SCIENCE

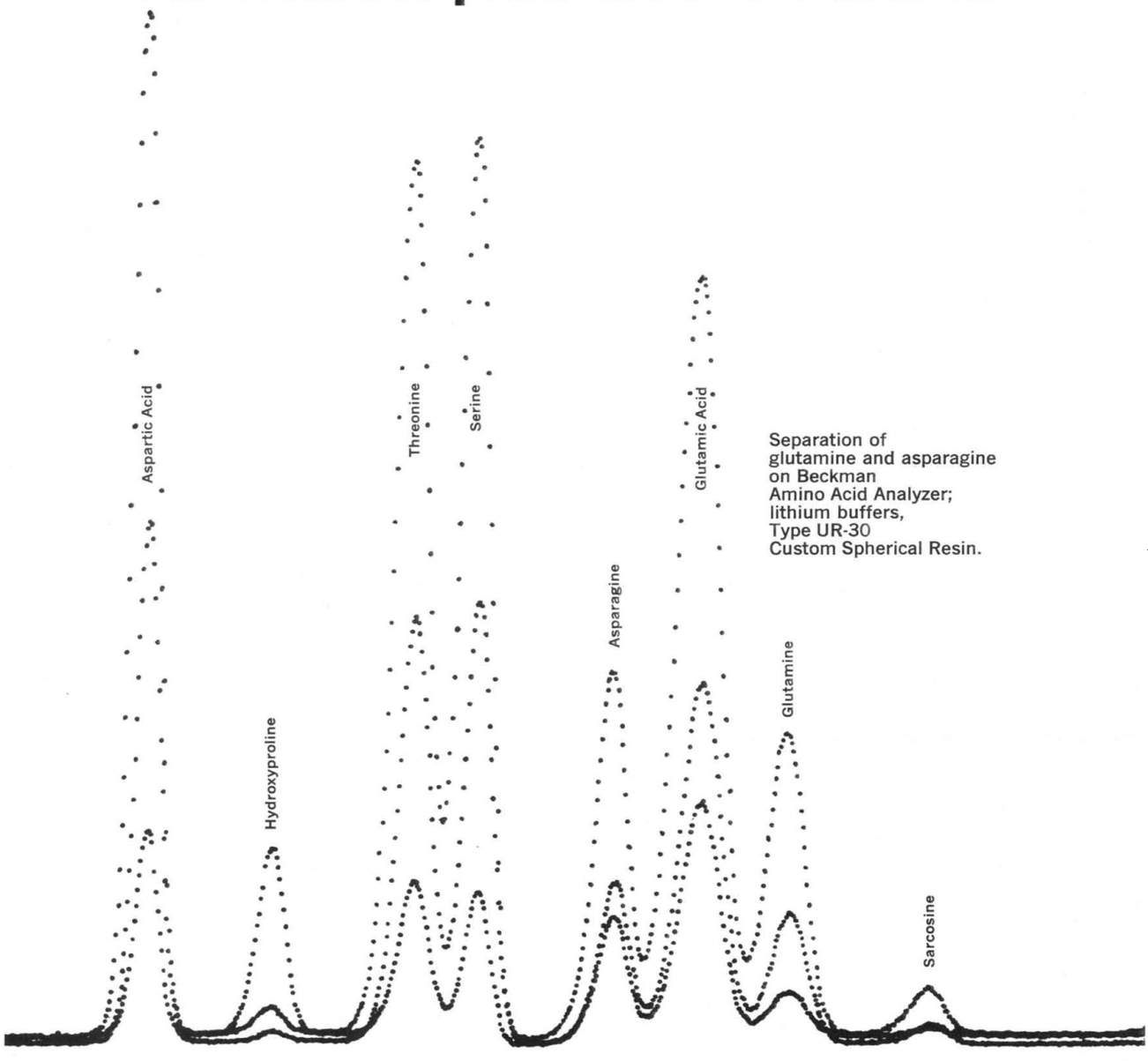
28 July 1967

Vol. 157, No. 3787

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

NOCTILUCENT CLOUD

Resolved: Two peaks are better than one



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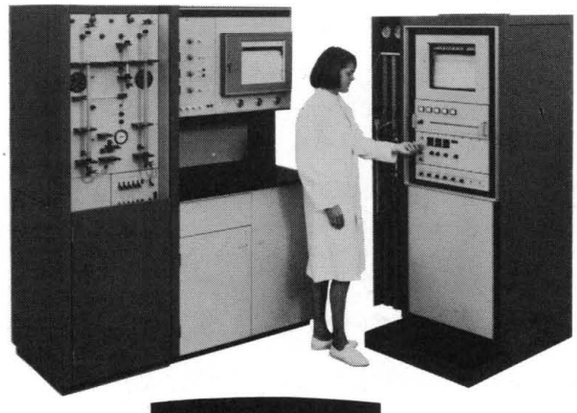

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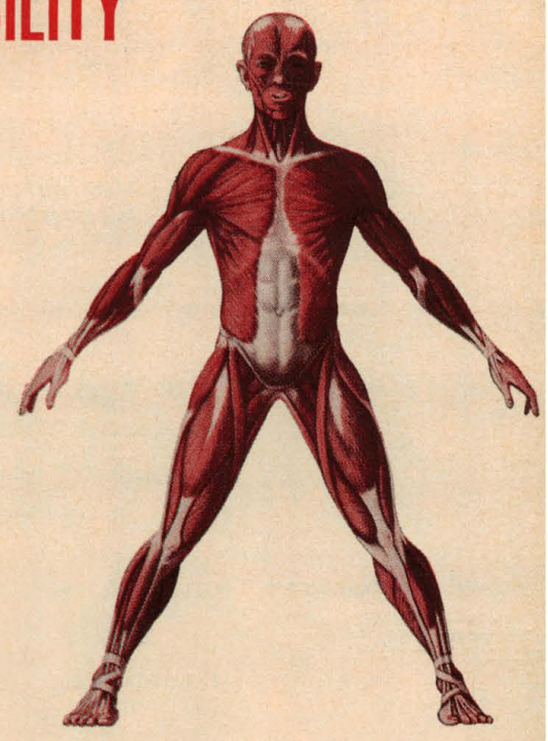

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STRUCTURE OF THE HUMAN BODY

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This basic anatomy text pioneers a new scheme of verbal-visual presentation designed to reinforce the learning process. Each illustration depicts a single concept or a few related facts and is placed where it can be "read" with the text. To fit this plan, more than 625 drawings were made especially for this book. Eight pages of plates are shown in full color. The muscles, nerves, and blood vessels are presented in newly-designed tables with integral illustrations. The emphasis throughout is on living, normal anatomy, and the relationship of structure to function is stressed. Developmental and microscopic anatomy are included where they aid the understanding of basic structure. The selection of material, its organization, and the unique presentation make this an unrivalled textbook for any college-level course in anatomy.

417 pages, 934 illustrations. $8.75. Published June, 1967.

Villee: BIOLOGY *New (5th) Edition!*

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With nearly half a million copies in print, Villee's *Biology* is well established as a leading introductory college text. In the *New (5th) Edition*, the chapters on genetics, evolution, and cell metabolism are entirely new, as are the discussions of biosynthetic processes and the utilization and conservation of energy. The rest of the text has been thoroughly updated and many new illustrations have been added. Dr. Villee maintains just the right balance between the organismic, molecular, and ecological levels; between plants and animals; between generalization and detail. As in previous editions, he emphasizes the comparative, evolutionary, and biochemical aspects of biology.

730 pages, 804 illustrations. $8.25. Published March, 1967.

Stevenson & Moore: *A New Book!*

THEORY OF PHYSICS

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Written primarily for science and liberal arts majors, this exciting and original non-calculus physics text covers the standard curriculum but is thoroughly "modern" in point of view. The authors have integrated modern physics throughout the book instead of presenting it separately at the end. The book is organized into five sections: Motion, Energy, Oscillations and Waves, and Applications. A wealth of pedagogic aids make this an outstanding text from which to teach as well as to learn. Some 1200 problems give the instructor a wide choice at any level (an answer book is available).

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375 pages, illustrated. $4.50. Published April, 1967.

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668 pages, 150 figures. $8.75. Published April, 1966.

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Vol. 15, No. 3787

SCIENCE

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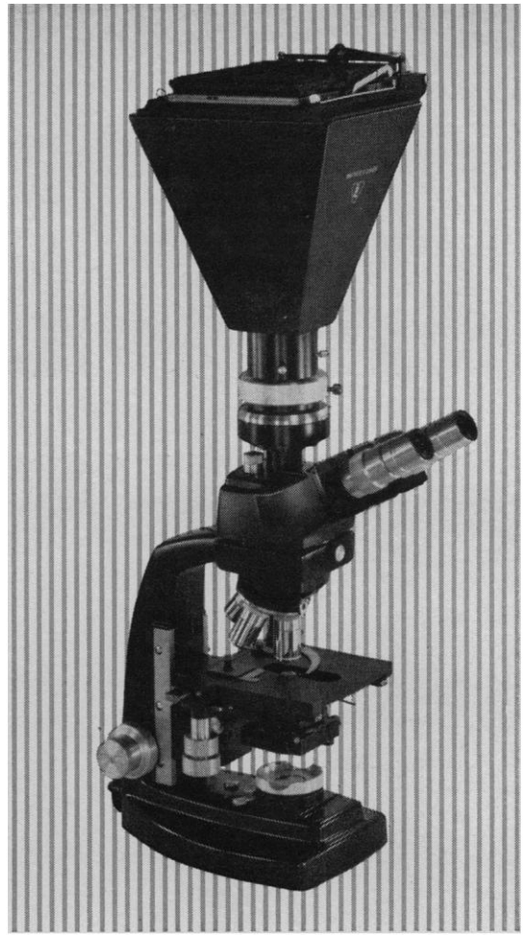
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

(Top) Panoramic view of noctilucent cloud over Stockholm, Sweden, night of 21 August 1966. Panorama spans an azimuth from approximately 330 degrees through north to 70 degrees. (Bottom) Noctilucent cloud over Torsta, Sweden, 10–11 August 1958. See page 419. [George Witt, Institute of Meteorology, University of Stockholm, Sweden]



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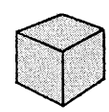

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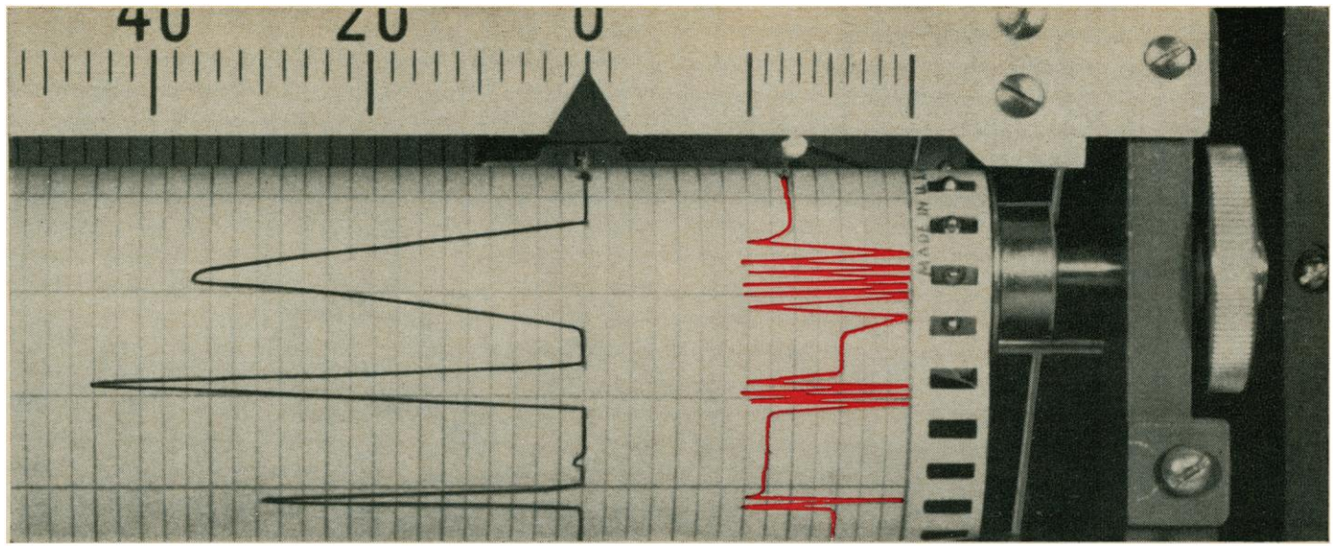

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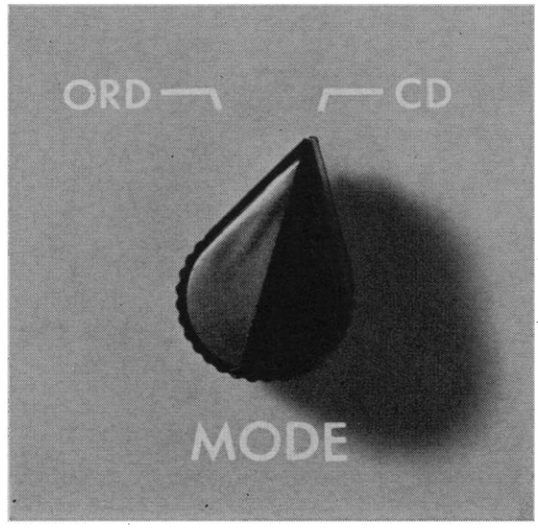

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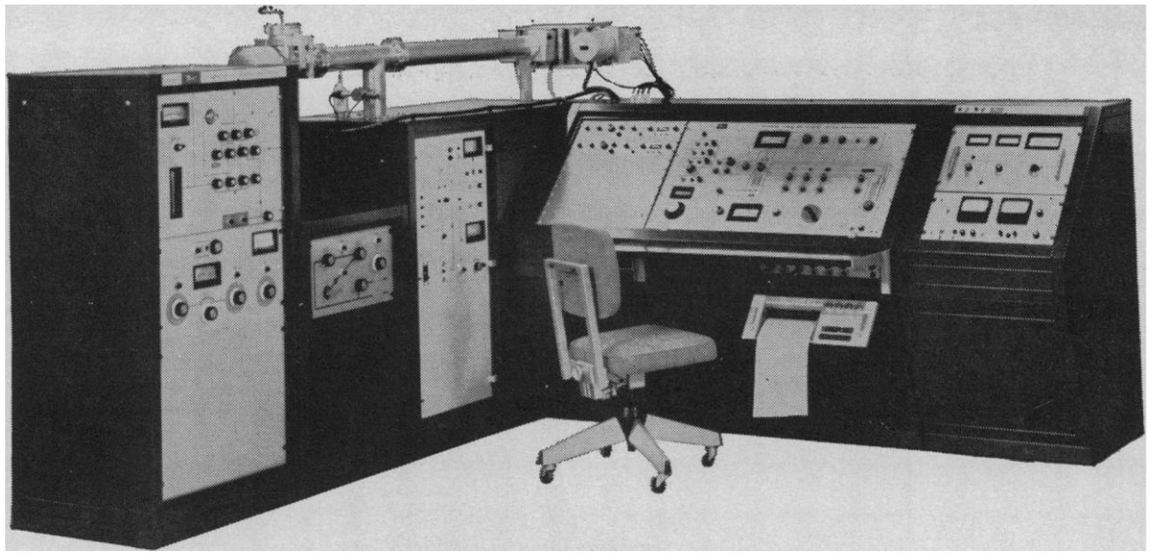

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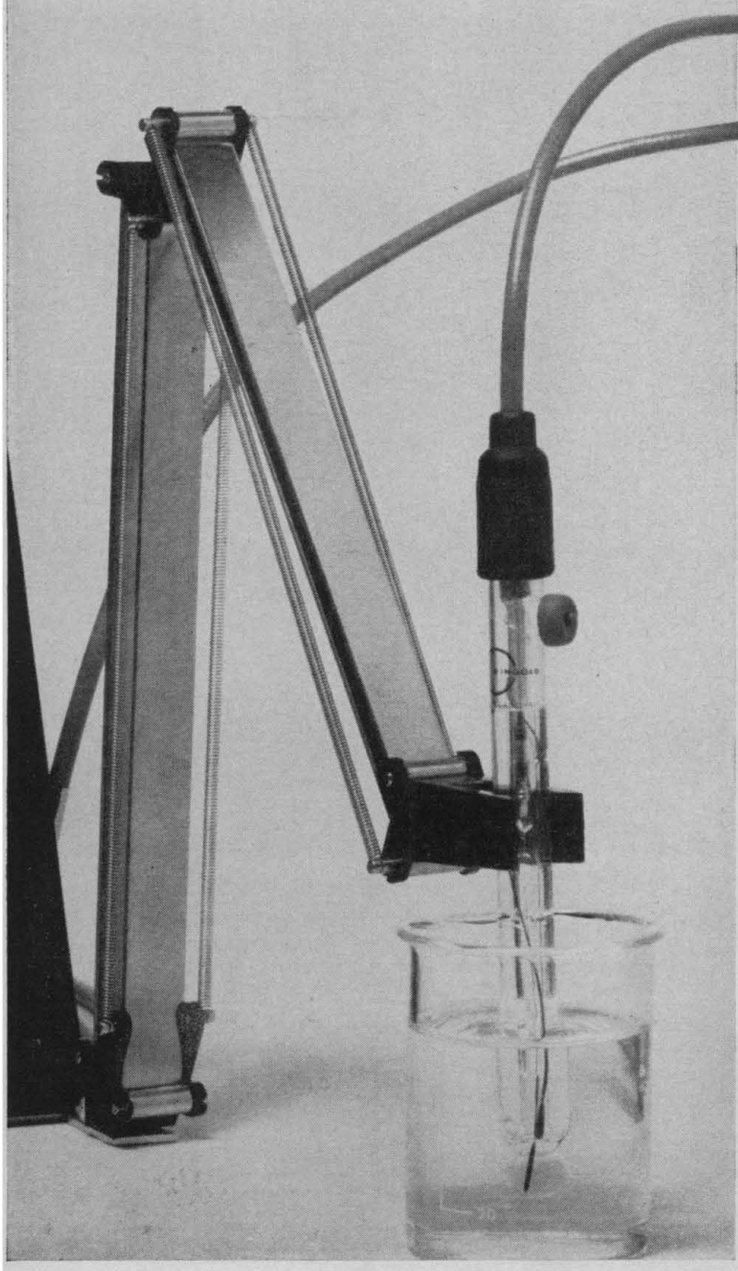

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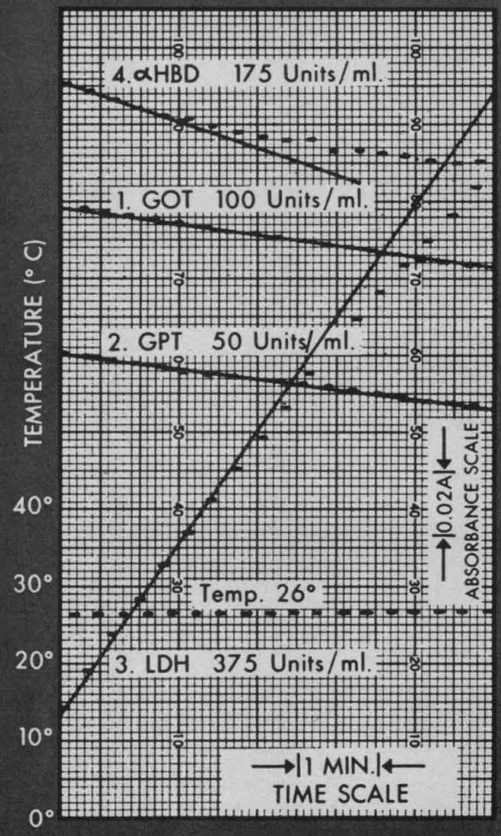

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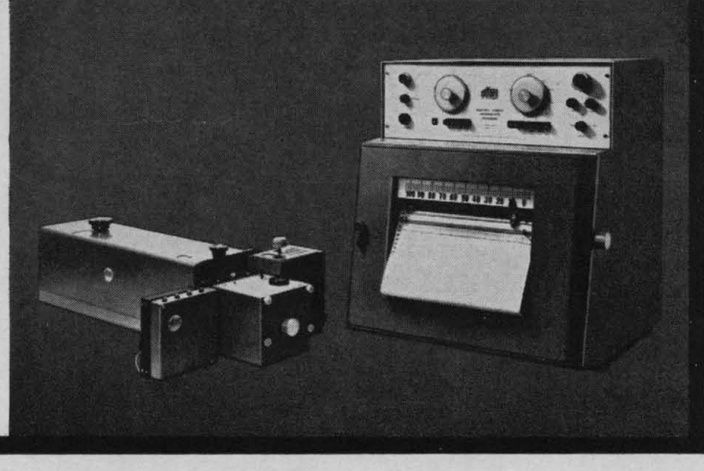

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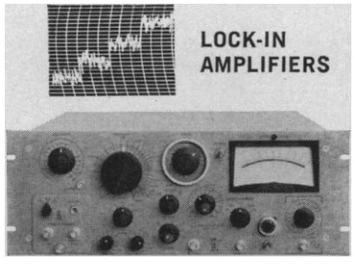

Lock-In Amplifiers have application where the signal of interest is or can be made to appear at a single frequency and where a reference voltage related in frequency and phase to the signal can be obtained. These instruments employ phase-sensitive detection and narrow-band filtering techniques to provide a DC output signal proportional to the amplitude of the fundamental component of the signal being measured. The Lock-In Amplifier can be described as a tuned voltmeter, the response of which is "locked" to that particular frequency and phase at which the signal information has been made to appear. They operate typically in the frequency range of 1.5 Hz to 150 kHz with full scale sensitivities down to 10^{-9} volts.

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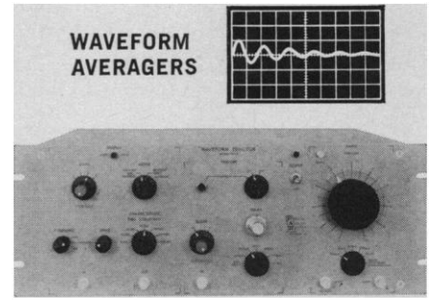

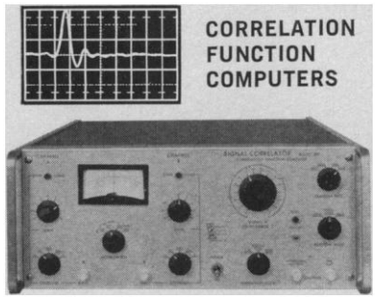

Correlation Function Computers are the most general form of signal processing equipment that can be constructed (Lock-In Amplifiers and Waveform Averagers are actually special cases of correlation equipment). Whereas a reference or synchronization signal is required in the other equipment discussed, autocorrelation analysis allows periodic and random signals to be defined without this restriction. An even more powerful technique is crosscorrelation which has the ability to describe the degree of conformity between two different signals as a function of their mutual delay. The PAR Signal Correlator simultaneously computes in real time 100 points of either the auto- or crosscorrelation function over total delay spans of 100 microseconds to 10 seconds.

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Congressional Testimony

I, too, was much distressed by the partisan article, "The great research boondoggle," referred to in Abelson's editorial ("A partisan attack on research," 9 June, p. 1315). In his criticism of the magazine article, Abelson said, "The article is also very damaging when it quotes a professor of chemistry at a large university as saying that government support of research is 'potentially the most powerful destructive force the higher educational system has ever faced.'" That statement was made by me before a congressional subcommittee, but the following paragraph is the *complete* expression which I presented on my views of government support of university research and demonstrates clearly that the quotation as it appeared in the article was taken out of context (*1*).

> The present program for Government support of university research including the methods and policies for granting and administering funds, is at the same time the greatest benefit and also potentially the most powerful destructive force the higher education system in America has ever faced. Federal support has created opportunities for the evolution and advancement of human knowledge and for the stimulation of creativity far beyond the most prodigious expectations of our current senior scholars. University scientists, particularly the young men, with and without tenure, are working unbelievably long hours and with a passion that suggests a compulsion to prove their worth to society. At the same time an imbalance between the effect at the graduate and undergraduate levels has arisen with the results that the talents of the undergraduate students are not being developed. Hence the supply of dedicated teachers, competent scientists, engineers, scholars, and well-informed citizens is being constrained dangerously due, in part, to a loss of the stimulation, guidance and experience-inspired knowledge which traditionally has been passed on to the students by the research scholars.

W. T. LIPPINCOTT
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Ohio State University, Columbus 43210

Reference

1. Hearings before a Subcommittee of the Committee on Government Operations, H.R., 89th Congress, 1st session (Government Printing Office, Washington, D.C., 1965), p. 5.

Such attacks by quoting titles of valid research projects are unfair but not new.

In 1892, Congressman Hilary A. Herbert of Alabama nearly destroyed the U.S. Geological Survey by ridiculing the paleontological work of O. C. Marsh. He displayed a special author's edition of Marsh's work on toothed birds, a sumptuous volume with morocco binding, gilt edges, wide margins, specially tinted paper, and a wealth of illustration, ". . . pointing to it as an excellent example of the way in which large amounts of Government money were being wasted . . ." (*1*). The next day Herbert admitted that Marsh had written to him 6 years earlier, pointing out that the work in question was not published by the Geological Survey, that the cost of illustrations (and special printing) had been borne by the author, and that a supposed duplication of printing was only of a 40-page abstract.

In spite of this admission, "birds with teeth" continued to appear in speeches against the Survey as a symbol of government waste. The House voted to end all federal work in paleontology. Senator Wolcott of Colorado indicated that the birds themselves were not important, ". . . but here is a chance to cut Survey appropriations." The Geological Survey was eventually saved only by the resignation of Director John Wesley Powell in 1894.

Today it would be just as tempting for a congressman to launch such an attack on radiation studies as a way of cutting the AEC appropriation or an assault on biochemistry to "get" NIH. Scientists should do their best to inform the press that a book, or a research project, should not be judged by its title.

ELLIS L. YOCHELSON
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Bowie, Maryland 20715

Reference

1. C. Schuchert and C. M. LeVine, *O. C. Marsh, Pioneer in Paleontology* (Yale Univ. Press, New Haven, Conn., 1940), p. 317.

Why's of Weightlessness

Lilley's letter (9 June) on weightlessness in space corrected one popular misconception but propagated another with the statement, "The gravitational forces on an Apollo crewman will be very weak for much of his journey, and his weightless condition will indeed be due to his remoteness from the earth and moon."

The reason for weightlessness during an earth-moon trajectory (which, even at the gravitational minimum point, is still subject to appreciable solar gravitation) has nothing to do with decreas-

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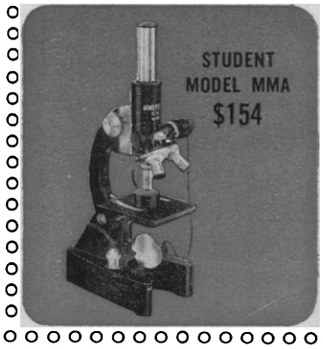

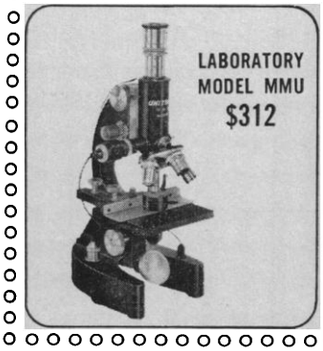

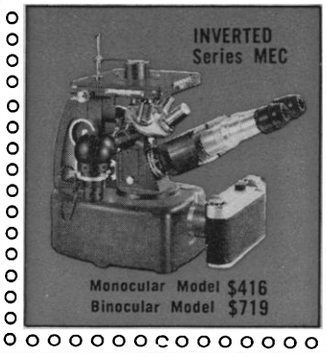

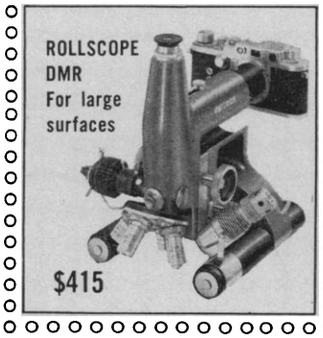

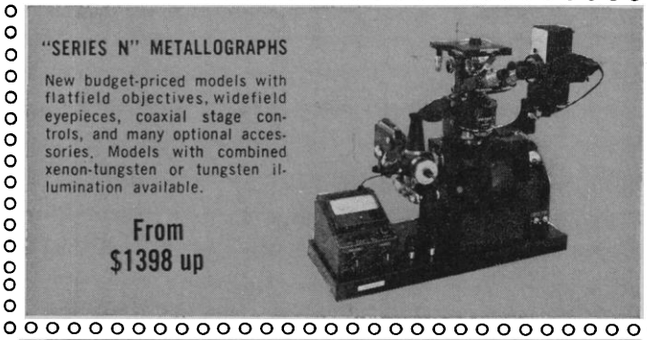

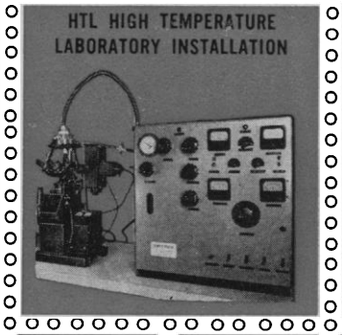

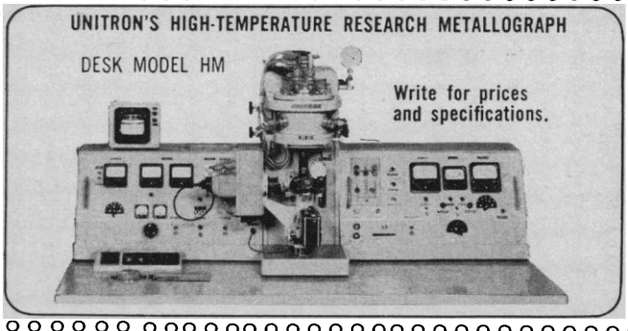

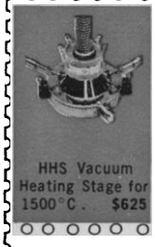

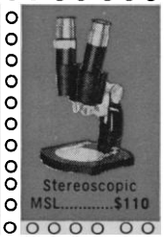

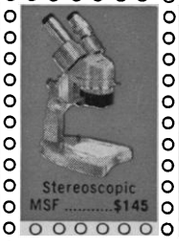

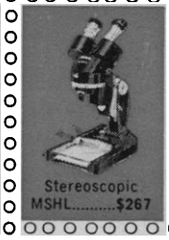

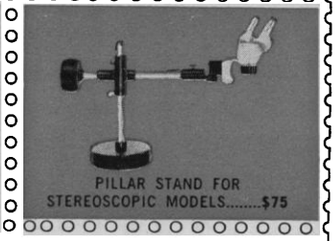

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ing gravitation—weightlessness would obtain in a gravitational field of any strength whatsoever. The explanation is exactly the same as for weightlessness during a near-earth orbit: whenever the rocket motor is not firing, both the spaceship and the astronaut are in the free-fall condition, and thus both move on the same trajectory with the same acceleration and consequently with no relative motion between them.

Weight can only be caused by a gravitational field when, as on the surface of a planet, a body is restrained from accelerating. For example, a spring scale measures the force which the earth exerts to keep a body from accelerating downward; this is its weight.

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Measure of Education

In commenting on Carter's article on the National Assessment of Educational Progress ("Educational testing: national program enters critical phase," 5 May, p. 622), I should like to make two points: (i) the twin problems of measurement—criterion and sampling—do not appear to have been met by those responsible for NAEP; and (ii) since there is likely to be no way of maintaining the security of the tests and other instruments, it is inevitable that in a significant number of instances the tests will, as the American Association of School Administrators has predicted, dominate if not determine the curriculum.

What shall be the criteria by which citizenship shall be assessed? Are comparisons of educational progress in this domain to be made across social class lines or will the white, Anglo-Saxon, Protestant ethic be the standard? Will the same measures serve central city and suburb, North and South; and, if not, how will comparisons be made?

Two things might be said concerning the sampling problem. At the American Educational Research Association session on NAEP in Chicago in 1966 one of Tyler's assistants explained how random sampling would be achieved; then, presumably sensing some enthusiasm from his audience, invited any administrators present to volunteer their schools as subjects! A sample made up of volunteers first, and second, of subjects from schools whose administrators are *not* among those who object to NAEP, may not be particularly representative.

The influence of NAEP instruments on the curriculum is more serious. Already examples of some test items are public knowledge. Can anyone suppose that when the program is completed the mass media and the popular press will not insist on using many more items as examples in reporting the level of educational progress discovered by the investigators? School boards and citizens groups all over will demand that the full battery be administered in their schools to determine whether the taxpayers are getting their money's worth. Under such circumstances it is hard to believe that most teachers and principals will not begin to slant the curriculum in the direction of the tests.

It is perhaps unfortunate that AASA took quite such a strong stand—unfortunate but understandable. After all, school people have been criticized for everything from Sputnik to their inability to solve the problems of delinquency, poverty, crime, and what-have-you. (It might be observed that the condemnation of the schools over Sputnik has not turned to equally loud applause now that we seem to have drawn even in the space race.) What is more disturbing is the emotional and uninformed reaction of so many people who attack the critics of NAEP. In "stating their oppositions to AASA's stand," for example, the dean of Harvard's Graduate School of Education and his associates say, "We believe that the risks of knowing nothing are greater than the risks of knowing something, and that the national assessment program should be allowed to go forward in a *modest* and *exploratory* way without *harassment.*" (*1*) (Italics mine.)

It seems inappropriate to employ such emotion-laden words in deliberating the merits of what should be a scientific investigation. There is a third possibility that could be added to "knowing nothing" and "knowing something." The something "known" can be either true and useful or false and harmful. The odds that the unhappy third result may obtain are too great to ignore.

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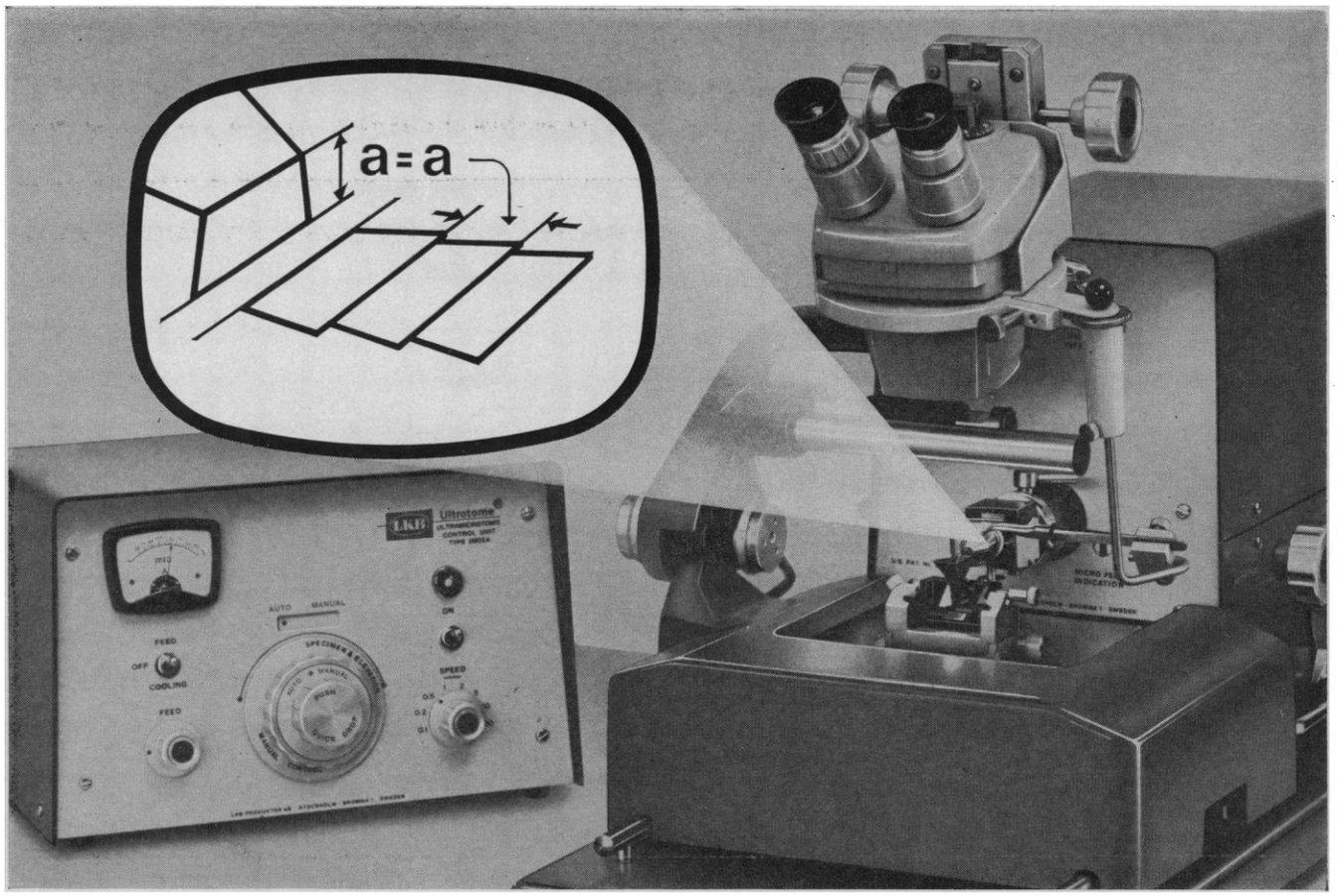
Reference

1. *Harvard Grad. Sch. Educ. Alumni Bull.* **12**, No. 1, 31 (1967).



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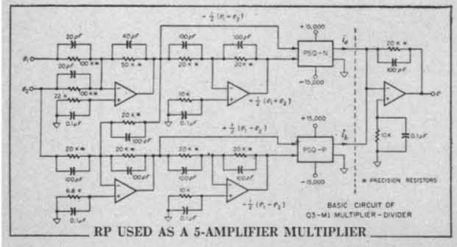

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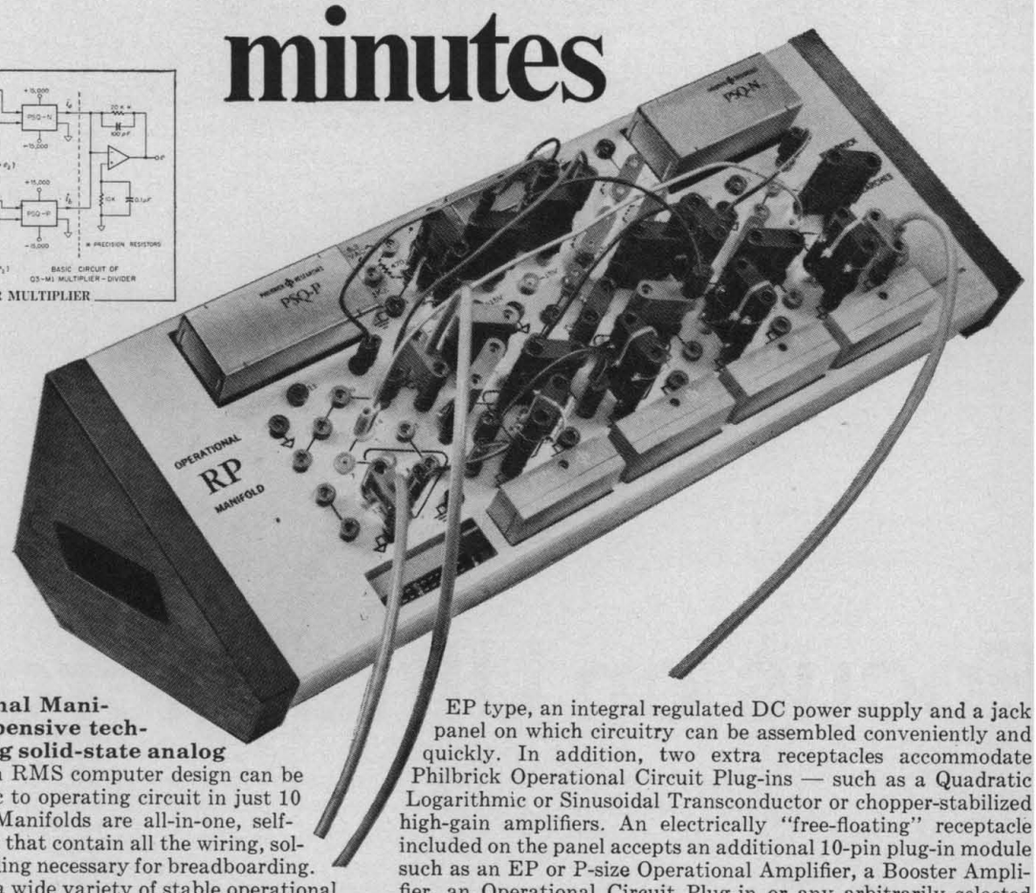

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Mainland China: An Emerging Power

Mainland China has substantial natural resources and a tremendous human potential. Although only modest progress has been made in the development of material resources, great steps have been taken in achieving the intellectual status necessary to sustain an advanced technology.

What is the intellectual potential of the Chinese? It seems great. The 1960 U.S. census figures show that there were 135,000 Chinese men in this country. Yet from this small number have come many university faculty members as well as members of other professions. The U.S. census figures for different racial groups show the following comparison, on the basis of professional manpower per thousand of the group's male population: engineers, white, 10.8, Chinese, 26; natural scientists, white, 1.7, Chinese, 5.0. Behind these figures are positive and negative factors of many kinds; nevertheless, the performance of the Chinese in our environment is impressive. What will be their performance in the environment of the Chinese mainland? The present regime has both helped and hindered the development of China. Some of the ideological handicaps are alluded to in an article appearing in this issue of *Science* (page 392). However, there has also been great progress.

In 1949 there were only about 50,000 scientists and engineers in mainland China. In the period 1949–63, some 671,000 Chinese students graduated from colleges and universities, with majors in natural sciences, agriculture, medical sciences, or engineering. A recent congressional report indicates that a broad educational base has been established in China. The report* states:

> The number of children and young adults in full-time educational institutions today is five to seven times the school enrollment in 1949. The number in primary schools has jumped to over 100 million, including almost all urban children and a great majority of rural children. . . . If the word "school" is extended to include part-time education . . . China may be said to be just one great big school.

Fruits of this educational effort are appearing. The committee document states, "A Canadian doctor who has recently visited China's medical colleges, hospitals and research institutions reported that he had found good equipment, high medical standards, excellent medical care . . . 'almost all comparable to Canadian standards.' " A British physicist, K. Mendelssohn, writing in the 1 July issue of *Nature,* reports seeing in China many locally manufactured products, such as diesel-driven trains, electric generators, gas turbines, machine tools, and electronic gear. He also noted electron microscopes, precision balances, and computers. At the Institute for Solid State Physics he was shown superconducting solenoids of niobium-zirconium and of niobium-tin. He also saw equipment for producing artificial diamonds of a size and quality similar to those made in the West.

Today 80 percent of the population in China is engaged in agriculture. Although energy sources such as coal are abundant, electric output now is only about 4 percent that of the United States. Soon all this will change and China will become a great power. Will mainland China then be a menace to all mankind, or will she return to a long tradition of noninterference in the affairs of others?—PHILIP H. ABELSON

* "Mainland China in the World Economy," *Report of the Joint Economic Committee, Congress of the United States* (Government Printing Office, Washington, D.C., 1967); see also, "An Economic Profile of Mainland China," *Studies Prepared for the Joint Economic Committee, Congress of the United States* (Government Printing Office, Washington, D.C., 1967).

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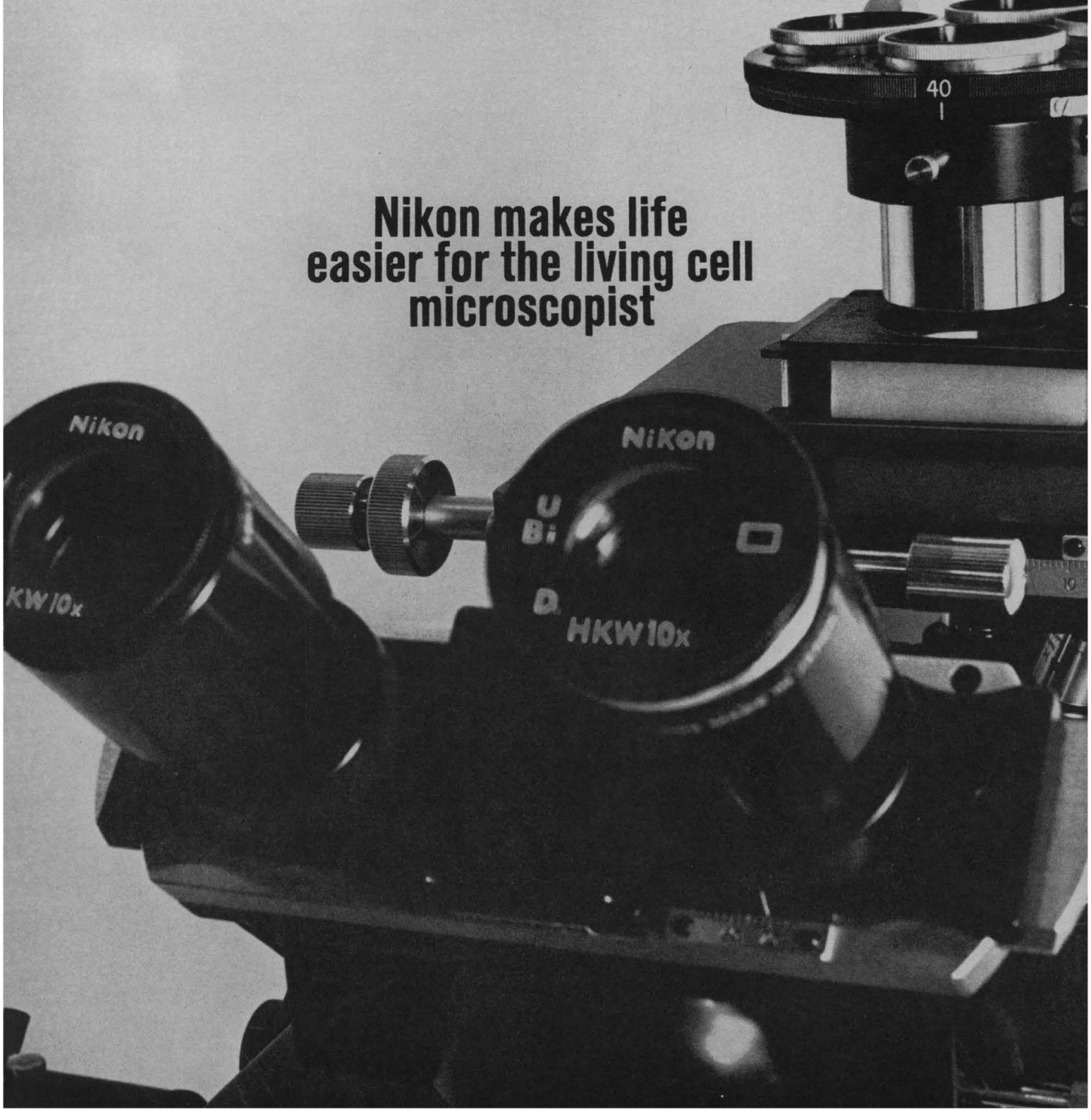

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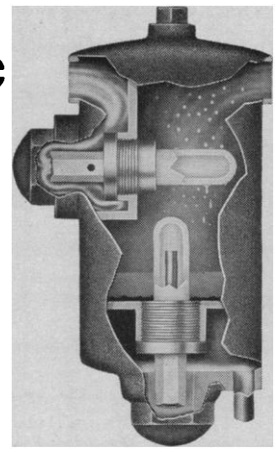

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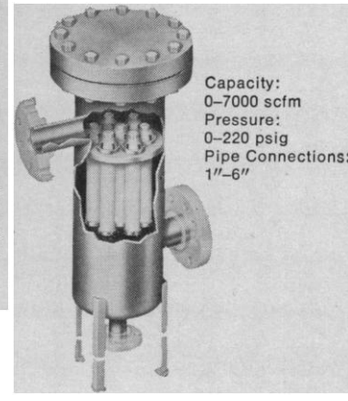

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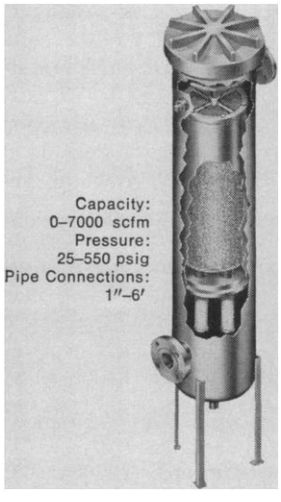

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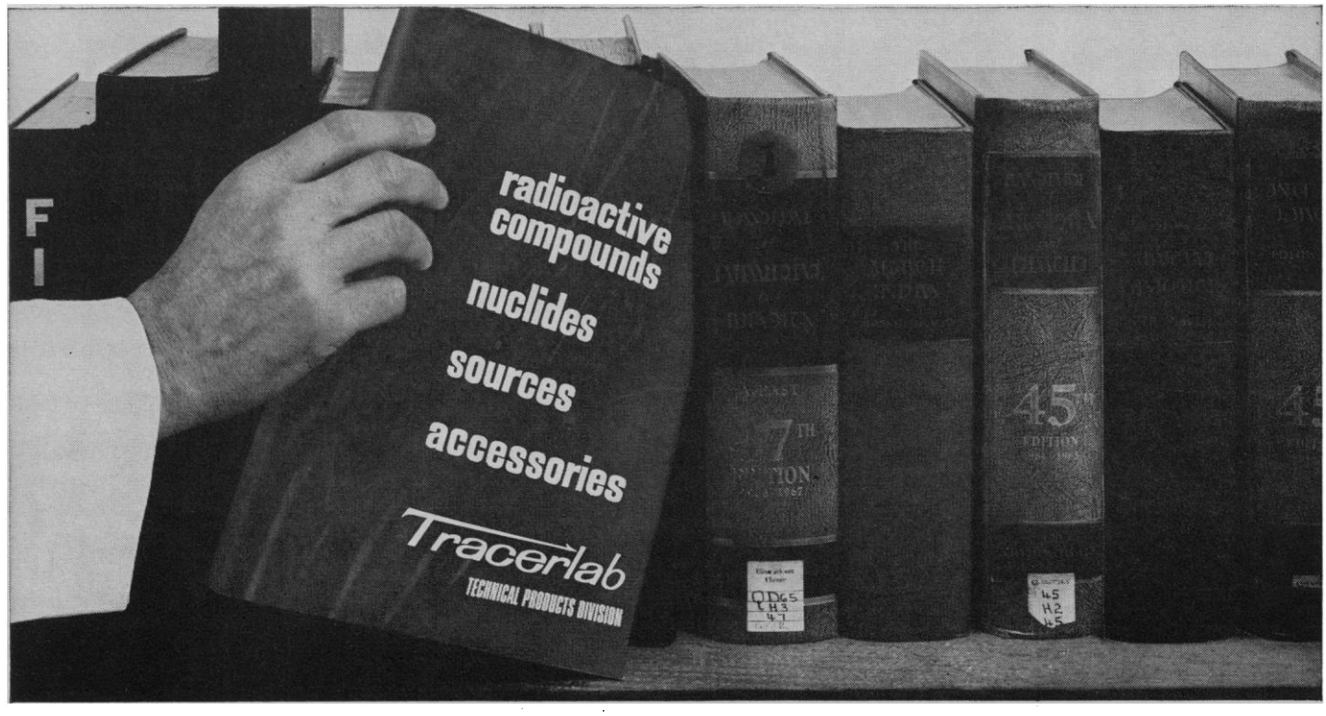

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7–9. **Cryobiology,** 4th annual mtg., Washington, D.C. (V. P. Perry, Tissue Bank, NMRI-NNMC, Bethesda, Md. 20014)

7–11. Engineering of Unconventional **Protein Production,** conf., Santa Barbara, Calif. (Engineering Foundation, 345 E. 47 St., New York 10017)

7–11. **Topological Dynamics,** symp., Fort Collins, Colo. (J. Auslander, Dept. of Mathematics, Univ. of Maryland, College Park 20740)

9–11. Applications of **X-Ray Analysis,** 16th annual conf., Denver, Colo. (J. B. Newkirk, Metallurgy Div., Univ. of Denver, Colo. 80210)

10–12. **Lessons from Revolution,** symp., San Francisco, Calif. (W. J. Monihan, Univ. of San Francisco, San Francisco 94117)

13–16. **Soil Conservation** Soc. of America, 22nd annual meeting, Des Moines, Iowa. (7515 NE Ankeny Rd., Ankeny, Iowa 50021)

13–17. **Energy Conversion** Engineering, 2nd conf., Miami Beach, Fla. (ASME, 345 E. 47 St., New York 10017)

14–16. **Astrodynamics,** Guidance and Control, conf., Huntsville, Ala. (American Inst. of Aeronautics and Astronautics, 1290 Sixth Ave., New York 10019)

14–17. National **Medical** Assoc., St. Louis, Mo. (S. C. Smith, 520 W St., NW, Washington, D.C. 20001)

15–18. American **Dietetic** Assoc., Chicago, Ill. (R. M. Yakel, ADA, 620 N. Michigan Ave., Chicago)

20–23. American **Phytopathological** Soc., Washington, D.C. (J. P. Fulton, Dept. of Plant Pathology, Univ. of Arkansas, Fayetteville 72701)

20–25. American **Crystallographic** Assoc., Minneapolis, Minn. (T. Zoltai, Dept. of Geology and Geophysics, Univ. of Minnesota, Minneapolis 55455)

20–25. American Soc. of **Parasitologists,** 42nd annual mtg., Tucson, Ariz. (D. V. Moore, Univ. of Texas, Southwest Medical School, Dallas 75235)

21–23. **Cryogenic Engineering,** conf., Palo Alto, Calif. (K. D. Timmerhaus, c/o Engineering Center, AD 1-25, Univ. of Colorado, Boulder)

21–25. American Assoc. of **Clinical Chemists,** 18th annual mtg., Philadelphia, Pa. (M. E. Rylan, 318 Rodman Ave., Jenkintown, Pa. 19046)

21–25. **Complex Problem Solving,** conf., Andover, N.H. (S. S. Cole, Engineering Foundation, 345 E. 47 St., New York 10017)

21–25. **Poultry Science** Assoc., 56th annual mtg., Durham, N.H. (C. B. Ryan, c/o Texas A&M Univ., College Station 77843)

23–25. **Estuarine Pollution,** natl. symp., Stanford, Calif. (R. M. Kennedy, Kennedy Engineers, 604 Mission St., San Francisco, Calif. 94105)

23–25. **Gas Dynamics** Symp., Evanston,

Ill. (The Symposium, Northwestern Univ., Evanston)

23–25. Wave Propagation and Dynamic Properties of **Earth Materials**, symp., Albuquerque, N.M. (G. E. Triandafilidis, Univ. of New Mexico, P.O. Box 188, University Station, Albuquerque 87106)

23–26. American **Physiological** Soc., fall mtg., Washington, D.C. (Executive Secretary, 9650 Wisconsin Ave., Bethesda, Md.)

24–26. **Phytochemical** Soc. of America, annual mtg., Madison, Wis. (T. J. Mabry, Univ. of Texas, Austin 78712)

25–1. American Soc. for **Pharmacology and Experimental Therapeutics**, fall mtg., Washington, D.C. (Executive Officer, 9650 Wisconsin Ave., Bethesda, Md.)

27. American Assoc. of **Electromyography and Electrodiagnosis**, annual mtg., Miami Beach, Florida. (M. K. Newman, 16861 Wyoming Ave., Detroit, Mich. 48221)

27–1. American Congr. of **Physical Medicine and Rehabilitation**, 45th annual session, Miami Beach, Fla. (Executive Director, 30 N. Michigan Ave., Chicago, Ill.)

27–1. American Inst. of **Biological Sciences**, 18th annual mtg., College Station, Tex. (AIBS, 3900 Wisconsin Ave., NW, Washington, D.C.)

The following societies will meet in conjunction with the AIBS. Additional information is available from AIBS or from the program chairmen listed below.

American **Bryological** Soc. (Secretary Treasurer, Box 36, S.W. Missouri State College, Springfield)

American Soc. for **Horticultural Science**. (Executive Director, 615 Elm St., St. Joseph, Mich. 49085)

American Soc. of **Human Genetics**. (c/o Division of Medical Genetics, Dept. of Medicine, Johns Hopkins Hospital, Baltimore 5, Md.)

American Soc. of **Naturalists**. (Executive Director, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

American Soc. of **Plant Physiologists**, (Secretary, c/o Dept. of Biology, Yale Univ., New Haven, Conn.)

American Soc. of **Plant Taxonomists**. (Secretary, c/o Botany Dept., Univ. of California, Berkeley)

Botanical Soc. of America. (Secretary, c/o Botany Dept., Indiana Univ., Bloomington)

Ecological Soc. of America. (Secretary, c/o Ecology Section, Health Physics Div., Oak Ridge National Lab., Oak Ridge, Tenn.)

Genetics Soc. of America. (Executive Director, 3900 Wisconsin Ave., NW, Washington, D.C. 20016)

Mycological Soc. of America. (Secretary-Treasurer, c/o Pioneering Res. Div., Natick Labs., Natick, Mass.)

28–30. Gatlinburg Conf. on Special Topics in **Nuclear Education and Research**, Gatlinburg, Tenn. (J. E. Mott, Oak Ridge Associated Universities, Box 117, Oak Ridge, Tenn. 37830)

28–30. Preparation and Properties of **Electronic Materials**, 9th annual conf., New York, N.Y. (L. R. Weisberg, RCA Labs., David Sarnoff Research Center, Princeton, N.J. 08540)

28–30. **Space** Program Issues of the

70's, conf., Seattle, Wash. (AIAA, Meetings Manager, 1290 Sixth Ave., New York 10019)

28–31. **Clay Minerals** Soc., 16th natl. conf., Golden, Colo. (L. G. Schultz, U.S. Geological Survey, Bldg. 25, Federal Center, Denver, Colo. 80225)

28–1. **Electron Microscope** Soc. of America, 25th annual mtg., Chicago, Ill. (Executive Director, c/o School of Chemical Engineering, Olin Hall, Cornell Univ., Ithaca, N.Y. 14850)

28–2. **Alaska Science** Conf., 18th, College. (P. Morrison, Inst. of Arctic Biology, Univ. of Alaska, College 99735)

29–31. Association for **Computing Machinery**, 22nd natl. conf., Washington, D.C. (T. Willette, Box 6, Annandale, Va. 22003)

29–1. **Electron Microscopy** Soc. of America, annual mtg., Chicago, Ill. (A. V. Loud, Pathology Dept. College of Physicians and Surgeons, Columbia Univ., 630 W. 168 St., New York 10032)

31–2. American **Physical Soc.**, Seattle, Wash. (Executive Secretary, 538 W. 120 St., New York 10027)

31–6. American **Psychological** Assoc., annual mtg., Washington, D.C. (APA, 1200 17th St., NW, Washington 20036)

International and Foreign Meetings

August

6–9. International Union Against the **Venereal Diseases and the Treponematoses**, 25th general assembly and technical conf., Munich, Germany. (G. A. Canaperia, Via Salaria 237, Rome, Italy)

7–12. **Computers and Human Development**, Kuala Lumpur, Malaysia. (C. C. Yoon, Dept. of Mathematics, Univ. of Malaya, Kuala Lumpur)

7–12. Hungarian Soc. of **Mechanical Engineers**, Intern. Spectroscopy Colloq., Debrecen, Hungary. (L. Prockl, The Society, Szabadság tér 17, Budapest V, Hungary)

7–19. **Sedimentology**, 7th intern. congr., Reading, England, and Edinburgh, Scotland. (Sedimentology Research Lab., Dept. of Geology, Univ. of Reading, Whiteknights Park, Reading, Berks., England)

8–12. Acta **Endocrinologia**, 6th congr., Helsinki, Finland. (B. A. Lamber, University Central Hospital, Haartmaninkatu 4, Helsinki 29)

9–11. Association of American **Feed Control** Officials, 57th annual, Toronto, Canada. (B. Poundstone, Agricultural Experiment Sta. Bldg., Univ. of Kentucky, Lexington 40506)

10–17. World Congr. of the **Deaf**, 5th, Warsaw, Poland. (Polish Assoc. of the Deaf, The Principal Board, 1-3, Jezuicka Str., Warsaw 40)

11–17. **Apiculture**, 21st intern. congr., College Park, Md. (J. I. Hambleton, Univ. of Maryland, College Park 20742)

13–17. Canadian **Pharmaceutical** Assoc., annual mtg., Toronto, Ont., Canada. (175 College St., Toronto 2B)

13–19. Social **Psychiatry**, 2nd intern. congr., Amsterdam, Netherlands. (M. S. Jones, Intern. Assoc. of Social Psychiatry, Dingleton Hospital, Melrose, Scotland)

14–17. Controlled **Fusion and Plasma Physics**, 2nd European conf., Stockholm, Sweden. (Mrs. B. Törnell, Div. of Plasma Physics, The Royal Inst. of Technology, Stockholm 70)

14–18. Australian **Spectroscopy**, 6th conf., Brisbane. (D. James, Univ. of Queensland, St. Lucia, Brisbane, Queensland)

14–18. **Operations Research** Around the World Mtgs., Kyoto and Tokyo, Japan. (J. E. Walsh, Systems Development Corp., Santa Monica, Calif.)

14–19. International Federation for **Medical and Biological Engineering**, 7th conf., Stockholm, Sweden. (Secretary-General, The Conference, Stockholm 60)

14–22. Rehovoth Conf. on **Health Problems in Developing States**, Jerusalem and Rehovoth, Israel. (A. Manor, P.O.B. 150, Rehovoth)

16–18. Colloqium on the **Gravitational N-Body Problem**, Paris, France. (G. M. Clemence, Yale Univ. Observatory, Box 2023, Yale Station, New Haven, Conn. 06520)

16–23. International Assoc. of **Scientific Hydrology**, symp. on computation of maximum floods, Leningrad, U.S.S.R. (World Meteorological Organization, 41, Avenue Giuseppe Motta, Geneva, Switzerland)

19–25. International Union of **Biochemistry**, 7th intern. congr., Tokyo, Japan. (Secretariat, c/o Dept. of Chemical Pathology, Guys Hospital Medical School, London S.E.1, England)

19–26. International **Geological** Congr., 23rd, Prague, Czechoslovakia. (M. A. Dudek, Ustredni Ustav geologicky, Malostranske nam. 19, Prague 1, Czechoslovakia)

20–23. American Soc. of **Agricultural Engineering**, Quebec City, Canada. (M. Y. Chartier, Faculté d'Agriculture, Univ. Laval, Cité Universitaire, Québec 10e)

20–24. Society for **Industrial Microbiology**, annual mtg., London, Ont., Canada. (S. Rich, Dept. of Plant Pathology and Botany, Connecticut Agricultural Experiment Station, P.O. Box 1106, New Haven 06504)

20–24. **Biological Photographic** Assoc., 37th annual mtg., Toronto, Ont., Canada. (S. Klosevych, Terminal A, P.O. Box 33, Ottawa 2, Ont.)

20–25. **Biometrics**, 6th intern. conf., Sydney, Australia. (H. L. Leroy, Laboratory for Biometrik and Populationsgenstik, EIDG. Tech. Hochschule, Zurich, Switzerland)

21–24. **Entomological** Soc. of Canada, Ste. Anne de Bellevue, P.Q., Canada. (R. Blais, Forest Entomology and Pathology Laboratory, P.O. Box 35, Sillery, P.Q.)

21–24. World Meeting on **Medical Law**, Ghent, Belgium. (R. Dierkens, Apotheekstraat 5, Ghent)

21–25. **Microscopy**, 14th intern. symp., Cambridge, England. (Mrs. S. Graft, MICRO-67, McCrone Research Inst., 451 E. 31 St., Chicago, Ill. 60616)

21–26. **Psychotherapy**, 7th intern. congr., Wiesbaden, Germany. (Secretary-General, Westfalisches Landfskrankenhaus, 483 Gutersloh, Germany)

21–2. New Theories in **Medical Practice**, intern. congr., Merano, Italy. (W. Grune, Kongressbüro der Bundesärztekammer Haedenkampstr. 1, 5000 Köln-Lindenthal, Germany)

22–25. Institute of **Management Sciences**, 14th annual intern. mtg., Mexico City, Mexico. (C. Gibson, Ford Founda-

tion, Reforma 243-7 Piso, Mexico 5, D.F.)

22–25. **Nematology**, 9th intern. symp., Warsaw, Poland. (H. Sandner, c/o Inst. of Ecology, Dept. of Applied Biology, Nowy Swiat 72, Warsaw)

22–31. International **Astronomical Union**, 13th general assembly, Prague, Czechoslovakia. (Asst. Secretary-General, Astronomical Institute, Czechoslovak Acad. of Sciences, Budecska 6, Prague)

23–25. Canadian Assoc. of **Physical Medicine and Rehabilitation**, 15th annual mtg., Winnipeg, Man., Canada. (Secretary-Treasurer, 153 Lyndhurst Ave., Toronto 4, Ontario)

23–25. **Computational Linguistics**, intern. conf., St. Martin-Dheres, France. (A. H. Roberts, Center for Applied Linguistics, 1717 Massachusetts Ave., NW, Washington, D.C. 20036)

24–28. **Anaesthesia**, 3rd intern. symp., Poznan, Poland. (W. Jurczyk, Ul. Dluga ½, Poznan)

24–28. **Marine Biology**, 2nd European symp., Bergen, Norway. (H. O. Brattstrom, Biological Station, Univ. of Bergen, Bergen)

25–30. Hyperfine Interactions Detected by **Nuclear Radiation**, intern. conf., Pacific Grove, Calif. (K. E. Sebrell, Lawrence Radiation Lab., Univ. of California, Berkeley 94720)

25–31. **Physical Medicine**, 5th intern. congr., Montreal, P.Q., Canada. (B. Talbot, 6300 Darlington Ave., Montreal 26)

25–1. First Intern. **Health** Conf., Copenhagen, Denmark. (P. A. Wells, 90 Buckingham Palace Rd., London, S.W.1, England)

25–2. **Logic, Methodology and Philosophy of Science**, 3rd intern. congr., Amsterdam, Netherlands. (Congress Secretariat, c/o Holland Organizing Centre, 16, Lange Voorhout, The Hague, Netherlands)

25–3. **Epidemiological** Assoc., 5th intern. mtg., Krakow, Poland. (R. M. Acheson, Dept. of Epidemiology and Public Health, Yale Univ. Medical School, 60 College St., New Haven, Conn. 06510)

27–1. Laurentian **Hormone** Conf., Mont Tremblant, P.Q., Canada. (The Conference, 222 Maple Ave., Shrewsbury, Mass.)

27–2. **Ionization Phenomena in Gases**, 8th intern. conf., Vienna, Austria. (F. Viehbock, Osterreichische Studiengesellschaft fur Atomenergie, Lenaugasse 10, A-1082 Vienna VIII)

28–29. **Oxidation**, intern. symp., San Francisco, Calif. (T. Mill, Stanford Research Inst., Menlo Park, Calif. 94025)

28–29. International **Theoretical Physics** Conf. on Particles and Fields, Rochester, N.Y. (R. E. Marshak, Dept. of Physics and Astronautics, Univ. of Rochester, Rochester 14627)

28–30. American **Mathematical** Soc., Mathematical Assoc. of America, 72nd joint summer mtg., Toronto, Ont., Canada. (Executive Director, SUNY at Buffalo, Univ. of Buffalo, Buffalo, N.Y.)

28–30. Canadian Inst. of **Mining and Metallurgy,** 6th conf. of Metallurgists, Kingston, Ont., Canada. (The Institute, 906–1117 St. Catherine St., W. Montreal 2)

28–1. **Atomic Masses and Related Constants**, 3rd intern. conf., Winnipeg, Man., Canada. (H. E. Duckworth, Univ. of Manitoba, Winnipeg 19)

BOOKS RECEIVED

(*Continued from page 418*)

Human Parasitology. Practical exercises in medical natural history. Daniel M. Jarry. Translated from the French edition (Paris, 1961) by R. Crawford. Pergamon, New York, 1967. 247 pp. Illus. $7.

Imagination and the Growth of Science. A. M. Taylor. Schocken, New York, 1967. 118 pp. $3.95.

Immunological Properties of Protein Hormones. Proceedings of a meeting organized under the auspices of Accademia Nazionale dei Lincei and of Consiglio Nazionale delle Ricerche (Rome), June 1964. Filippo Polvani and Piergiorgio Crosignani, Eds. Academic Press, New York, 1966. 273 pp. Illus. $12. Twenty-three papers.

International Tectonic Dictionary—English Terminology. John G. Dennis, Ed. American Assoc. of Petroleum Geologists, Tulsa, Okla., 1967. 208 pp. Illus. $5; members, $3.50. Memoir No. 7.

Introducing Culture. Ernest L. Schusky and T. Patrick Culbert. Prentice-Hall, Englewood Cliffs, N.J., 1967. 160 pp. Illus. Paper, $2.95. Prentice-Hall Anthropology Series.

Introduction to Nuclear Chemistry. D. J. Carswell. Elsevier, New York, 1967. 289 pp. Illus. $11.

An Introduction to Polymer Chemistry. D. Margerison and G. C. East. Pergamon, New York, 1967. 308 pp. Illus. $5.95. Commonwealth and International Library.

Introduction to Quantum Theory. Hendrik F. Hameka. Harper and Row, New York, 1967. 288 pp. Illus. $12.

Introduction to Radar and Radar Techniques. Denis Taylor. Philosophical Library, New York, 1967. 135 pp. Illus. $4.75.

Lubrication and Lubricants. Eric R. Braithwaite, Ed. Elsevier, New York, 1967. 582 pp. Illus. $30. Ten papers.

Lunar Geology. Gilbert Fielder. Dufour, Chester Springs, Pa., 1967. 184 pp. Illus. $8.95.

Major Problems in Developmental Biology. The 25th symposium of The Society for Developmental Biology (Haverford, Pa.), June 1966. Michael Locke, Ed. Academic Press, New York, 1966. 420 pp. Illus. $16. Eleven papers.

Man Incorporate: The Individual and His Work in an Organized Society. Carl B. Kaufmann. Doubleday, Garden City, N.Y., 1967. 287 pp. $5.95.

A Manual of Closed Reduction of Closed Fractures and Dislocations. Robert Mazet, Jr. Thomas, Springfield, Ill., 1967. 141 pp. Illus. $10.50.

Manual on Industrial Water and Industrial Waste Water. Sponsored by ASTM Committee D-19 on Industrial Water. American Soc. for Testing and Materials, Philadelphia, ed. 2, 1967. 1006 pp. Illus. $17.25.

Microbiology. Philip L. Carpenter. Saunders, Philadelphia, 1967. 488 pp. Illus. $7.50.

Middle-Class Juvenile Delinquency. Edmund W. Vaz, Ed. Harper and Row, New York, 1967. 297 pp. Paper, $3.95. Readers in Social Problems Series. Nineteen papers.