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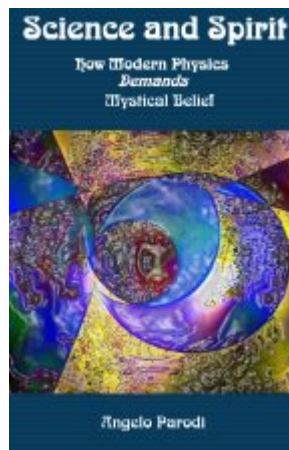
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Science And Spirit



By Angelo Parodi

Earth Changes

To some people, the notion of a connection between the planet and its inhabitants may seem no more than the ludicrous meanderings of new-age gurus, but in fact, there is sound scientific foundation for such assumptions. It's common knowledge that planets, the earth included, have magnetic fields associated with them, though fewer people may be aware of precisely how such fields are generated.



Figure 31

As shown in Figure 31, if an electric current (defined as a movement of electrons) is made to flow through a wire wrapped around a metal rod, the rod will exhibit a magnetic field. The field exhibits distinct north and south poles, as shown. (The arrow indicates the direction of the current flow.) Similarly, if the direction of the electric current is reversed, so too will the north and south poles of the magnetic field be inverted, as shown in Figure 32).



Figure 32

The question that might arise is: precisely how is such a magnetic field generated in the earth? To understand the answer, it is necessary to look at the internal composition of our planet (Figure 33).

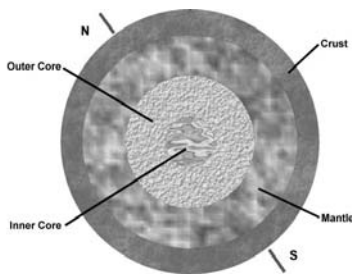


Figure 33

As illustrated, the earth is comprised of several layers. (The relative thickness of the layers are not drawn to scale.) The outermost layer—the one upon which we live—is known as the crust. The crust is the thinnest of the layers, ranging from 3 to 25 miles in thickness. The next layer, known as the mantle, is approximately 1,800 miles thick, and is composed primarily of molten material at high temperatures. This, of course, is what emerges in the form of lava during volcanic eruptions. Below the mantle resides the earth's core, separated into two segments—the outer core and the inner core—each existing at increasing temperatures. The primary elements in the core are molten iron and nickel. The difference in temperatures results in corresponding differences in viscosity. Due to these differences in viscosity, the inner and outer cores tend to rotate at distinct speeds, and the variance in relative motion causes charged metallic materials to move at disparate speeds as well. This results in moving charges similar to those described in the cylindrical rod example. The effect is the induction of the earth's magnetic field. Author William Hutton quotes William Broad as writing in *The New York Times* of July 18, 1996, that "three scientific groups [have] found strong evidence that Earth's inner core of solid iron is spinning freely within the molten outer core, making the inner core 'virtually a planet within a planet'." (William Hutton, *Coming Earth Changes*, Virginia, ARE Press, 1996, p. 29.) An understanding of these basic geophysical concepts is essential to providing credence to predictions of possible earth changes.

The Earth's Changing Fields

By examining drilled rock samples from deep beneath the surface of the earth, scientists can examine how the earth's magnetic field has changed over the course of millions of years. The reason this is possible is because metallic particles in molten material become oriented within the prevailing magnetic field of the planet, and then retain this orientation after it cools. (Picture a situation in which a magnetized needle is floated in a bowl of water, much like the original compasses. We might set the bowl in a freezer, in which case the needle would become fixed within the ice, revealing its original orientation.) These investigations have revealed several critical statistics. First, it has been found that the polarity of the earth has reversed itself 171 times over the past 76 million years. (Gregg Braden, *Awakening to Zero Point*, Bellevue Washington, Radio Bookstore Press, 1997, p. 17.) Second, it appears that these reversals do not happen instantaneously, but rather, follow a period in which the magnetic field gradually diminishes toward a zero-point, and then reverses itself and begins to increase toward the opposite polarity. Third, these reversals are generally accompanied by various cataclysmic upheavals. And finally, the earth's magnetic field is currently in a state of rapid decline. In fact, it is approximately 38%

lower today than it was 2,000 years ago, and is currently decreasing at a rate of about 6% per 100 years. Further evidence of this effect is seen in the fact that the earth's rotation has slowed sufficiently to require the National Bureau of Standards to reset their cesium atomic clocks in order to compensate for the slowdown. The mechanics underlying this process are not too difficult to envision. Anyone who has ever driven a car with automatic transmission will have noticed that when accelerating from a standing stop, the vehicle gains speed smoothly and gradually. The reason for this is that between the engine and the transmission is a fluid-coupled device called a torque converter. Inside the torque converter are two sets of blades, one attached to the engine side, the other to the transmission side. Between them, the only coupling is a viscous fluid. While stopped with the engine running, the blades on the engine side turn, while those on the transmission side (which are mechanically coupled to the wheels), remain motionless. As soon as the brake is released, however, the engine's torque is transferred to the fluid, and the fluid then begins to rotate the blades on the transmission side, causing the vehicle to start moving. At first however, the blades on the transmission side do not move as quickly as those on the engine side—it takes a while for them to catch up. Conversely, when you take your foot off of the accelerator, the car does not come to an abrupt halt. For some period of time the moving mass of the vehicle causes the blades on the transmission side to continue turning at a faster rate than those on the engine side. This results in the effect known as 'engine braking', as the slower moving fluid begins to retard movement of the blades connected to the transmission, and hence, the driving wheels. It's not difficult to imagine what would happen in the earth's core if some cosmic giant were suddenly to put his hands around the earth's crust and instantaneously stop its rotation. The viscously-coupled core would continue to rotate for some period of time before it reached equilibrium with the outer surface.

As we learned when we talked about Maxwell's theory of electromagnetism, a changing electric field induces a magnetic field that tends to oppose the electric field, and a changing magnetic field induces an electric field that tends to oppose the magnetic field. The net result is a self-propagating electromagnetic wave, consisting of alternating electric and magnetic fields. Of course, we know that photons—the particles associated with electromagnetic radiation—have zero rest mass, and as such, can propagate at the speed of light. The earth, on the other hand, has a great deal of mass, so the mutual induction effect has a far greater latency; that is, the changes happen far more gradually. Nevertheless, we can see how the relative movement of the inner core would gradually slow, come to a stop, and then slowly begin to reverse itself, thereby reversing the planet's fields. Some time later, according to some accounts, the earth's physical rotation would slow, stop, and gradually begin to turn in the opposite direction. This is precisely what many scientists believe has

happened to the earth in the past.