

OF THE WEEK

Quake-prediction precautions	308
Nearest galaxy	309
A new quantum number?	309
Galaxy dust-lanes	309
Nuclear safety study	310
Evolution and lungfish	310
Viking gets charged	310
Neuroscience and health	311
Meganeurites and retardation	311

RESEARCH NOTES

Earth Sciences	312
Biomedicine	313

ARTICLES

Nitrogen fixation	314
Alien intelligence?	316

DEPARTMENTS

Letters	307
---------	-----

COVER: Recent research has shed new light on the steps by which microorganisms convert ("fix") nitrogen to a form usable by plants. Pictured is a water fern that receives nitrogen from a microscopic blue-green algae; other plants form root nodules that enclose nitrogen-fixing bacteria. The goal of current research is to improve on nature's system in order to increase crop productivity and quality. See p. 314. (Photo: Charles F. Kettering Foundation)

Publisher	E. G. Sherburne Jr.
Editor	Kendrick Frazier
Senior Editor and Physical Sciences	Dietrick E. Thomsen
Senior Editor and Behavioral Sciences	Robert J. Trotter
Biomedical Sciences	Joan Arehart-Treichel
Biology/Chemistry	Janet L. Hopson
Science and Society	John H. Douglas
Space Sciences	Jonathan Eberhart
Contributing Editor/ Mathematics	Lynn Arthur Steen
Copy Editor	Michelle Galler Riegel
Art Director	Dale Appleman
Assistant to the Editor	Susan Strasburger
Books	Margit Friedrich
Advertising	Scherago Associates, Inc. 11 W. 42nd St. New York, N.Y. 10036 Fred W. Dieffenbach Sales Director

Copyright © 1975 by Science Service, Inc., 1719 N St., N.W., Washington, D.C. 20036. Republication of any portion of SCIENCE NEWS 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., \$10; 2 yrs., \$18; 3 yrs., \$25. (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). Cable SCIENSERV. Telex 64227.

LETTERS

Burden of proof on astrology

Two recent letters protest that for a scientist to speak against astrology without elaborating the "evidence against" it is unjust. The editor appropriately notes that the same issue of *THE HUMANIST* that carried the scientists' statement also carried a number of pages of additional criticism of astrology. I would like to add that at least one book has been written calling attention to specific failures of astrology: *L'Astrologie*, by Paul Couderc, Presses Universitaires de France, 108 Boulevard Saint-Germain, Paris. Unfortunately for most Americans, the book is in French. Its author is an astronomer.

In a larger sense, however, it is idle to call for firm scientific evidence against any superstition such as astrology. It is the essence of superstition that it never guarantees any specific chain of cause and effect, and hence, never makes a crucial test prediction whose failure would destroy the superstition. It would thus be more appropriate for the apologists for astrology to criticize the scientists for ignoring the scientific evidence in favor of astrology, if the apologists can tell us what that evidence is.

Of course one can regard every speculation as true until proven false. Personally, I know of no firm evidence against vampires.

C. B. Stephenson
Cleveland Heights, Ohio

I suppose that those who believe in astrology also cling to the beliefs that there are witches who change people into toads, that the gods control their every movement, that every unoccupied house is haunted by spooks, that there are sea monsters at the end of the earth waiting to gobble up some poor unfortunate ship, that the spirits of the dead dance every Halloween, that the earth is the center of the universe, and that the Great Pumpkin rises out of the pumpkin patch every Halloween to give all those who believe in him presents! And I'll swear to that by my lucky rabbit's foot!!

Kevin Smith
Rogers, Ark.

Re the continued arguments about astrology and all the nonsense "supporting" it: That is rather illogical reasoning on the part of James Kolodzey in his letter.

Although science can and does provide an enormous amount of evidence against this almost universal superstition; it isn't necessary. What is necessary is for the advocates to furnish evidence of the validity of astrology.

If I tell you that there is a little red devil in my basement that I talk to all the time, you (nor science) should not be called upon to prove that it isn't so. The burden of proof rests on me, as does the burden of proof rest on supporters of astrology.

All one needs to do is to read the facts about astrology in any encyclopedia. There should be some Federal law to prevent purveyors of horoscopes advertising in publica-

tions. The gullible should be protected. Under the "sign" of the \$, astrology is a \$100-million hoax.

Some time back Dr. Charles Wahl, professor of psychosomatic medicine at UCLA's Neuropsychiatric Institute, said: "I've seen that astrology and the reliance on horoscopes do decided psychological harm, and my view corresponds with almost all scientifically educated persons, in that astrology is a system of belief maintained without any shred of scientific proof and, like all species of irrationality, it does, in the long run, incredible harm. It also gives charlatans an enormous advantage in preying on the minds of the easily influenced."

Equating astrology with the legitimate sciences is like comparing alchemy with chemistry or faith-healing with medicine. The few predictions which come true are attributed to coincidence. Harold Spencer Jones, distinguished HM Astronomer of the Royal Observatory in Greenwich, England, in 1973 said: "I have had shoals of letters, many of them tragic, telling how the belief in astrology has ruined homes which until one of the partners took it up were very happy ones. I have never seen any argument put forward in support of astrology which would bear the least scientific investigation."

C. D. Craddock
Salt Lake City, Utah

I am very amused at the philosophy expressed by the astrologers that their beliefs must be right because science has not proved them to be wrong. It seems that they are entirely missing the point. It is not the responsibility of science to sanctify astrology; that is the astrologer's responsibility. No scientific theory is ever generally accepted until it has been proved.

John W. Orner
Wilmington, Mass.

The scientists should have kept quiet rather than objecting to astrology because the burden of proof rests with the astrologers. James Kolodzey's letter says, "As far as I know there is no firm evidence against the basis of astrology." Let's have him put out the firm evidence for the basis of astrology.

J. M. Wallace
Pittsburgh, Pa.

Nobel Prize

You erred in your statement that Aage Bohr "is the first person to win the Physics Prize, whose parent also won it. His father . . . Niels Bohr . . . won the 1922 prize . . ." (SN: 10/25/75, p. 261).

Sir Lawrence Bragg won it with his father in 1915.

Sir George Thomson won the prize in 1937, and his father Sir J. J. Thomson won it in 1906.

And we should also include Irène Joliot-Curie daughter of Pierre and Marie Curie, Nobel Laureates of 1935. Although her prize was in Chemistry (1935), it was given for a research very akin to her parents', the synthesis of new radioactive materials.

F. J. López-López
Physics Department
Southwestern College
Chula Vista, Calif.