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 mountain-top 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.

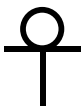
Let us recall the book of Cohane on *The Key* with his several basic words, all god-words, divine, and most likely astral in original reference, *og, enah* (or *hawa*), *ala*, and *aza* among them. The Black Magellanic Cloud is the name for the seemingly starless patch in the Milky Way near the Southern 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 mid-second 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 war-dances 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 break-out 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 burdensome restraints imposed upon literature by the 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 belief-system). 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 explorer-scientist, 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 self-deception 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.

g. Derived Data: the systematically collected information 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 and 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.

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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.

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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.)

4. Given a sharply defined set of these three paradigms, one may expect to find that all three paradigms "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 scientific-catastrophists 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."

5. Marx and Engels were conducting a triple campaign a) to 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.

8. They attempted to recruit practitioners of the new science 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 favor the term "quantavolution" and find myself, in 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?
II. What are the young around the country hearing, reading and learning now that relates to the issue?

III. *Scientific freedom.* Essentially all matters can be publicly discussed in philosophy and science. Instances of opposition from governments, from private groups that include scientific and educational establishments?

IV. Matters permitted (or disallowed) for discussion in schools

1. "Whatever the teacher can get away with" (like the policeman on the beat)

2. What the school (educational) authorities prescribe and permit

a) Free schools
b) Conventional schools
c) Conventional (trade) schools
d) Morally defined schools (religious)

3. What the political authorities prescribe and allow the school authorities to discuss.

4. What the publics prescribe and allow the political authorities to prescribe and allow.

5. 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.

V. What positions may be advocated in public? Practically 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

IX. 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 of First or Early causes.

2. The Time-table of the World, of Natural and Human History.

3. The occurrence and scale of catastrophism (e.g. “Deluge”)

X. Astronomy and Astrophysics

A. Conventional rhetoric: “Big Bang,” 5 billion years, gravitation, etc.

B. Deviations approaching certain religions: intelligent life, short duration, unstable Sun, etc.

XI. Geology and geophysics (Earth sciences)

A. Conventional rhetoric: gradualism, landscape evolution, etc.

B. Deviations: catastrophism, recency, etc.

XII. Biology

A. Darwinian, neo-darwinian, mutation, natural selection, gradualism, etc.

B. Macro-evolution, inherent design of change, quantavolution, catastrophe-induced change, recency.

XIII. Anthropology and Sociology

A. Long history of descent from primates, gradualism in evolution of culture, religion wholly culture dependent, etc.

B. Culture is religion-dependent, short history, unknown descent.

XIV. Psychology

A. Ethological view (“man is one of the smartest animals”), etc.

B. 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.

XXVI. Whether cosmogonical material, as presented in 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:

1) The scientist and his educated clientele are likely to 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.

2) A second harmful belief is that the scientific method is a 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 decision-making 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 subject-matter, 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 de-sloganized 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 de-humanizing 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 and 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 teams. That is, 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 practices, and certain scientists themselves. Various 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 re-storying 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)

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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.

I.

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 connections between the Orient, America, and the 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 pre-history.

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 extra-

terrestrial 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 proto-history. 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.)

The 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 micro-temporal 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 super-energy 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 and sacred-secular power forms; war; sexuality; economies; instrumental rationalism.

CONCLUSION

13. May 5 WHAT THE PRIMEVAL FORETELLS OF THE FUTURE: Centrality 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

1. 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, natural saltations, cyclism, catastrophe* (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.

A. The ascribed and actual origins of all major religions in catastrophes: Cases: Mosaism, Mazdaism, Greco--Romanism, Mesoamericanism, Hinduism.

B. The number and kinds of catastrophes claimed by religion.

5. Practices.

A. The conversion of legendary experiences into forms of religious practices.

B. Cross-cultural identification of the principal deities and their traits.

6. Ideology

A. The functions of catastrophic ideas in religion.

b. The sublimation of catastrophic religion in philosophy, ancient and modern.

C. Attempts to free religion and philosophy from 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 X 10^7, 10^9 or 5 x 10^9 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)

21. Shakespeare

22. Modern Forms

    A. Science fiction

    B. 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

    A. Problems of natural science models clashing with unconforming natural history

    B. 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 and Mars* (in Homer); *The Lately Tortured Earth* (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 well-knit 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 external-internal 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.

d) $5000 for the initiation of a microfiche newsletter, reprint 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.

g) $2000 additional publicity through the facilities of the IQ group to attract students.

h) Classroom facilities for offering three (assembled or open type) courses at College Park.

i) Possible classroom facilities in London, New York (this 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.Q.: A Unversity Program)

1. 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.

2. See e.g. R.A. Kerr. *Science*, 18 Jan. 1980, 293. "Venus 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 continuous, infinite progressions 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 equilibria"), ancient history ("prehistoric missing high 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 -- mountain-building, 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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The Burning of Troy

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