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Cover: In 1953, the United States and other nuclear nations were still setting off above-ground nuclear blasts, such as this 10-kiloton test in the Nevada desert. Ten years later, a partial test ban disallowed all but underground nuclear tests. Now, the nations of the world are advancing toward a ban on all nuclear tests. In preparation for this treaty, the United States has collaborated with other nations to devise a prototype global observation system. (Photograph: U.S. Defense Nuclear Agency)
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Letters

In a spin

"Reservoirs speed up Earth's spin" (SN: 2/17/96, p. 108) says the impoundment of 10 trillion tons of water in the Northern Hemisphere over 40 years has affected Earth's rotation and spin axis. "Antarctic warmth kills ice shelves" (same page) says four ice shelves have collapsed over 50 years.

How many tons of water previously impounded in those ice shelves was released? Would the amount offset or multiply the effect of reservoir impoundment? Could the "normal" fluctuation of Arctic and Antarctic ice buildup and release account for the observed change in Earth's rotation and spin axis? What effect might substantial global warming have on rotation and spin axis?

Is it significant or just an interesting factoid to bring up at cocktail parties?

Jim Uschold
New Orleans, La.

"Reservoirs speed up Earth's spin" claims that impoundment is the only human activity big enough to cause appreciable change.

Other factors might be significant: first, oil depletion, use, shipment, and consumption; second, population concentrations. Both of these factors involve large quantities and are asymmetrical.

Hugh Gershon
Glen Head, N.Y.

The recent disintegration of several Antarctic ice shelves has had little effect on Earth's spin. Ice shelves are floating layers of ice, so they do not raise Earth's sea level when they melt, just as an ice cube in a drink does not raise the level of the liquid as it melts.

A different issue is the fate of land ice in Antarctica. If this melts, it would raise sea level and partially counteract the impoundment of water in reservoirs. Glaciologists do not know what is happening with the massive Antarctic ice sheet, but there are hints that it has actually grown in recent decades. In that

case, it would exacerbate the reservoir effect, which moves water toward the poles and away from the equator.

In the other direction, the melting of mountain glaciers has added water to the oceans. Because most of the larger mountain glaciers are located in northern temperate regions, the loss of these glaciers has tended to shift mass toward the equator. Although the mass of water melted from glaciers falls short of the mass in reservoirs, it has canceled much of the reservoir effects, says Chao.

According to Chao, oil extraction and population patterns have not moved much mass, compared to the 10 trillion tons of water stored in reservoirs.

— R. Monastersky

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