PART SIX

BIOSPHERICS

Two sets of questions are addressed in these next chapters. What explains the distribution of fossil remains of life, particularly the large number of fossil clusters involving different species? A fossil generally connotes an individual, a herd, or a general disaster. The greater the confusion of species, the more likely an exoterrestrial catastrophe.

Given the increase in studies demonstrating an exoterrestrial connection with general extinctions, can natural history be reordered according to the occurrence, frequency, and type of exoterrestrial disaster? And is large-scale extinction possibly or invariably accompanied by large-scale biological innovation?

Sounds and sights are ordinarily excluded from natural historiography, because they do not linger and one can no longer find their remains. However, we ask two kinds of questions whose pertinence cannot be denied. If exoterrestrial forces were operative on Earth and induced terrestrial forces, what sounds would have been heard and what sights seen? Further, have ancient peoples left us with stories of sounds and sights that indicate certain natural events which they were experiencing? Were these on a quantavolutionary scale?

CHAPTER TWENTY-SIX

FOSSIL DEPOSITS

In coarse quartzose sandstones of stream channels of Antarctica's Transantarctic Mountains, fossil bones of the definitive reptilian genus, Lystrosaurus, were found. Deemed typical of Lower Triassic forms, it has been uncovered also in South Africa, India and China. In the sandstone, mudstone and white quartz pebbles are intruded along with the bone fragments. Logs and coal are at the same depth. Volcanic material is above and below. Remains of between 40 and 50 specimens are among the more than 400 specimens of other species in the same deposit. Numerous fossil relations have been shown between South America and Southern Africa, though not yet the Lystrosaurus. The China parallel introduces properly the Pangean connection.

Pangean world distributions of many species of flora and fauna, both fossil and living, can be traced. Living species that have no way of traversing present-day barriers are discovered to exist on both sides of the barriers, as the tigers of Africa, India and Siberia. Extinct species of one area are alive in another area, impassibly separated by modern geography, as the elephants and camels of North America, probably miscegenable with those of Africa. Specimens of the same extinct species are found in areas separated by modern geography.

A collapsed time schedule for the creation of the ocean basins demands a reconstruction of how aquatic species developed. Pangea was a world of small waters. Small and shallow lakes and swamps are conducive to the generation of individual variations within species and the prolongation of their careers. Whales and sharks travel great distances, but do not need to do so; they can flourish in a Tethyan sea; so with every other aquatic species. The great deeps are a last resort.

The eels from everywhere descend to breed from their rivers into the salt ocean and there find the Sargasso Sea, the great belt of

weed-bearing waters on both sides of the Mid-Atlantic Ridge. They die there and their young swim for thousands of miles and years of time to find the rivers of Europe and America. The American eels have 104 to 111 vertebrae, the European 114 or 115, and n'er the twain shall meet.

Igor Akimushkin conjectures that eels originated or dwelt in the intercontinental fissure when it opened up an asserted 130 million years ago, not far from their fresh waters. Then they expanded their mobility to follow the drifting continents [1].

Fitting the case to the quantavolutionary theory, it would appear that the Sargasso Sea is a part of the old Tethyan world-girdling shallow freshwater sea; that for breeding the eels found the gulfweed more necessary than the saltwater noxious; that there has been too little time to cast off the habit of traversing great distances, or of adapting to seawater for the long adult life; and that the small differences between American and European eels are an additional indication of a recent common ancestry. The Sargasso Sea seems to be growing, which, since it must precede the eels, indicates that it may not have been in existence long. In sum, eel migrations are as much a proof of continental rafting as continental drift is proof of the reason why eels must be astonishing long-distance travelers.

So also with aquaticized birds: if they migrate today intercontinentally, it is a stretching of their original habits; the irregular geometry, followed by birds that fly away from the arctic directly south and then veer at sharp angles to find their winter grounds, and vice versa to return, may be a function of land-mass migrations; the birds seem to be pursuing their original routes. If so, there may have been little time in which to evolve more efficient habits.

The Pangean shallow waters life centers were mostly wiped out, but survivors could readily adapt to the continental shelves and slopes, and the shallow and middle depths of the new ocean basins. (Wegener once alluded to the exclusive presence of shallow-water fossils in marine paleontology.) A typical succession pattern for the survival of an aquatic species would be to migrate or be turbulently transported from a Pangean center in a flooding action that settled into a temporary pond on

the way across the land and towards what was to be the ocean. By the time of arrival at the finalized ocean shelf, where almost all aquatic species concentrate, the ocean waters bordering the land were quiet and cooled enough to permit proliferation. The exponential arithmetic for the growth of the population of the species at this stage would produce numbers sufficient to choke the oceans in a thousand years.

In the oceanic abyss, few species are found, and the same species are more commonly found on the continental shelf with few mutations. There is no exclusively abyssal flora or fauna, nor any "living fossil ancestors." The fact, however, that species do inhabit the abyss signifies that the abyss, were it old enough and the conventional processes of evolution occurring, would be teeming with adapted and mutated species.

The same logic would explain the scarcity of life forms in the high mountains, in the atmospheric bands, deep, below the land surface, and in the deserts. The inhospitability of these environments is only relative to dubious premises. Conventional long-time uniformitarian evolution and adaptation would have permitted all niches to become life-niches. Recent catastrophes provide of extinct niches such as would support a 50-foot winged dinosaur. If the oceanic salt seas carry few analogous niches for today's species, the reason may be limits imposed by the recency of drastic change, rather than limitations of nature.

Rocks dredged from the bevelled tops of a number of seamounts carry imbedded fossils of current species that give 8 to 12,000 years readings on C14 dating (probably 4000 years old, then). The abyssal floors contain many bones, remarkably preserved. Large shark teeth of unknown species abound. Elephant teeth are found far down the continental slopes of North America. Their preservation for more than several thousand years is unlikely.

The mountain is a new life-niche for mankind. A swamp is preferred. The altitude of the ruined city of Tiahuanacu is too high for the natives to reproduce themselves readily; they used to descend to the plains for the purpose. Either they were correct or had been living too brief a time up high to be sure. The mountains rose after the city was flourishing. Generally, if

mountains were old, they should support many more life forms than is the case. The erect posture of humans is well-adapted to sky-watching and life in the swampland; wading and carrying were greatly facilitated (as probably with certain dinosaur species). The food supply of swamps is lush and the fish and game of swamps easier to catch than the animals of the plain and mountain. It is a common error to portray hominids as living in the African climates of today and exerting themselves in the pursuit of large animals. Findings of bones pounded and scraped by hand-axes relating to hominoids might only signify omnivorous scavengers.

Large attached organisms are rare on the most recent oceanic ridges. The proliferation of such species on such ridges, that are rich in flora and fauna, is to be expected after a brief passage of time. The intense activity of the ridges several thousand years ago blocked their prompt development.

A distinctive southern flora, Glossopteris, found nowhere in the northern regions, is found as a fossil in India, Australia, South Africa, South America, and Antarctica. The case of India is doubly significant because a northern, adaptable, counterpart to Glossopteris exists but has never been found in India which is attached to Asia. This fact not only indicates continental rafting, but also recent continental rafting; there has been too little time for overland diffusion to have occurred.

Identical genera of late Permian fauna are found in Northern Russia and South Africa. A fossil dinosaur of five continents (North America, South America, South Africa, Europe, and Asia) is known. Pangean distribution is generally confirmed. South America and South Africa, however, do not share mammalian identity today; cats are the only common genera. Many mammals common to both areas existed in Pangean times, before the catastrophes. Flora and invertebrates present a different picture today: there are numerous identities.

Evidences of paleozoic faunal commonalty between North America and Europe are common. Many extinct Bohemian forms are replicated in extinct Texas forms, for example. During the paleozoic and mesozoic, some identical flora were to be found in East Asia and Western North America, and others in

Eastern North America and Western Europe.

The age-breaking catastrophes, since they came from the skies, handicapped severely large land animals. Most of the dinosaurs were wiped out at once; the larger mammals were mostly exterminated in one brief period. Elephant remains have been found in South America in Chile, Venezuela, and Brazil, as well as alive in Africa and India. Mastodon remains were discovered in Ecuador and Colombia. Elephant fossil bones were found in a Brazilian bed, or nearer to the sea than that same bed, which contained hundreds of modern human skeletons mixed among numerous marine shells and nodules of carbonaceous matter; these were discovered about 1827; the bed was referred to as of limestone and of tufa (volcanic lava).

Piles of torn and mashed mammalian remains (mastodons, mammoths, bison, etc.) along with remains of many types of contemporary flora and other fauna, are discoverable in Alaska and Siberia. They are found in muck pits. They portray instant disaster by tidal and atmospheric forces. Large deposits of bones are found in Baja California (Mexico) cast up by the same kind of forces, uniting elephants and sharks in death.

Most species of large mammals suffered extinction in undeniably modern times. (In 1975 a radiocarbon dating of a mammoth find placed it at only 400 B.C.) The species that could betake themselves to high ground or fly quickly from one place to another survived in larger numbers. Humans were among the survivors. Maybe it will be also shown that humans were present when the continents split apart. The implication of such proof is that an ecumenical culture must have existed prior to the Lunarian *diaspora.*

The references to the catastrophic extinctions at "the end of the Pleistocene" mark the end of the ice age, which should, according to conventional theory, have been a blessing to most species, but was a universal disaster; life was first threatened by advancing ice and water, and then practically destroyed by the forces that broke up the ice and by ice break-up as well.

Many voluminous deposits of destroyed life occur in areas far beyond the tropical or temperate climate where the same or

related species exist today. Injections of space gas at very low temperatures, associated once or several times with the tilting of the Earth's axis, may be evidenced in well-preserved, suddenly frozen life forms found in various places. Moreover, in every area of the globe where collective disaster is manifested among the plant and animal species, the geology of the areas usually confirms the biology: ooze and clay boundaries shift in the deposits of the ocean beds; organic layers are sandwiched between inorganic; ash is generally distributed on several levels of many marine and terrestrial sediments. Each level represents a general disaster; some stand for world disasters. Conflagration, tides, atmospheric violence, and other disastrous forces can probably be discovered wherever the mind is directed. Or so it seems.

Nature lends her occasional favors of fossils in a cruel way - by disasters. Human cult practices provide on occasion fossil cemeteries; otherwise human paleontology, too, would be dependent on the rare, unplanned event of a Pompeii. It is a euphemism, and misleading, to speak of "fossil cemeteries," or even of '"fossil assemblages," but, too, "dump," 'heap," "deposit," 'collection," 'aggregate" and other words are also questionable. Perhaps "fossil deposit" would be best, signifying many life forms concreted with clay, pebbles, and sand.

Fossil deposits may include on the one hand mineralized or petrified remains, or on the other hand preserved organic remains. The basic principle of fossil analysis requires every fossil occurrence to be approached as a catastrophic event. Quick burial of a potential fossil is essential. Then, occasionally, one or more of several chemical processes will preserve some of the organic structure itself, or an image of it, for posterity. R. Redfern summarizes fossilization for us, letting disaster pop out of a fully uniformitarian ideology in an analogy of the "fossil food" in a supermarket.

> Paleontologists sometimes find fossilized animals preserved in an almost complete state: sloths in arid caves, mammoths packed in ice, and men in peat bogs. Such effective preservation was the result of rapid reduction of moisture content or temperature, impregnation with chemicals, exclusion of air, or of a

> mixture of all four. Although we would hardly call preserved food 'fossil food' when we buy it from a supermarket, there is really nothing new about desiccation, deep freezing, chemical additives, vacuum packaging, and various combinations of all four [2].

If all the remains of all that has ever lived had been preserved, might they exceed in mass the Earth itself? Termites and many insect species are considered geologically ancient. There is said to be a half-ton of live termites for every living human being. Considering that entire islands and hills have been found composed of mammoth and large mammal bones, and considering the huge fossil beds of vegetation, we can be sure that recent catastrophes have laid down the organic soils of today and a great deal more that has been eroded or quantavoluted since then.

What dies is thus quickly recycled biotically, unless some geological intervention occurs. And this intervention that fossilizes is almost always connected to the cause of death. The fossil record therefore is distorted as to populations of the species and to a lesser degree to the kinds and numbers of species.

Not all is known about fossilization, and less is realized. Ardrey mentions that the waters of Lake Victoria (Africa) were once fossilizing animals quickly and well because of some unknown quality probably not now present. E.R. Milton describes his examination of a petrified tree trunk in Alberta (Canada) [3]:

> The piece... was pure clear silica inside, it was coated with a rougher opaque crust of partially fused sand. The tree whose stump was petrified was alive five years ago! After the tree was cut down to accommodate the right of way for a new power transmission line, an accidental break allowed the live high-voltage wire to contact several tree stumps still in the ground. The power was cut off within hours of the break. All of the tree roots which contacted the broken wire were fossilized... Obviously, electricity can metamorphose matter quickly.

One's mind reverts to earlier passages of this book where the

presence of heavy electric fields and poisonous gases are given credence; perhaps these may have helped in the fossilizing process.

A fossil is typically an accident, a disaster, an anomaly. We should not find in Ecuador a mixture of mastodon bones, pottery, and coal. Nor reptiles with full stomachs, pterosaurs swallowing food, a mammoth with buttercups in his teeth, or an ichthyosaur mother in the throes of birthing her infants. The very existence of fossils reflects, says C.B. Hanson, "inefficiency in the natural systems for recycling organic material." He experimented with sending mammal bones down a flume in a laboratory in attempts to replicate natural conditions. M. Coe studied the decomposition of elephants in a Kenyan drought, and concluded that only rapid burial would allow any chance for fossilization [4]. There was no question here of the elephants being assembled to die and then deeply buried away from water and doused with petrifying chemicals so as to produce one of the fossil assemblages so commonly found in natural history. In fact, the best case of a fossil assemblage that geology can afford from historical times is the resort population of Pompeii and Herculanum smothered and buried by the gases and ashes of Vesuvius in 79 A.D.

The following exchanges concerning a fossil conglomerate of prehistoric Nebraska clarifies the issues, as perceived by uniformitarians and catastrophists [5]. We quote the catastrophist:

> "In the American Museum of Natural History (New York) there is on display in the Late Mammals room (Room 3, 4th floor) a rectangular fragment (about 1.7x2.5 m, and 15 to 50 cm thick) of a bone breccia from a 'fossil quarry' near Agate, Sioux Co., Nebraska. Most of the bones are from a small, two-horned rhinoceros, *Dicera-theriurn*, with minor amounts from *Moropus* (6%), a clawed mammal related to horses, and from *Dinohyus* (1%), a giant piglike mammal. Extrapolating the quantity of individuals that make up this fragment over the total volume of the breccia layer (360 sq. m 15 to 50 cm thick), one arrives at 8200 *Diceratheria,* 500 *Moropi* and 100 *Dinohyi.* This breccia is believed (by Museum officials) to

have formed in quicksand. The accompanying text reads:

> The accumulation of bones is believed to have been formed in an eddy in the old river channel at a time when the valley was not so deeply cut out as it is now, and the river flowed at the higher level. A pool would be formed at this eddy, with quicksands at its bottom, and many of the animals which came to drink at the pool in the dry seasons would be trapped and buried by the quicksand. The covering of sand would serve to protect the bones from decay and prevent them from being rolled or water-worn by the current, or from being crushed and broken up by the trampling of animals that came to drink. But the sand of a quicksand is always moving and shifting around (whence its name of *quick*-sand), and with it the buried bones would be shifted around, disarticulated and displaced, so that when finally buried deeper by later sediments of the river valley they would be preserved as they are seen here, complete and almost undamaged, yet all the bones separate and disarticulated.

"I wonder whether the inventor of this mechanism has done his best to find an *actualistic* example of quicksand sucking up animals (with a lesser density than itself) in such a selective manner. Or is this another example of a *gradualistic* mechanism being preferred at all costs, even if it violates actualistic principles and physical laws? Has the possibility of a herd suddenly buried by a landslide or a liquefied sediment been considered? Are the properties of the overlying sediment compatible with this hypothesis? If so, it would be interesting to investigate this possibility also for other bone breccias, and to find out whether such breccias are more common from certain periods of Earth history than from others."

The story and comments are those of Hans Kloosterman, Editor of the magazine, *Catastrophist Geologist.*

Kloosterman's note receives a reply from Richard H. Tedford, Department of Vertebrate Paleontology, the American Museum

of Natural History:

> The hypothesis you object to also bothers me. The hall displaying the block of bones is to be revised and that will give us the opportunity to revise the captions for the exhibits. I think the critical evidence here is the extent of disarticulation of the remains which implies dismemberment of the carcasses and transport in a fluid and I see nothing improbable in the ordinary hydraulic agencies in a fluviatile regime. The concentration of remains can also be attributed to irregularities on the floor of the channel (observed during excavation) and the development of local eddies over the larger bones first deposited that trap further remains being swept downstream. The catastrophic factor may be the cause of death of a large group of animals and there are ways to assess this (unfortunately not tried with reference to the deposits in question), but normal stream transportation and deposition seems to me to be sufficient to explain the resulting deposit.
>
> Richard H. Tedford
> The American Museum of Natural History
> Dept. of Vertebrate Paleontology
> New York, USA

And, in rebuttal, Kloosterman writes the following:

> If we first of all keep separate the two possibilities: death and deposition by the same or by different causes, the disarticulation of the remains certainly suggests that death has occurred previous to deposition, but the high bone-to-sediment ratio of the layer and the paucity of species suggests rapid burial after death, pointing to a connection between the causes of death and burial. Museum specimens will provide no answer to these problems and we will have to go back to the field, and also compare the characteristics of many different bone layers. Are layers when consisting of only a few species always composed of herbivores? Are their sedimentological characteristics different from other bone layers? Doesn't there exist any

> classification of bone layers, or have I just been unable to find it?

The issue is attacked by a hydrologist:

> The quotation from the American Museum of Natural History implies that a pool, formed at an eddy in a river would have a quicksand bottom. There is only one way such quicksand could form, and that is by upward movement of groundwater through the bottom of the pool (see reference on Ink Pots springs). While this is not uncommon, there is no evidence (e.g. sorting of the sandy matrix of the bone breccia) presented for this.
>
> Again referring to my Ink Pots paper, it is clear that density differences between quicksand and "trapped" animals do present a problem. The animals may have died from exhaustion, but they would not have been "sucked in". Lacking further evidence for the quicksand hypothesis, I think the mud flow (liquefied sediment slide) solution is more likely.
>
> The only way to solve this question is to collect all the evidence, including grain size distribution throughout the deposit, and detailed description of all "foreign matter" in the sediment.
>
> Robert O. van Everdingen
> Hydrology Research Div., Environment Canada
> Calgary, Canada
>
> Ref.: Van Everdingen R.O., 1969: The Ink Pots--a group of karst springs in the Rocky Mountains near Banif, Alberta. *Can. J. Earth Sci.* 6/4: 545-554.

And Kloosterman concludes the case:

> The problem here is that an equally strong and pervasive uniformitarian influence exists in sedimentology as in paleontology, with, in the interpretation of sediments, an aversion to even such common and minor catastrophes as rapid mass movements. Even if we are willing to consider

> catastrophist hypotheses, some basic data may be lacking, and thus the "cooperation" of the two specialities may lead to a typical case of "cross sterilisation," so common between two different disciplines or even branches of the same discipline.

Enlightening as these comments may be, it is noteworthy that what to this author seems to be the more likely solution of the problem is not mentioned. The animals are of distinct species and were killed together, their bones disarticulated, and their bodies concurrently buried, in a (probably presumed) "eddy" of a now extinct river. No indication of water-wear or scavenging affects the bones. Probably a large cyclone was involved; the animals were picked up, torn apart, dumped, at some distance, and buried in a matrix of debris that was also being transported. If the conglomerate contained more species, further study might reveal a possibility of a water tide as the prime factor.

K.E. Chave's tumbling barrel experiments, in which shells and skeletons of marine animals were subjected to water, chert pebbles, and sand abrasion at 30 revolutions per minute, saw a reduction to under 4 mm grains of most of the structures within 183 hours, with perhaps 40 hours representing a half-life figure for average structures [6]. Complementary reduction occurs biochemically and by the action of other animals.

Clearly, then, given 200 hours of rolling about, little identifiable fossil life would remain. Supposing that the rolling were stretched out in a tide or current, about 300 kilometers of movement at one kilometer per hour would reduce practically all life forms to grain size in a bio-mineral soup, which, when motion ceased, would be deposited and in a matter of days form a strong deposit, partly mineral and partly biological. The tide would be moving much faster in any disastrous scenario. The rate of destruction would increase with the speed. Therefore, a fast tide in a few hours over a stretch of a few kilometers would render the fossil record something readable, if at all, by electron microscope and paleobiochemistry.

If tides had totally overrun the globe, the fossil record would be much less - all the less because tides dig up old deposits as they move, too. On the other hand, is the fossil record so generally

rich as to imply large expanses of peaceful, tideless time when shells could find a quiet home, preserved, until pushed into visibility, there to encounter aeolian forces? Looking at the question in another way, where in the world would a fossil go to rest undisturbed by currents, electricity, and chemicals for a million years, or a hundred million, or a billion? "Hitler's *Festung Europa* (Fortress Europe) has no ceiling," we used to say in 1944. Has any fossil anywhere an anti-electro-chemical fortress, a Festung Fossilia with a ceiling? If we had available to us a thorough paleontological survey and map of the Earth above its granites, we should be able to answer the question of the age of the surface since its last scourings. We do not have it.

Discovered fossil assemblages number in the hundreds, although they are not nicely inventoried. They occur on every continent, in many countries, in high and low latitudes, whenever land animals, plants and marine life have thrived. A large number remain to be discovered. A list of over fifty is before me as these lines are written, and I realize that they are almost all either late Cretaceous (reptiles) or late Pleistocene (large mammals), and that one must take into account many times this number for the aforesaid periods and then every "rich fossil bed" that graces the boundaries of the total phanerozoic calendar.

An item from *Chemical and Engineering News* comes to mind [7]. Workers "found the fossil skeleton of a baleen whale some 10-12 million years old in... diatomaceous earth quarries in Lompoc, Calif. ....The whale is standing on end in the quarry and is being exposed as the diatomite is mined... The fossil may be close to 80 feet long." A sarcastic reader wrote in (March 21, 1977) that "Everybody knows that diatomaceous earthbeds are built up slowly over millions of years as diatom skeletons slowly settle out on the ocean floor. The baleen whale simply stood on its tail for I00,000 years, its skeleton decomposing, while the diatomaceous snow covered its frame millimeter by millimeter." That is, catastrophes affect the minute as well as the great life forms.

We do not know what proportion of fossils contributing to paleontology was derived from conglomerates as against individual finds. As expected, no one has sorted the assemblages into those involving collective catastrophe and those

accumulated by normal individual disasters. A committee of experts would probably find few if any of the latter category, some of doubtful origins, and the majority to be collective disasters.

It would not take long today to conclude, for example, that the famous La Brea (Los Angeles) tar pit and similar pits, discovered many kilometers away, portray catastrophes. The conglomerates of smashed and disarticulated bones of discordant species (saber-toothed tigers, peacocks, etc.), gravel, and asphalt point to a paradise of wild life suddenly devastated and revived only as the dry, thinly populated land, poor in fauna, of recent historical times. The time of the La Brea incident has had to be lowered drastically; for one thing, human bones have been found there; but also, the assemblage has been connected with other major events, such as the drying of lakes, placed at about 3500 years ago.

On the principle of "the Great Contrary" as the ancient Chinese called it, it would seem that the uniformitarians have received their chief input to the reconstruction of ancient species from the catastrophes that they would deny, just as the omnipresence of strata upon which they depend for their geology carries the heaviest implication of repeated disturbances of the Earth's surface.

Fossil conglomerates are not partial to genera or to epochs. Many recent studies have been based upon material dredged from marine sediments, and concern minute organisms or creatures. These, too, usually mark boundaries ordinarily termed epochal, or climatic, or even catastrophic, for they involve abrupt terminations of some certain composite of species. Thus, when suddenly a thick band of coccoliths is dredged up from the bottom of the Black Sea, aged perhaps three to five thousand years, a sudden end to a regime becomes apparent: a deluge of strange waters, an abrupt climate change, an electric shock transmitted throughout the body of water, or a sudden break in the food chain occasioned by similar events [8]. We speak more of this when we come to discuss extinctions.

At Bearsden, near Glasgow, a fossil conglomerate termed Carboniferous by age is found. Marine and freshwater strata are

interlaced; marine and non-marine life-forms are present, not necessarily tied to their "appropriate" rock strata (land plants and marine animals are mixed); crustacean and shark fossils (rapidly decomposable) are found in high degree of preservation [7A]. Though often the material of coal beds, they are not carbonized. A series of tidal thrusts is to be assumed; further, coalification does not occur, it appears, unless an independent heated element is added before or after dumping. The evidence is consistent with the catastrophic theory of coal formation.

Coal deposits are fossil conglomerates of a most impressive kind, and call upon the winds, the tides, and the giant bulldozers of ice and rock.

Quotations from botanist Heribert Nilsson are pertinent [9]:

> Even if our peat-moors grew to a thickness of 2,000 meters, *nothing* would be similar to the Ruhr Carbon or any other coal district... If the possibility of an autochtonous formation of the seams is judged from the point of view of the amount of material available, the results must be considered as highly improbable. A forest of full-grown beeches gives material only for a seam 2 cm. It is not unusual that they are 10 meters thick, and such a seam would require 500 full-grown beech forests. *Whence this immense material?* How was it deposited all at once? Why did these masses of living organic material *escape decay*, why was it not completely decomposed?"

To what degree sediments are "rock fossil assemblages" is unknown. They too, with or without fossils, can be transported by high-energy vehicles. If a tree stands vertically in a sediment does it not demand that its whole depth of burial should be carried throughout its stratum wherever it leads and the whole be considered instantaneous? Should not the vertical great whale referred to above be a measure of a whole stratum's instantaneity? A stratum can only be as thin as its tallest fossil will allow. A poly-strata fossil wipes out practically all the temporal pretensions of the blankets of its bed. Ideally, it should wipe out all identical blankets everywhere.

A famous instance of ancient catastrophic fossilization was

introduced by Hugh Miller in 1841 in regard to the Old Red Sandstone [10]:

> The River Bullhead, when attacked by an enemy, or immediately as it feels the hook in its jaws, erects its two spines at nearly right angles with the plates of the head, as if to render itself as difficult of being swallowed as possible. The attitude is one of danger and alarm; and it is a curious fact...*that in this attitude nine tenths of the Pterichthes of the Lower Old Red Sandstone are to be found...*
>
> At this period of our history, some terrible catastrophe involved in sudden destruction the Fish of an area at least a hundred miles from boundary to boundary, perhaps much more. The same platform in Orkney as at Cromarty is strewed thick with remains, which exhibit unequivocally the marks of violent death. The figures are contorted, contracted, curved, the tail in many instances is bent round to the head; the spines stick out; the fins are spread to the full, as in Fish that die in convulsions... The record is one of destruction at once widely spread and total, so far as it extended... By what quiet but potent agency of destruction were the innumerable existences of an area perhaps ten thousand square miles in extent annihilated at once, and yet the medium in which they had lived left undisturbed in its operations?

The depth of the fossil bed was immediately determined. Miller gives it at over 8000 feet. Hence all sandstones of this type everywhere in the world must be treated hypothetically as quantavolutionary. This promptly casts suspicion upon all rocks in the 360° global ambiance of the sandstones.

It seems that this episode, which fascinated the scientific public over a century ago, is due for a reassessment in the light of current knowledge especially since a new element is found at the well-known scene, radioactivity. "Anomalous high radioactivity has been detected in *Homosteus*, a fish from the same Old Red Sandstone beds in which Pterichthyodes occur," writes Hans Kloosterman [11]. We have mentioned similar cases earlier. Kloosterman continues:

> Latter-day uniformitarians tend to explain the radioactive anomalies by differential absorption of radioactive elements posterior to deposition. Conceivably this will bear out to be correct, but it could be only a partial explanation. Has any study been undertaken to find out whether high radioactivity in fossil bones correlates with the great faunal breaks of the Earth's history?

Radioactivity does not kill and assemble fauna quickly. It is associable with forces that do so and it implies exoterrestrialism: cosmic lightning and electrical discharges; freezing, gassing, and smothering fall-out, and incoming tides that have been radiated elsewhere.

Many microchronic catastrophists, hot on the scent of fossil absurdities, believe in the contemporary existence of species that are conventionally placed in superposition and assigned sequential periods of existence. The number of individual anomalies - a cold-water clam in a hot-water clam bed or a dinosaur among mammoths - is too small. Indeed, I have read of no incontrovertible case of major consequence for the reconstruction of time and evolution. The most sophisticated of their concepts seems to be fossil zoning, by which, if I understand rightly, is meant the simultaneous growth of ecological sets of a greatly different order. These sets are shuffled about as the scene changes, under castastrophic duress. One ecology is piled upon another and a long temporal sequence is assigned to the whole and its parts.

I can conceive how, let us say, continental tides of translation might sweep in and deposit a life zone upon one area; also I can conceive of another wave, reverse or oblique to the first, carrying upon the same area a second layer of fossilized sediments, and, in the end, of the second being given incorrectly a much younger age that the first. I cannot conceive, on the other hand, of nature being so neat, so orderly, or so given over to long range thrusting. One bears in mind that the longer the transport, the worse the conditions for fossilizing. Also, the chances that a tide or bulldozer will pick up inter-zonal species are excellent and therefore will place not only 'A' upon 'B' but 'B' upon 'A'. But such occurrences are quite rare, and almost always distinguishable. The inconsistency would be noticeable.

One cannot but feel at times that paleontologists have a lore that is locked out of the literature and that would emerge upon systematic questioning. Thus, what are the statistical parameters of fossil deposits *in situ:* how often, for instance, are fossil beds pure and how often apparently heterogeneous and to what degree? Are fossil deposits of ancient ages more likely to be heterogeneous than late fossil beds? If fossils usually travel, as Ager says, do they travel with their own age group? Does the age-pure rich fossil bed indicate, not a long, but a short chronology, because the fossils have not had time to be mixed or destroyed?

No part of the world is without fossil deposits. This would indicate that no part of the world has escaped catastrophic experiences. Marine fossils are of shallow seas: the oceans may be too young to have spawned new species, much less to cast them over the continents.

A great many fossil deposits are assigned old ages. The horrified fish of the Old Red Sandstone referred to earlier are Devonian and given hundreds of millions of years. The theory of this book has been tending toward confining biosphere catastrophes to the nearby ages and to an early period of "radiant genesis," defined in *Solaria Binaria*, with a stable intervening period. Either the ancient assignments will have to be re-timed or we shall have to give up this notion of a long period of Pangean stability during which quantavolutions were in abeyance. (See, e.g. the time charts following the text.)

We cannot conclude here from the study of fossil deposits that all major disturbances have been recent. But these conglomerations lend direct and substantial support to the quantavolutionary theory that Earth changes have been sudden, large-scale, and intense, and that most, if not all, have been very recent.

Notes (Chapter Twenty-six: Fossil Deposits)

1. *Animal Travellers, loc. cit*., 126-46.

2. *Corridors of Time: 1,700,000 Years of Earth at Grand Canyon* (N.Y.: Times Books, 1980). *Cf*. G.M. Price, *Evolutionary Geology and the New Catastrophism* (Mountain View, Calif: Pacific Press, 1926), 234-9.

3. V *S.I.S. Rev*. 1 (1980-81), 10-1.

4. *Fossils in the Making*

5. 2 *Catas. Geol.* 1 (1977), 1-2; *Ibid*. nº 2, inside cover.

6. K.E. Chave, "Skeletal Durability and Preservation," in J. Imbrie and N. Newell, *Approaches to Paleoecology* (N.Y.: Wiley, 1964), 377-82.

7. *Chem. and Engin. News*, Oct. 11, 1976, quoted in III *Kronos* (Eall 1977), 68-9.

7A. 5 *S.I.S.* Workship 1 (1982) 28-9 citing *Nature* (17 June 1982), 574.

8. Egon T. Degens and D.A. Ross, "Chronology of the Black Sea over the Last 25,000 years," in *Chemical Geol*. (Elsevier: Amsterdam, 1972), 4; also, with J. Mac Ilvaine, 170 *Science* (9 Oct. 1970), 163-5.

9. Quoted by Bennison Gray "Alternatives in Science," VII *Kronos* 4 (1982), 15, from Nilssen's "Summary of the facts and leading principles concerning the non-evolutionary phenomena in the world of biota and the theory of emication," based upon his *Synthetische Artbildung: Grundlinien einer exakten Biologie*, 2 v., Lund: Gleerup, 1953).

10. *The Old Red Sandstones* (Edinburgh, 1941), 48.

11. Kloosterman, *et al*. (supra, fn 5) citing S.H.U. Bowie, D.Atkin, "An Unusually Radioactive Fossil Fish from Thurso,

Scotland," 177 *Nature* (1956), 487-488; W.R. Diggle, J.Saxon, "An Unusually Radioactive Fossil Fish from Thurso, Scotland," 208 *Nature* (1965), 400.

CHAPTER TWENTY-SEVEN

GENESIS AND EXTINCTION

Man is an exceptional creature, creative and destructive. He is a walking catastrophe for other kinds of life. Rashmi Mayur, in agitating for a "Kalotic World Order," projects that mankind will extirpate most species of life within this generation in exchange for 1.5 billion more people. J.W. Carpenter has cited estimates that 25% of all existing species may become extinct by the year 2000 [1]; this is not the work of man alone perhaps, for the Earth itself may be enduring a longer-term decline stemming from its ancient cosmic bouts. But man is failing to protect the Earth.

If our approach is believable, nature requires high-energy forces to extinguish species and must need an equally great force to create them. The forces at the same time maybe subtle and powerful, as with invisible radiation, or flagrant and powerful, as with the crash of a large body into the Earth. Such is quantavolution.

It appears to be easier to discover death than new life. The literature on biological extinctions is getting heavier all the time, but little is forthcoming on genesis. We wonder why. Could it be a taboo against one kind of creation? Perhaps. Might it be this, that eighteenth century economics picked up an idea that common people have always had - and some great ones like Machiavelli and Hobbes, too - that life is a struggle among men; there are few places at the top; one must eliminate competitors to get one’s place; survival is a power struggle. Early modern economists went along with the notion. Thomas Malthus (1766-1834) pushed the line of thought into a world-wide view: goods are scarce, and men will compete for them; who is most effective gets the most; human populations are checked in their growth only by nature's instruments of famine, plague, and war. Later man was excused from the struggle, if he would develop "moral restraint" against excessive breeding. He has not done so.

But the biological world, as young Charles Darwin saw, had no moral restraints and was operating continuously under the pressures of the environment. Nor was there any *rentier* psychology in nature: "Give me my little niche and I will give you yours." Pressure to expand was infinite and this aggressiveness led to the most marvelous adaptations (to other's niches) and actual physical evolutions. So went the line of thought.

The underlying amoral (but moral in its own way) view here found the idea of catastrophism disturbing, first because a moral agent called God was customarily employed to command the disasters and reconstitute the world afterwards, and second because catastrophism without divine controls appeared to be quite disorderly and not progressive, lacking the capacity to create species (Elohim promises Noah *this* Deluge would be the last; nor did the survivors anywhere talk of new species, these all having been created once before.)

Nor when Mendel appeared on the scene with proof of mutations, was it appreciated that a mutation was a micro-disaster, perhaps tied into catastrophe somehow. It was for a later generation of scientists and theorists, impelled by the logic of the atomic bomb, to bridge the gap between an invisible particle and a visible awesome destruction. It was (and is) still too early to say how catastrophe creates as well as destroys; a third line of theory has to be developed to explain the paths of genesis, which despite repeated extinctions, have led to new and different forms of life.

Nonetheless, biological quantavolutions appear to have a large creative element. One of the rare early geologists to perceive this was Clarence King, and, in his attempt to assail evolution on its firmest historical ground, he penned several passages of beauty and importance [2]:

> Greek art was fond of decorating the friezes of its sacred edifices with the spirited form of the horse. Times change: around the new temple of evolution the proudest ornament is that strange procession of fossil horse skeletons, among whose captivating splint-bones and general anatomy may be descried the profiles of Huxley and Marsh. Those two

> authorities, whose knowledge we may not dispute, assert that the American genealogy of the horse is the most perfect demonstrative proof of derivative genesis ever presented. Descent they consider proved, but the fossil jaws are utterly silent as to what the cause of the evolution may have been.
>
> I have studied the country from which these bones came, and am able to make this suggestive geological commentary. Between each two successive forms of the horse there was a catastrophe which seriously altered the climate and configuration of the whole region in which these animals lived. Huxley and Marsh assert that the bones prove descent. My own work proves that each new modification succeeded a catastrophe. And the almost universality of such coincidence is to my mind warrant for the anticipation that not very far in the future it may be seen that the evolution of environment has been the major cause of the evolution of life; that a mere Malthusian struggle was not the author and finisher of evolution; but that He who brought to bear that mysterious energy we call life upon primeval matter bestowed at the same time a power of development by change, arranging that the interaction of energy and matter which make up the environment should, from time to time, burst in upon the current of life and sweep it onward and upward to ever higher and better manifestations. Moments of great catastrophe, thus translated into the language of life, become moments of creation, when out of plastic organisms something newer and nobler is called into being.

The breaking of an age is the occasion for instant creation and instant destruction. The quantavoluting high-energy forces concentrate upon reducing and at the same time increasing the variety of species. Otto Schindewolf, from 1950 on, was tracking what he called faunal discontinuities, for which task D.L. Stepanov called him the "most important and consistent spokesman of the idea of neocatastrophism in contemporary paleontology." In him one finds a more stringent scientific tongue than King's but the same view. "Faunal discontinuities... involve not just the dying out of old, but also the more or less

sudden emergence of new phyla. This phenomenon can no longer be successfully accommodated under the term catastrophe in the true meaning of the word: it should rather be described as *anastrophe."*[3] (that is, 'upturn,' not 'downturn'). It was partly for this same reason that the term *quantavolution* was chosen. Probably most species are born or die out at the disastrous junctures of natural history whence the rocks and fossil seas, too, provide evidence of commotion.

Pietro Passerini cites estimates of 1.5 million extant species and between 3 million and 8.5 million species as existing but still unidentified [4].

G.G. Simpson estimated the number of existing species at two millions. and the all-time average since the beginning of life at between 500,000 and 5 millions. He guessed that the average species endured from 500,000 to 5 million years. He put the time since life began at from one to two billion years. When he performed his arithmetic he emerged with a high total estimate of all species of four billions, a medium estimate of 341 millions and a minimal estimate of 50 millions [5].

Sometime later, Teichert estimated the number of discoverable or fossilizable species at ten millions, lower than Simpson by a factor of five. The vertebrates among them were guessed at a round million. Cook used many less, accepting 1,105,000 for the living species, and then proposed that a figure of 130,000 for fossil forms discovered be considered a fairly complete sum of all past species. He asserts grounds for believing that most fossilizable species have already been discovered, implying that most or all species were created in short order and that a tenth or so have been eliminated. If algae and worms can be traced in the sediments, what would not have been traceable?

Schindewolf comments that "good conditions of preservation existed even for the most delicate, soft-bodied organisms in the Precambrian;" furthermore, it is incorrect that the rock strata of quantavolutionary times are missing or totally destroyed along with their hypothetical fossils [6]. Cook's view accords with his microchronic view of Earth history, which would permit one or several catastrophes and a natural dissembling of the fossil record to tempt exaggerations of the expanses of time and the

progress of evolution.

Between Cook's one million and Simpson's two million for living species, reconciliation is conceivable. Between his 130,000 (say 200,000), and Simpson's maximum of four billions, there is no hope of ultimate agreement. Even Simpson's minimal figure of fossil species, 50 millions, is 250 times larger than Cook's. Altogether we are in a state of ignorance on what nature has afforded as candidates for extinctions. For that matter, no one is so bold as to define absolutely a species, much less to maintain nowadays that the conditions for speciation have always been the same. There may indeed be one or more dubious premises in all reasoning on the subject.

We may be confident that at least all major forms of life and many manifestations of each have been recovered from the past. In this sense, for the philosopher anyhow, there are no important gaps in the record. Yet, evolution demands ancestors, and its theory becomes dubious if the extinct are not sufficient in numbers to provide ancestors. Or at least the same few ancestors would have had simultaneously to branch in numerous directions; this is not impossible to argue; and a shortness of time would be no handicap to the argument. For the moment, to hold in abeyance an opinion on stasis and evolution, I shall accommodate my thinking to a million or more living species and over a million fossil species.

For several additional issues beg introduction. With the painful realization of gaps in the record that refuse closure, the reality of quantavolutions, and the improbability of point-by-point evolution no matter how much time is allowed, some scientists have spoken forthrightly for a new look at the record. They find that the path of evolution has been irregular, that there are times to evolve and times for quiescence. (Nor is this an artifact of time estimates.) Writes Brough, concluding an extensive review:[7]

> Evolution seems to have worked in a series of more and more restricted fields with large-scale effects steadily decreasing. Evolution at the present time is a slower and much more restricted phenomenon than it was earlier, and seems to be concerned with speciation in a pattern of

> larger systematic units which was laid down in the more or less remote past, and seems to have been standardized for a long time.

Genesis may not work at the will of God, but it does not work uniformly either. "Given a more or less even mutation-rate, and Natural Selection as a cause in evolution, there is difficulty both in accounting for the early and relatively rapid phases of evolution giving rise to major groups and also for the great decline in this phenomenon in later geological time."

Brough holds to spontaneous mutation as the source of genesis and speciation, and "Natural Selection merely works on these;" furthermore, "changes in organic forms have nothing to do with external factors." So he gets into a tight corner.

> There seem to have been evolutionary surges in the past when large changes of organic form took place, and produced the larger systematic units... There is plenty of evidence suggesting that during these evolutionary surges changes produced by mutations were not random, but were directional; this is well seen in such groups as the mammal-like reptiles, and in the higher bony fishes where several independent phyletic lines undergo the same sort of changes at about the same time.

Natural Selection may have assumed more importance when this process slowed down. An example of the evolutionary surge would be the "sudden appearance of a highly-developed fauna in the Cambrian," after diligent search of undisturbed sandstone, shales and limestones of the pre-Cambrian for hints of what was to come.

We speak here of simultaneous physical changes in a collectivity of species that may be unrelated. Within a species a saltation of individual changes must be also occurring. Hence there should suddenly occur a heavy branching out of types, some to survive, some soon to die. But then we encounter two additional phenomena of the fossil record - a lack of transitional types and an absence of short-lived sports.

In the case of all the thirty-two orders of mammals, Simpson

tells us, the ancestral record is very poor. "The earliest and most primitive known members of every order already have the basic ordinal characters, and in no case is an approximately continuous sequence from one to another known. In most cases the break is so sharp and the gap so large that the origin of the order is speculative and much disputed [8]." E.C. Olson, reviewing the literature lately, reports: "under the very best circumstances... morphological and stratigraphically graded transitions between classes and subclasses have been found. At the level of phyla and higher categories, any information on transitions as far as the fossil record is concerned is essentially non-existent."[9]

T.H. van Andel surmises that missing links “may have been expunged from the record."[10] The *Glomar Challenger* found one-half of the assigned 125 million-year record missing from deep cores drilled in the South Atlantic Ocean: he implies a catastrophic removal of the layers.

Other paleontologists, specialists in other evolutionary fields, agree: as with the rocks, so with the life forms, there are more gaps than record. In treating of this important point, discussion has focused upon "transitional types." It can be said that for no phylum, class, order, family, or species is there an indisputable succession of types that is predicted under the neo-Darwinian theory of evolution.

If, as Rodabaugh points out, micromutations must account for all observable variations between species, then the number of transitional species must be exceedingly large. "Furthermore, each species must be exceedingly viable in order to survive long enough to give rise to some 'evolved' descendent."[11] He then proceeds mathematically to demonstrate, with a probability approaching certainty, that transitional forms have not in fact existed. A "transitional form" is the species of life that is both intermediate and ancestral in relation to any two discovered fossil or living forms. "Missing link" would be a synonym for it. Where, for instance (if birds are indeed descended from reptiles), is the reptile who is just starting to sprout the wings of the bird? And the ancestor of the horse is nowhere to be found. D.M. Raup and S.M. Stanley [12] are quoted: "Unfortunately, the origins of most higher categories are shrouded in mystery;

commonly new higher categories appear abruptly in the fossil record without evidence of transitional forms."

Until lately, the ape Ramapithecus was in favor as the possible ancestor of the hominids. In 1982, it was reported that close study of a skull of Sivapithecus dated at 8.5 million years, and regarded as practically identical to Ramapithecus, showed definite relationship to the orangutan and hence was deemed not to be a transitional form to man [13].

Nevertheless, although it is already admitted that transitional forms are absent, Rodabaugh computes, from the number of fossil birds estimated to have been found, the probability that a transitional form will exist. He finds the possibility so tiny as to be absent, quoting Emil Dorel: "Events whose probability is extremely small never occur." Rodabaugh concludes that, either the present biological world got here by macromutations ('hopeful monsters') or by special creation.

The "hopeful monster" is the new species, containing many changes, thrown out by a general mutation, and hopefully satisfying the conditions of survival. Rodabaugh declares that the concept "is rejected by nearly all evolutionists." Still, it has been reported, "within certain of the dying families [of Upper Cretaceous ammonites], an increase in size and the presence of bizarre-looking forms may be noted. This is a common accompaniment of extinctions of many groups."[14] It suggests catastrophe, accompanied by radionic mutating storms that both alter and destroy species. At the end of an "age" (defined as a "more settled" period), the species-mix and distribution of the biosphere suffer revolutionary change. Whereupon the struggle for life niches renews under more and more uniform conditions, which may, however, not be the uniform conditions of the past age.

Charles Hapgood, another catastrophist, whose work has already been cited, confronts the same problem and although admitting that the major proponent of macromutation or "systematic mutation," Richard Goldschmidt, is opposed by the majority of writers, believes that a sudden shift of the Earth's poles and crust could produce the requisite shortening of the tempo of evolution.

I am treading upon uncertain ground. In what has been said of the sacred and divine elsewhere (in *Chaos and Creation* and *The Divine Succession*, both works of the Quantavolution Series), I maintain that the historical gods are scientifically explainable within the framework of natural causes and human nature, but merge into a philosophy of religion that is not germane here. Hence enlightenment on the scientific level has to come through a uniform explanation of the fossil record or through macromutation in a catastrophic setting.

It is possible that a trillion "sports" have been disposed of by quick extinction, and that the few fossils that come down to us represent trillions of individuals of the standardized species. In this case, the absence of transitional "missing links" is not so improbable as some make it out to be. That is, if during a billion years, the average number of individuals per "long-lived" species has amounted to, say, a trillion and the average aborted and transitional form had to "make" or "break" on no more than one thousand specimens, then the chances of finding and recognizing such a necessarily handicapped form in the fossil record are negligible. That is, the transitional species would be a small population. If successful, it would spread with exponential rapidity.

If, for every significantly mutated species which survived there were 10,000 that did not, then even $10^4 X l0^3$ would give only 10^7. By contrast, the surviving species averaged $l0^{12}$ specimens that might enter the hall of fame of the fossil record. The relative chance is then 100,000 to 1. Consequently, if even a single showcase of transitional freaks has entered into the fossil record, there is enough to satisfy mathematical expectation.

It is more likely that a form of quantavolution operates (it is discussed in *Homo Schizo I* and *Solaria Binaria).* The absence of transitional types, if it proves anything, probably goes to prove that something like quantavolution must exist in genetics; there is then no expectation of transitional types. A mutated reptile has wings and it flies, without a long time of flight-prone ancestors.

However, transitional forms are not the most bothersome problem. Nor is it the continual relapse into Lamarckian

environmentalism that characterizes the literature of many professed Mendelian-Darwinists. It is the nagging intuition of purposefulness that afflicts both the religious and atheistic observers alike. The species, from the virus up to the human, appear to be put together meaningfully. The species function in the wierdest, meanest, most wonderful ways to exist - not to progress, adapt, change, or intelligize, but simply to carry on an existence as best they can. Every species appears probabilistic to the point of impossibility.

A species may be "fantastically" constructed; but it is functional. A billion cases of an animal or plant cannot be denied. Its every trait relates to every other trait, just as in a culture every culture trait relates to every other culture trait somehow, no matter how "senselessly." The species is a whole, just as a culture is a whole. How can it be that, amidst the millions of chemico-physico transactions always occurring in the human body, a shot of adrenal hormone, prompted by a scare, is practically simultaneously counteracted by a hormone to prevent over-reaction to the scare, as the classical work of Cannon on homeostasis, or *The Wisdom of the Body,* first elaborated?

Stanley's calculations show that species of European mammals of today have on the average survived for one to two million years by conventional calculation (middle pliocene mollusks had a mean duration of 7 my). Very few species of short duration (less than 0.4 my) occurred in the record. No ephemeral species appeared and disappeared. He concludes that "much more than 50 percent of evolution occurs through sudden events in which polymorphs and species are proliferated."[15] So here we find no sports, no transitionals, and a suggestion of macroevolution or quantavolution or "punctuated equilibrium." Also Stanley and Harper have noted a lack of correlation between rate of evolution and generation time [16].

Life forms have widely varying generation-lengths. The human, who lives relatively long, reproduces from dozens to millions of times more slowly that most animal species. The human, therefore, should have had less evolutionary change in his past than a great many 'lower' and 'simpler' forms. Too, if the capacity to mutate is considered a positive feature of a species in "natural selection," then the human and many another 'advanced' species

should be regarded as handicapped in the struggle to survive and adapt.

The biologist will probably agree with this and go in search of other advantages afforded these handicapped species in natural selection. When his search fails, he must grant that biology has always had an in-grained prejudice for the complex 'higher' animals, especially man. Man, like other advanced mammals, and indeed like all specialized as opposed to primitive, general, and simple organisms, is poorly designed for survival.

Nevertheless this dismal picture includes a seed of hope, indeed a new hypothesis of quantavolution. If generation rate and evolution rate do not correlate, it may be that evolution occurs, whether in simple short-lived forms or complex long-lived forms, at an instant time that is absolutely short and therefore, reversing the history of the Colt revolver, "makes a big man equal to a little man."

More importantly, a long-lived form may inherit a genotype which all life forms share, no matter their generation time. This would be the ability in a mutation to change instructions for the largest and most *complicated* cell assemblage as readily as for a single-celled animal. One result would be equalization of evolution effects; the concomitant would be quantavolution or macroevolution, that is, the instant all-around change when a mutation occurs.

We have already noted the conspicuous absence of flora and fauna of the ocean bottoms and high mountains. The matter is relevant here again. The charts of extinction of species are also charts of genesis of new species. When species are exterminated in large numbers, new forms follow. Paleontologists question whether the new species are alterations of the old, or descended from earlier forms that failed to appear in the old fossil record, or evacuees from other zones of life. The first would seem logical but we are given to believe that first the old die out and then the new appear. This is an aspect of the problem of missing transitional forms. Yet it seems inexplicable.

Should not the dying dinosaurs and mutated mammals appear in the same strata? If heavy radiation is killing off one form but

creating another, the stratigraphic gap should be inconsiderable, or the old and new forms should grade continuously into one another. It should not require more than several centuries to prove the fitness of a new form and to find it in numbers upon the next catastrophic occurrence. Perhaps this is what did happen; however, we are used to placing a million years between any two highly visible events in the record. Or at least one should be able to locate first a catastrophized conglomerate of fossils and then in succeeding uncatastrophized strata the new forms appearing as individual fossils. Else we should have to double the number of catastrophes, one for extinction and a second for genesis.

But is it "flesh or fowl?" Or, as Velikovsky asks: "Were all dinosaurs reptiles?"[17] Live birth among dinosaurs seems now fairly certain and not rare and there may have been a large mingling of important features hitherto believed distinctive between dinosaurs and mammals. Western USA rocks (Hava Supai Canyon, Colo.) produces drawings of dinosaurs, elephants, ibex, and human figures, as well as pictographs. If this ensemble is of the same time, a shocking reconstruction of the holocene period must ensue, absorbing time all the way back into the Cretaceous and up into the neolithic. But all those creatures exhibited may be pre-selenian, and were extincted, even the particular human race of the artist, around 12,000 B.P.

Leaving this perplexing issue, we return to the problem of the ecological niches. These should be quickly occupied upon the demise of old species. Cameroun and Benoit found algae, fungi and bacteria thriving in volcanic lava laid down by volcanic eruption on Deception Island in Antarctica. Elapsed time was one year [18]. Krakatoa's little island received new life, too, within several years of being exploded and completely burned out, not only microscopic life but amphibia, reptiles and birds.

Yet, to repeat an earlier fact, large attached organisms are rare on the most recent oceanic ridges, according to Heezen and Hollister [19]. At 1000 to 4000 meters of depth, the ridges should be rich in flora and fauna, of established species. This signifies either an extremely young age for the ridge system as a whole, or for the most recent millennia a very heavy general eruptive activity.

In the end, so far as concerns genesis, we hold to quantavolution in biology and geology. The holospheric principle continues to be productive; the lithosphere, atmosphere, hydrosphere transact continually with the biosphere: all are affected by high-energy forces ultimately originating exoterrestrially. Genesis or the new in life occurs hand-in-hand with the destruction of the old life forms. This is nothing more than Schindewolf's "anastrophism."

No more revolutionary times than the present have struck geology and biology since the victory of gradualism and evolution over a century ago. The most striking signals of the change are emitted from the new studies of the extinction of species.

In 1961 Schindewolf prepared for the 113th General Assembly of the German Geological Society a status report on neocatastrophism [20]. He claimed major faunal discontinuities on the boundaries of the Precambrian-Cambrian, Permian-Triassic, and the Cretaceous-Tertiary eras. "On the divide between the Precambrian and the Cambrian there was a relatively sudden and thorough-going transformation of the animal kingdom, in which durable hard parts were deposited for the first time." There is a partial species overlap of short duration as the Permian moves into the Triassic as he notes in 4 groups of fauna, but he names 24 that expired and 24 that newly appeared. At the Cretaceous-Tertiary boundary, "the dinosaurs represent only one aspect of the much wider extinction process and the profound change in the composition of the faunas..." The larger mammals then came into being.

P.S. Martin and others trace the extinctions over most of the world[21]. D.A. Russell draws a picture of losses of 50 out of 250 terrestrial genera, a third of floating marine genera, half of the bottom-dwelling genera, and least of all in losses, about a fifth of the swimming marine genera [22]. He estimates that 75% of all species died alongside the dinosaurs, and in a period of only 1000 years, in conjunction with magnetic field reversals instigated perhaps by blasts of supernova radiation from a nearby star. He argues that "it is beyond the capacity of forces within the crust of the Earth to produce global catastrophe on this time scale;" conjectures of glaciation are inadequate, especially since no evidence is to be had of a general

temperature change. Nor does Russell grant that the Sun could expel such high bursts of radiation. Schindewolf here denominates 16 faunal groups as exterminated, 3 as overlapping briefly, and 24 as newly arising. As young Darwin wrote in his *Journals* (Jan. 9, 1834), "certainly, no fact in the long history of the world is so startling as the wide and repeated extermination of its inhabitants." (How could such observations end up in uniformitarianism?)

Schindewolf also dismisses explanations offered for these quantavolutions, none of which he deemed valid, such as gaps in the rock and fossil record, epidemic diseases, climatic changes, ice ages, differing depositional characteristics of species, reduced salinity of seawater, competition and natural selection, mammals eating dinosaur eggs, and changing sea levels.

Then he reaches into the skies. "Since faunal discontinuities are universal phenomena, they must arise from *universally active causes.* This has compelled me to look for agencies that would (1) have worldwide effects and (2) could extend to the totality of biotopes in the sea, on dry lands, in freshwater and in the air, as well as to stocks of most varied habitats and ways of life."[23]

His explanation lies in radiation storms:

> Since 1950 I have favored the hypothesis that sharp fluctuations in the high-energy cosmic radiation reaching the Earth should be considered among possible causes... I proposed that, on the one hand, the direct impact-effects of ionizing radiation should be considered, and, on the other, especially the increased generation of radioactive isotopes, which would become incorporated in the living organic matter and the molecular compounds of the chromosomes. Here they would unleash a twofold mutagenic activity, through ionizing radiation, on the one hand, and by the liberation of electrons in the decay of the isotopes on the other.

He cites theories of supernovas as the source and media for the transmission of the anastrophic material, and credits E.A. Ivanova with "a connection between the faunal discontinuities and the migration of radioactive elements." Schindewolf points

out that the exceptional survival rate of insects compared to other fauna may be due to the fact that "the resistance of insects to radioactive radiation is about ten times greater than that of human beings and other organisms."

Schindewolf's conclusions, including his exoterrestrialism, have been supported by later studies. In a summary report of 1982 [24], W. Sullivan added the Devonian-Carboniferous and the Pleistocene-Holocene boundary periods. In the former some 30% of the animal families disappeared. In the Pleistocene climax, 70% of the large mammals extincted. In both eras, marine life suffered greatly as well. He separates the Permian-Triassic into two extinction periods, 50 million years apart. Raup estimates that 96% of all marine species may have died out in the late Permian. Valentine and others before him (1974) have noted the petering out of highly innovative evolution [25]. The origination of phyla, classes, and orders came successively to a halt; families declined, but diversified in the Mesozoic-Cenozoic. A macrochronometrical paleontogist would say that there has been no major innovation in life for 40 million years (present company excepted).

Species, as we have indicated earlier, are an unknown quantity, with gross discrepancies in estimates of their historical numbers. Species are also more susceptible to genesis than the statistically concocted general groups with their assigned, more basic features; this is in accord with theory, whether microevolutionary or macroevolutionary. Probably species have been extincted and ramified on disastrous occasions that did not affect the existence of the basic forms to which they pertain.

Mankind may be one case in point; small differences are all that can be observed between man and ape, but as with the absence of major differences between men and women, in the words of the French deputy: "Vive la petite difference!" In the two volumes on *Homo Schizo,* the origins of the differences between hominid and homo are discussed.

We uneasily recognize the need to consider together at the same time a new chronology, a new theory of mutations, better data on numbers and extinctions of species, and the observed quantavolutions of the Earth. For only by such means will we be

enabled to answer a question such as the suddenness of extinctions. Somewhere in the space between a day and twenty million years, a line has to be drawn to distinguish catastrophe and gradualism.

The studies and critiques of the work of Alvarez and associates on the Cretaceous-Tertiary extinctions illustrate the point. The superseding of dinosaurs by large mammals is known, with their accompanying less dramatic extinctions and creations. Also now a chemical boundary is known. By one count, "Iridium-rich layers marking the end of the Cretaceous Period have now been found at more than two dozen locations around the world." Freshwaters and seabottoms were affected along with dry land. Iridium is much rarer in the Earth's crust than in presumably exploded and space-affected meteorites. Hence a cosmic event is predicated, the Alvarez group holding to a middle-sized meteoroid explosion as the source, and a several months darkness accompanying the explosion as the killer of the dinosaurs.

Critics argue that the dinosaurs did not extinct with the end of the Cretaceous and took much longer to die out anyhow. Others say that the iridium is a product of heavy deep volcanism and slow sedimentation. Another maintains that the dinosaurs died from a drying up of their swamps. Still another claims that a mere several degrees of temperature rise or fall would halt the incubation of reptilian eggs and in a short time destroy the species.

After the Cretaceous comes a "nine-million-year" period of the Tertiary known as the Eocene. Geologists (Ganapathy, W. Alvarez *et al.*, and O'Keefe) now speak of a "terminal Eocene event", a catastrophe marked, as in the case of the end of the Cretaceous, by high iridium concentrations and microtektite fields. Do tectites and iridium always occur in exoterrestrial crashes? Or does this suggest that the two events, post-Cretaceous and post-Eocene, were one and the same, the "Eocene" and other eras having been concocted for differing fossils and strata of the same time.

An impatience and frustration seizes a person who is imbued with the perspectives of quantavolution and recency in biology

and geology. Ordinary accounts of animals, plants, volcanos, winds, rocks, etc. become lame and foolish. The author, riding a KLM plane across the Atlantic in 1982, puts aside this chapter and glances through the *KLM News* magazine. There a puff is given KLM for flying seven small lemon sharks from Florida to Holland. The sharks needed "tender, loving care," "had to be massaged constantly," "sprayed continuously," "given extra oxygen," - these being beasts "having inhabited the oceans since some 50 million years before man made his first appearance." How, one wonders, could the sharks have prospered through one catastrophe after another: either the extinction would not be complete and exponential reproduction would quickly make up the difference, or else sharks are young species and much of their ecology must be young as well, including, say, manganese nodules that form around shark teeth in the abyss.

There are then the meteoroids and the supernovas as sources of anastrophic radiation. Could "cosmic" radiation come from volcanism? If deep, heavy, and worldwide, radiation closely akin could fall out from volcanism. But such volcanism, as we explained earlier, must look for high-energy excitation from the skies. As for the supernovas, in *Solaria Binaria* Milton and I attribute heavy radiation to at least three novas - a preliminary outburst of the Sun creating its binary, and two explosions of its binary in subsequent millennia. We also designate several other possibilities of radiation, that would be heavy enough to account for periods of intervening radiation, not from novas but from impact-explosions and crustal removal in passing encounters.

Here and there now reports are issuing of excessive radiation levels in rocks and fossils. Kloosterman was earlier quoted on the subject. Salop speaks of a primary enrichment of uranium in dinosaur bones. Numerous similar findings have been reported since 1956 in Brazil and Argentina. Some bones from an undated red sandstone were radioactive. J.E. Powell summarizes these findings. Fossils from Mongolia also show high levels of radioactivity. Kloosterman located these facts and also discovered that almost none of the world's natural history museums have measured radioactive levels in specimens of their collections [26].

However, the prevalence of fossil conglomerations around the

world implies brief periods of extinction, and forces not alone of radiation, and pre-existing ecologies quite different from those that came after the catastrophic periods.

So many rich fossil deposits occur in circumstances that reveal high-energy processes to be at work. In Baja California, fossils were laid down over hundreds of square miles of the desolate terrain, exposed by surface erosion. Living and extinct species mingled in broad confusion. Flint and obsidian artifacts lay also upon the fossil sediments. The bones of mastodons, ancestral horses, a giant tortoise, camels, bison, sharks, whales, sea cows, and fish were plentiful. A shark species found in Mississippi turned up here in the Pacific. Assigned times, prior to investigation on the spot, ranged from 50,000 years (in the case of the artifacts) to 60 million years. Dating aside, the giant, confused, and rich fossil fields signal a catastrophe or a series of catastrophes at short intervals of time, from floodwaters sweeping in from land and sea.

S.J. Gould, who has pursued assiduously the study of extinctions, has had to go well beyond gradualism, uniformitarianism, and natural selection. Luck or chance figures heavily. Random macromutation can substitute for isolation, by creating two species in the same niche without the benefits conferred by travel. Commenting on the Permian-Triassic catastrophes, where an estimated ninety-six percent of the families of marine organisms ceased their existence, he says:

> There are few defenses against a catastrophe of such magnitude, and survivors may simply be among the lucky 4 percent. As the Permian extinction set the basic pattern of life's subsequent diversity (no new phyla and few classes have originated since then), our current panoply of major designs may not represent a set of best adaptations, but fortunate survivors.

Would the stripping of half the Earth's crust and an associated expansion and cleavage of the Earth, together with a paving of the ocean basins, all occurring within several thousand years and most of it very quickly in a single action complex, exterminate entirely the biosphere? Even the most determined catastrophists have passed over so frightful a concept. If, as has been

conjectured, a meteoroid explosion of a few kilometers' diameter would destroy the dinosaurs, the colossal event portrayed here would annihilate all life.

To counter this universal scepticism, there is the fact that life does flourish today despite the event, so that if the event were proved, then the scepticism would have to vanish. However, taken as a problem in its own right, instead of an inference determined by an external logic, we should stress certain possibilities in the event of lunar fission.

1. The atmosphere at the time might have been enormously greater and so extending far into space to permit a reviving reverse flow to replace the escaping atmosphere, and to act at the same time as a great vacuum cleaner against the heavy dust clouds and heated air.

2. Although an enormous number of species may be extincted, only several survivors of a species may guarantee a replenishment of continental scope within centuries.

3. The possibility must be entertained that hitherto unused intra-species genetic adaptability can permit survivors of modified form under stresses seemingly quite destructive.

4. Holospheric catastrophes by their very complexity can block each other's effects, allowing some life-preserving niches to survive and even fabricating niches where none existed before.

It is no longer rare to hear scientists arguing an intervention from outer space to push evolution along. Objections arise from extreme proposals, whether of intelligent visitors or of lower orders. "Extraterrestrial footsteps on the sands of history," R.E. Dickerson has remarked, "do not seem to be mandatory."[27] They would be superfluous, for that matter, if a quantavolutionary theory has laid down the sands. Further, as detailed in *Solaria Binaria,* if exoterrestrial voyagers had landed on Earth they might well have felt at home. Until quite recently, their former planetary abode would have provided a genetic milieu in the same vast plenum of atmospheric gases that the Earth enjoyed. However, Mars and Mercury have lost practically all of their life-support systems while the Earth has retained a

crucial halo of air and a vast supply of water.

In itself this can be made into an argument for a short term of life on Earth. The more one studies the possibilities of natural disasters the more likely it appears that, over long stretches of time, these would have been so frequent as to make a total disaster much more likely to occur. That is, if several disasters are granted, given the same Earth and Universe, why did not many occur and why not worse? Assigning the Earth and its species five billion years of self-development may turn out to have been a frustrating detour in the history of the human mind. By contrast, encapsulating the disasters within a unified theory, quantavolution, may prove enlightening and progressive.

Notes (Chapter Twenty-seven: Genesis and Extinction)

1. Despatch, UP Int′1,19 April 1982. He is Res. Director, Patuxent Wildlife Research Center.

2. *Op. cit.*

3. *Op. cit.*

4. "Knowledge and Entropy," 3 *Catas. Geol.* (June 1978), 17-9.

5. ′How Many Species?" 6 Evolution (1952), 342; Teichert, "How many Species?" 30 *J. Paleont.* (1973), 967-9

6. *Op. cit.*, 12

7. James Brough,"Time and Evolution," in *Studies in Fossil Vertebrates*, Atlone,London, 1958, 38, 34, 36.

8. *Tempo and Mode in Evolution*, (NY: Columbia U.Press,1944) 106; see review of his *Splendid Isolation* (New Haven, Conn: Yale U. Press, 19800 by Jill Abery, *S.I.S. 4 Workshop* (1981), 25-332.

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11. David A. Rodabaugh, "Probability and the Missing Transitional Forms," 13 *Creation Res. Soc. Q.*(Sep 1976), 116-9.

12. *Principles of Paleontology*, 1971 (San Francisco: Freeman, 1971), 306.

13. 121 *Sci. News*, (Feb.6 1982), 84.

14. V *Ency. Britannica* (1974), 576.

15. S.M. Stanley, "Stability of Species in Geologic Time," 192 *Science* (16 April, 1976), 267-8.

16. C.W. Harper, Jr., comment, 192 *Science* (16 Apr. 1976), 269-70.

17. II *Kronos* 2(1976), 91-100.

18. NASA, news release 69/80, 27 May 1969.

19. *Op. cit.*, 550-7.

20. *Op. cit.*

21. S. Martin, and H.E. Wright, Jr., ed., *Pleistocene Extinctions: The Search for a Cause* (New Haven, Conn.: Yale U. Press, 1967).

22. 3 *Catas. Geol.*1 (June 1978), 8; additional data in 10 *Geos* 3 (Summer 1981), 8.

23. *Op. cit.*, 18-9.

24. *NY Times*, Jan 19, 1982, C1.

25. 48 *J Paleontology* (May 1974) 549-52.

26. 3 *Catas. Geol.* (June 1978), 4-7.

27. Letter, *Sci. Amer.* (Dec. 1978), 10.

CHAPTER TWENTY-EIGHT

PANDEMONIUM

Polite language exclaims, "Pandemonium ensued..." In ruder language, "All hell broke loose..." In either case *all* (pan-) *demons* (daemon-) are in action (ium). "Pan" was a god as well as the word for "all." He was the son of Hermes (Mercury) according to one story. He was a noisy disturber of the peace, a collector of disorderly crowds, an orgiastic god of revelers. He was by no means a symbol of sounds alone but of general tumult. Great noises are all-absorbing and entrancing, as the rock-music discotheques aim to prove. Pandemonium is not only the sounds and their effects in themselves but also the meanings that their auditors place upon them. In the end, the catastrophic pandemonium evolves into music.

A pandemonium is how high-energy sounds to people as it bursts upon the human world. A spectre is how high-energy is seen by people as it occurs. Smell and taste are affected also in the processes studied by the earth sciences. A natural catastrophe, especially, is a holistic event: every human sense, and every part of the habitat, is affected.

Pandemonium is the capital of Hell in Milton's *Paradise Lost.* Elsewhere, Plato offhandedly mentions a catastrophe that he does not name and says that the survivors came down from the mountains with their ears ringing. Hesiod, in his *Theogony*, speaks of Mother Earth (Gaea) groaning under the pressures of Ouranos in primordial times. Here are reasons for treating of sounds in earth sciences: their natural origins and their effects on the biosphere. Observers of high energy forces without exception dwell upon their sounds. When we learn more of them, we shall know more about the earth sciences. There will be a place for a few acoustical geologists among volcanologists, seismologists, meteorologists, and paleontologists.

When a bad local flood occurs, as it did at Wilkes-Barre (Pa.) in the spring of 1973, the physical processes are mediated by television through their sights and sounds; there occur physical destruction, economic dislocation and distress - all of them mediated through the eyes and ears. Admissions to nearby mental hospitals went up sharply; also the use of hard drugs, and the suicide rate.

In the great Alaska earthquake of 1964, the destruction, death, terror, sounds and sights all together made their lasting impact on people. Psychiatric symptoms such as depression, withdrawal, guilt feelings, and irrational blaming of people were common reactions. The churches came alive with repenters and worshippers.

Modern cases permit us to empathize with the ancients. Exaggerate them a thousandfold and one gains an impression of the ancient experience. We read in the log of a ship's captain at sea near the exploding Krakatoa: "So violent are the explosions that the eardrums of over half my crew have been shattered... I am convinced that the Day of Judgement has come."[1] The climactic blast was heard 3000 miles away. A crazed survivor ashore insisted that "the Arch Fiend stood everywhere, implacable, unpitying, offering help to none, listening to no imploration."

We are told that when the volcano at Cosequina, Nicaragua, erupted on January 30, 1835, the explosion was heard in Jamaica, 850 miles away. The blast was so terrible that at one village "300 of those who lived in a state of concubinage were married at once."

Tornados have their own repertoire.

> A tornado, like thunder, is heard many miles away. As it approaches, there is a peculiar whistling sound that rapidly changes to an intense roar, reaching a deafening crescendo as it strikes. The screeching of the whirling winds is then so loud that the noises caused by the fall of wrecked buildings, the crashing of trees, and the destruction of other objects is seldom heard. The bellowing of a million mad bulls; the roar of ten thousand

> freight trains; like that of a million cannons; the buzzing of a million bees (when the tornado is high in the air), and, more recently, the roar of jet airplanes - these are some of the phrases used by those who have experienced a tornado [2].

And so to meteors: Frank Lane writes of the meteoric shower of February 9, 1913 that was first seen at Saskatchewan, Canada, and last seen off the Brazilian coast, 6000 miles away. "As they passed southeast over Ontario they grew more brilliant and great explosions were heard. Detonations and earth tremors were caused along the path of the procession to distances of 20 to 70 miles on either side." In 1958, L. LaPaz wrote, "To listen to the sound effects produced by a large meteorite fall is a unique and awe-inspiring experience. Neither a hedge-hopping jet nor a keyholing rocket gives rise to the sky-filling reverberations set up by a falling meteorite."[3] Neither a nuclear blast, with its single report, one might add.

The rumbling, grinding, screaming sounds of earthquakes are well-known. Velikovsky quotes the plaint of the Egyptian scribe of Papyrus Ipuwer at the time of *Exodus:*

> Years of noise... There is no end to noise... Oh, that the Earth would cease from noise, and tumult (uproar) be no more.

The ancient Greek poet Euripides speaks in *Hippolytis* of tidal waves near Corinth:

> An angry sound, slow swelling
> Like god-made thunder underground
> A wave unearthly crested in the sky;
> Till Sciron's Cape first vanished from my eye,
> Then sank the Isthmus hidden, then the rock
> of Epidaurus. Then it broke, one shock
> and roar of gasping sea and spray flung far,
> and shoreward swept.

In assessing what such sounds do to humans, it is well to recall that the age of firecrackers, firearms, cannon, dynamite, and

nuclear blasts is young. The first detonation of dynamite occurred in 1881 [4]. Primeval sounds were entirely of nature, apart from the pathetic imitations of sounds made by humans. If the paradigm of this book is correct about Pangea, the pre-quantavolutionary, pre-human period of late times, the world was peaceful and orderly, with overcast skies and little celestial or terrestrial turbulence. Man's ears were not made for explosions any more than his eyes were made to stare at the sun. A tiger's roar, an elephant's trumpeting, squeaks, whines, growls, yells, the splashing of waters, the snapping of twigs, the slumping of old trees - this in our theory was the pre-holocene acoustical environment.

However, and it is argued so in *Chaos and Creation* and *Homo Schizo I*, awful noise descended upon the first humans, as they were being born. Great noise was from the first heard as a manifestation of the gods, a theophany. When meteoroids broke through the skies, when cataclysms began, then came a pandemonium that terrified humankind, that drove people mad, that deafened them, and that catastrophized human nature and culture, together with their ecology.

Stephens reports that accidents, absenteeism and other factors indicating degradation of human performance can be correlated with infrasonic waves arriving from storms 2000 miles away [5]. Infrasonic waves cause nausea, disequilibrium, disorientation, blurring of vision and lassitude. All of these have been described as accompanying earthquakes, ball lightning and volcanism [6].

Some thunderous and strange sounds accompanying the passage of meteorites are attributable to the friction and collapsing vacuum of passage, but others have been theorized as products of the conversion of kinetic energy into electromagnetic radiation. Romig and Lamar have studied this problem. The high velocity of such waves would explain why some meteoric sounds are heard during and even before the visual sighting of meteors [7]. C.S.L. Keay has recently summarized from New South Wales many reliable reports of a large fireball in the atmosphere, tens of kilometers high, whose sounds reached the ears instantly with hisses, hums, swishes and crackling.[8]

Frederic Jueneman has speculated, on the basis of apparent

acoustically provoked mutations in a London bomb crater from World War II, that catastrophic acoustics may have been an active mutator in ancient times [9]. The sensitivities of plants and animals to sounds has been widely surveyed by P. Tompkins and C. Bird [10].

The splendors of auroral displays vary with the behavior of the Sun and the Earth's magnetosphere, among other factors. They stretch from 90 to 400 kilometers high, and on occasion seem to dip down to the very plane of the viewers. They, like all other fascinating phenomena of nature have been held responsible for the allegedly mad legendary accounts of catastrophes. Thus the ancient Teutons might recite their sagas of a world on fire, but uniformitarians, unimpressed, would see in these only the auroras that the northern peoples were lucky enough to view. This is a topic for another time and another author: spectres of colors, rays, and lurid skies were plentiful in cosmic disasters, exceeding the auroras. Every disaster has its color scheme and geometric figures.

It has its sounds as well, and the aurora can join other natural forces even today in suggesting the pandemonium of catastrophe. An account by Hans Jelstrup, a Norwegian astronomer, in 1927, exemplifies the auroral visual and auditory experience [11]:

> When, with my assistant, at 19h 15m Greenwich Civil Time, I went out of the observatory to observe the aurora, the latter seemed to be at its maximum: yellow-green and fan-shaped, it undulated above, from zenith downwards - and *at the same time* both of us noticed a very curious faint whistling sound distinctly undulatory, which seemed to follow exactly the vibrations of the aurora.

They later proceeded to record the impulses on an instrument and found "the vertical component was greater than 100 microvolt / meter."

Many years earlier, another Norwegian had polled persons from "all parts of the country" about the sounds of the aurora and received "92 affirmations against 21 negations."[12] Apparently many people provided a surprisingly large set of descriptions.

They used words and phrases like: sizzling, creaking, soft whizzing, the sound of tearing silk, "hoy, hoy, hoy," a rustling stream, crackling, rolling din in the air, clashing, like a flapping flag, flapping of sails, hissing of fire, the sound of a flight of birds, the buzzing of a bee, roaring of wind, soft breeze, roaring of the sea, a distant waterfall.

What can be made of this, aside from its entertaining aspect, is that the sounds of nature are legion; that these join the centurions of electrical sounds; and that a record is to be had of all these sounds in these mild times of the Earth that can be used to identify ancient and legendary metaphors of sound. So that when dragons hiss and flaming rays dart from their nostrils, one does not simply say here is an especially exciting auroral display, but assigns to the dragon hypothetically the electrical qualities and sounds of the aurora or of bolides whose "sounds are described as hissing, swishing, whirring, buzzing and crackling" when they have the "brightness of the full moon" and reach the observer at the same time as the visual image does [13]. So, too when in *Ezekiel* (XLIII, 2) it is said that the voice of the Lord "was like the sound of many waters." Ancient records and legends are rich mines of electrical allusions from which not only the state of electrical phenomena can be assessed but also the electrical technology of early cultures can be surmised; this field, ignored hitherto, is being researched by J. Ziegler.

The Books of Moses carry testimony of great celestial noise that cannot be rationalized as ordinary thunder. And Noah, it is said in Jewish legend, was spoken to by a voice from the sky amidst a great commotion. This followed the failing of things upon the earth and was followed by the Deluge. The story of Job, later on, reads: "Hear ye attentively the terror of his voice, and the sound that cometh out of his mouth." Again: after the ends of the earth are lit up, "a noise shall roar, he shall thunder with the voice of his majesty, and shall not be found out when his voice shall be heard." A circum-global sound.

As the Jews passed from Egypt in the tumult of Exodus, they paused at Sinai. "I am Yahweh," heard the people during the night at the Mountain of the Lawgiving. "And all the people saw the roars, and the torches, and the noise of the trumpet, and the mountain smoking: and when the people saw it, they trembled

and stood far off." Ten blasts of the trumpet sounded out the Decalogue, legend tells us also.

Great sounds were reported from around the world: the Babylonian *Gilgamish* epic: "Loud did the firmament roar, and earth with echo resounded." Hesiod's *Theogony:* the huge Earth groaned when Zeus lashed Typhon with his bolts - "the earth resounded terribly, and the wide heaven above." Velikovsky pursues the name Yahweh elsewhere: he finds Jo, Jove (Jupiter); Yahou, Yao (Chinese emperor of the age); *Ju Ju huwe,* (an Indonesian invocation to heavenly bodies): Yahou, Yo (in the Hebrew Bible); Yao, Yaotl (ancient Mexico); Yahu (ejaculation of the Puget Sound Indians and other Amer-lndians when they performed the ritual of raising up the fallen sky off the earth) [14].

It is perhaps of some significance that Cohane has found Haue, a Middle-English god-name, in the names of gods, sacred places, rivers, salutations, and objects all over the world into the hundreds of instances. "In the landscape of the Old Testament part of the world is still overflowing with Hawa place-names."[15] All sound alike despite spellings such as oa.., ua.., awa.., huwa.., oua.., wa.., and so on. Provisionally, we may entertain the idea that the sound of great natural events were incorporated in the basic vocabulary of new-born humanity. If so, the popularity of the "awah" sound is at least as ancient as the time of Moses (circa 1500 B.C.), and probably several thousands of years older, and would also then be carried on down to modern times. 'Yow," "wow," and "ow" are everyday American slang exclamations. The divine voices were also heard later on. A Babylonian hymn to Nergal (Mars) is of the first millennium B.C. and reads:

> His word makes human beings sick,
> It enfeebles them
> His word - when he makes his way above -
> Makes the country sick.[16]

The motions, noise, and gases of a heavenly body of large dimensions seem to be indicated here. The god Mars is referred to in Babylonia as the God of Noise. There is an insistent

connection of noise with the planet Mars.

The connections between heavenly sounds, sacred events, and the beginnings of music appear to be secure. From Chernikov, in the Ukraine, Soviet scholars reported finding mammoth bones converted into skull drums, shoulder blade kettle drums, and lower-jaw xylophones, at an estimated date of 20,000 years. If the instruments, all of the drum family, are correctly identified, it would mean that the settlement was fully human, with a religion. For nowhere is there any indication of musical instruments or musical sounds that are not connected with the heavenly host.

When the Wonguri tribe of Australia conducts today its holy dream time ceremonies, the assemblage beat sticks together; the dancers keep rhythm; and the stories of earliest times are recounted, of the time the Moon left their land forever and the morning star accompanied her. Ancient Greek myth tells of the infant Zeus; he was being hidden from his father Kronos who would swallow him; his nurses, the Curetes, drowned his cries with drums, cymbals, and dancers.

Drumming and whistling may be the oldest emulated sounds. The bull-roarer is an ancient and world-wide instrument, a primitive noise-maker that whips the air into a sound like a falling body. It thunders and whistles. Perhaps whistling also developed with a pipe or fife. The horn, whence the trumpet, might follow; it is a piercing and blasting instrument. The arched string instrument - harp, lyre - must have joined the sacred group quickly. All together they reproduce the music of the spheres and of the gods.

In earliest China the drums were used to communicate with heaven. The drum comes from K'uei, a green oxlike creature who came out of the sea shining like the sun and moon and making a noise like thunder. He was captured by Huang-ti who made him into a drumskin. But the same K'uei is also the master of music who alone can bring harmony between the six pipes and the seven modes. Without this harmony heaven and earth would lack their essential music. K'uei was also master of the forge, of dance, and of regulating floods [17].

The sickle with which Kronos (Saturn) castrated Ouranos

(Uranus) was also the harpe (lyre) of Demeter who had taught the Titans to reap. The strings of the lyre were ultimately five or seven, corresponding to the number of spheres counted as planets. Vail thought that the arch of the harp and sickle came from the opening of the boreal hole of the north when the regime of canopy skies began first to break down; the arch was the sickle; it was also the arch of the lyre, and the strings to be plucked were the beams of light playing down upon the earth.

Here, as in many other cases, an issue is whether the sacred image came before the invention or the invention was made and compared with a later celestial image. As usual I incline towards the position that the sacred example preceded the profane.

The correspondence between the number of planets and the number of strings on the lyre is an instance in point. It is only one of many. The number of observed planets obviously determines the number of strings on the instrument, not *vice versa*. An old Chinese text says that "the calendar and the pitch pipes have such a close fit, that you could not slip a hair between them."[18] This seems an odd expression until one realizes that the sacred calendar is replete with a synchronous musical calendar - from Easter music to Christmas music, for example. The pipes are pitched to heavenly sounds and numbers; the calendar is an arrangement of heavenly events.

The Pythagorean philosophy of ancient Greek culture generated the theory of music and the theory of numbers out of the behavior of the heavens. The "harmony of the spheres" of which the ancients spoke was probably first the sounds of heaven of the "better" sort, to which humans might adjust, and which, to them, presaged a tranquil stability, and then later, inferentially, the visual reliable order of the heavenly bodies as noted and welcomed by philosophical astronomers.

Robert Temple has been able to locate a fundamental connection between geodesy in Egypt and Greece. The Greeks and Assyro-Babylonians had the heptatonic or seven-toned diatonic scale of today. The Egyptians possessed a musical octave of seven degrees (that is, an eight-tone scale, such as the West has today). The same seven degrees was the geodetic principle followed in the topographical surveying of Egypt. For the Egyptians, 1°

North was at Behdet and 8° was at the southernmost limits, by the Great Cataract of the Nile. Further, Temple, with suggestions by L. Stecchini, established an octave of centers for oracles: running up the lines of latitude and musical scale at equal intervals, thus: Barce, Triton, Paphos, Omphalos (Crete), Kythera (or Thera perhaps), Delos, Delphi and Dodona [19].

Robert Graves has reported an octaval version of the name of Yahweh, *Jehuovao*. The sacred name can then be pronounced and chanted as a set of vowels running the gamut of a musical scale. We are reminded of the connections between Egyptian and Hebrew culture, when Demetrius wrote: "In Egypt the priests sing hymns to gods by uttering the seven vowels in succession, the sound of which produces as strong a musical impression on their hearers as if flute or lyre were used." The seven vowels were uttered in succession as the divine unspeakable name [20].

Musical sound, and also noise, can be broken down into pitch, rhythm, timbre and volume. The first instruments specialized in rhythms, for instance, and had variations of pitch, timbre and volume. The pipe or flute specialized in pitching different tones and a whistling timbre. Using such elements in combinations, music could be built up. But it would not have been possible without the basic psychological changes that were taking place in people. Control of themselves and the gods was the paramount motivation behind the people who originated music and all other aspects of culture.

The humans had a compulsion to repeat their first experiences, which were naturally terrible; this is explained fully in my work, *Homo Schizo I*. The repetition of rhythms is the repetition of the sounds of the gods at work upon the world. The orgiastic side of music - the furious beatings, poundings, amplitudes, blasts, whirling dances and frenzied lyrics - is an imitation of the behavior of the gods in the days of creation. The orgiasm is the basis of the plot of song and chant; it gives the melody line, the beginning, middle and ending.

Repetition and orgiasm shape the four elements of music, and lend form both to the instrument and to the unique composition prescribed for it. The very design of an instrument is intended to

supply a limited span of capabilities to the musical elements. Not only does the music itself follow patterns under strict general rules, but the instrument is a mechanical contrivance to see that the rules are obeyed.

To all of this is added from the start the sublimation that the music affords. Tests of endurance, involving the basic, and destructive, elements of earth, air, water, and especially fire, sometimes are incorporated into the dance and music. Battles of the gods, too, may be emulated. The gods are being controlled at the same time as they are being celebrated and honored; the audience is being controlled as it celebrates and honors the gods.

"Heavenly sounds" are a contradiction; they are actually the suppressed and sublimated sounds from heaven that destroyed the world. In The Holy Dreamtime of the Australian Womburi is a Holy Dreamtime of all other peoples - for all peoples have them. Sacred myth, song, dance, and music provide an escape from horror by saying and doing all that was said and done in those days in a way that remembers in order to forget.

Contemporary music that is avant-garde has the subconscious ambition, certainly doomed to fail, of confronting the terrible days of catastrophe directly. It brushes aside the sublimation, and the compulsive repetitiveness of music. It destroys expectation, and unleashes the gods. It destroys form by atonalism and arhythmism. It randomizes the four elements. Whatever happens in a sound-producing setting - "a happening" - is "music." The computer is used to reduce dependency upon skills, pitch, volume, rhythms, and timbre. It creates the mixture that is the "true reality". All this is often done without full realization. It is nevertheless a largely honest attempt to return to the primeval chaos in which humanity was born.

I have known geologists to taste stones and drippings, to smell in crevices, to feel the texture of rocks, to tap a fracture and listen, and of course to hold up a specimen to view by every angle of light. Hence it is not a radical departure from the earth sciences if we carry our inquiry into broader realms of sound and light. Our intent is not to create a marriage of sciences and humanities: that is good in its own right and if it is a by-product of this interest, so much the better. Our motive is to understand and

possibly to reconstruct natural history. Whereupon it happens that, once the idea of the constancy of natural events through long eras of time is put aside, and another model of inquiry is advanced, we must take advantage of the treasury afforded by human history. The dumb rocks can tell their stories in part through human lips. All the motions that are forbidden the dead past are resumed through the sights visited upon early human eyes. The sounds and sights of events that witnesses and their descendents describe are clues about an Earth that is less static and more dynamic than the earth sciences have heretofore portrayed.

Notes (Chapter Twenty-eight: Pandemonium)

1. Furneaux, *Krakatoa,* 188.

2. Frank Lane, *The Elements Rage*, *loc. cit.,* 1958,

3. *Ibid*., 179.

4. IV *Ency. Britannica* (1974), 955.

5. R.W.B. Stephens, 7 *Ultrasonic* (Jan. 1969), 30-5.

6. See Corliss, *op. cit.*, CrSD-045, GI-232 from *Monthly Weather R* (Feb. 1895), 57.

7. 28 *Sky and Telescope* (Oct. 1964), 215.

8. C.S.L. Keay, "The 1978 New South Wales Fireball," 285 *Nature* (1980), 464-6.

9. I *Pensée* 4(1973), 112.

10. *The Secret Life of Plants* (New York: Harper and Row, 1973).

11. Reported in Carl Störner, *The Polar Aurora* (Oxford: Clarendon Press, 1955), 137.

12. S. Tromholt, 32 *Nature* (24 Sept. 1885). 499-500.

13. Daniel S. Gilmor, *Scientific Study of Unidentified Flying Objects* (NY: Bantam, 1969) as reported in Corliss, *op. cit.*, C1-235, GSH-001, from M.D. Altschuler paper.

14. Examples here are from Velikovsky, *Worlds in Collision.*

15. J.P. Cohane, *The Key* (NY: Crown, 1969).

16. Velikovsky., *Worlds in Collision*, 263.

17. Santillana and von Dechend, *op. cit.*, 125-8.

18. *Ibid.*, 4.

19. *Op.cit, 29.*

20. *Ibid.*,266

CHAPTER TWENTY-NINE

SPECTRES

To recount the visual experiences of ancient humans in regard to natural phenomena would be a work of thousands of pages of agonies, joys, and revelations. However, the reader is probably aware of their nature through voluntary and inescapable exposure to fairy tales and horror movies. The earth sciences will profit more from a discussion of some relationships between natural events and the spectres that accompany them. I shall avoid speaking of the eyes when used functionally, as, for example, to assess damage or to organize a new life. Rather I shall concentrate upon the visual effect in itself, and what it conveys about natural events.

Uniformitarians usually abandon their position on change when it comes to what ancient voices convey about natural events. That is, in order to hold on to their belief in a natural world that changes by gradual evolution rather than by quantavolution, they say that humans have changed their "exaggeration-rate." They often deny ancient testimony, using pseudo-anthropological arguments that early mankind was superstitious and excitable, hence quite unreliable. What he claimed to see were in fact illusions and delusions; what he passed on as memories were gross exaggerations. In other words, nature behaves in the same way; man has changed.

This theory we find unacceptable, as also we do its accompanying statements, that typically proceed like this:

> Ancient people are not to be believed if they say that a large body was spotted and approached in the sky. Or that bodies of all shapes and sizes rushed high and low through the skies. When mountains and land are seen to rise, and at other times watched as they sink, this must be an illusion and an exaggeration. No one could have seen a

> wall of towering water. That there should have fallen sheets of flame and weird colored waters or dense substances, including even life forms, that ice and hail should fall in deluges and wind should sweep away forests: these again were delusions. Seeing the landscape dissolve in an earthquake, while even the air is rendered into visible shock waves, and seeing the Earth explode and pour out boiling magma from cracks and cones: again illusions. Telling of the destruction of almost all that was living: people must have been psychotic to make up and pass along stories of such events.

The quantavolutionary position is that they were probably psychotic, but partially because of the nature of such events. Thus, to some extent, we become uniformitarian in respect to human psychology as we become quantavolutionary in regard to nature.

An increasing number of studies of modern mankind in disaster lead us to accord greater reliability to ancient stories. A severe trauma of terror, such as the nuclear blast at Hiroshima, leaves the survivors quite catastrophized. What happens thereafter matters little to the survivor. Subsequent sights are likely to fall upon a numbed and hopeless creature. Where survivors are reduced to hopelessness, few lift their hands to help others. The prognosis of the group is poor. Studies of the aftermath of Hiroshima have shown this to be the case. Each succeeding horrible sight is seen by eyes becoming too jaded to respond. We should bear in mind, too, that Hiroshima was a local event, a minute fraction of what many a fossil agglomeration and extinct volcano chain tells us once happened. When we see millions of trees all felled at once buried in the Fens of England, a blast many times greater than Hiroshima has to be postulated.

After the explosion and tidal wave of Krakatoa, a survivor spoke of scenes "too horrible to remember; incidents that reminded of the animal instinct that enables people to do the impossible."[1] When a fireball blazed erratically across the Southern States of the U.S.A. on March 24, 1933, people were terrified. "Ninninger (1936) says that seasoned cattlemen, accustomed to facing the vicissitudes of life and who ordinarily knew no such thing as fear, told him they despaired of their lives during these 'terrible

moments.' Yet they were 75 miles from the fireball's nearest approach !"[2]

If, however, people on the periphery of a disaster survive, these will be terrorized but hopeful of themselves. Even this was noted at Hiroshima. If after days, months, years or centuries, a disaster of the same dimensions strikes, and again some survive - some of a new generation, too - then the memory and meaning of catastrophe is reinforced. But again the survivors are active, self-preservative, and hopeful. They still can believe in some surcease and control. They have meanwhile established relations with gods and nature, the very forces of wrath. They can immediately interpret the events, and produce one or more inventions to propitiate and control the gods and, therefore, the events.

Prophets will help them to remember and to react:

> The Lord will smite you with madness and blindness and confusion of mind; and you shall grope at noonday, as the blind grope in darkness... (Deuteronomy)
>
> And they shall go into the holes of the rocks .... for fear of the Lord and for the glory of his majesty, when he ariseth to shake terribly the earth... (Isaiah)
>
> The great day of the Lord is near, near and hastening fast... l will bring distress on men, so that they shall walk like the blind, because they have sinned against the Lord; their blood shall be poured out like dust, and their flesh like dung... (Jeremiah)
>
> I am about to shake the heavens and the earth, and to overthrow the throne of kingdoms .... the horses and their riders shall go down, everyone by the sword of his fellow... (Haggai)

These are the visions of prophets and there are many more like them, posed as promises, to be sure, but with the full assuredness that comes from past experiences. We note marks of genuineness: going into caves during earthquakes (for the sky

brings worse terrors); the kingdoms are overthrown, then the survivors attack each other; the survivors are stunned, maddened, functionally blinded. The preventatives are difficult, if not impossible: that all should worship faithfully and properly, and obey divine commandments.

Now here is a legend of the Indians of the Badlands of South Dakota. It tells of how the Badlands came into being, laying it onto violations of the will of the Great Spirit who had granted plenty but had decreed peace, and there was no peace. Warriors prepared for battle:

> At last all were assembled and the day had come for the advance. And now the Great Spirit took matters into His own hands. Dark clouds hid the sun from the face of the world. Lightning streaked across the blackness and thunder rumbled high over the hills. From the ground flamed forth fire, and the earth shuddered and rocked. A wide gulf opened and into it sank the mountain tribe - all their people - all that they possessed. With them sank all life - the waving grass - the clear springs - the animals.
>
> As suddenly as it came the storm ceased. The earth became fixed in waves as it had rolled and shaken. There was only a barren waste on which nothing has ever grown or can grow [3].

After a catastrophe, the sights of doom are only partially capable of recall. They are personalized, humanized. Then they tend to fade over time. They are sublimated in many ways. The history seems to us strange; it is literal, detailed, yet surreal, as in the Bible story of Sodom and Gomorrah. I discussed the geology of the story in Chapter 22. When the family of Lot, warned by an angel, was fleeing the doomed Cities of the Plain, it was forbidden to look back. The Cities were utterly destroyed. Lot's wife turned to look and was transformed into a pillar of salt. Thus did subsequent generations, perhaps even the descendants of the family (who violated the taboo against incest to perpetuate themselves), remember the event and tie themselves personally and visually into it.

Of salt in the Great Rift Valley of the Jordan there was plenty or

perhaps just then it came to be plenty and is plenty today. It was a convenient "memory tag", to imagine a seen horror encased in a pillar of material produced out of the holocaust itself; then 'this is where Lot's wife was frozen with fear and died' becomes 'this is where Lot's wife became a pillar of salt because she viewed the terrible wrath of the Lord.' That is, the story is tied into the event all the more closely. That there may have been nothing left of her except a location and new salt would help, if true, to explain the story. The others, who dared not look back, would have no way of knowing.

I am not arguing for literalism but for "spectralism" which I would define as subjective realism: first, a sympathetic and fully possible truth has to be searched for and, then, whatever is left over as "false" has to be explained in the vision of the subjects and of their immediate descendant, and finally in objective psychological and anthropological terms.

A much broader range of cases may advance the argument. There is, for example, the dragon. Everyone knows what a dragon is. All do not know that it is a theophany, a divine manifestation. And that the creature is closely tied to visions of events in the sky, many times repeated.

Chamber's Encyclopedia, defunct now for many years, carried a charming passage on the dragon:

> The dragon appears in the mythical history and legendary poetry of almost every nation, as the emblem of the destructive and anarchical principle; ...as misdirected physical force and untamable animal passions... The dragon proceeds openly to work, running on its feet with expanded wings, and head and tail erect, violently and ruthlessly outraging decency and propriety, spouting fire and fury from both mouth and tail, and wasting and devastating the whole land.

The dragon is regarded as a benevolent creature by the Chinese, however. And no people has been so devoted to the symbol. Its iconography was as intense as that of the crucifixion of Christ in Medieval Europe. Recently, Carl Sutherland found that the dragon made its appearance in Chinese art around 1500 B.C. [4]

This date is a well-marked catastrophic boundary, known in radiochronometry, archaeology, geology, legend and history. Eliminating bit by bit "all later accretions," he thinks that he has "attained some understanding of the sight observed by the ancient Chinese: a writhing, bright, elongated thing. It was irregular in outline; it was apparently on fire... This thing, the dragon, seemed to be driving off the terrible flaming globe and so to be benevolent as well as powerful." Later on it was given legs and scales. It is almost always shown in the heavens. Flame symbols show the sky to be on fire. The globe carries lightning and thunder symbols as well as fire symbols. (Probably the lightning generated the moving legs of later representations.) The Chinese Emperor with a "Dragon Face," sat on the "Dragon Throne" wearing robes of state on which dragons were displayed.

Dwardu Cardona has presented first-hand descriptions of comets that compare them with dragons [5]. The accounts range from England to China. The comet of 449 A.D. stretched over England from beyond Gaul to the Irish Sea, "a ball of fire, spreading forth in the likeness of a dragon, and from the mouth of the dragon issued forth two rays..." Thus wrote Geoffrey of Monmouth. Some comets "lash their tails" wildly.

The Chinese "Kung Kung" dragon flung himself in rage against the heavenly mountain, turning the skies around, and tilting and flooding the world. He had a son-dragon, "K'au-fu" who wished to keep pace with the Sun. K'au-fu tried to quench his thirst *en route* by drinking up the rivers of China but succumbed finally of thirst. Cardona identifies the myth with the Phaeton myth and episode. Phaeton, eager to drive the Sun's chariot, did so incompetently. Legends recite that he came so close to Earth that the rivers of Asia, Africa and Europe dried up. Strabo's *Geography* mentions the terror of the Syrians and Aramaeans at the sight of Typhon, probably the same as Phaeton [6].

> That the myth of Phaeton describes a shifting of heavenly bodies, we know from Plato. That Phaeton was a comet, or a 'blazing star,' we know from Cicero. That this 'blazing star' became a planet, we know from Hesiod. And that this planet was the planet Venus, we know from both Nonnos and Solinus [7].

Then Cardona takes up the question of the Chinese "fire pearls," or "tear drops of the Moon." These we have discussed as the tektites, which are scattered over the Earth. He concludes that they splashed upon Earth after great meteoroids or cosmic lightning discharges had blasted the Moon. Possibly it was the work of the cometary Venus, for the dragon Lung is pictured chasing a great pearl across the sky. And the fear that the Moon will be devoured by a comet is part of some legends and modern anthropological reports.

That the ancients may have actually observed such bursts upon the Moon is argued by astronomer Jack B. Hartung [8]. According to the *Chronicles* of Gervase, for June 18, 1178, at Canterbury, England, five persons witnessed with their naked eyes the explosion of a crater. Hartung estimates it as perhaps 13 miles in diameter. In Gervase's words:

> A flaming torch sprang up, spewing out, over a considerable distance, fire, hot coals, and sparks. Meanwhile the body of the Moon which was below writhed, as it were, in anxiety...

Whether this writhing was an illusion created by air waves or an actual rolling seismism of the Moon's surface is not to be known. Bancroft once reported an Aztec legend that the sun and moon emerged equally bright, but to the gods this was not seemly; so one god took a rabbit by the heels and slung it in the face of the moon, dimming its luster with a blotch whose mark is seen to this day [9].

Great events have impacts on human behavior and human behavior can be sometimes used to conjecture upon possible great events. One must reason back and forth, trying all the while to avoid circular argument. A difficult case is the similar duration of the lunar cycle (today) and the menstrual cycle of women (today). The one is 29.5 days; the second can vary from 21 to 35 days, but concentrates upon 29 days. Gestation occupies generally nine moon cycles. Various scholars have mentioned these 'coincidences.' Recent studies have shown that the Moon cycle is more closely followed when women of varying menstrual periods are shut up in a room where they cannot be aware of moontime and suntime; they unconsciously

tend to approach the lunar revolution.

It is ordinarily believed that the Moon was on the present cycle long before the first human evolved. Anthropologists have maintained that the coincidence ultimately reinforced human attention upon the Moon and also provided specious grounds for marking the peculiarity and witchcraftiness of the female sex. Menstruation is often the subject of taboos [10]. In some places, women in menstruation must not be seen. Harsh penalties for violations of menstrual taboos are common.

Under the quantavolutionary theory here, it would be possible to view the "ideal" menstrual cycle as itself determined by the cycle of the Moon. Only the human female behaves on the monthly cycle. A psychosomatic response to the greatly feared and revered goddess and god of the Moon, newly in place and settled into a regularity, could be achieved by disciplining a varying physiological function. People will go to any lengths to harmonize their behavior with that of their gods. (I discuss this subject in the volumes on *Homo Schizo.)* To bind a whole sex and indirectly a whole people by its important reproductive cycle to the Moon god who passed them in daily review would appear to be a principal invention of the human race. There was strong incentive to devise this proof of devotion to the great god: it had ceased to bring ruin on the world and was guarding the new peace.

"Spectralism" might propose another case for consideration. How long have nights and days characterized earthly existence? A legend has persisted down to our times on the high plateau of Bolivia, around the impressive ruins of Tiahuanacu, that the city existed before there were stars in the sky. Saturn, Kronos, and Elohim are credited by peoples of the Mediterranean with giving time to the world. The Hebrew creation story has the Lord on High declare: "Let there be lights in the firmament of the heavens to separate day from night; let them serve as signs and for the fixing of seasons, days and years." Whereupon the Sun and Moon were placed in the sky. I would suppose that the Moon, after terrorizing humanity by its assemblage and irregularity, promptly became the basis for calendars everywhere, once it began to obey the laws of Kronos (Chronos or *Time*). Time-factoring in earliest mankind was a way of

following the gods in whatever regularities they might exhibit; Marshack has reported paleolithic lunar marking extensively [11].

Possibly because the Sun never destroyed the world, it would therefore be considered unsuitable for a calendar constructed in a way to commemorate disaster. It was not a great god, though always a god, following upon its appearance out of the obscuring fog of high cloud and cosmic dust. Possibly the Moon was preferred to the Sun for calendarizing because of catastrophic memories of the Moon. Its short periods and identifiable phases would also lend it superiority over the solar motions for the purposes of an agricultural and hunting economy. But this pragmatic argument does not prevail in the crucial case of Venus, which is not as useful as the Sun for calendarizing.

The Sun was rarely calendarized; yet Venus was. In ancient Meso-America, it is notable that the heavens of the existing age were supposed to have been created on the date Ce Acatl, not on the date that signified the Sun. Ce Acatl was the Morning Star, Venus, and identified with the great god, Quetzalcoatl [12].

Quetzalcoatl was also the name of a bird of gorgeous plumage. Marcus Varro, the learned Roman author, reported that once long before his time the planet Venus changed its color, size, form, and course, a strange prodigy which, he said, had happened never before or since. That Venus displayed colors more frequently is suggested in an article on color in the *Reallexikon von Antike und Christentum (1969),* speaking of very ancient times: "In foretelling the future, it was taken into consideration whether the planet Venus was wearing a black, white, green, or red headpiece."

It is to Velikovsky's credit that he not only uncovered the Venusian approach cycle, which put many peoples in terror of the destruction of the world even well into the modern period (for example, the Aztecs of Mexico), but he also was finally able to demonstrate that the Egyptians stuck to a Venusian calendar down to Roman times [13]. Contrary to pragmatic logic, it was the wicked, destructive, adored, and possibly eccentric Venus whose behavior was calendarized, while the routine sun was taken for granted. When and if the sun became disordered, it did

so as a reluctant tool of others, as in the legends of the Phaeton disaster; there Helios refuses to appear, after the loss of his son, and the gods are hard put to get him back upon his regular rounds.

A spectre is something seen that is there and not there. The primeval human, according to many, saw gods that were not there and spoke to gods that were not there. The noise and sights were pure hallucinations. Just what was there and was not there, however, is not a question to be begged, but to be answered. No one, today or ever, has seen a personal disaster with the cool eye of a scientist thousands of years from the scene. But the cool eye should not claim that the disaster did not occur - or that it happened in a way to conform to his daily newspaper accounts of earthquake, floods, and meteors. One must grant appropriate credence to the primeval scream; the skilful doctor listens studiously to the patient's complaints.

The popular Revelation of John, Apostle of Jesus, is a magnificent mad vision of the destruction of the world. The Catholic Bible says that "the Apocalypse is a revelation of things that were, are and will be."[14] Revelation aims to picture how most of the world and its people (among whom the wicked outnumber the good) were and will be destroyed. The good are imperishable, and will be judged and admitted to heaven.

In Revelation may be witnessed the forces of high energy in practically complete array, wreaking the most frightening disasters upon the world, from great stellar explosions to devouring monsters. The forces are commanded by, indeed are, angels. Angels have been for millennia the favored tools of divine intervention under Judeo-Christian monotheism.

Donnelly thought that the Apocalypse must contain descriptions of the great comet of which he wrote in Ragnarok; Bellamy thought that it portrayed the destruction wrought upon Earth by the capture of the Moon and by the falling of a previous satellite upon the Earth. Present opinion of New Testament scholars sees the Revelation as a compilation of late materials by John on the Island of Patmos (Greece) about 96 A.D. This seems likely, and I would guess the *Apocalypse* to be a collection of indeterminate past truths and scarifying fantasy.

Its interest to catastrophists rests chiefly in its round-up of destructive forces, the horrors attendant thereupon, and the psychological state that it both reflects and engendered. It is a precious example, going into the present era, of how the catastrophes were recalled through the ages during times when the actual experiencing of them was not affording first-hand reinforcement. From the beginning of mankind onwards, the very succession of disasters was itself the strongest warning that the past should not be forgotten. The great popularity of the Bible is probably due to the capacity of many of its passages to re-enact the terrible days of chaos and creation.

The Bible is instructive, too, on experiences of cosmic darkness. In the Genesis story of creation, the record of man begins in a world growing lighter, but still sunless and moonless. Elsewhere, I have discussed the atmospheric developments that coincide with this account, which is by no means the sole account passing down to us. The cherished light was not to be turned on forever, for the Bible itself and every single mythology of the world tells with dismay of various succeeding ages when a darkness fell upon mankind. The Götterdämmerung (or Ragnarok) of the Norse and Teutons is both a twilight of the gods in the sense of a universal darkening and in the sense of an approaching struggle and death of the old gods.

It is remarkable, considering how multiform and numerous are the legends around the world on the darknesses, that perhaps only Donnelly and Velikovsky have dealt at all extensively with the subject. Darkness is very much a part of the Biblical catastrophes. In the story of the Lord's visit to Abram and ordering of sacrifices may be seen the sixth catastrophe mentioned in the Bible (after the Creation, the Garden of Eden expulsion, the Deluge, Job's trials, and the destruction of the Tower of Babel). There Abram fell asleep at twilight and a "great fear and darkness" came upon him. And in the darkness "a smoking furnace and blazing torch passed."[15]

Later on occur the catastrophes of Sodom and Gomorrah, Joseph (Egyptian famine), Exodus, Joshua, David, Elijah, Amos, and Isaiah. The catastrophe of Exodus brought complete darkness for some days: "They saw not one another, neither rose any from his place for three days." (10:22) An Egyptian stone inscription

about what was probably the same event states that "during these nine days of upheaval there was such a tempest that neither men nor gods [the royal family] could see the faces of those beside them."[16]

Darkness figures prominently in most accounts of catastrophes whenever the period. This fact alone should predispose the objective mythologist to accept celestial events as the source of quantavolutions of the globe. Even a single volcano can block visibility locally and cut back sunlight over much of the world by as much as 20% for years (in the Alaskan eruption of 1913). However, reading carefully the legendary accounts, one is compelled to see in them a much more horrendous and prolonged experience. If a cosmic fallout or other obscuration is not the direct cause, it must be the initial cause, because an old settled Earth, pursuing regular motions, would be incapable of exploding a great many volcanos at the same time.

Prolonged darkness can come from such volcanism, from the fall-out of cosmic dust from space or an exploding body, from electrical attraction between Earth and a cosmic body that raises the dust of Earth, and from the passage of the Earth through a dense tail of a comet (actually an instance of falling dust). Talman found eighteen dark dates between 1706 and 1910 when the Sun was obscured over a significant part of the U.S.A. or Canada by forest fires. In only three cases did the darkness endure for as much as five days [17].

Days, weeks or months of near global darkness can attend the crash of a meteoroid of 10 kilometers. Scholars studying biosphere extinctions now refer regularly to such effects, as in the study by the Alvarez group referred to earlier. Years of darkness have been claimed in rare cases, the Exodus period being one of these. Heavy winds are reported during the days of Exodus; Talman found the dark days of forest fires to be windless. Perhaps volcanism of a rare kind produced the Exodus dark skies, but more likely is the combination of large-scale volcanism and a prolonged fall-out of cometary dust. Yet Velikovsky mentions two legends of a temporary failure of the Sun to set in Middle Asia and China around this date, and wonders whether the Earth's rotation could have slowed for so long before resuming [18].

The close of the Cretaceous age with its heavy extinctions saw a darkness of only weeks or months, according to one view, which suggested as the cause an exploding meteoroid of middle size. Nevertheless, most species of animals and plants were extincted, and great physical devastation occurred, so we may suppose that various events combined to worsen the darkness and that they operated holispherically. We suspect much more than the meteoroid was active.

The most impressive of all sights, to judge from many accounts from the earliest records and legends to the most modern of writers is that of a comet approaching the Earth. Unlike the strike of a nuclear missile, the comet gives the fullest visual warning, as well as causing a number of electrical effects from afar. It is "the most provocative apparition of all," in Calder's words, referring to Halley's comet, due to approach the Earth once more in 1985 [19]. When the Roman Emperor Nero saw the comet of about 60 A.D., he had many leading Romans murdered to avoid the death he saw for himself in the heavenly portent. "The Incas of Peru regarded comets as intimations of wrath from their Sun-god Inti... In twentieth-century Oklahoma, at the apparition of Halley in 1910, the sheriffs arrived just in time to prevent the sacrifice of a virgin by demented Americans calling themselves Followers."[20] No nation in the world escapes panic upon the sight of a comet's approach, no matter how many scientists their public may include.

That the sight of a comet in itself could so impress people, without ever having caused harm, as so many such as Calder declare, is highly doubtful. Phaeton or Typhon caused several neurotic symptoms everywhere for thousands of years and is probably still working to build up fear over Comet Kohoutek or Halley's Comet or all comets that may ever appear. As attested to by the behavior of modern tribes of Amazon jungles, literacy and historiography are not required.

Peoples picture comets in many different forms, none of them impossible. They tie comets into many lessons, symbols, rites, and stories of their religions. Beyond religion, they integrate the comet-complex into sex, work, play, politics, and war, in highly disguised ways. They dread new apparitions and revere substitute portrayals of past comets. Nor could this universal fear

be diffused from one cultural center to another, like the sweet potato or noodles; the fear must have a basis in historical reality. As we have demonstrated in so many writings, the comet as an apparition that is followed by catastrophe is a substantially true memory retained of mankind.

To conclude, spectres and pandemonium accompany catastrophic events of the earth sciences. In themselves they do not leave vestiges. Still, little by little, research will build up rough measures of the intensity and scale of the events from the visual accounts available in legend and reports. In the case of every important god stretching back before the dawn of classical history, we can elicit and reconstruct from legends of sight and sound the workings of high energy forces that connote catastrophes.

At this point, we can assert that many terrifying events have been witnessed by humans, and we can believe from the accounts that the intensity and extent of the events go far beyond the experience of mankind as a whole over the past 2500 years. Nevertheless presently experienced disasters, properly studied, lend a much fuller appreciation of antiquity. When the Egyptians suffered terribly from the natural catastrophe of the time of the Hebrew Exodus, a scribe wrote that women became barren and men lost their hair; the Ipuwer papyrus was known and read long before the nuclear bombs of Hiroshima and Nagasaki, but a new sensitized generation was required to perceive in these scarcely intelligible lines the awful news of radiation disease.

Notes (Chapter Twenty-nine: Spectres)

1. Furneaux, *Krakatoa,* loc.cit.,108.

2. Lane, *The Elements Rage*, Loc.cit.,179

3. M.E. Gridley, *Indian Legends of American Scenes* (NY: Donahue,) 101

4. 4 *Pensée* 1(1973-74), 47-50; see also V *S.I.S. Rev*. 280-1, on the cosmic serpent.

5. I *Kronos* 2 (1975), 35-47.

6. VII *Geography* (1924 ed.), 3,8.

7. Cardona, *Supra* fn5, 37.

8. Dwardu Cardona, "On the Origin of Tektites," II *Kronos* 1(1976), 42-3.

9. Related in Donnelly, *loc.cit*.,169.

10. Wolfgang Leader, *The Fear of Women* (NY: Harcourt, Brace, Jovanovich, 1968).

11. Alexander Marshack, *The Roots of Civilization* (NY: McGraw Hill, 1972).

12. *Codex Telleriano-Remenesis* II,PI.33.

13. "Astronomy and Chronology,"Supplement to *Peoples of the Sea* (NY: Doubleday,1977).

14. Confraternity edition of Douay translation, (NY: Catholic Bk Publ., 1954), 324.

15. *Genesis* 15: 12, 17. D.W. Patten,R.R.Hatch, and L.C. Stinhauer, *The Long Day of Joshua and Six Other Catastrophes* (Seattle: Pacific Meridiam, 1973).

16. Velikovsky, *Worlds in Collision*, 59; *cf.* 58-62.

17. C.F. Talman, 112 *Sci. Amer.* (6 Mar. 1915), 229.

18. *Worlds in Collision*, 62.

19. *The Comet is Coming!* (NY: Viking, 1980).

20. *Ibid.*, 12-3.

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