CHAPTER SEVEN

THE MAGNETIC TUBE AND THE PLANETARY ORBITS

The arc along the axis between the principals created a magnetic tube, which surrounded the discharging gases (see Figure 13).

A magnetic field surrounded the electrical axis and extended outward to infinity [46]. The magnetic surfaces are here represented by lines, which by their increasing thinness indicate progressively weaker magnetic fields; see Figure 14. The strength of the magnetic field at a given distance from the axis depends only upon the magnitude of the electrical current flowing between the principals.

The ability of the magnetic field to constrain the motions within a gas depends upon the presence of electrified atoms. Whenever the energy density of the magnetic field at a given location exceeds the energy density of the gas [47], the field can influence the flow of the gas and thus delineates the boundary of the magnetic tube. As noted earlier (Chapter 5) the presence of even a small fraction of an electrified gas can be sufficient to trap the neutral gases.

The electric current is mainly ions moving from the Sun to Super Uranus. It would be a negligible fraction of the total gas flowing between the two stars. Most of the electrical current was confined to small channels within the region of the flowing gas. Gas continually left the Sun and entered the plenum.

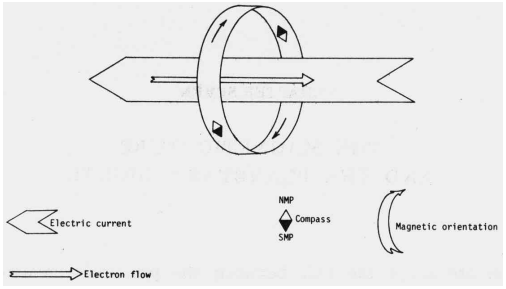

Figure 13. Magnetic Field Associated with an Electrical Flow
(Click on the picture to view an enlarged version. Caution: Image files are large.)

An electric current is always encircled by a magnetic field. By convention the direction of the electric current is opposite to the motion of the electrons contained in that current. For a moving electron the magnetic field is directed such that, if the election flow follows the thumb of the *left hand*, the north magnetic pole of the magnetic field created by the electron flow is orientated around the motion in the direction of the curled left fingers.

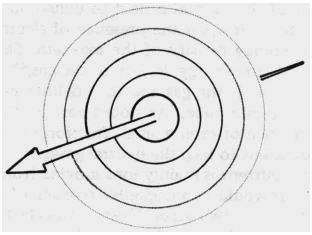

Figure 14. Decreasing Magnetic Field Strengths Surrounding Central Current at Increasing Distances (Click on the picture to view an enlarged version. Caution: Image files are large.)

The magnetic field created by an electrical flow is oriented in the plane perpendicular to the direction of the electric current. The intensity of the magnetic field depends upon the magnitude of the current and inversely upon the distance from the current to the place where the intensity is being monitored. The further one is from a given current the weaker the detected magnetic intensity.

Most of this gas followed the electrical arc through the plenum (Alfvén, pp433-435). At Super Uranus the flow impinged upon a small area of the facing hemisphere. It is difficult to make direct observations of gas exchange within binary star systems, but some have been made. Batten (1973a, p2, p5) reports a typical value of 450 kilometers per second for the velocity of

flowing gas. Using his value, we estimate that in the Age of Urania the flow may have amounted to about one-thousandth of the number of molecules in the plenum, or one hundred-millionth of the solar material per year.

In the region where the discharge passes, the gas would be hottest and hence of slightly lower density than that of the surrounding region. Moving outwards, the gas would become progressively cooler. If no other factors influenced the gas, we would expect to find gas density increasing in successively cooler layers. However, since the magnetic field grows weaker moving outwards, the density of gas that is constrained also drops. Thus, the highest gas density would be found in the warm region surrounding the discharge. Here marked chemical changes within the gases of the plenum are expected.

Because the electric discharge took the form of a pulsating arc, electrified gases could move radially during the relaxation cycle of the discharge. Gases of lighter mass move more rapidly than heavier gases and thus migrate more readily. Those atoms whose electrons could be most easily stripped off also migrated. This migration, coupled with chemical processes, altered the mixture in the magnetic tube until the gases now commonly found in the planetary atmospheres dominated it.

Given, a 27-teraampere current flowing late in Solaria Binaria, the magnetic tube had the capacity to contain a gas density comparable to that of the Earth's present atmosphere (at surface level). The full plenum, at this same time, could have contained more than the equivalent of one hundred "Earth-masses" of gas and vapors [48].

In a magnetic field, electrified atoms are constrained and follow the magnetic field direction at each location. Motions along the field are unimpeded, but motions across the field produce forces that cause an electrified particle to revolve round the local magnetic field line [49]. Combinations of along and across motions produce a spiral path about a magnetic field line, as shown in Figure 15.

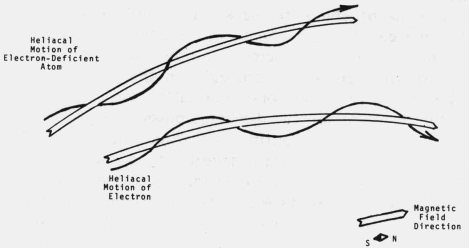

Figure 15. Motion of Drifting Charged Particle in a Magnetic Field(Click on the picture to view an enlarged version. Caution: Image files are large.)

An electrically charged particle moving in a magnetic field is subjected to a force acting perpendicular to both the direction of its motion and the direction of the magnetic field. The result is that charged particles move freely along a magnetic field. The motion of the charge becomes helical because the constraint forces the particle to circle around the magnetic field while the particle translates along the field. Electrons and ions spiral in opposite directions.

The circular magnetic field surrounding the axial electrical discharge was also responsible for the production of much electromagnetic radiation within the plenum. Radiation would be emitted as ions and electrons were forced to spiral around the curved magnetic field lines of the magnetic column. This radiation process is called *Bremsstrahlung*, or braking radiation [50]. It is emitted whenever charged particles are retarded (decelerated). By radiating, the particles lose energy to the surrounding gas. An enormous glowing gas cloud soon surrounded the arc-an => *afterglow*-like the great ion trails left by large meteors.

As they lose energy, the spiraling particles move with smaller and smaller radii around the magnetic field line. By emitting braking radiation, motion across the magnetic field is greatly reduced. Since motion along the magnetic field is unaffected by the presence of the field, it eventually dominates. Thus the gases surrounding the discharge tended to flow around the magnetic column.

The same radiation as described here is used by biologists to mutate rapidly growing species such as *Drosophila*, the common fruit fly. In Solaria Binaria, radiation was abundant precisely when needed to explain periods of great biological change.

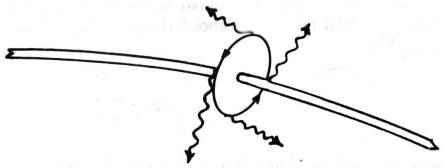

Figure 16. Braking Radiation Emitted by a Spiraling Electron
(Click on the picture to view an enlarged version. Caution: Image files are large.)

A charged particle experiencing a force accelerates; it gains or loses energy through the acceleration. When energy is liberated (because the accelerating particle is losing energy) it appears as electromagnetic waves emitted in a direction perpendicular to the charge's acceleration.

Earlier, we suggested that, in the outermost parts of the magnetic tube, material was revolving about the electric arc. This revolution began early in Solaria Binaria when the intercompanion current was greatest. The immense magnetism so generated was able to magnetize all of the contained and revolving material. Once magnetized, directed flow was assured (see Figure 13). Among this material were the electrically accreting primitive planets, also strongly magnetized. They revolved about the arc locked in direction by their magnetized structures.

As the binary extended, the arc weakened, in consequence of which the magnetism around the arc declined. With diminished magnetism, more and more material could exist in a non-magnetized state. Although this material had all been magnetized earlier, the magnetization would begin to decay as soon as the surroundings allowed it. The decay of magnetized Earth rocks has been documented by Nagata. There is probably a positive correlation between the ease of magnetization of a material and the duration of its remanence. So, as the magnetic tube weakened, the now orbiting bodies would lose their magnetism differentially depending upon their composition. As we will show later, Earth's decaying magnetism of today is a remnant of its stay in the magnetic tube.

Once in orbit about the arc the gases and solids (including the planets) of the plenum would retain their motions unless dis-

turbed. This leads us to conclude that, in addition to their binary "dumb-bell" orbit, the Earth and the other planets also initially orbited in a circle about the Sun-Super Uranus arc (Figure 17).

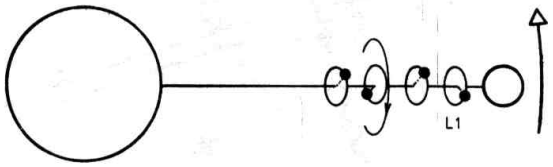

Figure 17. Primitive Planets in Orbit About the Electric Arc(Click on the picture to view an enlarged version. Caution: Image files are large.)

Over most of time the solar planets have orbited locked between the component stars of a binary. Their motion about the electrical connection between the stars resulted because the strong magnetic field generated by the electric arc kept the electrically charged planets in orbit around the arc. In a "gravitating" system only the Lagrangian point (labeled L1) allows a planet to co-revolve with the pair of stars, but for orbits under the influence of electrical force co-revolution is possible at many points along the electrified axis of the system.

Because of electric repulsion, we propose that the arcuate orbits of the primitive planets were situated somewhere in the vicinity of what is called the => *Lagrangian point* L1 for the Sun-Super Uranus binary system. Near this point co-rotation is expected as the dumb-bell rotates. In fact, even in today's Solar System, where the magnetic tube has collapsed, a Sun-Earth-satellite pair (ISEE 1 and 2) has been orbited at the L 1 point between the Sun and the Earth. In today's system, all the planets orbit with different times and the L 1 orbit is barely stable; but in Solaria Binaria, with a strong magnetic tube in place between the principals, L 1 would be a most likely haven for planetary bodies in the binary.

Since we propose the existence of more than one primitive planet, and since each is electrically charged, the planets would revolve about the arc staying as far from each other as the principals would allow. This, we feel, would crowd the four planets near the L 1 point.

The planetary orbits about the axis, like rings on a pole, would be substantially closer than today's concentric orbits. The planets would maximize their separation, subject to three constraints: repulsion by the principals, repulsion from the arc, and the need to follow the magnetic lines of the tube.

In consequence each planet orbited about the axis tending to expand or contract its orbit depending upon its charged state relative to the axis and its need to stay away from the other planets. Their speed and direction was dictated by the flow of magnetized material about the arc, despite their need to avoid one another. Given that the planets as a group occupied a limited region of the tube, they positioned themselves on their orbits so as to maintain the net maximum distance from the summated repulsion of all of the other orbiting planets. Perhaps the simplest, and at the same time adequate, response to the constraints would be for each planet to take a different azimuthal position [51] on its orbit in the magnetic tube.

In the opaque plenum, and because of their different revolutional phases, no planet could be observed from another planet. Even when the plenum was clearing, the planets so positioned would be difficult to discern. They may not have been perceived until the => *Age of Jovea*, when, freed from the tube, their dim radiance could be isolated against a darkened sky.

The magnetic tube, unlike the arc and the sac, was not directly observable, and so could not enter into human awareness, even in the final days of Solaria Binaria. Its presence, nevertheless, allowed later men to see the arc. Its grasp upon the gases amidst the revolving planets was instrumental in converting the energy moving away from the arc into a huge visible column of "flaming, twisting" light -- again a possible source of serpentine imagery in early symbolism.

The magnetic tube may have played a part in generating cosmic sounds. Archaic Greek philosophers, especially the Pythagoreans, employed the phrase "music of the spheres" to designate what has since been regarded as an unreal belief in celestial and planetary sound. That the violent forces within the tube would have emitted acoustical waves is unquestionable [52]. In the manner of => *whistling atmospherics*, as lately

studied (Hines, p816), such sound would be trapped by the magnetic field and propagated along the magnetic tube.

In the late times of the tube, when celestial bodies could be distinguished visually, the sound might have inspired the Pythagoreans to the invention of their sacred musical scale, which was also related to their sacred theory of numbers - both sound and numbers constituting theophanies. The sounds might first have been involved in the earliest sacred music. The magnetic tube worked its wonders by an invisible hand.

Notes on Chapter 7

46 A magnetic field only appears when relative motion exists within systems containing electric charges (Sherrerd).

47 The energy density of a gas depends upon the density of the gas => *particles* and upon their temperatures (average random motion), and upon their kinetic energy as they flow within the electric field.

48 The "mass" of the plenum depends upon the gas composition.

49 The authors understand that magnetic field lines are only a method of visualizing motion of charged particles being acted upon by magnetic fields and that they are not ingredients of the theories of electromagnetic interaction, but we feel that the use of field lines provides the reader with insight into the direction of the magnetic field around the electrical arc and into the motion that would occur as ions and electrons moved within the plenum.

50 *Bremsstrahlung* is observed from X-ray tubes, particle accelerators (synchrotrons), atomic beta decays, "supernova remnants" and cosmic X-ray sources.

51 Azimuthal angle is, here, a measure of the planet's progress around its orbit. Planets whose azimuthal angles differ would be said to have a revolutional phase shift (as in Figure 17).

52 Several expert observers, working at remote locations, report sound associated with intensive displays of the Aurora Borealis (Harang, Stomer).

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