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COVER: As Oedipus might have acknowledged, incest is surrounded by guilt, fear, confusion and other emotional problems. Behavioral scientists currently studying incest are finding that it occurs with surprising frequency and for many complex reasons. Although the effects on children can be devastating, some researchers suggest that incest may not necessarily be harmful in all cases — a position that is triggering heated rebuttals. See p. 218. (Painting: Oedipus and the Sphinx by Jean-August-Dominique Ingres, Paris Musée de Louvre)

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LETTERS

A misleading hole

In the article "Notes from earth" (SN: 3/15/80, p. 174), you state the weight of the earth as 6.588 x 10^{21} tons, and you say humans have drilled 5 miles into the surface, or only .00125 percent of the way to the center. My calculator gives this as 0.125 percent of the way. I hope you didn't try to tell your mass from the hole in the ground.

A.J. Bulstrode
Chattanooga, Tenn.

An attractive alternate

The question which comes to mind after reading "Gravity's Repulsive Side" (SN: 3/8/80, p. 148) is, why must there be "only one kind" of mass? If one *assumes* only one kind of mass then one may derive the graviton of spin two. But there is no experimental evidence of the spin-two graviton.

What if there are two kinds of mass, namely matter and antimatter, just as there are two kinds of charge? Can antimatter be said to have "negative mass"? Could a spin-one graviton mediate an attractive force between like masses (as observed) but a repulsive force between matter and antimatter, just as (in reverse) the photon mediates an attractive electromagnetic force between unlike charges but a repulsive force between like charges?

If an equal amount of matter and antimatter were created simultaneously and homogeneously in the big bang, then why did not mutual annihilation occur in fairly short order as matter and antimatter coalesced gravitationally? Perhaps because of gravitational repulsion between matter and antimatter?

John Blethen
San Francisco, Calif.

"Gravity's Repulsive Side" suggests an attractive alternate hypothesis: Matter gravitationally attracts matter; antimatter attracts antimatter; matter and antimatter repel each other; particles without rest mass (e.g. photons) are attracted to both. This hypothesis has a high degree of symmetry, but it is strongly challenged by a not yet satisfactory theory of quantum gravity.

Such a hypothesis would simplify the cosmological big bang theory. The creation of equal quantities of hydrogen (proton-electron atoms) and anti-hydrogen (negative proton-positron atoms) would explain both the expansion of the universe through antigravity and the inhomogeneity of forming galaxies of essentially pure matter and of pure antimatter by gravity. It could solve the problem of "where has the antimatter gone?" Antimatter may be out there in supergalactic clusters held together by antimatter attraction, just as our supergalactic cluster is held together by matter attraction.

Perhaps the fact that the hypothesis is easily verifiable will offset objections by theorists. A beam of antimatter particles in a vacuum could be monitored to determine whether there is a deflection away from earth's gravity or toward it.

Richard D. Mathews
Philomath, Ore.

(The suggestion that antimatter may have negative mass has frequently been raised. Evidence up to now is against it, but any sort of gravitational experiment with subatomic particles is extremely difficult, because gravity is overshadowed by a factor of up to 10^{40} by other forces acting on them. In the case of antiparticles the difficulty is compounded by their liability to annihilation with ordinary particles. They don't stay around long enough for such delicate effects to be measured. Nevertheless, the question is sure to be tested in the Antiproton Accumulator being built at the CERN laboratory in Geneva. —D.E.T.)

Not enough information?

Rene H. Males of the Electric Power Research Institute writes to complain that Susan West, in her acid rain articles, stated incorrectly that EPRI insists that not enough data are in to justify restrictions (SN: 3/15/80, p. 163).

In defense of West, I read "Tracking the Clues to Acid Rain" in the November 1979 AWARE magazine, an article reprinted from the Sept. 1979 EPRI JOURNAL. The AWARE article has numerous one-line "zingers" headlined throughout the text. It would be hard to come to any other than West's conclusion, although it could be argued that the specific statement was not made. One of the one-liners did say, "information needed to forestall misdirected regulatory standards...." Another stated, "Sources of acid rain can be respiration of plant roots." To that all I can say is if you are going to play games with words don't complain when your readers suspect subterfuge.

The time has come to dispense with the rhetoric. The "energy crisis" is real and has potential for serious social and political repercussions. We can reduce our national energy consumption by 50 percent a lot easier than we can feasibly maintain let alone increase our present rate of usage. Cheap and readily available raw materials and energy plus a national debt gone mad borrowing against tomorrow have made it possible to satisfy the demands and desires of our "now generation." Undo the many laws, regulations and contracts that promote waste and most of our present problems will be alleviated.

Allen J. Pecar
Mancelona, Mich.

(In testimony March 19 before a Senate subcommittee, Ralph Perhac of EPRI said, "We do not have enough scientific information at this point to tell what regulations to make." Similar testimony at previous hearings led to the writer's statement — Ed.)