

AMERICAN ASSOCIATION
FOR THE
ADVANCEMENT OF SCIENCE

Board of Directors

PAUL E. KLOPSTEG, *President*
 CHAUNCEY D. LEAKE, *President Elect*
 WALLACE R. BRODE, *Retiring President*
 H. BENTLEY GLASS
 GEORGE R. HARRISON
 MARGARET MEAD
 THOMAS PARK
 DON K. PRICE
 MINA REES
 WILLIAM W. RUBEY
 ALAN T. WATERMAN
 PAUL A. SCHERER, *Treasurer*
 DAEL WOLFLE, *Executive Officer*

Editorial Board

DONALD J. HUGHES H. BURR STEINBACH
 KONRAD B. KRAUSKOPF WILLIAM L. STRAUS, JR.
 EDWIN M. LERNER EDWARD L. TATUM

Editorial Staff

DAEL WOLFLE, *Executive Officer*

GRAHAM DUSHANE, *Editor*

JOSEPH TURNER, *Assistant Editor*

ROBERT V. ORMES, *Assistant Editor*

CHARLOTTE F. CHAMBERS, SARAH S. DEES, NANCY
 S. HAMILTON, WILLIAM HASKELL, OLIVER W.
 HEATWOLE, YUKIE KOZAI, MILDRED L. MACE,
 ELLEN E. MURPHY, ELEANOR D. O'HARA, BETHSABE
 PEDERSEN, NANCY L. TEIMOURIAN, LOIS W.
 WOODWORTH

EARL J. SCHERAGO, *Advertising Representative*



SCIENCE, which is now combined with THE SCIENTIFIC MONTHLY, is published each Friday by the American Association for the Advancement of Science at National Publishing Company, Washington, D.C. The joint journal is published in the SCIENCE format. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.

Editorial and personnel-placement correspondence should be addressed to SCIENCE, 1515 Massachusetts Ave., NW, Washington 5, D.C. Manuscripts should be typed with double spacing and submitted in duplicate. The AAAS assumes no responsibility for the safety of manuscripts or for the opinions expressed by contributors. For detailed suggestions on the preparation of manuscripts and illustrations, see *Science* 125, 16 (4 Jan. 1957).

Display-advertising correspondence should be addressed to SCIENCE, Room 740, 11 West 42 St., New York 36, N.Y.

Change of address notification should be sent to 1515 Massachusetts Ave., NW, Washington 5, D.C., 4 weeks in advance. If possible, furnish an address label from a recent issue. Give both old and new addresses, including zone numbers, if any.

Annual subscriptions: \$8.50; foreign postage, \$1.50; Canadian postage, 75¢. Single copies, 35¢. Cable address: Advancesci, Washington.

Crowded Spectrum

Radioastronomers have hitherto devoted much effort to siting their radiotelescopes in locations as free as possible from man-made sources of radio noise; the best locations are those remote from transmitters of all kinds and protected by mountains from line-of-sight transmission from distant sources. Even this kind of siting is far from ideal. Radio waves are no respecters of international or spatial boundaries: weak signals of distant origin may bypass the mountains by reflection from the ionosphere. Satellites pose an additional hazard. They broadcast directly and also may reflect waves of earthly origin with enough intensity to interfere with reception by radiotelescopes. When communications satellites are put into orbit the threat will be increased.

Radioastronomers the world over are in general agreement about their needs. Because of the extraordinary sensitivity of their instruments and because weak signals can only be distinguished from background noise by repeated observation and averaging of results, they need certain bands of frequencies that are entirely free of man-made radio waves.

Two major difficulties stand in the way of satisfaction of these needs: in most advanced countries much of the radiospectrum is already allocated for governmental and private use, and international allocations of radio space are controlled by treaty. Thus, any freeing of parts of the spectrum for radioastronomy depends upon new internal and external agreements. It is in this context that the Administrative Radio Conference of the International Telecommunication Union now meeting in Geneva is all-important for the future of radioastronomy. The 84 participating members are attempting to negotiate a new treaty for allocation of radio frequencies.

Radioastronomers in this country have been highly critical of the position of the U.S. delegation, which originally proposed to reserve only the hydrogen line from 1400 to 1427 megacycles per second and to work out other desirable allocations where practical. In anticipation of the current conference, the Federal Communications Commission several years ago made an inquiry on radioastronomy and elicited the opinions of individual radioastronomers. All agreed upon the importance of the hydrogen line, and all wanted other bands reserved, but they did not agree upon which ones. Many of those proposed cut into frequencies now in use by governmental and commercial broadcasters. These could be changed only upon the establishment of superior claims. Our delegation to the Geneva conference could not enter into a treaty that disregarded these domestic commitments. It could, however, get a foot in the door by agreeing to a "resolution" to allocate certain frequencies to radioastronomy. This would not have the force of a treaty, nor would it require Senate ratification, but it would permit gradual readjustment of the requirements and would amount to a statement of intent to support the needs of radioastronomy.

It is gratifying to report that, largely as a consequence of a meeting at the National Academy of Sciences-National Research Council on 16 October between radioastronomers and responsible government officials, including a representative of our delegation to Geneva, the U.S. position at the conference has become much more favorable to radioastronomy.

On 26 October the U.S. delegation, while continuing to ask for reservation of the hydrogen band for the exclusive use of radioastronomy, added 16 others for joint occupancy by present users and radioastronomy. This puts the U.S. closer to the position taken by the U.S.S.R., Great Britain, Belgium, the Netherlands, and others. It improves the outlook for gradual clearing of the desired bands, a step that will give radioastronomy a chance to continue its spectacular exploration of the cosmos.—G.DuS.