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Letters

Once in a red moon

The article summarizing the attempt of Humphreys and Waddington to date the crucifixion of Jesus of Nazareth (SN: 1/21/84, p. 40) is interesting, but the conclusion rests on tenuous evidence.

Humphreys and Waddington interpret Acts 2:20 as referring to an event associated with the crucifixion. As I am sure they know, this passage is a quotation of the prophet Joel (Joel 3:1-5). The introduction to the quotation in Acts (Acts 2:16) makes it clear that Peter's speech is applying the prophecy *not* to the crucifixion, but to the situation at hand, that is, the Pentecost experience of the disciples. In the subsequent part of Peter's speech where reference *is* made to the crucifixion (Acts 2:22-24, 32-33), there is no allusion to the supposed lunar phenomenon and the focus of interest is clearly on the Pentecost experience. It is thus quite dubious that the reference to the blood-red moon is intended as an allusion to some physical phenomenon occurring on the evening of the crucifixion. Since

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this interpretation constitutes the entire basis on which Humphreys and Waddington choose April 3, A.D. 33 as the date of the crucifixion, their conclusion is extremely tenuous.

Moreover, the Synoptic Gospel accounts of the crucifixion mention a "darkness" covering the earth (Mark 15:33; Matthew 27:45; Luke 23:44), which might be interpreted as a solar eclipse. But they do not report any lunar phenomenon. Even this possible report of a solar eclipse cannot be taken as a definite reference to an observable phenomenon. "Darkness" was a symbol of the powers of evil and thus might be functioning here as a literary-theological device.

Humphreys and Waddington may have narrowed the possible dates of the crucifixion to two. But in my judgment it cannot be said that they have established which of the two is correct.

(Rev.) Thomas E. Hosinski, C.S.C.
Asst. Prof. of Theology
University of Portland, Ore.

A solar eclipse can happen only at the time of new moon. Passover occurs at full moon, which

is when lunar eclipses do happen. The darkening of the sun on the afternoon of the crucifixion is attributed by Humphreys and Waddington and others to a Khamsin dust storm.

—D.E. Thomsen.

Fusion notes

I would like to clarify a few points in Dietrick Thomsen's article on my conjectures concerning fusion economics ("Economy of Fusion," SN: 1/7/84, p. 10).

I do not support a crash program to develop fusion power. However, I believe the U.S. fusion budget should be increased sufficiently to achieve and maintain a 5 to 10 year technological lead, and so that low cost approaches to fusion can be explored in parallel with the demonstration of scientific feasibility and the development of an expanded fusion engineering program.

In "fusion... has a... holy cause," "holy" is an exceedingly poor choice of words. "Noble" and "crucial" are the ideas that I want to express.

The first fusion reactor could not begin oper-

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lation already there, says a National Zoo spokesperson. Little primary forest remains, and the reserve houses a railroad and a dam. The researchers might "create corridors between the patches of forest" to spruce up the area. But the lack of continuous woods helps the researchers too. It will isolate the wild from the captive-born and prevent interbreeding and disease spread.

Monkey in Poço d'Anta reserve (right).



The primate center and personnel at the base of Serra dos Orgãos, a mountain range in the state of Rio de Janeiro (below).



Photos: R. Mittermeier

To survive in the wild, the tamarines must become facile at "feeding and anti-predator responses," says Kleiman. They must master the ways to hunt for food, get in and out of the rain, and find nesting holes in trees — quite different circumstances from receiving two meals of canned marmoset food a day in the zoo and sleeping in a nest box.

Beck will teach the tamarines by taking them through a series of exercises. The schedule for the golden lion tamarines is graduated: Beck will slowly increase the cage size and hide their meals in more difficult places until the golden lion tamarines sleep outdoors and eat wild food. Beck and Aldemar Coimbra-Filho, director of the primate center, will also eval-

uate what the golden lion tamarines have retained through several generations of captivity and have learned from the exercises before deciding whether they can be released.

The program faces problems besides training the monkeys and reforesting the forest. The golden lion tamarines must be secured from human harm and competition. According to Russell Mittermeier, di-

rector of the World Wildlife Fund U.S. Primate Center (which partially funds the project) the Brazilian public is responding more warmly to the golden lion tamarine attempt than to other conservation projects because of the U.S. involvement. The Brazilian government has also acted in support of the effort to save the species. It banned the export of the golden lion tamarine. And it posted guards to prevent people from hunting and living in the 12,500 acre preserve.

The prospects for the golden lion tamarine look good. Although Evans expects mortality will be high, he feels the tamarine's curiosity and ability to learn quickly will help. "We're optimistic about the chances," he says. □

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ation in 1993. At best we could begin to build a research reactor at that time.

Ms assumption of a 20 percent long term increase in the cost of fission relative to fusion (due to the depletion of high grade uranium ore) is based on the cost increase for fission or fusion hybrid breeders.

With advanced fuels (e.g. DD), both inertial and magnetic fusion may in principle achieve higher efficiency by various direct conversion schemes. With DT fuel, inertial fusion may achieve higher efficiency by various schemes (e.g., absorbing the 14 MeV neutrons in a discus shaped mass of lithium which then jets into MHD power generators). The high temperature material problems which have so far impeded the development of fossil and fission MHD systems may possibly be solved by insulating the reactor walls with circulating lithium materials.

More work is needed before we can be confident that the cost of the fuel pellet factory is "well in hand" at \$50 million to \$100 million.

The cost of the pellet driver may possibly be reduced to roughly 10 percent of the power plant cost by a combination of three means: improve the pellet performance (e.g. by use of polarized fuel) to reduce the required driver energy, realize projected improvements in driver technology, and time-share the driver with two (or more) reactors.

Regarding sensitivity, if the fusion technology (driver and target factory) cost fraction were reduced to 10 to 20 percent, then the total cost would be most sensitive to the net electrical generating efficiency and to the cost of the fusion analogue of the fission nuclear steam supply system.

*John H. Nuckolls
Lawrence Livermore Laboratory
Livermore, Calif.*

Man and beast

Just a brief semantic quibble on your article, "The Living Link" (SN: 1/21/84, p. 41). *Orangutan* (pronounced O-rahng-oo-tahn; slight accent on the third syllable) is compounded of two Malay/Indonesian words: *Orang*, meaning human being, and *hutan*, meaning "jungle" or "forest;" hence it means "Man of the jungle." Thus "orang" won't work as an apocopation of "orangutan," since it carries semantic freight of its own, at least to those of us who know the language and, given what the "orang" are doing to the natural habitat of the orangutan, has a connotation which the orangutan themselves might find offensive.

*Rodney H. Mill
Green Meadows, Md.*

Correction: A description of a study conducted by Selma Kaplan and colleagues at the University of California at San Francisco (SN: 2/11/84, p. 92) incorrectly reports that short normal children were treated with synthetic human growth hormone. Rather, all the children in the study received growth hormone derived from human cadaver pituitaries.

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