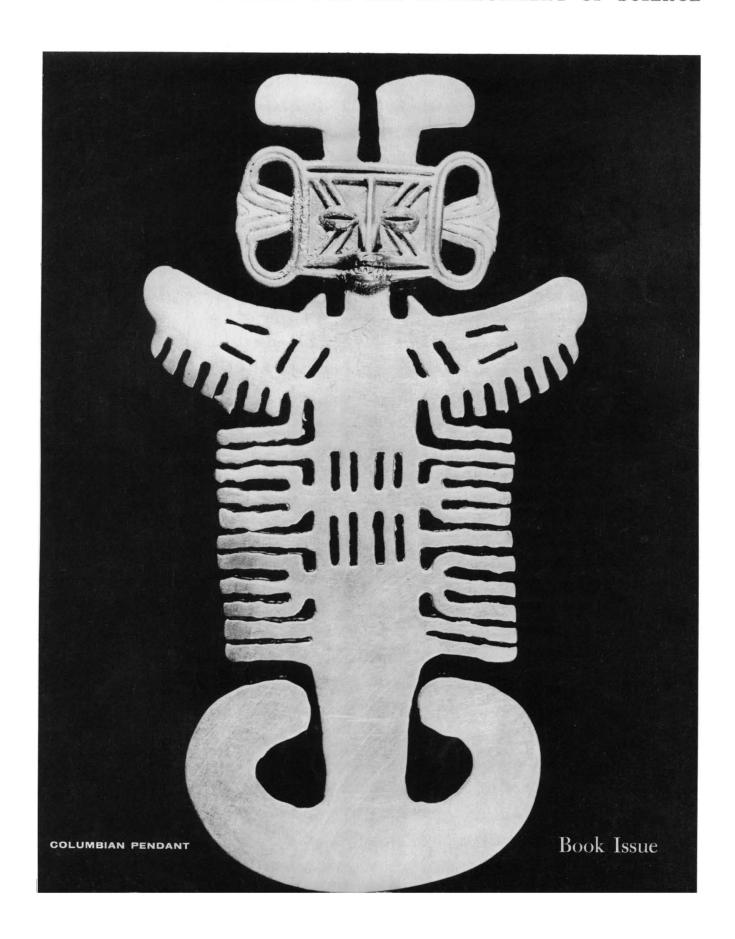
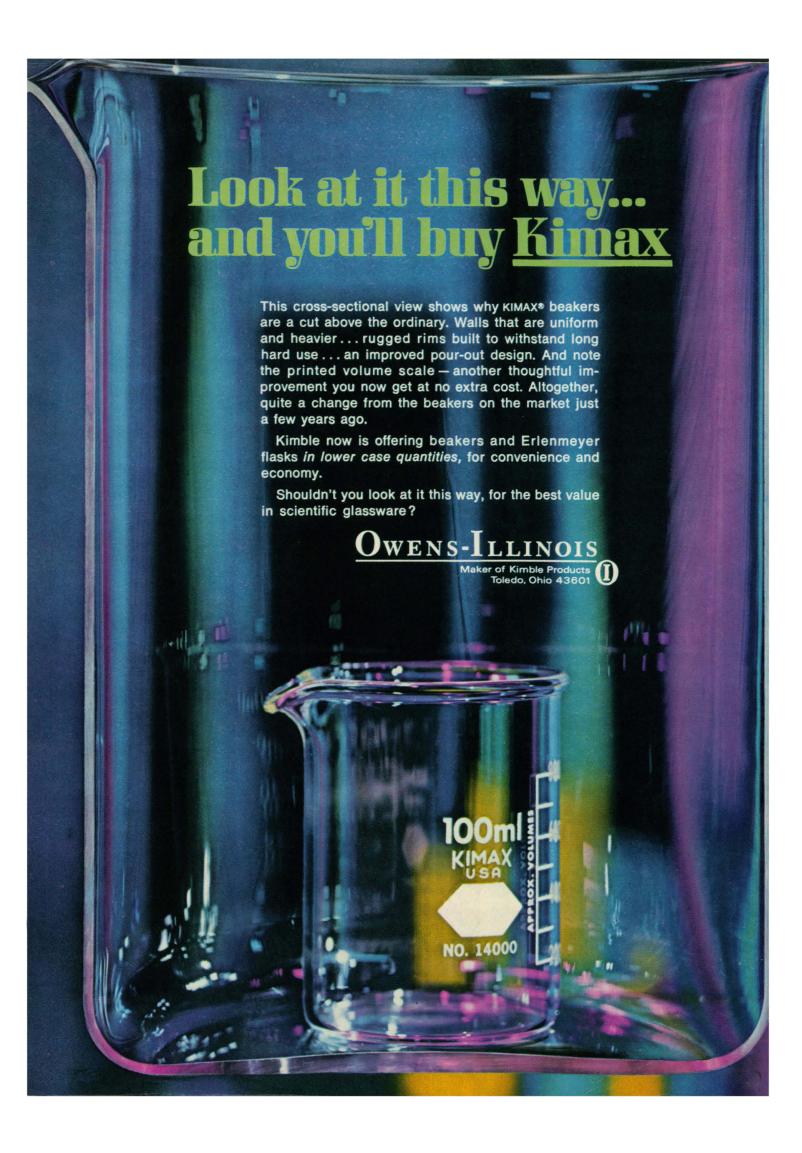
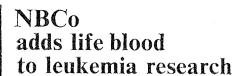
## SCIENCE 13 May 1966 Vol. 152, No. 3724

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE







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1. B. Stearns, K. A. Losee and J. Bernstein. Med. Chem. 6, 201 (1963)

2. G. R. Gale, Biochem. Pharmacol. 13, 1377 (1964)

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## SCIENCE

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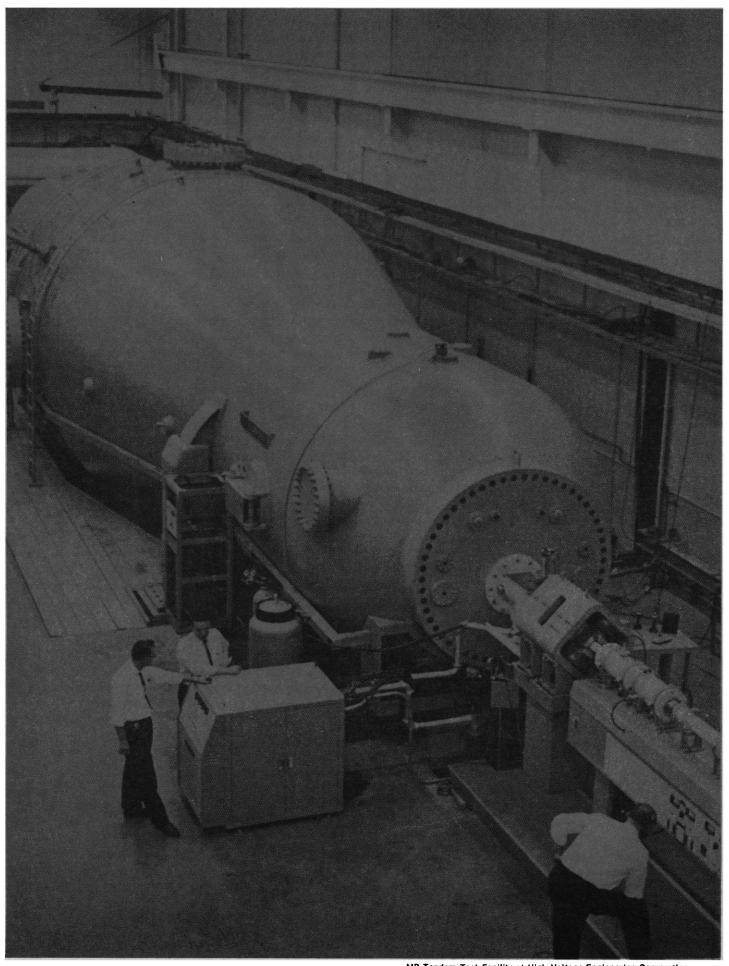
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#### COVER

Gold pendant, Tolima style, Colombia. Although the pre-Hispanic cultures of Colombia never attained political units as large or stable as those of Peru or Mexico, the technological and artistic achievements of the early Colombian cultures were by no means negligible. The complex metallurgical tradition characteristic of a number of these cultures appears at a surprisingly early date. See review of *Colombia*, page 923. [G. Reichel-Dolmatoff, Universidad de los Andes, Bogotá, Colombia; Frederick A. Praeger, Inc., New York City]



MP Tandem Test Facility at High Voltage Engineering Corporation.

SCIENCE, VOL. 152

## New opportunity for heavy element research:

# Uranium ions accelerated to 200 MeV by HVEC Emperor Tandem

Uranium ions have been accelerated to record-high energies exceeding 200 MeV during heavy-ion performance tests of the first completely assembled Model MP "Emperor" Tandem. The tests were carried out at HVEC's MP Tandem Test Facility at Burlington.

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500X photomicrograph of uranium ions accelerated by MP Tandem striking photographic emulsion plate at 10 degree incidence. Note frequent collisions with atomic nuclei in emulsion.



MP Tandem accelerator being installed at Yale University has accelerated proton beams of 20 microamperes in the range from 10 to over 20 MeV. Acceptance tests are now in progress.



MP Tandem accelerator being Installed at Atomic Energy of Canada Ltd.
Chalk River Laboratories achieved 15
MV terminal voltage during initial
test of the electrostatic structure.



#### Now . . .



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#### REFLECTANCE SPECTROSCOPY

By WESLEY WM. WENDLANDT and HARRY G. HECHT, Texas Technological College, Lubbock, Texas. Treats the theory of reflectance spectroscopy in detail and provides thorough descriptions of the instruments involved. Both industrial and research applications are discussed, including reflectance spectra of inorganic compounds, surface studies, high temperature reflectance, and color measurements. Although the technique is not new, it has not been exploited to any very great extent. Volume 21 in the Interscience series, Chemical Analysis. 1966. 298 pages. \$12.00.

#### TRACE ANALYSIS: Physical Methods

Edited by GEORGE H. MORRISON, Cornell University. The first comprehensive treatment of trace analysis using modern physical methods for application in both the physical and biological sciences. The principles, apparatus, scope, general approach, and applications of each method are covered with emphasis on determinations at the parts per billion level. An Interscience Book. 1965. 582 pages. \$16.00.

#### **INSECT SEX ATTRACTANTS**

By MARTIN JACOBSON, U.S. Department of Agriculture, Beltsville, Maryland. Designed as a convenient reference, the book covers completely the field of insect sex attractants, concentrating on their occurrence, biology, isolation, chemistry, mechanisms of action, and present and potential uses in survey and control programs. An Interscience Book. 1965. 154 pages. \$7.75.

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By BELA A. LENGYEL, San Fernando Valley State College. Emphasizes ideas and principles ideally suited to the reader with moderate general knowledge of atomic physics and electronics, who aims for an understanding of lasers of all types. Starting with the physical principles, the reader is introduced to the multitude of processes employed in modern laser technology. 1965. 311 pages. \$8.95.

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Introduction to Lake Biology and the Limnoplankton By G. EVELYN HUTCHINSON, Yale University. Begins with a modern account of the origin and nature of the freshwater biota, continues with a brief formal discussion of the division of the communities of lakes into appropriate parts, and concludes with a thorough treatment of all aspects of the plankton with the exception of their productivity. 1966. Approx. 1048 pages. Prob. \$29.00.

#### METHODS OF BIOCHEMICAL ANALYSIS Volume 14

Edited by DAVID GLICK, Stanford University Medical School. The latest volume in this annual series that forms a collection of authoritative methods, procedures, and techniques for the determination and assaying of biologically important substances and systems. Judicious selection of topics emphasizes developments and innovations of current interest. The volume presents a review of recently developed or improved methods used in biochemistry, critically evaluates them, and recommends and describes the best analytical procedures. An Interscience Book. 1966. 562 pages. \$15.00.

#### METHODS OF VITAMIN ASSAY Third Edition

Edited by MYER FREED, Senior Chemist, Dawes Laboratories, Inc., Chicago. A handbook of vitamin assays designed for the convenience of the analyst. Revised and expanded, this is a modernization of a classic working tool for the laboratory, including general information about vitamins, and directions for equipment and technique. New chapters on Vitamins D and E have been added, and the one on Vitamin B<sub>12</sub> has been completely rewritten. An Interscience Book. 1966. 424 pages. \$14.00.

#### POLAROGRAPHIC TECHNIQUES Second Edition

By LOUIS MEITES, Professor of Analytical Chemistry, Polytechnic Institute of Brooklyn. A greatly expanded new edition of a book that was enthusiastically received in the first edition by chemists using polarography and other electroanalytical techniques in their analytical and research work. Special emphasis has been placed upon the relationships among polarography and solid- and stationary-electrode voltammetry, amperometry, chronopotentiometry, controlled-potential electrolysis, coulometry, stripping analysis, and other recently developed techniques. An Interscience Book. 1965. 752 pages. \$19.50.



#### As Traditionally . . .

#### OXIDASES AND RELATED REDOX SYSTEMS Proceedings of a Symposium held in Amherst, Massachusetts, July 15-19, 1964 In two volumes

Edited by TSOO E. KING, Oregon State University; HOWARD S. MASON, University of Oregon Medical School; and MARTIN MORRISON, City of Hope Medical Research Institute, Duarte, California.

The International Symposium on Oxidases and Related Oxidation-Reduction Systems brought together the world's leading authorities on oxidases and related enzyme systems that catalyze reactions involving oxygen. They were encouraged to synthesize their contributions, to point out the major problems and to speculate on possible solutions. The subject matter ranges from the fundamental chemistry of oxygen to the highly organized subcellular particulates containing the enzyme systems that catalyze the cellular reactions of oxygen. The articles are arranged according to the increasing complexity of the system under study. The book features: fundamental processes of respiration and energy conservation; respiratory processes, basic enzymes and new techniques of study; biochemistry of subcellular particulates; studies of subcellular systems involved in the metabolism of drugs, and perhaps hormones; cellular respiratory processes and oxygen utilization. 1965. 1144 pages. \$32.50.

#### **ASTRONAUTICS FOR SCIENCE TEACHERS**

By JOHN G. MEITNER, Stanford Research Institute. (With 9 co-authors). The first and only text on astronautics specifically prepared for science teachers. The book was written by experts in the various fields of astronautics, who are also experienced lecturers and writers. 1965. 381 pages. \$8.95.

#### VITAMINS AND COENZYMES

By ARTHUR F. WAGNER and KARL FOLKERS, both of The Merck Sharp & Dohme Research Laboratories Division of Merck & Co., Inc., Rahway, New Jersey. A comprehensive summary of twentieth century research, this book offers a complete and carefully documented picture of the chemistry of vitamins and coenzymes. For every known vitamin or cofactor, it provides up-to-date, detailed discussion of isolation . . . structure determination . . . organic synthesis . . . biosynthesis . . . metabolic role . . . mechanism of action . . . biological activities . . . and therapeutic role in animals and humans. An Interscience Book. 1964. 532 pages. \$17.50.

#### PLANT BIOCHEMISTRY

By GEZA DOBY; revised edition translated by I. Finály. A broadly conceived treatment of the subject with emphasis, particularly in Part I, on the logical sequence of the processes of metabolism. After a short survey of biocatalysts participating in all processes, first the assimilation of carbon, then the metabolism of carbohydrates as primary compounds are discussed. An Interscience Book. 1966. Approx. 772 pages. Prob. \$25.00.

#### INSOLUBLE MONOLAYERS AT LIQUID-GAS INTERFACES

By GEORGE L. GAINES, General Electric Research Laboratory, Schenectady. Discusses thoroughly the properties of insoluble monolayers on liquid surfaces. The book describes the methods by which layers may be studied, with details of a large number of experimental techniques. A volume in the Interscience series, Monographs on Physical Chemistry. 1966. 386 pages. \$14.00.

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#### THE GLASS ELECTRODE

Authors: G. EISENMAN, R. BATES, G. MATTOCK, and S. M. FRIEDMAN. A timely and useful reprint volume combining chapters on the glass electrode that have appeared recently in four different publications of Interscience Publishers and John Wiley and Sons, Inc. Paper: 1966. 332 pages. \$7.00.

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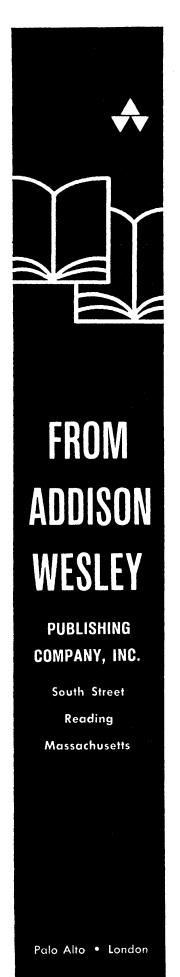
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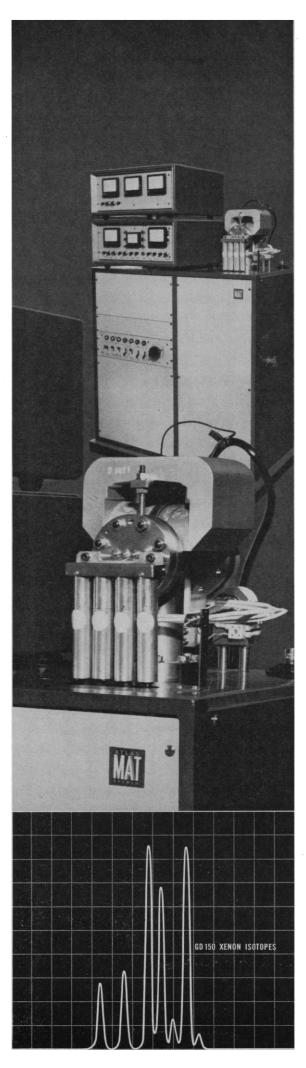
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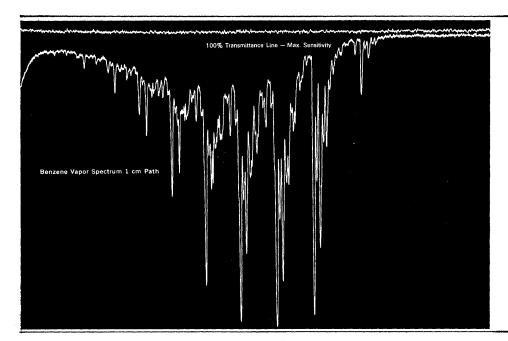
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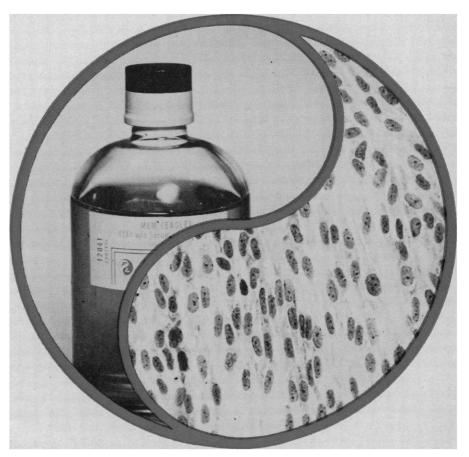
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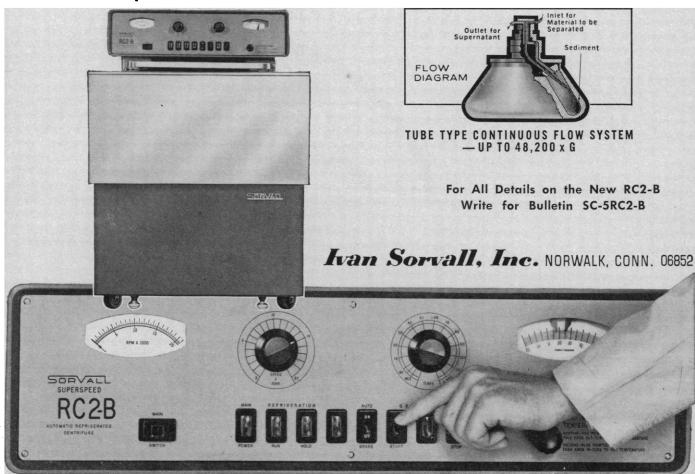
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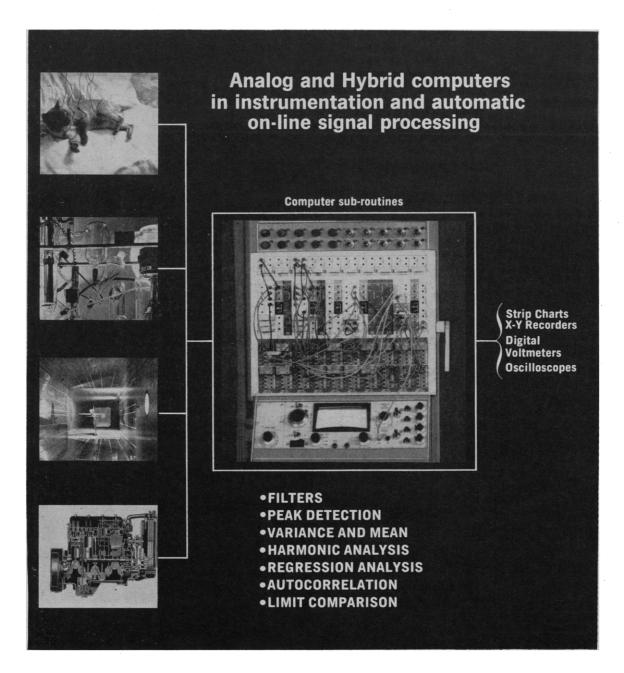
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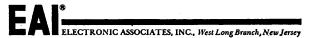
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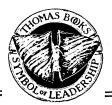
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MEDICAL CARE: Social and Organizational Aspects compiled and edited by Leslie J. DeGroot, Harvard Medical School, Boston. (With 40 Contributors) Physicians must be increasingly concerned with a variety of social and economic forces impinging on the time-honored doctor and patient relationship. The test as presented is organized as a sort of pilgrim's progress through medical practice... beginning with the selection of medical students... progressing through a consideration of undergraduate and postgraduate medical education... continuing with sections on the structure and function of university and community hospitals... and concluding with an analysis of the agencies—both public and private—that now so importantly influence medical practice. Current problems in each area are thoroughly examined. June '66, 552 pp., 11 il., 15 tables, \$16.50

PHYSICIAN-GENERALS IN THE CIVIL WAR: A Study in Nineteenth Mid-Century American Medicine by Paul E. Steiner, Univ. of Pennsylvania, Philadelphia. This is a unique study of thirty-three physicians who served in nonmedical capacities during the American Civil War. An attempt is made to determine the significance of this phenomenon . . . a peculiar feature of American history which has never been repeated. The lives of the thirty-three physician-generals are studied in depth . . . their early environment, primary education, medical and postdoctoral training, medical practice, and extramedical interests both before and after the war. A remarkably clear picture of American medicine and medical education in the middle of the nineteenth century emerges as does the part played by physicians in the Civil War. April '66, 216 pp., 33 il., 6 tables, \$8.00

- □ SELECTED READINGS IN THE HISTORY OF PHYSIOLOGY (2nd Ed., Revised, Enlarged, and Reset) Compiled by John F. Fulton (Late Sterling Professor of the
  History of Medicine.) Completed by Leonard G. Wilson.
  Both of Yale Univ., New Haven, Conn. Jan. '66, 618 pp.
  (6¼ × 9¾), 108 il., \$14.50
- ☐ THE DISADVANTAGED AND POTENTIAL DROPOUT:

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  Compiled and edited by John Curtis Gowan, San Fernando

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  Demos, California State College at Long Beach. (45 Contributing Authors) April '66, 644 pp., 10 tables, \$18.50
- ☐ THE USE OF DIAGNOSTIC ULTRASOUND IN BRAIN DISORDERS by Charles C. Grossman, Presbyterian-University Hospital, Pittsburgh. Feb. '66, 172 pp., 146 il., \$9.00
- □ VECTORS AND VICTIMS: Being a Collection of Essays
  About Flies Without Zippers and Other Nuisances of Man
  by Joseph Hirsh and Herman Zaiman, both of Albert Einstein College of Medicine, New York City. '65, 80 pp.,
  \$4.25
- ☐ RADIATION ACCIDENTS AND EMERGENCIES IN MEDICINE, RESEARCH, AND INDUSTRY edited by Lawrence H. Lanzl, Argonne Cancer Research Hosp., Chicago; John H. Pingel, Argonne National Laboratory, Argonne; and John H. Rust, Univ. of Chicago, Ill. (With 31 Contributors) '65, 352 pp., 32 il., 10 tables, \$11.75.
- ☐ MENTAL HEALTH FOR STUDENTS: A Guide for Adjusting to College by Arthur G. Nikelly, Univ. of Illinois Health Service, Urbana. Feb. '66, 224 pp., \$7.50
  - EXPERIMENTAL PARAPSYCHOLOGY: A Review and Interpretation by K. Ramakrishna Rao, Duke Univ., Durham, N. C. April '66, 268 pp., \$9.50
- ☐ THE COLOR ATLAS OF INTESTINAL PARASITES (2nd Ptg.) by Francis M. Spencer, San Angelo Medical and Surgical Clinic, Texas, and Lee S. Monroe, Scripps Clinic and Research Foundation, La Jolla, Calif. Jan. '66, 160 pp., 260 il. (232 in full color), \$9.50
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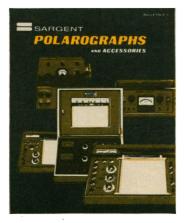
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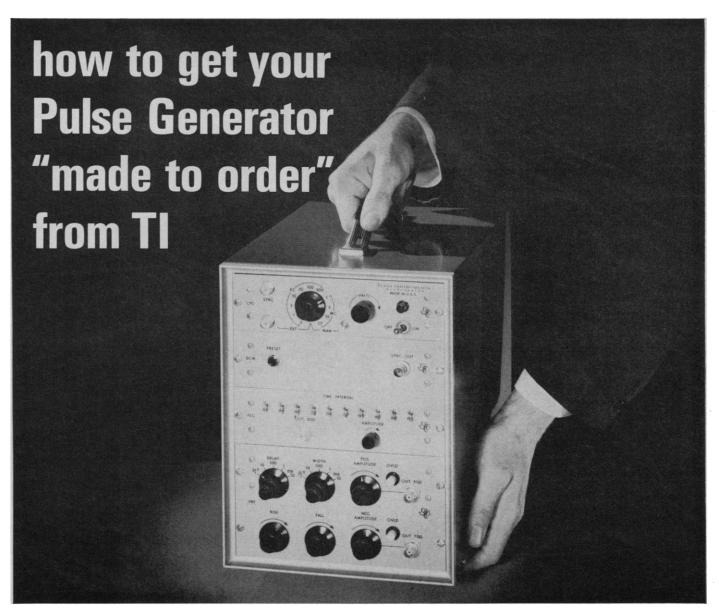




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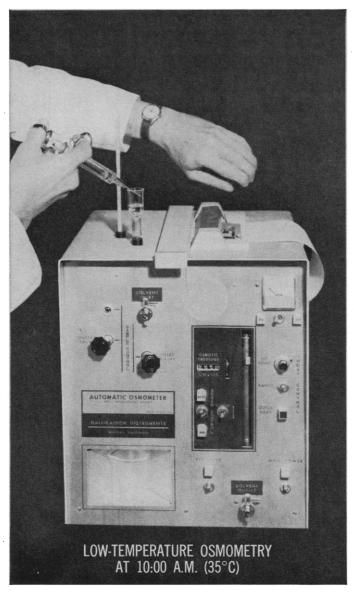
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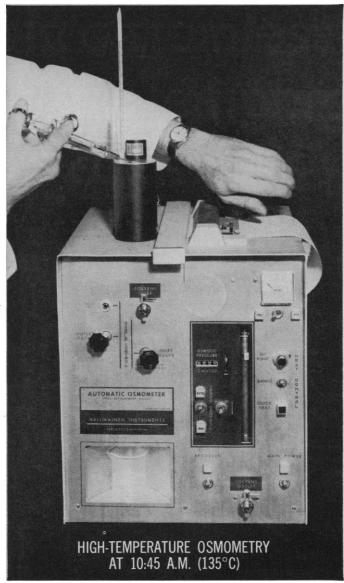
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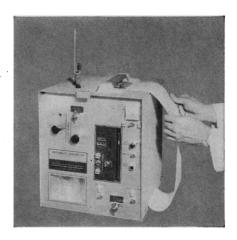
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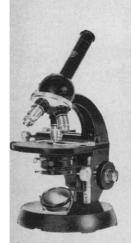
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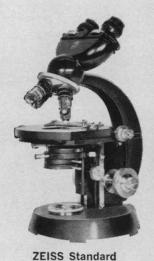
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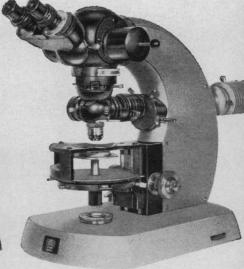
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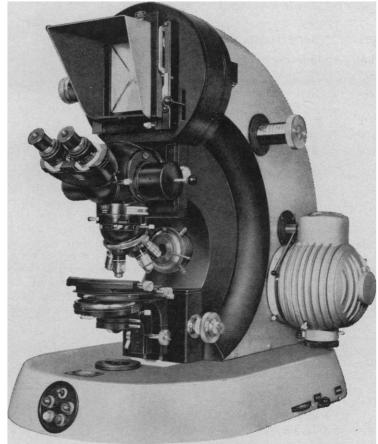
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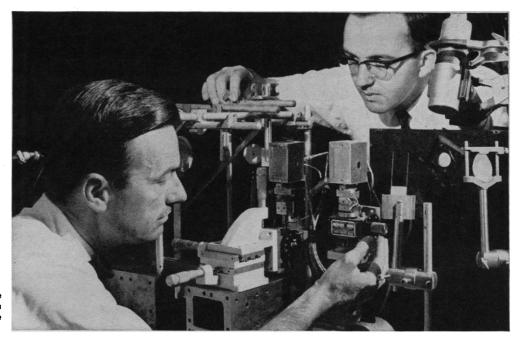


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R. C. Miller (left) and J. A. Giordmaine check the alignment of the crystal in which variable-frequency, laser-type light is generated.

#### A Tunable Source of "Laser" Light

A narrow beam of light, as generated by a laser, appears to offer many desirable qualities as a possible medium of communication. Individual lasers, however, operate at separate, discrete frequencies. For communications, tunable sources of light comparable to the variable-frequency oscillators used in radio work are useful.

Recently, Bell Telephone Labora-

tories scientists J. A. Giordmaine and R. C. Miller demonstrated an experimental tunable source of this type. Operating on parametric oscillation principles at optical frequencies (see illustration below), the device uses a crystal of lithium metaniobate, which is "pumped" by a laser beam. The device emits two beams, each of which is tuned by changing the temperature

of the crystal. With the present model an 11° C temperature change produces a 6 percent change in output wavelength of each of the beams.

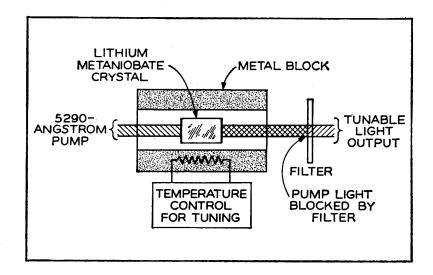
Tunable, coherent sources represent a versatile scientific tool of importance for optical spectroscopy. In other applications, they could function as local oscillators in optical-frequency superheterodyne receivers.

Operating features of tunable source based on parametric oscillation at optical frequencies: "pump" light from laser enters lithium metaniobate crystal at left, and, as a consequence of parametric oscillation, two additional beams are produced in the crystal. End surfaces of crystal, to which dielectric coatings have been applied, are partially reflecting. From right end emerge the two beams, plus the pump light, which is blocked by the filter.

The principles governing parametric oscillation include the conservation of the energy and momentum of the interacting photons. As a consequence of energy conservation, the sum of the two output frequencies equals that of the pump. These output frequencies vary with temperature since the crystal's temperature-dependent index of refraction controls photon momentum in the beams.

In current work, the second harmonic of a pulsed calcium tungstate/neodymium-doped laser provides the required 7 kilowatts of pump power. Pump frequency of 5.7 x  $10^5$  gigacycles (5290A wavelength) produces output frequencies ranging from about 2.6 x  $10^5$  gigacycles (11,500A) to 3.1 x  $10^5$  gigacycles (9700A), depending on temperature.

Lithium metaniobate, whose unique optical properties are essential to this effect, was first investigated in detail at Bell Laboratories where, also, large optical-quality crystals for this experiment were grown.



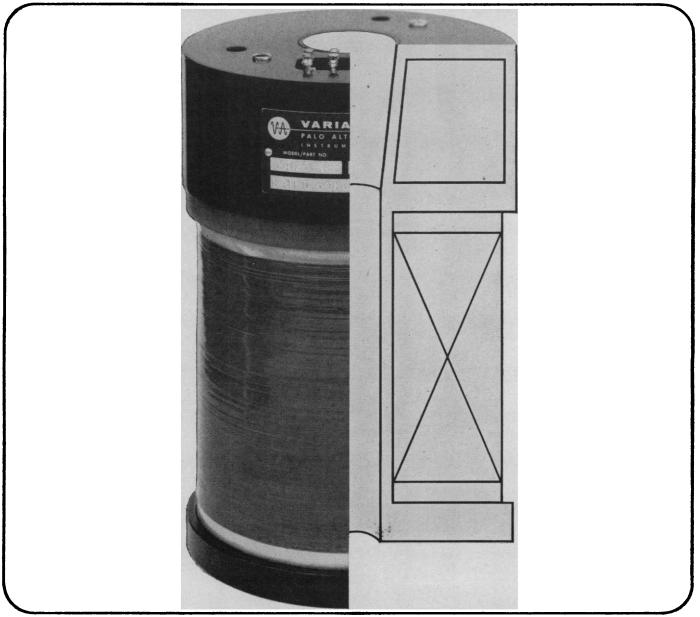




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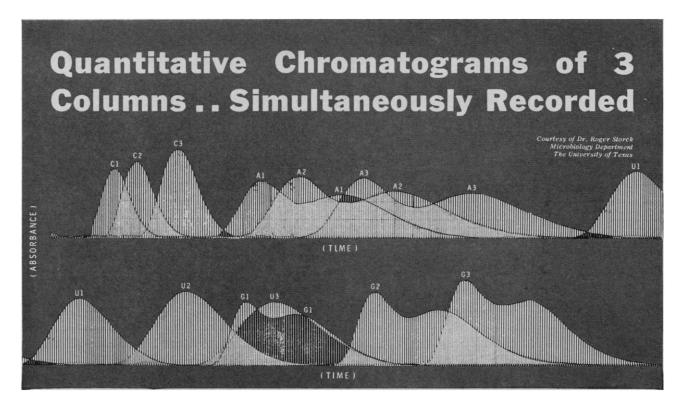
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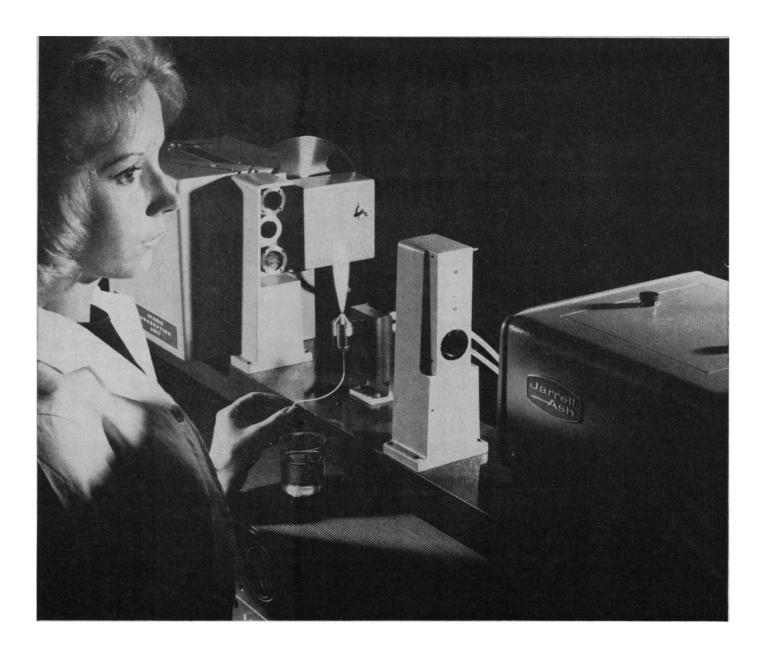
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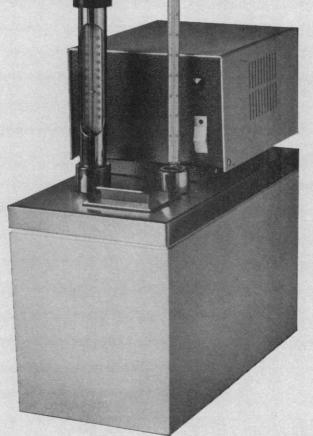
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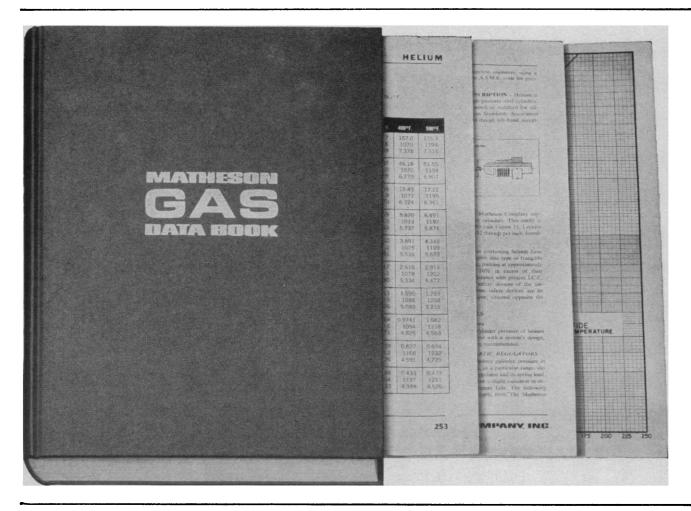
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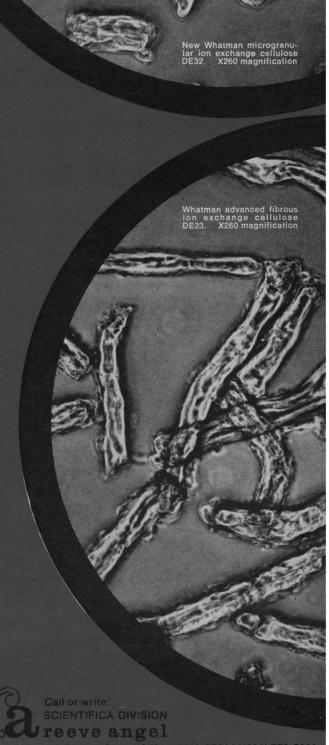
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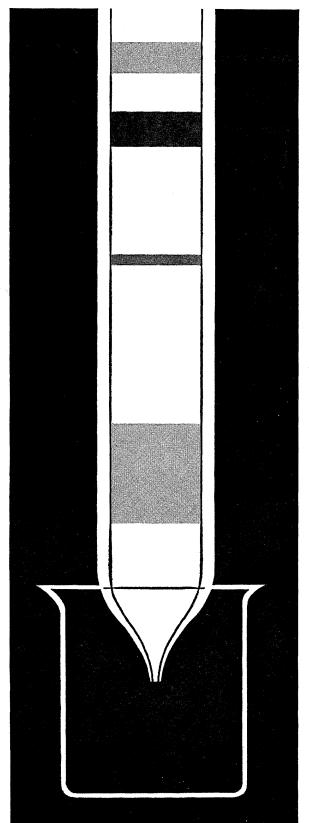
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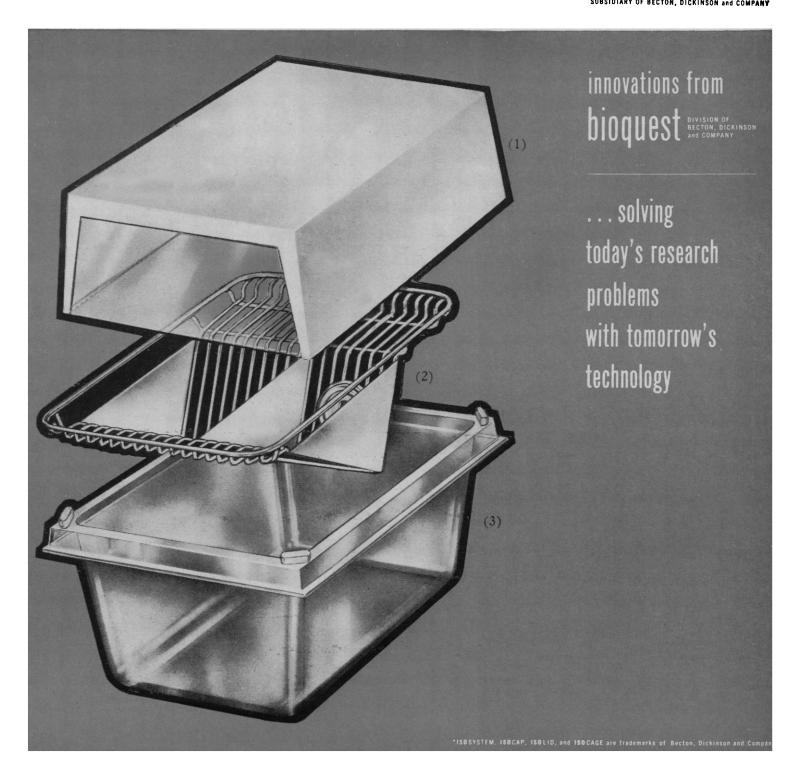
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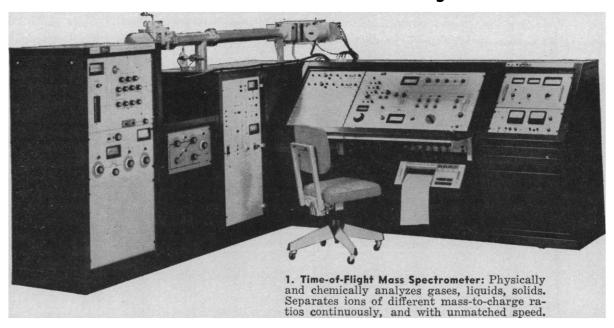
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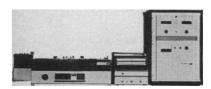
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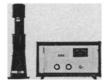
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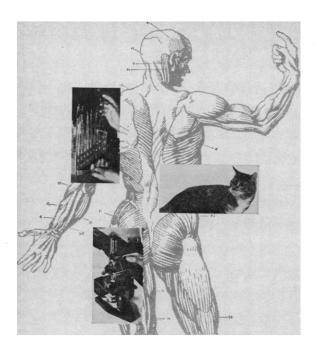
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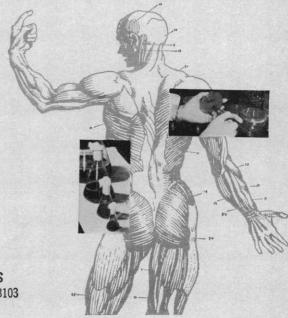
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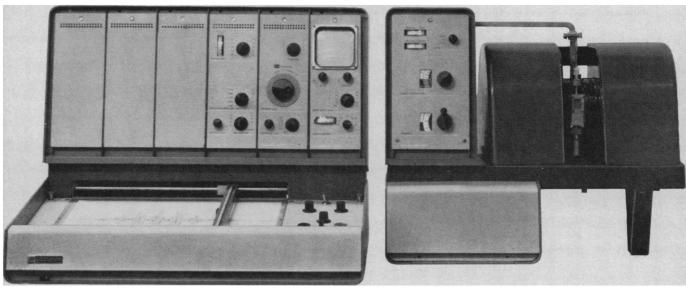
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1914 Rosemary Hills Drive, Silver Spring, Maryland

... There is little doubt that India and other countries would benefit by having more science. Further, studies in anthropology and sociology indicate that it is easier to export technology than either social organization or ideology. But I would like to suggest that it is not a simple matter to transplant any particular item of culture, and some items would have no meaning in the new environment. What might be more important is that the more advanced culture should not be guilty of operating from the outmoded theory of technological determinism. There must be significant social, economic, political and educational reforms in the less advanced country in order to provide at least a minimally fertile environment for the new technology.

Professionals in social work in the United States have learned that financial assistance is necessary. They have also learned that it is useless in changing persons or the way they live. We must give the people the "hook and line." In this case, it is going to be skills and attitudes. I suggest that the fundamental research that is most immediately needed in underdeveloped countries might be on social problems rather than in electronics.

WILLIAM H. GULLEY Department of Anthropology and Sociology, Eastern Kentucky State College, Richmond

... The terrible weakness of our socalled foreign aid is that it is based not on what underdeveloped countries want but on what we wish to give them. Many representatives of foreign governments have pleaded for scientific equipment so that they could handle their problems directly. Most of these appeals have fallen on deaf ears or are sidetracked by red tape. Pakistan, for example, is planning a university at Islamabad with a curriculum centered upon technical education. It has already allocated funds for instructors (some of whom only the U.S. can supply) and buildings. What it wants is technical and scientific equipment. Scientists and equipment manufacturers who have been approached in this country evince most favorable attitudes, but our government people are ambivalent. Indeed, Pakistan has been excluded from conferences on Asia, and at this writing that slighted nation is entering into treaties with China. . . .

The press in this country is almost unanimous in stressing what it calls the social, political, and economic problems in Asian countries. The State Department is much concerned with persuading those countries to change their policies. But the nationals regard this as interference. They desire help from our skilled technicians, and tools and equipment, but they want to make their own policies. The lack of sympathy abroad with our aims in Viet Nam arises almost entirely from the observation that we insist on giving countries what we think is good for them rather than what they ask for. If we gave them the technical assistance they desire, we would make friends all over the world, and we should then not have to bother about anything else.

SAMUEL L. LEWIS
772 Clementina Street,
San Francisco 3, California

Abelson opens his editorial with a proverb: "An alms-giver throws a starving man a fish, whereas a truly charitable man gives him a hook and line." Eight hundred years ago another scientist-philosopher, Moses Maimonides (1135-1204, Spain-Egypt), systematically elaborated on this profundity. In a chapter on "giving to the poor" in his Mishneh Torah (Recapitulation of the Law, 1180), he erected an eight-rung ladder of intelligent philanthropy: (i) giving grudgingly, (ii) giving graciously but inadequately, (iii) giving after solicitation, (iv) giving before solicitation, (v) giving to an unknown beneficiary who knows not the donor, (vi) giving to a known beneficiary who knows not the donor, (vii) giving and receiving in absolute anonymity, (viii) giving not a grant but a loan or a job-an opportunity to emerge self-reliant. Maimonides' catechism, designed for guidance of individuals, has implications for the few rich nations luxuriating and blundering amid the impoverished family of man.

ELY E. PILCHIK

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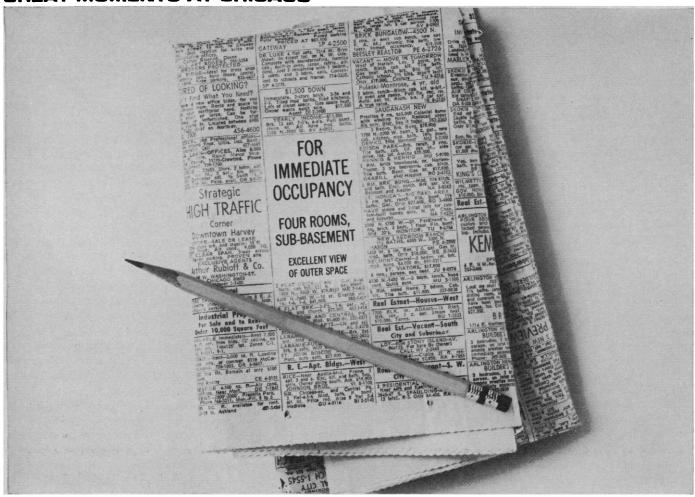
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# **Transforming the National Science Foundation**

A bill now before Congress (H.R. 13696) proposes several changes in the nature and organization of the National Science Foundation. If these changes are adopted, the social sciences will be explicitly included; international responsibilities will be increased; and responsibility for supporting research will be extended to include applied research in areas related to national goals. There will also be organizational changes. The status of the Director will be enhanced, and he will be given a substantial part of the authority and responsibility that hitherto have been assigned to the National Science Board. The National Science Board, relieved of managerial responsibility, is expected to become a more important policy-forming body, with special responsibility for national policy concerning science resources. And it will be expected to publish an annual report on the status and health of science and its disciplines, giving an indication of the aspects of science which may have implications for the needs of American society.

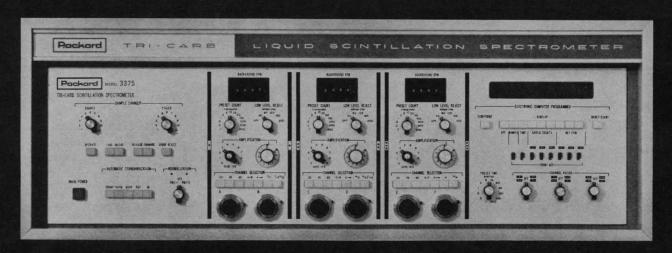
Congressman Daddario, author of H.R. 13696, said in Science (1 Apr., p. 42) that these changes are necessary because the Foundation has not keep pace with social demands, and that they are intended to give the Foundation a more positive and dynamic stance in government-science affairs. They are not, however, intended to diminish the support of general-purpose basic research or to detract from the Foundation's primary role of supporting science without regard to specific applications.

Testimony presented at recent hearings was generally favorable to the proposals, but endorsement of the idea of having the Foundation move into applied areas was sometimes reluctant. William Carey said that the Bureau of the Budget considered the judgment a close one but did not object, and he then added the hope that the Foundation would use the new authority "in a selective way and not at the expense of its primary function of supporting basic research." Frederick Seitz, president of the National Academy of Sciences, warned that the danger is far from remote that we would "pay a heavy price by sacrificing positions of leadership in important fields of science."

If the changes are adopted, it seems likely that the Foundation will receive larger appropriations, that it will assume a more influential role in determining the course of science, and that it will become more clearly a part of the centralized machinery of government directed toward the achievement of national goals. It will not become as missionoriented as are the Atomic Energy Commission and the Department of Defense. Yet it will move closer to that status. In addition to evaluating projects submitted to it, it will actively select areas of research to be emphasized. Decisions as to what to support and how to use the Foundation's resources will become more centralized, more the responsibility of the Director and his staff, and he, in turn, will become more clearly accountable to the Congress and the President for the achievements of the Foundation.

These changes will give the Foundation enlarged opportunities to be useful. But the larger opportunities must be paid for. Political vulnerability will increase. Pressures will increase, and may come from more points of the compass. There will be risk that short-term objectives will take precedence over long-term goals. If the changes are made, as they probably will be, the National Science Board and the Director will be responsible for protecting the Foundation against paying too high a price for its new opportunities.—DAEL WOLFLE

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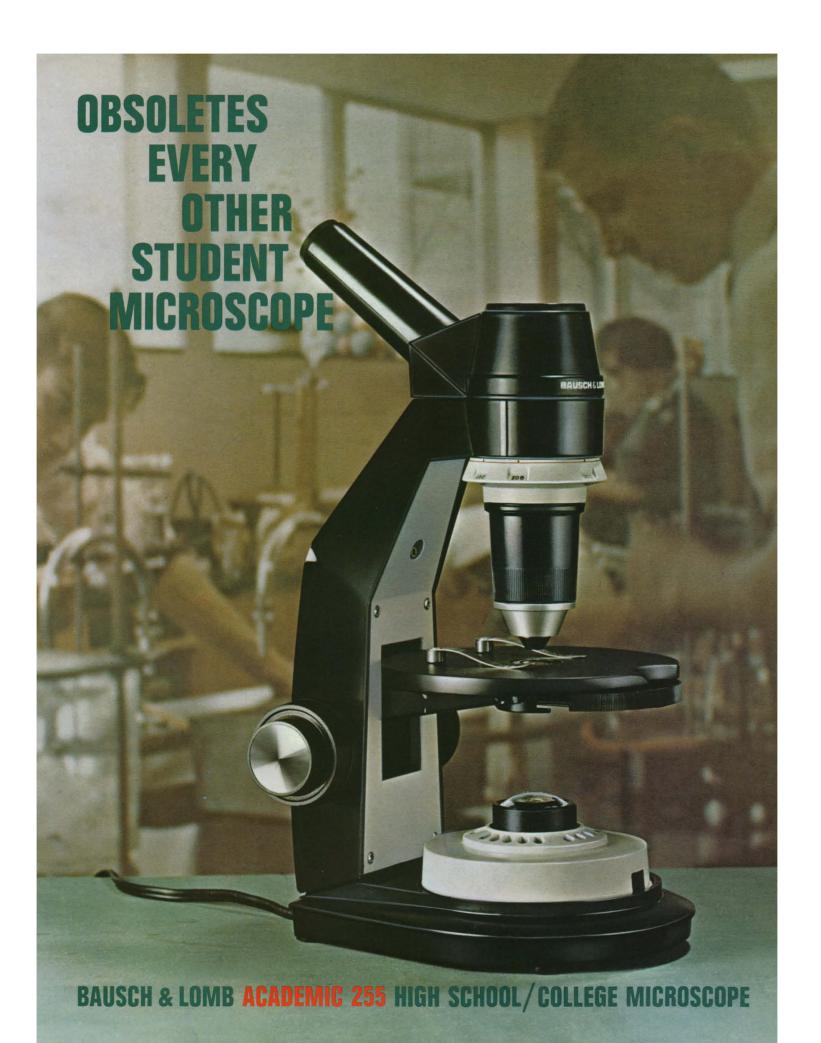


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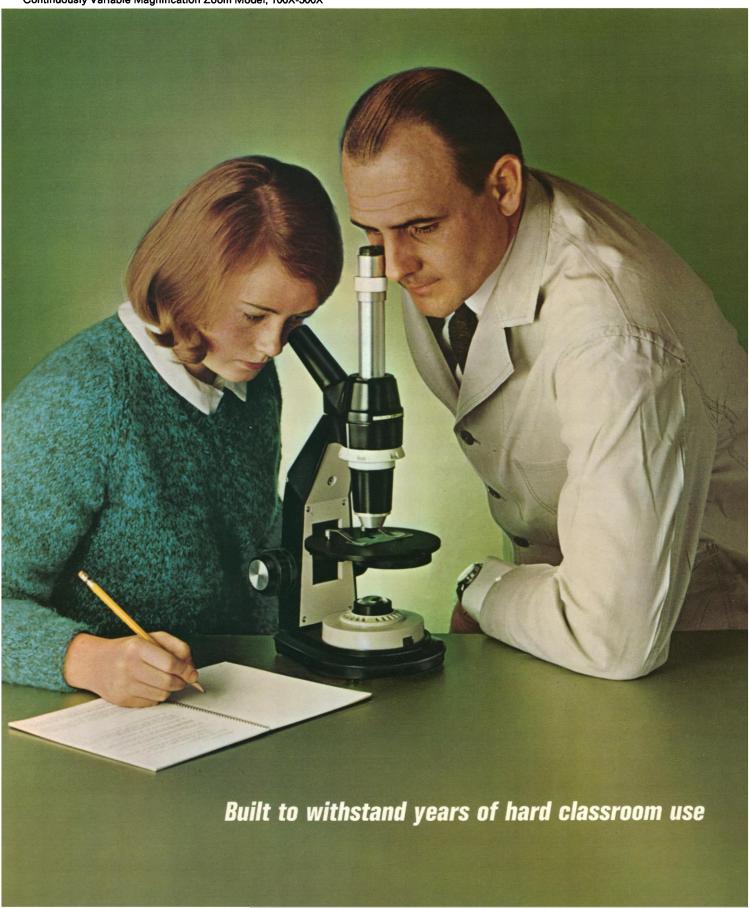
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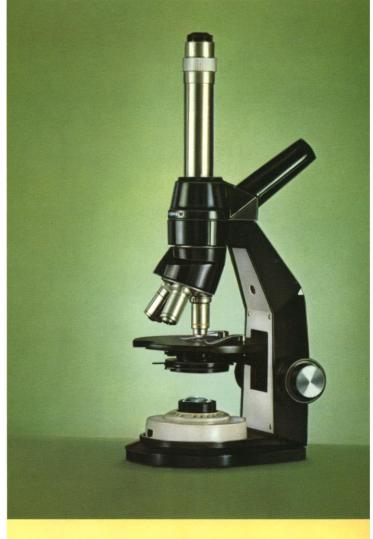
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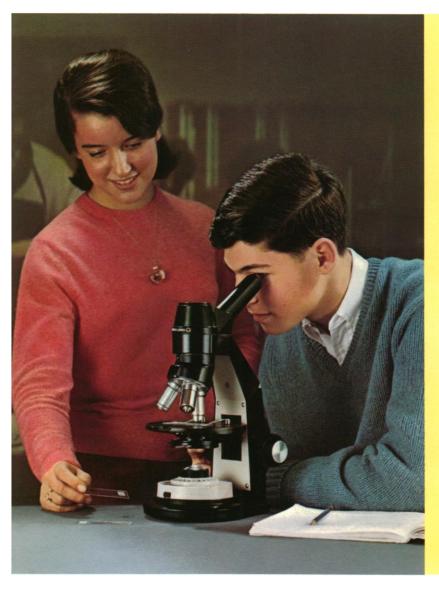
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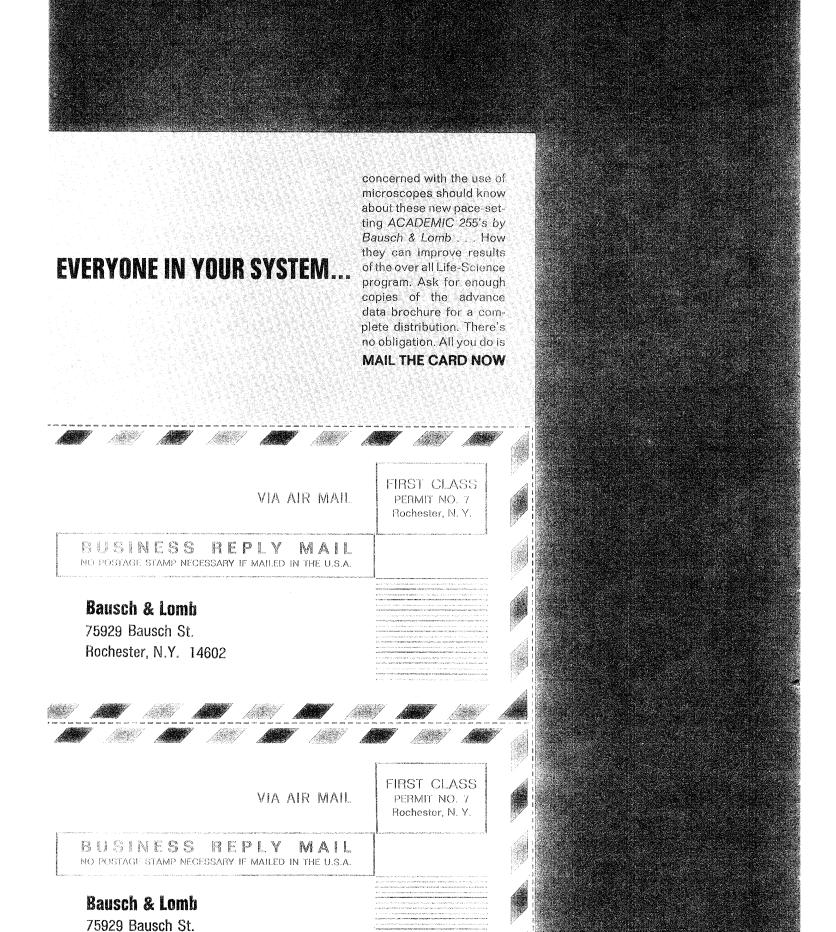
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Andes 2: Excavations at Kotosh, Peru, 1960, Seiichi Izumi and Toshihiko Sono (Kadokawa Publishing), 7 May 1965, 796
Archaeology of New York State, The, William A. Ritchie (Natural History Press), 11 Feb. 1966, 677

Archeological Investigations in the Parita and Santa Maria Zones of Panama, John Ladd (Smithsonian Institution), 19 Nov. 1965, 1017

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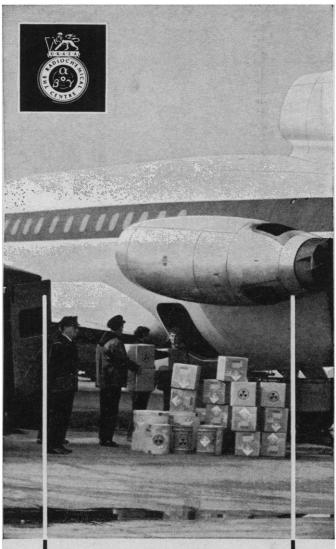
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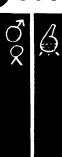
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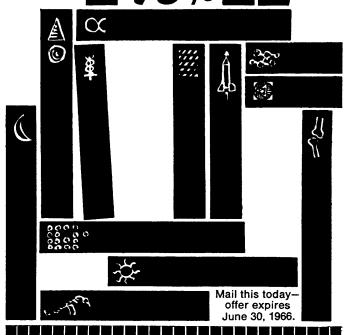
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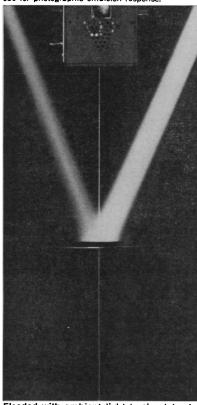
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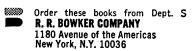
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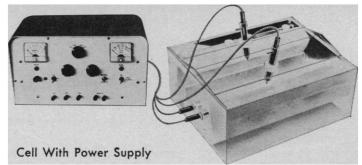
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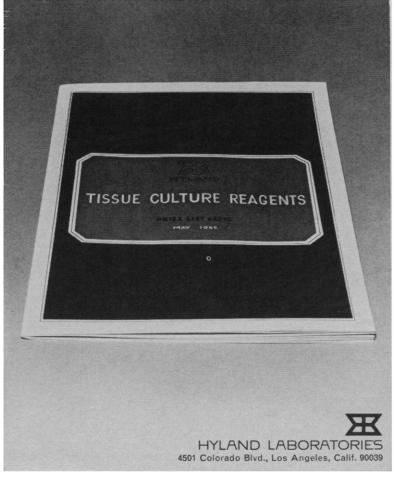
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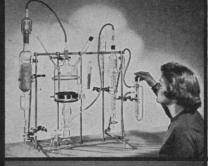
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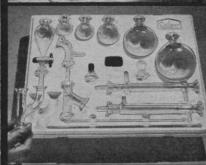




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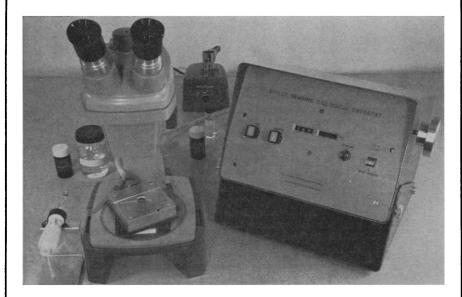
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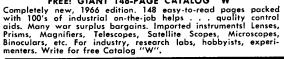
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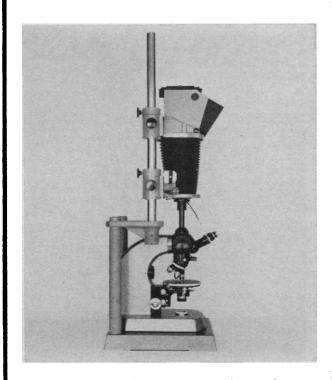
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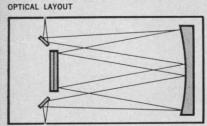
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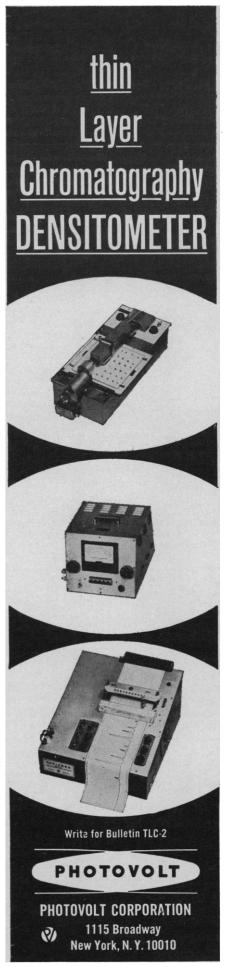
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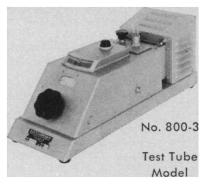
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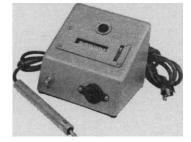
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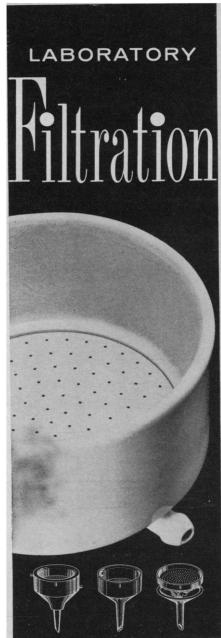
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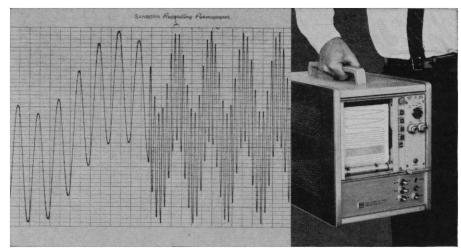
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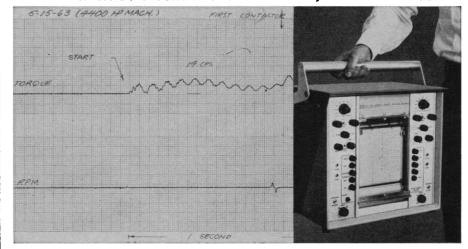
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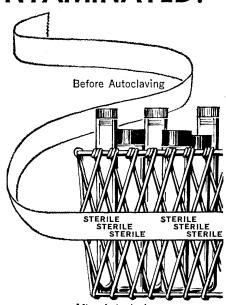
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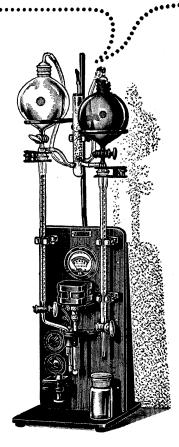
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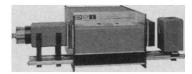
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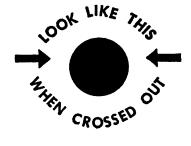
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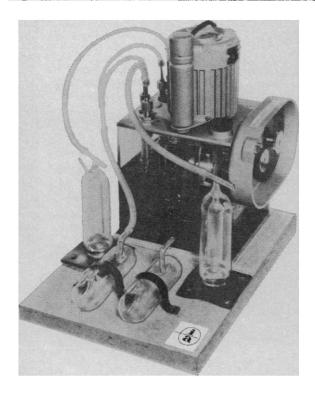
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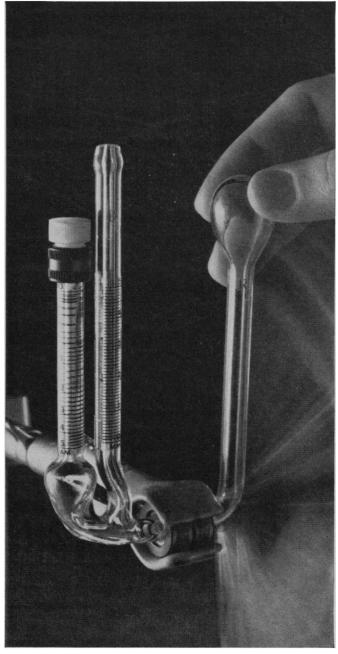
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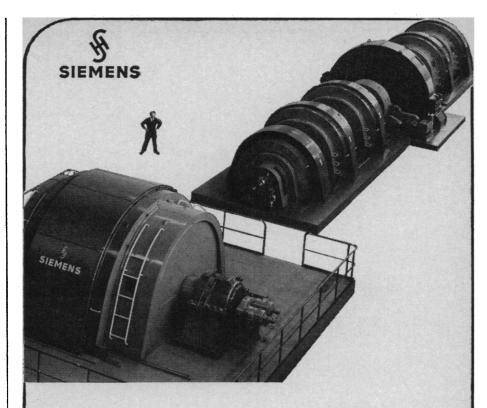
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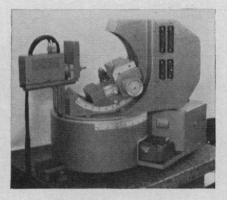
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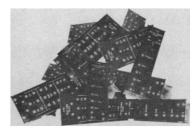


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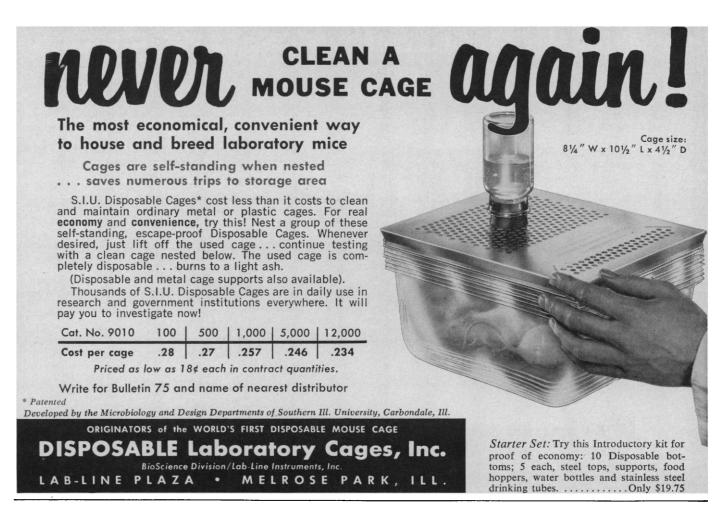
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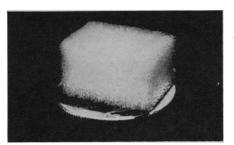
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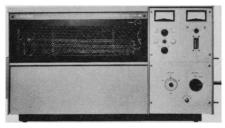


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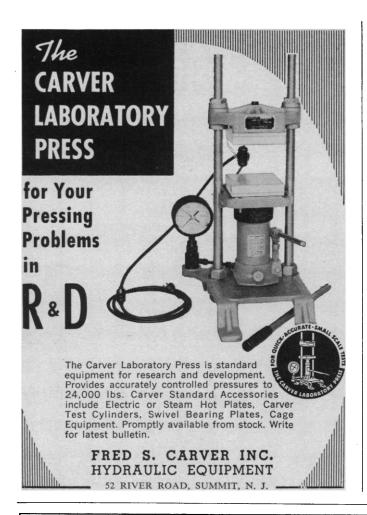
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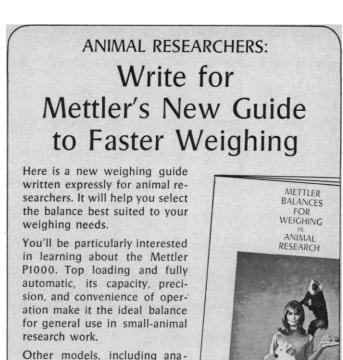
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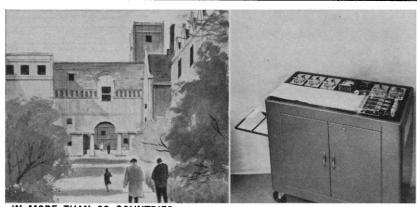
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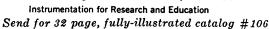
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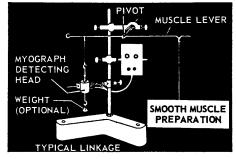




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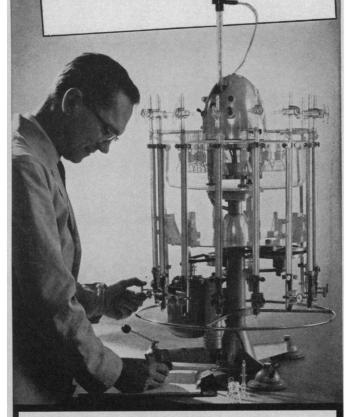
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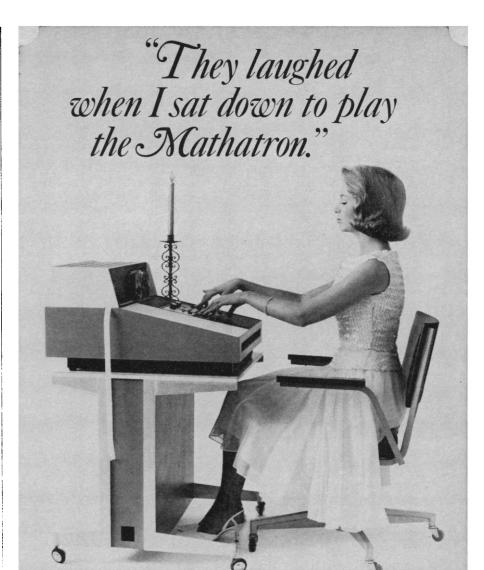
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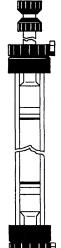
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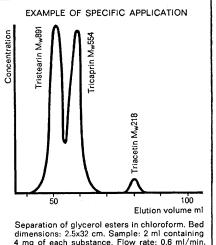


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course requirements, be assigned to research teams for which they will act as research librarians. Applicants for the program must hold an M.S. degree in library science; preference will be given those who also have a degree in one of the physical or biological sciences. Appointments are for 1 year and may be renewed for up to 3 years. Annual stipends will be \$5500, plus \$500 for each dependent and a 5 percent annual increment. The program is to begin 1 July, although appointees need not start their training at that time. (Andrew Lasslo, Department of Pharmaceutical and Medicinal Chemistry, University of Tennessee College of Pharmacy, Memphis, 38103)

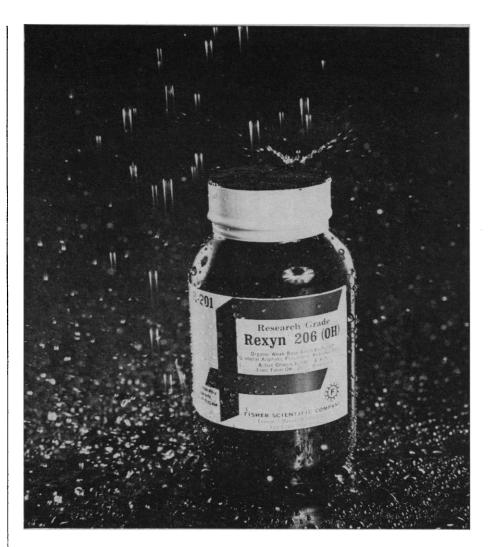
#### **Summer Institutes**

Non-Linear Effects in Plasmas, 5–23 September, Faculté des Sciences d'Orsay, University of Paris; organized by Joint Institute for Laboratory Astrophysics, sponsored by NATO; for graduate students and research workers; participation, free of charge, attendance limited. Some travel grants available for U.S. citizens. (G. Kalman, JILA, University of Colorado, Boulder)

Thermoanalysis, 5th annual, 13–22 June, Fairleigh Dickinson University. First session, principles and applications, 13–17 June; background and laboratory demonstrations of techniques; fee: \$125, \$65 dormitory facilities. Second session, recent advances, 20–22 June; for those familiar with the field; fee: \$75, \$40, dormitory facilities. (Saul Gordon, Fairleigh Dickinson University, Madison, New Jersey)

#### **Meeting Notes**

"Marine geodesy, present and future" will be the theme of an international symposium 28-30 September in Columbus, Ohio. Marine geodesv involves. basically, the establishment at sea of horizontal and vertical control for hydrographic, bathymetric, and geophysical surveys and navigation. The symposium's technical sessions will deal with definition of marine geodesy, its challenges and opportunities, including law at sea; requirements for geodetic controls and networks for exploration mapping, charting, and navigation; methodology and technology for marine geodesy and application of under-



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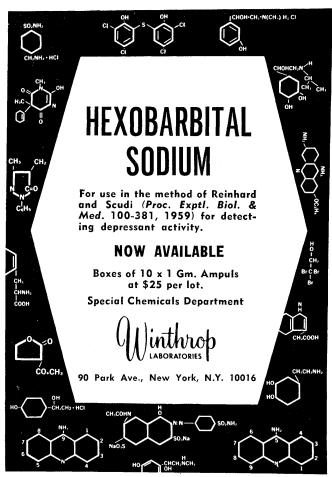
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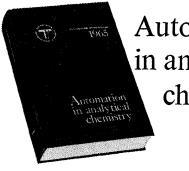


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A symposium on origin and distribution of the elements will take place in Paris 21-23 September. Papers are invited for presentation at any one of the meeting's five sections: theories of origin; solar, stellar, and interstellar abundances; meteorites; planets, asteroids, comets, tektites; and terrestrial abundances. The proceedings are to be published, and manuscripts are also solicited for publication whether or not the papers can be presented during the Paris meeting. Sponsors: International Association of Geochemistry and Cosmochemistry, International Union of Geological Sciences; and UNESCO. (Earl Ingerson, Department of Geology, University of Texas, Austin 78712)

The 51st national conference on weights and measures is scheduled for 11-15 July in Denver, Colorado. The meeting covers both weights and measures laws and regulations and the technology of weighing and measuring. It is meant as a meeting ground for all levels of government concerned with weights and measures administration, for industries associated with weighing and measuring equipment and packaging, and for industries which offer their products for sale in weighed and measured quantities. Registration fee: \$15. Sponsor: National Bureau of Standards. (Executive Secretary of the Conference, NBS, Washington, D.C. 20234)

#### Scientists in the News

Vernon Knight, clinical director of the National Institute of Allergy and Infectious Diseases, has been named professor and chairman of the microbiology department at Baylor University and head of the division of infectious diseases, effective 1 July.

Howard Gest, professor of microbiology at Washington University, will join the faculty at Indiana University 1 July as chairman of the department

of microbiology. The department, formerly the department of bacteriology, has been headed by **Leland S. McClung**, who was recently appointed assistant director in the division of biological sciences.

A. Donald Misener will succeed George B. Langford as director of the University of Toronto's Great Lakes Institute, effective 1 July. Misener is now associate director of the institute and professor of physics at the university.

John M. Ward, chairman of the biology department at Temple University, has been appointed dean of science at Oregon State University, as of 15 July.

Leo Goldberg, professor of astronomy at Harvard, has succeeded Donald H. Menzel as director of the Harvard College Observatory. Menzel, who had led the observatory since 1952, has retired to devote full time to teaching and research at the university.

**Richard B. Woodbury** has been appointed to a 1-year term as chairman of the office of anthropology at the Smithsonian Institution. He has been with the Smithsonian since 1963.

**Donald C. Goodman**, anatomy and neurology professor at the University of Florida, has been named chairman of the university's anatomy department.

The following were recently elected Fellows of the Royal Society:

Alan Rushton Battersby, professor of organic chemistry, University of Liverpool

Thomas Benjamin Brooke, assistant director of research, department of engineering and department of applied mathematics and theoretical physics, University of Cambridge

**K. G. Budden**, lecturer in physics, Cavendish Laboratory, University of Cambridge

R. E. Davies, professor of biochemistry and chairman, department of animal biology, University of Pennsylvania

W. R. S. Doll, director of the statistical research unit, Medical Research Council and lecturer in medical statistics and epidemiology, University of London

S. F. Edwards, professor of theoretical physics, University of Manchester

**J. S. Forrest**, director, Central Electricity Research Laboratories, Leatherhead, Surrey

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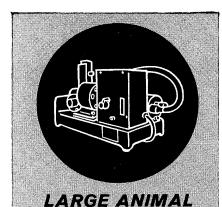
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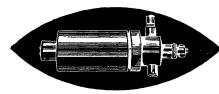
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