LETTERS
Neutron Facilities: P. B. Moore; Polywater on the Highway: J. Shapiro;
Oak Ridge Cancer Treatments: P. L. Johnson; Censorship Charge:

EDITORIAL
Support for Scientific Journals

ARTICLES
Acyclic Stereoccontrol Through the Aldol Condensation: C. H. Heathcock
Carcinogen Testing: Current Problems and New Approaches:
J. H. Weisburger and G. M. Williams
Prehistoric Irrigation Systems in the Salt River Valley, Arizona:
W. B. Masse

NEWS AND COMMENT
MIT Agonizes Over Links with Research Unit
Human-Animal Relationship Under Scrutiny
Reagan's Plan for Nuclear Power
No Boost in Sight for Science Budgets
Germplasm Resources Are Losing Ground
Gore Investigates Radiation Clinic

Briefing: Arms Control Teach-ins Planned by Scientists; NIOSH Move Is
Postponed; French Discuss Reviving 1968 University Reforms; Senate
Gives Blessing to Baby Bell

RESEARCH NEWS
Evolutionary History Written in Globin Genes
Whither the Shoreline?

BOOK REVIEWS
From ENIAC to UNIVAC, reviewed by P. E. Ceruzzi; History of Programming
Languages, B. Randell; Basic Structure and Evolution of Vertebrates,
Mechanisms of Nitrogen Dioxide Reactions: Initiation of Lipid Peroxidation and the Production of Nitrous Acid: W. A. Pryor and J. W. Lightsey........ 435
Metals in Estuarine Sediments: Factor Analysis and Its Environmental Significance: F. Bopp III and R. B. Biggs ................................. 441
Epifluorescence and Video Analysis of Vacuole Motility and Development in Stomatal Cells of Allium: B. A. Palevitz and D. J. O’Kane ......... 443
Complete Nucleotide Sequence and Organization of the Moloney Murine Sarcoma Virus Genome: E. P. Reddy, M. J. Smith, S. A. Aaronson ........... 445
An Efference Copy Which Is Modified by Reafferent Input: C. C. Bell ........... 450
A New Laser Scanning System for Measuring Action Potential Propagation in the Heart: S. Dillon and M. Morad .................................... 453
Blood-Brain Glucose Transfer: Repression in Chronic Hyperglycemia: A. Gjedde and C. Crone .......................................................... 456
Voltage Clamp Studies in Macrophages from Mouse Spleen Cultures: E. K. Gallin ................................................................. 458
Interaction Between the Antibiotic Trichothecenes and the Higher Plant Baccharis megapotamica: B. B. Jarvis et al. ............................... 460
Direct Electrical Connections Between Transient Amacrine Cells in the Catfish Retina: K. I. Naka and B. N. Christensen .............................. 462
Vibratory Communication Through Living Plants by a Tropical Wandering Spider: J. S. Roovner and F. G. Barth ..................................... 464
Choline Stimulates Nicotinic Receptors on Adrenal Medullary Chromaffin Cells to Induce Catecholamine Secretion: R. W. Holt and R. A. Senter 466
Multiple Opiate Receptors: Alcohol Selectively Inhibits Binding to Delta Receptors: J. M. Hiller, L. M. Angel, E. J. Simon .............................. 468
Brain Pyruvate Dehydrogenase: Phosphorylation and Enzyme Activity Altered by a Training Experience: D. G. Morgan and A. Routtenberg 470

PRODUCTS AND MATERIALS

Waveform Generator; Storage for Hazardous Chemicals; Sample Extraction; Low-Temperature Diffractometer Sample Chamber; Acoustic Microscope; Mouse Hybridoma Adjunct Reagents; Literature ....................... 474

C. Patterson; Comparative Physiology and Evolution of Vision in Invertebrates, R. D. DeVoe; Beyond the Atmosphere, D. K. Allison; Books Received ............................................................... 430

Cover
Oblique aerial photograph of a Louisiana salt marsh dominated by smooth cordgrass, Spartina alterniflora. In the marsh interior, Spartina dieback, characterized by sparse vegetation and open water bodies, is evident. Ecophysiological studies show that roots of highly productive streamside Spartina (adjacent to streambanks) respire aerobically, while that of the inland and dieback sites respire anaerobically. See page 439. [R. Boyd, Louisiana State University, Baton Rouge, Louisiana 70803]
Support of Scientific Journals

Offices of scientific societies and editors of their journals are becoming apprehensive about the future of scientific publication. A system that has served science and society well is moving into a phase of increasing financial stress. The Royal Society has conducted a study of scientific publication in the United Kingdom.* A major conclusion is that "a combination of pressures will very soon put the scholarly scientific publication system of the United Kingdom, as of other countries, under considerable strain. Journals are increasingly dependent on the international library market for their income; libraries are suffering cuts in their budgets and are looking for ways to economize; they have to cancel subscriptions to some periodicals on the assumption that material from them if requested can be obtained as loans or photocopies under some interlibrary cooperation scheme. ... Scientists themselves assume that the journal and library system will continue and in general do not wish to see restriction on photocopying. Publishers see this as a severe threat to their existence. New specialized journals continue to be launched.... These new and often expensive journals intensify the librarian's problems."

Prior to World War II, journals published by scientific societies in the United States received most of their financial revenues from members. Today only a minor fraction are supported in that way. Instead, the burden has been shifted largely to the libraries. An example is the structure of financial support for the Journal of Biological Chemistry, sponsored by the American Society of Biological Chemists. This periodical publishes about 12,000 pages a year. It has almost 7000 subscribers, consisting of 5000 nonmembers, who pay $285 each; 1200 members, who pay $100; and 650 students, who pay a nominal rate. Authors are charged $35 a page, but the page charges are not always honored. The result is that nonmembers, mainly libraries, provide about 75 percent of the support. Practices vary among the major societies. A few charge up to $140 a page; some have no page charges. Almost all have higher subscription rates for nonmembers than for members.

Many scientific journals are owned by commercial publishers. They obtain almost all their revenues from libraries. Subscription rates are high, sometimes thousands of dollars a year. Costs range up to 20 cents per page and more, whereas the scientific societies provide material to libraries at usually no more than 3 cents per page.

For more than a decade, costs of periodicals have increased faster than inflation, while library budgets have usually barely kept up with it. Librarians have sacrificed services and procurement of books to maintain their serial collections. Many now find that they must curtail subscriptions. The libraries cannot be counted on to continue to be the sole or major support for scientific periodicals.

The publication of refereed journals is crucial to the health of science. If present modes of support are curtailed, costs must be reduced or additional revenues obtained from other sources. The best way of cutting costs is to reduce the number of pages printed. Today many scientists give priority to publishing as many items and pages as possible. If the goal were to cram information into a limited space, the number of pages could be reduced by a factor of 2 to 4.

Additional revenues might be obtained from page charges. After all, research is not complete until it is published. The federal government might be asked to support scientific publication directly; at present, there is little chance that it will do so. In the end, it may be necessary for the members of scientific societies to contribute more. They already provide substantial support by refereeing articles, but in the future they may be called on for much larger membership fees.—Philip H. Abelson