CHAPTER EIGHT

THE EARTH'S PHYSICAL AND MAGNETIC HISTORY

The generally round shape of the Earth is an effect of external electric pressure to bring it into electrical balance with the plenum. It was originally a dense aggregate, a fragment of Super Sun trapped in the magnetic field that was generated around the arc joining the Sun and Super Uranus. The aggregate grew rapidly in a short time from accretions of smaller bodies and chemical elements.

The Earth's density alters from lighter material on the outside to heavier on the inside, in proportion to the intensity of requirements of materials for charge -- lesser on the outside, greater at the center. Density and conductivity are correlated. In an intensely electrical ambience, the deposition and transmutation of metals such as iron and nickel at the core of the Earth are understandable.

Though knowledge of the Earth's interior is by inference, its seeming simplicity may be a fact and, if so the result of its electrical accretion and its conductive nature. By contrast, the superficial crust of the Earth consists of more poorly conducting species. It has also been subjected to many geophysical incidents of a recent kind. Therefore, its highly differentiated structure is understandable (see ahead to Chapter Eleven). Granite, for example, is a rock formed as a global covering at and near the surface under highly energetic conditions. It may once have been basalt that was electrically energized by the magnetic tube to the point of metamorphosis. Too, it may have migrated by electrophoresis and deposited by electrolysis, as particulate, from the enshrouding plenum. It is old, then, but not so old as the core and mantle of the Earth.

Granting that the granite cloak could not be a metamorphosis of sedimentary rock requires admitting that the sediments can never have been very deep, not much more than the observable sedimentary cover on the continents and ocean bottoms today!

A half-million years of violent and gradual erosion would seem to be sufficient to provide it. If, as will be argued in Chapter Thirteen, the Earth has lost crustal material by explosion, it has also gained some materials from the explosions of foreign bodies (see Chapters Eleven and Fourteen); the search to explain ore, salt, and other anomalous bodies embedded in the surface must begin with a study of their possibly cataclysmic accretion.

The mineral structure of the Earth harbors magnetism, which is the capacity of some of the Earth's rocks and of its total surface and ionized atmospheric gases to give evidence of a distinctive electrical presence both now and in the past. Rock magnetism, imprinted in ferruginous and other rocks by some past event, yields magnetic intensities up to one microtesla [53]. At the surface the magnetic field of the Earth's body has an intensity of sixty microteslas. In rocket and orbiting satellite observations made in the ionosphere, high above the surface, intensities as low as ten nanoteslas are found. This ubiquitous force is weak to the point of impotency, yet at the same time it is highly significant in reconstructing the Earth's history and present state.

The globe as it accreted was aligned with the magnetic field lines around the electrical axis discharging between the Sun and Super Uranus. It was forthwith magnetized [54]. It, too, orbited the axis, maintaining a fixed direction relative to the magnetic field in which it moved. As depicted in Figure 18, it posted its rotational poles at right angles to its magnetic axis [55].

Quantavolutions eventually weakened the field of the magnetic tube leaving today only a feeble magnetic field in the region of the ecliptic (see Figure 11). The outflowing solar wind protons seem to leave the Sun radially. Except near the Sun this flow seems to be focussed mainly onto a disc enveloping the ecliptic. The outer-planetary space probe Mariner 10 has noted some depletion of solar wind at high ecliptic latitudes (Kumar and Broadfoot).

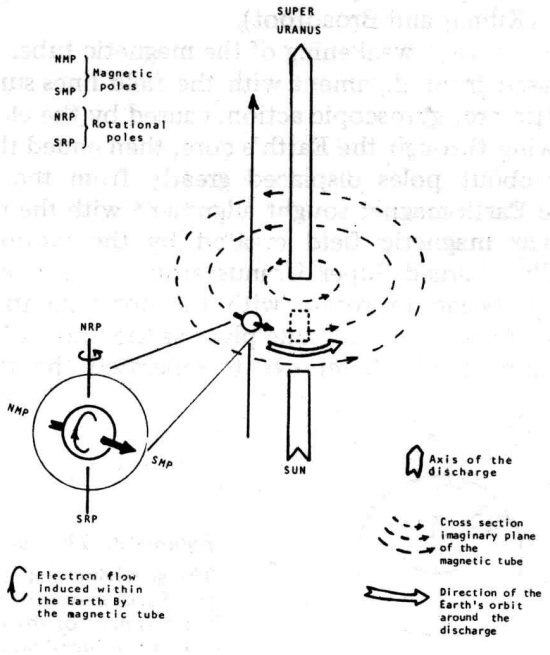

Figure 18. The Earth in the Magnetic Tube *(Click on the picture to view an enlarged version. Caution: Image files are large.)*

The magnetic field around the electric arc of Solaria Binaria made the electrically charged Earth orbit around the arc. The magnetic intensity of the constraining field caused the material of the Earth to become magnetized. So held in orbit the Earth's rotational and magnetic poles were located 90 degrees apart on the Earth's surface, the rotational axis was directed parallel to the arc, while the magnet axis was directed along the contours of the magnetic tube.

After sufficient weakening of the magnetic tube, the Earth was released from alignment with the field lines surrounding the electric arc; gyroscopic action, caused by the electric current flowing through the Earth's core, then ended the former rotation about poles displaced greatly from the magnetic axis. The Earth-magnet sought alignment with the now dominant solar magnetic field created by the motion of the electrically charged Super Uranus around the charged Sun. The Earth began to rotate with the north rotational pole (geographic north) in the same place as the "north" magnetic pole (Figure 19)[56]. Later events separated the two poles.

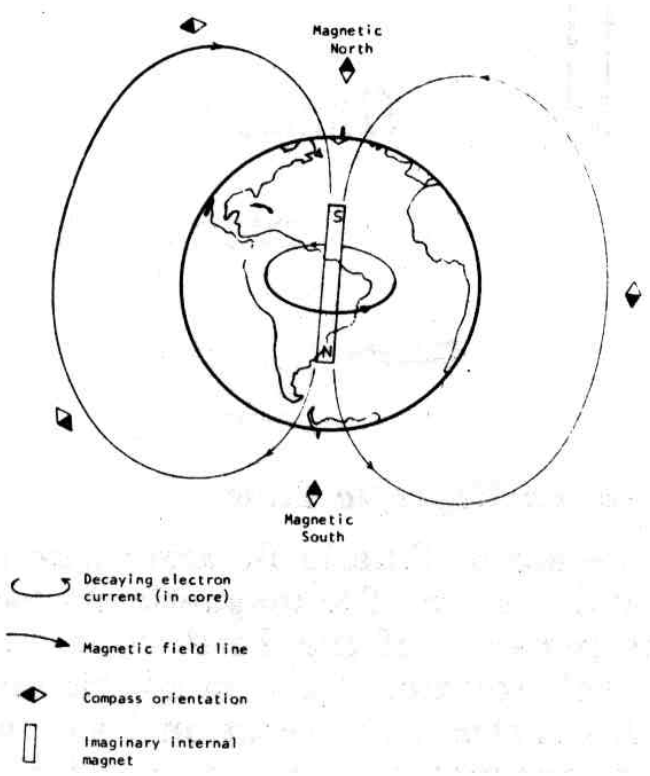

Figure 19. The Earth Magnet(Click on the picture to view an enlarged version. Caution: Image files are large.)

The surviving magnetization of the Earth's interior arises from the remnant of the electric current induced within the Earth's material during its stay in the magnetic tube. This decaying current is detected externally by the presence of an ever-weakening magnetic field, which surrounds the Earth.

Presently the magnetic axis is tilted eleven degrees to the rotational axis (Haymes, p214). The term *far-magnetic field* refers to this dipolar field observed from a great distance above the Earth. The *near-magnetic field* has its poles in northern Canada and on the Antarctic coast, south of Australia. Here the magnetic field is vertical. Location of these, often called "dip poles", is difficult and somewhat dependent upon crustal conditions rather than upon the internal magnetization (Haymes, p217). The present dip pole in the northern hemisphere [57] drifts westward by more than five kilometers per year (Vestine, p90). Its daily motion carries it through an elliptical loop with amplitudes up to 130 km reported (Serson).

Only in the recent quantavolutionary periods (the post-Saturnian : see Chapter Fourteen) have the magnetic poles abandoned the equatorial region. Palaeomagnetic estimates of

the location of the ancient magnetic poles of the Earth's surface register an aversion to high latitudes (Lapointe *et al.*).

Under earlier Solaria Binaria conditions, therefore, the surface rocks and internal magnetism of the Earth were in line with the field forces of the magnetic tube. All subsequent accidents to the Earth that brought magnetic disturbances, whether in the rocks or in the poles, must be overlaid on the fundamental magnetic map imprinted upon the globe during its youth. Furthermore, the electric generator of the Earth's magnetic field must be the descendant, still declining, of the primeval current set in motion by the magnetic tube. This current flows in the conductive material deep within the Earth. There it creates, and mainly defines, the field, the lines, and the poles of today. Its ancestor, much stronger, was present to imprint magnetizable rocks under circumstances of changes [58]. Today, many rocks point magnetically towards what was some pole of the past, some to the neighborhood of the present magnetic pole, and most to nowhere in particular. Only a few of the rocks are magnetized at all.

The magnetic poles of today are located near Thule, Greenland, and in Antarctica (120°E, 75°S). When these poles are joined, it must be noted that their axis does not transect the center of the Earth -- it is offset by 436 kilometers towards the surface of the sphere, where lies the basin of the Pacific Ocean (Haymes, p214). From this it may be inferred that, subsequent to the establishment of the magnetic field of the Earth, a quantavolution scooped out the Pacific basin and deformed the Earth (see Chapter Thirteen).

The present global field, which we have said is descendant from the Earth's stay in the magnetic tube, is complex in that later events have acted either to induce new electric currents (located superficially within the core) or to perturb parts of the main current flow. The result are the disturbing currents, shown in Figure 20, the imprint of more recent quantavolutions of the world order when Earth suffered electrical encounters on a large scale (de Grazia, 1981, 1983a; Juergens, 1974, 1974/5; Velikovsky, 1950, pp85ff), including meteoroid impacts (Dachille, 1978) and encounters.

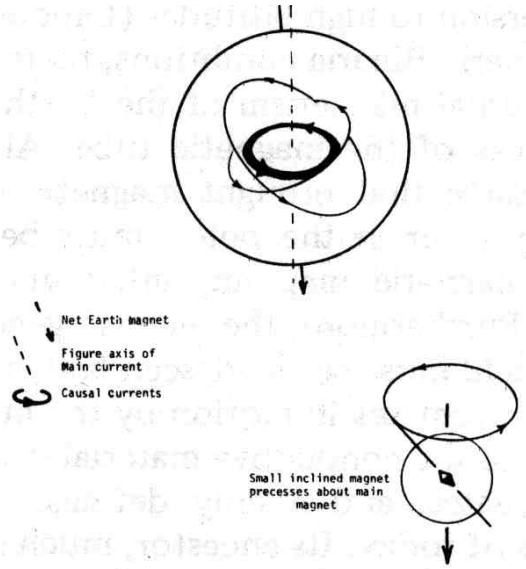

Figure 20. Magnetic Transactions Within the Earth. *(Click on the picture to view an enlarged version. Caution: Image files are large.)*

The drift of the Earth's magnetic dip poles across the continental surfaces indicates the complex nature of the causal current through the material making up the Earth's bulk. It is likely that the major current (drawn thickly) was induced during the Earth's stay in the magnetic tube. However, lesser currents (drawn thinly and located closer to the planet's surface) were individually induced in each of the interplanetary encounters of the Late Quantavolutionary period. Each of these lesser currents must transact with the main current, and likely also with one another, resulting in a complicated precession of the total magnetic field around the figure axis, which is directed perpendicularly to the plane of the major internal current (see inset). The net motion is the observed drift of the magnetic dip poles.

Not only can surface anomalies be explained by celestial intrusion, but so can the wander of the dip poles, a vector sum of the complex wobbling. If large electrically charged bodies passed close to the Earth's surface they could especially disturb the electric current in the core as noted above. These lesser currents, once created, would interact with the existing magnetic domain of the Earth (see insert, Figure 20).

Malkus concludes that precession of the Earth's rotational axis produces torques upon the Earth's fluid interior. He sees these torques as generating the internal dynamo that is conventionally called up to create the Earth's magnetism. Here we adduce his results only in evidence of magnetic wobble arising from torques.

The Earth's magnetic field has been weakening over the 150 years of measurement of it strength (Cox, p237). This implies a

decay of the current within the Earth's core. Such a decay could be the main source of heat flowing from the Earth's interior. At the observed rate of magnetic decline, it would take on the order of six hundred years to heat the core one (degree) kelvin. Even granting a much stronger field ten millennia ago we do not believe that the Earth's core is fluid. The observed surface magnetism and seismic profiles of the Earth's interior are consonant with a solid conductive body containing an excess of free electrons. Given that the Earth's field is weakening, it is logical to believe that rock magnetism is decaying at least as rapidly (see behind, Chapter Seven). Neither would still be present if magnetization had not occurred very recently.

The magnetic testimony of the lithosphere is largely fossil, in that the present interior current of the Earth passes its magnetic force into the atmosphere without the capacity for imprinting anything except molten rock. That is, if some rocks carry a complex magnetism, it must be measured and read as a much more intricate registry than the present magnetic field could generate.

As indicated earlier, the strength of the Earth's magnetic field is over fifty times that of the strongest rock magnetism. Presumptively, in the magnetic tube the Earth's overall magnetization would have been only a fraction of that of its environment. Notwithstanding its genesis the time measure of the current within the Earth's core is to be adjudged by the surface magnetic field and not by the rocks. Rocks containing => *magnetite,* of igneous origin, are imprinted by the Earth's field when they freeze. Other rocks containing similar minerals can be made magnetic if subjected by lightning to piezostress (Hertzler and Phillips or to magnetic shock (Dachille, 1978). Magnetization by any, or all, of these modes can occur when large charged cosmic bodies encounter the Earth.

Magnetic surveys disclose magnetic axes in all directions (Milsom, Vestine, p94). Typically, the survey instruments are set to read as "north" and "the reversed north". That is, the preconceived theory calls for a magnetization in the direction of the (wandering) north magnetic pole, and, in recent years, evidence that the poles may be on occasion reversed, "north" thereupon reading "south". The theory is vitiated by lack of consistency in the readings.

To revive the theory, extinct poles in off-north directions are postulated as the determinants of deviant readings, even though this practice begs the question by using two variables to prove each other. Juergens (1978) has criticized the interpretation of published evidence of geomagnetic orientations and reversals (see also Cox, p244).

The Earth's magnetic field has never been reversed. It is securely implanted in the Earth. Should the earth have tilted or turned upside down (Warlow), our model requires that its magnetic field would have turned with it, acquiring perhaps some minor dislocation or a tangential minor current as an offshoot.

Once the magnetization has stopped, the magnet decays. What is the duration of the Earth's magnetic field and its rock magnetism? Until recently both were considered permanent or assigned exceedingly long durations. Now it is recognized that magnetized objects lose their magnetism over intervals that are impressively short, Cook (1966, p282), using data given by Nagata, estimates the total decay time at under 70 millennia. By our theory, the magnetic tube would have held sway over the Earth's magnetic field and any lithospheric imprinting up to its weakening and collapse some 6000 years ago. If the tube were weakening, the Earth's field should have decayed with it. After the tube collapsed, the Earth's magnetism began to function independently. Its continued loss in strength has been noticed.

Barnes summarizes measurements made of the Earth's magnetic moment and magnetic field intensity from the determination by Gauss in 1835 until the middle of the decade past. These data show that the magnetic moment is decaying with a half-life of about 1400 years.

He notes that the energy in the Earth's magnetic field can produce, by self-induction, an electric current in the conductive core of the Earth. This current loses energy to the core in the form of heat, producing the observed decay of the external magnetic field. At present, by his computations, the core current required is 6.16 gigaamperes with a power loss of 813 => *megawatts.*

If the Earth's field had been decaying undisturbed for more than a few thousand years, magnetization would have been present whose decay should have melted the Earth [59]. Recent onset of the presently noted decay seems in order.

From the Earth's magnetic moment and using Barnes' estimate of the present internal current, we arrive at a "radius" for the Earth magnet of two megameters (about one - third of the globe's size). Since the magnetic intensity at the surface is a dilution of the internal magnet, discussion should be focussed on the latter. Our estimates yield a magnetic intensity close to ten times the surface value at the source. The decay of this magnet over the past few millennia is of interest, for, adapting the decay calculated by Barnes, we obtain the data in Table 4.

If no quantavolutions had occurred, the above extrapolations would predict that seven millennia ago, the Earth's magnetization was thirty-two times it present strength. In the same era, then, the heating of the core should have been 32 squared, or 1 024 times the 1970 value. Under this enhanced decay, the core would be heated by one degree in 226 days. This heavy heating could warm the iron in the core above its Curie temperature in five centuries were it to continue undiminished. Since several celestially-induced saltations punctuate this interval, it is unlikely that the magnetic decay can be extrapolated meaningfully back through the interval. Even if it could, the Earth core would still remain safely cool since the liberated heat is not all retained in the core; it flows outward towards the surface; and on its way it encounters over thirty times the volume of material of its region of genesis. The surrounding mantle material requires up to twice the energy per kilogram to heat as it does the metal-rich core. Thus the heat is easily dissipated providing the Earth-magnet is not allowed to grow further into the past and, indeed, this it need not do, for during its stay in the magnetic tube the current did not decay and its energy output was benignly dissipated.

TABLE 4

CALCULATED UNDISTURBED DECAY OF THE EARTH'S MAGNETIZATION
(using Barnes' Decay Model)

Date (Astronomical years)	**Magnetic Field** (in => milliteslas) **Intensity**	
	at surface	**within core**
+ 1970	0.062	0.61
+570	0.124	1.22
-830	0.248	2.44
-2230	0.496	4.87
-3630	0.992	9.74
-5030	1.98	19.5
-6430	3.97	39.0

Reckoning in astronomical years. AD years are designated with a+, BC years are lessened numerically by one year and have a - preceding them. (e.g.: 1 BC = 0.; 3 BC = -2)

Electricity probably played an important role in cooling the Earth's interior in the days of great magnetization. Evidence abounds that, under electrified conditions, heat flow and heat dissipation patterns are altered over those noted in the absence of electrical flow (see Asakawa). Earth currents persist to this day; we have no reason to believe that they were less strong in the past. Their role in shaping and maintaining a habitable globe cannot be overemphasized.

We do not know the maximum magnetization during Earth's stay in the tube, nor its level when the tube collapsed, releasing the field to free decay. The level of magnetism induced in a magnetizable material depends upon the purity of the material, the temperature, and the strength of the inducing field. The Earth's core is unlikely to be a pure magnetic alloy, hence its magnetization in the tube would not have to reflect more than a small fraction of the full strength of the inducing field. On

leaving the tube the core need not have been magnetized to any level that would pose a problem in thermal dissipation, whatever the model employed for the heat flow that began as the magnet waned [60].

Given a half-life for magnetic decay of the order of 1 400 years, it is reasonable to conclude that all existing magnetization of surface rocks must be very recent. A rock magnetized to one microtesla (about the strongest value noted) would decay to the limit of detectability (one nanotesla) in ten half-lives. If rock magnetism decays at least as rapidly as does the Earth's field, fourteen thousand years would erase all magnetic imprints from the rocks! Not only must the rock magnetism be very recent, but also most of it has probably resulted from electro-thermal events of cosmic origin.

The presence of magnetism throughout the Earth's domain cannot be denied, despite difficulties in explaining its generation and variation when using models which maintain that the Earth is not an electrically charged body. Those who have studied the electrical currents associated with the body of the Earth and the higher atmosphere above the Earth, and those who have studied the electrical flow from the atmosphere to the ground and its variation, might well have concluded that the Earth is most easily understood as an electrically charged body. That they have not so concluded is significant. From the earliest modern experiments in electricity the evidence of an electric Earth has loomed closely under the printed pages of explanations. Many investigators perceived the answer but were discouraged by their inability to offer proof of their suspicions (for example, Sanford, p105, pp72ff). Our assertion that the Earth is a body that carries a net surplus of electrons is paramount in understanding its properties [61].

In the beginning the Earth was far from electrical equilibrium with the plenum of the young Solaria Binaria. Consequently the accumulating Earth material transacted strongly with its surroundings. The Earth probably glowed visibly as it formed and for a time thereafter.

At an early date this visible Earth-glow was extinguished and the Earth became the dark planetary body that it is today. An electrical current of 1800 amperes still flows from space to the

Earth. This continuing electrical transaction partially decreases the Earth's charge by 3.5 X 10^{29} electrons per year. This altered charge represents a flux that is ten times that ascribed to the Earth-magnet in the core. The Earth-air current density is 3.5 microamperes per square kilometer of surface. There is evidence of a possible electric connection between the Earth and the Sun; this circuit drives, in part, the Earth's weather cycles (Webb, Cole).

The energy liberated by the Earth-current is in addition to that from the influx of sunlight. Its power has yet to be determined and its significance is mainly unexplored. Nevertheless several phenomena are recorded indicating the Earth's electrical state. An electrical gradient exists, increasing the electrical potential maximally near the ground by a few hundred volts per meter of upward displacement (Chalmers). Higher, the gradient declines, producing a maximum potential difference of 300 000 volts between the ground and the atmosphere at an altitude of twenty kilometers. The direction of this gradient is consistent with the notion of a negatively charged Earth in a slightly less negative environment [62]. So the => *troposphere* forms an electrical sheath joining the ionospheric plasma to the charged Earth.

Above, in the => *ionosphere*, strong electrical flows are documented with maximum currents of the order of 90 000 amperes. These flows occur in a plasmasphere analogous in form but not in behavior to the Sun's photosphere.

Farther up, another electrical sheath, a => *double layer*, exists which joins the plasmasphere below to the solar wind above. This sheath, at the so-called *magnetopause*, has produced phenomena that have defied explanation (Kelley) because electric neutrality is demanded of the Earth. The double layered sheath, like the chromosphere-corona of the Sun, is the gatekeeper for the systems. It admits and accelerates incoming electrons, while it repels or retards incoming ions. From the Earth-side it prevents electrons from escaping and facilitates the outflow of ions.

On occasion, solar outbursts flood the double layer, diminishing its effectiveness (Hartline) and suddenly altering for a time the Earth's charge level. This produces a saltation in the length of

the day, that elsewhere has been called a “glitch” (Danjon; Challinor; Gribbin and Plagemann, 1973). In the weeks that follow, the Earth regains its charge balance and the rotation corrects itself. Rotational saltations are explainable in terms of a charge exchange between the Earth and the surrounding interplanetary plasma.

Inasmuch as in the past the Earth was farther from equilibrium with its surroundings than it is now, electrical readjustment was more spectacular than the small electrical transaction noted today. As the Earth came into balance it would appear to an Earth bound observer that the Earth’s electrical charge was decreasing with time, whereas in fact the opposite is more correct. The Earth is gaining charge continuously. In line with the electrical explanation for rotational saltations, the deceleration of the Earth’s rotation is explicable as a charge increase with time.

We maintain that its continuous charging and the interruptions determine the Earth’s very geophysical integrity thereto. There are links between volcanism and climatic change, and tidal phenomena are linked with both of the former and with seismicity (Roosen *et al.*). It is suspected that an extraterrestrial trigger is responsible for these correspondences (Rampino *et al.*, p828, Johnston and Mauk, pp266-7). That trigger is intimately related to variable rates of charge accumulation by the Earth. These variations have been in the past responsible for drastic quantavolution of the Earth’s surface.

There is mounting evidence that even the biosphere is shaped in consonance with the Earth’s electric and magnetic state. Discussion of this subject need not be further postponed.

Notes on Chapter 8

53 The unit of magnetic field intensity is the tesla. Such an intensity is very strong, comparable to the largest magnetic intensity noted in the cosmos. One tesla represents one hundred million magnetic lines of force passing through each square meter of the magnetized surface. The nanotesla is one-billionth (USA) as strong and represents the weakest detectable magnetic intensity.

54 As were all planets then in the tube, meteorites are generally found to be magnetized (Levy). The cases of other bodies will be treated later.

55 This rotation would have the same period as the Earth's revolutional motion about the electrical axis. The poles of rotation would lie parallel to the arc.

56 This is the south pole of the internal magnet. It attracts the north pole of a compass.

57 The north dip pole is located between Bathhurst Island and Prince of Wales Island in the Canadian Arctic (260° E, 74° N). Its motion is complex but reasonably well documented since 1950 (Dawson and Dalgetty) with some data over the past millennium (Yukutake).

58 It is known that molten rock will be imprinted if it solidifies, and then cools to its => *Curie temperature* in the presence of a magnetic field.

59 On similar grounds, cosmogonists have rejected the possibility that the Earth's core contains its share of the radioactive elements posited as the Earth's cosmic allotment.

60 The Earth's rotational spin-loss, ascribed to tidal friction, liberates forty-two million times the energy presently lost by the magnetic field. The Earth has not boiled from the tides (compare with Darwin, 1879).

61 We remind the reader that this electron surplus is relative to the Earth's material itself: relative to the cosmos the Earth is

an electron-deficient body, while relative to its immediate surroundings the Earth is close to, but not quite at electrical equilibrium, as we shall note below.

62 Such an arrangement of charges is seen elsewhere; it may be a means of shielding the Earth’s electron complement from a voracious Sun (see Technical Note B).

CHAPTER NINE

RADIANT GENESIS

The physical history of Solaria Binaria may be divided into three major periods according to the intensity of quantavolution occurring: a primary period of violent changes and rapid development, extending perhaps to a quarter of a million years; a secondary period of relative balance among the elements within the system, extending almost to the present; and a shorter tertiary period of system breakdown, when Super Uranus, the planets, the sac and plenum, and the electrical arc with its magnetic tube underwent abrupt transformations.

A biosphere was generated during the primary period and produced its main forms. That is, there was first a time of radiant genesis, a proto-zoic stage, followed by a time of the escalation of basic biological types, a palaeo-zoic stage. Then occurs a meso-zoic period of formal and ambient stability, which coincides with the secondary period of relative balance in physical history. These are the subjects of the present chapter. The Cenozoic, which we redefine as a period of explosive quantavolution, corresponding to the period of system breakdown, is the subject of Chapter Twelve; there the origins of human nature will be discussed (see also Table 6).

The prevailing theory among scientists conjectures that a sequence of chance chemical combinations occurring over time produces the “self-replicating molecule” deoxyribonucleic acid (DNA). For the moment we pursue this idea of chance chemical combinations.

In Solaria Binaria, the sac is the vat of chemical evolution. Its gases are hydrogen-rich but contain, by inheritance from the body of Super Sun, all simple ingredients found in life forms. The energy sources which catalyze the process are ultraviolet radiation, electric discharges (lightning bolts), and ionizing particles (from cosmic rays or radioactivity). Using a variety of

gaseous mixtures, energy sources and temperatures, experimenters have been successful in producing a multitude of prebiotic compounds in short times [63]. The ultimate step, the creation of life, has not been reproduced in the laboratory ! Presently, experimenters are searching vigorously for some means of reproducing the “reproducer” -- DNA -- in the laboratory.

The composition of the plenum gases varied significantly over time, though for a long time the gas density remained fairly constant. Once Solaria Binaria came into existence, electrical forces produced => electrophoresis among the electrified atoms throughout the system; in electrified gas mixtures the components apportion themselves within the mixture in relation to their ionization potentials. “The component with the lowest ionization potential becomes more concentrated at the => *cathode*, that with highest ionization potential at the => *anode* “ (Francis, pp195ff). The rate at which separation of the constituents occurs depends upon the => *mobility* of the ions. The mobility of an ion is of the order of one to ten centimeters per second for each volt per centimeter of electrical field (at standard atmospheric temperature and pressure -- S.T.P.). At constant temperature the product of ion mobility and pressure is approximately constant (Papoular, p94).

The least => *massive ions* are the most mobile and so they will migrate soonest ; the heavier ions will take longer to separate. In Solaria Binaria only a partial separation was effected, but this was sufficient to contribute to the anomalously low abundance of lithium, beryllium and boron noted in the solar spectrum (Ross and Aller).

The effect of the discharge was to reapportion the plenum gas mixture, changing the local percentage of hydrogen relative to the heavier atoms. This would effect greater efficiency in producing organic compounds in certain regions within the plenum (Dayhoff *et al.*, p1462).

After the nova (see behind to Chapter Four) the plenum occupied a large volume; it was honeycombed with variously electrified domains producing a state of great electrical disequilibrium. Held together by pervasive cosmic electrical pressure, the gases of the plenum assumed the smallest volume

consistent with their charge density. In reaction to the nova, electric flow within the plenum worked to equalize charge densities within the sac, while maintaining an outward radial gradient of increasing charge density in concession to the external demand from the continuing cosmic transaction.

The result was an initial implosion of the sac, as charges were redistributed, superposed upon a much slower expansion of both the sac and the rest of the system as galactic charge accumulated. Consequently, over most of their history, the Earth and the other primitive planets were immersed in a dense plenum of gases which was opaque to radiation; this gas was at least as dense as the present atmosphere at the Earth's surface.

The nutritive soup from which living forms emerged was not wholly the primitive vapors of Earth (conventionally the oceans and atmosphere) but the total surface of the planets and the volume of the sac. Appropriate temperatures were available in most of this volume within thousands of years of the nova of Super Sun. Various organisms can survive temperatures well above the Earth's present temperature. Fish, fly larvae, and aquatic metazoans survive in hot springs where temperatures approach 320 K (Dicke, 1964, pp119ff; Wickstrom and Castenholz). Live bacteria have been discovered in an oil well where temperatures approached the boiling point of water (Dicke, 1964). Thus it is argued that the Earth could have had a much warmer climate in ages past when life arose. Urey concludes that temperatures have been below 425 K since the Earth's crust separated (Miller and Urey). Fox (1960, p203, p206, 1970), maintains that certain chemical processes preceding the genesis of life were accomplished by heat. He now considers the debate over past temperatures irrelevant since the critical processes can occur at temperatures well below 425 K.

If we consider only that portion of the plenum which enveloped the planetary region (a cylinder 35 gigameters long by 100 megameters diameter) we have a reactor volume which is sixty million times the combined volume of the Earth's atmosphere and oceans, in which life otherwise is believed to have been generated. The energy source for the plenum was the electric arc. The early arc may have liberated about 10^{23} watts to the

plenum, compared with 3 X 10^{13} watts received as ultraviolet radiation by the Earth's atmosphere [64], or with 3 X 10^{11} watts received as lightning discharges (see Chalmers for data).

If Solaria's plenum at the edge of the central flow zone is compared with the outer surface of the Earth's atmosphere with regard to energy density, Solaria's plenum will have had an advantage by a factor of 500 000.

At the other extreme, if the energy is spread throughout the entire volume of both reactors, the advantage in energy density still is with Solaria fifty-fold.

If the time taken to generate life in an energized primitive environment depends primarily upon the rate at which the primitive gases can be excited to produce chemical changes, then life ought to have been generated within the plenum after a time somewhere between two thousand and two hundred million years! [65]

Should the initial photolysis not be the rate-controlling step, then the immense volume factor greatly favors a more rapid biosynthesis in the plenum than supposedly occurred in the Earth's atmosphere and oceans aeons ago. Furthermore, a highly electric environment may speed up generation time, and therefore the intergenerational opportunities for mutation. As we see it, the plenum was an ideal reactor in which living systems could be synthesized and sustained [66].

Evidence that the generative environment was highly magnetic can be inferred from the sensitivity of many living organisms to magnetism. Both animal and plant life respond to strong magnetic fields (above 100 milliteslas), showing modified growth or behavior (Kolin, pp40ff). Magnetic fields more closely approximating the Earth's field today have also been used to stimulate organisms. In some instances the magnetic field seemingly applied directional clues (Barnwell and Brown, p275, p277, Pittman).

Where steady magnetism, regardless of strength, seems to be beneficial (Hays), magnetic variability seems to induce pathological effects, even in modern humans; coronary arrest

correlates strongly with extended intervals of disturbed magnetism (Malin), psychiatric hospital admissions correlate less strongly (Friedman *et al.*). Sudden biological extinction has been linked to periods of magnetic confusion in the paleontological record (Whyte, p681). Such periods, in our view, would be more likely produced by cosmic large body encounters that would inject magnetic disturbances along with other disastrous effects upon the biosphere.

To summarize, in regard to the time available for the origin and development of species, the Solaria (SB) model is 2000 times less "effective" than the Evolutionary (E) model. With respect to the volume of the life-generating region, the SB model is six million times more effective. Considering the energy density, SB is five hundred thousand times more effective following the establishment of the binary arc. Actually, before its establishment, the nova phase, lasting for months, would have organized the Solaria Binaria system to the equivalent stage of two billion years (2 aeons) of conventionally ascribed Earth history. Hence the SB model, assessing energy density, would well exceed by a millionfold the E model. Since mutagens work upon mutable forms, and branching of species is an exponential concept, the effectiveness of Solaria Binaria in quantavoluting life is multiplied again by the volume of the life-generating region. So, even on a short time schedule, Solaria Binaria appears to be millions of times more capable of producing the species of today.

Still, even this might not be enough to originate and develop the species. The first stages of life are of such low probability, and the alter stages of higher but still low probability, that a "guiding factor in life development " must yet be sought. For example, an average protein is formed of a chain of about one hundred amino acids. To quote a creationist: "If all the stars in the Universe had ten earths, and if all of the earths had oceans of 'amino-acid soup', and if all the amino-acids linked up (randomly) in chains 100 acids long every second for the entire history of the Universe, even then the chance occurrence of a given very simple protein [10^{-130}] would be inconceivably remote" (Stengler, p16) [67]. And the building of a protein is only one of many complex arrangements adding up to life as we know it [68].

The model of Solaria Binaria might only serve to supersede conventional theory of the evolutionary process, and not to discount it and provide an alternative positive theory, were it not for its electrical features. Life begins by microscopically mimicking its gigantic progenitor, the sac. It has no choice. Every atom, in endeavoring to hold its electrons or gain others, seeks to surround itself with the smallest and densest complete electrical perimeter possible. This is usually an octet of electrons. Whenever necessary, atoms aggregate into molecules where a compromise sharing of electrons will lead to a higher density electrical perimeter [69]. From here the molecules proceed to more complicated systems that ultimately come alive.

The concept of life therefore is an extension of the concept of the "cavity" with which our book began. Life is a way of gaining, hoarding, and begrudgingly doling out electricity. In countless numbers organic molecules determinedly build themselves micro-sacs of chemicals in reaction to electric gradients, capture raw materials, manufacture compounds within the sacs, fire themselves with ever accumulating electric charge, until, incapable of continuing this process without bursting their sacs, they force out unused parts. Usually these are excreta. In critical cases, they are replications of themselves -- if not exactly so, then in fundamentally similar ways. No cell divides itself in mirror like fashion, uniformly, in the beginning. But every deviant is a candidate for the first exact mitosis.

The step from excreta to exact reproduction is critical. The sac of organic electrical activity is not "intelligent" except by human prejudices, *ex post facto*. But the sac can most efficiently -- effectively and reliably -- excrete if it separates its ingredients on the binary principle of "one for you and one for me". Least change, least imbalance, and therefore longer life ensure if the sac polarizes uniformly prior to excretion, setting half of its contents opposite the other half and splitting itself down the middle, closing the gap at the instant of its division. Excretion becomes reproduction.

Sacs that thus form cells which divide offer more chances of survival and conquest of space by numbers than sacs that either hold their accretions until they burst or bifurcate inequitably

from an electrical standpoint, thereupon having to internally reorganize their electrical accommodation upon every mitosis. One notes the terrific speed with which life can develop and reproduce under rules of uniform mitosis. Within a few thousand years the plenum might be filled with such cells. Indeed, perhaps large areas were filled with them.

One is not permitted logically to adjudge life as superior to rocks, which have their own form of durability. The biosphere today is a tiny fraction of the rock masses and space of the Universe. As an offshoot of universal change it has a special interest and importance in the perspective of the human mind. Life has a special mode of material extension which, after all, could fill the Universe promptly under proper conditions, and this is a constant challenge to the entropic concept of the Universe [70].

Life's arrangement of electrical signals is perhaps its chief embedded characteristic. "Electrical potentials occur in all cells studies thus far, although their biological importance is recognized in only a few cases" ("Cell and Cell Division", *Ency. Brit.*, 1974, Macro. vol. 3, p. 1050). The surface of cells is negatively charged. The cell membranes are 6 to 10 nanometers thick and are highly resistant electrically (from 1,000 to 10,000 ohm/cm^2). They produce voltage gradients which drive the biological functions (as noted ahead) and produce a cell interior that is more highly negatively charged than the surface layer of the cell. That cells are so electrically arranged is understandable when one considers charged cells in a charged universe. In metaphorical language, the overall picture of the cell, and the image of the primordial cell, then, is one in which a peculiar combination of chemical compounds survives by erecting an electrical screen to admit nutrients and to repel destructive invaders, then organize its internal components to sustain itself and to resist random escape from the community.

Several varieties of cell growth and transformation are observable. The "main" type of self-duplication ensues as a permissible, organized, collective escape, or excretion, providing for the maintenance of a complete defense system. Cell division would operate by an electrical signal system. The members are an

electric grid (as in a vacuum tube), and acts as a gatekeeper among the elements in and surrounding the cell and during mitosis.

Cells make macro-molecules, including genetic molecules, which do not exist elsewhere in nature and are not allowed exit through the cell membrane. Inasmuch as macro-molecules are concentrators of electricity, this synthesis permits the cell to sustain longer than otherwise would be possible its quest for additional electrical charge. The cell thus builds a higher concentration of charge than is available elsewhere in the plenum mixture. This process is the essence of metabolism.

Metabolism concentrates electricity in the macro-molecules, thus depleting of its nutrients the medium trapped in the cell. (The analogies of cell as sac and of nutritive medium as plenum are close and possible homologous.) The cell responds by excretion of water, ions and gases (by-products) and ingestion of electron-rich nutrients.

Strain is imposed upon the cell membrane, for it must both contain the increased material and at the same time defend the cell against penetration by electron-deficient atoms and molecules. The membrane signals the cell nucleus concerning an imminent site of charge deficiency and leaking. Then the genetic macro-molecules of the cell, which are the only ones capable of dividing themselves more or less equally, and have been so doing since their last episode of cell division, respond to the signal of impending disaster by completing their synthesis, and by lining up on the two sides of a perimeter membrane that is being electrically trenched through the nucleus at the future site of fission. Actually, the division line-up is provoked by an electric polarization of opposed centrioles, each representing a focus of peak negative charge on the edge of the nucleus.

Midway between the two centrioles, the newly forming perimeter constitutes an electron-poor trench. Following the genetic molecules, the other materials of the cell are drawn electrically to flow in equal amounts to either side of the perimeter-to-be, pursuing the two centrioles. By contrast the cellular material that is to constitute the cell wall itself flows into the trench from both sides. Thus, without breeching its old perimeter membrane, the cell has doubled its surface and has

divided. Electrical forces move the two new cells apart. Never are two cell membrane in contact even in a densely packed tissue. Some 15-20 nanometers of intercellular space, filled with a sugary fluid, separate them.

From the self-reproducing cell to the hominid of a few thousand years ago requires passing by many landmarks in the organization of life.

Close to the solar nova and birth of Solaria Binaria at the beginning of the Period of Radiant Genesis, one may position groups of critical developments: the provision from solar debris of chemicals and transmutations in the plenum; and pre-biotic organic molecules (amino acids, sugars, nitrogen bases, plus other compounds).

Cell membranes, left-handed symmetry of organic macro-molecules [71], proto-enzymes, porphyrins and => *nucleotides* -- these developments would readily follow. The cell probably took in the latter three constituents after proto-proteins had been formed independently in the plenum. Some cells, instead of dying, began to engage in mitosis, whereupon self-duplication, as described here, would soon follow.

Large cells would ingest small cells, or form around them, per-forming two types of action: digestion, the beginning of animal behavior [72], with the breakdown of the electrical defenses of the smaller cells, and in other cases the formation of cell colonies using the membrane of the host cell as a super-membrane or skin of the smaller internal cell or cells. Large cell colonies would float in the magnetic tube and, later on, settle upon solid bodies.

From the development of the cell, the mode of basic change in life forms ever thereafter can be surmised. Time after time it happens that some portion of the excreta of the organism is retained within the sac of the colony and supplied with the coded electrical signals that connect with the master genetic material so that its descendant in the next generation can draw upon its experience and existence. The developing special organ excretes within the organism and returns signals to make demands, denote satiety and share directiveness in the behavior of the full organism.

For example, the eye is always close to the mouth. The photo-receptive organ that perceives food chances is close to the sac opening that can employ opportunities for ingestion. The organism as a whole is, as it always has been, ready and eager to accept charge-bearing contributors which allow it to increase its density. (It rejects cations for this reason). It permits and then becomes dependent upon the vision, with the genetic material duly recording and perforce returning in the form of instructions the interrelated, combined signals of the eye-mouth.

The genes do not "know" that they are building an eye to go with the mouth; nevertheless, they do so with despatch, as they eagerly accept extensions of all such special organs in the Period of Radiant Genesis; for the environment has a plenitude of electron-rich chemicals, a state of affairs that does not persist beyond the first half-million years of Solaria Binaria. In more modern times, the cell (and hence the organism as a whole) is more hard-pressed to find energy-rich molecules and in the very stress to obtain nutrients it has bureaucratized itself so to speak, and is hence even less equipped to obtain them. In the modern electrified environment, vital processes take much longer.

The plenum of Solaria Binaria was the creator, cradle, and mutagen of life. The broad sculptures of plants and animals were completed during the first half of its existence. If fossils represent the basic variety of life, the phyla and the orders came into being then. No new general forms have originated in recent times (Brough). Despite great waves of extinction, slightly over one million living species are named today. The fossil record should show millions of ancestral species to provide the present number, but in fact shows only about one hundred thousand species. This contrast has excited comment: why were large changes peculiar to early existence; why were small changes more common in recent times (*ibid*.)?

Set up in this manner, the questions seem to accept answers from Solaria Binaria theory. The plenum promoted creation initially, as would be expected, promoted it less when the binary was stabilized, and became quite destructive and conservative as it exponentially decayed and collapsed.

The agents of these change may be identified. The first period provided an immense number of prototypes and access to abundant nutrients, so testing their viability (Ayala). The second period provided a stable environment of abundant nutrients but an end to the easy method of forming combinations. Further, the more distinctive and specialized the species, the less likely its electrical transformation would eventuate in new designs of life.

In the final period, environmental disasters extinguished many species, but also promoted very many, already genetically deviant individuals to the status of families, genera and species.

To acknowledge that a great many of these lesser, less creative designs have emerged in the later history of Solaria Binaria requires a theory of genetic realization. The genetic material can carry far more instructions for the construction and behavior of any organism than are required at any given time (Ayala). Under lower (but higher than present) solar system quantavolutionary conditions, suppressed instructions can be triggered. It is conceivable that every living species carries in its genetic code instructions for metamorphosis (monsterism). Cosmic rays, nuclear explosions, radiation fall-out meteoroids, electromagnetic typhoons, encounters of Earth with large bodies (comet, meteoroid), viral epidemics, and “silent” significant changes in electrical discharges within Solaria Binaria and the Solar System may be the means of suddenly extinguishing some genetic instructions and releasing others, quantavoluting a species into a similar but substantially modified species that is altered anatomically, physiologically and behaviorally.

Success has not attended the search for transitional forms that bridge the “gap” of development from one species to another under conventional Darwinian theory. It may be maintained that transitional forms, such as reptiles with half developed wings or hominids that spoke but poorly, never existed (Rodabaugh, p119). All orders of mammals appear with their “basic ordinal characters” (Simpson, 1944, p106). Many of the plant species, it is believed, are replicas of other species (=> *polyploids*), differing almost entirely in size alone, with the physiology and behavior appropriate to giantism and dwarfism [73]. That the horse, a favorite instance of evolution since Lyell, has evolved

its peculiar configuration by means other than genetic realization seems unlikely. The millions of years authorized to complete this series of changes (among others) are unnecessary and probably even insufficient unless supported by a theory of genetic realization, a position that has forced its way into contemporary evolutionary thought to evade the constraints of ever greater stretches of time and of evolution by random mutation under uniform Solar system conditions.

The problems of explanation that remain are historical and technical, inasmuch as a common electrical process is followed in all biological changes. The applications of the process -- to change marine animals into amphibians, reptilian types into mammals, one animal into another with all the anatomical, physiological and behavioral changes involved -- occur according to a simple set of principles. Nor are these adaptation, nor survival of the fittest, nor random successful experimentation with mutations, all of which are minor aspects of quantavolutionary change. Rather, electrical claims are provoked by opportunities, encounters and transactions, and organize themselves into genetic storage and release.

Evidence from the surface of the smaller remaining planets shows total devastation and almost total loss of atmosphere. On Mars, where some atmosphere remains, no biological residues survived (Horowitz, p55). The Martian surface was found to be so deficient in organic material that a mechanism for their removal is being sought. The inner Solar System is now sterile, excepting Earth’s biosphere, which thrives.

A final short period follows the period of evolution; it is an epoch of explosive quantavolution that comes down to the present. It witnesses catastrophes of life forms, quantavolution through genetic realization, and the rise of *Homo sapiens*. On the physical side, it carries the record of the destruction of Solaria Binaria and the advent of the Solar System. Though short, this period contains the full human experience. Its story forms the second part of this book.

Notes on Chapter 9

63 The work of Stanley L. Miller and Cyril Ponnamperuma stands out.

64 Miller and Urey cite this value for radiation capable of modifying the primitive gas. The more complex molecules produced after the initial photolysis are more easily excited and are affected by lower energy radiation, which is present in greater amount.

65 Presuming that the same processes took one gigayear in the primitive environment of Earth, as is postulated by currently accepted theories.

66 Recently a series of papers in *Nature* and elsewhere, also the book *Lifecloud*, authored by Hoyle, Wickramasinghe, N.C. and others, has considered the possibility of life, now on Earth, having originated from simple molecules, which populate the cold interstellar gas clouds.

67 Insertions ours, taken elsewhere from Stengler's paper.

68 The variety of propagating forms in the plenum probably extended beyond the mainstream of life. Groups of biological polymers separate spontaneously into coacervatives, small droplets of diameters to 500 micrometers. Where they can metabolize, coacervatives are stable, and can grow and divide. These active droplets are regarded as analogues, not ancestors, of cells (Dickerson).

69 Molecules often assume distorted shapes to achieve this compromise. If a spherical arrangement is possible, it is preferred to all others.

70 The Universe is supposedly increasing its entropy with time, that is to say, the parts of the Universe become even more disordered. Living systems represent increased order because of their internal organization.

71 The origin of one-handed symmetry was probably in the magnetic field (see Edwards *et al.*). Committed to spiralling into right-handed helices, the DNA molecule and all of the molecules with which it transacts profit from the design, for

they thus attain denser molecular packing, producing greater electric stability. The tightest-packed helix is the alpha right-handed (screw) helix - here each turn of the coil incorporates 3.6 to 3.7 amino-acid units. This form of the helix has no open spaces in the center; further, all amino-acid structures are exposed on the surface of the helix (Mazur and Harrow).

72 We see certain bacterial and plant behavior in photosynthesis as a concurrent development, supplementing an animal diet with the capturing of a chlorophyll (pigment) molecule, precursor of the protein, which was useful in the internal manufacture of foodstuff.

73 One-quarter of the flowering plants may be polyploid species. Some vertebrates are polyploids as well (Tinkle).

Click here to view
the next section of this document.