

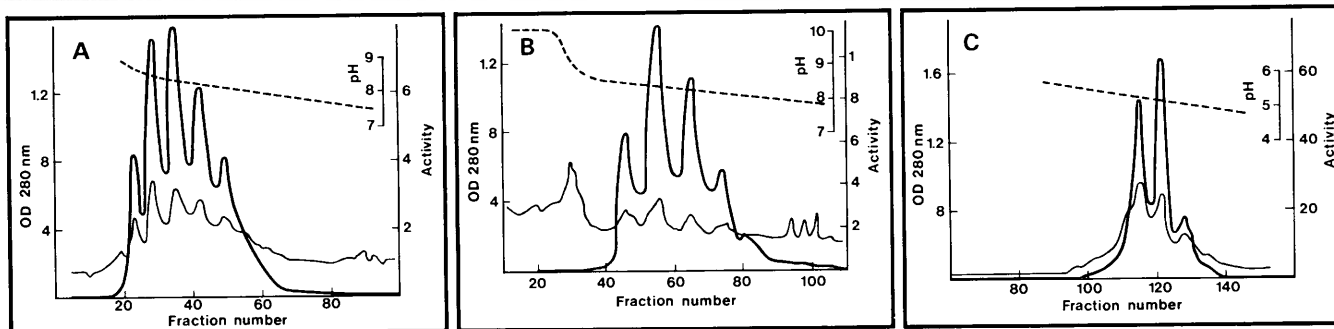
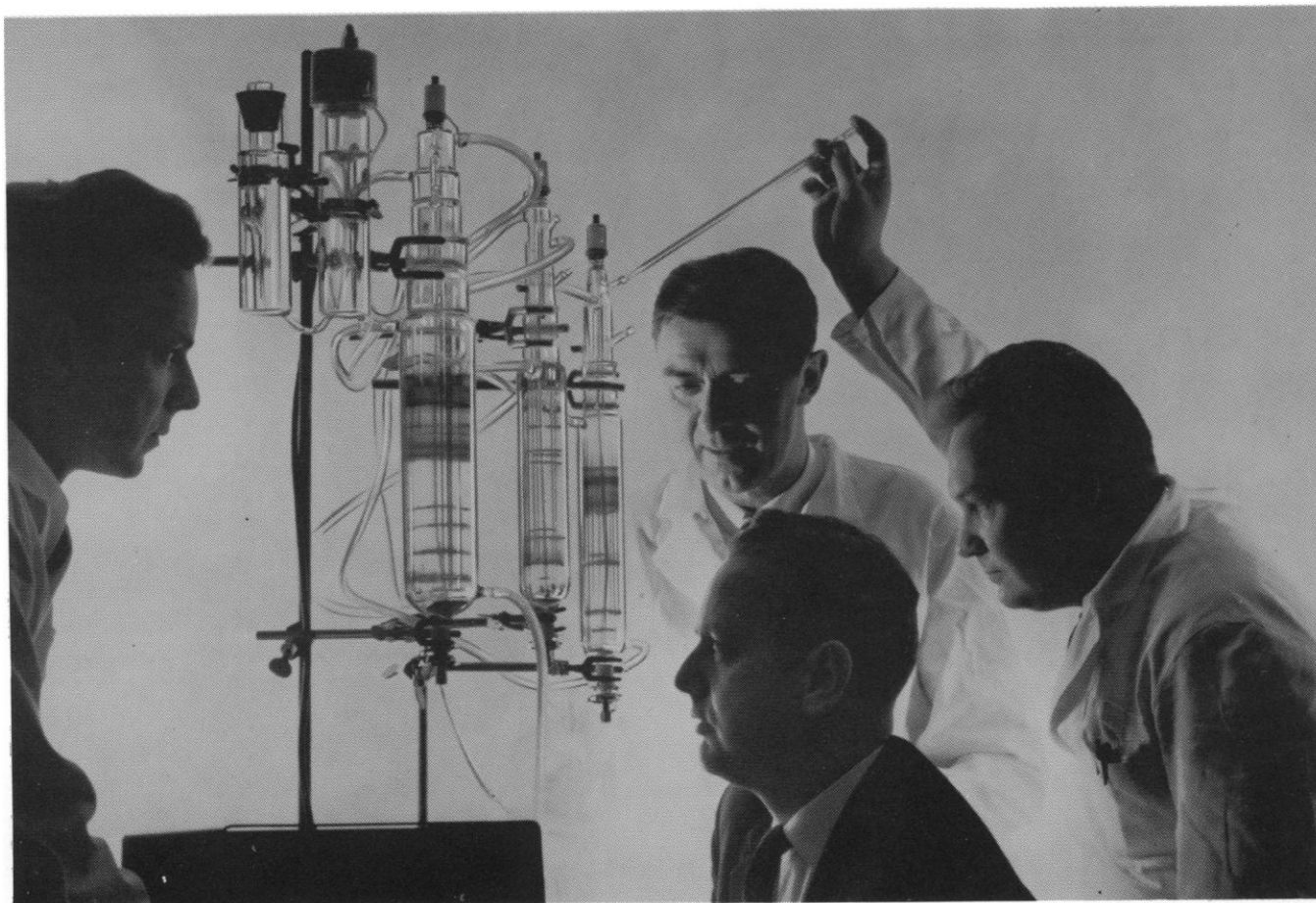
# SCIENCE

12 November 1971

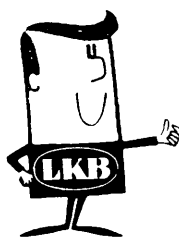
Vol 174, No. 4010

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE





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## COVER

Aerial view of the northwestern slopes and foothills of the Pico de Orizaba, (snow-capped mountain on left, 5511 meters) in Mexico. In the foreground can be seen Guadalupe Victoria, principal source of obsidian exploited by the Olmec of San Lorenzo Tenochtitlan. See page 666. [Michael D. Coe, Yale University]

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

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## **Nuclear waste assayed automatically for isotope inventories.**

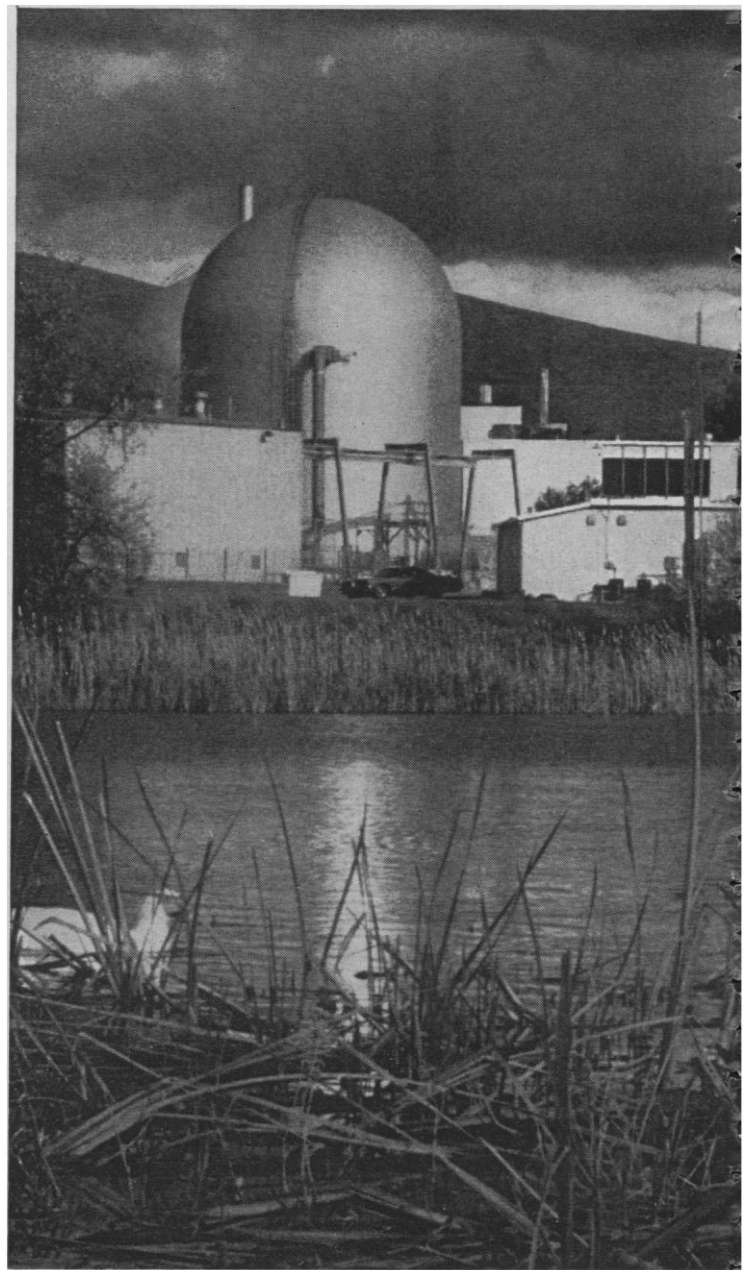
Of all industrial waste products, none requires more care than radioactive materials. And the assay of radioactive wastes is uncommonly time consuming and expensive.

In a significant simplification of this problem, Gulf Energy and Environmental Systems, Inc. has developed a mobile automatic assay system with the help of Hewlett-Packard computerized nuclear instrumentation. Briefly, the system produces a penetrating beam of nuclear particles to induce gamma rays and measures the radioactivity without removing the material from its container. The computer analyzes the measurement, compares it with the known characteristics of nuclear materials, and automatically determines the types and quantity of isotopes present.

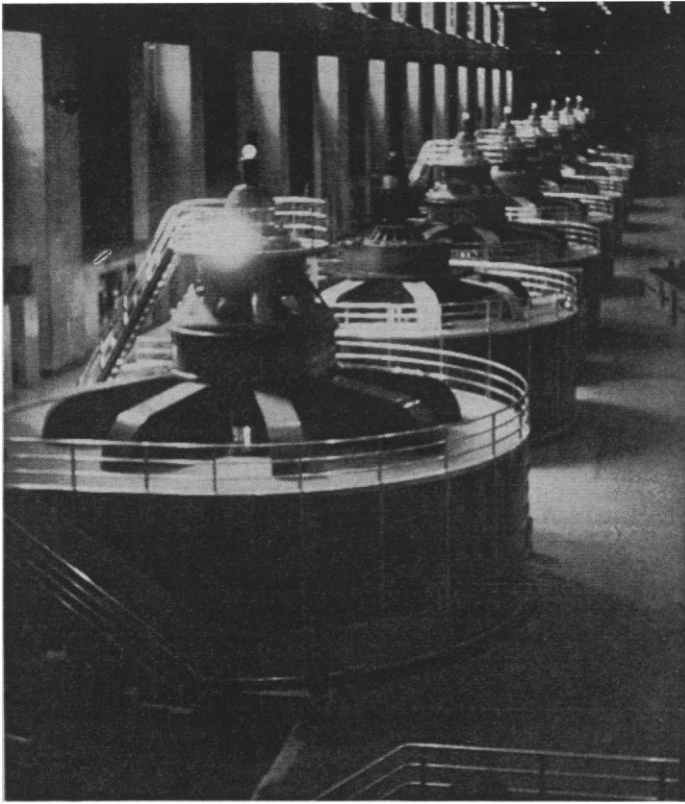
The Gulf system is better than previous techniques on at least two scores. Because it computerizes the intricate analysis, the system is easily operated by technicians. Results are immediate and accurate to 1%.

Similar HP nuclear measurement systems, beginning at \$30,000, continuously monitor atomic power plant effluents and print out the type and amount of radioactivity. Detailed information is yours for the asking.

*Pollution-free nuclear power generating plants now have added assurance they will stay that way. A Hewlett-Packard computerized measurement system helps by making a careful accounting of nuclear waste materials.*







*Keeping power generating equipment operating at capacity, especially during periods of peak demand, is vital. To insure against downtime, a new tool from HP can "look inside" key machinery and predict when it will need service or maintenance.*

### **"Transformation Machine" converts fuzzy signals into sharp answers for power systems.**

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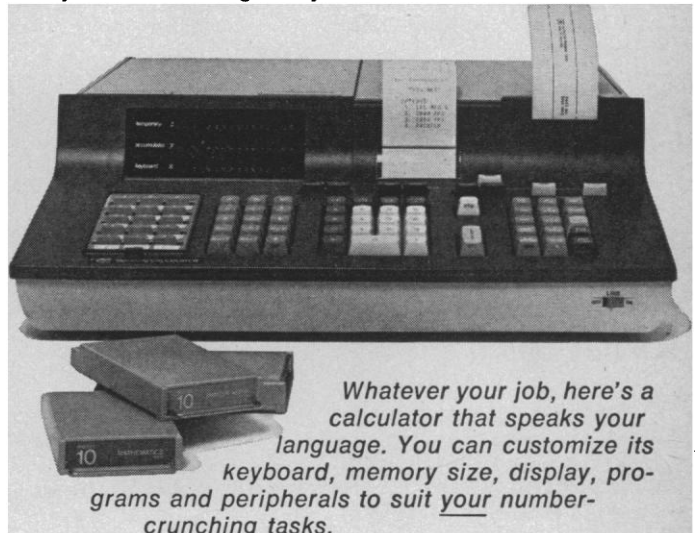
Scientists in many other fields have been confronted by measurement signals so complex that they look as useless as noise. Until recently, the best solution was to use the complex mathematics of the Fourier transform and program a computer to do the complex signal analysis computations off-line.

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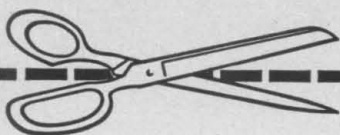
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38mm Biogon	Comparison of lenses	40mm Distagon
f 4.5	Aperture	f 4
38mm	Focal length	40mm
90°	Angle of view	88°
8	Number of lens elements	10
12" to ∞	Focusing range	19" to ∞
B, 1-1/500 sec	Synchro Compur Shutter	B, 1-1/500 sec
4.5-22	Diaphragm	4-32
63	Filters—Hasselblad Series	104
Optical	Viewing system	Reflex
No	Interchangeable?	Yes
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optical viewfinder. But should you ever require reflex viewing and focusing, you can remove the film magazine and attach a ground glass back in its place. Then when you're ready to shoot just take it off and put the film magazine back.

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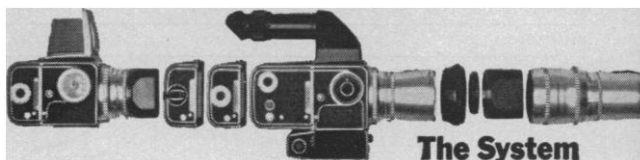
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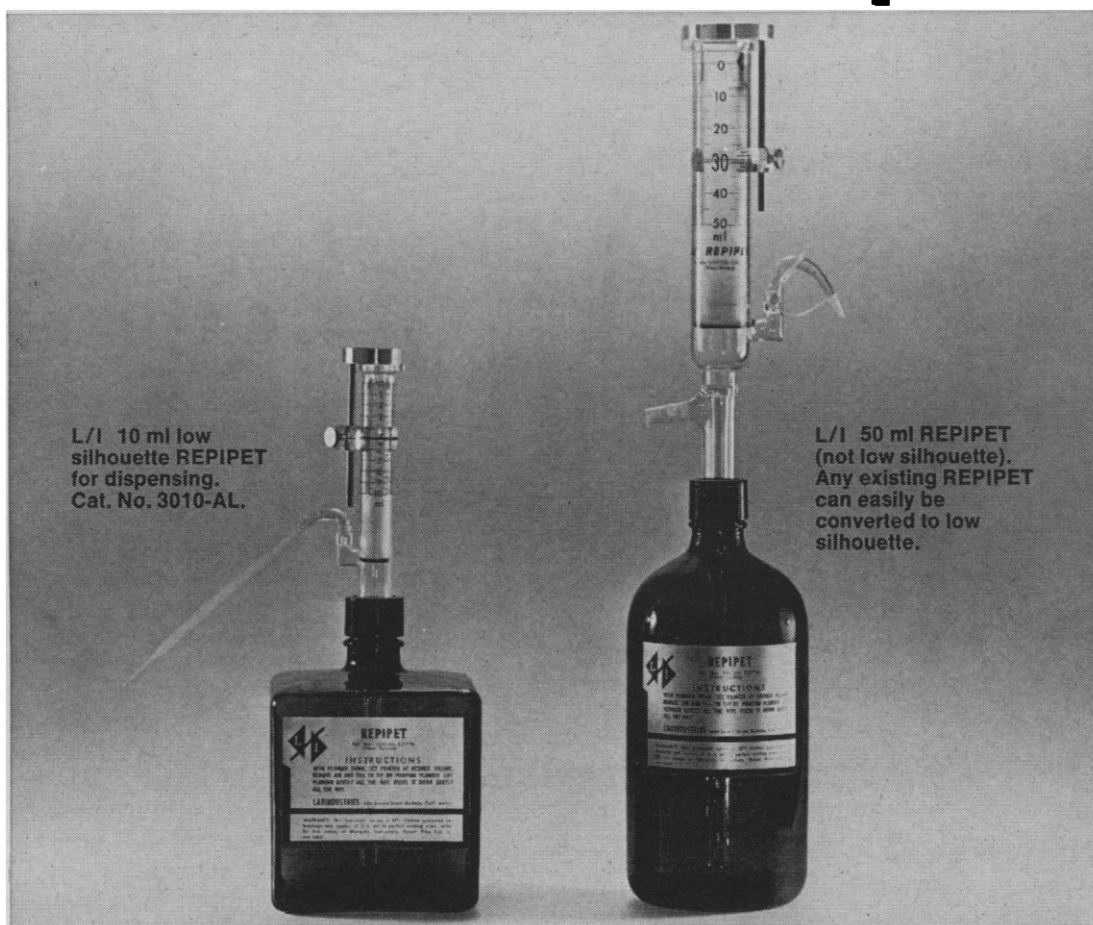
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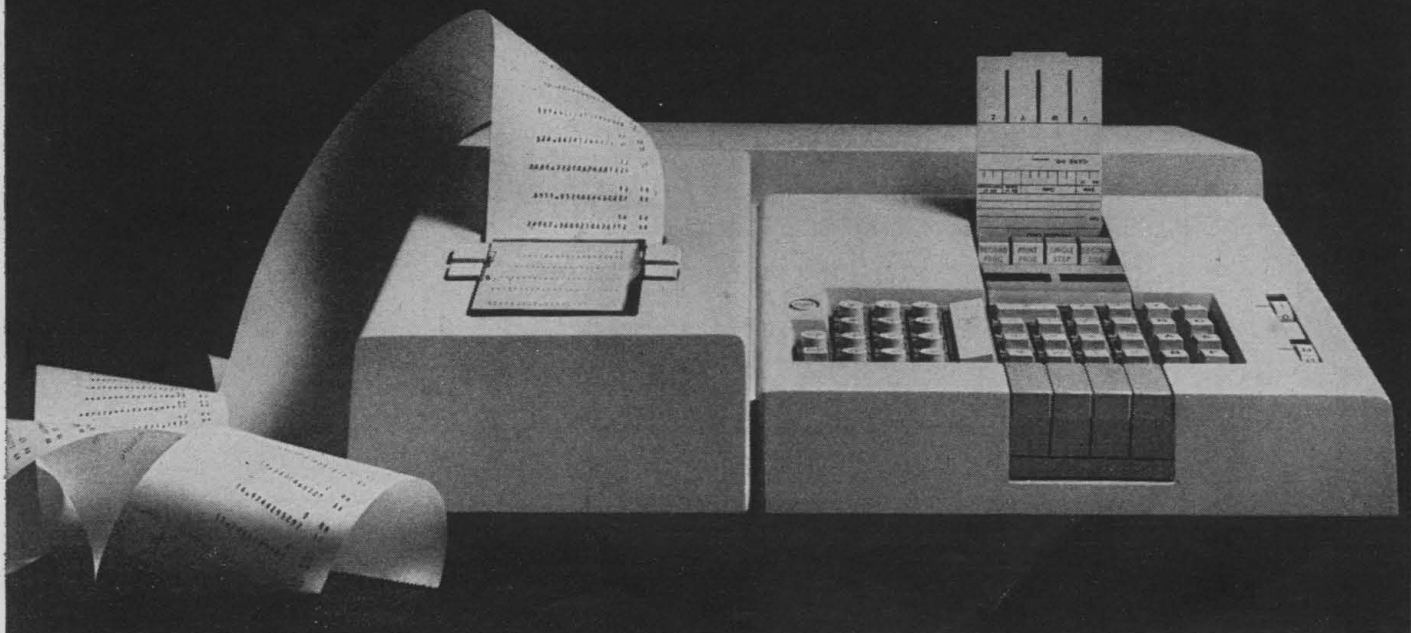
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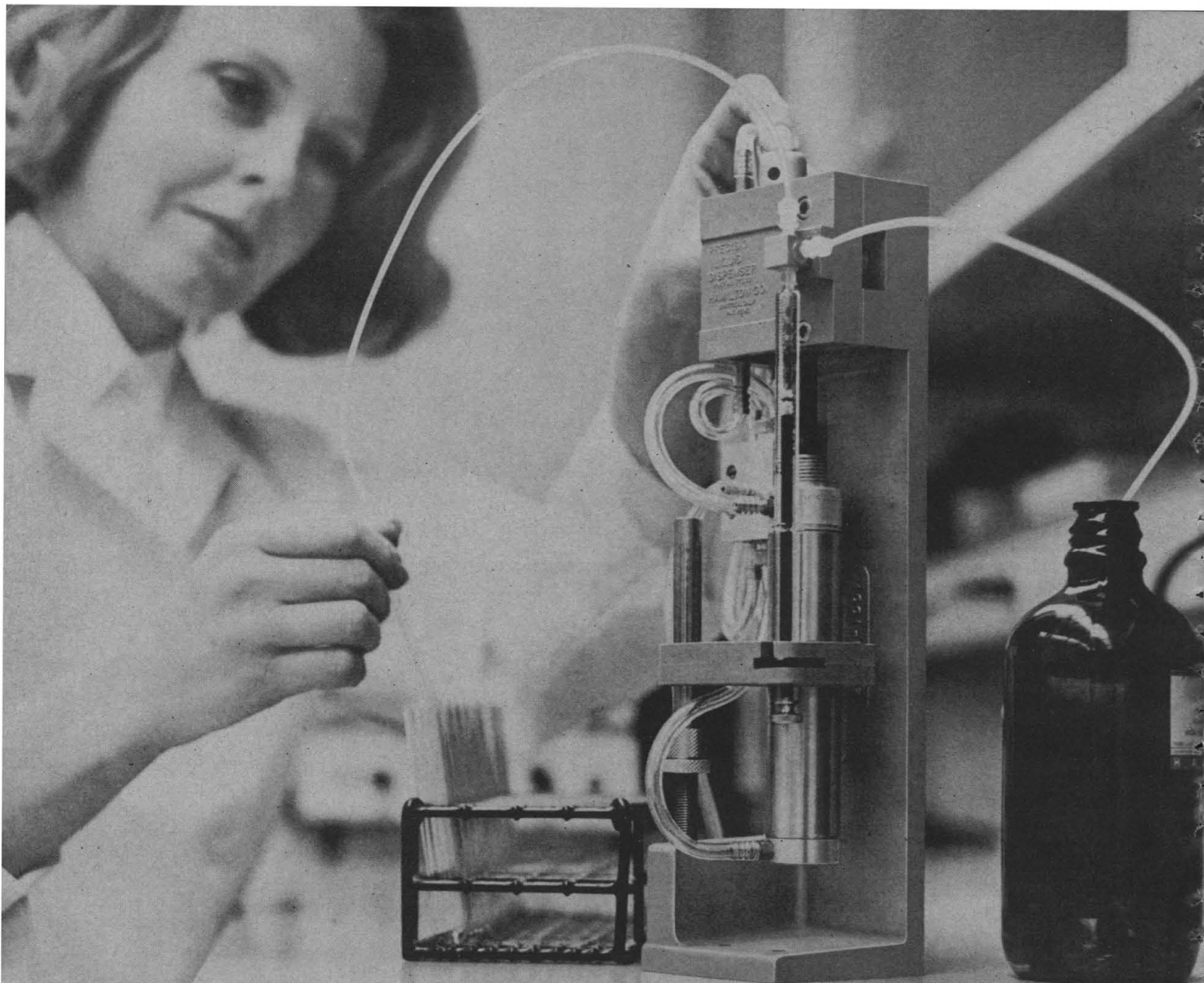
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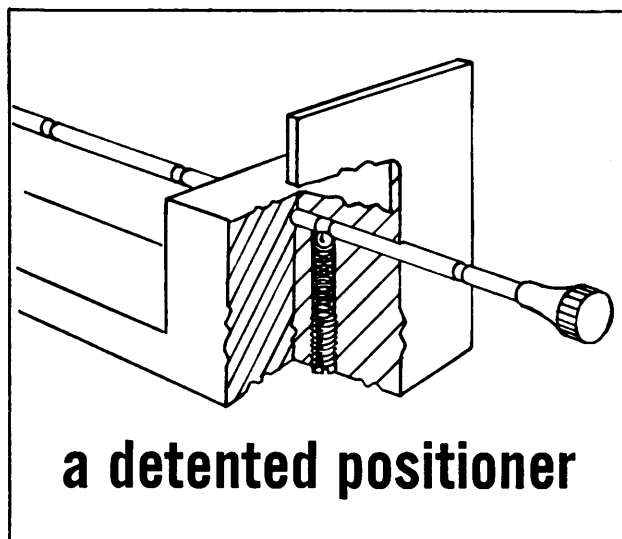
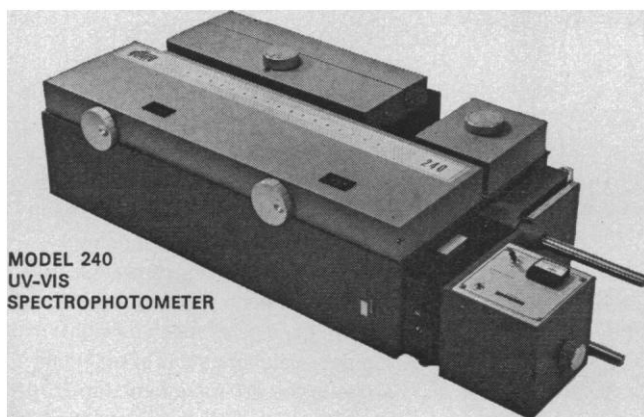
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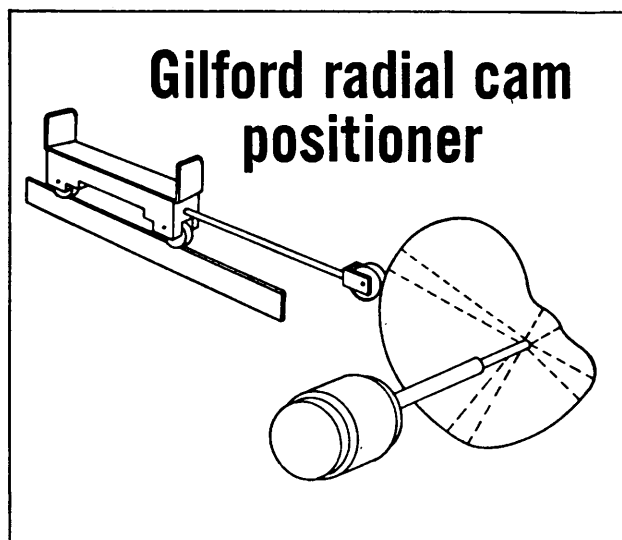
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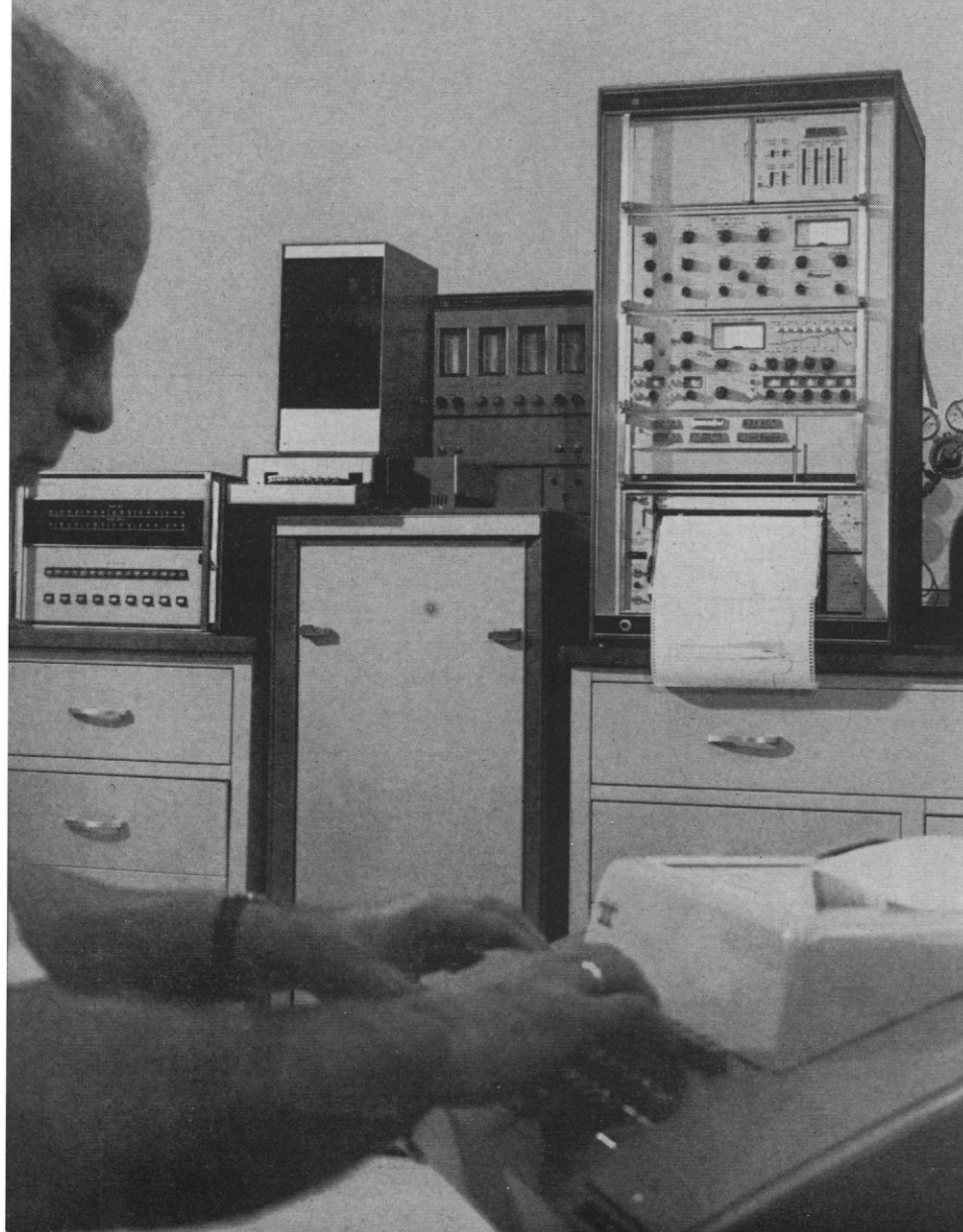
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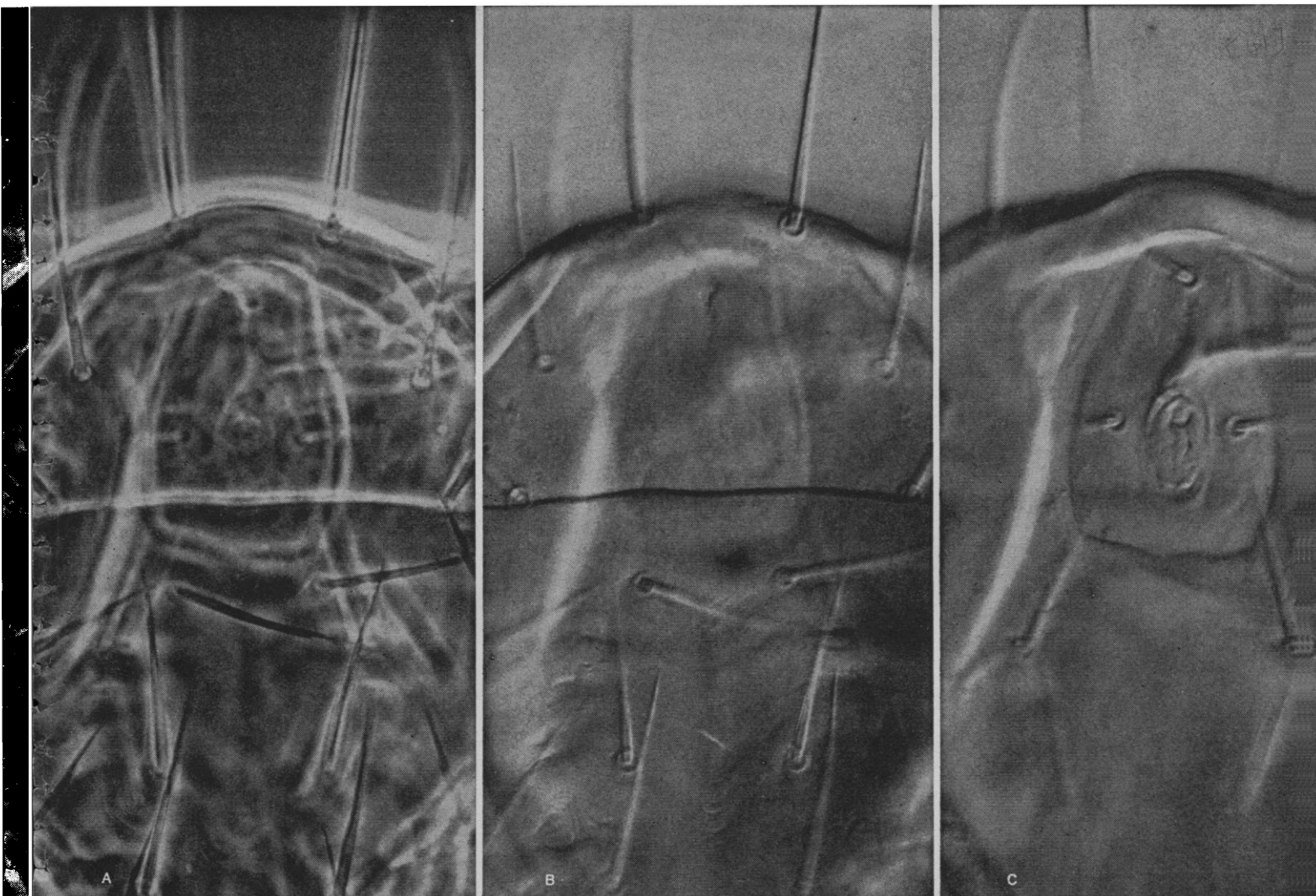
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*Ornithonyssus bacoti*, taken with Zeiss Photomicroscope II, total magnification 1000X, no preparation. (A) Transmitted Phase Contrast; (B&C) Nomarski Interference Contrast in two different focal planes. Notice the 3-dimensional effect.

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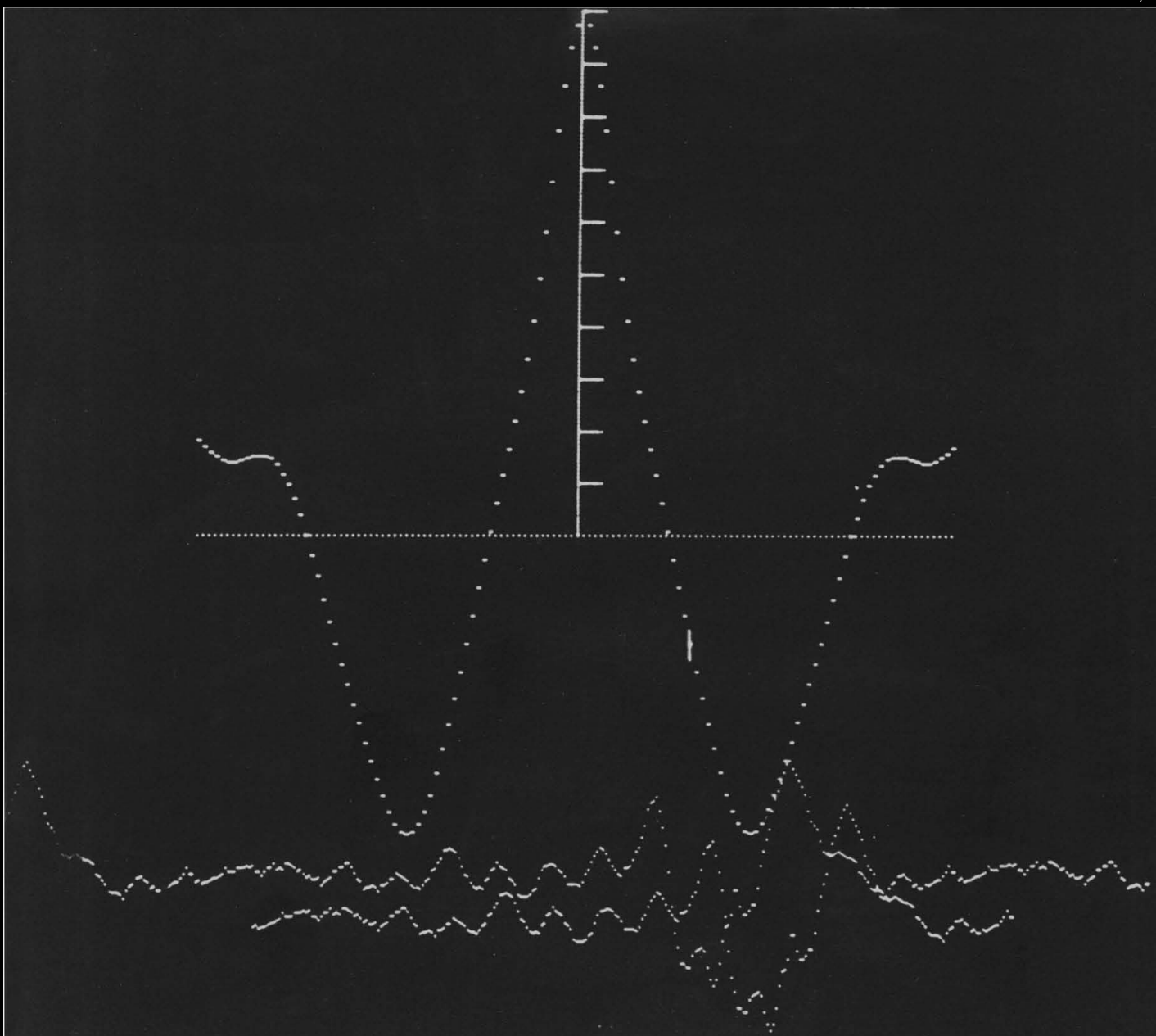
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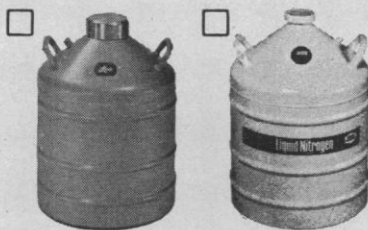
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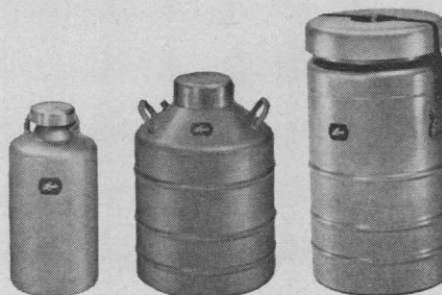


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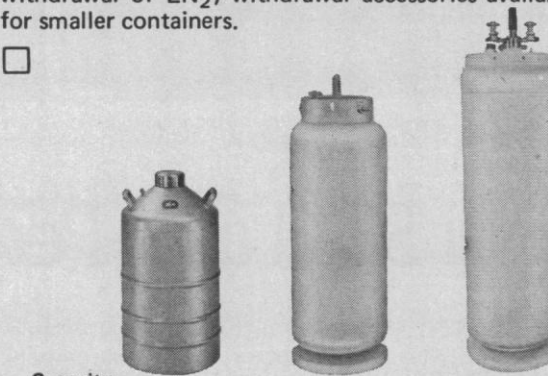
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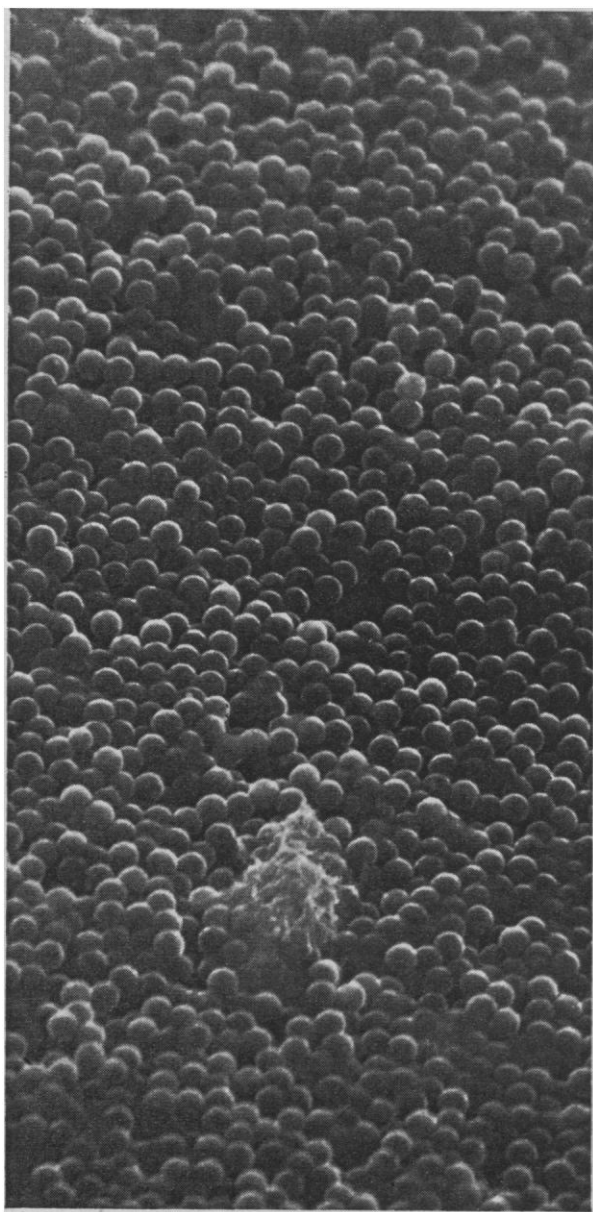
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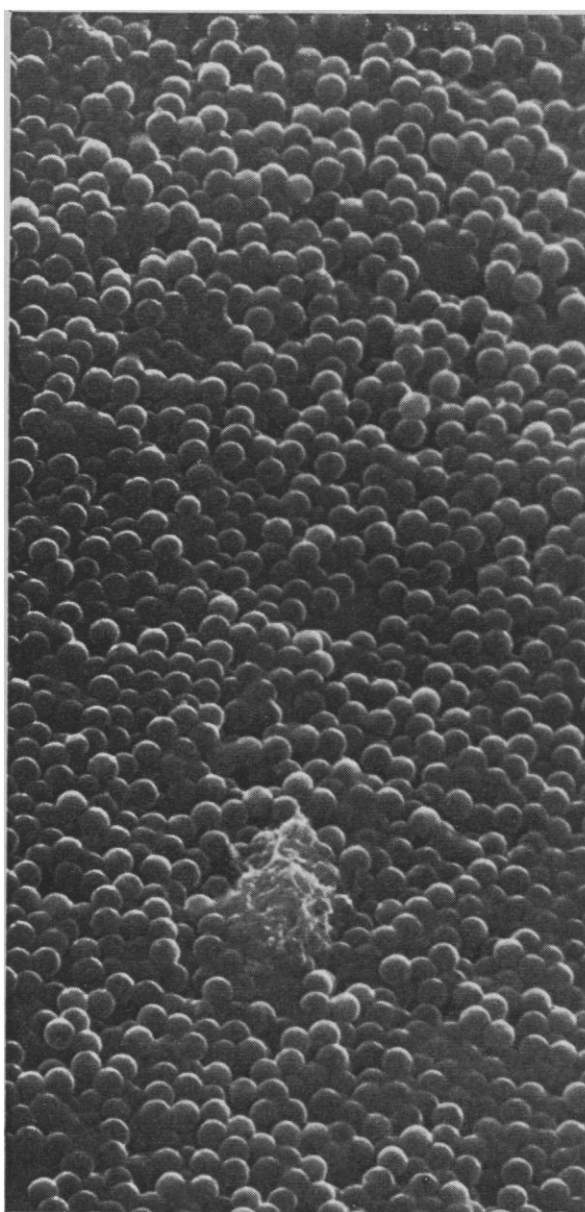
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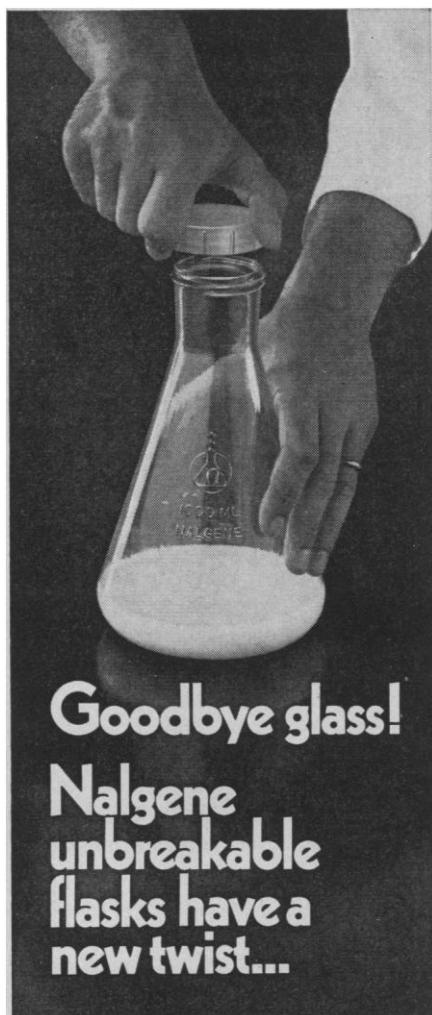
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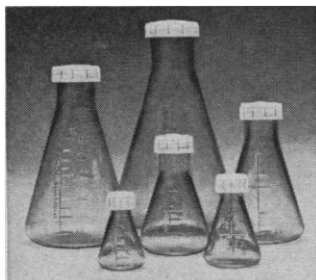
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WILLIAM C. ORTHWEIN

*Department of Engineering Mechanics and Materials, Southern Illinois University, Carbondale 62901*

### The Space Shuttle

The conflicting analyses of the costs and benefits of the space shuttle that were carried out by Rand and by Mathematica (News and Comment, 11 June, p. 1112) have stimulated controversy over this space transportation system. The costs and benefits of the shuttle constituted a major topic of discussion at the recent Space Systems Meeting of the American Institute of Aeronautics and Astronautics.

The cost of the full operational space transportation system is now put at \$12.7 billion, although new cost-cutting efforts may reduce that figure. This cost includes shuttle development, test, and production; establishment of facilities; and a reusable orbit-to-orbit shuttle or "space tug" that would be used to replace and retrieve satellites in orbits up to the geosynchronous.

According to the Office of Management and Budget (OMB), the shuttle must be wholly justifiable on the basis of economic return, and the system must generate this return at a 10 percent discount rate. Such a conservatively high rate reflects the relatively low priority now afforded to space ventures.

Lindley (1) reports that the OMB specifications would be met by a traffic rate of 39 flights per year, much lower than the recent rate of launches by all users (NASA, Department of Defense, Comsat, and so forth). The specifications would also be met by a continuing level of space spending, again by all users combined, of \$3 billion per year—much lower than is the case even today. Woodcock (2), analyzing shuttle design requirements after the methods

applied to new commercial jet transports, also concludes that the current designs are adequate to meet the OMB requirements.

Shuttle benefits include reduced launch costs, elimination of launch losses through an intact-abort capability, on-orbit refurbishment and check-out of satellites with attendant simplification of satellite design, and optimal use of man in spaceborne investigations. Two types of payloads would be carried: those physically separated from the shuttle and those which remain attached, subsequently returning to Earth. These classes are referred to, respectively, as "automated satellites" and "sortie missions."

The automated satellite represents a development of the classic unmanned satellite. Salee (3) proposes an analytic method for determining the cost reductions such satellites might achieve. He suggests maintenance of the satellite by routine shuttle revisit, rather than relying upon redundant or high-reliability design. Salee concludes that such satellites should use available hardware, with new development eschewed in favor of proven designs. The resulting payloads would feature low technological risk, high credibility of cost prediction, and lower research and development cost. He reports a saving of 50 percent in a typical case, the High Energy Astronomical Observatory.

The sortie mission represents a fundamentally new mode of space operation. Bader and Farlow (4) propose that scientific sortie flights could resemble the experiment-carrying aircraft flights of the NASA program; their conclusions are echoed by Stuhlinger and Downey (5). In sortie flights, the scientists themselves would furnish the instruments, which could be of standard laboratory design, and they would accompany them to orbit. The instruments would require little or no space-qualification, and the scientists would require no astronaut training.

This approach contrasts with current methods, in which space experiments require the involvement of hierarchies of designers, managers, review and evaluation boards, contractors, and NASA centers. The time from experiment proposal to flight is 3 to 5 years; the cost, \$30,000 per pound and up. Shuttle sortie experiments could be carried out at an equipment cost of \$100 to \$1000 per pound. Time from proposal to flight would be months or even weeks. Most important, the scientist could spend his time actually preparing

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his experiments, rather than overseeing exchanges of documents with contractors and designers.

Specialized research on research and application modules, or RAM's, would also take place (6). Hook and Carey (7) discuss the discipline areas that would benefit. In astronomy, the shuttle could support x-ray and infrared studies, as well as a 3-meter, diffraction-limited, optical telescope (900 to 10,000 angstroms) (8). Life sciences research at zero gravity could yield new insights. In materials science investigations, large crystals and unique composites might be produced at zero gravity, with possible commercial application. Engineering investigations in space technology and communications research could also use the shuttle in the sortie mode.

In the field of earth observations (5), high-quality, low-cost information could be gathered about crop yields and diseases. Other observations might involve earth physics, forestry and resource management, land-use patterns, and locations of new mineral or seafood resources. Water resource management and hydrology, geography and cartography, and oceanography might also benefit, as well as air and water pollution research. Disaster relief would benefit from the quick response time of a sortie mission for surveys of the damage and coordination of relief.

The scientific benefits of the shuttle do not in themselves justify its development; the \$12.7-billion cost to establish this system is larger than the amount the National Science Foundation will receive during the same time. Defense, commercial, and applications benefits combine as well to furnish the justification. Nevertheless, the scientific benefits should not be overlooked. For the first time, laboratory-type investigations may be carried out in space, not by scientist-astronauts, but by scientists.

T. A. HEPPENHEIMER

*Department of Aerospace Engineering,  
University of Michigan, Ann Arbor*

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1. R. N. Lindley, *AIAA Paper 71-806*.
2. G. R. Woodcock, *AIAA Paper 71-810*.
3. A. M. Salee, *AIAA Paper 71-807*.
4. M. Bader and N. H. Farlow, *AIAA Paper 71-808*.
5. E. Stuhlinger and J. H. Downey, *AIAA Paper 71-814*.
6. W. L. Breazeale and J. T. Milton, *AIAA Paper 71-813*.
7. W. R. Hook and W. T. Carey, *AIAA Paper 71-812*.
8. R. J. Kirby and R. S. Johns, *AIAA Paper 71-815*.
9. The above reports are obtainable from the American Institute of Aeronautics and Astronautics, Order Department (JF), 1290 Avenue of the Americas, New York 10019. Price per copy, \$2.

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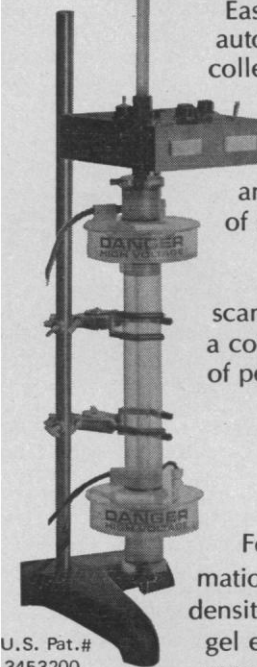
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## Treatment of Laboratory Animals

Maurice B. Visscher's article (28 May, p. 916) on the Animal Welfare Act of 1970 (P.L. 91-579) leaves the scientific investigator with an unjustified sense of security that there is under this act no possibility of bureaucratic interference with the design or execution of any experiment.

It is true that Section 13 of P.L. 91-579 contains language to the effect that nothing preceding Section 13 can be construed as authorizing the Secretary of Agriculture to promulgate rules, regulations, or orders with regard to design, outlines, guidelines, or performance of actual research or experimentation by a research facility. Immediately following, however, is what is known in governmental circles as a "march-in clause":

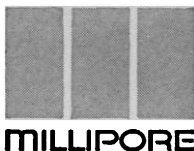
Provided, however, that the Secretary shall require at least annually, every research facility to show that professionally acceptable standards governing care, treatment and use of animals including appropriate use of anesthetic, analgesic and tranquilizing drugs during experimentation are being followed by the research facility during actual research or experimentation.

This clause will certainly leave the investigator or facility open to question if some functionary of the Department of Agriculture assigned to reading these annual reports does not interpret "professionally acceptable standards" as the investigator or research facility does. These standards have yet to be decided upon, and even when that occurs they may not conform to the investigator's ideas of professionally acceptable standards.

Because of the quoted clause, the American Society For Pharmacology and Experimental Therapeutics did not endorse the legislation which became P.L. 91-579. Rather, the society consistently and publicly, on the recommendation of its Committee on Public Affairs, endorsed the legislation with regard to treatment of laboratory animals proposed by Representative Paul G. Rogers (D-Fla.) and Senator Jacob K. Javits (R-N.Y.) in the 90th and 91st Congress (1966-1970). We still believe that the Rogers-Javits proposals would have better served the interests of all concerned.

LEONARD PROCITA  
*Committee on Public Affairs,  
American Society For Pharmacology  
and Experimental Therapeutics,  
Albany Medical College,  
Albany, New York 12208*

12 NOVEMBER 1971



## the technology that separates tumorogens from antigens in vaccines

Some viral vaccines have caused tumors in mice so pharmaceutical manufacturers, of course, have to eliminate the tumorigenic agents with extreme prejudice before the vaccines can be shot into men.

One way to do it is to bust up the virus into antigenic pieces with chemicals. In doing this, though, viral DNA, which can be tumorigenic, is let loose. Since antigen molecules and DNA molecules can't easily be separated on the basis of size, the chemical solution becomes part of the problem.

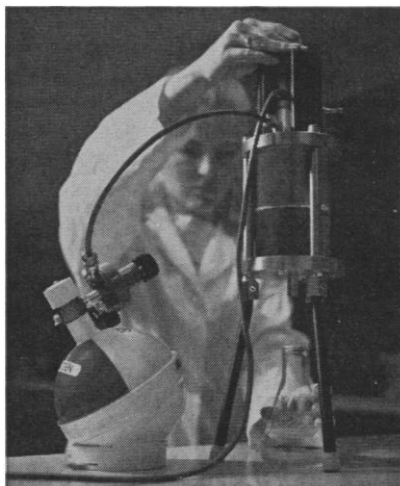
That part of the problem can be solved by breaking up DNA into pieces too small to carry genetic information with DNase; but this enzyme also acts as an antigen and a vaccine with two different antigens hardly meets acceptable standards of biological purity. So there's a whole new problem.

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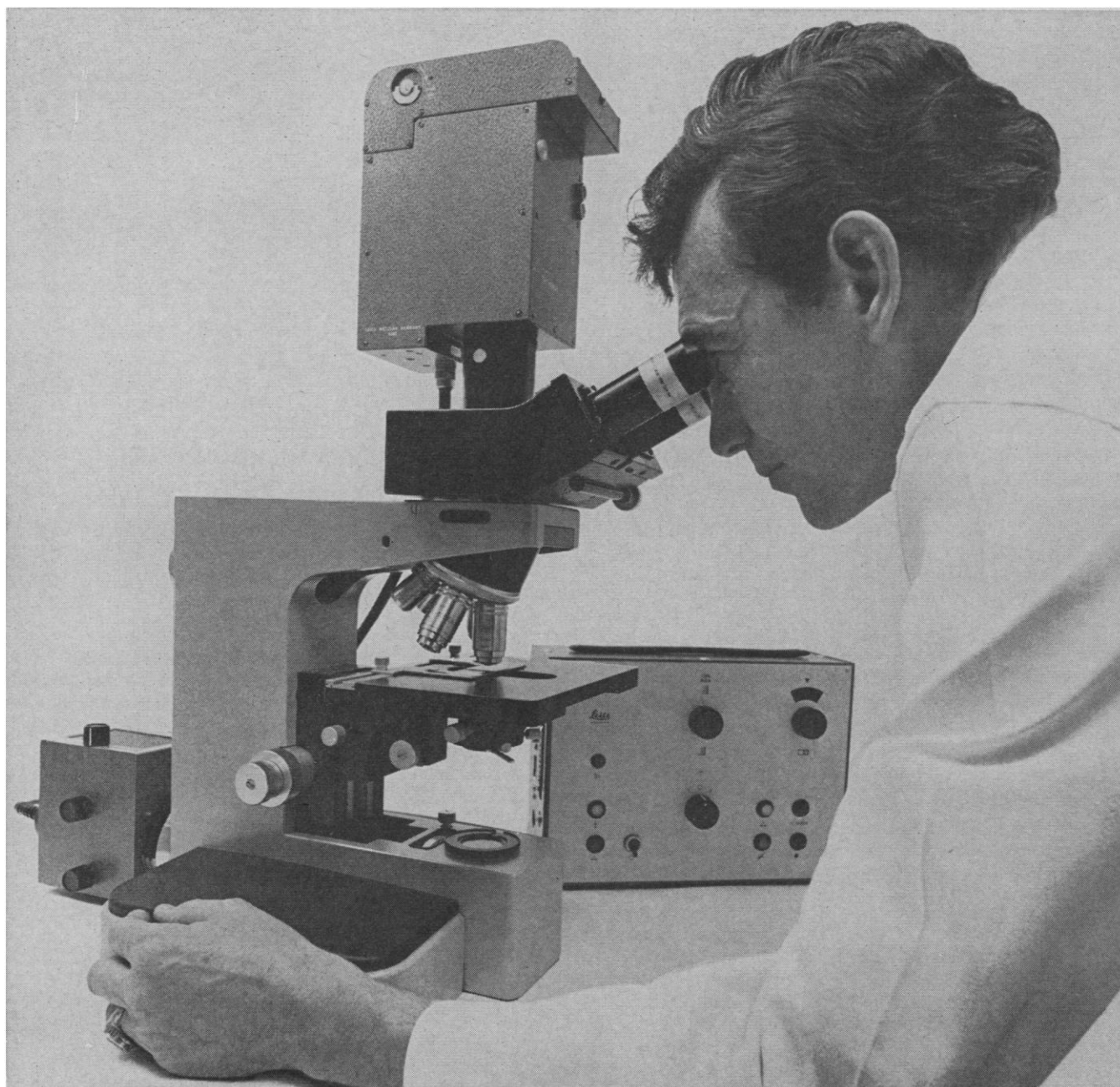
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## Training Scientists for New Jobs

The American scientific enterprise has been experiencing a prolonged period of anxiety. At one time, scientists were among the most favored groups in society and many of them felt secure in their view that the pursuit of fundamental research was the only really worthwhile activity. Since an increasing number of positions were available on campus, academia trained and indoctrinated the best students to become professors.

Relatively sudden changes in public attitudes, in governmental support, in the financial status of universities, and in the job market have damaged the morale and poise of many scientists, particularly chemists and physicists. A few news stories about Ph.D.'s driving taxicabs have led professors, students, and the public toward the attitude that we are training too many physical scientists. The leading universities, which traditionally have produced the best doctorates, have drastically cut their enrollments of entering graduate students in physics and chemistry.\* Should their example be followed in other schools, it would lead ultimately to a decimation of science faculties.

Instead of a gloom and doom attitude, a more constructive approach seems called for. Unemployment statistics indicate that that problem is not as dreadful as it has been portrayed. Moreover, if the universities would provide a broader-gauge indoctrination and training, more kinds of positions would be available to science graduates.

A recent survey conducted by the National Science Foundation† provides data on the employment status of scientists. The results indicate that the overall unemployment rate for physical scientists is 3 percent. Among those having the Ph.D. degree, the rate is only about 1 percent. The overall rate is age dependent, and those who are in the 25-to-29 age bracket are experiencing the toughest problems. Their unemployment rate is 5 percent. These findings are corroborated in conversations with professors of chemistry and physics at leading universities. They indicate that their best students are being placed, but that their lesser products are not always so fortunate.

Those professors who continue to indoctrinate and train their students only for the pursuit of fundamental research will find that the job market for the next several years will be poor. A limited number of academic posts will be available. Government support of research will not increase greatly, and industry's basic research is more likely to be curtailed than expanded. Unless professors are willing to watch their departments shrink, they must prepare their students for a broader range of positions. Almost all of the major problems of society involve a component of science and technology. The discipline of a good education in science, with its emphasis on facts and on a systematic approach to problem solving, could be an important component in training for many non-research careers in the public and private sectors.

Examples of what might be done are provided by some of the great technology-oriented companies. Only a small fraction of their technically trained employees are active in fundamental research. Others are engaged in development, in market surveys, in sales, and in all levels of management. Research managers point out that, for every dollar spent on successful basic research, \$10 must be spent on development and \$100 eventually spent on all the tasks involved in introducing a new product. These figures illustrate why industry and perhaps even society can afford to engage in only a limited amount of basic research. They also indicate potential usefulness of employing individuals of great competence in activities other than pure research.—PHILIP H. ABELSON

\* Much of the content of this editorial was derived from a Conference on Unemployment organized by the AAAS and held 12 October 1971. † National Science Foundation Report No. 71-26.

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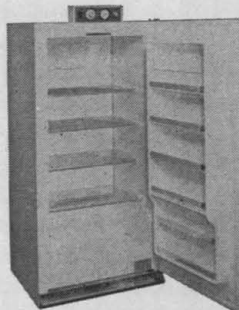
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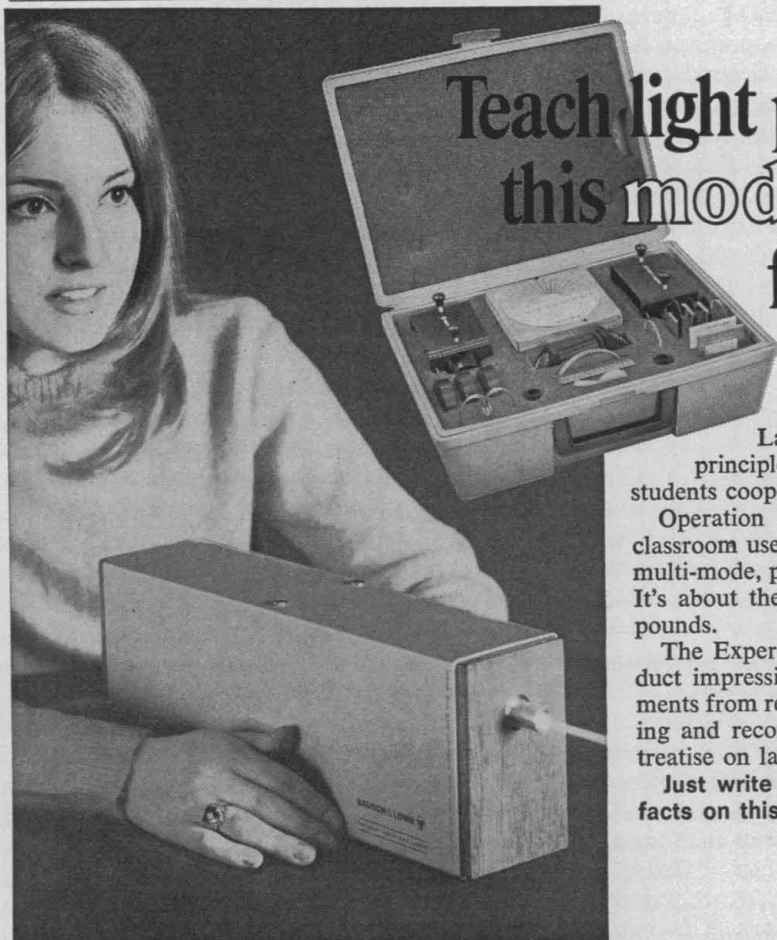


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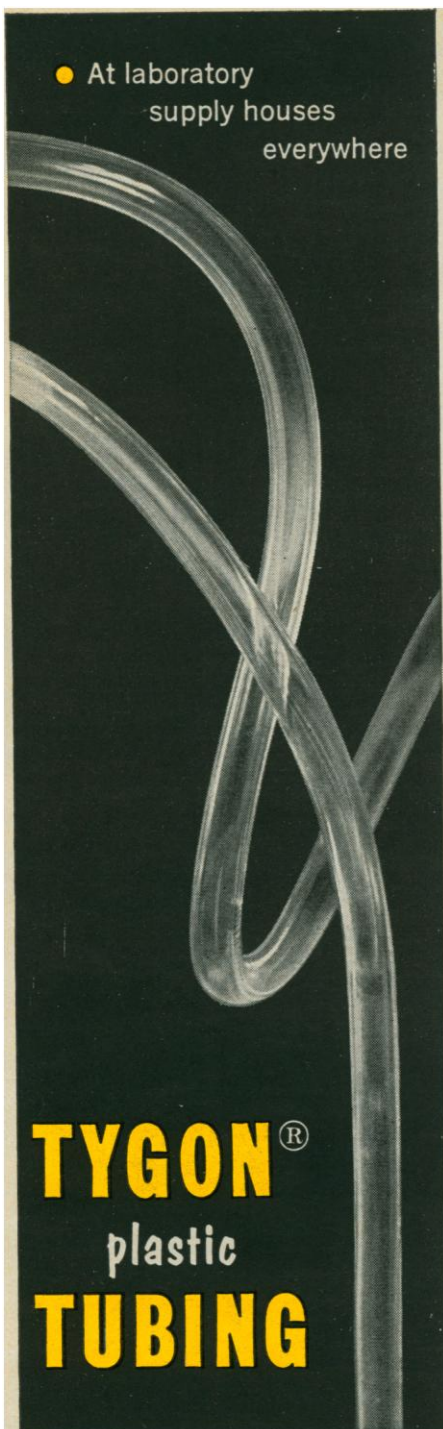
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to contribute toward conferees' travel expenses, registration fee, and/or subsistence expenses at the conference location. However, total travel and subsistence expenses usually will not be provided.

**Cancellation.** The conferee deposit is forfeited if an approved application is canceled. This deposit is not transferable to another conference or conferee.

**Membership.** Requests for membership in the conferences or for additional information should be addressed to Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Pastore Chemical Laboratory, University of Rhode Island, Kingston, Rhode Island 02881. Telephone: 401-783-4011.

The program for the Winter Gordon Research Conferences follows.

#### Electrochemistry

Allen J. Bard, chairman; James D. E. McIntyre, vice chairman.

**10 January.** Robert O. Becker, Theodore L. Jahn, and Barnett Rosenberg, "Bioelectrochemistry—fundamentals and future."

**11 January.** Richard S. Nicholson and J. M. Saveant, "Cyclic voltammetry—progress and prognosis." Organic electrode reaction mechanisms: Lennart Ebersson and Lynn S. Marcoux, "Organic electrode reaction mechanisms: ECE vs. disproportionation"; Manuel M. Baizer and W. Ves Childs, "Reductive couplings."

**12 January.** Fred Anson, W. Plieth, W. R. Fawcett, and Robert deLevie, "The electroactive species at the electrode surface."

**13 January.** Larry R. Faulkner, R. VanDuyne, and Nicholas Winograd, "Recent advances in electrochemical-spectroscopic phenomena." Open session.

**14 January.** Barry Epstein and Harry B. Mark, Jr., "Electrochemistry and the environment."

#### Chemistry and Physics of

##### Liquid Crystals

Roger S. Porter, chairman; Julian F. Johnson, vice chairman.

**17 January.** E. F. Carr, "Anomalous alignment and domains in nematics"; H. Gruler, "Elastic properties of nematics"; R. S. Porter, "Discussions of liquid crystal chemistry."

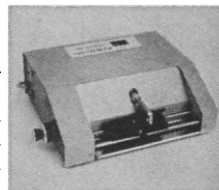
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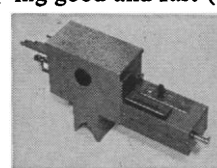
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18 January. J. Kessler, "Thermal conductivity of nematics"; W. R. Young, "Preparation and calorimetric study of ring-methylated esters and methyl-branched chlorostilbenes"; E. M. Barrall, II, "Thermodynamics of mesophases."

19 January. H. K. Bücher, "Studies on dynamic scattering and kinetic behavior of homeotropic nematics"; F. Jones, "End group effects on mesomorphic properties of binary systems"; J. F. Johnson, "Discussions of liquid crystal physics."

20 January. F. Saeva, "Induced circular dichroism in cholesterics." Discussion of unsolved problems in liquid crystals: G. H. Brown, "Ultrasonic and x-ray studies of nematics; liquid crystals as solvents."

21 January. Distinguished foreign guests. Open discussion.

### Polymers

Frederick E. Bailey, Jr., chairman; John I. Lauritzen, Jr., vice chairman.

24 January. (R. D. Lundberg, discussion leader): J. E. Glass, "Adsorption of water-soluble polymers at non-reflecting boundaries"; A. Silberberg, "Polymers in interfacial regions." (J. R. Knox, discussion leader): J. F. Johnson, "Separation mechanisms for polymer fractionation."

25 January. (W. R. McDonald, discussion leader): G. S. Y. Yeh, "Order and structure in amorphous polymers"; K. C. Frisch and H. L. Frisch, "Topologically interpenetrating polymer networks." (C. L. Sieglaff, discussion leader): T. T. Szabo, "Composites-multiphase polymer systems."

26 January. (R. Porter, discussion leader): N. W. Tschoegl, "Time-temperature superposition in block copolymers"; M. M. Labes, "Polymerization in liquid crystal systems." (R. M. Fitch, discussion leader): H. R. Allcock, "New advances in phosphonitrilic polymer chemistry."

27 January. (W. Zimmt, discussion leader): H. E. Podall, "Semi-permeable membranes for reverse osmosis processes"; M. M. O'Mara, "Polymer flammability." (F. E. Bailey, discussion leader): G. W. Ingle, "Plastics and the environment."

28 January. (J. I. Lauritzen, discussion leader): R. F. Steiner, "Associating protein systems"; O. Vogl, "New aspects of chloral polymerization"; A. C. Ouano, "Molecular weight detection of GPC effluents."

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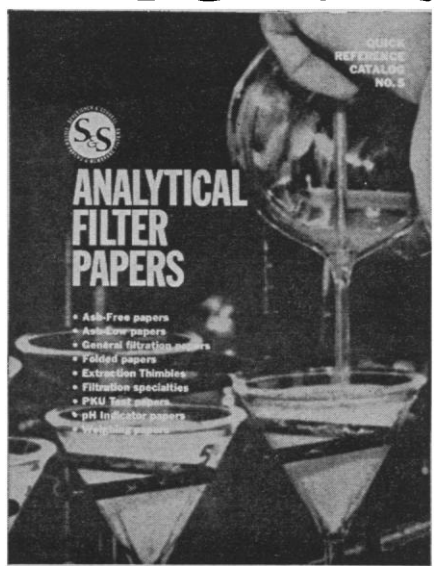
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## Forthcoming Events

### December

3-4. **Tutorial on Multi-Testing**, Intern. Health Evaluation Assoc., Washington, D.C. (C. A. Caceres, 1759 Que St., NW, Washington, D.C. 20009)

5-7. **American Astronomical Soc.**, San Juan, Puerto Rico. (H. M. Gurin, AAS, 211 FitzRandolph Rd., Princeton, N.J. 08540)

5-7. **American Soc. of Hematology**, San Francisco, Calif. (F. H. Gardner, ASH, 51 N. 39 St., Philadelphia, Pa.)

5-8. **Chemical Specialties Manufacturers Assoc.**, Washington, D.C. (E. E. Wilson, CSMA, 50 E. 41 St., New York 10017)

5-8. **Association of Military Surgeons of the United States**, 78th annual, Washington, D.C. (W. Welham, AMSUS, 8502 Connecticut Ave., Chevy Chase, Md. 20015)

5-8. **International College of Psychosomatic Medicine**, 1st congr., Guadalajara, Mexico. (A. J. Krakowski, 202A Cornelia St., Plattsburgh, N.Y. 12901)

6-7. **Vitamin E and Its Role in Cellular Metabolism**, New York, N.Y. (P. P. Nair, Biochemistry Research Div., Dept. of Medicine, Sinai Hospital of Baltimore, Baltimore, Md.)

6-9. **American Geophysical Union**, San Francisco, Calif. (A. F. Spilhaus, Jr., AGU, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

6-9. **Ultrasonics Symp.**, Inst. of Electrical and Electronics Engineers, Inc., Miami Beach, Fla. (J. E. May, Bell Laboratories, 555 Union Blvd., Allentown, Pa. 18103)

6-9. **Symposium on Underground Waste Management and Environmental Implications**, American Assoc. of Petroleum Geologists, Houston, Tex. (W. H. Curry, P.O. Box 572, Casper, Wyo. 82601)

7-10. **American Soc. of Agricultural Engineers**, Chicago, Ill. (J. L. Butt, ASAE, P.O. Box 229, St. Joseph, Mich. 49085)

8-11. **American Rheumatism Assoc.**, San Diego, Calif. (Miss M. M. Walsh, Arthritis Foundation, 1212 Ave. of the Americas, New York 10036)

9-10. **Modeling of Complex Systems in the Pursuit of National Goals**, American Soc. of Cybernetics, Washington, D.C. (T. H. Murray, ASC, Suite C1112, 1600 S. Joyce St., Arlington, Va.)

9-14. **American Acad. of Optometry**, Toronto, Ont., Canada. (C. C. Koch, AAO, 214-215 Foshay Tower, Minneapolis, Minn. 55402)

13-14. **Society of Cosmetic Chemists**, New York, N.Y. (Miss S. A. Ragon, Amerchol Park, Talmadge Rd., Edison, N.J. 08817)

13-14. **Liquid Crystals Symp.**, London, England. (Faraday Soc., 6 Gray's Inn Sq., Gray's Inn, London, W.C.1)

13-17. **Use of Isotopes and Radiation in Research on Soil-Plant Relationships Including Applications in Forestry**, International Atomic Energy Agency, Vienna, Austria. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

15-16. **Mechanical Properties of Ceramics, Fibres and Composites**, London, England. (Meeting Officer, Inst. of Physics and Physical Soc., 47 Belgrave Sq., London, S.W.1)

16-19. **Psychoanalysis**, American Psychoanalytic Assoc., New York, N.Y. (Mrs. H. Fischer, APA, 1 E. 57 St., New York 10022)

18-22. **Interamerican Congr. of Psychology**, Panama City, Panama. (L. F. S. Natalicio, SIP, 1801 Lavaca, Suite 11-E, Austin, Tex. 78701)

20-21. **Polychlorinated Biphenyls (PCB's): Chemistry, Environmental Aspects, Toxicology, Biochemical Actions, Alternatives**, Durham, N.C. (D. P. Rall, NIH, Nat'l. Inst. of Environmental Health Sciences, Research Triangle Park, N.C. 27709)

26-31. **American Assoc. for the Advancement of Science**, Philadelphia, Pa. (D. W. Thornhill, AAAS, 1515 Massachusetts Ave., NW, Washington, D.C. 20005)

26-31. **Metric Assoc.**, Philadelphia, Pa. (R. W. Mattoon, Chemical Physics, Dept. 408, Abbott Laboratories, North Chicago, Ill. 60064)

26-31. **American Soc. of Naturalists**, Philadelphia, Pa. (Miss J. Spofford, Dept. of Zoology, Univ. of Chicago, Chicago, Ill. 60637)

26-31. **American Soc. of Zoologists**, Philadelphia, Pa. (D. Sprugel, Jr., Illinois Natural History Survey, 179 Natural Resources Bldg., Urbana 61801)

27-29. **American Economic Assoc.**, New Orleans, La. (H. F. Williamson, 629 Noyes St., Evanston, Ill. 60201)

27-29. **Society for the History of Technology**, New York, N.Y. (M. Kranzberg, Crawford Hall, Case Western Reserve Univ., Cleveland, Ohio 44106)

27-29. **American Philosophical Assoc.**, New York, N.Y. (A. Pasch, APA, 117 Lehigh Rd., College Park, Md. 20742)

27-30. **Archaeological Inst. of America**, Cincinnati, Ohio. (Miss E. A. Whitehead, AIA, 260 W. Broadway, New York 10013)

27-30. **Society for General Systems Research**, Philadelphia, Pa. (R. E. Ericson, 12613 Bunting Lane, Bowie, Md. 20715)

28. **National Assoc. of Science Writers**, Philadelphia, Pa. (Mrs. R. Arctander, Box H, Seacliffs, N.Y. 11579)

28-30. **Linguistic Soc. of America**, St. Louis, Mo. (T. A. Sebeok, Research Center for the Language Sciences, Indiana Univ., Bloomington)

28-30. **History of Science Soc.**, New York, N.Y. (J. C. Greene, Dept. of History, Univ. of Connecticut, Storrs 06268)

### January

4-6. **Solid State Physics Conf.**, 9th annual, Manchester, England. (Inst. of Physics, 47 Belgrave Sq., London, S.W.1, England)

9-11. **Association of American Colleges**, Washington, D.C. (AAC, 1818 R St., NW, Washington, D.C. 20009)

9-14. **Mercury in the Industrial Environment**, Engineering Foundation, Pacific Grove (Monterey Peninsula), Calif. (EF, 345 E. 47 St., New York 10017)



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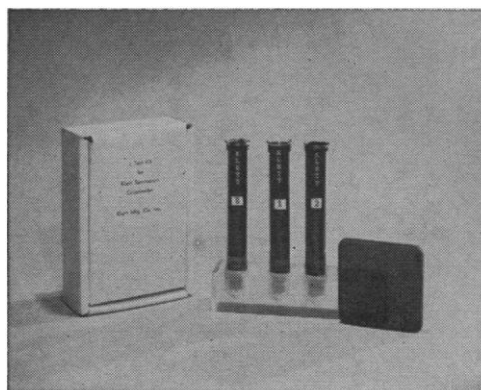
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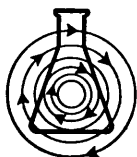
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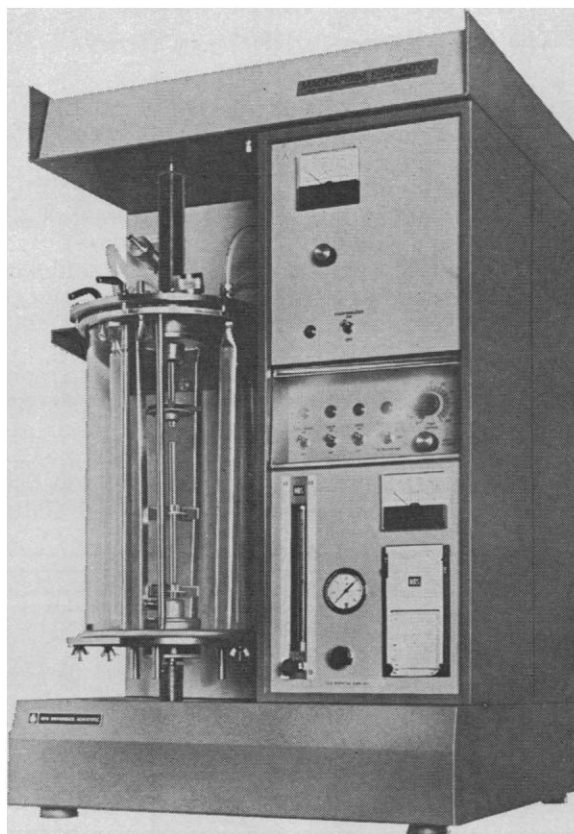
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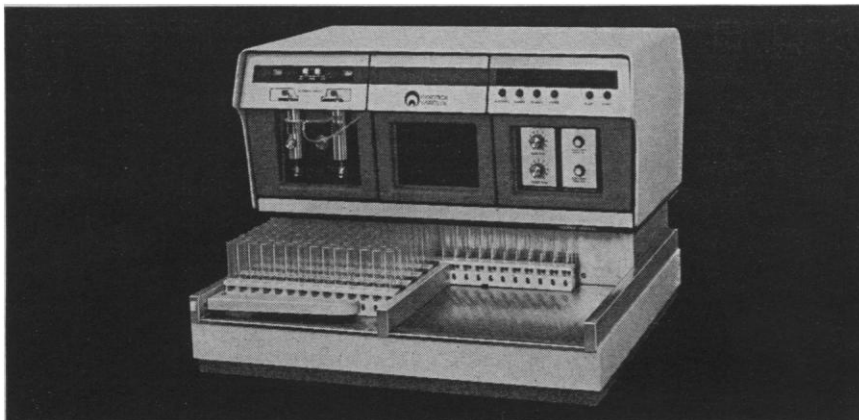


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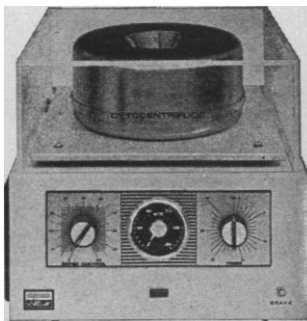
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10-11. **Molecular Basis of Biological Transport**, Biochemistry-Papanicolaou Cancer Research Inst., 4th annual, Miami Beach, Fla. (Biochemistry-PCR Winter Symposia, P.O. Box 906, Biscayne Annex, Miami, Fla. 33152)

10-12. **Surface Physics of Semiconductors**, Southampton, England. (Inst. of Physics, 47 Belgrave Sq., London, S.W.1, England)

10-13. **American Meteorological Soc.**, New Orleans, La. (K. C. Spengler, AMS, 45 Beacon St., Boston, Mass. 02108)

10-13. **Radioactive Isotopes in Clinical Medicine and Research**, intern. conf., Badgastein, Austria. (R. Hofer, Second Medical University Clinic, Isotopes Lab., A 1090, Wien, Garnisonsgasse 13, Austria)

11-15. **National Soc. of Professional Engineers**, Dallas, Tex. (P. H. Robbins, NSPE, 2029 K St., NW, Washington, D.C. 20006)

13-14. **Molecular Basis of Electron Transport**, Biochemistry-Papanicolaou Cancer Research Inst., 4th annual, Miami Beach, Fla. (Biochemistry-PCR Winter Symposia, P.O. Box 906, Biscayne Annex, Miami, Fla. 33152)

16. **Human Factors in the Design and Operation of the Highway Transportation System**, 5th annual workshop, Washington, D.C. (A. J. McKnight, 300 N. Washington St., Alexandria, Va. 22314)

17-19. **American College of Surgeons**, sectional mtg., Miami, Fla. (Communications Div., ACS, 55 Erie St., Chicago, Ill. 60611)

17-21. **Numerical Reactor Calculations Symp.**, Intern. Atomic Energy Agency, Vienna, Austria. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

19-21. **American Mathematical Soc. and Mathematical Assoc. of America**, Las Vegas, Nev. (A. B. Willcox, MAA, 1225 Connecticut Ave., NW, Washington, D.C. 20036)

23-27. **American Soc. of Heating, Refrigerating, and Air-Conditioning Engineers**, New Orleans, La. (A. T. Boggs III, ASHRAE, 345 E. 47 St., New York 10017)

24-26. **Aerospace Sciences**, 10th mtg., New York, N.Y. (American Inst. of Aeronautics and Astronautics, 1290 Ave. of the Americas, New York 10019)

24-27. **Environmental Design Research Assoc.**, 3rd annual, Los Angeles, Calif. (W. J. Mitchell, School of Architecture and Urban Planning, Univ. of California, 405 Hilgard Ave., Los Angeles 90024)

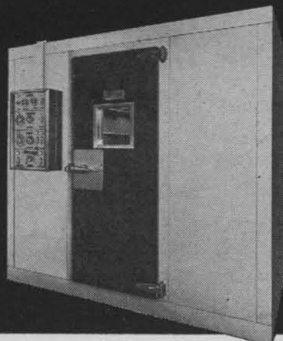
27-29. **American College of Surgeons**, sectional mtg., Sydney, Australia. (Communications Div., ACS, 55 E. Erie St., Chicago, Ill. 60611)

27-30. **American College of Psychiatrists**, Coronado, Calif. (P. A. Martin, ACP, 857 Fisher Bldg., Detroit, Mich. 48202)

30-4. **Power Engineering Soc.**, New York, N.Y. (J. W. Beam, Inst. of Electrical and Electronics Engineers, Inc., 345 E. 47 St., New York 10017)

30-7. **Role of Surface Properties in Dosage Form Design and Development**, 7th annual Arden House Conf. on Industrial Pharmacy, Harriman, N.Y. (S. M.

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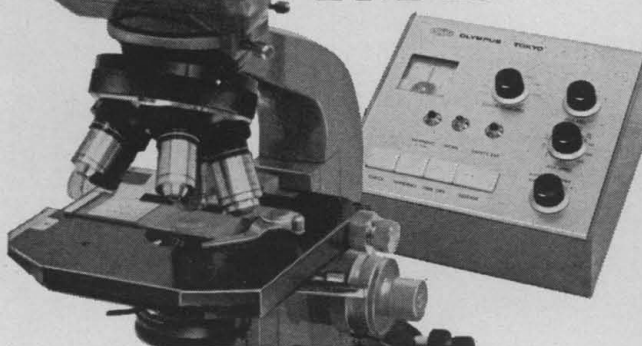
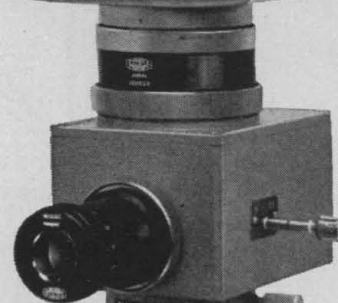
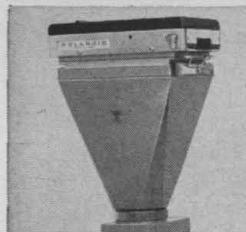
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Gross, College of Pharmaceutical Sciences, Columbia Univ., 115 W. 68 St., New York 10023)

31-3. American Assoc. of **Physics Teachers**, San Francisco, Calif. (W. F. Johnson, AAPT, 1785 Massachusetts Ave., NW, Washington, D.C. 20036)

31-4. International Symp. on **Information Theory**, Pacific Grove, Calif. (T. Kailath, Dept. of Electrical Engineering, Stanford Univ., Stanford, Calif. 94035)

## February

1-3. **Computer-Aided Design and Computer-Aided Manufacturing** Conf. and Exhibit, Soc. of Manufacturing Engineers, Atlanta, Ga. (T. C. Akas, SME, 20501 Ford Rd., Dearborn, Mich. 48128)

3-5. Association for **Hospital Medical Education**, Chicago, Ill. (T. G. Kummer, AHME, 2001 Jefferson Davis Hwy., Arlington, Va. 22202)

4-5. Problems of the **Female Breast as Related to Neoplasms and Reconstruction**, New York, N.Y. (R. K. Snyderman, Memorial Sloan-Kettering Cancer Center, 444 E. 68 St., New York 10021)

5-6. **Medical Education**, 68th annual congr., American Medical Assoc., Chicago, Ill. (C. H. W. Ruhe, AMA Council on Medical Education, 535 N. Dearborn St., Chicago 60610)

5-9. American Acad. of **Allergy**, San Francisco, Calif. (J. O. Kelly, AAA, 225 E. Michigan St., Milwaukee, Wis. 53202)

5-12. Asian and Pacific Congr. of **Gastroenterology**, Manila, Philippines. (Philippine Soc. of Gastroenterology, P.O. Box 2598, Manila)

6-11. American Soc. of **Range Management**, Washington, D.C. (F. T. Colbert, ASRM, 2120 S. Birch St., Denver, Colo. 80222)

6-12. **Chemistry of Natural Products**, 8th intern. symp., New Delhi, India. (S. Rangaswami, Indian National Science Acad., Bahadur Shah Zafar Marg, New Delhi-1)

7-9. **Integrated Optics-Guided Waves Materials Devices**, Optical Soc. of America, Las Vegas, Nev. (OSA, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

8-12. American **Group Psychotherapy** Assoc., New York, N.Y. (L. Kane, AGPA, 1790 Broadway, New York 10019)

9-11. American Acad. of **Occupational Medicine**, Pittsburgh, Pa. (D. Minard, Dept. of Occupational Health, AAOM, 130 DeSoto St., Pittsburgh 15213)

9-19. **Ground Water Quality and Treatment**, 14th conf., Urbana, Ill. (V. L. Snoeyink, Dept. of Civil Engineering, Univ. of Illinois at Urbana-Champaign, Urbana 61801)

14-15. **Psychology of Technical Communication**, Philadelphia, Pa. (Inst. of Electrical and Electronics Engineers, Inc., 345 E. 47 St., New York 10017)

14-16. Use of **Enzymes in Agricultural and Food Industries**, 13th intern. symp., Paris, France. (S cretariat, XIII me Symp. International, Commission Internationale des Industries Agricoles et Alimentaires-Bureau International Permanent de Chimie Analytique, 24, rue T h ran, Paris 8 )

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14-16. American College of Surgeons, sectional mtg., St. Louis, Mo. (Communications Div., ACS, 55 E. Erie St., Chicago, Ill. 60611)

16-18. Australian Electrochemistry Conf., 3rd, Terrigal, New South Wales. (D. A. J. Swinkels, B. H. P. Central Research Labs., Shortland, N.S.W. 2307, Australia)

16-18. Solid-State Circuits Conf., Philadelphia, Pa. (Inst. of Electrical and Electronics Engineers, Inc., 345 E. 47 St., New York 10017)

18-19. Symposium on Regulation of Catecholamine Metabolism in the Sympathetic Nervous System, New York, N.Y. (I. Saulpaugh, New York Heart Assoc., 2 E. 64 St., New York 10021)

20-23. American Inst. of Chemical Engineers, Dallas, Tex. (F. J. Antwerpen, AICE, 345 E. 47 St., New York 10017)

20-24. American Inst. of Mining, Metallurgical and Petroleum Engineers, San Francisco, Calif. (J. B. Alford, AIMMPE, 345 E. 47 St., New York 10017)

21-22. Coastal Zone Pollution Management Symp., Charleston, S.C. (B. L. Edge, Rhodes Engineering Research Center, Clemson Univ., Clemson, S.C. 29631)

23. Applications of Auger Spectroscopy, London, England. (Meetings Officer, Inst. of Physics, 47 Belgrave Sq., London SW1X 8QX)

23-25. Society of Professors of Education, Chicago, Ill. (Miss R. Bayles, Atlanta Univ., Atlanta, Ga.)

23-25. Research and Training Reactor Utilization, American Nuclear Soc., College Station, Tex. (J. D. Randall, Nuclear Science Center, Texas A&M Univ., College Station 77843)

26. Oregon Acad. of Science, Portland. (C. L. Smith, Dept. of Anthropology, Oregon State Univ., Corvallis 97331)

28-3. Medical Data Processing Symp., Toulouse-Pyrenees, France. (E. E. Van Brunt, Permanente Medical Group, Medical Methods Research, 3779 Piedmont Ave., Oakland, Calif. 94611)

#### March

1-4. American Acad. of Forensic Sciences, Atlanta, Ga. (J. T. Weston, 44 Medical Dr., Salt Lake City, Utah 84113)

1-5. American College of Cardiology, Chicago, Ill. (W. D. Nelligan, ACC, 9650 Rockville Pike, Bethesda, Md. 20014)

2-3. American Astronomical Soc., Div. on Dynamical Astronomy, College Park, Md. (J. D. Mulholland, Dept. of Astronomy, Univ. of Texas, Austin 78712)

2-4. Diagnosis of the Functions in Endocrinology—Methods and Interpretations, 18th symp., German Soc. of Endocrinology, Hannover. (J. Kracht, Pathologisches Institut, Klinikstrasse 32 g, 63 Giessen, Germany)

3-5. American College of Apothecaries, Chicago, Ill. (D. C. Huffman, Univ. of Tennessee, College of Pharmacy, Memphis 38103)

4-10. American Concrete Inst., Dallas, Tex. (ACI, Box 4754 Redford Sta., 22400 W. Seven Mile Rd., Detroit, Mich. 48219)

6-8. National Federation of Science Abstracting and Indexing Services, New

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York, N.Y. (Miss S. Keenan, NFSAIS, 2102 Arch St., Philadelphia, Pa. 19103)

6-10. **Analytical Chemistry and Applied Spectroscopy**, 23rd Pittsburgh conf., Cleveland, Ohio. (H. W. Fracek, Fisher Scientific Co., 585 Alpha Dr., Pittsburgh, Pa. 15238)

6-10. **Neutron Inelastic Scattering**, 5th symp., Intern. Atomic Energy Agency, Grenoble, France. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

6-11. **International Acad. of Pathology**, Chicago, Ill. (Miss J. Graves, Intersociety Committee on Pathology Information, Inc., College of American Pathologists, 9650 Rockville Pike, Bethesda, Md. 20014)

8-15. **National Wildlife Federation**, Mexico City, Mexico. (T. L. Kimball, NWF, 1412 16th St., NW Washington, D.C. 20036)

9-10. **Advanced Analytical Methods for the Clinical Laboratory**, Oak Ridge, Tenn. (C. D. Scott, Oak Ridge National Lab., P.O. Box X, Oak Ridge 37830)

9-10. **American Soc. for Clinical Pharmacology and Therapeutics**, Houston, Tex. (R. T. Smith, 1718 Gallagher Rd., Norristown, Pa. 19401)

11-18. **American Assoc. of Pathologists and Bacteriologists**, American Assoc. of Neuropathologists, and Pediatric Pathology Club (joint), Cincinnati, Ohio. (A. J. French, 1335 E. Catherine St., Ann Arbor, Mich. 48104)

12-17. **American Soc. of Photogrammetry**, Washington, D.C. (L. P. Jacobs, 105 N. Virginia Ave., Falls Church, Va. 22046)

13-17. **International Union against Cancer Conf.** (melanoma and skin cancer, leukemia). Sydney, Australia. (Intern. Cancer Conf., GPO Box 475, Sydney, NSW)

13-17. **California Membrane Conf.**, Squaw Valley. (C. F. Fox, Dept. of Bacteriology, Univ. of California, Los Angeles 90024)

14. **Acoustic Emission**, London, England. (Meetings Officer, Inst. of Physics, 47 Belgrave Sq., London SW1X 8QX)

14-16. **Mineral Waste Utilization**, 3rd symp., U.S. Bureau of Mines and IIT Research Inst., Chicago, Ill. (M. A. Schwartz, IIT Research Inst., 10 W. 35 St., Chicago 60616)

19-25. **Council for Exceptional Children**, 50th annual intern. conv., Washington, D.C. (W. C. Geer, CEC, Suite 900, Jefferson Plaza, 1411 S. Jefferson Davis Highway, Arlington, Va. 22202)

20-22. **Physical Electronics Conf.**, 32nd annual, Albuquerque, N.M. (R. L. Schwoebel, Dept. 5330, Sandia Labs., Albuquerque 87115)

20-23. **American Assoc. of Dental Schools**, Las Vegas, Nev. (B. F. Miller, 211 E. Chicago Ave., Chicago, Ill. 60611)

20-23. **Institute of Electrical and Electronics Engineers**, New York, N.Y. (D. G. Fink, IEEE, 345 E. 47 St., New York 10017)

20-23. **American Soc. of Neurochemistry**, 3rd natl., Seattle, Wash. (W. L. Stahl, Dept. of Medicine (Neurology), School of Medicine, Univ. of Washington, Seattle 98105)

20-24. **Use of Isotopes in Studies on the Physiology of Domestic Animals** with Special Reference to Hot Climates, Intern. Atomic Energy Agency, Athens, Greece. (J. H. Kane, Div. of Technical Information, U.S. Atomic Energy Commission, Washington, D.C. 20545)

21-23. **Control of Hazardous Material Spills Conf.**, Houston, Tex. (H. N. Myrick, Univ. of Houston, 3801 Cullen Blvd., Houston 77004)

23-25. **American Philosophical Assoc.** San Francisco, Calif. (A. Pasch, APA, 117 Lehigh Road, College Park, Md. 20742)

23-25. **Seismological Soc. of America**, Honolulu, Hawaii. (D. Tocher, P.O. Box 826, Berkeley, Calif. 94701)

26-29. **Environmental Mutagen Soc.**, Cherry Hill, N.J. (W. W. Nichols, Inst. for Medical Research, Copewood St., Camden, N.J. 08103)

## April

3-6. **National Assoc. for Research in Science Teaching**, Chicago, Ill. (R. W. Lefler, Dept. of Physics, Purdue Univ., Lafayette, Ind. 47907)

3-7. **American Educational Research Assoc.**, Chicago, Ill. (R. A. Dershimer, AERA, 1126 16th St., NW, Washington, D.C. 20036)

3-8. **American College of Radiology**, Bal Harbour, Fla. (W. C. Tronach, ACR, 20 N. Wacker Dr., Chicago, Ill. 60606)

4-6. **Symposium on Computer-Communications Networks and Teletraffic**, 22nd annual intern. symp., New York, N.Y. (J. Fox, Polytechnic Inst. of Brooklyn, MRI Symp. Committee, 333 Jay St., Brooklyn, N.Y. 11201)

4-7. **American Assoc. of Anatomists**, Dallas, Tex. (R. T. Woodburne, Dept. of Anatomy, Univ. of Michigan, 4643 Medical Science II, Ann Arbor 48104)

4-8. **Institute of Management Sciences**, Houston, Tex. (Mrs. M. R. DeMelim, IMS, 146 Westminster St., Providence, R.I.)

5-7. **Reliability Physics Symp.**, 10th annual, Inst. of Electrical and Electronics Engineers, Las Vegas, Nev. (H. Lauffenburger, IITRI, 10 W. 35 St., Chicago, Ill. 60616)

5-7. **Phase Analysis: Identification and Quantitative Determination**, Hull, England. (Meetings Officer, Inst. of Physics, 47 Belgrave Sq., London SW1X 8QX)

5-8. **American Orthopsychiatric Assoc.**, 49th annual, Detroit, Mich. (Miss M. F. Langer, AOA, 1790 Broadway, New York 10019)

5-9. **Learning and Culture**, Soc. for Applied Anthropology, American Ethnological Soc., and Council on Anthropology and Education (joint), Montreal, Canada. (Miss N. Gonzalez, Dept. of Anthropology, Univ. of Iowa, Iowa City)

6-8. **Florida Acad. of Sciences**, Winter Park. (R. W. Long, Dept. of Biology, Univ. of South Florida, Tampa 33620)

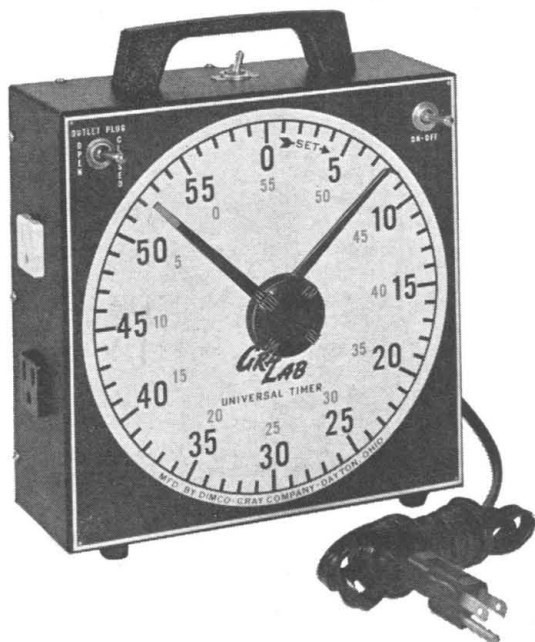
6-8. **Association of Southeastern Biologists**, Mobile, Ala. (Miss M. L. Gilbert, Biology Dept., Florida Southern College, Lakeland 33802)

7-11. **National Science Teachers Assoc.**, New York, N.Y. (R. H. Carleton, NSTA, 1201 16th St., Washington, D.C. 20036)



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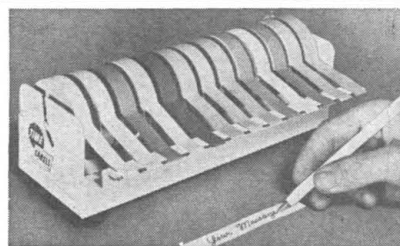
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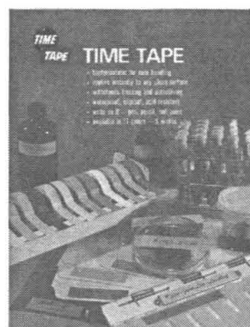


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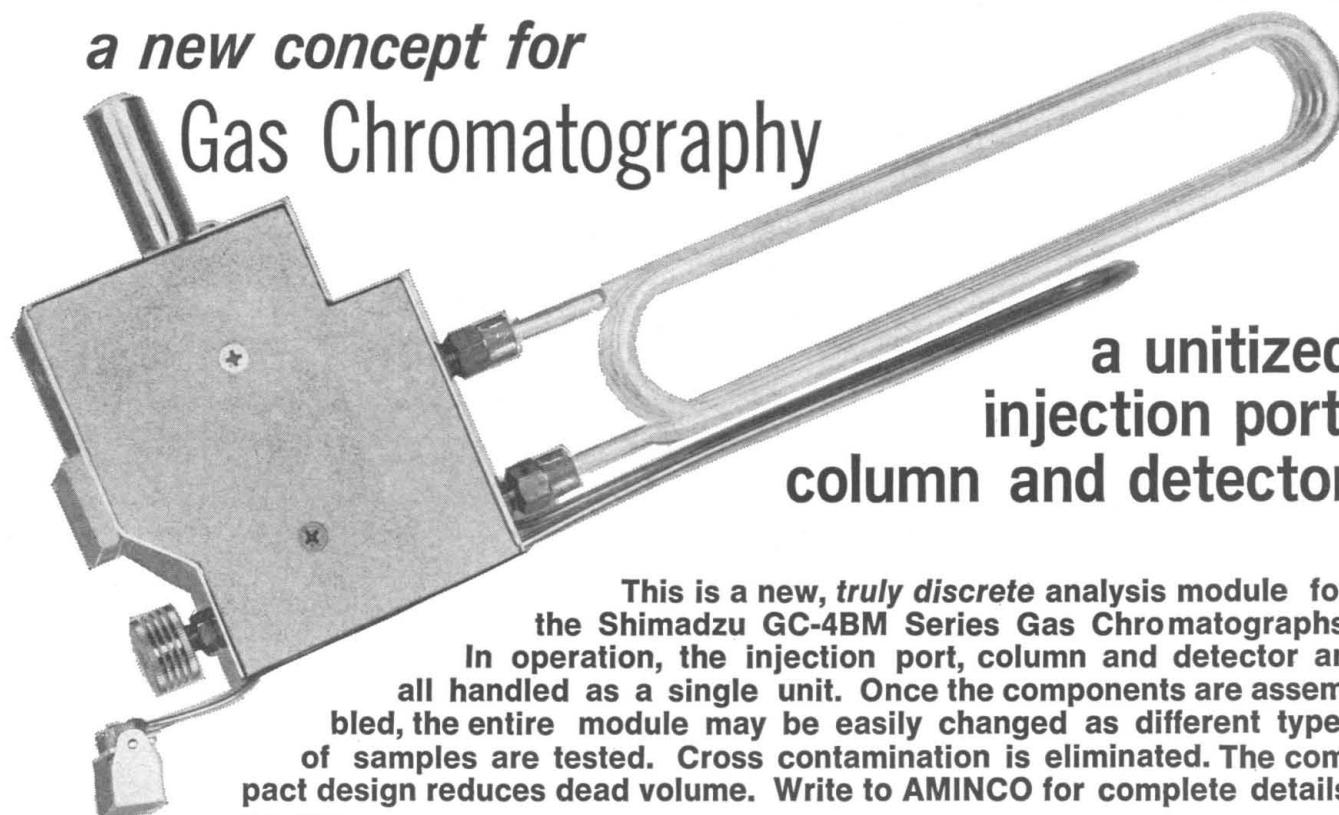
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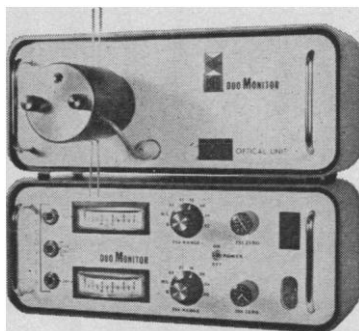
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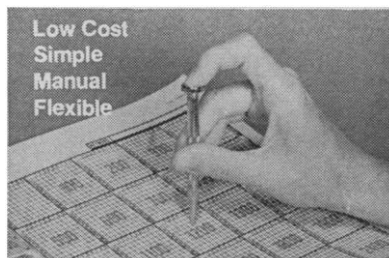
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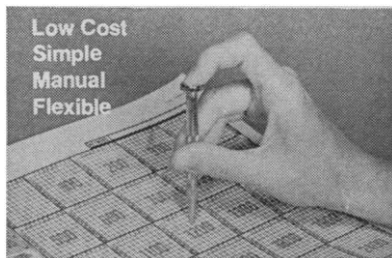
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9-14. American Soc. of Biological Chemists, Atlantic City, N.J. (R. A. Harte, ASBC, 9650 Rockville Pike, Bethesda, Md. 20014)

9-14. American Chemical Soc., Boston, Mass. (F. T. Wall, ACS, 1155 16th St., NW, Washington, D.C. 20036)

9-14. Federation of American Societies for Experimental Biology, Atlantic City, N.J. (Miss A. Nixon, FASEB, 9650 Rockville Pike, Bethesda, Md. 20014)

9-14. American Soc. for Experimental Pathology, Atlantic City, N.J. (R. E. Knutti, ASEP, 9650 Rockville Pike, Bethesda, Md. 20014)

9-14. American Soc. of Pharmacology and Experimental Therapeutics, Atlantic City, N.J. (E. B. Cook, ASPET, 9640 Rockville Pike, Bethesda, Md. 20014)

10-12. Acoustical Holography, 4th intern. symp., Inst. of Electrical and Electronics Engineers, Inc., Santa Barbara, Calif. (Meetings Officer, IEEE, 345 E. 47 St., New York 10017)

10-13. International Conf. on Magnetism (Intermag), 10th, Inst. of Electrical and Electronics Engineers, Kyoto, Japan. (D. H. Looney, Bell Telephone Laboratories, Inc., Whippany, N.J. 07981)

10-14. Modern Trends in Activation Analysis, 4th intern. conf., Saclay, France. (P. L. Leveque, Centre d'Etudes Nucleaires de Saclay, B. P. No. 2, 91-Gif-sur-Yvette, France)

10-14. American Assoc. of Immunologists, Atlantic City, N.J. (Mrs. B. B. Reines, AAI, 9650 Rockville Pike, Bethesda, Md. 20014)

10-14. Nuclear Activation Techniques in the Life Sciences, Intern. Atomic Energy Agency, Ljubljana, Yugoslavia. (IAEE, Kärntnerring 11-13, A-1011 Vienna, Austria)

10-15. Optical Soc. of America, New York, N.Y. (Miss M. E. Warga, OSA, 2100 Pennsylvania Ave., NW, Washington, D.C. 20037)

11-13. Conference on Phosphorus in Fresh Water and the Marine Environment, Intern. Assoc. on Water Pollution Research, London, England. (K. J. Ives, Dept. of Civil and Municipal Engineering, University College, London, Gower St., London, W.C.1)

12-14. Machine Perception of Patterns and Pictures, Teddington, Middlesex, England. (Meetings Officer, Inst. of Physics and Physical Soc., 47 Belgrave Sq., London SW1X 8QX, England)

13-15. American Assoc. of Physical Anthropologists, Lawrence, Kans. (E. I. Fry, Box 339, Southern Methodist Univ., Dallas, Tex. 75222)

13-15. Population Assoc. of America, Toronto, Ont., Canada. (J. W. Brackett, PAA, P.O. Box 14182, Benjamin Franklin Sta., Washington, D.C. 20044)

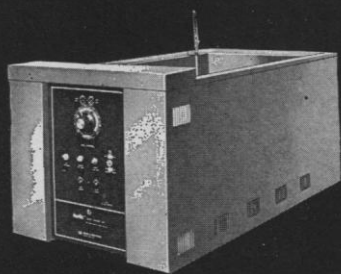
14. Utah Acad. of Sciences, Arts and Letters, Provo. (K. T. Slack, Marriott Library, Univ. of Utah, Salt Lake City 84112)

14-16. American Psychosomatic Soc., 29th annual, Boston, Mass. (H. Weiner, APS, 265 Nassau Rd., Roosevelt, N.Y. 11575)

16-19. National Council of Teachers of Mathematics, 50th annual, Chicago, Ill. (J. D. Gates, NCTM, 1201 16th St., Washington, D.C. 20036)

SCIENCE, VOL. 174

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### BOOKS RECEIVED

(Continued from page 686)

son, Ed. Plenum, New York, 1971. xiv, 294 pp., illus. \$19.50.

**Cosmopolitan World Atlas.** Rand McNally, New York, ed. 2, 1971. Variously paged. \$19.95.

**Cranio-facial Growth in Man.** A conference, Ann Arbor, Mich., May 1967. Robert E. Moyers and Wilton M. Krogman, Eds. Pergamon, New York, 1971. x, 360 pp., illus. \$18.75.

**Curves and Automation: The Scientists' Plot.** Jesse Dilson. Lippincott, Philadelphia, 1971. 144 pp., illus. \$5.50.

**Cybernetics, Art and Ideas.** Jasia Reichardt, Ed. New York Graphic Society, Greenwich, Conn., 1971. 208 pp., illus. \$13.50.

**Electron Scattering from Complex Nuclei.** Part A. Herbert Uberall. Academic Press, New York, 1971. xvi, 480 pp., illus. \$24. Pure and Applied Physics, vol. 36.

**Encyclopedia of Animal Care** (Formerly Black's Veterinary Dictionary). William C. Miller and Geoffrey P. West. Williams and Wilkins, Baltimore, Md., ed. 9, 1970. viii, 1014 pp., illus. \$15.50.

**Fabre. Poet of Science.** G. V. Legros. Translated by Bernard Miall. Horizon, New York, 1971. 352 pp. \$7.50. Reprint of the 1913 edition.

**Fast Reactions.** David N. Hague. Wiley-Interscience, New York, 1971. viii, 160 pp., illus. \$8.50.

**Food Study Manual.** Helen Charley. Ronald, New York, ed. 2, 1971. xii, 276 pp., illus. Paper, \$5.50.

**The Gary Schools.** Randolph S. Bourne. M.I.T. Press, Cambridge, Mass., 1970. lxviii, 324 pp., illus. \$12.50. Reprint of the 1916 edition.

**The Genetics of Human Populations.** L. L. Cavalli-Sforza and W. F. Bodmer. Freeman, San Francisco, 1971. xviii, 966 pp., illus. \$27.50.

**Ground Water.** A Selected Bibliography. Frits van der Leeden, Ed. Water Information Center, Port Washington, N.Y., 1971. x, 116 pp. \$15.

**Homeopathy in America.** The Rise and Fall of a Medical Heresy. Martin Kaufman. Johns Hopkins Press, Baltimore, Md., 1971. xii, 206 pp. \$10.

**Hormones in Development.** A conference, Nottingham, England, Sept. 1968. Max Hamburger and E. J. W. Barrington, Eds. Appleton-Century-Crofts, New York, 1971. xx, 854 pp., illus. \$30.

**The Human Aviary.** A Pictorial Discovery of New Guinea. Kenneth E. Read. Photographs by George Holton. Scribner, New York, 1971. 64 pp. \$6.95. A Scribner Portfolio in Natural History.

**Immunity and Tolerance in Oncogenesis.** A conference, Perugia, Italy, June 1969. Lucio Severi, Ed. Division of Cancer Research, Perugia, 1970. 2 vols., boxed. xcvi, 1310 pp., illus. \$60.

**The Kaiser-Permanente Medical Care Program.** One Valid Solution to the Problem of Health Care Delivery in the United States. A symposium, Oakland, Calif., March 1971. Anne R. Somers, Ed. Commonwealth Fund, New York, 1971 (distributor, Association of American Medical Colleges, Washington, D.C.). xii, 238 pp., illus. Paper.

**The Language of Sociology.** Charles W.

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Lachenmeyer. Columbia University Press, New York, 1971. xii, 130 pp., illus. \$7.50.

**Languages of the Brain.** Experimental Paradoxes and Principles in Neuropsychology. Karl H. Pribram. Prentice-Hall, Englewood Cliffs, N.J., 1971. xvi, 432 pp., illus. \$9.50.

**The Logic of Science in Sociology.** Walter Wallace. Aldine-Atherton, Chicago, 1971. 140 pp., illus. Cloth, \$6; paper, \$2.45.

**Making New Schools.** Joseph Turner. McKay, New York, 1971. xiv, 302 pp., illus. Cloth, \$5.95; paper, \$2.95.

**Measure and Category.** A Survey of the Analogies between Topological and Measure Spaces. John C. Oxtoby. Springer-Verlag, New York, 1971. viii, 96 pp., illus. Paper, \$7.50. Graduate Texts in Mathematics, 2.

**Signal Processing, Modulation, and Noise.** J. A. Betts. Elsevier, New York, 1971. xii, 292 pp., illus. \$12. Science and Technology Series.

**Social Control and Social Change.** John Paul Scott and Sarah F. Scott, Eds. University of Chicago Press, Chicago, 1971. x, 238 pp. \$7.95.

**Soils.** An Introduction to Soils and Plant Growth. Roy L. Donahue, John C. Shickluna, and Lynn S. Robertson. Prentice-Hall, Englewood Cliffs, N.J., ed. 3, 1971. xx, 588 pp., illus. \$9.95.

**Spontaneous and Virus Induced Transformation in Cell Culture.** J. Pontén. Springer-Verlag, New York, 1971. iv, 256 pp., illus. \$22.50. Virology Monographs, vol. 8.

**Statistical Abstract of Latin America, 1969.** Kenneth Ruddle and Mukhtar Hamour, Eds. Latin American Center, University of California, Los Angeles, 1970. xvi, 382 pp. + foldout tables. Cloth, \$12; paper, \$8.

**Stereochemistry of Carbohydrates.** J. F. Stoddart. Wiley-Interscience, New York, 1971. xiv, 249 pp., illus. \$14.95.

**A Stereotactic Atlas of the Brainstem of the Mallard (Anas platyrhynchos L.)** A Stereotactic Apparatus for Birds and an Investigation of the Individual Variability of Some Headstructures. G. A. Zweers. Van Gorcum, Assen, The Netherlands, 1971 (U.S. distributor, Davis, Philadelphia). viii, 148 pp., illus. \$20. Studies in Neuro-Anatomy, vol. 10.

**Steroid Protein Interactions.** U. Westphal. Springer-Verlag, New York, 1971. xiv, 568 pp., illus. \$24.90. Monographs on Endocrinology, vol. 4.

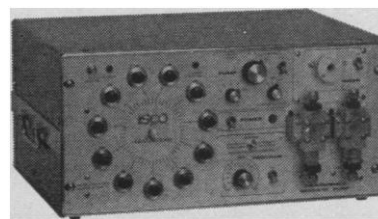
**Stimulus and Sensation.** Readings in Sensory Psychology. William S. Cain and Lawrence E. Marks, Eds. Little, Brown, Boston, 1971. x, 326 pp., illus. Paper, \$5.95.

**Teaching Elementary Science.** Through Investigation and Colloquium. Brenda Lansdown, Paul E. Blackwood, and Paul F. Brandwein. Harcourt Brace Jovanovich, New York, 1971. xiv, 434 pp., illus. Paper, \$5.95.

**Trees.** Structure and Function. Martin H. Zimmermann and Claud L. Brown. Springer-Verlag, New York, 1971. xiv, 336 pp., illus. \$19.80.

**Twentieth Century Theme.** A Philosophical Study. D. W. Gotshalk. Coronado, Lawrence, Kans., 1971. vi, 56 pp. Paper, \$2.

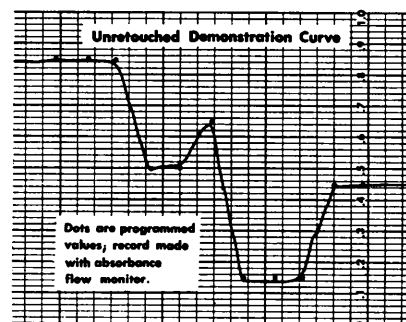
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