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COVER: After a decade of rapid change, science education faces new challenges: New curricula and technology, a reemphasis on science as a humanity, declining enrollments, changing patterns of funding, even an assault from creationists. A five-article special report begins on p. 186. (Drawing: A 13th-century lesson in astronomy. Photos: Florida State University, George Washington University.)

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A special issue on science education

As you will see, this expanded issue of SCIENCE NEWS is devoted in large part to science education. SN's Science and Society Editor John H. Douglas has spent the better part of six weeks researching and writing the main part of the coverage, and his articles are supplemented by contributions from Behavioral Sciences Editor Robert J. Trotter and Medical Editor Joan Arehart-Treichel. The goal, within our limitations of space, has been to try to present a picture of the most important trends, developments, problems and controversies in science education. We think you will find it informative. As always, your comments are welcomed. Next week we return to our usual format of reporting the week's scientific news in all its diversity.

The Editor

to the editor

Reproducing rare animals

Joan Arehart-Treichel's comment on the possible applications of artificial insemination and embryo transplants (artificial in-ovulation) to endangered animal species (SN: 2/24/73, p. 124) is an area of prime concern to me and others in the field. At Cornell, Thomas Cade's artificial insemination of the red tail hawk marked an early step in such uses. Considerable interest has been stirred in response to my two articles on this subject in the Feb. 1972 BULLETIN OF THE ATOMIC SCIENTISTS and May 1972 ORYX. John Perry, assistant director of the National Zoo in Washington, Ivo Poglayen, director of the Louisville Zoo, William Conway, director of the Bronx Zoo, Ronald Reuther, director, San Francisco Zoo, and W. Peter Crowcroft, director, Chicago Zoo, have been discussing possible uses of experimental reproduction in saving some animals from extinction.

Perry, in particular, is interested in the possible applications to the golden marmoset of Brazil. The work of Brackett reported in the article is not encouraging for the endangered primates, but certainly our success with artificial reproduction in hoofed animals, dogs, and cats could be applied to the white, Sumatran and Indian rhinos, the tiger and cheetah, if research scientists, veterinarians, zoo managers, and experts in the reproduction of domesticated animals would pool their now scattered and unrelated information and information energies.

Robert T. Francoeur, Ph.D.
Associate Professor of
Experimental Embryology
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Madison, N.J.

Dirac's theory

I found Dietrick Thomsen's article on mathematical theory (SN: 3/3/73, p. 137) fascinating. However, Paul Dirac seems to thwart his own cause in postulating two standards of length. Would this then be a "unified" field theory? It would seem that more than one factor is necessary to arrive at two results.

One interesting result of his postulates is the decrease of the strength of gravity as the universe ages. This would explain the red shift of the galaxies, generally considered to be a sign of motion. With Dirac's idea, light produced by the galaxies billions of years ago would be of decreased frequency due to gravitational red shift. This would indicate that the galaxies were not necessarily hurled apart, as in the "big bang" theory, but may be stationary, or drifting apart only because of the decrease of the strength of gravity. Then, how *did* the universe assume its present state?

Glenn Lubiens
Fullerton, N. Dak.

More on wolves

Animals have suffered enough throughout the years, but man, who could be their only source of help, left them to survive for themselves in a world created by man. Your article on the wolf's extinction (SN: 2/17/73, p. 109) points out that people who don't care for his existence don't care for the beauty and enjoyment of wild animals and nature.

Mary Miller
Niles, Mich.

The reference to the American Psychological Association on p. 121 of the Feb. 24 SCIENCE NEWS was in error. It should have read American Psychiatric Association.

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