

weigh less, and because the mothers are not fully mature in both the physical and behavioral aspects of parenting, these pups are simply not cared for as well as they would be by an older mother.

Although younger mothers may be more likely to lose their pups, older mothers may also lose their newborns in the chaos of large harems, amidst all the battles and challenges. When this happens, the disoriented baby seal is in greater jeopardy of being accidentally trampled by a fast-moving adult bull on its way to or from a fight, or to mate. Such incidents account for 30 to 35 percent of pup deaths at a rookery each year, according to Le Boeuf.

But the orphaned pups that escape that fate are faced with perhaps an even more grim form of death. Separated from their mothers, the orphans attempt to find a "foster mother." Some are lucky and succeed; the others — individually or in groups — must try to steal milk from mothers nursing their own pups. At first, the mother may simply threaten the intruder; if that doesn't work, she bites it. If that doesn't send it away, she begins biting the orphan repeatedly; when this happens, four or five other mothers for some reason join in, and the pup is killed. These intentional retaliations by the adult females account for 55 percent of rookery pup deaths, Le Boeuf says.

Some pups are even killed by the losers, who, it appears, attempt to copulate with them when they cannot get access to an adult female. Losing the dominance bat-

tles to the stronger, usually older seals does not seem to diminish the losers' desire to mate in the least. In their attacks upon adult females heading back towards the sea after breeding, Le Boeuf reports, these inexperienced and overzealous males may inadvertently puncture one of their victim's blood vessels with a misplaced bite. This, or some other type of misguided movement, results in the death of 1 in 1,000 adult females, he says.

Though this may seem like a low death incidence, Le Boeuf points out that the actual incidence is probably higher than that observed. More significantly, he says, even a 1 in 1,000 incidence is considered high in terms of the natural selection procedures. For example, he says, for a female to remain a producer of offspring she must, obviously, avoid the possibility of death — which in this case comes in the form of the attacking male. Le Boeuf has already observed some females returning to sea at high tide, apparently to cut down the potential attack zone.

Moreover, the biologist notes that among humans, the annual incidence of rape in the United States ranges from 8 to 35 per 100,000 people; from this perspective, he says, the incidence of death from rape among elephant seals, 100 per 100,000, is quite high.

But Le Boeuf and his colleagues acknowledge it can be extremely difficult to tell whether or not a female is willing, even during some of the post-breeding attacks by losers. Within the harem, Reiter has noted behavior similar to that observed at

drinking establishments in Oklahoma. She calls it the Okie Bar Effect, or the "Are you going to let this guy do this to me?" effect. In such a situation, the female appears to permit a lesser bull to mount her, and then proceeds to make a very noticeable vocal and visual show of it. This frequently will attract a "higher," dominant male, who will push off the other bull and take over himself.

Regardless of what mating scenario applies, it is clear that elephant seals continue to breed in record numbers. "It's at the peak slope of the exponential curve," says UCSC's Richard S. Condit. While this has biologists and naturalists pleased, some, like Le Boeuf, are beginning to feel slightly uneasy about potential overcrowding at breeding grounds. Elephant seals gravitate naturally to isolated islands, and until 1975 their rookery here was located solely on Año Nuevo Island. Since then, however, their density has driven an increasing number of them to the mainland, and it is expected that this year, for the first time, the population at the point will outnumber that on the island. Some of this may be traced to El Niño, which last year drove many females to the more-sheltered point, where they are bound to return for breeding this year.

As they become more comfortable around humans — public tours are conducted throughout each day at the point — Le Boeuf worries that elephant seals may migrate "to beaches where no one wants them." But then again, who would tell them that? □

Letters continued from page 115

Panic

In reference to your article "Low blood sugar no cause for panic." (SN: 1/28/84, p. 58), if you chemically induce a panic attack, then watch for corresponding drops in blood sugar levels, all you can conclude is that panic attacks may or may not cause hypoglycemia. I do not see how Dr. Gorman can conclude [that] low blood sugar itself is not the source of panic. It seems to me one would have to lower the blood sugar level, and see if you could trigger a panic attack to test that hypothesis.

Susan A. Kriz
Glen Ellyn, Ill.

Ed's note: The article should have said that Gorman and colleagues concluded that hypoglycemia is not the source of all panic attacks. They note in their journal report that they did not prove that hypoglycemia never causes panic attacks.

Mirror, mirror

I found that the cultural aspect of magic mirrors ("Inscrutable Mirrors," SN: 1/14/84, p. 30), is very well explained, including a citation from the New Testament. From this standpoint, I might point out that magic mirrors that projected the image of Mary or the cross were used by hidden Christians during the Tokugawa shogunate.

Chinese authors may be upset by reading the article because they would agree with my interpretation instead of the light penetration theory in the old days.

The author could have mentioned the Ayrton and Perry article in PROCEEDINGS OF THE ROYAL SOCIETY because they investigated the Makyo systematically for the first time, and Sir William Bragg based his description on their papers. For the specialists in optics, I could have cited other well-known names such as Brewster and Arago, as well.

Hideya Gamo
Professor, Electrical Engineering
Univ. of Calif.
Irvine, Calif.

What's in a Gray

I was surprised to read in your article "Irradiation — It Cuts the Gas" (SN: 2/4/84, p. 72) that the kiloGray (kGy) was reported to be equivalent to 0.001 rad.

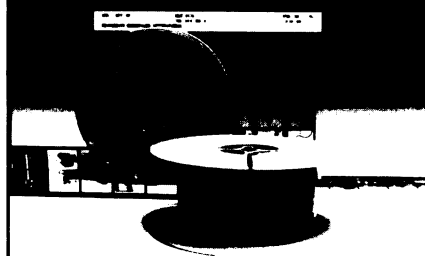
In fact, the Gray, a unit derived from the International System of Units to describe absorbed dose of ionizing radiation, is equivalent to 1 J/kg or 100 rad. Thus, 1 kGy is equal to 100,000 rad, not 0.001 rad.

Charles H. Nauman, Ph.D.
Exposure Assessment Group
U.S. Environmental Protection Agency
Washington, D.C.

We went to the Nuclear Regulatory Commission for a kGy-to-rad conversion factor and were misinformed. — J. Raloff

Ed's note: Chris W. Patterson of the Los Alamos National Laboratory in New Mexico collaborated with William G. Harter in his work on molecular spectra (SN: 2/4/84, p. 76).

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