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 focused 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).

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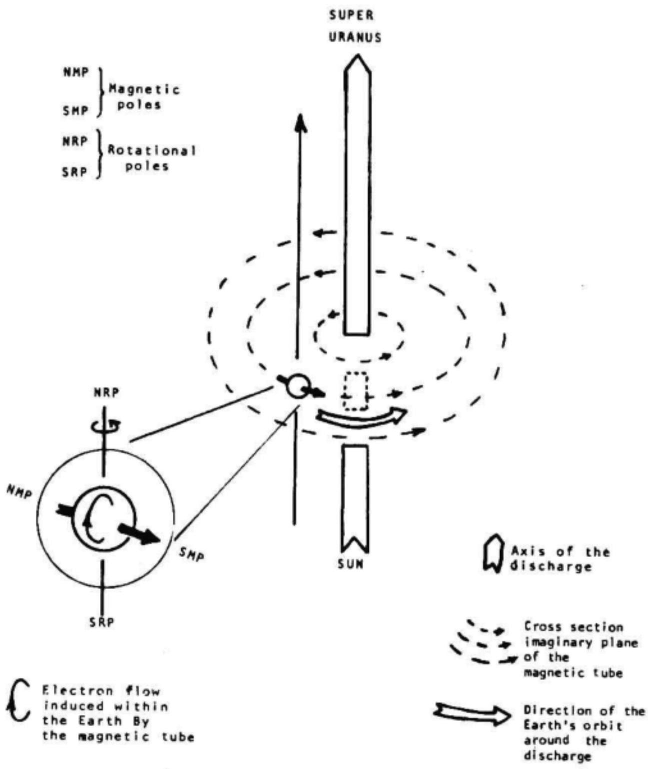
[53] The unit of magnetic field intensity is the tesla. Such an intensity is very strong, comparable to the largest magnetic intensity noted in the cosmos. One tesla represents one hundred million magnetic lines of force passing through each square meter of the magnetized surface. The nanotesla is one-billionth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

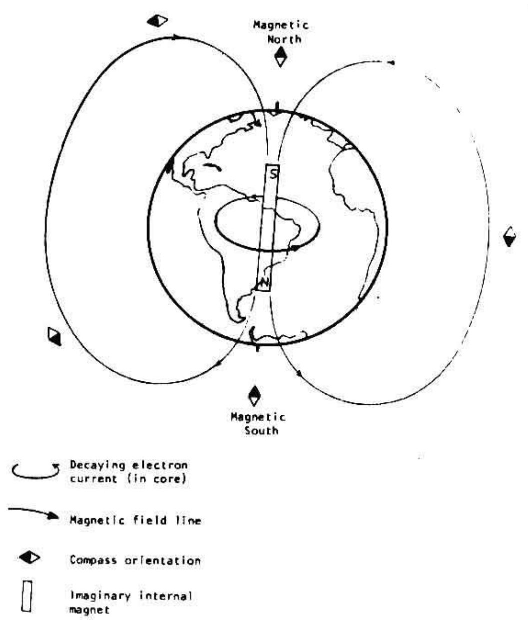
Figure 18
The Earth in the Magnetic Tube



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



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, p. 217). The present dip pole in the northern hemisphere[57] drifts westward by more than five

[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

kilometers per year (Vestine, p.90). 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, p. 214). 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

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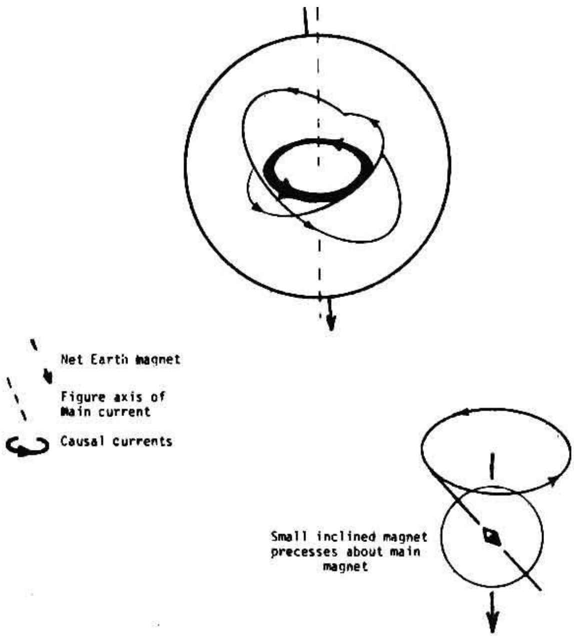
and Dalgetty) with some data over the past millennium (Yukutake).

[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.

scale (de Grazia, 1981, 1983a; Juergens, 1974, 1974/5; Velikovsky, 1950, pp. 85ff), including meteoroid impacts (Dachille, 1978) and encounters.

Figure 20
Magnetic Transactions Within the Earth.



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 (Mil-som, 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, p. 244).

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, p. 282), 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

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[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.

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.

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

Table 4
CALCULATED UNDISTURBED DECAY OF THE EARTH'S MAGNETIZATION

(using Barnes' Decay Model)

	Date (Astronomical Years) at surface	**Magnetic Field Intensity (in => milliteslas) 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)

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]

[60] The Earth's rotational spin-loss, ascribed to tidal friction, liberates forty-two million times the energy

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, p. 105, pp. 72ff). 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 3.5×10^{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

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.

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

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[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).

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 the Earth's very geophysical integrity is determined by its continuous charging and the interruptions thereof. 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.