then the methodology of literary analysis will take a step forward, and the techniques can be applied to other fields, most directly to those in which the Unconscious plays an important role, as for example political science. Here, for instance, one could hypothesize that a sociogenic route ran from Malthus to Darwin to Freud to Lasswell, with a "rational" diversionary and less productive route from Darwin to Bagehot to Wallas to Lasswell.

Still another point of significance has to do with why the investigator should propose this study only now, after 38 years of interest in the general area. Until recently, he has not known enough of the problem-area. He has long been familiar with the literary giants that constitute the "panel of respondents" for the study, Doestoevsky, Mann and the others, and used most of the tools and concepts in other areas. In the past dozen years, he has been working steadily in the history of science and its relations to religion, legend and ancient literature, and upon the origins of human nature, the results of which research have begun to appear only very recently.

Lately, he has come to think that a new paradigm of science may be imminent, one which synthesizes the uniformitarian and catastrophist Weltanschauung in futuristic terms. Within the last decade, the universe has been dubbed "explosive," the sun

"inconstant," the geographical poles "tilted" and "reversed," the globe of the world "cleaved," the crust of the earth "convulsed," the civilizations of the Bronze Ages "razed" by natural forces, the species "extinguished in waves," the atmosphere "ravaged" by mutagenic radiation storms, the hominid recently transformed into a "hallucinatory" human, and Uniformitarianism reduced to "a methodological hypothesis": all of these statements have been made by "establishment" scientists of high rank.

We think that the signals of a changing major paradigm are to be found not only in science but in the arts and humanities, perhaps in the burgeoning of interest in what this study regards as other "escape hatches" of the literati: science fiction in all media, extreme violence, catastrophes, the occult in many forms, "last survivors" themes and "lost worlds." There is searching for a new paradigm in literature that would burst the bounds of "the Literary Unconscious" and flood out into the exterior world under new permissive conditions, upon the dismissal of the gatekeeper, the Uniformitarian paradigm; and literature would then be partially emptied of the Unconscious that had been elaborated in the century under discussion here. In such a case, there may be something prophetic in this "Last Hurrah" for the Unconscious, and the study may offer some theoretical and methodological possibilities to those who will be addressing themselves to the literature of the future.

At bottom, the project owes much of its importance to the contribution it may make to relations between "the Two Worlds" of science and the humanities. Indeed, we have here "Three Worlds," for we envision a three-way interaction among social sciences (psychology, sociology), the humanities, and the natural sciences. The study can reveal how far-reaching are the transactions and connections between the worlds in these large regions of intellectual movement, which, it is submitted, have not been as well explored as is generally believed.

DETAILED EXPOSITION OF THE PROJECT

A number of elements composed the U paradigm as it emerged victorious from its centuries of struggle with catastrophism, as the C paradigm is often called: time and space are absolute; the Newtonian laws of gravity and motion govern natural events rigidly; the heavens are constant and the universe is orderly; they operate through measurably equal units of time and through measurably equal coordinates of space; time is long and uninterrupted by sudden leaps; the surface of the earth has accumulated its features over long eons of time; nor are sudden leaps found in biology and cultural history, which have proceeded "by very short and slow steps" (Darwin); and social change is part of "cosmic evolution" (Herbert Spencer).

We have not, apparently, defined the U paradigm in its present circumscribed form (which already shows it to be on the defensive) as a mere hypothesis that rates of change in geology are to be considered as having been uniform unless proven to the contrary. Rather we take up the U idea in its broadest form as a world view, in the period of its great victory. For it was tied to two centuries of prior changes in the sciences of man and the skies. The philosopher-psychologists Locke, Hume, Fontanelle and Diderot had made of man a mechanical creature, highly determined by external forces. Hutton, the father of geological uniformitarianism, published his Theory of the Earth in 1775. Writes Mason (1962, 403), "Hutton based his view that the rock-forming agencies of the earth were constant on the by now established theory that the solar system was mechanically stable and permanently self-sustaining."

The close friendship and association of Darwin with the great U geologists adds credibility to the labeling of a U paradigm. In fact the peak prestige of the U paradigm would probably be registered around 1875, after the publication of Descent of Man. (The Origin of Species had been published and immediately sold out in 1859.) By 1875, too, Ernest Renan was widely known for his social-scientific studies of religion and myth, foreshadowing The Golden Bough of James Frazer, of whom it has been said that "Frazer seems an English Renan, so close do the two men appear at number of points both in outlook and reputation" (Vickery, 1973). The U paradigm penetrated all scientific fields, the social sciences, and social philosophy (including both Marxists and capitalists).

The criterion most commonly attributed to U is that it held man and nature to be forever undergoing a constant slow rate of change. Even if no other features of the U paradigm were unfriendly to literature, this one would be fatal to amiable concourse between science and literature. Literature has undergone great transformations from its prehistoric origins onwards, but one crowning trait has persisted: literature depends upon erratic and sudden rates of change; it demands them; its humanistic quality says, "Give me surprising and revolutionary change - I must have such concepts as the Greek 'catastrophe,' the 'turning down point,' and only then can I give you a story."

By contrast with U, Catastrophism, whose principles had been steadily eroding between 1600 and 1875, offered the following beliefs: the world, the species, and mankind were created abruptly; they were repeatedly subject to destruction by divine or natural forces in the skies and earth; the time spanned by these catastrophes was short, changes in temporal and spatial dimensions of the universe are brought on by divine, heroic, and natural forces that are immense and unpredictable; all the hosts of heaven -- sun, moon, stars, planets -- may change their motions and qualities; in this awful setting, measurement is less of the essence of being than miracles.

The Unconscious may be defined briefly here as those mental operations that are ordinarily not subject to awareness or recall. They exercise effects upon all life processes, including intellectual and emotional behavior. The Unconscious is variously portrayed and compartmentalized. One of the tasks of the proposed study is to compare and contrast the topology of the Unconscious as psychiatry sees it with the topology as it has been fashioned by literary figures for the purposes of their art. In literature the Unconscious was scarcely developed so long as the C paradigm prevailed. It was buried in sin and guilt, projected as the workings of gods and devil. Miracles and 'true' prophecy were accepted as movers of action. Authors could invoke seriously mysterious life forms, natural disasters, and portents. The external world could be turned upside down instantly. The skies were inhabited by a heavenly host that passed to and from the earth.

As examples, consulting the Gospels (Strauss, 1820), or Shakespeare's Antony and Cleopatra (Wolfe, 1976), one sees how the hero, framed in the C paradigm, lived and died in company with prodigious manifestations of nature. The 'hero' in modern literature died in a way to satisfy the U paradigm. The 'hero' has managed to stay alive in politics by causing his own catastrophes, wars, and holocausts.

In the period of a century following 1870, frank expressions of catastrophism were effectively stilled in the serious intellectual world of science and literature. Literature (and indeed all art) might have been expected to show no structural and thematic changes correlative with the changes in scientific philosophy, or to exhibit changes that were in tune with the dominating world view of science. And, in fact, this was true to a certain extent of the best literature as well as continuously true of popular writing whose audience lived always in catastrophic as well as uniformitarian belief systems. Stendhal's hero of Rouge et Noir rued that he was born too late for the Battle of Waterloo, and committed murder finally to achieve drama, an indication perhaps of the reluctance of the old pre-uniformitarian world view to accept the new unglamorous world view. Manzoni's Betrothed dwelled in earlier times, endured a terrible plague, but responded to modern economic 'laws' of Smith, Malthus, and Ricardo.

The popularity of the novel came rapidly, not only to please a new kind of public, but also to supply the author's need for more pages to develop stories, to embrace time, to attend to the once "insignificant." The poets, significantly, went "mad," like Baudelaire, and art and poetry went "bohemian." And we would point out that here was an escape route from the intolerable normality and statistical quality of the uniformitarian historical and world vision.

But meanwhile a major "normal" substitute formation for the dying catastrophism was occurring. It would be consonant, even if uncomfortable, with the Uniformitarian consensus. Psychiatry began its long march. Indications of "the Unconscious" began to appear. Henri Ellenberger's excellent (1970)book brings out the highlights. (It is misleadingly entitled, *The Discovery of the Unconscious*. A small fraction of the large book actually deals with the Unconscious, and nowhere does the work treat of the hypothesis of the presently proposed research, except by utmost indirection and as noticed by an ear cocked for it. Its subtitle of

The History and Evolution of Dynamic Psychiatry is more descriptive of the contents.)

Mesmerism, spiritism, magnetism and hypnotism dominated early psychiatric circles. In literature, Edgar Allen Poe used the theories in his stories. The novelists Charles de Villers, E.T.A. Hoffman, Alexandre Dumas, and even Balzac also incorporated magnetism. "But," writes Ellenberger (p. 161), "magnetism was more exploited by popular writers than by great ones." Further, "Magnetism was condemned by the Academie and despised by Universities." (p. 160) Victor Hugo practiced spiritism. In Flaubert's Salammbo (1859) the subconscious eroticism of a maiden brings about hysterical behavior. "Hypnotism inspired a number of novels," (p. 165) such as George du Maurier's bestseller Trilby.

It is fairly obvious that these modes of psychiatry could not long confront the juggernaut of uniformitarian science. They passed and with them their literary passengers. A second wave of ideas came into psychiatry with the German romantic movement (1800-1830) -- an ideal, a yearning, a love of nature -- but then also a school of Naturphilosophie (von Schelling et al.), with a deep interest in the "soul" and the unity of man and nature. Freud and Jung were heavily influenced by Romanticism, and of course the intermediary psychiatric thinkers -- Von Schubert, Troxler, Carus, Fechner, and Bachofen as well. "Fundamentally Romantic are the concepts of unconscious, particularly as revived in Jung's 'collective unconscious' and the emphasis on dreams and symbols." (Ellenberger, 205).

According to Ellenberger, "After 1850, the philosophy of nature and Romanticism seemed to have completely disappeared. It was the period of positivism and the triumph of the mechanistic Weltanschauung. (He excepts Fechner and Bachofen.) Wilhelm Griesinger (1817-69) stands out here, a synthesizer of brain anatomopathology, neuro-psychiatry, clinical psychiatry, and dynamic psychiatry. "He proclaimed that the greatest and most important part of the psychic processes were unconscious." (p. 241)

Nietzsche is, of course, the exemplar of the Romantics in many ways and an enemy of the uniformitarian credo, with his ideas of the super-man, the will, and moral preoccupations. "Nietzsche is inexhaustible in his attempts to show how every possible kind of feeling, opinion, attitude, conduct and virtue, is rooted in selfdeception or an unconscious lie. Thus, 'everyone is the farthest to himself,' the unconscious is the essential part of the individual, consciousness being only a kind of ciphered formula of the unconscious, 'a more or less fantastic commentary on an unconscious, perhaps unknowable, but felt, text." (p. 273)

Theodore Thass-Thieneman (1968) reports that the concept of the unconscious was actively at work in linguistics before Freud and quotes Hermann Paul (1880, trans. 1888): "Perhaps the greatest progress by modern psychology consists in the acknowledgment of the fact that a great many psychological processes go on without clear consciousness, and that everything which has been in consciousness remains an effective motive in the unconscious. The acknowledgment of this as a matter of fact is of the greatest importance for linguistics, and it became utilized by Steinthal in great extent. All manifestations of speech are growing out of this dark space of the unconsciousness of the mind." (p. 23 of Principles of the History of Language, 1888.) Steinthal's work was contemporary with that of Paul. By 1889, Hericourt could write in the Revue Scientifique that the unconscious activity of mind was a scientific truth established beyond doubt, and claimed that Chevreul had experimentally demonstrated so. (Ellenberger, 314)

"In the last decades of the nineteenth century, the philosophical concept of the unconscious, as taught by Schopenhauer and Von Hartman, was extremely popular, and most contemporary philosophers admitted the existence of an unconscious mental life." (Ellenberger, 312). There was no absolutely new theory, but the growth was exponential: "The assumption had been held for many centuries. In the seventeenth and eighteenth centuries, it attracted more attention; in the nineteenth, as one of the cornerstones of modern dynamic psychiatry. [N.B.: This term refers mainly to therapeutic as opposed to laboratory or experimental psychology, but also to Fechner and Helmholtz.] The traditional speculative approach, which was also that of the Romantics, was now supplemented by two other approaches, the experimental and the clinical." (Ellenberger, 311)

Sigmund Freud, trained in neurology, attracted to hypnosis, and inspired by Romanticism, joined the scientific temper to the literary needs and produced a theory of the Unconscious that would bridge (not without strains and stresses) the chasm between uniformitarian science and creative literature. He opened up a grand ballroom of the mind, showed how its scenery could be changed instantly, depicted the wars that could be waged and the defeats suffered within it, extended its billings to include everyday life and jokes as well as tragedy, introduced the gods as the gigolos of illusion-seekers, and then, to help the literary writer more, even wrote the songs to be danced to with his ideas of symbols and languages.

A most significant contribution of the builder of the mental ballroom was his life-long pursuit of scientific respectability so that those who entered and departed would not be ashamed or endure the hoots of derision from scientists gathered at the doors. The occult, science fiction, allegories, fairy tales, and other literary devices to tell a story despite the restraints of science have been extremely popular, but have not won to their authors the kudos of the science-dominated elites. "Freud claimed... that his world was grounded in reality, perceived by scientific method." (Roazen, 18) In relation to literature, his attitude is that of a scientist who is trying to study by scientific methods the writer's advanced ideas: "...Creative writers are valuable allies and their evidence is to be prized highly, for they are apt to know a whole host of things between heaven and earth, of which our philosophy has not let us dream." (Quoted by Roazen, 16-7.)

Freud, rather than Nietzsche, became the central figure in the history of the Unconscious partly because he was a conformer to the uniformitarian ideal. By contrast, Nietzsche was in revolt against science; science "is a principle inimical to life and destructive. The will for truth could be a disguised wish for death." (Ellenberger, 273) So it came about that Nietzsche, who knew and spoke of the unconscious, of inhibitions, sublimation, repression, functional amnesia, selfdestructiveness and the "id" before Freud, and was admired by Thomas Mann, Carl Jung and a host of literati and conoscenti, was banned from the precincts of Uniformitarian science where Freud was allowed, no matter how reluctantly, to enter.

Freud's striving for scientific status has governed psychiatric history over nearly a century, and the realm of the unconscious is widely regarded as one of the great scientific "discoveries" of the modern age. Thousand of practitioners in many fields of science have employed the concept. It was to this authoritative support, then, that the writer might refer when asked his credentials as a speaker of truths. It is not generally appreciated how important this was and now is to the serious writer who seeks to employ fiction in its various forms as a teacher of humanity.

Just as it has become plausible that practically every scientific canon of the U paradigm would threaten literary creativity, it may become credible that the U paradigm would provoke defense mechanisms, and particularly, the Unconscious. But we have to analyze carefully the dynamics of the events; they are quite roundabout. Here is an hypothesis of how the "scientific Freudian" would reason, using U premises.

Human behavior is animal. Animal (human) behavior was a long time is developing. What is civilized is also ancient (prehistoric, primitive [cf. Fraser]). Morality is animal and relative. It is built up in a culture, like beavers and ants and apes build their behavior patterns. Myth, language, and symbols develop either on a constant plane or curve of rationality and clarity over long periods. The evidences of catastrophism are interpreted as expressions of repressed instinctual tendencies. The developing intelligence - mechanical though it be - is given the possibility of understanding and controlling nature. Both the environment and human mind are in a "steady state." The feelings of catastrophism are attributed to the repressed traumas and anxieties of "normal" existence in civilization.

In the end, the theory of the unconscious substituted for analogous functions of pre-Unconscious psychology. Thus was filled the vacuum left by the "scientific" destruction of the latter when U took over from C.

The criticism often directed against the theory of the Unconscious, that it was non-provable, non-testable, etc., is perhaps correct, but irrelevant to the *functions* of the theory, which becomes in effect part of the U ideology.

Once introduced and elaborated as part of the scientific corpus, the Unconscious made its way more readily into literature. As Steiner (1967, 6) has said, "The science will enrich language and the resources of feeling (as Thomas Mann showed in *Felix Krull*, it is from astrophysics and microbiology that we may reap our future myths, the terms of our metaphors)... And it is precisely the 'objectivity,' the moral neutrality in which the sciences rejoice and attain their brilliant community of effort, that bar them from final relevance."

However, by our theory, the Unconscious was not transferred as a topological field or map into the novels and dramas. Rather it was reworked. The literary Unconscious will probably be shown not to have the same geometry as the scientific Unconscious. For example, Freud's typology of regressions is not the typology adopted by novelists. No one yet knows what typology the novelists drafted and settled upon, perhaps none at all, perhaps highly idiosyncratic forms. We may discover this structure in some part. Yet, a priori, when Freud discerns a regression from conscious to unconscious, from the present to childhood, and from language to pictorial and symbolic representations, we are entitled to move with Proust's "Recovering of Lost Time," (as it is better translated) for evidences of this typology, or for additional ones or for substitutes. And so it is with a number of the mechanisms and delineations of the Unconscious; in this study, even though it is not the central issue, the comparison of literary structuring of the unconscious with scientific structuring will come naturally and one day perhaps tell us much about the nature of literary needs and inventions.

The proposed study would proceed to identify among a selected group of authors the biographical information that would indicate their awareness of and interaction with the concept of the unconscious, then to show in the work of the same authors how the concept of the unconscious is employed, and finally, to examine, by comparison with the uniformitarian "real world," how the "unconscious world" of these writers manages to satisfy the demands of scientific respectability while achieving the requirements of literary fiction.

Because the spread of the uniformitarian paradigms and the development of the idea of the unconscious occurred throughout western civilization, it might be well to study writers from several countries. Further, leading writers, rather than typical authors, should such exist, were chosen, because of their influence upon the other writers, teachers, scientists, and students of their cultures, and also, I should add, because I am more familiar with their lives and work. Thirdly, authors who altogether complete the range of literary activities made possible in "the ballroom of the unconscious" were selected.

To these ends, the following authors and works were chosen:

F. Doestoevsky (1821-1881) for his pre-Freudian use of the Unconscious. *The Insulted and Injured* (1861); *Crime and Punishment* (1866); *The Idiot* (1868); *The Possessed* (1871-2); *The Brothers Karamozov* (1879-80)

Andre Gide (1869-1951) for his stylistic mastery and methods of disclosing unconscious motives. Fruits of the Earth (1897); The Immoralist (1902); Strait is the Gate (1909); Cellars of the Vatican (1914); The Counterfeiters (1926).

Franz Kafka (1883-1924) for objectifying the unconscious by treating reality as surrealism. "Metamorphosis" and Other Stories (var.d.); The Trial (1925); The Castle (1926); Amerika (1927).

James Joyce (1882-1941) for the frank and full integration of the "stream of consciousness" (and unconsciousness) into reality settings. *Dubliners* (1914); *Ulysses* (1922); *Portrait of the Artist as a Young Man* (1916); *Chamber Music* (1907); *Exiles* (1918).

Thomas Mann (1875-1955) for his frank devotion to the morality of Nietzsche and his careful, logical delineations of the unconscious vs. the rational. *Buddenbrooks* (1901); *Magic Mountain* (1927); *Death in Venice* (1911); *Doctor Faustus* (1947); *The Confessions of Felix Krull* (1954).

Eugene O'Neill (1888-1953) for his explorations of tragic madness and the Oedipal unconscious. *Strange Interlude* (1928);

Mourning Becomes Electra (1931); Ah, Wilderness (1933); The Iceman Cometh (1946); Long Day's Journey into Night (1955).

Luigi Pirandello (1867-1936) for his superimposition of scientifically possible contradictions into plot and character. *The Old and the Young* (1913); *Right You Are If You Think You Are* (1918); *Six Characters in Search of an Author* (1921); *Naked* (1924); *Tonight we Improvise* (1930).

Marcel Proust (1867-1922) for his mastery of time in all of its unconscious aberrations beneath the ticking of the "clockwork universe." *Remembrance of Things Past* (7 vols., 1913-7).

Besides these authors, to whom distinct chapters of the intended monograph are devoted, occur other intellectual figures who are to be treated in the proposed research. They include Shakespeare, John Bunyan, John Milton, and Voltaire in Chapter I; Newton, Fontanelle, Locke and Hume in Chapter II; Hutton, Lamarck, Lyell, Cuvier, Buckland and Agassiz in IV. Boulanger, rarely mentioned, is discussed in Chapter VI; he combines scientific catastrophism (comet and flood); a theory of the origins of religion in real-world fear; a theory of collective amnesia; and the use of the myth from suppressed traumas - all in an unprecedented manner.

For some time now (one may argue) the theory of the Unconscious has been turning against the U paradigm. For it has been bringing to the fore unassimilable, uncomfortable, anxiety-producing material. Since the disintegration of catastrophic religions and political ideologies, there has been no vessel to hold its acids.

The U theory had implied that "in time" therapies would be devised to control and appease the Unconscious. Behaviorist psychologists such as Watson and Skinner have tried to turn their backs upon it. Under the U theory, all is explainable; when explainable it is controllable; when controlled, anxiety is reduced and happiness is produced. To the extent that this sequence has failed to materialize and disenchantment with the theories has occurred, the concept of the Unconscious is counter-productive for U.

That is, the Unconscious (with the old C paradigm admission to "science" denied and its controlling capacities foregone) can only turn on itself in literature and art, allying itself with impressionism, expressionism, surrealism, the occult, science fiction, yoga-tao-sufi, and other modes of compatible existence. The "tragic" departs from the art and literature; the "contradictory" (irony, farce included) and "obscene reality" replace it; there are phenomena to label "tragic" but no entity to judge them to be tragedy; the tragedy is like the tree falling in the forest unheard and unobserved.

Moving along in tandem with the U and Evolutionist injunctions, the Unconscious has been revealed to affect thousands of psychological functions and social behaviors, in areas that must be designated non-instinctual or at least not wholly instinctual, and therefore human. Perhaps our historical study may generate hypotheses in answer to the questions: What will follow the U paradigm? Or, after the Unconscious, what?

The literary mind is not happy with being a "reservation Indian." A continuous bombardment of the scientists occurs. We are so used to it that we only know of its excesses. The literary mind wants the real world to have the catastrophic qualities so that it can turn its plots and characters loose upon it. This will continue to cause tension between science and literature, with science requiring literature to be 'abnormal' and literature wishing its innermost thoughts to be 'normal.' Perhaps, as Neuman (1959, 25) has written, "the breakdown of consciousness, carrying the artist backward to an all-embracing participation with the world, contains the constructive creative elements of a new world vision."

Added note on Methodology: Types of Sources and Causal Connections Sought

The major methodological challenges of the project have to deal with gathering relevant and ample data and establishing causal relations between several critical sets of events.

Data Occur in Several Classes

- a. Writings in the History of Science, such as works number 9, 21, 27, 28, 29, 40, 47, 78 in the accompanying bibliography.
- b. History of Literature in general or in special aspects, such as numbers 1, 22-4, 71, 56, 59.
- c. History of Psychology, # 16, etc.
- d. History of Ideas, such as items 8, 37, and 65.
- e. Works of Figures Prominent in Parts I and II. These are generally available, as with S. Freud, *Standard Edition* (20), Kaufmann on Nietzsche (38), Boulanger's works (3) are rare, but have been read at Princeton U. Library where they remain available.
- f. Works of the Panel of 8 Authors: generally available both in original languages and in translation. An estimated 40 volumes are involved here, averaging 5 per author.
- Derived Data: the systematically collected information g. obtained from the works of the Panel of 8 authors. The parameters of this information, for which the collective terms "questionnaire" and "framework of interrogation" are used above, have to be formulated; this task is one of the most rigorous and demanding phases of the investigation. In a vital sense, the project is the devising of a "framework of interrogation" for the panel of authors and other data. Putting aside the systematic searching for biographical connections and other material of use to the study, the examination of the panel works to extract from them their "geometry" and the "dynamic" of the unconscious that they employ. There occur questions such as: What proportion of the time in each work does Author A deal with the Unconscious? In which of the following psychological categories (derived from the scientific typography) does the U action take place? (There follows a set of categories.) If there is no easy fitting, describe the

image (map, idea, functions) of the Unconscious that the writer is pursuing.

- h. Biographical and autobiographical writings involving the 8 authors, such as the *Journals* of Gide.
- II. Major Causal Transactional Connections
- a. Theory of the Unconscious in Science. Well-recorded in the sources.
- b. Between Catastrophism and Uniformitarianism. Data appears adequate and interconnections already well developed.
- c. Between (a) uniformitarianism, (b)Catastrophism, and (c) psychology of the unconscious. Difficult (an typical of historiography of ideas). If ab, bc, ac and abc are identified (or distinguishable) as interacting according to certain typical modes, then statements of their causal connections can be deduced. If influences between and among them are directly attributed by participants, then causal transactions are more strongly proven.
- d. Between the psychology of the Unconscious and literature of the unconscious. Appears solvable because both universes (psychologists and literary figures), are in touch abundantly, directly and through intermediaries of press, common acquaintances and influences.
- III. Topology of the Unconscious in Science and Literature

Topology of the Psychological Unconscious has not been finely drawn; existing schemes of the Unconscious may be improved by our analysis here. Topology of the *Literary* unconscious has to be invented almost entirely by the investigator. (This is the "ballroom of the unconscious" metaphor used above.) Even isolated gems, such as this statement from the pen of George Steiner (1967,31), are exceedingly rare: "As if aware of the fact that science had torn from language many of its former possessions and outer provinces, Joyce chose to annex a new kingdom below ground. *Ulysses* caught in its bright net the live

tangle of subconscious life; Finnegan's Wake mines the bastion of sleep."

The topologies must then be related to the original topology of the Uniformitarian and Catastrophist paradigms.

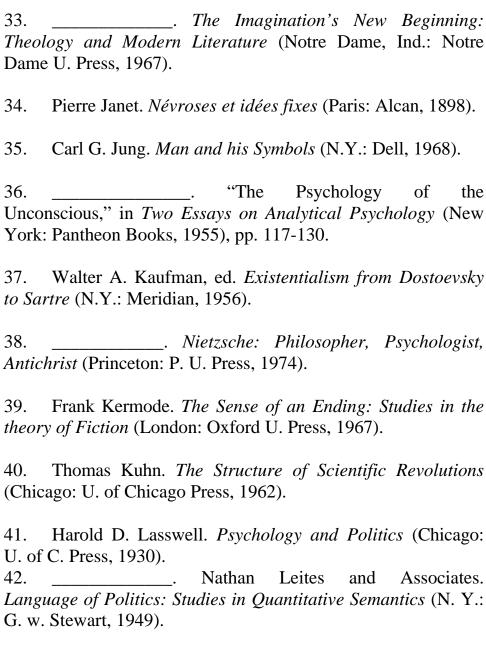
Efforts at introducing strict logico-empirical quantitative method into the history of new ideas are infrequent possibly because they are rarely successful. This does not mean, however, that they serve no heuristic purpose, or that they do not result in an underlying structure that produces a superior, if seemingly qualitative, work. I am not relying rigidly upon the content analysis techniques described above to disgorge neat tables; if, as is likely, they produce fairly organized heaps of data, I shall be neither surprised nor displeased, but shall fall back upon the "tried and true" styles of literary analysis employed in such works as Mario Praz' The Romantic Agony, or John Vickery's The Literary Impact of the Golden Bough. As H. T. Pledge wrote in his History of Science (p. 143) "Science should explain what we notice...not notice only what it can explain." I shall try to explain what I notice by the most exact means possible.

SELECTED BIBLIOGRAPHY OF PERTINENT WORKS

- Richard F. Atnally. "The Human Trinity: The Shapings of Time in Eighteenth Century Literature" (Unpublished Paper delivered at MLA Convention, New York, 1976).
- Marie Bonaparte. "Time and the Unconscious," 2. International Journal of Psychoanalysis (1940), 427-68.
- 3. Nicholas-Antoine Boulanger. L'Antiquité devoilée...ages, 3v (Amsterdam: M. M. Rey, 1977).
- 4. Donald Brinkmann. Probleme des Unbewussten (Zurich: Rascher, 1943).
- F. S. Cohn. "Time and the Ego," 26 Psychoanal. Q. (1957), 168-89.

- 6. F. G. Crookshank. *Individual Psychology and Nietzsche* (London: C. W. Daniel, 1933), Pamphlet # 10.
- 7. Charles Darwin. *The Descent of Man and Selection in Relation to Sex*, 2v. (1871, many editions since).
- 8. _____. *The Origin of Species* (1859).
- 9. Alfred de Grazia. "An Early Mathematical Derivation of an Election System," 44 *Isis* (Jan. 1953), 42-50.
- 10. ______. Public and Republic: American Ideas of Political Representation (New York: Knopf, 1951)
- 11. Sebastian de Grazia. *Time, Work, and Leisure* (New York: Doubleday, 196).
- 12. L. Dooley. "The Concept of Time in Defense of Ego Integrity," 4 *Psychiatry* (1941), 4:13-25.
- 13. Jan Ehrenwald, ed. *The History of Psychotherapy: From Healing Magic to Encounter* (New York: Aronson, 1976).
- 14. Loren Eiseley. *The Invisible Pyramid* (New York: Scribners 1970).
- 15. Mircea Eliade. Cosmos & History: The Myth of The Eternal Return (New York: Harper, 1959).
- 16. Henri F. Ellenberger. *The Discovery of the Unconscious* (New York: Basic Books, 1970).
- 17. Linda Fleming. *The Sub-Culture of Science Fiction* (Chapel Hill, N.C.: U. of N.C., P D. Dissertation in Sociology, 1977).
- 18. P. G. Fothergill, *Historical Aspects of Organic Evolution* (London, 1952).
- 19. J. T. Fraser, ed. *The Voices of Time* (N. Y.: Braziller, 1968).

- 20. Sigmund Freud. *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (trans. and edited by J. Strachey with Anna Freud, London: Hogarth Press, 1955-).
- 21. C.C. Gillispie. Genesis and Geology: A Study in the Relations of Scientific Thought, Natural Theology and Social Opinion in Great Britain, 1790-1850 (1951).
- 22. Charles Glicksberg. *The Literature of Nihilism* (Lewisburg: Bucknell U. Press, 1975).
- 23. ______. Modern Literary Perspectivism (Dallas: SMU Press, 1970).
- 24. _____. The Self in Modern Literature (U. Park, Pa.: U. of pa. State Press, 1963).
- 25. Stephen Jay Gould. "Evolution's Erratic Pace," *Natural History* (May, 1977), 12.
- 26. John C. Green. *The Death of Adam* (Ames: Iowa State u. Press, 1959).
- 27. George Grinnell. "The Origins of Modern Geological Theory," I *Kronos* # 4 (1976), 68-76.
- 28. A. R. Hall. The Scientific Revolution, 1500-1800: The Formation of the Modern Scientific Attitude (Boston: Beacon Press, 1954).
- 29. John Hampton. *Nicolas-Antoine Boulanger et la science de son temps* (Geneve: Droz, 1955).
- 30. Edward von Hartmann. *Philosophy of the Unconscious* (1869).
- 31. Jules Hericourt. "L'activité inconsciente de l'esprit," Revue Scientifique, 3rd series #1 (1889), II, 257-268.
- 32. Frederick J. Hoffman. *Freudianism and the Literary Mind* (Baton Rouge, U. of La. Press, 1957).



- 43. Nathan Leites. *A Study of Bolshevism* (Glencoe, Ill.: Free Press, 1953).
- 44. Karl Mannheim. *Ideology and Utopia: An Introduction to the Sociology of Knowledge* (1936, N.Y.: Harcourt, Brace, World, 1968).
- 45. Frank Manuel. *The Eighteenth Century Confronts the Gods* (Cambridge: Cambridge U. Press, 1959).

- 46. Edward L. Margetts. "The Concept of the Unconscious in the History of Medical Psychology," XXVII *Psychiatric Q*. (1953), 115.
- 47. Stephen E. Mason. A History of the Sciences (Collier Books, 1962).
- 48. Joost A. M. Meerloo. *Along the Fourth Dimension: Man's Sense of Time and History* (N.Y.: John Day, 1970).
- 49. James Miller. *Unconsciousness* (N.Y.: Wiley, 1942).
- 50. Joseph-Marie Montmasson. *Invention and the Unconscious* (N.Y.: Harcourt, Brace, 1932).
- 51. Thelma Moss. *The Probability of the Impossible* (N.Y.: New Amer. Library, 1974).
- 52. Frederick W.H. Myers. *Human Personality and Its Survival of Bodily Death*. 2 vols. (London: Longmans, Green, 1903).
- 53. Erich Neuman. *Art and The Creative Unconscious* (N.Y.: Pantheon Books, 1954).
- 55. Marjorie Hope Nicholson. *The Breaking of the Circle, Studies in the Effect of the 'New Science' Upon Seventeenth Century Poetry* (Evanston: Northwestern U. Press, 1950).
- 56. ______. Voyages to the Moon (N.Y.: Macmillan, 1948).
- 57. Shelley Orgel. "On Time and Timelessness," *J. Am. Psychoanal. Assn.* (1965), 102-21.
- 58. H. T. Pledge. *Science Since 1500* (N.Y.: Harper & Bros., 1959).
- 59. Mario Praz. *The Romantic Agony* (trans. London: Oxford U., 1933).
- 60. Paul Roazen. Freud: Political and Social Thought (N.Y.: Vintage Books, 1970).

- 61. Joseph R. Royce. "Psychology at the Crossroads between the Sciences and the Humanities," in Royce, ed., *Psychology and the Symbol* (N. Y.: Random House, 1965).
- 62. Schlipp, P. A., ed. *Albert Einstein: Philosopher-Scientist* (N.Y.: Tudor, 1951).
- 63. Arthur Schopenhauer. World as Will and Representation (1814).
- 64. Robert Sears. Survey of Objective Studies of Psychoanalytic Concepts
- 65. Pitirim Sorokin. *Social and Cultural Dynamics*, 4 vols. (1937-41).
- 66. George Steiner. *Language and Silence* (N.Y.: Athenaeum, 1967)
- 67. David Friedrich Strauss. *The Life of Jesus Critically Examined* (1820; trans. Philadelphia, Fortress Press, 1972).
- 68. Theodore Thass-Thienemann. *Symbolic Behavior* (N.Y.: Washington Square Press, 1968).
- 69. ______. The Sub-Conscious Language (N.Y.: Wash. Square Press, 1967).
- 70. Hans Vaihinger. *The Philosophy of "As If"* (N.Y.: Harcourt-Brace, 1935).
- 71. John B. Vickery. *The Literary Impact of the Golden Bough*. (Princeton: Princeton U. Press, 1973).
- 72. John B. Watson. "The Myth of the Unconscious," 155 *Harper's Magazine* (1927), 503-7.
- 73. Rene Welleck. "The Concept of Evolution in Literary History," reprinted in S. G. Nichols, Jr., ed., *Concepts of Criticism* (New Haven: Yale U. Press, 1963).

- Lancelot L. Whyte. The Unconscious Before Freud 74. (N.Y.: Basic Books, 1960).
- J. O. Wisdom. The Unconscious Origin of Berkeley's 75. Philosophy, International Psychoanalytic Library, #47 (London: Hogarth Press, 1953).
- 76. Irving Wolfe. "The Catastrophic Substructure of Shakespeare's Antony and Cleopatra," I Kronos, #3 (1975), 31-45, #4 (1975), 37-54.
- Walter von Wyss. Charles Darwin, ein Forscherleben 77. (Zurich & Stuttgart: Artemis-Verlag, 1958).

CHAPTER TWENTY

O.K. ORIGINS

O.K. is also okay, okey, or okeh. It is a noun, verb, adjective, and adverb. "O.K., the most successful abbreviation ever coined, in the United States or elsewhere, has been borrowed by all the languages of Western Europe and some of those of Asia." So writes the illustrious H.L. Mencken in his book on the American language. But where does it come from?

Let us resort to this author's journal:

Stylida, Naxos, March 28, 1980

Stormy weather, some rain, high winds, thick clouds low-passing, two days running.

Working on my novel Ron's Norm last night. Talking of a chapter in which Ron cites John Cohane on the pre-Christian Irish Christmastime Og Day when people engaged in drunken orgies. Ami suggested moving a word to another paragraph. It was the word "OC." I said "O.K." I looked at it, remembered the mystery of its origin, and thought "This O.K. could be OC, the most ancient Irish god-name." I read in the Oxford English Dictionary on Etymological Principles (Vol. II p.4028 of microprint edition), "the earliest occurrence so far noted is in the Boston Transcript of 15 April 1840. In this and two examples from April and June the meaning is not clear, but the explanation oll korrect' appears on June 18..." Then, "1840 Atlas (Boston), 18 June 2/1 The band rode in a stage, which had a barrel of Hard Cider on the baggage rack, marked with large letters 'O.K.' - oll korrect." I suspect that Irish immigrants, who were becoming exceedingly numerous in Boston at this time, brought the word, a folk word, with them. The use of the letters on a bandwagon and to mark a container of hard liquor can be related to an archaic festival, it would seem. Other theories of the origin of O.K. are weak, such as a misspelling by illiterates, which however goes well with the idea that the origin was among "illiterate Irishmen," rather than with the slightly later attribution to General Jackson

who was not as uneducated as his detractors made him out to be - unless, which is possible, Jackson, descended of Scots-Irish, did also pick up the O.K. from the folklore of the ancient OC. Significantly, another explanation is that 'O.K.' comes from the Oklahoma (note: oc) Choctaw (note: oc) Indian word "oke" ("it is") in an attribution of 1885. (Americans often use a simple "oke," one, not two syllables, and 'periods' may have been later additions.) It is conceivable that this "oke" (it is) is like the Yahweh (I am) and was a Choctaw god name once. Both OG and HAUE are among Cohane's half dozen key words.

POSTSCRIPT OF 1983

The *oc* syllable is a straight-out affirmative in the *langue d'oc* population of southern France where oc meant yes, as contrasted with the *langue d'oil* of the North of France, which prevailed (*oil* becoming *oui*).

Returning to the Irish drink, *uech*, one is led to another of Cohane's basic words, *haue*, who he believes to have been a divinity preceding *oc*, and is found in *Yahweh* and *Jove* (properly pronounced in Latin). The most sacred parish in Ireland is called Aughaval, which disassembles into *og/ava/ala*.

Now H.L. Mencken comments about O.K. that "its long disputed etymology has been practically settled by Allen Walker Read." Not so, although Read wrote three articles, and Mencken one, on the subject between 1941 and 1963. He is probably correct, though, in saying that "it arose from a vogue for acronyms which developed in Boston in the summer of 1838." This would help explain the social readiness for the invention and why it quickly acquired misleading punctuation points.

I prefer the bandwagon explanation, which combines the Irish, politics, music, holiday, the god Oc, and the intoxicating drink. (Only in the 18th century did the Irish authorities finally suppress the celebration of Og Night.) O.K. was early used as a watchword and title, as the "O.K. Club," and is associated with revelry, noise-making, and carousing, all of which the early Irish contributed to American politics in some unusual degree. On April 3rd, 1840 the New York *Daily Express* reports, "About 9 o'clock, a procession from the 10th and other up-town wards

marched down Center Street headed by a banner inscribed 'O.K.'" and on November 7, the *National Intelligencer* declares that "The Irish Locosfocos [a political faction] in the 6th ward [of New York City] have been parading the streets with shillelahs [batons], swearing 'O.K.' etc." Apparently O.K. was even yet an oath of some kind. O.K. is a strong affirmative, difficult to pronounce dubiously, very definite, a password, watchword, acclamation, an expression of secular camaraderie, with its sacred pagan meaning suppressed but lending force and universal acceptance to the word. There still exist the expletives, Ugh! and Oc! (in Ireland) and Och! (in Scotland). Such was Oc, says Cohane, "once the supreme ruler of the universe in the minds and hearts of our ancestors." O.K.?

CHAPTER TWENTY-ONE

JUPITER'S BANDS AND SATURN'S RINGS [1]

With a mind to the present Pioneer explorations of the neighborhoods of planets Jupiter and Saturn, an article by Thomas Taylor (of Walworth) - published in the *Classical Journal* of 1819 - ought to be reviewed. Taylor was a renowned Platonist and his article was entitled, "On the Coincidence between the Belts of the Planet Jupiter and the Fabulous Bonds of Jupiter the Demiurgus"[2]. There, quoting passages of the neo-Platonist Proclus (c. 410-85 A.D.), *On the Timaeus of Plato* and *On the Theology of Plato*, Taylor points out "that Jupiter the Demiurgus is said by ancient theologists to have put his father Saturn in chains, and also to have surrounded himself with bonds; and that the moderns have found the body of the planet Jupiter to be surrounded by several substances resembling belts or bands, and likewise that there is the faint resemblance of a belt about the planet Saturn"[3].

To have been capable of this assertion, Taylor would have had to educe declarations concerning the two systems of divine bonds from the highly abstract writings of Proclus and to realize the recency of telescopic identification of the two systems. Actually, Galileo and his associates had sighted the rings of Saturn about 1608; however, he mistakenly believed them to be two smaller bodies of a triple-bodied Saturn [4]. Working with a superior telescope, Christian Huygens had identified the "ring" of Saturn as such (but note the singular) and had drawn Jupiter with two equatorial streaks in his *Systema Saturnium* of 1659. In his posthumously published *Cosmotheoros* of 1698, he wrote of the bonds of Jupiter and compared them with the clouds of Earth [5].

A review of what Proclus had to say gives no cause to dispute Taylor's translation and comment. Proclus does not, in these lines, directly say that the bound gods are the actual planets of the same names. But all known planets, including Jupiter and Saturn, were identified at that time with gods, called by their names, and were supposed to exhibit their traits. Plato further argued that the planets and stars were huge, and he insisted that the gods were among the planets and not upon Olympus [6]. The modern practice of arbitrarily labeling new objects of the sky from Greek mythology has obscured the sacredness of the ancient belief in the union of astral bodies with divine personages. If any distinction between the planet and god were required, it would relate, as Taylor put it, to "the planet Jupiter, who being a mundane divinity, according to the theology of the Greeks, is a procession from, but no the same with, Jupiter the fabricator of the world"[7]. That is, the abstract god, Jupiter the Demiurge, is something beyond Planet Jupiter, the concrete manifestation of the Demiurge. Early Greek usage did employ the possessive or genitive case, "of Jupiter" in referring to the planet, but by Aristotle's time the significance of the distinction had been lost and the nominative "Jupiter" was used for both god and planet.

Proclus writes in a language and logic that are typical of theological speculation, but evidently he reasons thus: Mighty Jupiter, god of law and order, god of the supreme intellect, confronts his father, Saturn, also an all-perfect intellect, and places this intellect under bonds to control its activity according to Jovian ordering principles. Then, because Jupiter is logical and just, he binds himself so that he will be subject to his own laws. Thus the intelligible intellect of Saturn is comprehended by the intellect of Jupiter which then comprehends its own intelligibility.

Proclus writes: "As the intelligible is indeed exempt from intellect, but intellect is said to comprehend it, thus also Jupiter is said to bind his father. And in placing bonds about his father, he at the same time binds himself"[8]. Proclus refers repeatedly to the bonds and binding of Jupiter and Saturn, and explicitly to Jupiter's "Saturnian sections and bonds."

Taylor wondered at this coincidence of modern scientific observation and ancient theology, and inferred that such theology must be "no less scientific than sublime." Is there another explanation of the coincidence?

One might postulate an ancient civilization of a type advanced beyond Plato's Atlantis, which would have been thoroughly devastated but whose telescopes would have been unmatched until the nineteenth century. Only so advanced a culture could produce and systematically employ such a telescope. Paleo-anthropology and archaeology, overseen by the sociology of invention, do not admit of a specific technology that far exceeds the general level of its culture. Then, if it had existed, the destroyed civilization would have inspired myths of some essential correctness within the survivors' theology.

One may stretch farther for hypotheses, but they would be most unlikely: the reports of informed visitors from outer space; the presence of magnifying atmospheres; larger, more marked sets of clouds and rings around Jupiter and Saturn seen through a clearer atmosphere of ancient times; ancient human sports with telescopic vision; a saucer telescope of brilliant conception and low technological requirements; etc.

One is naturally driven back to the text and the probability that the ancient insistence upon the bonds around the planets is an independently invented conceit, a remarkable coincidence. Yet this probability is not large either. The coincidence is complex, and the more complex a coincidence, the more likely a causal association.

Furthermore, the complex parallel is consistent with a great deal more of myth that is connected with the same planets, such as the great heat and electricity of "Thunderbolting Zeus," and the putting away of Saturn (Kronos) beyond the possibility of his affecting the affairs of Earth or the rule of his son, Zeus. An elementary course in the Greek classics will recite Hesiod's *Theogony*, wherein Zeus is pictured as the son of Kronos, preserved from being swallowed by his father through the substitution of a stone swaddled in cloth, who then leads a successful revolt of Saturn's other progeny who had been swallowed and then vomited up. Galileo ceased his observations of Saturn for two years, and when next he looked in December of 1612, the rings were out of sight. "Has Saturn devoured his children?" he mused, but predicted that in 1614 they would return [9].

If it were not for the massive conviction of contemporary science, backed by a stable sky and a workable celestial mechanics - or more bluntly, if one were to dismiss certain premises and conclusions of modern astronomy - one would apply modern psychological and anthropological analysis to the coincidence and to the words of Proclus, and suggest, as Taylor could not say 150 years ago, that the quotations exemplify how a primordial experience is anesthetized by its traumatic character and remembered as a religious obsession. This then produces a theology that proceeds to generate concepts of rule and law in the universe so as to complete and perfect the process of anesthesia or amnesia.

However, since few scholars are prepared to discount current astronomical retrojections of the state of the skies, or to believe in an astronomically learned ancient civilization that was subsequently destroyed, the coincidence may be handed over to non-scientific folklorists of the occult, or laid to a naive poesy of the ancients revived by a befuddled English savant.

Notes (Chapter 21: Jupiter's Bands and Saturn's Rings)

- 1. This article is one of 22 essays contained in a presentation to Dr. Immanuel Velikovsky on December 5, 1975, in honor of the 25th anniversary of *Worlds in Collision*. It was first published in Kronos, vol. II 3 (1977).
- 2. XX Classical Journal, No. 40 (181), pp. 324-6.
- 3. *Ibid.*, p. 324. Taylor cites Bonnycastles's *Introduction to Astronomy*, p. 37 as his source. He properly adds that the binding of Saturn by Jupiter was well-known myth, but the binding of Jupiter occurs only in these two hitherto undiscovered passages of Proclus.
- 4. Cf. Galileo's First and Third "Letters on Sunspots," to Mark Welser, May 4, 1612 and December 1,1612, pp. 101-2 and 143, in G. Galilei, *Discoveries and Opinions of Galileo*, trans. by Stillman Drake (New York: Anchor Books, 1957).
- 5. A. Pannekoek, *A History of Astronomy* (trans., Interscience Publishers, New York, 1961), pp. 254-5.
- 6. J. Harward, *The Epinomis of Plato* (Oxford: Clarendon Press, 1928), pp. 93, 95ff.
- 7. *Op. cit.*, p. 324
- 8. *Ibid.*, p. 326.
- 9. *Op cit.*, pp. 143-4.

Part Four

POLEMICS AND PERSONAGES

CHAPTER TWENTY-TWO

MARX, ENGELS, AND DARWIN

More research is needed to delineate the attitudes of Karl Marx and Frederick (or Friedrich) Engels towards the Uniformitarian and Catastrophist paradigms of the nineteenth century, and to explain why the two men chose to align themselves with the Uniformitarian rather than the Catastrophist mode of thought. After all, were they not complete revolutionaries?

The term "paradigm" has been popularized by Thomas Kuhn in *The Structure of Scientific Revolutions* (1962; 2nd ed., Chicago, U. of Chicago Press, 1970). The term embraces much of the theory and discussion employing the terms "world-view" (J.C. Greene), *Weltanschauung* (A. von Humboldt), "ideologies" (Mannheim), "models" (R. Thom), "fictions" (Vaihinger). Kuhn's term is unquestionably appropriate as he defined it:

"On the one hand, it stands for the entire constellation of beliefs, values, techniques, and so on, shared by the members of a given community. On the other hand, it denotes one sort of element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science." (p. 175)

It may be too often assumed that there is little which is problematical in the position of Marx and Engels on the present issue. That is, Marx and Engels were aspiring "modern" scientists; the movement of "true" science was along Uniformitarian lines; therefore marxism would join the victorious ranks of science, which, being politically neutral and scientifically objective, could serve communists as well as capitalists in education and politics.

However, if the following steps are developed in the present research inquiry, the matter may be cast in a different light:

1. The Uniformitarians adhered to a paradigm of science that can be abstracted and observed as a developing process. Its elements were composed typically of the following beliefs: time and space are absolute; the Newtonian laws of gravity and motion govern natural events rigidly; the heavens are constant and the universe is orderly; they operate through measurably equal units of time and through measurably equal coordinates of space; time is long and uninterrupted by sudden leaps; the surface of the earth has accumulated its features over long periods of time; nor are sudden leaps found in biology and cultural history, which have proceeded "by very short and slow steps" (Darwin); and social change is part of "cosmic evolution" (Herbert Spencer).

The U paradigm can be considered broader than its circumscribed form as a mere hypothesis that rates of change in geology are to be considered as having been uniform unless proven to the contrary. Rather, the U idea is taken in its broadest form as a world view, in the period of its great victory. For it was tied to two centuries of prior changes in the sciences of man and the skies. The philosopher-psychologists Locke, Hume, Fontanelle, and Diderot had made of man a mechanical creature, highly determined by external forces. Hutton, the father of geological uniformitarianism, published his Theory of the Earth in 1775. Writes S.E. Mason A History of the Sciences (1962, 403), "Hutton based his view that the rock-forming agencies of the earth were constant on the by now established theory that the solar system was mechanically stable and permanently self-sustaining."

The close friendship and association of Darwin with the great U geologist adds credibility to the labeling of a U paradigm. In fact the peak prestige of the U paradigm would probably be registered around 1875, after the publication of the *Descent of Man.* (*The Origin of the Species* had been published in 1859.) By 1875, too, Ernest Renan was widely known for his social-scientific studies

of religion and myth, foreshadowing *The Golden Bough* of James Frazer, of whom it has been said that "Frazer seems an English Renan, so close do the two men appear at a number of points both in outlook and reputation." (Vickery, 1973) The U paradigm penetrated all scientific fields.

2. The Catastrophist paradigm, whose principles had been steadily eroding between 1600 and 1875, offered the following beliefs: the world, the species, and mankind were created abruptly; they were repeatedly subject to destruction by divine or natural forces in the skies and earth; the time spanned by these catastrophes was short, changes in temporal and spatial dimensions of the universe are brought on by divine, heroic, and natural forces that are immense and unpredictable; all the hosts of heaven - sun, moon, stars, planets - may change their motions and qualities; in this awful setting, measurement is less of the essence of being than miracles; history moves in cycles.

Even since ancient Greek science (Parmenides, Pythagoras, Plato (*et al*). there had been a scientific type of catastrophism, employing the divine very much as Newton and most modern Uniformitarians did, as a removed and/or mechanical power. This strain had been modernized, even as Newton was writing, by his disciple Whiston, and later by eminent figures such as Vico, N.A. Boulanger, Cuvier, and Buckland. The strain was much more evident in the time of Marx and Engels than now.

3. Marx and Engels were deeply engaged in developing a paradigm of Socialism (or Communism) that was composed of numerous elements: materialism (with atheism); economic determinism (which Engels traced back to the beginnings of life itself); the stability of the heavens and earth in the very process of continuous change. Science as a unity, embracing nature, species, societies, and individuals, all responding to similar laws. All is to be measured along a historical continuum in which (the Hegelian dialectic) opposing forces move according to three principles: that quantities change into

qualities and vice versa, that the opposites interpenetrate, and that negations are in turn negated. That geogeny teaches the evolution of the Earth was stated by Marx in 1844. The species evolved a will that is capable independently of abetting the relentless historical process: "Man is the sole animal capable of working his way out of the merely animal state." (Engels, *Dialectics of Nature*, New York: International Publ., 1940, p. 187.)

Given a sharply defined set of these three paradigms, one 4. expect to find that all three paradigms mav "interpenetrate" to some degree, but that the Marxist Paradigm overlapped considerably more with the other two. That is, close analysis may show that, with an approximately equal logic, rationality and (at least at that time) "evidence", either the Uniformitarian or the Catastrophist paradigm could be made to fit the Marxist paradigm. There are clear indications in their work of this: for example, Engels believed that mankind evolved first on the lost continent of Lemuria in the Indian Ocean, which sank catastrophically. Elsewhere he adopts the theory that intense atmospheric change (heat, etc.) can bring about conditions for new species of life and life itself. He rejects Lamarck's "vital aim" of evolution but often shows Lamarckian as well as Darwinian beliefs, even including the racial acquisition and inheritance of mathematical aptitude. Both Marx and Engels held to a kind of cyclical or at least helical theory in their historical dialectics, and Engels speculated upon a long-range cyclical cosmology - with worlds being born and then dying out, only to be reborn. His sense of absolute time was perhaps a little shaky, now taking in the grand new sweeps of geological time enthusiastically, and then again conjecturing a rapid evolution within the record of the human species. It remains to be seen how much he knew about or how seriously he considered the scientificcatastrophists such as N.A. Boulanger, or the scientific side of theists such as Buckland. At times he gave hints of backsliding; thus, writing in Dialectics of Nature (led. 1966, 28); "The defect of Lyell's view - at least in its first form - lay in conceiving the forces at work on earth as constant, both in quality and quantity ... the earth does not

develop in a definite direction but merely changes in an inconsequent fortuitous manner."

- Marx and Engels were conducting a triple campaign a) to 5. revolutionize philosophy: They had turned Hegel upside down and were using his historical dialectics to unite all phenomena of nature, biology, and society into a single scheme. b) to offer political programmatics to the world: From the great philosophical scheme would be deducible the principles of the future society, the classless communist society. And c) to lead a political revolution. Any action on their part such as to align themselves with a scientific paradigm could not be accomplished to the neglect of any of these three goals. That is, to them a "fact" or "theory" of science, such as "long-term time", "drop-by-drop geology", or step-by-step biological evolution through natural selection could never be simply such. Either it could be made to fit their truly global paradigm and world-scheme, or it had to be discarded, or it was a mistake. Yet they were compelled to confront any assertion that engaged the attention of the "intelligentsia" or "the masses," and, of course, such were the elements of the great paradigms.
- 6. Whereupon, Marx and Engels assimilated, not without negative criticism, the Uniformitarian paradigm to their own Socialist Marxist paradigm in several philosophical steps. There is many a statement in the Marxian literature of the type of "We were first to..." and "Come into our camp..." And, also, direct statements show under what conditions they would accept "long-time"; "evolutionary biology"; stable nature, and "natural selection" into this system.
- 7. Simultaneously, they might have been seeking to attach to their movement the social respectability that began to accrue rapidly to "up-to-date" science. Their contempt of Catastrophists is manifest: "Cuvier's theory of the revolutions of the earth was revolutionary in phrase and reactionary in substance" (Engels, *Dial. of Nat.*, p. 10) Their pride at being the essence of the modern scientist is manifest in many places.

- They attempted to recruit practitioners of the new science 8. to their political movement - or at least to their philosophy which, significantly, they felt would inevitably lead to their politics. Charles Darwin was the most notable case. Considering how enveloped Darwin was in the social circles of "gentlemanly" Whig England, and that his greatest defender and "social equal", Thomas Huxley, was a "Social Darwinist", ergo an enemy of the planned society, it can be ventured here that the attempt to capture Darwin would be as foolish as trying to hijack an El Al plane with a penknife. The London Geological Society was "composed of gentlemen", and was taken over by liberal Whigs, whose perceived opponents were the church and Tory establishment, not the capitalist class. (G. Grinnell, 131, In E. Milton, Ed., Recollections of Fallen Sky, 1978 (Distrib. by Metron Publications, Princeton) Marx and Engels are among the founders of the sociology of knowledge and were past masters at scrutinizing the motives behind people's actions. Indeed, Marx wrote, promptly upon reading The Origin of Species, in a letter to Engels (Marx-Engels Selected Correspondence, Moscow, 1965, p. 128): "it is remarkable how Darwin recognizes among beasts and plants his English society with its division of labor, competition, opening up of new markets, 'inventions', and the Malthusian 'Struggle for Existence'". It may be considered whether they were here acting irrationally, or perhaps rationally on a "nothing ventured-nothing gained", or "there is nothing to be lost" basis. Whether there was actually some long-term losses as a result of such a "calculated risk" is a question worthy of consideration.
- 9. The study has an intense focus on such incidents, but its ulterior goals are larger than the personal interactions studied. The earlier interest of the present investigator in the connections between ideologies and practices (cf. *The Velikovsky Affair*) have suggested to him other similar cases such as the present one of Marx and Engels. The use of Catastrophists, Uniformitarians, and Socialists for

case study leads in turn to a larger interest in the sociology and psychology of science.

The opportunity is extraordinary, for Marx and Engels were interested third parties to the widespread conflict of many years between Uniformitarians and Catastrophists. How they made up their minds to support the former, and to what extent they would support them, are questions whose answers bear importance in he history and philosophy of science.

Such considerations imply that there will be no lack of publishing outlets for the final manuscripts, but also that the final report should also avoid being "captured" by its medium of publication and should appear in separate monographic format, or, if not, under the most objective scientific auspices.

Monograph: The proposed report is conceived as possessing a simple organization as follows:

Prospective Table of Content

The Alignment of Marx and Engels with Scientific Uniformitarians against the Catastrophists

Introduction: A paradox of the scientific and social revolution; Marx and Engels (revolutionaries) reject "Revolutions of The Globe" (Cuvier's term) for drop-by-drop and bit-by-bit evolution.

Part One

The Setting for Decision (1830-1870)

- I. The Socialist Paradigm of Marx and Engels
- II. The Uniformitarian Paradigm
- III. The Catastrophic Paradigm

Part Two

Matching the Paradigms

- IV. The Three Scientific Models Compared for "Scientificity"
- V. The Theological Question and Agnosticism in the Three Models
- VI. Social Pressures: Public Opinion and Scientific Opinion on the Paradigms.
- VII. The Politics of Scientific Paradigms: The "Social Darwinists" Win the Uniformitarian Paradigm; Marxists Are Trapped in It.

Conclusion: A Fateful Decision for "Scientific Socialism." Revision of the conventional view of the decision; query whether subsequent progress of "communist science" has shown effects of the internalized paradox or contradiction (e.g. was the Lysenko episode an "aberration" of Soviet science or was it an eruption of the internalized contradiction?)

Bibliography

BIBLIOGRAPHIC NOTE

The topic of the proposed research is specific but the materials of research are diffuse and far-flung. The material to be consulted does not lend itself to a preliminary set of titles. On the one hand, a number of works on nineteenth century intellectual history and histories of science (such as H. T. Pledge's *Science Since 1500*, 1959) carry accounts of Uniformitarianism and Catastrophicism, Darwinism, Marxism, the struggle between science and religion and so on to other topics under treatment here. There exist some excellent more special studies as well, such as C.C. Gillispie's *Genesis and Geology* (1951) and John C. Green's *The Death of Adam* (1959). The works of Lyell, Darwin, Cuvier, and many another contributor are of course readily available. The complete works of Marx and Engels are published in German and beginning to be published in English (in 100 volumes); meanwhile much of

the essential work, such as Engels' *Dialectics of Nature*, is available in English, too. The "Social Darwinists" who 'stole" Darwinism from Marx and Engels (and socialism) are also treated in a number of sources, both original and secondary.

On the other hand, the subtlety (if the word may be permitted) of the proposed investigation requires that fragments of evidence and indicators be pulled from many sources. Consultants, who have spent their lives reading in the voluminous archives, can probably give some of the best clues to where to look for pieces of the mosaic. The most important letter of Darwin to Marx refusing permission to let Volume II of Das Kapital be dedicated to him (13 October 1880) was first published in the Soviet Journal Pod Znamenem Marxizma in 1931 (un 1-2). In his speech at the grave of Marx (17 march 1883), Engels, according to Valentino Gerratana (New Left Review, 1975, p. 61) quoting from Marx-Engels Selected Works (London, 1978, p. 435), "publicly linked for the first time the name of his great dead friend with that of Darwin," saying "Just as Darwin discovered the law of development of organic nature, so Marx discovered the law of development of human history." The statement is repeated by Engels in 1888 in his preface to the English translation of the Communist Manifesto. Again, tucked away in Marx' Theories of Surplus Value (London, 1969, V. II, p. 121), is the assertion that Darwin could be used to refute Malthus (despite Darwin's statement that Malthus was his inspiration for the theory of natural selection!) Or, in setting a benchmark for the total disrepute of catastrophism (which is necessary to show that Marx and Engels would have had strong motives for eschewing it), one searches out indicators such as The Spectator (7 May 1887, 626) asserting, "No geologist of repute now believes that mountain-ranges originated in catastrophes."

The literature in German, French, and Italian on evolutionism and Marxism is large, and at this point it is hard to say which works may turn out to contain more than the typical polemical and philosophical arguments. By the same token, it would be premature and tedious to list the works of Hume, Kant, Hegel, Lamarck, Lewis Morgan, Herbert Spencer, and others, who also have a general relevance and may be cited and quoted in establishing the "circumstantial evidence" for the character of the missing pieces of the puzzle.

The three paradigms of Uniformitarian, Catastrophist, and Marxian thought will have to be originally constructed, though with reference to numerous works. The specific question of the research - the psychological dynamics of Marx and Engels in "adopting" the uniformitarian model in whole or in part - has not, to the knowledge of the investigator here, been asked before. The obvious "answer" given or implied in numerous places in the literature, that "Marx and Engels liked Darwin's scientific explanation of the origin of species" will, it is believed, be reduced to a misleading simplism upon the completion of the research.

POSTSCRIPT: A CAUSE FOR EMBARRASSMENT

The research proposed above was submitted for support to the National Science Foundation in 1977 and turned down smartly by its anonymous critics. A note in *The Journal of the History of Ideas*, (Jan-Mar 1978, 135) based upon articles of Lewis S. Feuer (32 Annals of Science, 1975, 33 *Ibid.*, 1976), called the well-known writer Isaiah Berlin to task for repeating a canard about Marx. Apparently, the widely disseminated story, that Marx had written Darwin asking for permission to dedicate to him the second volume of *Das Kapital*, was false; further, Darwin had not written to Marx in reply, refusing kindly the permission. But the Darwin letter had been written to Eward Aveling.

In reply, I. Berlin explained that in truth Marx and Darwin had not written to each other. Berlin's passage in his book, *Karl Marx*, was based on a 1934 article in *Biochronik* which in turn cited a Russian translation of Darwin's 1880 letter in a 1931 work. He added that the story was still being disseminated in the Soviet Union. Of course, it is also still carried in a number of English-language works.

Marx complained of the *Origin of Species* as being "grossly unfolded in the English manner" and Engels of its "crude English method." Marx, long before Darwin, had conceived of society as having a natural history and was a king of evolutionist, without natural selection. But both approved of his work.

If I were now, six years later, to answer the question I posed for research: "Why did the great revolutionaries not support revolutionism?" I would not have to contend with this annoying proof of their support. I would perhaps move toward the theory that they gave Darwinism reluctant support because they were being swept off their feet by the rush to evolutionism, and because they were so totally joined in opposition to the religious establishment.

The implications of the problem posed here, and for my interest in it, are not alone historical and philosophical. I foresee that communist theory, impelled by the logic of revolutionism, may discover quantavolutionary roots in the thought of Marx and Engels and find their development to be more compatible with marxist theory than is evolutionism. If so, the center of natural philosophy and its subtended sciences might shift to the Soviet Union.

CHAPTER TWENTY-THREE

RELIGION AND EDUCATION

Present here first is an editorial essay criticizing attempts to avoid the consideration of the Bible in schools and to restrain schoolroom discussion of various hypotheses of natural history. The second piece sketches a method for examining the relations of state education to religious teachings. The author is generally concerned that the words "to teach" should mean "to educate" or at least "to consider" rather than meaning "to advocate" and "to indoctrinate."

I. QUANTAVOLUTION AND CREATION IN ARKANSAS

Sometimes when you see how winners behave, you sympathize with the losers. I have been feeling that way about the Arkansas trial on teaching creation. The state's lawmakers, in that mixed mood of cordiality and cunning not foreign to our fifty-two bicameral bodies, decreed that creation science should be taught alongside evolutionary science in the schools of the State. This, my experience as political scientist told me, was a bit daffy to begin with - and probably unconstitutional.

But now experts have paraded before the court. The lawyers have had their say. The media and the intellectual establishment have rooted against the enactment. The skeleton of the ancient Tennessee monkey trial has been dangled before our eyes. The creationists have been humiliated in one more contest. The prestigious scientists are back in their academic locker rooms receiving congratulations. A few fans, carried away by remote analogies, say that we will have to tolerate Reaganism awhile longer, but at least not that bit about God building the world in a week.

The expert testimony against the law may have been misleading, however, as to the current posture of science respecting biological change. Walter Sullivan (NYT Dec. 27) has deftly indicated the short-fall of truth: that theories of evolution now also include theories of genesis in outer space or in transferences from cosmic bodies; that evidence of transitional types or "missing links" in evolution is today scarcely richer than in Charles Darwin's time; and that, in some quarters, jumps in evolution are considered probable. In this last case, we go back to catastrophic and saltation theories of the past century and to theories of a directing inherent intelligence from this century.

Professor Stephen Gould of Harvard University was a witness in the Arkansas trial. Although unfriendly to the creationists, he has himself devised a saltatory argument, based partly upon increasing evidence that catastrophes have brought about both the extermination and birth (one dare not say "creation") of species; this he calls the theory of "Punctuated equilibrium." I "quantavolution" and find myself, favor the term consequence, sometimes in the company of Biblical literalists and creationists; they are, it goes without saying, as intelligent and effective as their non-literalist scientific counterparts.

Gould, like most educated people, is committed to very long ages of evolution. To him and to them, the very thought of Biblical literalism, with its collapsing of time into a few thousand years, is red flag to the bull. Here again, Sullivan has delicately hinted of the possible vulnerability of measures of time. Very little time may have been needed for evolution itself.

Quantavolution could have been a prompt, highly creative business under certain catastrophic conditions, as, for instance, in great cyclonic chemical factories fashioned from a bombardment of heavy meteoroids. This would leave thousands of unchanging species hanging around "unnecessarily" for millions of years between quantavolutions. "In other words," writes geologist Derek Ager, "the history of any one part of the earth, like the life of a soldier, consists of long periods of boredom and short periods of terror." A number of empirical scientists and philosophers can be cited to these points. A few of them go far beyond Agar and are severely critical of long-term time scales.

So, is the majority of scientists telling the majority of the State legislature: Your majority cannot vote against our majority? I trust that this is not the case. No. They must be trying to say, but awkwardly, that the name of God should not be bandied about in the classroom, first because to do so is unconstitutional, and second because discussions of God raise tempers unduly and go on interminably to the detriment of empirical studies.

But, giving the legislators the benefit of the doubt (which is good law), they too may have had such in mind. They may want taught in the schools something that they think is creation science, meaning those forms and findings of scientific work that do not exclude peremptorily the account of cosmic and human origins accepted by the majority of their constituents. Besides, they may argue that young people would learn their biology lessons better if they had more than one model of genesis put to them. Furthermore, they may believe it harmful for students to hear one story in class and a second story at home or church, or perhaps nowhere; such compartmentalization can only contribute to the madness produced by our complex, contradictory, pluralistic, and confusing culture.

In the end, not much will have happened by virtue of the Arkansas creation trial and we shall go on in the schizoid style of our culture. This is too bad. Discussions of contrasting theories of the origins of life are educational. There might have been an opening here to brighten up the drab and dispirited classrooms of some of our schools.

II. COSMOGONY AND THE CONSTITUTION

(The following memorandum was prepared in May, 1982 for the American Enterprise Institute of Public Policy Research, Washington, DC. It outlines a research and public policy project recommended for the issue that, in a cursory way, is addressed in the article above.)

INTRODUCTION: The issue is presently raised of opening educational offerings in public schools to theories that can accommodate certain widespread religious beliefs. The theories deal with cosmogony, a basic question for both religion and

sciences: what brought about the universe that humankind experiences? The answers are several and conflicting; public consensus is absent. Hence, the issue belongs in the eternally important category: the accommodation of nonconsensus views on basic matters under a Constitutional consensus. In salient ways, the question resembles others once or now experienced: Can a Constitution govern a nation half-slave and half-free? A nation half-socialist and half capitalist? A people one-third living from governmental work, a third on welfare, an a third on independently derived in come? One-half at war and one-half at peace? Of two or more languages; different religions; different world views?

As the final product of the research, a report may be visualized in four parts: A historical-philosophical section; a scientific section; a legal section; and a pragmatic policy section.

The first describes the problems of maintaining essential constitutional consensus in regimes split by diametrically opposing ideological factors, stressing the age-long tug-of-war between religious and secular interests, leading up to and through the U.S. Constitution, down to this moment. It focuses especially upon the educational system as the prize of the various protagonists. It defines the present issues as centered upon the demand of certain religious parties, having translated their religious authority into secular convictions governed by the rules of science to impose consideration of the new "creation science" upon the teachers of elementary and secondary school pupils.

The second section inquires how far the various natural and social sciences have gone, if indeed they have so moved, in approaching the areas dominated by "creation science." The points d'appui appear to be on the suddenness of creation and the role of natural catastrophes in bringing about the changed state of the world. At the least it seems that a growing body of science, which is nonreligious, is occupying common ground with creation science on these three matters. The trend, moreover, is manifest in practically every field of science.

The third section introduces the rationale by which opponents of the adamancy of conventional public education (who are in turn

backed by the claims of a great majority of scientists and their organizations) seek to ensure equal status for their views under the U.S. Constitution. An intensive examination of the case thus far argued and adjudicated will be supplemented by an examination of cases pending.

The last section will discuss the views of the public, the politicians, and the educators on the values implicated in the contests. It will project the consequences of the possible legal outcomes. It will finally attempt a reconciliation of the views of the parties in a public policy that, if it may not be entirely satisfactory, would satisfy constitutional requirements and improve what is in the last analysis the goal of all concerned, the mental and moral development of the young by way of the educational system.

PART ONE: HISTORY AND PHILOSOPHY

- I. What attitudes do the public and its leaders hold on the cosmogonical issue in public education, and how intensely? Who is active on it?
- What are the young around the country hearing, reading II. and learning now that relates to the issue?
- Scientific freedom. Essentially all matters can be publicly III.discussed in philosophy and science. Instances of opposition from governments, from private groups that include scientific and educational establishments?
- Matters permitted (or disallowed) for discussion in IV. schools
- "Whatever the teacher can get away with" (like the 1. on the beat) policeman
- 2. What the school (educational) authorities prescribe and permit
 - a) Free schools
 - Conventional schools b)
 - Conventional (trade) schools c)
 - Morally defined schools (religious) d)

- 3. What the political authorities prescribe and allow authorities to discuss. the school
- 4. What the publics prescribe and allow the political authorities to prescribe and allow.
- What the Constitution prescribes and allows to the foregoing.
 - 6. What the courts determine to be what the Constitution prescribes and allow to the foregoing.
- What positions may be advocated in public? Practically V. any. What is disallowed? (e.g. the overthrow of government by violence).
- VI. What may be advocated in public schools? Describe and document
 - 1. Systematically (in the curriculum), e.g. darwinism.
 - 2. Personally (e.g. deism, sexism)
 - 3. Unconsciously (e.g. class and race prejudice)
- VII. Limitations on teaching as affected by competence and relevance. Problems of preserving a boundary between discussion and advocacy. Might such an impracticality justify a curricular limitation?
- VIII. Distinctions of fact, propositions, theories, general theories, general philosophy, world-views.

PART TWO: HOW SCIENCES COPE WITH COSMOGONY

- The Topics of Natural and Religious History: The logic of their handling in science and religion (as distinguished in VIII. above). Common sub-topics:
- 1. Origins or genesis. involvement of the Divine and Early causes. of First or

- 2. The Time-table of the World, of Natural and Human History.
- 3. The occurrence and scale of catastrophism (e.g. "Deluge")

Astronomy and Astrophysics X.

- Α. Conventional rhetoric: "Big Bang," 5 billion years, gravitation, etc.
- Deviations approaching certain religions: intelligent B. duration, unstable Sun, etc. life, short

XI. Geology and geophysics (Earth sciences)

- Α. Conventional rhetoric: gradualism, landscape evolution, etc.
 - B. Deviations: catastrophism, recency, etc.

XII. Biology

- Α. Darwinian. neo-darwinian, mutation. natural selection, gradualism, etc.
- В. Macro-evolution, inherent design of change, quantavolution, catastrophe-induced change, recency.

XIII. Anthropology and Sociology

- Long history of descent from primates, gradualism in evolution of culture, religion wholly culture dependent, etc.
- В. Culture is religion-dependent, short history, unknown descent.

XIV. Psychology

Ethological view ("man is one of the smartest animals"), etc.

- В. Uniqueness of man; man creates his perceived world, etc.
- XV. Summary: Norms of science and deviations therefrom (unconventional logic and history).
- XVI. Norms, and deviations therefrom, within and among religions and in the population.

XVII. Reconciliation:

What can be advocated as scientifically factual and theoretical.

What can be discussed under religion but not in science.

What parts of views of certain religions cannot be handled as science.

PART THREE: LEGAL

- XVIII. A review of the law on separation of church and state, as related to the cosmogonical issue.
- XIX. A scenario of what the constitutional law "could have been" under the same constitutional provisions but with different "public winds blowing." What future scenarios are conceivable? XX. The analysis of McLean vs Arkansas and related cases on the cosmogonical issue.
- XXI. The extent to which the Constitution can be said to demand solely a secular and scientific approach.
- XXII. The extent to which the Constitution can be said to delegate the definition of secular and scientific theory and "truth" to school boards, legislatures, scientific bodies, and judges.

PART FOUR: PRAGMATIC

XXIII. The extent to which the secular and scientific approach is presently prescribed and in fact controlled and pursued in the public schools.

XXIV. The extent to which the secular and scientific approach, if "properly and logically" provided in public education, satisfies the logic, needs, and demands of religious groups.

XXV. Whether religious views (considered as authoritative but unverified fact statements and other rhetorical positions ranging up to world views) can be justified in education generally, and especially in the public schools.

Whether cosmogonical material, as presented in XXVI. public schools, should be assigned to the social sciences, biology, the natural sciences, or in a special combination or department.

XXVII. The educated child, presumably the goal of everyone concerned with the cosmogonical issue. What the pupil should be concerned with factually and morally. How morality and moral teachings permeate all education in different forms and what the effects of excluding the divine may be.

CHAPTER TWENTY-FOUR

THE OUTLOOK OF SCIENTISTS

A social scientist studying scientific behavior can readily bring to bear upon the subject certain facile propositions of his trade. None the less useful for being imprecise are the injunctions against regarding all scientists as alike and to allow for the temporal changes in their ways of recruitment and their environmental settings. So we cannot speak of all scientists. Yet modes of behavior do exist and, in generalizing, we should perhaps imagine a biochemist on the "pure" side and a structural or electronics engineer on the "applied." Furthermore, if it is today rather than fifty years ago of which we would speak, we should conceive of a fairly administered scientist - listed on a payroll, belonging to associations, assured of a lifetime job, possessed of an M.A. degree if an engineer and Ph.D. if "pure," using institutional rather than personal library and research facilities, spending government funds, and accorded a higher middle-class prestige.

Whatever we would say about our model men may be cautiously extended to the remaining vast majority of scientists insofar as they are related in character, habit, and habitat. Had we time, something extra might be said of the more absolute deviants among behavioral and natural scientists; we wish we might, for it is tiresome to have scientists judged by their extremes and rather ironic when the judges are, in other spheres, experts upon sampling and restrictive interference. Surely, administration, of which we have to do here, can only exist on a presumption of manageable clusters of traits and actions.

FALLACIES ABOUT SCIENTISTS

Our typical scientists are not without various conceptions that they share with the educated population and which, on the whole, do more harm than good, both in understanding the role of science and in the practice of science itself. Although an empirical validation of the extent and intensity of the attitudes is unavailable, they may be set forth hypothetically:

- The scientist and his educated clientele are likely to 1) believe that the scientist is more specialized than he actually is. Sociologists of science would do well to supply us with a variety of information: What part of the symbol-bank and logic-bank of typical scientists is a result of pre-specialized education and training in the culture, the family and the schools? What part of his symbol-intake is trans-disciplinary? What part of it is irrelevant, strictly speaking? What part is "Mentally or operationally" employed in ways more extensive than either the intent upon intake or the prima facie "scientific" and "specialized" meanings of the symbols? The sum of the answers to these questions would help define how specialized the scientist is. That question would probably be answered "Not much." The typical scientist carries his specialization "on the top of his head." And a gross miscellany rides below.
- A second harmful belief is that the scientific method is a 2) UNIQUE behavioral set; its procedures of hypothesis, controlled observations, findings, and relating - with all the detailed stipulations, techniques, and modes of expressing the behaviors in symbols - are thought to be the last word in human development and qualitatively distinct from other behavioral sets. Instead, the scientific method should be construed as a distinct but recognizable form of administration. That is, it may be viewed as a set of routines, historically evolved and professionally sanctioned, for arriving at a decision of a confirming or disproving sort, whose value is thereupon judged by the leaders (often co-administrators) of the system of administration. Their judgment is affected by, among other things, the relation of the decision to other decisions already made, and especially the disturbance to the system of decisionmaking and decisions-made of the new decision with its potentiality for heightening the efficiency (internal and practical) of the total system, if adopted.
- 3) It is further believed by the typical scientist (from whom emerges in collectivity the general influence of science upon society) that the real world is the hard world of the senses, that

there is one world, and that science is objective in relation to this world; that is, science "finds" the world. I suppose that scientists will go on indefinitely en masse "finding" the real world, rushing in to fill the gap every time that a deviant scientist or a poet, or an Idealist cracks open reality. Yet one can still assert, no matter if pessimistically, that a number of the social problems of science would be eased if scientists themselves were to permit themselves a hypothetical theory of the reality that they presume to be dealing with.

An important consequence of this same recommendation, if adopted, would be that scientists and their clienteles would cease to believe that they are seeking the truth, except as a myth that is needed to inspire them. They seek an answer reflected back from the packed closets of reality in the terms of the question as they ask it.

4) It would also be socially and scientifically helpful, if scientists and their educated clientele would abandon the notion that there is only one way of saying things "scientifically." A proposition may be phrased in as many ways as may prove useful with regard to the system of logic and science it is intended for or in relation to the action it is intended to guide. A single event or action sequence may be phrased in relation to several natural and human relations sets, and in prose or mathematical language of sundry kinds.

In the view of science as administration, the difficulty referred to is one commonly experienced in administrative systems. Once devoted to a special administrative role and language, the administrator cannot adapt himself to other modes of expression; he regards them as wrong and sometimes dangerous - even when the applicability of the language is manifested in its control over behaviors and operations.

5) It is further erroneously believed that the natural sciences are systematic. This condition is thought to be of immense importance to science itself and to the society it serves, as well as being a holy stigma that marks it off from "unsystematic social science." (We may as well put aside the last point, the nonsensical quality of which is highlighted by the general answer to the other points.) The natural sciences are not systematic,

however; some elements of mathematics are, but these are forms of non-empirical logic, a world in itself. The science of mathematics shapes and is shaped by the empirical sciences, natural and social. Not being anchored directly to reality problems, it can sometimes unite a field or part thereof before the field has valid propositions to "really" unite; "Devinez avant de démontrer," wrote E. Kasner, is the principle of great mathematics.

However, systematic empirical science is hard to discover and is probably a myth. What we have are a few major individual propositions whose practical implications are numerous (for example, the Mendelian "laws"); a few links of large practical importance (for example, the general principle of relativity); the useful predictive classifications (for instance, Mendeleef's Periodic Table of Elements). Most laws of the individual fields of science are not tied together logically, empirically, or quantitatively. Men know them as impressive beings rising separately out of the formless stream of existence. The situation is worse when the various fields are considered. As they are written, understood, and applied, the statements of physics are as far from biology as those of anthropology. Yet, "in theory and essence," they might be capable of a common formulation even while carrying on their former interdisciplinary functions. If by systematic science is meant an interlocking set of propositions, framed in the same symbol-system and moving up and down the full range of generality and across the full diameter of subjectmatter, then systematic science only begins to exist. (We should add, furthermore, that not one but numerous such systems is the conceivable ideal.)

6) The typical scientist is also likely to believe that a certain system of politics fosters the development of science. This is usually a "welfare state," centralized, common-man democracy. Actually, the development of science has occurred richly in mixed systems, in whose interstices science may house and whose inconsistencies feed it. Bureaucratic nineteenth century Germany was favorable to scientific development, but not bureaucratic Soviet Russia today. Elements of democraticness (in the Old Liberal sense) and aristocracy played a role in the German situation; a totalitarian psychology dominates Russian public policy today. In any event, the problem is most complex,

depending for formulation and solution upon a careful desloganized sub-classification of political systems, but also a fine classification of scientists according to personality-structure, field, and level of problem pursued.

7) Most scientists and their clientele still hold that social scientists are not "true" scientists and almost all of them will deny that the natural scientist is a SOCIAL scientist. The first belief has been refuted elsewhere; suffice to say that no acceptable evidence demonstrates any qualitative break in the continuous susceptibility of social and natural materials to the scientific method.

It is more important here to deal with the second belief, that the natural scientist is not a social scientist, when in his habits, his perceptions, and his statements he behaves as one. He would be a better scientist and a more effective personality if he acknowledged the fact. The following behaviors and conditions make him a social scientist:

- a) He is a psychological product of his culture and behaves as such.
- b) His work and his unconscious or conscious critical faculties are based upon the psychological preconditions of perception and cognition.
- c) He uses language. He has to communicate.
- d) He uses logic.
- e) He operates in an administrative setting whose rules are part of his work.
- f) His statements about natural events and relations are human-oriented, ultimately if not immediately, and if "applied," probably immediate.
- g) Finally and most important, if least credible, any statement of natural relations (even if it be discovering a sub-atomic particle) is a statement of social science in all of the above senses in the first place, and beyond that insofar as

the "thing" described only exists as the faint echo of a set of axiomatic behaviors begun in the everyday world. Man can only know himself, and all of the finery of the artificial world is himself mirrored. Once he disdains some part of himself, that part of his image vanishes; once he fancies himself in a new guise, a new world, which may be new science, appears. For example, today we speak of new developments in the life sciences and psychology wherein the means of psychotherapy and pharmacology are joined and where a new common language may be expected to develop. It is possible to conceive of a whole range of social and natural sciences possessing a new common language, and interchangeable operations wherein social and natural are "nonexistent" as separates. This would occur, I should venture, when the major parts of critical sciences becomes "objectified" in the fundamental sense of that world, that is, independent of the "existence" of the things being talked about. At this point, scientific discourse will be constructed around problems to be solved, including perhaps some systematic ethical statement. There are indications of such a development in segments of the information sciences, in empirical-logical philosophy, in operations research theory, in non-parametric statistics, in game theory, and in model-theory in several empirical sciences.

ALL SCIENCE IS SOCIAL SCIENCE

Everything said in the previous section about the fallacies of the typical scientist's self-image, when reversed into affirmatives, help to describe the nature of the scientific system. The scientific system is a human system in the complete sense of the phrase. It can be viewed from the perspectives of a sophisticated time and motion study, with the proportions of science feeding into the systemic process with all other experience, with the extent of the system physically defined as the communicators of frequency of relevant contact.

It is particularly important to reorganize affirmatively the last expressed thoughts about "all science as social science." Going directly to the last defense of a natural science as apart from human science, the question centers on the nature of a validated theory:

- 1) A validated theory expresses world relations according to a conventional set of perceptions, dimensions, and symbols.
- 2) It refers to values, understood implicitly, when couched in "pure scientific terms," and made explicit, when in applied terms.
- 3) It instructs all known parties (this is a pretense, since the unknowns share an enormous common culture) that they will experience the equation, x=f(y), as its protagonist does. It assumes that they are interested in the experience, indeed in the precise experience or one very close to it. Thus, as in (1) above, the psychological state of the unknown parties is vital to the validation and transmission of the communication.
- 4) As well as suggesting that in order for x=f(y) to be true the function has to be uniform to, assimilated to the symbol system of, and lead to understandable consequences for all unknown parties, we would add that all of the factors essential to the production of the equation have to be satisfied in all succeeding experiences of the event being described. That is, it is not enough to have the equation and believe that these events occur infinitely in isolation. The total human interaction pattern has to be replicated with "sufficiently high" approximation of the original condition of the communication. Only this can be the radical operationalist position.

If a "core" of natural science is left, it must reside in that very constricted statement of an equation that isolates and abstracts the purely "non-human" interactions of x and y. We have shown, I believe, that everything about this statement, except the presumed "existence" of two interactants, is human, not natural. Yet there can be no denying that it is precisely this dehumanizing of the natural world, the abstracting and isolating of certain "things" in it, and the making of these particular and concrete, that has given us a changed world. (This is so, even though many other historical events of a more conventionally ideological sort, Christianity for instance, have changed the world as much or more.) This core of science, we must say then,

is vastly effective. It is so because (a) it gets credit for all the human relations that first composed and thereafter surround it; (b) its isolation is accompanied by magical instruments and incantations; (c) its effects are "newsworthy" in an age when, by circular definition, "news is what people want to hear" and what people believe in (thus, even though no event is as crushing as the withdrawal of love, a nuclear explosion is a new toy, unknown to other ages and the man on the street; but (d) most of all because, on the whole, the new relations of non-human being - a chemical reaction in a cell, a sub-atomic event, a new engine - produce new human relations, both psychological and real; in this sense, still quite human, the purely physical equation is a bridge between psychomotor present and human psychomotor potential.

THE ADMINISTRATION OF SCIENTISTS

The foregoing exposition of various dysfunctional perspectives of scientists and the view of science s a human system may have some utility to scientists in the process of discovery, research and development. This is usually termed the individual creative process. It is, however, my major intent here to discuss some of their implications for the science of the administration of science. For this purpose, we shall again take an affirmative stance and talk about the ideal social setting of scientific work, the ideal scientist, and the ideal scientific organization.

First, a clarification of the subject is in order. Administration is a process; the science of administration is the science that describes it; and the applied science of administration is the set of rules for conducting administration on behalf of specified goals, according to the science of administration. Administration is largely institutionalized habit with varying small introjections of hypothetical or creative behavior.

An applied science of administration perforce introduces values. You cannot act rationally without acting towards an end. The applied scientific administration of science must have goals. These goals are the combination of elemental goals that are found in all realms of life, with an emphasis, verging upon exclusiveness, on one goal - discovery. If we use Harold D. Lasswell's classification of valuing behaviors, we say that the

total of elemental base values is eight in number -- power, wealth, well-being, respect, rectitude, affection, skill, and enlightenment. The process of discovery is the search for enlightenment by this scheme.

Hence, in the broadest sense, that social setting, that scientist, and that scientific organization which can be termed most absolutely scientific are those that seek exclusively and successfully the goal of discovery. At the same time, the definition of the ideal in each case depends upon a set of preferences for means and ends behaviors that may produce more or less of the absolute achievement. Still, for an organization to be called scientific and a man a scientist it must be stipulated that they have as an important high priority preference the ambition to make discoveries about natural and human relations. Given this goal, administrative and habitual conduct must be oriented toward efficiency, that is, the highest return toward the goal in exchange for the lowest resource commitment possible.

THE IDEAL SETTING

Granted the vagueness of the value, enlightenment, and of its sub-value, scientific discovery, we cannot expect too great a precision in describing the ideal setting of science. We may list the following four event-complexes as favorable; very rough specifications are given the major terms, simply to indicate how the setting must be examined:

- 1. A pluralistic society, to nourish and protect differences. (Say, at least four autonomous sub-cultural groups of considerable functional and informal authority.)
- 2. A social orderliness and stability of at least one segment of society that can provide a nestling place for scientists. (Say, a considerable bureaucratizing or leisure set-up somewhere, which the creative and eternal-minded can cling to and move out from.)
- 3. A disciplined intellectual training of a significant number (5%) of the young for intellectual pursuits. (Say, not too much "Progressivism" in education, but enough drill in procedures and in the myths of intellectualism.)

4. A willingness of the elite to commit heavy resources (always relative to what is available) to discoveries. (Say, 5% of GNP).

All of these four items are, strictly speaking, beyond the province of scientists, as such. If they occur, science is promoted, if not, then suppressed.

THE MOTIVATED SCIENTIST

In general, keeping in mind that we are discussing a problem now of the applied science of administration, we must admit that whatever incentives produce more goal-directed behavior - with discovery as the basic aim - must be "good" ones, holding aside the surrender of certain mean incentives to other citizen goals (e.g. it may be deemed socially unwise to accord too much prestige to scientists, or too much money, considering democratic or anti-materialistic ideals). Suppose for instance a scientific group has varying numbers of certain German types who are motivated to scientific discovery by the power they gain in human relations; others of Jewish type who are impelled by a search for high respect; and still other "Yankee" types who wish to "cash in" on their knowledge or to find affable surroundings. Obviously the scientific administrator had better give up any of his own prejudices as to what a scientist should respond to in the way of incentives. So too those libertarians who universalize the force of liberty in scientific work. Liberty is a social permission to choose without restraint ultimate goals and the means necessary to reach such goals. Here too, the scientific administrator cannot prejudge the directions of the demand for liberty, nor himself demand wholesale liberty. So long as scientists and citizens make such a hash of the term liberty, of course, the administrator may often be in the position of proclaiming a desire for universal liberty on the one hand, while restraining a great many of its potential manifestations on the other.

To a high degree, therefore, the administration of scientists becomes a process of giving individuals the attention they require within a framework of liberties and restraints imposed upon means-values in terms of the basic value of discovery and such basic values as envelop the larger society in which the organization operates. The sociology of science thus becomes fundamental to the administration of science.

THE CHANGING COMMUNITY OF SCIENCE

At one time, perhaps from 1600 to 1920, the scientific community was fairly close-knit. Informal ties abounded. Journals were few and well-read. Dozens of the scientific fields of today had not come into being. Individual scholarship, or scholarship-apprentice teams, were almost the sole mode of organization. The lone tinkerer held the field. A loose, informal, but effective system, we should say.

The rapid increase in new fields, an increase in scientific activity in different countries, and an increase in technological orientation of societies brought about the situation still prevailing. In this phase we find a great many professional associations being organized, new journals appearing in abundance, and a developing crisis of collective information procedures. Practically all of the communicative administrative processes are bigger imitations of the former system. Huge associations use the vocabulary, machinery, and practices of old personal associations. Every journal acts as if it alone existed and sufficed. Communications through libraries and publishing is a halting step removed from 1600 A.D. Interdisciplinary project and team research, however, are experimented with and come to be regarded as essential, but they are administered "from outside" even when the administrators are coopted from the That teams. administration is regarded as distinct from scientific process. One may say that there has been a failure to achieve either effective informal or effective formal community. Yet the costs of trying to maintain a community of scientists or, better, a network of communities, are mounting rapidly. Exhausting conferences and consultation, for example, are made to substitute for ample, calm flows of systematic data storage and exchange. There is a loss of creativity, too, to auxiliary occupations, such as foundations offices and research entrepreneurship. That is, there is a superfluity of expediters, because of the basic malorganization of scientists.

A new era of science appears to be in the offing. In it, a rationalization of the role of the individual scientist is occurring. Both the sources and the language of contributions to knowledge are becoming collective and anonymous. Will a peak be reached in this regard and will it be impossible to give credit where credit is due? What will happen to the prestige motive that impels men to work as scientists? What "Fame" be replaced by more abstract motivations such as collective honors, security, good pay, and good fellowship? The network of scientists will be very wide, covering millions of souls, highly diversified by field. But it will be tied together by a ramified system of interlingual machinery of an interscience and inter-ethnic kind, of electronic data storage and retrieval apparatus, and of improved methods of coordinating the scientists' operations with policies and decisions.

It is in this kind of general system that science as administration and the administration of science will work. It may be called a "tandem" system, for the scientific work and administrative work will go together, with each scientist aware of the communication problem as never before, seeking to observe the effects of his statements upon human action rather than their separate commentary upon an objective reality.

Strangely, this is a 2500-year-old lesson that has only been verbally learned. A naive history of science is at fault. It has often been stated that the Greeks and other ancients possessed a potential for science not much less than the present achievements of science, but lacked a sense of technique. For example, Archimedes, who was the Greek scientist most concerned with technology, reports that he did not publish some of his work because it was too mechanical and practical. Far from being an aside in the history of science, this observation is the critical statement of what brought about modern science and where lies the embryo of the new science.

It is science as procedure that created modern science. To the classical idea of the world as the real thing, Leonardo, Galileo, and especially Francis Bacon added "the scientific method." But it is the fully self-conscious recognition of science as procedure alone that would bring about the new science. Science is a hunt for all the worlds there ever might be. Hence, when we appreciate the operations of science as a communication system

founded upon conventional agreements, we shall have a formula both for new scientific discovery and for organizing the discovering activities of scientists. Jean Piaget, psychologist of the origins of thought in children, once said "logic is the morality of thought, morality the logic of action." By the same token, scientific procedure is the morality of scientific thought, and the morality of science is the science of applied science.

CHAPTER TWENTY-FIVE

'SCIENTIFIC' REPORTING

The story begins in September 1963 when for the first time a professional journal, The American Behavioral Scientist, investigated the circumstances surrounding the publication of Immanuel Velikovsky's Worlds in Collision in 1950. The authors of the ABS studies, which were collectively entitled The Politics of Science and Dr. Velikovsky, presented a great deal of material that would appear to a reasonable man of good will to be damaging to the pretenses of scientific institutions, scientific themselves. practices, and certain scientists explanations for the behavior of scientists were offered, and substantiated by considerable evidence. A plea was made to receive Velikovsky's theories with a courteous and just appraisal, forgetting the disgraceful past treatment meted out to his work and to his character.

The following material consists of an article reproduced in its entirety from the April 1964 issue of *Bulletin of the Atomic Scientists* together with comments on that article, published in the *American Behavioral Scientist* of October 1964. A demand for a retraction and a chance for a full response was not conceded by the *Bulletin*, and required the full reproduction and response. Still, no way was available for answering the *Bulletin* before its own readership, who were left feeling that Velikovsky and the *ABS* both had been put in their place. The story is developed more circumstantially in *The Cosmic Heretics*.

CLICK HERE TO VIEW HOWARD MARGOLIS' ARTICLE.

CHAPTER TWENTY-SIX

EULOGIES TO THREE QUANTAVOLUTIONARIES

I

LIVIO CATULLUS STECCHINI
6 October 1913 - 28 September 1979
Oratio delivered 17 October 1979

Livio Catullus Stecchini Beloved child of illicit romance
A boy of lemons and flower
looking from Catania to the Ionian Sea
harking the threatening Fascist drums
following by way of eight tongues
and all manner of measures
the route of Odysseus,
the royal passages of the pyramids,
the Enlightenment and Disillusionment of modern man.

Tentmate of the corps of intellectual guards, he stuck to his post to the very end, weighing hypotheses, until, not giving up, mind you, he turned his face peacefully, for a respite, and died.

Diminished, the great bear, by then, so that he might, like a fairy child, slip through the keyhole of the otherworldly door, to where all measures cease to where the few corpuscules - or are they waves? - that sail about in abounding space, organized in the peculiar human mode, begin their free swim in eternity, infinity.

Beyond claim is Livio Catullus Stecchini.
Humanists, Catholics, Jews might find a
birthmark there but no sign of manacles.
No groups, except this, our own
non-group, can identify his body.
What a compliment, post mortem,
for a man:
That none owns him, none owned him
Such a great man, without claims and chains,
Never, nor, now, no more, ever.
We, the non-group, assembled once and for all,
attest to him, our man.

He was a professor
but this academy
and others equally distinguished,
were too limited for him.
They can boast that they
gave him a living, but better ought they boast
that he gave them more
than they were set to handle.
Stoicly he stood
for the puzzled students
to milk his patience.

He had his beloved families but roared when he sensed the trap of familial love and edged out the doors as daily the claims were assembled for Livio to take care of this and that: "Where are you going Livio?" "To the library - To bring Immanuel a book - To see Alfred." Not really higher claims, but freedom.

He was a man without cliques; you could take advantage of him. He was powerfully observant when his attention was called; he acknowledged good food between the artillery booms of his rhetoric. He was restless, but satisfied for the moment with whatever he found. He was generous. His wealth of mind is distributed around the world now in my pockets and yours, without usury. He was full of secrets that he would give away to any interested party - secrets of private lives, of history, of science, of myth, of writings, of books.

He was full of politics but emptied of actions because he knew the way and that none would follow it.

He would not set out to do good, but good would ride on his back. He would not seize upon a cause, but would give honest words, a comforting example, a plan of campaign.

His attention was everywhere.
You must seize his ear and eye.
For when you talk of General MacArthur
he is reliving the disgrace of Alcibiades.
And while you trace the route of Exodus
he is watching the Giants assault Olympus.
You receive your answer,
not where you clear a spot to snare a reply,
but out of an Amazonian jungle, or the labyrinth of Crete,
or deep from the pages of the New York Times.

He could not hate, agree as he might that in every particular, this one is an evil, that is a bad idea. He turns upon it, curious, contemplative, even grinning-it is agreeable, yes, exterminable in abstraction, but, remarkable, droll, typical "as Cicero said when..."

"like the Maori tribes who..."
"like the Bible which..."

He was a writer of many books who published but one, all to the advantage of the precious pieces in his manuscripts, articles and notes.

They live the life of the incunabula, and bits of papyrus, the legends, the rumors, the surviving numbers of baffling series that he found, distinguished, and appreciated, like wild mushrooms of the forest floor.

We must supply the ending: "Pythagoras said, whom Plato cites, as Plutarch quotes, which Stecchini renders" - but here the manuscript breaks off.

And he is right, now as before. The book is never fully written, as the play never ends, except by convention, which insists upon control of the world, lest we die.

If we could control the world, you would live forever, Livio, a never-ending book for us to read, whose pages of warmth and surprise move through all ages of time to all ports of call.

There we visit the gods, and the fishwives.
Anchors aweigh!

II

RALPH JUERGENS

Who are we to say but
Juergens' friends who call goodbye
and wish some testimony from
the world he leaves and joins concurrently:
Charges on the cosmic spheres should spark,
the electric sun confess its theft of power,
the academic hulks should shiver,
astronomy and physics classes suspend.

Tall sails of new bold abstraction moved quietly his boat of exigencies carrying family, offices, friends. Diffident teacher calmly correcting. His papers stand in orderly files, called to attention for the future salute. Magna cum laude his life work ends.

Princeton, November 7,1979.

III

IMMANUEL VELIKOVSKY 1895-1979 [1]

"Where have you been? I tried all yesterday to reach you," said my mother's voice early on the day afterwards. 'Of course, I was in the library stacks,' I said, wishing she would not demand an accounting as greeting. I might go into the stacks one day, and come out to discover that a catastrophic world war had meanwhile begun and ended.

'Your friend is dead!' I thought, 'Velikovsky!' My Mother, of an age with him and long hard of hearing, did not trust herself to pronounce his name quickly. He died at 0800 hours on Saturday. Day of rest, a quiet death at daylight, his hand in the hand of his lifelong love alone. It had recently occurred to me more than once that he might live forever. But he did not. He glided off to sea.

I reflected foolishly and I could not be faulted for not maintaining a hot line. I was even justified - more foolish thought - in being undiscoverable, for in the labyrinthine Princeton Libraries, who could find me, and it was Velikovsky's fault; I might be in the religious section, or in archaeology, or the astronomy collection, or the art library, or in geology; I might be anywhere in the acres of buildings and shelves, thanks to Velikovsky. Survivor's guilt, compounding the loss and mourning, so tattooed are we by the ancient great losses - Noah naked drunk on the first post-diluvian vintage, the unworthy remnant brought out of Egypt, Ipuwer's lament of survivors.

The great man was buried on Sunday morning, his close family in attendance, at a small Jewish cemetery near the Atlantic Ocean, in a plot that he had selected just the year before. Elisheva, Mrs. Velikovsky, is quite in command; the friends telephone one another and mark time in place uneasily, wondering what is to be done now.

Before Velikovsky retired at eighty-four, he had stretched his large frame over a multitude of people and affairs. I think that from the beginning he felt destined to greatness. Out of Russia, but more than Russian, he absorbed Zionism, humanitarian Socialism, and the marvels of science. He grew into a doctor of medicine. He returned enthusiastically to Russia on the bright promises of the Revolution, only to be instantly repelled by the anti-semitism that has always cursed Slavic Byzantium.

He never went back but found another life and social promise in Palestine, and intellectual promise in the psychoanalytic circles of Central Europe. He began a series of booklets on what we might call unified science. He studied, he worked; he watched the mad world like a comet thrashing its head with its tail.

I have heard his reasons, and those which others give, for his next move. I think, however, that the moment to achieve greatness had arrived and he required the proper theater of action. At the decisive moment, Napoleon left Egypt for Paris. Velikovsky left Palestine for New York as the war began.

There he practiced psychiatry - a brief, authoritative and evidently successful way of therapy characteristic of himself. He became a publicist, too, and wrote many articles on international affairs, the War, and Near East policies. But more and more he was digging into ancient history. For he had found reason, while in Palestine, for a basic Cartesian doubt of the chronology of ancient times. And he had grasped an almost mystical compatibility among his ideas of Freud and Moses, of his restorying of ancient Israel and Egypt, of his perspective upon the contemporary turmoil of Palestine, and, yes, even on his view of the forces that drive the planets through the heavens.

Velikovsky had civil courage. He never lost political stance. He was not recognizably a politician of a democratic setting. He was more comfortable with a marshal's baton than with a smile and a trick. It cost him much to restrain his heavy political instincts during the numerous world crises of these several decades. But he had found bigger game and a more certain target - a revolution in mankind's view of man's experience. His ponderous, direct and clearly conceived kind of political action emerged in the politics of science. It was a sublimated warfare. He never suffered a defeat, although, to hear him talk, one would imagine total defeat imminent.

My former wife, Nina, with roots like him in Slavic culture, once said to me, 'You must not try to cheer him up. He is a Slav. You must tell him that things are even worse than he imagines, then he will feel better.' So I did, once or twice, and it worked, but it's not my style. One time when he was perturbed by the clamor of his opponents and the diminishing faculties of old age, I exclaimed, 'What's the matter with you? Do you want to live forever?' This worked, too, and he was amused when I told him that these ego-fracturing words were shouted at my platoon by our sergeant in World War II.

When the war ended, he converted his great energies totally to working out the implications of his several radical ideas. He reordered Near Eastern chronology. He brought to focus and fixed the causes and consequences of several cosmic catastrophes. He produced masterly critiques of conventional astronomy and geology. By now there was no question in his mind wherein lay his greatness nor, with the publication of his

first books, was there any question in the mind of a million readers. The gripe was with the academic establishments.

Although prepared all his life for persecution, Velikovsky was startled and incensed at becoming a target of persecution by scientists. Here was a tragic irony for one who had believed and followed all the rules of the sciences to the best of his abilities. Here was the reputedly freest part of the free world turning upon him.

Thirty years of struggle to defend his ideas and character ensued. He fought magnificently. Even if there were not a valid sentence in his books - actually, several of the greatest works of the century - Velikovsky should achieve a respectful prominence for his work on behalf of scientific integrity.

Egocentric though he was (but who can deny him the right and need to draw up his embattled wagons into a defensive circle?) he maintained under the interminable attacks of those years an honesty, a personal correctness, a saliency, and a devotion to the ideals of science that made his assailants by contrast appear as howling savages. For a time, it seemed his defenses would be overrun and that he would be condemned as a heretic by the scientific establishment. As was typical of him, he chose from history the greatest intellectual heretics as his models, showing here as almost in every area a fine discrimination in taste, preferring Giordano Bruno, for example, to Galileo Galilei. The record is published in part, but there is more, much more, to come.

My feeling, however, is that by the time these latter works are printed, they will be read wonderingly and happily. I think that Robert Jastrow's article on Velikovsky, carried by the *New York Times* on the heels of a poor obituary, practically constitutes diplomatic recognition. For Jastrow accredits to Velikovsky an impressive array of scholarly skills and theories that carry a legitimate and considerable scientific force. When the opposition consents to argue on the facts, a new juridical order comes into being.

So much of Velikovsky is alive, it is conceited to call him dead. One needs to remind oneself, even here, even a few yards from his home, that he has departed. What is to be published of his now? There is much, none of it quite ready for the presses. His exchanges with Einstein are almost in final written form; here his advocacy of electromagnetic forces in astrophysics is on stage. His book on the Saturn catastrophe needs only modest attentions. The two remaining links of his reconstruction of ancient history -- dealings with the Greek 'Dark Ages' and the Assyrian conquests -- are nearly completed. Several volumes of materials concerning the first decade of controversies over his published works are finished, but not the two past decades. His manuscript on Mankind in Amnesia requires much work. In addition, individual pieces and, I believe, any notes of value should appear. Under favorable conditions, perhaps fifteen years of further publication from his pen may be expected. Beyond all of this, there will exist an archive useful to scholars in many fields. Professor Lynn Rose is to act as literary executor of his will, under the general direction of Elisheva Velikovsky, whose knowledge of Velikovsky's archives may exceed that of her husband. Together, his already published books and articles and his publishable works fashion a monumental scholarship of the age.

Apart from a few notes, autobiography is lacking. Velikovsky did no like the idea of someone writing his biography. He wanted to do the job himself, and thought about it much. He was half-convinced that no one would say the right things about him, but further he was a poet and literary master for whom the task would be an aesthetic pleasure. Far less would he like our obituaries, I am sure, for we are bound to be dull or in error or inconsequential.

When my father died, Velikovsky sought to console me by predicting that, following his own experience after his father's death, I would enter upon a period of heightened productivity. I did no agree; nor did the predicted happen; we were too unlike. Nevertheless, Velikovsky's death impels me to repeat his prediction, this now concerning his many intellectual sons. It is a large brood. Even if half of them have linear temperaments, like myself, there will rest a generous half who are like Velikovsky and who will bring the next two decades to burgeon with revolutionist primevalogy.

Death is schizo. First it confiscates our dearest assets. Since billions have lost meaning in today's financially inflated world, we cannot decry the loss of billions in knowledge from the death of a man. Rightly we can say that the death of Velikovsky is irreparable. When I think of the extra matter that we must all discover and learn now that this prodigious man is gone, I am in despair.

One day, shortly before he died, we were talking of my own finished study of *Moses and His Electrical God*, and of Freud's identification with Moses and assignment of Carl Jung to be Joshua, I grumbled: 'Freud didn't know 'Joshua!'' Velikovsky turned his rugged face and pale brown eyes full upon me and said evenly, like a weatherman reporting: 'Joshua was working as an executioner in Egypt. There is a midrash.' I hate the robber death.

But death releases the miscreants from school. I think not only of those sons of Velikovsky already appearing in print - perhaps they will carry forward more energetically the best of the new but too of those persons around the world who have been hidden, sheltering contentedly under the great oak, imagining that their offerings are puny. And how these persons will now appear here and there and should be immediately recognized and greeted as authentic, hitherto silent students and advocates of the new science. Like the men who wrote letters to the Washington Star commenting on an editorial obituary of Velikovsky: 'No one knew who they were,' but one might perceive that their letters were of an expertness and understanding that could not be called momentary nor were they incidental to the passage of Velikovsky. These types are ready to do something. They must do something now; no more free rides. Thus works death for the greater good.

When all is said and done, I feel sorry for the many scholars and scientists who did not appreciate Velikovsky in his lifetime. They labored often and deviously to bring up some discovery to send crashing down upon him. By now it should be painfully evident to them that they are sons of Sisyphus, condemned for their intrigues to push huge rocks up the hill only to have them fall back to the bottom, times without end. They might have

enjoyed, as we have enjoyed, to live in communion with a great intellectual adventure and its leader.

Notes (Chapter 26: Eulogies to Three Quantavolutionaries)

1. Princeton, November 1979 First published in the *Society for Interdisciplinary Studies Review* IV 2/3 (1979-80) 29-31

Part Five

COMMUNICATING A SCIENTIFIC MODEL

CHAPTER TWENTY-SEVEN

A COSMIC DEBATE [1]

I hope here to expound the ramifications of a coming cosmic debate in the sciences and humanities. All of the disciplines might be affected if, as a result of such a debate, there occurred a major shift away from the prevailing ideology of uniformitarianism in the direction of quantavolution or catastrophism.

I attach the word "cosmic" to the debate with three meanings. First, as I have implied, it is cosmic in that all fields of knowledge are involved. Second, I must have reference to something of great importance, else why call it "cosmic"? Third, the subject will have something to do with cosmology - the nature of the earth, the skies and humanity. Also, the processes of cosmic change, creation and destruction, and the rate at which great changes occur.

There remain then the words "coming debate." Debate requires two sides that are determined to confront one another on rational grounds. I must state that the cosmic debate is not in full swing. It is coming, approaching. The established and conventional theorists of the sciences and humanities are still reluctant to engage in debate on this delicate yet vital subject of the cosmos. No doubt you know how difficult it is for a minor candidate to get into debate with a major candidate in a political campaign. The major candidate has too much to lose and too little to gain in such an encounter. And so it is with established scientists and humanists. Scholars are only human, after all; I am tempted to say that they are only politicians after all. Why should they lend their ideas to attack, to change, to reconstruction?

EVOLUTIONARY AND REVOLUTIONARY PRINCIPLES

I shall try to state the established position in respect to this cosmic debate and then set forth my own position. The established position, with some over-simplification for purposes of clarity, is as follows: the heavenly bodies as we see and experience them have proceeded unchanged and unthreatening for ages beyond human recall, perhaps for hundreds of millions, even billions of years. The earth, our globe, has existed in its present form for hundreds of millions of years; some say that the continents have been shifting at an unnoticeable pace that has accounted for large movements over many millions of years continental drift, it is called. Present species, including mankind, have evolved over many millions of years from primitive ancestors, with excruciating slowness; mankind is now recognized to have developed over millions of years from recognizable club-wielding, stone-working hominid archetypes. Such are the components of what may be called the uniformitarian, or evolutionary cosmology.

Standing in contrast to this *evolutionary* position is one that may be called *revolutionary*, as Immanuel Velikovsky suggested to me a few weeks ago. Instead of being uniformitarian, it is catastrophic. It reviews first ages of nature and mankind, and draws several conclusions: The Earth has suffered wide-scale natural disasters in consequence of changes in the solar system. These disasters have happened within reach of human memory. Cultures everywhere have assigned disasters to the planets. Human nature was both physically and psychically affected by catastrophe. The human mind first, later, and always has suppressed its terrible memories of such events, and let them emerge in altered forms, sometimes benevolent, productive and artistic, at other times malevolent, destructive and deranged.

If these propositions of primevalogy are defensible, they will affect practically all areas of human knowledge. This is perhaps obvious. Some recognize, in the theory of revolutionary primevalogy, elements of the creation theories of the ancient religions - still held by a majority of people of the world, incidentally - those talked-about gods and floods and fire, and so forth. You know, of course, that this old view of cosmology affected every aspect of life, through, and science. Then, when

the uniformitarian theory arose and supplanted the older theory in the minds of the educated, it too affected every part of society and science. Hence the present proposed *revolutionary primevalogy* may be expected to do the same. That is, it too will affect life, thought, and science in all their manifestations.

Ι.

The first area of debate introduces issues of epistemology and ideology. Where did mankind achieve full awareness, the basic requirement for human memory, prediction, and control? Under what circumstances was awareness achieved? Whence came our capacity to abstract the categories of time, space and individuality? The assumption of revolutionary primevalogy is that humanity developed in great leaps, under circumstances of extreme physical and social stress.

From this field of *psycho-sociology*, one enters the field of language, *linguistics*, and symbols. Here, too, occurs a universal tongue. The biblical Tower of Babel story is not a unique representation of a unity and subsequent dispersal of languages groups. Does the behavior of "The Gods" cause language to diversify quickly, and yet at other times to freeze its forms of meanings?

Theology is the heir of terrible experiences. It was the conceptual battering ram that integrated animal and celestial operations. As the skies opened and engulfed mankind, the human mind responded and worked back and forth productively.

Theology was the original queen of sciences because of its promise to control mankind's response to the disorders of the heavens. The government of the passions, both personal and social, is a persisting problem. Political behavior and dogmatic and aggressive *ideologies* have their biological origins in the physiology of humans, but their historical origins are founded upon abrupt as well as continuous change in human ecology. When the skies fell, man was shocked into self-awareness, religion began, and with religion and from religion came politics - the organization and direction of human efforts towards the propitiation and control of the gods and the environment.

The controversy that has attended the publication and testing of Dr. Velikovsky's theories itself presents issues of a fundamental kind in political science, the history of science, and philosophy. The experience is already well-documented, and will, when Dr. Velikovsky's archives are opened, be the best-documented case in the *history of science*. A philosopher, viewing this experience, cannot help but become agitated over the intellectual and moral rules under which scientists operate and govern themselves. But even more elemental is the philosophical question as to the origins of philosophy in the sublimation and rationalization of forms of thought and behavior originating under traumatic conditions in "times beyond recall".

II

A second category of knowledge to enter the approaching cosmic debate is history. No field of pre-history and ancient history can escape reappraisal.

The field of ancient Greek history will serve as an example. Gripped by the uniformitarian and evolutionary ideology, and therefore unimpressed by evidences of wide-spread, almost total, disasters that overtook the Minoan and Mycenean precursors of Greek civilization, most historians have accepted a theory that allows 500 years of dark ages. During this period they allege that one set of civilizations declined and the primitive new Greek civilization began.

Revolutionary primevalogy says that these dark ages were not 500 years long, but occupied about 100 years, and that what happened was the destruction of the great civilizations by natural causes, involving disturbances of the earth and the skies, and that the survivors of the catastrophe came out of a state of disastrous shock to reassemble the new civilizations of Homeric Greece. Those survivors behaved in ways that were full of contradictions and madness. And it was perhaps quite important, to the history of the Western mind, that the crazed survivors and their ideas and behavior have been taught to schoolboys for 2600 years as a model for manly behavior. Women's Liberation advocates, please take note. Educators, take note. Why have these models been allowed to persist? Is history but an obsessed

recapitulation of disastrous experiences? Is it but a shell-shocked capering?

Call the roll of the ancient civilizations: Egypt, Mesopotamia, Palestine, Crete, Cyprus, the Aegean, Greece, the Etruscans, the Romans, the Megalithic pre-historic humans of Europe, the Olmecs and Mayans, the Peruvians, the North American Indians, China, India, Iran, and so forth. Wherever one ventures equipped with the revolutionary theory, old historical evidence is reshaped and new theories emerge. Matters large and matters small become involved. How did the ballgames of many cultures come to be invented and why were they religious? Why do modern Peruvian Indians put bowls on their heads when the earth quakes? Are ancient Meso-American statues wearing helmets because they are astronauts, as one popular writer has implausibly said, or to shield them from "flak"? Civilized centers known to us seem to connect with common centers that were obliterated in catastrophes, leaving behind many puzzling between the Orient. and connections America. Mediterranean. All such problems extend beyond history into anthropology and other fields, of course.

III

A third large area of fuel for debate would be the humanities. There are many fields here and my breakdown of the fields cannot be very logical. Is *costuming* a field? Where did clothing originate, or the helmets we have been talking of? Clothing was born of disaster, says the Bible, of expulsion from the Garden of Eden, which may have corresponded to a tilting of the earth's axis and the coming of the cold seasons.

Certainly *mythology* is a humanistic field. It seems odd to me that no contemporary school of mythology, except of course the revolutionary school of which I speak, admits to the reality and historicity of myths. Or if one does, it waters down reality to most trivial occurrences before accepting it.

Robert Graves, in his famous collection of *The Greek Myths*, defines some thirteen types of expression that might be called myth, none of which approach our own. Mircea Eliade, the most distinguished mythologist of the moment, invented a phrase,

illud tempus, "That Time", to refer to a point to which all myth connected with the cosmos went back. But he would not venture himself into the real precincts of That Time. He says, in effect, that everyone and everything can be referred back to that Time, but nothing really happened then. Strange indeed.

Certainly, much is to be done in the revision of mythology. Better than Freud, Jung and others, the revolutionary primevalogist can explain myth in the context of a human mind trying to cope with disastrous ecological experience. Mythanalysis goes hand in hand with a reconstructed natural history to permit great advances in translating symbols and making sense out of the apparently senseless. This will be true not only of so-called primitive and ancient myth. But also of the great bodies of material summed up in the Bible, the Vedas, the Koran, and other sacred religio-moral-historical works.

If the effect of massive collective shock is the suppression of memory, another effect is the partly conscious and vigorous design of methods for ridding humans of the impressions and anxieties bubbling up from the repressed memories. This is commonly accomplished by divisionary, symbolically loaded activity. The study of religious worship and rituals can view these human activities existentially - for their present functioning, that is. It can view them, too, with their prayers and liturgies, as endless repetitions, enforced through all succeeding generations, of the both terrible and life-saving human-making events of the disastrous periods of human history and prehistory.

The development of *literature* would be another diversion of anxiety. Every people has its songs and dances that sooth the uneasy breast. I studied one song that is found in the *Odyssey* of Homer, that I call the Love Song of Demodocus. It consists of a hundred lines of poetry describing an opera ballet. I believe that I have discovered in its plot a masking of the terrible planetary encounter between Moon and Mars that I mentioned a moment ago. According to the song, Aphrodite (the Moon Goddess) and Mars (the war god) are making love in the bed of the god Vulcan, who traps them by his electrical genius and then is persuaded to release them by the Earth-god Poseidon. Like religious observances, but much more roundabout, the song

recalls the terrible days, and by recalling them in a disguised form, relieves the mind of the people concerning them.

What people do and do not forget, and what they should and should not forget, are of course important problems, and, if revolutionary primevalogy can throw light upon stress, memory, and forgetting, psychologists will be grateful, as was a German psychiatrist with whom I discussed last summer the question of controlling the memory of Nazism. On the one hand, Germans have to remember the Nazi experience in order to think straight and correct themselves; on the other hand they have to forget and distort it in order for life to be tolerable. But now, you see, we have entered the fields of *educational psychology* and *political psychology*.

IV

And so we move into a fourth large category of the fields of knowledge, the social science. A related field of study is that of political institutions. How were the state, law and order, and administration invented? Do the circumstances of the origins of political institutions affect the ways in which these operate today?

To take one instance, the invention of kingship, what does revolutionary primevalogy lend to the study of kingship? A number of scholars have shown that the earliest kings were believed to be gods or closely identified with gods; these gods were celestial and planetary; the power of the king was as unlimited as that of the gods; and often, strangely, the kings would be put to death ceremonially upon the completion of that period of time.

It seems unlikely that a man would be made a god unless people had experienced the terrible turmoil of heavenly crashes and interventions upon earth, whereupon a strict imitation of the celestial model would be in order - obsessions transformed into institutions. But you see, an institution, defined as process, is nothing but a set of channels for routinized behavior.

There is probably much left of this primordial desperation, fear, and propitiation in modern kings and presidents. Why, after all,

should not President Richard Nixon have been fired or retired like any ordinary employee or executive? The fears and anxieties surrounding his downfall were all too reminiscent of primeval methods of imitating gods out of terror of being punished.

I may read to you from the *Lawbook of Manu*, one of the ancient East Indian documents where the eight great gods that guard the points of the compass form also the eight divine parts of the king:

When the world was without a king and dispersed in fear in all directions, the Lord created a king for the protection of all.

He made him of eternal particles of Indra and the Wind, Yama, the Sun and Fire, Varuna, the moon, and the Lord of Wealth.

And, because he had been formed of fragments of all those gods, the king surpasses all other beings in splendor.

Even an infant king must not be despised, as though a mere mortal, for he is a great god in human form [2].

Lacking self-knowledge, and therefore lacking self-control, modern men and women and children repeat the same thoughts and mechanisms that produced the sacred absolute kings of the earliest empires.

Revolutionary primevalogy has also brought new insights to bear upon two well-debated older theories of human culture. One of these has held that human institution and manufactures developed in the world independently, although similarly, in different places of Asia, America, and Europe. The second theory has held that occasional encounters between separate peoples had to be the method by which so many features of so many cultures came to resemble one another.

The revolutionary theory says "yes" and "no" to both the independent invention and the diffusion theory. The revolutionary theory alone can assert that at one time in the history of mankind, before a set of universal catastrophes occurred, a universal culture existed. Further, the drastic changes of the surface of the earth destroyed most of this grand ecumenical culture, leaving the remnants of humanity in their isolated locations, there to continue many of their old common practices and beliefs, but also there to reconstruct their cultures in accord with their separately-experienced disasters.

The Bible speaks of at least four universal disasters; the creation of the world itself, the drastic change of mentality and environment accompanying the expulsion of Adam and Eve from the garden of Eden, the great flood, and the plagues and chaos of the exodus from Egypt. Those stories have a reality to them that the continuous efforts of modern evolutionary science have not succeeded in effacing. The task of revolutionary primevalogy is to resume once more, and with all the improved tools of the sciences and humanities, the reading and interpretation of the myths of creation and destruction from all over the world. The success of such studies would of course strongly impress the field of *theology*.

Besides anthropology and political science, other fields of social science where revolutionary primevalogy enters into debate occur readily. If the disasters were tied up with the creation of the human mind, then they would be intimately connected with psychology, which studies the human mind, and with social psychology, that treats of man and society. I have already mentioned the problems of stress and forgetting, collective amnesia, displacement of anxieties, the psychology of symbols, the origins of creativity. But I should mention as well the fascinating but dismal study of warfare, of destructive aggressiveness, of war formations, of armaments. Would not our ways of looking at and attacking the problems of human conflict change if we were to see them as primeval recapitulations of projections of the battles of the heavenly hosts? Gods made war, and men followed their example, rather than the contrary, as the apologists for the gods would have it.

Again, as with the large picture, so with the small. Did Roman hegemony, based upon the legion, that was maneuvered around the short sword, to whose exercise they devoted themselves so tenaciously, express in that dedication the image of flaming Mars as a sword which various ancient cultures of the seventh and eighth century attested to seeing in the sky?

Nor can the field of *sexology*, even as developed by the Freudian psychologists, escape the debate, for it seems to me that the exceedingly ramified, refined, and violent manifestations of sexual behavior found in humans may in many respects be a secondary derivation from the catastrophic experience, rather than a primary result of biological and familial evolutionary development.

I shall pass over the field of economics with a hint of the revolutionary challenge to it. The biblical, and even worldwide, myth that work is a curse upon man laid by his Fall from God's Grace is more scientifically correct than, say the theory of Karl Marx that work is an imposition of the system of ownership, or the more generally accepted idea that human beings were born workers. Work, I would postulate, is a catastrophically indoctrinated obsession with routines and with the avoidance of future disasters. (You will understand, of course, that I have no prejudice against work, and am typically addicted to it.)

V

At the University of Lethbridge, early this years, I developed the question whether physical changes may have occurred in man during the catastrophes that occurred over the last 15,000 years. Here is an issue on the borderline of the *anthropological sciences* and the *biological sciences*. I reasoned that one or a combination of events must have happened to propel a large-skulled primate into the human being that we know: the annihilation of numerous "competing" subspecies; activation of glandular systems not apparent in fossils; obsessive social transference through many memorial generations; and conventional, but greatly speeded-up, mutation; such are the possibilities of explaining human history.

It may be understood, then, how the biological sciences will enter the debate: through direct challenges to Darwinian uniformitarianism; through new hypotheses handed over to the chemists of life and genetics, who are already making such rapid progress that they encourage revolutionary primevalogists to think in turn of the famous literary work of Ovid, not to mention a multitude of other ancient sources, where he catalogues a bizarre zoo of metamorphosed beings; and, of course, by way of the science of *ecology* that would have to gear itself to considerations of sudden and extreme adaptation of species to atmospheric, climatic, and soil changes.

Revolutionary primevalogy contemplates a history of life that stresses massive quantities of mutational stimuli, and the rapid proliferation and even more rapid extinction of species. At the time they took over the world's educational and intellectual establishments, the Darwinian evolutionists knew neither of mutation nor radiation. They furthermore denied gross and rapid changes of the earth's morphology and ecology.

This is the year of the ozone peril, however, with newspapers carrying the warnings of scientists that if aerial nuclear bomb testing is practiced, if regular super-sonic plane flights are scheduled, and if the use of aerosol sprays continues to grow, then a point will be reached within half a century when half the high ozone layer may be destroyed and with it earth's people and animals. It should be added that these points are disputed. The Pentagon says: not so! Others, too, are content with the potential of the ozone layer for replacement, barring extreme abuse. Still, solar and outer-space radiation may do the job of killing off the species, once the ozone's protection is removed. Once more, the fragility of the earthly ecology is highlighted.

Yet nothing that mankind can do is anything but a pale reflection of what nature has done repeatedly in times past. The ashes of the immense explosion of Krakatoa of 1883, a volcanic disaster that startled the world, now lay scarcely detectable on the floors of the Indonesian seas. Below it however, in the cores taken by oceanographers, are to be found six heavy ash layers, laid down within the past million years. By comparison with any one of these six disastrous events, the greatest historical explosion, that of Krakatoa, was insignificant. Sometime in the same period,

another cosmic event scattered an estimated billion tons of meteorites or tektites over the island areas of the South Asia seas.

VI

I am tempted to go on describing the amazing discoveries of contemporary *oceanography*, were our time not limited - for instance, the global cleavage of the earth. An immense fracture runs from the Arctic to the Antarctic and then splits into a double-fork to run around the other side of the globe.

It would be well, also, to discuss the youngness and biological sterility of the ocean deeps. Since the species that inhabit the deeps are rather ordinary and few in number - Jules Verne to the contrary notwithstanding - one may wonder whether some intelligent and well-organized groups of people will one day achieve methods of breeding edible species for the deeps and feeding them in their habitat. Or whether oceanic bio-culture might not be accompanied by developments in thermal control, so that energy may be produced by thermal vertical differentials in the ocean, and so that climates may be moderated by current diversion. A new comprehension of why the oceans developed only in recent times will abet humanity's search for the earthly environment of the near future.

Almost without saying, now, we have passed from biology through the earth sciences, the sixth large grouping of fields of knowledge where important debates should shape up along revolutionary versus evolutionary lines. I have referred to issues of mineralogy, vulcanology, oceanography, and meteorology. Apart from the boundaries of fields, there stand some basic physical questions. Under the pressure of discoveries of the catastrophic events happening in the universe - pulsars, quasars, black holes, galaxy collapse, and so forth - scientists must begin to consider the morphology of the earth on a greatly magnified scale of forces. There have been some exertions of heat and pressure upon this globe through extraterrestrial and internal sources quite far from those normally taken into calculation by geologists in explaining surface rocks and features. The challenge that the nineteenth century genius, Ignatius Donnelly, put to the geological world, that the vast unstratified layers of clay, till, and stones that cover much of the globe are of extraterrestrial and cometary origin, was not too well answered. But, with modern geochemical techniques, the challenge may be answered. That is, if the appropriate scientists will attend to the matter.

In completing a short agenda of debating topics in the earth sciences, it may be well to introduce the field of *chronology*. This has, of course, its several parts, which may or may not be necessarily related. There are historical techniques where no documentation exists and even the chain of memorial generations becomes broken. Datings are then made by examining the stratification of fossils and human products below the ground. Here, and far beyond, extend the working of chemical clocks, such as radiocarbon dating, potassium-argon dating, and so forth.

Geological and archaeological dating are achieved by the penetration of strata of earth and the remains of cultures, and assigning a later date to what is above something else. Archaeology has not sufficiently considered the causes of sudden destruction of ancient civilizations, and therefore has made many mistakes of time, nor has it concerned itself with very ancient civilizations and centers of habitation that may have been entirely erased. But these can be inferred in the future with fair validity. No one seems to have considered, for instance, whether the cave artists of the Dordogne in France, or the builders of Stonehenge megalithic monuments may not have been survivors of catastrophes of the second, third or other millennia before Christ. And that the centers from which they derived were much more highly developed artistically and technologically.

Nor has *geology* sufficiently pondered the effects of catastrophes in burning and flooding deeply huge areas, and in thrusting and folding great masses of land beneath and above other strata so as to create illusions of ages that did not exist. Nor for that matter have conventional geologists given us sufficient assurances that the fossil beds by which datings are made are not the result of fossil zoning, that is, the moving of fossil beds into other strata, or above and below them, by catastrophic earth and water flows.

Indeed, far from feeling insecure in the face of criticism, geologists and archaeologists have been greatly heartened in their evolutionary uniformitarianism since World War II by the development of so-called chemical clocks. Often they abandon their former datings in favor of what they believe to be more accurate radio-chemical dates. Once having discovered that certain chemical elements are radioactive and decay into new elements, scientists have elaborated techniques for counting how much of a parent element is present in a certain things, how much of the daughter element is present in the things, and then how much time must have elapsed to produce that much of the daughter element. If uniformitarian theory held, then the measurement of the ages might be satisfactorily achieved. But a serious challenge may be leveled against the concept of chemical decay: why should we assume that an element decays today as it decayed a hundred million years ago?

Furthermore, in many cases, in applying specialized clockwork to given specimens, the history of the specimen is unknown. Today, the specimen may rest in a seemingly new bed; but this may be only the latest of various beds that it has occupied over the ages. The earth's surface, alas, may be a chain of flophouses for transient materials. What matters to the cosmic debate is the experiences of matter, and aging is only one kind of experience.

Besides, catastrophes, by frictional heat, pressure and electricity, and the mixing of elements in disequilibrium, introduce revolutions of the atmosphere, of the rocks, and of organic existence. If, for example, Mars, which is rich in argon gas, were to exchange any argon with heated rocks of the moon and earth, then any potassium-argon test of a rock might well show a very old age because of the presence in it of argon from a foreign source. The substance will have many stepdaughters. In fact, the chemical clocks registered great ages of the moon, although physically it gives evidence of having boiled recently. Such severe criticism may be leveled against the uniformitarian methods employed, that there is, to my mind, a strong probability that the moon was subjected to highly disturbing events as little as 2700 years ago.

VII

Now we have mentioned six categories of disciplines, and there remains only a seventh to exemplify. This would be the *physical sciences: mechanics*, terrestrial and celestial; *electrodynamics*, terrestrial and celestial - all that is encompassed by *astronomy* and *astrophysics* and the special subfield that take in the individual planets, the sun and the moon, without, however, omitting the importance of the earth's external and internal responses to its membership in the solar family.

Howsoever few are the fields and issues of the approaching cosmic debate in the sciences that I can present to you here, I would be remiss if I did not bring up the subject of astronomy, the "Queen of Sciences," it is called. Actually, astronomy is not the queen of sciences; it would be rather a precious and dilettante science were it not for the catastrophic events that the courtiers of the "queen of sciences" choose to ignore. Few people, certainly not rulers of empires, would pay attention to the skies were it not for the fact that the skies fell from time to time. As the children's fable about Chicken Little goes, "Run for your life, the sky is falling," and when all the little animals hear the refrain, they, too, run for their lives.

Within the last month, an American professor of celestial mechanics named Robert W. Bass published articles that should stimulate debate on the stability of the solar system. To my way of thinking, his work has put to rest the myth engendered by Pythagoras, Plato, Newton, and La Place, followed by a host of scientists, that the heavens can be mathematically demonstrated to be in a condition of long-term stability. Contrariwise, Professor Bass has shown that, if the heavens are stable at all, they are stable for empirical and experiential reasons, not because of any laws discovered by Newton or La Place or anyone else following after them.

We are left with the evidence of historical geology and protohistory. I think that these tell us, or they will tell us when the debate is finished, that the heavens have changed recently and are not eternally fixed in their movements.

Without pausing to examine the mathematics of Professor Bass, I would call your attention also to the work of an engineer who has occupied himself with electrical phenomena, Ralph Juergens. Mr. Juergens, working alone and without support other than that provided by the inspiration and encouragement of a few friends, has written articles that I am convinced will be numbered among the most important of our age. The thesis which he advances, and which is my candidate for the winning side in the approaching cosmic debate, is that electrical forces of almost unbelievable magnitude were exercised upon the Moon, Mars, Earth and other heavenly bodies in the recent past. His demonstrations are not beyond the grasp of the educated layman, and are based almost entirely upon the evidence that the evolutionary uniformitarians who command the space explorations have had to provide the public in the course of their work.

Mr. Juergens has shown that many striking features of the moon's surface - its giant craters and jagged valleys - and those of Mars as well - must be the product of gigantic electrical discharges between planetary bodies, and that these occurred in times within the memory of mankind. In a modest and incidental remark, Juergens has also suggested that the key to the solution of the urgent problem of nuclear fusion, for the production of cheap, non-polluting energy, may be in the study and understanding of the interplanetary electrical discharges that have been reported in such primeval epics as the Homeric battles of the gods.

SUMMARY

With the example of electromagnetics behind me, and the seven categories complete, I may now proceed to summarize. I fully appreciate, I beg you to believe, that I have but raised issues and not solved them. But such, after all, was the original intent of my talk. I wish to explain to you why I thought that the moment has come for enlarging the debate over cosmic issues in the sciences and humanities. I tried to explain why I believed that in practically every field there would be ample material for debate, provided only that the ruling conventional scientists permit themselves to be drawn into debate.

The problems are not all resolvable in favor of revolutionary primevalogy. Indeed, the contrast between revolutionary and evolutionary primevalogy is not absolute. Rather, I find, and I hope that you will agree, that there is a pressing need to present the case of revolutionary primevalogy to the intellectuals and educated public. Let the decision rest with them.

My own position, and that of other advocates of a revolutionary primevalogy, is simple to state:

Humanity was born in an uncontrolled and uncontrollable set of crises.

This condition was caused by stupendous celestial and geological events.

Everything that humanity has done or achieved, since the baseline to this set of events was drawn some thousands of years ago, has been affected, colored, and fashioned by them.

The future of both science and ethics rests in an appreciation of this revolutionary position.

From these theories, we can learn, first, that mankind is in a fundamental, natural sense helpless in the lap of God or Nature. Second, mankind is all one, a *unity*, as he faces the most fundamental principles of existence. Third, through education and new attitudes, a future not at all inferior, indeed superior, to past existences can be formed.

CODA

At this point, I had intended to conclude my talk, but in view of some of the questions that have been asked in the meeting rooms and corridors, I would like to offer you an extension of remarks, a kind of coda, if you please.

Perhaps you have noticed how I stress the need for the integration of numerous fields in order to develop a theory that can face several ways at once. Others have spoken in the same vein. The fact that on this platform we have had astrophysicists, humanists and social scientists is some proof of the point. Yet,

on the other hand, we must be always aware of the pitfalls of synthesis. Synthesis flies off readily into mysticism, generalities and scientific errors abounding.

The antidote is, of course, specialized knowledge. By specialism, I mean the capacity to understand work with severely constrained hypotheses, which presume many things, and which, braced by such presumptions, are able to dig in deeply at critical locations and emerge with findings which have to be confronted, whether to disprove them, or accept them, but in any event, to interpret them.

If revolutionary primevalogy is to progress in an orderly way and not to fly off wildly, it must accommodate to existing specialists or breed its own kind of specialists. This we are only beginning to do. We need not only to turn the other cheek when we are slapped by the specialist; we have to persuade the specialist and especially the would-be young specialist that our theories are eminently testable and that the smallest problem, as well as the grandiose problem, lends itself to a particular intense interest that they can recognize and that is important to the revolutionary view. Only if success attends this process will the "Operation Bootstrap" be possible, or to use another metaphor, will the circle of "integration - specialization - reintegration" be closed.

A second question that has been raised here, and often elsewhere, is the opposite of what the revolutionary primevalogists have been saying to the evolutionaries. Just as it can be rightly said that many evolutionaries are blinded by their need to find a secure world, it can be rightly said of some revolutionaries that they are catastrophic chiliasts, for whom the very next day is the great day of judgment and to whom the prospect of unsettled worlds gives pleasure. They are dominated by a Freudian death-instinct. They think of the end of the world like many of the ancient prophets are alleged to have thought of it, wishfully, hopefully, in despair at the state of the world.

But I must say, as I have watched the serious workers in this field, that if they are wishful catastrophists, they have successfully sublimated the wish, and are as cheerful and concerned about a constructive future as any normal person. This is the third conference of 500 persons that I have addressed

in nine months on related subjects and I have remarked on the sanguine and rational temperament of the proceedings and of the people in the audience as well. I should here say that this is in no small measure owing to the circumspection, sobriety, scientificity and humanity of Immanuel Velikovsky, whose work and whose general influence pervaded them.

And so now to my final comment. This is in answer to the repeated query: When will the next catastrophe occur? Surely this is a natural human concern. It is even a scientific concern, for one wished to know whether a set of events, occurring successively in times past and at staggered intervals, will occur again, and if so, in what temporal ratio to the past events. Nevertheless, I shall have to answer in a mood that Leo Rosten wrote recently was characteristic of dialogues in Yiddish: I answer a question by asking other questions. Why do you want to know when the human race will suffer another catastrophe? How soon is soon? Worse problems are before us, so why worry? The human race is much more likely to flatten itself or obliterate itself by hatreds and through techniques that it displays at this moment of time than it is to become a victim of the raging elements of nature. To these controllable human threats we should address ourselves. And it may be that a theory of revolutionary primevalogy will help us do so.

Notes (Chapter 27: A Cosmic Debate)

- 1. This public lecture was January 11, 1975, in Montreal, Canada, at the Saidye Bronfman Centre under the Chairmanship of Nahum Ravel, and at a symposium to discuss "Velikovsky's Challenge to Conventional Beliefs."
- 2. However he rejected this term and we could never settle upon another one. I finally coined the term "quantavolution," as contrasted with "evolution," but will be satisfied if the theory and mentality associated with the latter word are changed, letting the word "evolution" evolve suddenly, markedly, and generally.
- 3. Quoted in A-1. Basham. *The Wonder that was India* (New York: The Grove Press. 1959. pp.84-5.

CHAPTER TWENTY-EIGHT

SYLLABI FOR QUANTAVOLUTION

I

G 53.2112 Social Invention PRIMEVAL ECOLOGY, INSTITUTIONS, AND HUMAN **NATURE**

Professor Alfred de Grazia, New York University Spring Semester, 1976

Prerequistites: A Bachelor's Degree. (For undergraduates permission of the instructor or advisor is required. Call 598-3277.)

course is organized around a central concept, "Revolutionary Primevalogy," by which is meant that drastic natural changes (disasters) have occurred in 14,000 years (roughly the Holocene period) and produced a self-developing homo sapiens whose very mind and all its works have been causally and environmentally conditioned by those changes. Theories and evidence are drawn from various fields of the social sciences, humanities, and natural sciences. Specifically, political institutions and behavior are treated as relatives and adjuncts of human nature, behavior, and culture in general. "Enlightenment" over the ages has been almost entirely a burial and masking of symptoms; the basic problems of primeval mankind still rest with us and radical alternatives need to be searched out if those are not to determine the human future.

Primevalogy is a most difficult and complex field, both because of the clash of fundamental theories (religious-scientific, evolutionary-revolutionary), and because of the scarcity and ambiguity of data. Indeed the field hovers on the edge of being a non-field or anti-field. Sometimes one wonders: "If the events it deals with are provable, then the field cannot exist." This paradox is analogous to certain new problems of theoretical physics, where phenomena are so antitemporal or microtemporal or spatially contradictory that to observe them as occurring seems to be a proof that they cannot occur.

The approach, nevertheless, is conventionally scientific, even though it opposes conventional science and orthodoxy. We are not dealing with ghosts or creatures from outer space. Nor do we prove the existence of God. We are simply doing the best that we can with whatever the pragmatic and operational modern scientific tools and works afford us.

Each session will be divided into two parts. From 6:00 to 6:50 p.m., the lecture will present a straightforward statement of the theory of revolutionary primevalogy. Following a brief intermission, the instructor will take up and assess objections to the theory as presented; criticism and discussion by class members will follow and will terminate the session at 7:50 p.m. Since time may not permit all to participate who wish to do so, written comments and questions for written or oral reply may be submitted.

Towards the conclusion of the first session, members of the class will be asked to write a note to the instructor on their background and preferences for areas into which they might wish to delve when writing a paper for the course. Undergraduates may contribute a paper as well. The instructor will then, later on, make suggestions concerning possible topics. The final examination will consist of brief essays upon several of a list of questions that will be distributed well in advance.

> Calendar of Lectures (Wednesdays, 6:00 to 8:00 P.M.)

INTRODUCTION

1. February 4 REVOLUTIONARY PRIMEVALOGY: The science of first ages as products of abrupt, large-scale, intense events: evolution and uniformitarianism, catastrophism; the intimate relation of nature to humanity.

2. February 11 AGES OF CHAOS AND CREATION: The timetable of revolutionary changes; great world cycles; rise and fall of civilizations.

SECTION I

- 3. February 18 HUMAN TIME AND REAL TIME: Concepts and measures; how scientists defeated the theologians and created an old Earth; radiochronology; traditional time; astronomical bench-marks.
- 4. February 25 THE SUPER-FORCES OF NATURE IN THE HUMAN EXPERIENCE: Nineteen expressions of superenergy and their effects upon ecology and humankind.
- 5. March 3 THE DISRUPTION AND SETTLING OF HEAVEN: Observations of primeval people; planetary, cometary and other cosmic phenomena; Velikovky's synthesis; the heavenly waters.
- 6. March 10 EFFECTS OF GEOLOGICAL REVOLUTIONS UPON THE BIOSPHERE: Ice ages; cleavages of the globe; mountains, gorges, rifts; igneous patterns; adaptation and extinction of species.

SECTION II

- 7. March 17 WHEN AND HOW WAS HUMANKIND "CREATED": From hominid to homo sapiens; creation legends; the schizoid gestalt and the triple control problem; racial types and succession.
- 8. March 31 MECHANISMS & FUNCTIONS OF MEMORY AND FORGETTING; Great fears; the amnesia of holocausts; culture-creation through obsessive-compulsive behavior.
- 9. April 7 BIRTH, STRUGGLES, AND DEATH OF THE GODS: Gods and heroes; fatal flaws; divine ambivalence to man and man to gods; the greatest cover-up; Homeric plots; götterdämmerung.

- 10. April 14 COMMUNICATION BY SIGNS, SYMBOLS, AND LANGUAGE: Animal communication: earliest symbols; universal language; the Tower of Babel.
- 11. April 21. PRIMEVAL ORIGINS OF THE ARTS AND LITERATURE: Crafts, myths; liturgy art; dance; poetry.
- 12. April 28 PRAGMATICS AND INSTITUTIONS OF CONTROL: Group behavior; religio-political institutions sacred-secular power forms; war; sexuality; economies; instrumental rationalism.

CONCLUSION

- 13. May 5 WHAT THE PRIMEVAL FORETELLS OF THE Centrality **FUTURE:** of control problems; interconnectedness of knowledge; self-destructiveness; the "Jupiter effect" and other possibilities.
- 14. May 12 SUMMARY AND CONCLUSION OF THE LECTURES: Synopsis of the theory; problems of validations; practical uses; the politics of science; a new science.

II

THE CATASTROPHIST TRADITION IN THE HUMANITIES AND SCIENCES: ITS PERSISTENCE, RECENT DEVELOPMENT, AND EFFECTS UPON THOUGHT AND **BEHAVIOR**

(A proposed seminar of 1982)

Professor Alfred de Grazia New York University

I. INTRODUCTION

Explanation of the goals and work of the Seminar. Writing the Research Paper.

- 2. The Tradition that General Catastrophes have occurred on Earth defined. Terms such as revolutionism, macroevolution, punctuated equilibria, quantum evolution, quantavolution, cyclism, catastrophe natural saltations, (in topological mathematics). The concept of a sudden, intensive large-scale change in the process of natural and human history.
- 3. Examples of the infiltration (amounting often to dominance) of catastrophic ideas and theories into most fields of knowledge.

II. THE PLACE OF CATASTROPHISM IN THE ORIGINS AND HISTORY OF RELIGION AND PHILOSOPHY

4. Origins.

- The ascribed and actual origins of all major religions in catastrophes: Cases: Mosaism, Mazdaism, Greco--Romanism, Mesoamericanism, Hinduism.
- В. The number and kinds of catastrophes claimed by religion.

5. Practices.

- A. The conversion of legendary experiences into forms of religious practices.
- В. Cross-cultural identification of the principal deities and their traits.

6. Ideology

- The functions of catastrophic ideas in religion. A.
- sublimation of catastrophic religion in h. The philosophy, ancient and modern.
- Attempts to free religion and philosophy from C. catastrophe.

III. THE SEARCH FOR CATASTROPHES IN ARCHAEOLOGY AND ANTHROPOLOGY

- 7. Archaeology: Levels of natural destruction and ancient excavations.
- 8. Anthropology: the human species, a prolonged (or brief?) development.

IV. THE EXTINCTION AND GENESIS OF SPECIES

- 9. The Pleistocene and earlier exterminations.
- 10. Origin of species in catastrophes.

V. THE TREATMENT OF COSMIC DISORDER IN ASTRONOMY

- 11. "Immutability of the Spheres," Plato, Whiston, Laplace, Ovenden, Bass *et al*.
- 12. "The Explosive Universe," Hoerbiger, Baker, Velikovsky, Warwick, *et al*.

VI. THE STRUGGLE TO DISCRIMINATE CHANGE AGENTS IN THE EARTH SCIENCES

- 13. The Change of Paradigm
 - A. Dominance of catastrophism in early geology.
- B. The uniformitarian reconstruction: gradualism and terrestrial isolationism.
- 14. Ostracism and reductionism: cranks, denial, and anomalies.
- 15. Recent scientific literature (1970 to 1982) on extraterrestrial influences upon meteorology and geology.

VII. THE CRUX OF CHRONOLOGY: 10^4 , 10^6 , 2×10^7 , 10^9 or 5 x 10⁹ YEARS? MODES AND TECHNIQUES OF TIME-DETERMINATION.

- 16. Authoritative
- 17. Astrophysical
- 18. Biostratigraphical
- 19. Radiochronometric

VIII. CATASTROPHISM IN LITERATURE AND POLITICS

- 20. The Pentateuch, the Rig-Veda and early western epics (Homer, the Edda)
- Shakespeare 21.
- 22. Modern Forms
 - Α. Science fiction
 - В. The mass media
- 23. The Holocausts: the tendency of ancient collective traumatic experiences to repeat themselves in politics and war.

IX. THE HUMAN MIND TODAY: CONFRONTING AND COPING WITH CATASTROPHIC IDEAS IN SCIENCE AND **SOCIETY**

- 24. The reception system of science
- Problems of natural science models clashing with unconforming natural history
- В. Evolution of Quantavolution: issues in the biological sciences
- 25. Developing forms of thought

- A. Catastrophism in contemporary religion
- B. Psychological therapy and the catastrophic mentality
- C. Cosmic and political catastrophism: the meaning of nuclear war

SUGGESTED READINGS, ON RESERVE

(Keyed to outline and fully cited in the master bibliography provided each member of the Seminar)

I.

Isaac Asimov, Carl Sagan *et al.*, *Scientists Confront Velikovsky*; M. Truzzi, el., *The Zetetic Scholar* (excerpts); A. de Grazia, "The Coming Cosmic Debate in the Sciences and Humanities, " (offprint).

II.

Mircea Eliade, *The Myth of the Eternal Return*; D. Talbott, *Saturn*; A. Grazia, "Moses and the Management of Exodus;" J. Ziegler, *YHWH*; Plato, "Critias" and "Timaeus (selections);" A. Isenberg, "Devi and Venus;"

III

Claude Schaeffer, *Stratigraphie Comparée*.. (translated portions); A. de Grazia, The Rise of Homo Schizo (excerpted chapters);

IV

Luis Alvarez *et al.*. (Excerpts on iridium concentrations at the Cretaceous-Tertiary boundary, from *Science* magazine); Otto Schindewolf, "Neocatastrophism? in 2 *Catas. Geol.*

V

L. C. Stecchini, "The Inconstant Heavens" and "Astronomical Theory and Historical Data;" Thomas Taylor, "Coincidence between the Bolts of the Planet Jupiter and the Fabulous Bonds of Jupiter the Demiurgus," *Classical J.* (1819); R. W. Bass, "Proofs of the Stability of the Solar System," in 4 *Pensée*; H. B. Baker, "The Earth Participates in the Evolution of the Solar System," *Detr. Acad. Nat. Sci.* (reprint).

VI.

Cuvier, Revolutions of the Globe; Derek Ager, The Nature of the Statigraphical Record; D. Stove. "The Scientific Mafia"; reprint, J. A. Eddy, "The Case of the Missing Sunspots," 236 Sci. American.

VII

R.Juergens, "Radiohalos and Earth History," III *Kronos* (1977); "Geogullibility and Magnetic Reversals," III *Kronos* (1978); A. de Grazia, *Chaos and Creation*, ch. III.

VIII.

D. Patten, *The Biblical Flood*; Peter James, "Aphrodite: the Moon or Venus?" I *SISR* (1976); I. Wolfe, "The Catastrophic Substructure of Shakespeare's 'Anthony and Cleopatra'", I *Kronos* 3 (1975-6)

IX.

Stephen Gould, "Darwinism and the Expansion of Evolutionary Theory," 216 Science (1982); McLean vs. Arkansas (1982, Documents and Court Opinion); Thomas Kuhn, The Structure of Scientific Revolutions; Sigmund Freud on the repetition of traumatic experiences (Selected Papers); Manifesto of Nobel prize winners on nuclear warfare and humanity (1981).

SUPPLEMENTARY BIBLIOGRAPHY

All works cited as the specific background of the seminar meetings will be available on Reserve. In some instances, purchase of the materials is possible: in other instances, duplication of the materials has to be arranged. Although it is expected that the instructor will be able to convey his own research in the course of the meetings, copies of his relevant works will also be available on loan; these include in published or Xeroxed form: Chaos and Creation: Quantavolution in the Natural and Human Science; Homo Schizo (in two volumes): The Origins of Man and Culture and Human Nature and Behavior; Solaria Binaria (with Earl R. Milton); Moses and the Management of Exodus; The Disastrous Love Affair of Moon The Lately Tortured Earth Mars (in Homer); (Quantavolution in the Earth Sciences). In addition, members of the seminar will be Provided with a supplemental Bibliography of several hundred related items. They can expect to read at least 350 pages a week, apart from the reading they require for their research paper.

RESEARCH PAPER

Each participant will be expected to write a brief, compact research paper along the lines of an article in Nature magazine. Examples of acceptable topics might be: "The Present State of Theory on the Origins of Tektites," "Astronomical Orientation of Towns, Temples, and Carvings in Prehistoric Meso-America;" "Origins and Decay of the Earth's Magnetic Field;" "A Possible Reconciliation of Virgil's Trojan Legend and the Historical Founding of Rome;" "Electrical Phenomena Depicted in the Rig Veda;" "Was Australopithecus Human?" "Popular Opinion Respecting the Historicity of Catastrophes;" "Sources of Catastrophic Expectations in Certain Human Subjects;" "Statistical Frequency of Catastrophe-relevant Literature, 1900-1982, in Nature and Science magazines;" "Creation-time according to various Religions, Sects, and Writers;" "The Confirmation (Disproof) of Schaeffer's Theory of General Periodic Bronze Age Disasters in the Near East in the Light of Excavations since 1945;" "The categorizing of Donnelly's Ragnarok in the scientific and Popular Press, 1883 to 1890 in America and England;" "Current Astronomical opinion on the

Fixity of Planetary Motions;" "Assessments of the Validity of Potassium40 - Argon40 Radiochronometry;" "Migrating Eels and Continental Drift;" etc. Each Participant will present a copy of his paper to all other members of the seminar. Depending upon their quality, and granted the need for this approach felt in various quarters, the papers may be published in a suitable format.

CHAPTER TWENY-NINE

I.Q.: A UNIVERSITY PROGRAM [1]

DEFINITION OF A FIELD

A continuous and perennial "fringe" area of a number of humanistic and scientific disciplines centers upon the evidence that in the history and pre-history of man extensive natural changes occurred abruptly and catastrophically, and brought "quantavolutional" rather than evolutionary changes of geography, climate, the solar system, the biosphere, culture, and the human mind. These quantavolutions or saltations are capable of systematic scientific study.

The hypotheses of quantavolution pursue the following types of propositions: a) The Earth and its people have been subjected to catastrophic natural experiences (flood, heat, earthquake, meteoritic bombardment) of a kind unknown to recent history. b) These have occurred both before and after the passage of homo sapiens from the hominid. Evidence of them is to be located in legends, religions, psycho-social behavior, astro-physics, the geological and fossil record. d) A new general theory touching upon all fields of knowledge is evolving in the midst of conventional scientific theory, introducing critical modifications concerning natural history, the solar system, ancient history, and the origins of culture and human nature.

SCHOLARLY INTEREST

A number of scholars around the world are concerned with these topics, yet no university has come to serve as a focus of research, writing, publication, and coursework. The principal in scientific catastrophism has been Dr. Immanuel Velikovsky, recently deceased, whose published works, with several still to appear, have been read by millions of persons in several languages. At present, three journals, "Kronos" (USA), "The Society for Interdisciplinary Studies Review" (England) [2], and

"Catastrophist Geology" (Brazil) are devoted to the area; the literature also appears in other periodicals and in an increasing number of books; and William Corliss Co., Glen arms, Md., is engaged in an extensive publication of source-books. Quantavolution has its "fringe" problems, too, like all fields of leaning, and its scholars are as deeply concerned with maintaining scientific standards and distinguishing between "science fiction", "foolishness," and science and scholarship as their counterparts in other fields.

CURRICULUM

The greatest single need in the area of quantavolution is a wellknit communications and learning network, and it is the idea here that University College of the University of Maryland may be well adapted to these functions. A program of sixteen courses is to be outlined below for the potential student body of an Institute of Quantavolution. Courses might be given for academic credit, whether two or four credits in every case. Courses might be audited, where students are otherwise heavily occupied or cannot afford the cost of tuition. It is recommended that for the first two years, courses would be offered not for credit, but with the granting of a Certificate of the Institute of Quantavolution, University of Maryland, in mind.

Later on, after investigating the first two years' experience, arrangements might be made for an appropriate configuration of courses to constitute a major or minor offering leading to the Bachelor's Degree. Furthermore, students already possessing the BA or other degrees might earn a Master's Degree in Quantavolution upon completion of ten courses and the presentation of an approved thesis.

It would be presently impossible to establish the Q program at an orthodox department or an interdisciplinary program at any university in the country. If for no other reason, the trained scholars, observers, writers, and theorists in the field are not to be found at any university. This is an especially cogent reason for initiating the program in a University College externalinternal system, and, as such, it would perhaps demonstrate the unique capabilities present in such systems. Also, continuing commitment to a budget of a quarter-million dollars annually might be necessary were a university to undertake a program in Quantavolution.

Course designations in the field of Quantavolution (with brief descriptions)

- Q1. Introduction to Quantavolution. The essential literature; the controversial character of the field; a history of catastrophism: the hypotheses of Q.
- Q2. *Intermediate Quantavolution*. Systematic development of major theses of Q in the humanities, social sciences, and natural sciences.
- Q3. Primeval Quantavolution in the History of Science to 1950. Quantavolution as reflected in Greek thought; the concept of the Deluge; cometary theories of catastrophes; Plato; G. Bruno, Whiston, Cuvier, Donnelly, et al.
- Q4. The Scientific Reception System and New Science. The Velikovsky Affair and analogies related to PQ in other problem areas of science: ethics and rules of science.
- Q5. The Catastrophic Origins of Human Nature. Evolutional and quantavolutional possibilities in the rise of mankind; effects of primeval experiences upon human nature, culture and modern man: Jung, Freud and racial memories.
- Q6. The Bible and the Catastrophic Record. A review of ancient traditions of Exodus and the Books of Moses; influences of disasters upon Judaic-Christian-Muslim thought and practice.
- Q7. Catastrophism in Literature: From the Vedas to Joyce. The Hindu, Biblical (Psalms. Job, etc.), Homeric writings reinterpreted. Hesiod, Ovid, Shakespeare et al.
- Q8. Catastrophes. Science Fiction and the Arts. Ancient art, modern and therapeutic art; science fiction and catastrophe; catastrophe in films and documentaries.

- Q9. The Mythology of Disaster: How myth and legend obscure while they discuss natural disasters and cultural consequences; the great bodies of myth analyzed, compared.
- Q10. The Ancient Electricians. Study of ancient evidence before the present era of heavy atmospheric and earth electrification in especially the Mosaic period, the Vedas, and the Greek mysteries.
- Q11. The New Astronomy and Quantavolution. A binary solar system; origins of planets, comets; electromagnetic effects; the surprise of space exploration.
- Q12. Geological Problems of Quantavolution. Ice Ages theory. continental drift and plate tectonics, general earth morphology as a record of changes in global motions and heavy-body space encounters.
- Q13. Quantavolutions in the Biosphere. Modes of Biological change, atmospheric fluxes and their biological effects; evidence of disastrous boundaries in evolution; fossil assemblages.
- Q14. Chronology and Quantavolution. Radiometric and other geo-physical methods of dating the past; critique of uniformitarian assumptions; determining archaeological time.
- Q15. Chronological Reconstruction in Ancient Europe and the Near East. Velikovsky's attacks upon Egyptian chronology and their effects upon the dating of Mediterranean and Near East cultural events. Western Europe and the megalithic astronomers.
- Q16. Professional Writing and Translating. For the Certificate of the Institute of Quantavolution. For students having completed eight courses and approved by an ad hoc committee after oral interview. Supervised work on an approved topic discussed in committee.

INSTRUCTORS

Responsible instructors can be listed with the course titles. In the course of preparing this memorandum, thirty-nine potential qualified instructors were identified, of which sixteen were in the East Coast megalopolis. Especially in the formative stages, the right to designate and relieve instructors should vest in the Director of the Program. Because personal meetings are important to the purposes and method of the program, a number of adjunct instructors might be made available in various locations that are accessible to students not living within reach of the primary instructor. Every attempt would be made in advance to provide students with appointments at mutually convenient places and times with a traveling instructor. The flexible calendar of University College may permit these arrangements. For example, a student taking a course in Scotland, if the instructor is in America, or not "on circuit", might meet with an adjunct professor at a Scottish institution or another location nearer to him. An extensive bibliography is available for all of the listed courses. The required readings can be made readily available for students anywhere in the world. A microfiche system is planned to expedite communications at lower costs.

PROGRAM OF THE IQ

- A. A curriculum of 16 courses leading to a Certificate in IQ
 - 1) At College Park (3 to begin).
 - 2) Worldwide (16 to begin).
- B. A 2-day conference in London in collaboration with the Society for Interdisciplinary Study in March, 1981, open to the interested public. A 3-day conference at College Park, Maryland, open to the interested public, in January, 1981.
- C. Initiation of a library and archive of materials pertinent to Quantavolution. Works, books, and archives of Livio Stecchini, Ralph Juergens. I. Velikovsky, and others may be donated to the Institute.

D. Summer Tours:

"Light on the Greek Dark Ages" - Greece and Aegean.

"Megalithic Cultures of Ancient Britain, Ireland and Brittany."

"The Catastrophic Experiences and Legends of Mesoamerica" - Mexico. Guatemala.

"Quantavolution in the Rocky Mountain Setting" - U.S., Canada, Mexico

These four tours are recommended to begin. Others are possible. The lifelong learning program at the University of California, Berkeley, "Study Abroad in 1980" is offering similar courses for credit. They can be excelled in originality, if not as conventional travel experiences. Beginning in winter, 1980-1.

E. An interdisciplinary faculty seminar open to University of Maryland and metropolitan area faculty who are interested in familiarizing themselves with the concepts, methods, and findings of quantavolution. (Like the Columbia University Forums). The seminar would continue throughout the year.

SUPPORT OF IQ

The interests of the network of Quantavolution scholars are in teaching research, residential conferences of members of the group, public conferences, and publication of reprints and new works. In all of these respects, present resources and opportunities are inadequate. The experience of the past twenty years, which has included scholarly activities of all kinds, is indicative of the problems. The extent of personal economic sacrifices by practically all of the scholars engaged up to this time has been considerable. They are affected especially by the world-wide inflation and cannot cover, for example, costs for even essential travel and modest accommodations. They can use an abandoned barrack better than a Sheraton motel, a communal kitchen better than an established à la carte cafeteria. All of this is not to say that past efforts have been unsuccessful. Conferences at Frazer University in Vancouver, at McAllister University in Canada, at Glasgow University in Scotland, at Lethbridge University in Canada, and at the Bronfman Center with the University of Montreal, have been productive. The scholars involved are impecunious, but unusually resourceful and productive.

The University College of the University of Maryland, in sponsoring the program of Quantavolution, can consider the following items of support:

- a) Office space of 5 x 10 meters for individual conferences, content management of the programs, and custody of a special library.
- b) Administration of the program, *procedurally*.
- c) \$3000 for a *substantive* administrator of the program, working out of the College Park office part time. At least for two years, the job here involves building up the ramified network of communications among scholars and students, expediting assignments, watching schedules, promoting conferences, facilitating the production and publication of teaching materials, and receiving and maintaining a library.
- \$5000 for the initiation of a microfiche newsletter, reprint d) and publication system for the program, to be sold to students and through a commercial or university publishing outlet.
- e) \$3000 Expenses reimbursement for IQ developers for program-building, telephone and travel expenses, disbursed through central office of IQ authorization.
- f) Publicity of the program through University College.
- \$2000 additional publicity through the facilities of the IQ g) group to attract students.
- Classroom facilities for offering three (assembled or open type) courses at College Park.
- Possible classroom facilities in London, New York (this i) may be provided by Professor de Grazia, if necessary), and a Dutch or German site.

- j) \$3200 for purchasing the basic (missing) published materials for each of the 16 courses and duplication of the instructor's set of unpublished course materials (so that the central office would hold a record of materials on all courses).
- k) Provision of promotion and management of a general College Park First Annual Conference on Quantavolution in spring 1981, together with guarantees of \$12,000 in expenses of invited lecturers and discussion leaders.
- l) Expenses of shipping study materials, including archives and books intended for the central office of the Institute of Quantavolution at College Park.
- m) Instructors' costs of cassettes, telephones, mailing and travel.
- n) Unreimbursed time of persons who may be involved in the promotion and establishment of the program.

The total outlay for items not handled directly by IQ is best estimated by University College budgeting officers, but a figure of \$16,000.00 is assigned here. The value of the consulting time of the professors acting as the sponsors and organizer (n above) is estimated at \$8000 and waived here. The total special cash outlay of the first year of a two-year experiment amounts to about \$16,000.00 of which some portion may be directly returnable and the rest returnable in the ordinary course of business. Therefore, the total of investment, allowances, and advances may be in the neighborhood of \$32,000.00 for the first year.

A goal of 533 student tuitions would have to be set to meet this cost, of which perhaps half at College Park and half worldwide. However, significant alternative or additional income might be returned from conference activities at College Park and elsewhere, and from sales of materials. (Tuition for a course is figured at \$115.00 of which \$50 is put aside for its instructor and \$60 is allocated to costs.)

ORGANIZATION

- a) An Institute of Quantavolution may be formed independently as a non-profit corporation to work with University College.
- b) An IQ may be formed as a non-profit corporation by the University
- c) The name may be used without formal legal structure and the program handled as an ordinary administrative sub-division.

Perhaps the third method (c) is simplest and most flexible in the early stage. However, the group of instructors would wish to have freedom to develop a set of functions perhaps not typical of University College programs: further they would wish to accumulate ear-marked grants, contracts, etc. Finally, they would wish at some point to set up a physical presence, a living-working-teaching arrangement that might or might not be possible at College Park or even elsewhere in the University of Maryland system. The Director of the Program (who could also be chairman of the Board of the IQ) can be designated for a three-year trial period by the Chancellor of University College.

FIRST STEPS

- a) Approval in principle of the IQ
- b) Appointment of instructors and publicity of the program.
- c) Opening and administration of office of IQ 1980-1 beginning date may be possible, until May 1, 1980, from the standpoint of recruitment of students. In addition to a Director-designate, an Associate Director-designate may be appointed to act in the absence of or under the Director.

BENEFITS

In general, the University of Maryland may benefit from the proposed program. The field is demonstrably appealing to serious students. It has achieved a sufficient degree of stability in its problems, methods and materials to avoid exoticism and cultism. It addresses important philosophical and scientific problems in the traditional spirit of the liberal arts and in the proper hypothetical and operational spirit of science. There is a chance of showing a unique capability of the University College method in developing a new field of science and humanities.

Notes (Chapter 29: I.O.: A University Program)

- A proposal for an Institute of Quantavolution (I.Q.) submitted 20 February 1980 to Dr. Malcolm Moos, Director of the Carnegie Study on New Directions for the University, University of Maryland and Chancellor Ben Massey, University College, University of Maryland. University College operates intra-murally and extra-murally, with centers and students in various countries of the world.
- See e.g. R.A. Kerr. Science, 18 Jan. 1980, 293. "Venus 2. and Science's Fringe."
- 3. A. de Grazia, "The Coming Cosmic Debate in the Sciences and Humanities," in N. Ravel, ed., "From Past to Prophesy." (1975) [see "a Cosmic Debate" here above.]
- 4. The Society for Interdisciplinary Studies has members in 19 different countries and was founded four years ago.
- 5. At the writing of this memorandum, Egypt appeared closed as a possibility. At the moment of publication (Dec. 1983) Egypt is open and the Society for Interdisciplinary Studies (London) is planning to conduct such a tour under the direction of the ancient historian, Peter James.

CHAPTER THIRTY

PAST, PRESENT, AND FUTURE

In the Quantavolution Series I have carried out my commitment to tell what the heavens were once like and how they became unsettled, and what then befell the Earth and humanity. The story of much of this was partly suppressed in the memory, partly carried esoterically in myth and legend, partly lost in natural disasters, and partly destroyed by human hand.

The world is lucky that the Nazi book-burnings came in an age of printing: what was destroyed could be replaced from the stores of the free cultures. But in ancient times, books were hard to replace. Few if any copies of them existed in the first place. When the great libraries of Sumer and Akkad, of Ninevah, of Memphis and Thebes in Egypt, of Syria, of Athens, of the Celtic Druids at Alesia, of China, of Rome (even Rome, 83 B.C.), Jerusalem, Alexandria, and Tezcuco (Mexico) were burned, unique treasures were lost forever. The ancient writings that survive to this day can be carried on the shelves of a large bookcase.

Almost all of the lost works that dealt with astronomy, geology, anthropology, and the history of religions must have treated of catastrophes and possessed a catastrophic viewpoint. I venture this from the fact that the great majority of the works that remain can be so described. There is no reason to believe that these are a biased sample of the hundreds of thousands of manuscripts that were lost.

Indeed, because the later writers were prone to amnesia about catastrophe, they would have quoted from and edited their sources to conform to the solarian consensus that I have sometimes referred to. The Bible appears to the modern sensitive mind to be often catastrophic in content and tone. Still, various humane Judaic and Christian pastors play it sweet and low to

their flocks. Even this Bible evidences many effects of having been repeatedly edited, especially following upon the last series of "Mars" disasters, so as to cover up and smoothen out the more incredible and harsher passages. (I suppose that not one in a hundred Bible readers could imagine that the mysterious stranger with whom Jacob wrestled was meant to be a sky body, probably a planet.)

Hence it can be said that the lost libraries of the world have been more heavily catastrophic than the typical work that has come down. The trials and tribulations of history have produced and perpetuated a kind of censorship on catastrophic thought. It is far different from, but perhaps more effective than, the deliberate attempts to suppress the uniformitarian ideas of evolution when these were advanced by Darwin, Huxley and their allies, and more effective too than the uniformitarian efforts to censor Velikovsky's catastrophism.

Catastrophism flourished in the religious dogma of the world and still does. Certain doubtful exceptions are provided by a few primitive tribes, some modern versions of Christianity, periodic cultic manifestations largely of oriental character, materialistic "religions" such as the communistic, and scientific movements such as the Humanists. Otherwise religions believe that 1) the heavens and earth were torn apart in the beginning by divine forces, 2) mankind was created in the process, and 3) the original chaos and creation were repeated upon several occasions, and might happen again.

Scientific catastrophism as a school of thought accepted these premises, but, as we know, the prevailing scientific majority rejects them. Significantly, the present uniformitarian dominance was not achieved at the expense only of theology and religion. Many scientists, including some great ones, had to be ignored or pushed aside.

I have already indicate that in the early days of science, the prevailing view of history was catastrophic. Hindu science, Mayan astronomy, Mesopotamian and Egyptian science, and Greek science and philosophy generally adhered to catastrophic principles. The Chinese had probably the longest record of teaching uniformitarian principles. Two thousands years ago and

more they began to bet the life of their emperor upon the stability of the heavens, and the emperor tried not to lose the bet. Yet the bet is itself proof that a catastrophic fear was present. The Chinese could predict eclipses but took no chances and conducted solemn rites upon their occasion.

Certain medieval philosophers in the west, such as Maimonides, argued on behalf of a settled and orderly universe, but were outnumbered by Christian and Islamic philosophers in the tradition of the apocalyptics and millennialism.

The brilliant harbinger of modern thought, Giordano Bruno, thought that worlds were infinite in number and extent, that worlds were often born and destroyed, that the Moon had come lately into its place, and that the Earth was only temporarily undisturbed. Isaac Newton, for all that he laid down the laws that founded the dogmas of uniformitarianism in astronomy, nevertheless gave a good part of his later life to research in the chronology and authenticity of the Bible, with attention to the great Deluge. It was his assistant, Whiston, who introduced a great comet as the force that brought on the deluge. Therefore Whiston may be properly called the first modern astrophysical catastrophist.

Over a century later, Giambattista Vico wrote in his New Science (1744) that after the Deluge, Jove reorganized the world with his bolts of lightning: all the nations arrived separately at the worship of Jupiter and called him by different names. Soon afterwards Nicholas-Antoine Boulanger used an account of the comet and deluge to explain the origins of religions. They were, he wrote, based upon the primeval terror of the heavens. Sin and punishment were born, he thought, when the pleasant and egalitarian conditions of primeval life were disturbed by the disasters of heaven and earth. These events were attributed to the gods. To appease and propitiate the gods, rituals and sacrifices were established, punishments were meted out for infractions of customs and ritual rules, and great theocracies and monarchies were built up as the enforcement machinery of the gods. With Boulanger, an engineer, a full-fledged theory of catastrophism was born. Carli-Rubbi, an economist, was a worthy successor.

Almost all quantavolutionists since 1860 have worked under conditions of partial isolation and ostracism from the major centers of science and scholarship. But this condition may not persist much longer. Presently, as I have shown, there is a resurgence of quantavolutionary thought. A new multidisciplinary science is being born. Until it has grown, it must depend for its sustenance upon orthodox science. Repeatedly, and often ironically, the evolutionists and uniformitarians have delivered evidence into the hands of the catastrophists. The latter, after all, are very few in number and bereft of facilities and resources.

ANXIETY AND CATASTROPHISM

The present age is one to support a resurgence of quantavolution. The twentieth century has become an "Age of Anxiety" despite the soothing effects of the long-term dating of the uniformitarian model of history. Apparently the most progressive element of the human race was not to be consoled by modern science. Indeed, from anxiety, it moved towards catastrophism.

When Sigmund Freud began to write in the anterooms of his comfortable apartment in Vienna before World War I, he dealt at some length with hysterical women and disturbances of middle class life. The sexual problems that occupied him are discussed as commonplace in the mass media today and would perhaps amuse more than startle the contemporary film audience if portrayed.

Freud invented the psychoanalytic interview, which eased the labors of the human mind as it sought to recall its past. He rediscovered and placed upon a scientific basis the "unconscious" and the analysis of dreams. All of these enter the science of catastrophism.

As Freud grew older, the world changed rapidly around him. Great wars and revolutions occurred; empires broke down; cultivated nations sought to exterminate whole classes and peoples. Freud was driven to speculate about the origins of mankind and the future of civilization. He wrote that civilization was a contradiction of the mammalian instincts of humans and

could never be founded securely upon such an insubordinate creature as man. Finally, he thought that mankind was possessed by the instincts of eros and thanatos, life and death. The death instinct was self-destructive, suicidal, and, when projected upon the world, sought to carry the world into the grave as well.

Thus a great mind of the century passed from the "Age of Anxiety" into the "Age of Catastrophe." And with him, yet regardless of him, whole peoples and cultures pursued the same crossing. They began to move back from the ideology of progressive science into an ideology of the mystic, the occult, of magic, and of "fundamental" realities. Instead of pursuing pragmatic science and focusing upon cultural progress, many began to develop a concern for the survival of the species and a fascination for the forces of destruction.

Impending catastrophe had come to engage popular attention. Unidentified flying objects are observed, said to be carrying intruders of superior technology from far space. Since inspection at close quarters of Mars, Moon and Venus has rendered impossible a belief in these bodies as bases of operations for the invaders, a farther space is postulated. Efforts are made in the highest scientific quarters to communicate with some one of the thousands of possible advanced types of being that must exist in the universe.

Too, exploding stars in many parts of the heavens have impelled people to become worried about the stability of the skies, and various studies of the processes of the solar furnaces and the tides that the great planets and sun exert upon the earth give them grounds for further uneasiness. Californians live in anticipation of great earthquakes along the San Andreas fault. Various ethnic and religious groups in a number of countries including the United States, Israel, Lebanon, the Soviet Union, Nigeria, Ethiopia, Thailand, Cambodia, Vietnam, Iran, and China live in fear of persecution and genocide.

The case for an impending nuclear bomb holocaust is so strong that it has become a "given fact" in the logical premises of the multitudes. The poisoning of the atmosphere and of the food supply are freely predicted, with substantial justification. A climatic change spelling death by famine and suffering for hundreds of millions of persons is already happening. Laboratories of micro-biology are coming under official scrutiny for the possibility that their experiments in genetics may leak uncontrollable diseases, even while people, perhaps mistakenly, feel relieved that the armies of the great powers talk about renouncing biological warfare and destroying stocks of germs and poisons. Writings and films about catastrophe command audiences of unprecedented size.

One does well to appreciate, however, that throughout the past two centuries of scientific optimism and of parochial solutions for human problems, the mass of people has been convinced, as it always was before, that a catastrophic fate awaits human existence. The religions have been, with rare exceptions (if any), catastrophic in their world view. If to this permanent majority is now added the many educated backsliders who watch the world of human and natural events with catastrophic expectation, it can be said, without much exaggeration, that we are in an Age of Catastrophism: the potentiality is present in nature and man, and the concern is widespread and evident.

It should not surprise anyone to notice the coincidence of public and scientific movements. Sociologists of science and historians of science, such as, for instance, Barber, Kuhn, and Stecchini, are fully aware that the scientific movements of an epoch advance alongside public opinion; the two interact with unspoken accord to produce new models of science.

THE POLITICS OF UNIFORMITARIANISM

Science is a set of peculiar operations conducted by human beings in a group setting. Operations proceed over time with the rise and fall of different theories of man and nature. The victory of uniformitarianism over catastrophism was a scientific, organizational, and political victory. One instance may be provided here to show that such was the case. A reading of accounts of efforts to discredit Velikovsky may serve to supplement this example.

Incongruous though they may appear at first sight, the suppression of the word "stratum," an election of the Geological Society, and the downfall of the English Tories were at one

moment in history tied together. A uniformitarian English activist of 150 years ago, George Scrope put the first two together in letters to Charles Lyell, which George Grinnell, historian of science, has published.

Following Lyell's election as President of the Geological Society, Scrope wrote (April 12, 1831),

"By espousing you, the conclaves have decidedly and irrevocably attached themselves to the liberal side... Had they on the contrary made their election of a Mosaic geologist like Buckland or Conybeare, the orthodox would immediately have taken their cue from them."

Next year, Scrope was writing:

It is great treat... that two thick volumes [Principles of Geology] may be written on geology without once using the word, 'stratum...'" (September 29, 1832).

Why did "the father of modern geology" Lyell, shun the world "stratum" in his great work? Why, for that matter, did Darwin not use the word "evolution" in the *Origin of Species*? The most fetching geological sight to the eye of even the rankest amateur is the layer upon layer of rocks that often break into view when a profile of land is exposed. William Smith (1815), Lyell's predecessor, did use the word. Perhaps Lyell felt that "strata" implied discontinuities, and discontinuities implied catastrophes between strata. Which they may do. But Lyell failed. The word "stratum" was essential to geological description and classification and he went back to it himself. Yet many geologists see in the discontinuities of strata only a gradually eroded former body of rock that would, if only it were still there, exhibit a nicely graded continuum into what is there above now.

On May 3, 1832, Charles Babbage, a mathematics professor and political activist, wrote to Lyell. "I think any argument from such a reported radical as myself would only injure the cause, and I therefore leave it in better hands." Of this Grinnell comments: "Uniformitarianism" was promoted by the liberals as part of the 'cause' to undermine the theoretical foundations of monarchy and was not derived from field research." The established Church of England and the Monarchy were Tory strongholds.

Thus do the politics of science, a scientific concept, and the English "Great Reform Bill of 1832" go together.

Over many years I have had to consider by reason of my circumstances the ideology behind such great developments of the nineteenth century as the mass army, the large, perfectly coordinated symphony orchestras, the growth of bureaucracy in government and business, and the factory system in industry, the mass media, and massed spectator sports. I concluded that this routinization and massing of human behavior was an outstanding leitmotif of the age.

I am now persuaded that uniformitarianism, the great scientific empirical data-collecting movement of the century, was also part of this same ideology. For the scientists of the century were also in the business of collecting factual evidence of all kinds, assigning places and specialization to both facts and people, and routinizing scientific work. To this great movement, catastrophe, as the rare destabilizing and disruptive event - whether destructive or constructive - was anathema. It denied the value of infinite, regular series; it upset the establishment of industry, bureaucracy, economy, music, warfare, religion, and politics as progressions continuous, infinite of small changes. Uniformitarian science, far from being the enemy of all religion, was a key element in total religion, the unconscious world view of the nineteenth century.

One needs to be on guard against certain disturbing human behaviors that are inherent in scientific behavior, as in all human behavior. Yet it would be incorrect to think that the scientific establishment from dozens of fields is stupidly obstinate and engaged in conspiracy regularly against better theories. Philosophy and science are organized groups, suffering frequently from the ills that may afflict all bureaucracies and cliques.

Science moves ideologically. It moves, too, as an administered, habitual form of behavior. It moves with theoretical models, or as Thomas Kuhn has said, in theoretical paradigms; under certain conditions the model fails and a scientific revolution occurs. This happened in the change from Ptolemaic to

Copernican astronomy and from catastrophism to uniformitarianism.

But modern uniformitarian science, as we have experienced and enjoyed it, has achieved important successes. It has provided a housing for much practical invention. It has encouraged the careful, coordinated development of findings and techniques in many fields. Only if it comes to pass that quantavolutionary primevalogy gives a greater pay-off than evolutionary primevalogy, or when it is obviously worth setting up as a model running along a parallel track, should a changeover occur. By a changeover is meant a redistribution of effort and resources.

Uniformitarianism has enabled humanity to challenge nature (by giving nature a humbler and gentler guise). It has removed the historical gods from parroting human stipulations that hamper scientific investigation. It spawned the idea of a linear history, destroying the more conservative and pessimistic cyclical theories of history.

It has encouraged the idea that progress is possible in a long future of mankind. It has promoted faith in the stability of the world. An exquisite and productive division of labor in all areas resulted. There was no rushing to the caves and wombs of theology. It simplified religion, letting the deity be conceived of as a master designer and an overarching and all permeating intelligence. It promoted generally the practice of instrumentally rational bureaucracy and rationalism generally, and ultimately found expression in pragmatic, instrumental philosophy. It helped to form a vision of political and religious decision-making corresponding to the method of science - cool, not catastrophic.

Granted such important social functions, plus the comfort of a now secure dwelling place for humanity, plus the apparent scientific productiveness of the theory (which, however, may be the result of the assurances, not the content of its theory), the replacement of Uniformitarianism is neither a simple matter nor is it a victory to be celebrated without anxiety.

We can only surmise and hope at this time that the catastrophic subconscious of humanity, when dredged up, will bring with it its own comfort and some additional possibilities to sustain the human spirit on our small planet in infinite time and space. Unless it excites a strikingly novel religion, it may be a disastrous force in itself. Can we plan and program the human mind for all the equivalent and hopefully superior behaviors that should follow the demise of the old world-view?

That science will be entering upon at least a partially quantavolutionist phase seems likely. Even without awareness, uniformitarianism and evolutionism have been eroding in astrophysics ("the explosive universe," "cometary eruption from planets," "solar uncertainty"), geology ("continental drift" and "catastrophic end of the Ice Age"), biology ("systematic mutation," "great leaps," "mass extinctions," "punctuated missing high ancient history ("prehistoric equilibria"), civilizations," "sudden destruction of civilizations," "reconstruction of Egyptian and Greek chronology"), and mythology ("the enlarged truth of legend" and "the celestial obsession of myth").

The Encyclopedia Britannica was published in 1973 in an extensively updated form. Hundreds of its articles nevertheless were erroneous or lop-sided or incomplete according to the theory of quantavolution. For an example, its article on Earth Forms (geomorphology) may be selected. It begins incorrectly by arguing that catastrophism was founded upon Bishop Ussher's calculation of a 6000 year-old world. (Actually, catastrophism had been long in existence as a scientific outlook in both Christian and non-Christian lands.) It proceeds hesitantly with a conventional explanation of earth forms. Several examples of quick transformations are introduced -- mountainbuilding, peat and coal deposits, glacial advances, etc. -- but they are labeled as exceptional. Then the article lets out the quantavolutionary tiger: "Although present and past processes are similar in kind, process rates must have been variable." Variable process rates - exactly! For scientific catastrophists rarely said that processes themselves were dissimilar, although some assigned a basic role to divine creation. To them "earth, air, fire, and water" were always "similar in kin" but with rates of work that have been variable: once very high, they are now very low.

Uniformitarianism and evolutionism are then under critical stress. Of what use would be the emergence of a quantavolutionary model? In the first place, the newer view can claim what science in general claims on faith: To know is good because what one knows will bring good. Also, if knowledge in itself brings pleasure, then new knowledge of what befell ancient man and the skies and earth will be useful in bringing pleasure.

The quantavolutionary view introduces an opposition party. In science as much as in politics, a multi-party system is preferable to a one-party system. Like the elite of an underdeveloped nation, prehistorians may suppose that their area is too poor in resources and skilled manpower to afford a democratic opposition. On the contrary, like an underdeveloped nation, archaeology and pre-history would show a new gain after costs from the activity of a critical party espousing the revolutionary against the evolutionary point of view.

It has been said that "if you begin by treating the scientific ideas of earlier centuries as myths, you will end by treating your own scientific ideas a dogmas." History and philosophy will be the gainers by a revolutionary challenge. All truth, including mathematics, is based upon experience and also upon ideology. There is no purely theoretical science, nor is there any purely objective science. Continuous critical exposure of the foundations illuminates natural and early human history and makes history a living part of the operations of science.

Sooner or later, as the area of natural history is mined with quantavolutionary tools, significant discoveries should be facilitated. They may occur, for instance, actually in the exploration and mining of minerals and ores. Space exploration and observations; environmental conservation; the discovery of art treasures; the rediscovery of ancient inventions in the arts, sciences and social organization; the search for new power sources in electricity and nuclear fusion; sea bottom development; genetics; and institutional and political oversight these are some of the areas where a revolutionary perspective may be turned to some use.

The question of psychological therapy arises. The catastrophized quiddity of homo sapiens schizotypus raises a fundamental

barrier to therapy. Human nature stands opposed to its own cure. Nevertheless, this immense challenge should be confronted by the development of a field of quantavolutional therapy. It would work upon the quantavolutional human model through psychiatry with the aim of draining the naturally provoked and socially obsessed build-up of fear. Sublimatory measures, including personal and social pragmatics, might be devised.

But of what use is quantavolution to religion? Astronomer Fred Hoyle, in *From Stonehenge to Modern Cosmology*, once answered the question of why modern man investigates the structure of the universe. "The answer is no different in principle from the motives of the builders of Stonehenge. The motive is religious." But the motive for religion is not a religion. What shall the religion be? To get down to cases, what has been said in the Quantavolution Series to illuminate the role of religion.

It must have become plain by now that a quantavolutionary primevalogy, in this book at least, regards the historical gods as part and parcel of the sudden construction of the human being. The historical gods have been delusions, possible pure delusions. We were catastrophized, and wrapped up in the gods in our delusions.

Out of the study of animals, man, myth, and culture, we emerge with an historical and comparative picture that seems clear and sharp. We sense an every-present danger when the catastrophized, schizoid creature known as the human being speaks in the name of gods, asserts that gods speak to him, calls upon the gods to intervene in the world, treats in the name of gods with other people, and assigns human traits to the gods.

We feel that this all may be inevitable in our natures, but we refuse to accept it. We feel that the better part of catastrophes is directly responsible for what humanity is proud to be. But the larger part of catastrophism urges mankind along a path on the brink of its self-destruction.

History has on the whole been a record of failure in human relations. And the historical gods, those projected as experiences and teachers by the human mind, have invariably contributed to the record of failure. Presently, governments whom there is no reason to greatly trust are in command of populations that multiply beyond hope, of nuclear weapons aimed specifically at the destruction of civilization, and of technologies that are destroying the environment. If an ordinary person, under such circumstances, adds an entirely reasonable anxiety to his primordial anxiety-load, he cannot be reproached.

However, anxious people make anxious societies. Anxious societies make anxious governments. And anxious governments suppress liberties and make war. Great gods and little gods rise up like thermometers in the social heat: historical gods, political man-gods, gurus, and psychiatrists. A world vision is lacking. The people will not then concentrate upon a consensus of behavior that would assure a benevolent and beneficent world order.

The predicament is not for solution here. Never in the past 2700 years has humankind had such close brushes with death as in these last few years. And never was it so threatened by its own hand. Whenever natural disasters and the compulsion to repeat them occurred, brother fought brother, and nations fought nations; but none commanded the nuclear and chemical forces that today can consummate the terror-laden wish to destruction.

In comparison with the human threat to humanity, the natural threat appears to be moderate. If my theory is generally correct, the solar system is in a relaxing phase. It is settling down.

There remain four potentially disturbing elements. One is he Sun itself which is known now to be inconstant. It is well hat the disappearance of sun spots for seventy years three centuries ago caused only a "little ice age." The human suffering was considerable. Were there to be more of a lessening or on the other hand, a more explosive solar activity, the effects upon Earth could be quite damaging. It would be reasonable policy on the part of the world's governments to divert resources from armaments directly into solar study and into planning defenses against the possibility of serious solar perturbations.

No comets capable of exploding the Earth are known to be circumnavigating the solar system. There may be such long-term comets, now invisible, that would someday appear before a

startled world. Little could be done in such an eventuality. Happily the risk is very small. Still, at least some group should prepare from time to time a scenario and recommendations for dealing with cometary intrusions. A small comet on a collision course could, for instance, be exploded with nuclear space missiles at a safe distance.

A third danger to the world arises out of the growth of ice caps. Whether they are in fact growing is disputed. An answer to the question is technically possible. The answer should be obtained. An overloading of the ice caps could create an imbalance to the globe and cause an axial tilt. Horrendous floods, tides, earthquakes, volcanism, hurricanes and climatic reversals would follow. The ice caps might avalanche. It is already possible, however, to whittle away some of the ice by explosive melting or to tow away some of it to warmer regions to melt and use.

A final larger danger, as unpredictable as the others, lies in he instability of planet Jupiter. The "Jupiter Effect," which is tidal, is small by comparison. For Jupiter is extremely hot and highly electrified. If it were to fission, that is, to explode fragments of itself, the Earth might be directly affected by disastrous x-rays and other particle storms. Large meteoroids and comets from the explosion might enter upon orbits that could allow for encounters with the Earth.

The human race has suffered much from its birth throes, natural catastrophes, and its own destructiveness. It would appear savagely ironic if mankind were to come to an end so early in its career. There is no arguing this issue, and it is perhaps the point at which to end the whole discussion. Whenever a strange object appears in the sky, people everywhere are alerted and alarmed, with the panic of old surging within them. Whenever the question of man's duration on Earth is brought up, the pragmatic answer is as it must be "forever." A creature in search of eternity calls for a cosmology. Scientists or not, we need to go seeking

the divine in the universe, like children's chicken-licken, preparing our minds and our Earth for cooperation with the divine wherever and when it is encountered.

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End of
The Burning of Troy
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Home