

OF THE WEEK

Blackbody spectrum found deviant	260
Exploring Saturn's "extra" rings	260
Islet transplant successful in rats	261
Mental patient "guinea pig" suit	262
Saying yes to gluons	262
Antibody business begins	262
Power lines may lead to cancer	263
A quick trip for Soyuz 33	263
Vietnamese adjustment seems smooth	263

RESEARCH NOTES

Biomedicine	264
Environment	264
Chemistry	265

ARTICLES

Eradicating cotton killers naturally	266
Vibrating to the beat of the sun	270

DEPARTMENTS

Letters	259
---------	-----

COVER: The boll weevil has been the cotton farmer's most persistent crop-devastating enemy for most of this century. But now Integrated Pest Management, an array of innovative methods of attacking cotton pests, is coming to the aid of farmers—while decreasing their reliance on dangerous pesticides. See story p. 266. (Photo: National Cotton Council)

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
Earth Sciences	Susan West
Life Sciences	Julie Ann Miller
Policy/Technology	Janet Raloff
Space Sciences	Jonathan Eberhart
Contributing Editors	Lynn Arthur Steen (mathematics) Kendrick Frazier John H. Douglas Michael A. Guillen
Assistant Editor	Judy Klein
Art Director	Dale Appleman
Assistant to the Editor	Angela Musick
Books	Jane M. Livermore
Business Manager	Donald Harless
Advertising	Scherago Associates 1515 Broadway New York, N.Y. 10036 Fred W. Dieffenbach, Sales Director

Copyright © 1979 by Science Service, Inc., 1719 N St., N.W., Washington, D.C. 20036. Republication 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., \$15.50; 2 yrs., \$27.00; 3 yrs., \$37.50 (Add \$3 a year for Canada and Mexico, \$4 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

A planetary love affair

Bravo SCIENCE NEWS! Bravo! Your coverage of the Voyager I flyby, like that of many another mission launched under the auspices of the National Aeronautics and Space Administration, was very informative. But these photographs making up the covers of your March 10 and March 17 issues — magnificent! Simply magnificent! In the former one sees at a glance — although I can assure you of the fact that I did more than just glance; indeed, I darn near gloated — the awesome complexity intrinsic to the Great Red Spot. It is more than just an elongated oval — a spot — filled in with a homogeneous (if not monotonous) red. In the latter, one senses an awesome depth. Behind lo, one does not encounter depthless, "perspectiveless" space. Instead, one sees Jupiter — a Jupiter covering the entire photograph.

One suspects that those at SCIENCE NEWS, like Arthur C. Clarke, Stanley Kubrick and myself, hold a love affair with the banded giant.

Arthur K. Popkin
New York, N.Y.

Casting a shadow on the eclipse

The article "The Last Eclipse" (SN: 3/3/79, p. 137) errs in describing the moon's shadow during a solar eclipse as "a tiny darkened dot that moves across the earth's surface (or more accurately, that the earth, during its daily rotation, moves under)." Far from being "more accurate," this statement shows a lack of familiarity with the mechanics of eclipses, in that it implies that it is chiefly the earth's rotational motion which carries new positions on its surface into the moon's shadow. In fact, it is very much the moon's orbital motion which causes the lunar shadow to race eastward across the earth's surface at a speed of thousands of kilometers per hour (the exact velocity varies according to the angle at which the shadow strikes the earth's curved surface at a given moment). The earth's rotational motion, also in an easterly direction, actually *retards* the progress of an eclipse; in other words, for a given spot in the path of totality, a solar eclipse lasts a trifle longer than it would if the earth weren't rotating.

On Feb. 26, for instance, the moon's umbra first touched the earth in the eastern Pacific, where the eclipse could be seen as ending just at sunrise; it then moved swiftly along the Oregon-Washington border and into Montana, crossed a bit of North Dakota, then curved north into Saskatchewan, Manitoba, and the northern tip of Quebec, and finally ended on the Greenland icecap, where the eclipse could be seen as beginning just at sunset. Total time elapsed while the moon's umbra was on earth: just about an hour and a half.

By the way, after having anticipated this

eclipse ever since moving to Oregon as a schoolboy in 1962, and treating it in a long feature article in a Portland newspaper, I must say that I was far from being disappointed by the actual event. I was lucky enough to observe the entire eclipse, including a wholly unobstructed view of the period of totality, from a gloriously scenic hilltop just south of The Dalles, Oregon (across the Columbia from Goldendale, Washington, the spot endorsed by the mass media, which was not nearly so well favored). The temperature dropped about 10 F° during the eclipse; shadow bands were observed at the end of totality, and seemed to be nothing more mysterious than rippling shadows cast by the thin solar crescent shining through ordinary atmospheric turbulence. A beautiful Diamond Ring effect was seen at totality's end.

Your article's reference to eclipse watchers becoming eclipse addicts is certainly understandable; having seen one, I would heartily recommend the experience to anyone who is either interested in science or who can be moved by beauty. I would say that if one has the means, traveling halfway around the world to see a total solar eclipse would be entirely worthwhile.

Bill Ballard
Portland, Ore.

Discrimination at all levels

Joan Arehart Treichel is certainly correct (SN: 2/24/79, p. 120); Candace Pert was discriminated against when denied a Lasker Award for her research on brain peptide-opiate relationships. An even more notorious example of discrimination against outstanding woman scientists is the failure to give the Nobel prize to Jocelyn Bell, who discovered pulsars while a graduate student. (The award went to the professor for whom she worked at the time of her discovery.)

Unfortunately, such discrimination is felt at all levels. For example, J. Schwartz reports (NATURE, vol. 276, No. 5686, p. 310) that "it is common [in Great Britain] for younger women scientists to be given the riskiest research lines since senior researchers tend to take their scientific ambitions less seriously than those of their male colleagues because women bear children." Discrimination starts early in American public schools (SCIENCE, vol. 199, No. 4335, pp. 1320-1) and continues at all educational and employment levels. It is clear that science and humanity would certainly benefit if 50 percent of the population were given a full chance to use their scientific talents to the fullest.

Malcolm K. Claveland
Tucson, Ariz.

Correction: The detection of Jupiter's ring from earth by E. E. Becklin and C. G. Wynn-Williams of the University of Hawaii was not a photographic observation as reported (SN: 3/17/79, p. 172), but an infrared detection at 2.2 microns with an indium antimonide photoconducting detector system. The mentioned comparison — that it appeared about 11 magnitudes fainter than Saturn's rings as seen with the same equipment — referred to that infrared brightness.

SCIENCE SERVICE

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

Board of Trustees — *President*, Glenn T. Seaborg, University of California, Berkeley, CA; *Vice President*, Gerald F. Tape, Associated Universities, Washington, DC; *Treasurer*, Milton Harris, Washington, DC; *Secretary*, Julius Duscha, Washington Journalism Center, Washington, DC; *Allen V. Astin*, Bethesda, MD; *Joseph W. Berg Jr.*, National Research Council, Washington, DC; *Edward Bliss Jr.*, Newburyport, MA; *Bowen C. Dees*, The Franklin Institute, Philadelphia, PA; *David A. Goslin*, National Research Council, Washington, DC; *Elizabeth Neufeld*, National Institutes of Health, Bethesda, MD; *O. W. Riegel*, Glasgow, VA; *Aaron Rosenthal*, Washington, DC; *Edward W. Scripps II*, Edward W. Scripps Trust, Carson City, NV; *John Troan*, Pittsburgh Press, Pittsburgh, PA; *Deborah P. Wolfe*, Queens College of City University of New York, Flushing, L.I., NY

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