

OF THE WEEK

| | |
|--|-----|
| Chimp behavior showing changes | 276 |
| Left brain dysfunction linked to schizophrenia | 277 |
| Ocean eddies studied via satellite | 277 |
| Recombinant research violated NIH rules | 277 |
| Animals as earthquake sensors | 278 |
| How tumors beat the (immune) system | 278 |
| Update on Voyager | 279 |
| Proteases: Molecular scissors | 279 |
| Enkephalins have additional functions | 280 |
| Kitt Peak gets new head | 280 |

RESEARCH NOTES

| | |
|-------------------|-----|
| Physical Sciences | 281 |
|-------------------|-----|

ARTICLES

| | |
|----------------------------------|-----|
| Preparing for Japan's next quake | 282 |
|----------------------------------|-----|

DEPARTMENTS

| | |
|---------|-----|
| Letters | 275 |
| Books | 287 |

COVER — Gyre and Gimble — the first twin chimps observed to be born in-the-wild — rest contentedly in the arms of their mother, Melissa. The twins weathered a harrowing first six months of injury, food shortage and attack by other chimpanzees. Brutal, premeditated killings among chimps were seen for the first time by naturalist Jane Goodall in Tanzania. See p. 276. (Photo by Derek Bryceson, © National Geographic Society)

| | |
|--|---|
| Publisher | E. G. Sherburne Jr. |
| Editor | Robert J. Trotter |
| Senior Editor and Physical Sciences | Dietrick E. Thomsen |
| Behavioral Sciences | Joel Greenberg |
| Biomedicine | Joan Arehart-Treichel |
| Life Sciences | Julie Ann Miller |
| Policy/Technology | Janet Raloff |
| Space Sciences | Jonathan Eberhart |
| Contributing Editors | Lynn Arthur Steen (mathematics) Kendrick Frazier John H. Douglas Susan West Robert Navickis |
| Science Writer Interns | Judy Klein Dale Appleman |
| Assistant Editor | Jane M. Livermore |
| Art Director | Donald Harless |
| Books | Scherago Associates 1515 Broadway New York, N.Y. 10036 |
| Business Manager | Fred W. Dieffenbach, Sales Director |
| Advertising | |

Copyright © 1978 by Science Service, Inc., 1719 N. St., N.W., Washington, D.C. 20036. Reproduction of any portion of SCIENCE NEWS without written permission of the publisher is prohibited.

Editorial and Business Offices
1719 N Street, N.W.
Washington, D.C. 20036

Subscription Department
231 West Center Street
Marion, Ohio 43302

Subscription rate: 1 yr., \$12.50; 2 yrs., \$22; 3 yrs., \$30. (Add \$2 a year for Canada and Mexico, \$3 for all other countries.) Change of address: Four to six weeks' notice is required. Please state exactly how magazine is to be addressed. Include zip code.

Printed in U.S.A. Second class postage paid at Washington, D.C. Title registered as trademark U.S. and Canadian Patent Offices.

Published every Saturday by SCIENCE SERVICE, Inc. 1719 N. St., N.W., Washington, D.C. 20036. (202-785-2255) TWX 710-822-9433 SCIEN NEWS. ISSN 0036-8423

LETTERS

Fascinating Science

I would like to thank SCIENCE NEWS Senior Editor Dietrick E. Thomsen, and Dr. Grant J. Mathews of the Lawrence Berkeley Laboratory, for their participation in a benchmark radio program on cosmology.

This program was broadcast on March 7 over KGO San Francisco, a major AM radio station owned and operated by the American Broadcasting Companies, Inc. Listeners were able to talk by phone to Dr. Mathews, who was at the station, and Mr. Thomsen, who was on a phone patch from his home in Washington, D.C. Questions ranged from the scientific accuracy of the proposed Jupiter effect to the feasibility of interstellar travel.

The purpose of this program was to demonstrate to the management of the major electronic media that science is just as interesting to the general public as the other subjects that regularly obtain exposure in that medium, a hypothesis I had advanced to some ABC executives one night over cocktails. Your readers will not be surprised to learn that this hypothesis was not contradicted. There was much interest in the program which ran longer than the scheduled one hour because of the large public response.

Allen D. Allen
Northridge, Calif.

Playing with numbers

"What's in a Game?" (SN: 4/1/78, p. 204) explained the binary approach to the game of Nim. It is indeed true that a player will win if he leaves a Nim binary total of zero each turn. However, it is not always possible to do that, as was stated in the article, by taking the Nim total confronting one from any of the three piles. For example, piles of 3, 4, 5 produce a Nim binary total of $10 = 2$. Taking 2 from the 4 or 5 pile produces $11 + 10 + 101 = 100$ or $11 + 100 + 11 = 100$. Only by taking the 2 from the first pile do you get $1 + 100 + 101 = 0$.

In fact, there are numerous combinations where the Nim total exceeds the total in any one pile. Piles of 3, 6, 10 give a Nim total of $1111 = 15$ which cannot be taken from a single pile (solution: remove 5 from the pile of 10). Piles of 1, 2, 4 = $111 = 7$ (remove 1 from the pile of 4). Thus, leaving a Nim total of 0 is the winning play, but it cannot always be done by removing the number of stones represented by the Nim total confronting one, nor by removing the correct number from just any pile.

Harry C. Archer, Ph.D.
Falls Church, Va.

In the article "What's in a game?" Lynn Arthur Steen presents the usual binary explanation of how to win at the game of Nim.

The trouble with this explanation is that it makes winning very complex and quite difficult to do mentally.

The key to a simple solution is that binary is a way of writing numerals, whereas the winning method is based on numbers. Anything that can be done in the binary system has an equivalent in all other bases, so why not stick with base ten?

Instead of trying to find a zero sum in binary, it is only necessary to find an *even* number of ones, twos and fours — the place values in the binary system. If the piles were larger, the next number to keep even would be the next place value, which is eight.

Emanuel Kelmenson
Jericho, N.Y.

A whale of an inquiry

The Australian Government recently announced (March 19th) that it is holding an Inquiry into Whales and Whaling, and that it would welcome written submissions from interested individuals or organizations. It is particularly interested in hearing from people who have worked with cetaceans or had experiences with them. The government decided to hold an inquiry in response to growing opposition within Australia to the killing of whales.

Conservationists regard this as a very important inquiry, as it will be the first time that all the information on cetaceans has been placed before an independent authority and a decision as to whether a nation should still be killing whales in the late 1970s made.

When the International Whaling Commission meets annually to set kill quotas it examines only information related to numbers available for harvesting. Factors such as evolutionary history, central nervous system development and public attitudes are not considered. Philosophy developed in the 1940s governs the operation of the International Whaling Commission.

In order for the Australian inquiry to be as comprehensive as possible, broad guidelines have been set and it is hoped that all viewpoints will be heard and evaluated.

Any person or organization interested in participating should forward submissions to:

The Secretary
Inquiry into Whales and Whaling
P.O. Box E264
Canberra A.C.T. 2600 Australia
before May 31st, 1978.

Joy Lee
Athens, Ga.

Correction:

The prostaglandin-type fatty acids in plants (SN: 4/8/78, p. 216) were obtained using linolenic acid.

SCIENCE SERVICE

Institution for the public understanding of science founded 1921; a nonprofit corporation.

Board of Trustees — Nominated by the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE: **Deborah P. Wolfe**, Queens College of City University of New York; **Bowen C. Dees**, The Franklin Institute; **Athelstan Spilhaus**, National Oceanic and Atmospheric Administration. Nominated by the NATIONAL ACADEMY OF SCIENCES: **Gerald F. Tape** (Vice President), Associated Universities; **Allen V. Astin**, Bethesda, Md.; **Glenn T. Seaborg** (President), University of California, Berkeley. Nominated by the NATIONAL RESEARCH COUNCIL: **Gerald Holton**, Harvard University; **Joseph W. Berg Jr.**, National Research Council; **Aaron Rosenthal**, Washington, D.C. Nominated by the JOURNALISTIC PROFESSION: **Edward Bliss Jr.**, Newburyport, Mass.; **Julius Duscha**, Washington Journalism Center; **O. W. Riegel** (Secretary), Glasgow, Va. Nominated by E. W. SCRIPPS TRUST: **Milton Harris** (Treasurer), Washington, D.C.; **Edward Scripps II** (Vice President and Chairman of the Executive Committee); Edward W. Scripps Trust; **John Troan**, Pittsburgh Press.

Director: E. G. Sherburne Jr.; Assistant Director: Dorothy Schriver; Business Manager: Donald R. Harless; Things of Science: Ruby Yoshioka.