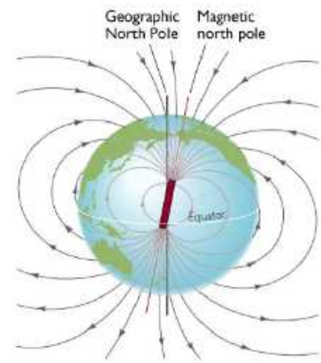
Earth's Magnetic Field is Fading



Scientists agree that the Earth's magnetic field has been fluctuating and weakening since German mathematician Carl Friedrich Gauss first started recording its intensity back in 1845 (1). Since then the field's intensity has decreased by 10%.

"At that rate of decline, the field could vanish altogether in 1,500 to 2,000 years", said Jeremy Bloxham of Harvard University at a meeting of the American Geophysical Union (2).

If this were to happen, the field would collapse altogether and then reverse, causing standard compasses to point south instead of north.

The fact that the Earth's field has reversed numerous times in the past is well documented within the geologic record. This is because iron oxides and other magnetic minerals align themselves with the planetary magnetic field as the rocks cool and solidify from a magmatic (liquid) state. Like tiny compass needles, those minerals literally point forever toward the magnetic poles that existed at the time of rock formation. This phenomena also allows Earth Scientists to accurately date historical reversals of the magnetic field; analysis of the decay of naturally-occurring radioactive trace minerals establish not only the ages of the rocks themselves, but also the ages of the reversals (3).

Still, physicists are unsure whether the current reduction in field intensity reflects the prelude to the vanishing and then reversal of the global field or just a temporary lull or "exclusion" from the norm. The interval between reversals of the Earth's magnetic field can be as short as 5,000 years or as long as 50 million years. There does not seem to be any logic or rule governing the planet's behavior.

Evidence also indicates that even during the period in which the planet was effectively without magnetic poles, the field strength would most likely remain above zero, though significantly weakened and chaotic. This "disorderly-flip" theory is supported by evidence from geology that in past reversals the decline was not total. Lava flows that solidified at Steen's Mountain during a lengthy reversal process show that the magnetic poles wandered across the equator three times. Though strength of the field was reduced to about 20% of maximum, there is no record that it fell to zero during that transitional period (4).

Whether large or small, such a lull could still generate significant effects, especially in regions where the weakening is most pronounced.

- Over the southern Atlantic Ocean, a continued weakening of the magnetic field has diminished shielding from the natural radiation that bombards our planet from space. Some satellites have fallen prey to the increased radiation levels, including a Danish satellite designed, ironically, to measure the Earth's magnetic field (5).
- Charles Jackman of NASA's Goddard Space Flight Center reports that significant but temporary losses of atmospheric ozone can be generated as the large influx of radiation in the form of protons streaming from the sun affects atmospheric chemistry of the atmosphere (6).
- Man-made and organic systems that depend on the magnetic field for navigation and other uses would be radically compromised whether the field disappears or enters a disorderly state. Magnetic lines of force near Earth's surface become twisted and tangled, and magnetic poles pop up in unaccustomed places. A south magnetic pole might emerge over Africa, for instance, or a North Pole over Tahiti (7).

Protons and electrons, the building blocks of physical matter, are themselves tiny permanent magnets that are affected by the health of the global field in ways as of yet completely understood by traditional scientists (8). Whether we are on our way to a complete reversal of the planetary magnetic field or just a significant deviation from the norm, its clear that magnetic deviation can have a significant impact on those conducting research in and working with subtle energies.

Bibliography:

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