Mercury's magnetic field is young!

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Once again, a NASA space probe is supporting the 6,000-year biblical age of the solar system. On January 14, 2008, the Messenger spacecraft flew by the innermost planet of the solar system, Mercury (figure 1). It was the first of several close encounters before Messenger finally settles into a steady orbit around Mercury in 2011.[1] As it passed, it made quick measurements of Mercury's magnetic field and transmitted them successfully back to Earth. On July 4, 2008, the Messenger team reported the magnetic results from the first flyby.[2]

As I mentioned on the CMI website earlier,[3,4] I have been eagerly awaiting the results, because in 1984 I made scientific predictions—based on Scripture—about the magnetic fields of a number of planets, including that of Mercury.[5] Spacecraft measurements[6,7] have validated three of the predictions (contrary to evolutionary ones), highlighted in red in the web version of the 1984 article. The fourth prediction was:

> 'Mercury's decay rate is so rapid that some future probe could detect it fairly soon. In 1990 the planet's magnetic moment should be 1.8% smaller than its 1975 value [measured by the Mariner 10 spacecraft].'

'Magnetic moment' above is a measure of the strength of the source of a magnetic field. No spacecraft visited Mercury in 1990, but at the above rate, Mercury's magnetic moment would be expected to be about 4% lower in 2008 than it was in 1975.[8] That is a very rapid decrease for something as big as a planet's magnetic field.

I got the rate of decrease by comparing my theory's magnetic moment at creation with the 1975 value, and by using a 6,000 year age for the solar system, as the straight line in figure 2 illustrates.

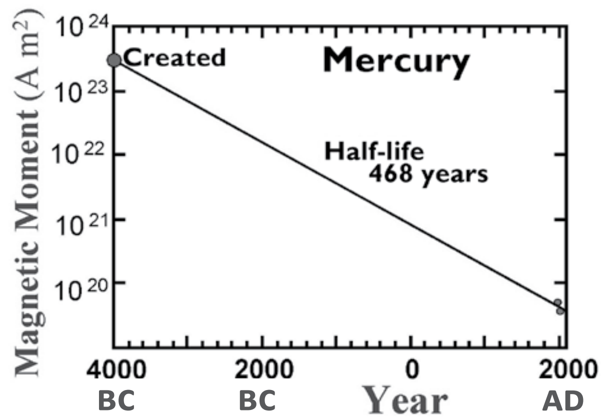

Figure 2. Rapid decay of Mercury's magnetic field strength.

Creationist theories of planetary fields expect such a decrease because electrical resistance in a planet's core will decrease the electrical current causing the magnetic field, just as friction slows down a flywheel. The smaller the core or the greater the resistance, the faster the field will decay. The decay rate given by the black line implies an electrical resistivity consistent with materials science estimates and with the decay-computed resistivity of other 'terrestrial' planets such as Earth.[9]

Figure 3 is a close-up view of the right-hand side of figure 2. It shows how the prediction compares with the January 2008 observations. On the left is Mercury's magnetic moment in 1975, 4.8 ($\pm$ 0.26) $\times$ 10^{19} Ampere square meters, according to the published analysis with the smallest error bars.[10] The slanted lines have the same slope as the line in figure 2, extrapolating the 1975 point and its error bars as a decrease into the present. The right-hand data point shows the January 2008 result, as analyzed in the same way as the 1975 result. The 2008 upper error bar overlaps the lower line, allowing for the possibility that the 1984 prediction is exactly correct.

There is also a possibility that the true value of the 2008 field is even lower than the prediction. My predicted

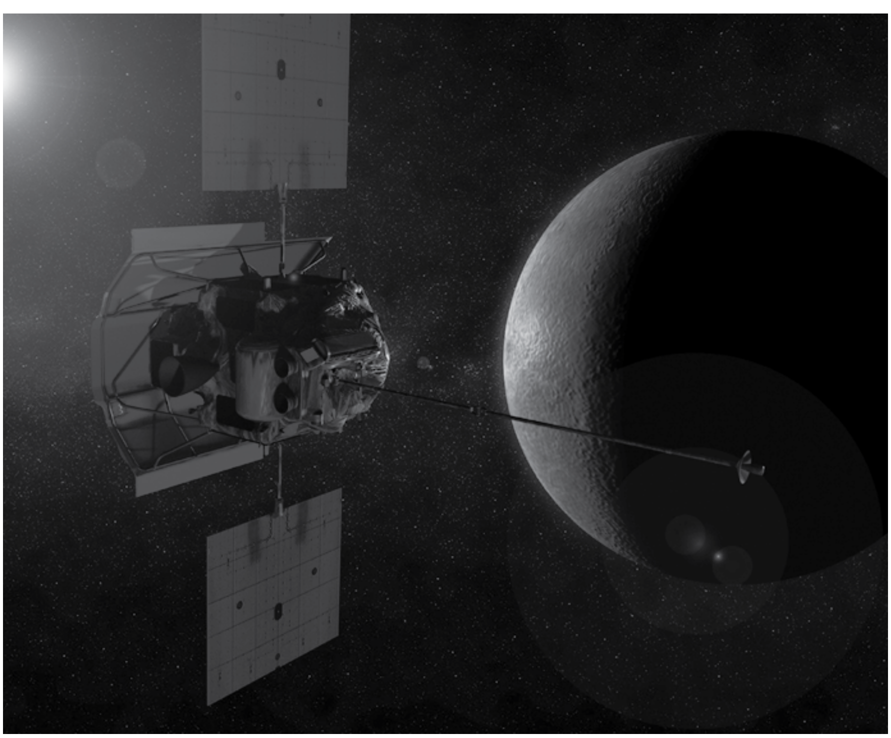

Photo from NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution

Figure 1. Messenger at Mercury. Magnetic field sensor is at right end of long boom.

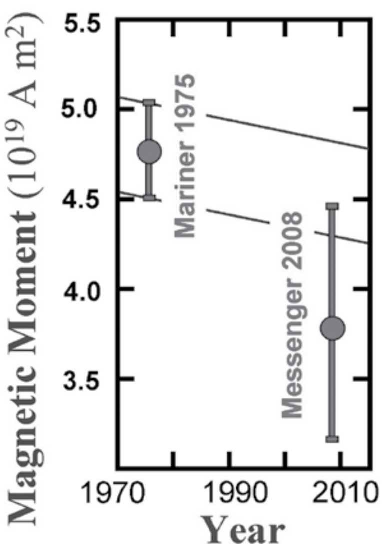

Figure 3. Spacecraft measurements of Mercury's magnetic field strength.

4% decrease in only 33 years would be very hard for evolutionary theories of planetary magnetic fields to explain, but a greater decrease would be even harder on the theories. That might be one reason the Messenger team seems reluctant to admit a decrease has occurred. Their paper confuses the issue by comparing different types of analysis with each other, like comparing apples with oranges. But in figure 3, which uses a single type of analysis (comparing apples with apples), the lack of overlap of the two error bars with each other (a horizontal line at about 4.5×10^{19} A m^2 can separate them) makes it statistically likely that a decrease has indeed occurred.

When Messenger makes more flybys and then goes into orbit around Mercury, we should get more accurate results. But the first results seem clear enough for us to expect good agreement with the creationist model. None of the now-verified predictions of the model could work without the biblically-specified original created material of planets and the biblically-specified age of the solar system, 6000 years. When NASA's space program began many decades ago, nobody expected it to vindicate Scripture so strongly.

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10. Ness, N.F., The magnetic field of Mercury, *Physics of the Earth and Planetary Interiors*, **20**:209–217, 1979. Use Ness's more accurate result in the second-to-last paragraph of the abstract and express his error bars of (± 18) gammas in the form above. 1 gamma = 1 nanotesla = 10^{-5} Gauss. 1 A m^2 = 1000 Gauss cm^3.

Germ's miniature motor has a clutch

Jonathan Sarfati

Bacterial flagellum: powered by an electric motor

Many bacteria are powered by real electrical outboard motors, only 45 nm in diameter.[1] These motors connect to long, thin, whip-like helical filaments several times as long as the germ, via a universal joint. This converts the rotary motion of the motor into wavelike motions in the filament. The motor comprises a stator, rotor, drive shaft and bushing that guides the driveshaft out through the cell wall. 'The assemblage of motor and filament is called a *flagellum*.'[1] Bacteria often have several flagella, and their concerted motion enables the cell to swim at 35 cell lengths per second.[1]

While our electrical motors are powered by a negatively charged current (electron flow in wires), the flagellar motor is powered by positively charged current. This is a flow of hydrogen ions (protons, H^+), from the outside to the inside of the cell (except for marine bacteria and bacteria that live in very alkaline conditions (i.e. low concentration of H^+), where sodium ions (Na^+) are used instead). The proton movement is driven by either an electrical or pH gradient, and the energy to generate this gradient comes from the oxidation of its food. The proton flow changes the shape of one of the stator proteins, which exerts a force on one of the rotor proteins, thereby driving the rotor.[1] A recent article said:

> 'The flagellum is one of nature's smallest and most powerful motors—ones like those produced by *B. subtilis* can rotate more than 200 times per second, driven by 1,400 piconewton-nanometers of torque. That's quite a bit of (miniature) horsepower for a machine whose width stretches only a few dozen nanometers.'[2]