

SCIENCE

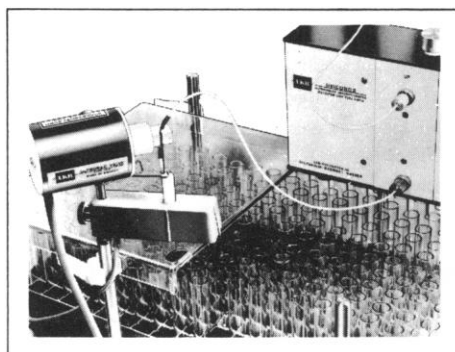
25 July 1969

Vol. 165, No. 3891

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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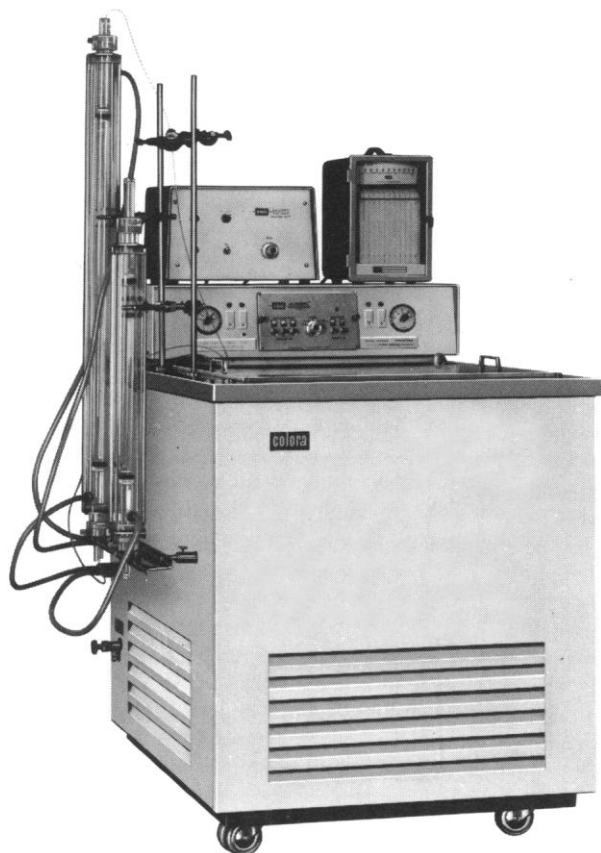
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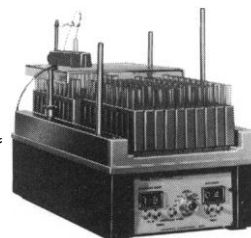
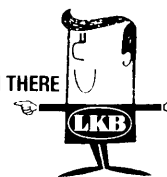
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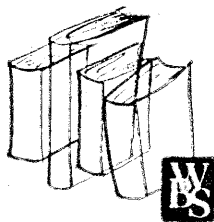
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Edited by Israel Davidsohn, M.D., and John Bernard Henry, M.D. 27 contributors. 1308 pp. 698 figs. \$24. Jan. 1969.

Strandness: Collateral Circulation in Clinical Surgery

In this unique new sourcebook, the circulatory system of every body area is fully examined with special emphasis on normal anatomy, physiology, congenital variations, clinical syndromes, diagnostic methods, results of treatment, and available collateral pathways.

Edited by D. E. Strandness, Jr., M.D. 9 contributors. 633 pp. 242 illust. \$18.50. Feb. 1969.



Kaplan: Weitbrecht's Syndesmology, A Description of the Ligaments of the Human Body

This remarkable classic, originally published in Russia in 1742, has been translated from Latin to English in its entirety for the first time. It includes 82 detailed engravings of the ligaments, most of them in life size. Each ligament is thoroughly described.

By Josias Weitbrecht (1702-1747). Translated by Emanuel Kaplan. 197 pp. 26 tables with 82 figs. \$30. March, 1969.

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Here is a superb new guide to specific methods of clinical prevention and treatment of respiratory failure following major surgery, trauma, hemorrhage, burns and shock. This excellent book includes the first extensive description of the new "Drinker valve."

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The New 3rd Edition of this highly respected work is an ideal guide for the student or physician who wants to review, refresh and update his concepts of anatomy. The book is arranged regionally—following the main natural subdivisions of the body (thorax, upper limb, head and neck, etc.)

By Ernest Gardner, M.D., Donald J. Gray, Ph.D., and Ronan O'Rahilly, M.D. 812 pp. 549 figs. and 67 plates. \$19. April, 1969.

Kleinsasser-Hoffmann: Microlaryngoscopy and Endolaryngeal Microsurgery

In this new book, the author shows you how he has adapted the surgical microscope used so successfully in otologic surgery and applied it to the difficult problems of microdiagnosis and microsurgery in the larynx. Special emphasis is placed on the early diagnosis and evaluation of all types of laryngeal cancer.

By O. Kleinsasser, M.D. Translated by Paul W. Hoffmann, M.D. 128 pp. 133 figs. \$12.50. April, 1969.

Healey: Synopsis of Clinical Anatomy

This new text-atlas fully examines those aspects of clinical anatomy which are most essential to the actual practice of medicine and surgery. Handsome drawings display clinically important points such as structural relationships—arterial supply—congenital anomalies.

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Morgan & Engel: The Clinical Approach to the Patient

Here is a brilliantly executed new book that helps develop the student's skills in acquiring, analyzing and reporting clinical information from patients. Some of the topics discussed include: initial interviewing, eliciting a history, reporting clinical data, sequence and flow of the physical examination.

By William L. Morgan, Jr., M.D., and George L. Engel, M.D. 314 pp. Illustd. \$9.75. May, 1969.

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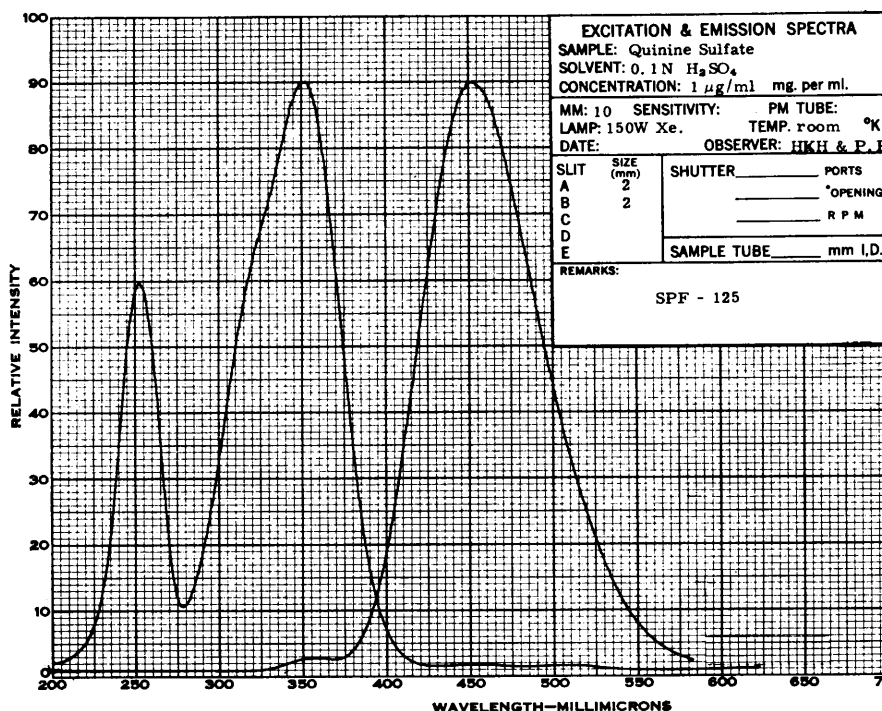
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Area devastated by pumice and scoria that fell from lava fountains during the 1959 eruption of Kilauea Volcano, Hawaii. See page 341. [Richard S. Fiske, U.S. Geological Survey]

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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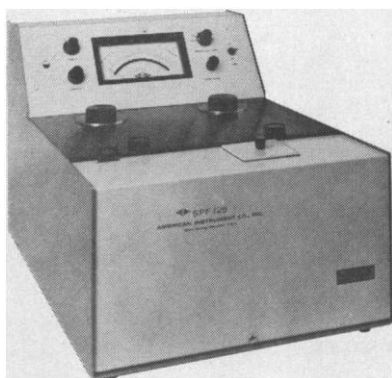


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our point of view!



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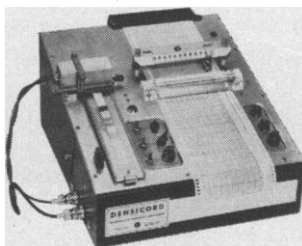
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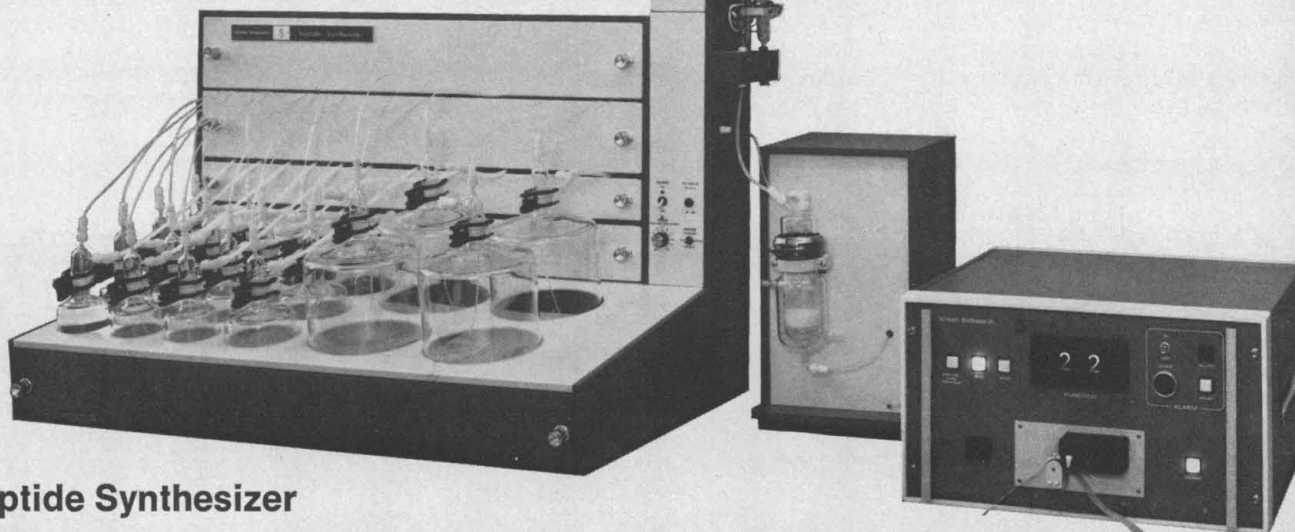
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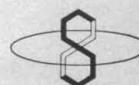
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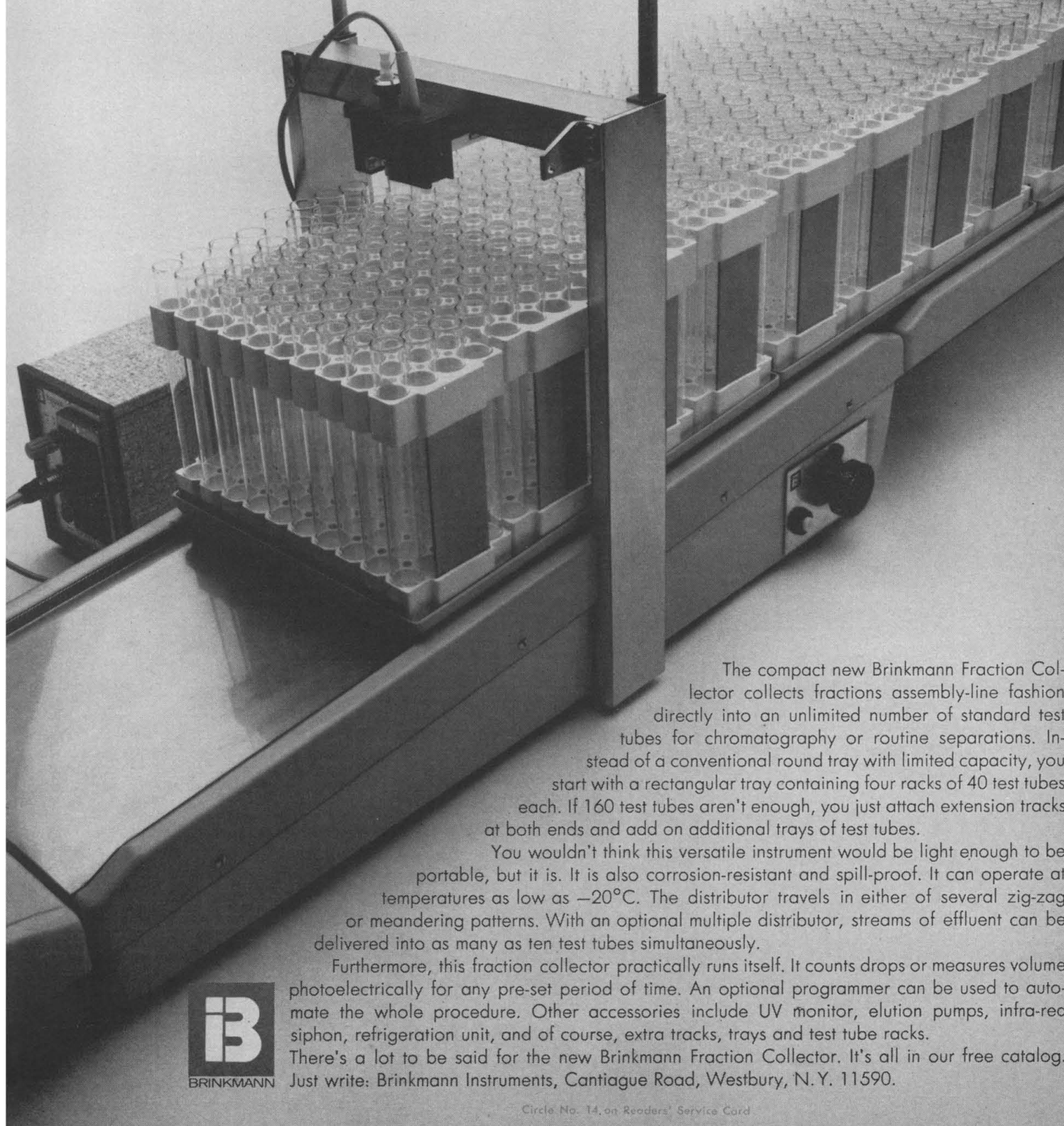
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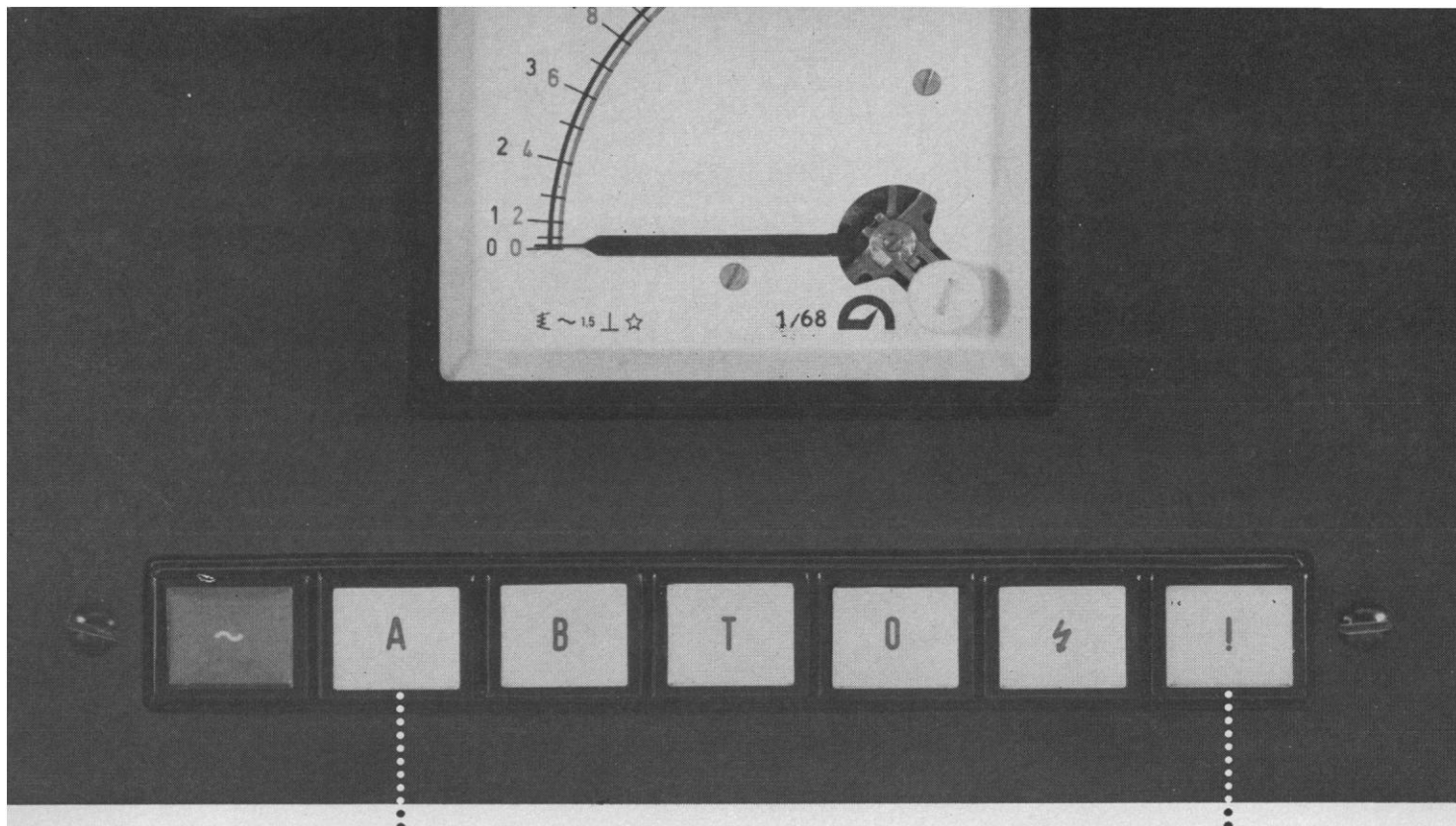
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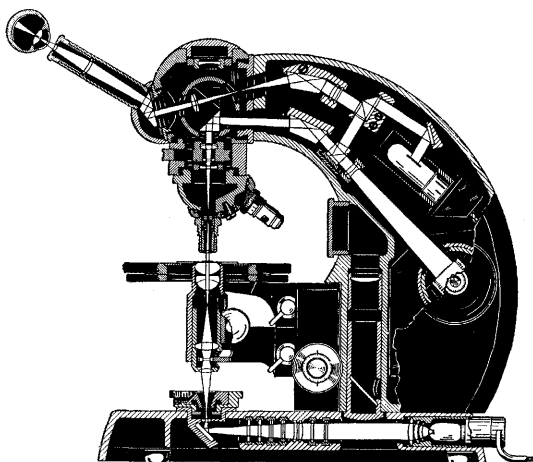


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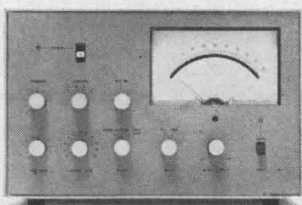
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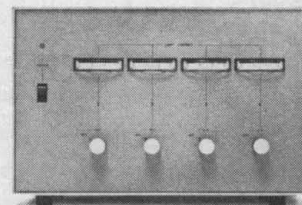
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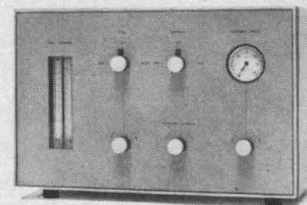
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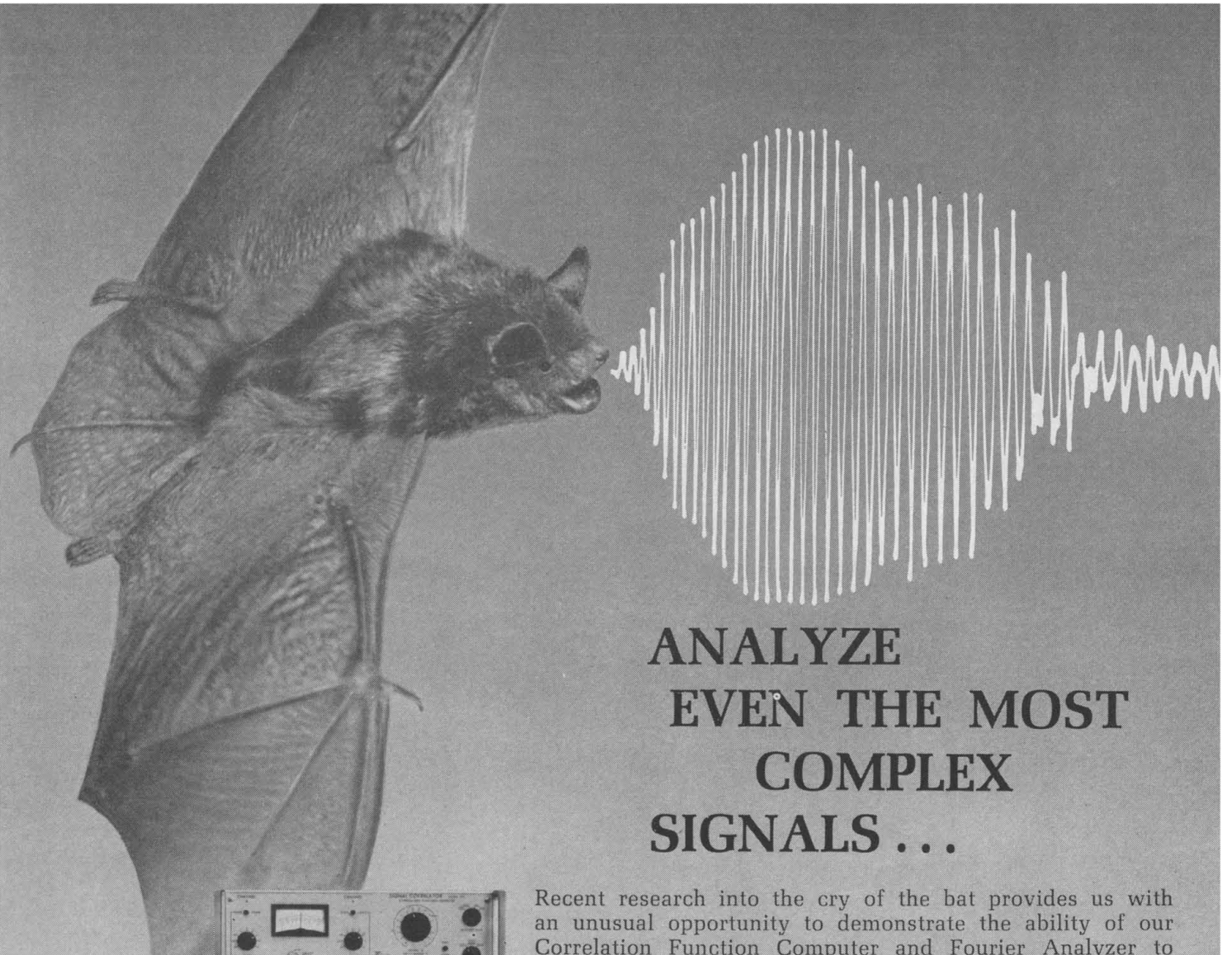
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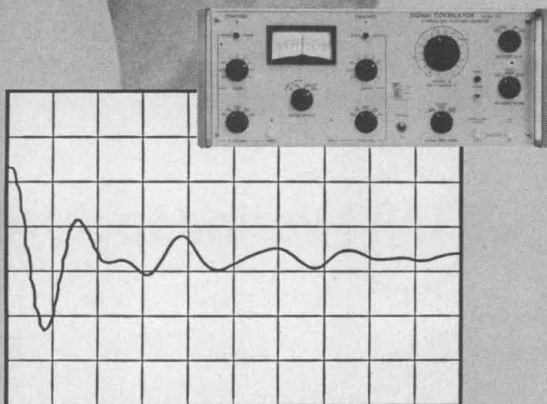
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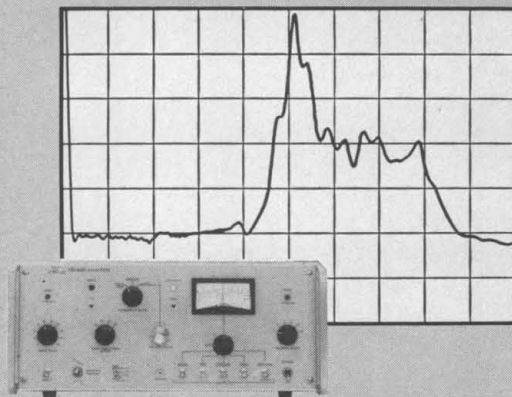
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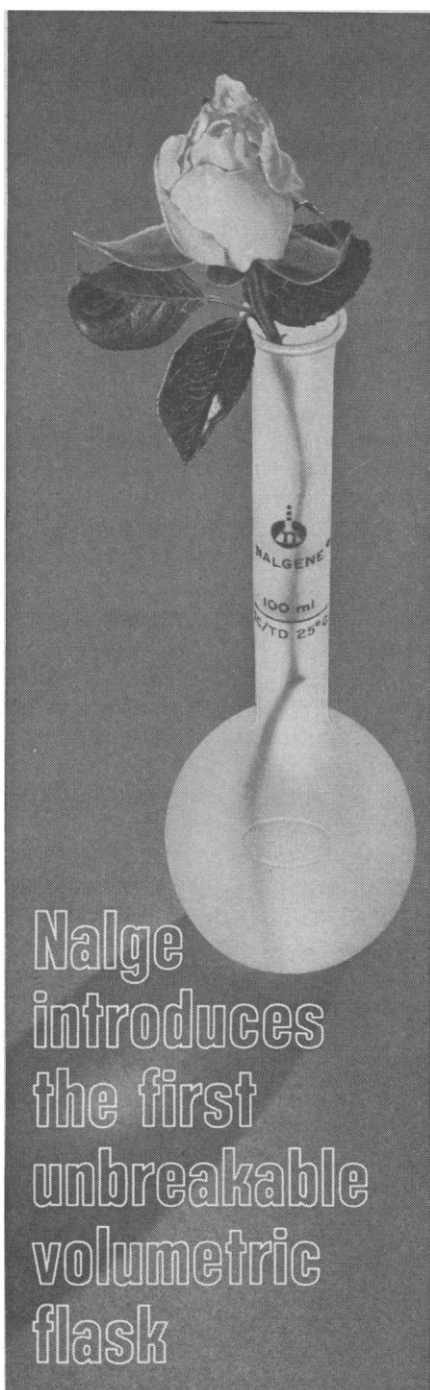
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no such sense of loyalty and honor, and they probably don't even read scholarly journals and couldn't care less about her predicament.

BARBARA C. COCHRAN
5095 Kenmoore Drive,
Concord, California 94521

Beattie, Orlans, and Brown seem to assume that there is no generation gap, and then quite logically attack Mead's explanation for one. As a member of the younger generation, I have serious doubts concerning their assumptions.

Probably all three consider themselves scholars, who, according to Brown, "know that their knowledge is reliable and meaningful." Did these three watch the CBS-TV specials, "Generations Apart," broadcast last May? Statistics (supposedly reliable and certainly meaningful) were presented to demonstrate the existence of, among other things, a "generation gap." Have they read the almost daily New York Times reports of violence in high schools and colleges here and abroad? On the less factual side, have they analyzed the lyrics sung by Simon and Garfunkel, the Beatles, and Judy Collins? Have they read SDS literature? Have they seen *Hair*? I doubt it.

The expanded version (New York Times, 16 Mar., p. 62) of the lecture fragments published in the *Science* editorial over Mead's signature refuted in part the objections of Beattie, Orlans, and Brown. This member of the younger generation can only applaud what Mead has to say, and hopes that her lectures in book form will receive the wide circulation they deserve.

JOHN MICHAEL STRAWN
(Oberlin '72)

81 Lexington Avenue,
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Obstructions

DuBridge's comments on the need "to mount research efforts in which scientists, social and political scientists, and engineers work together to seek basic causes, to develop new technologies . . ." concerned me very much ("Science serves society," 6 June, p. 1137). My recent personal experiences have led me to believe that industry and government are not sufficiently interested in interdisciplinary R & D operations to hire available trained people.

In anticipation of a need for people

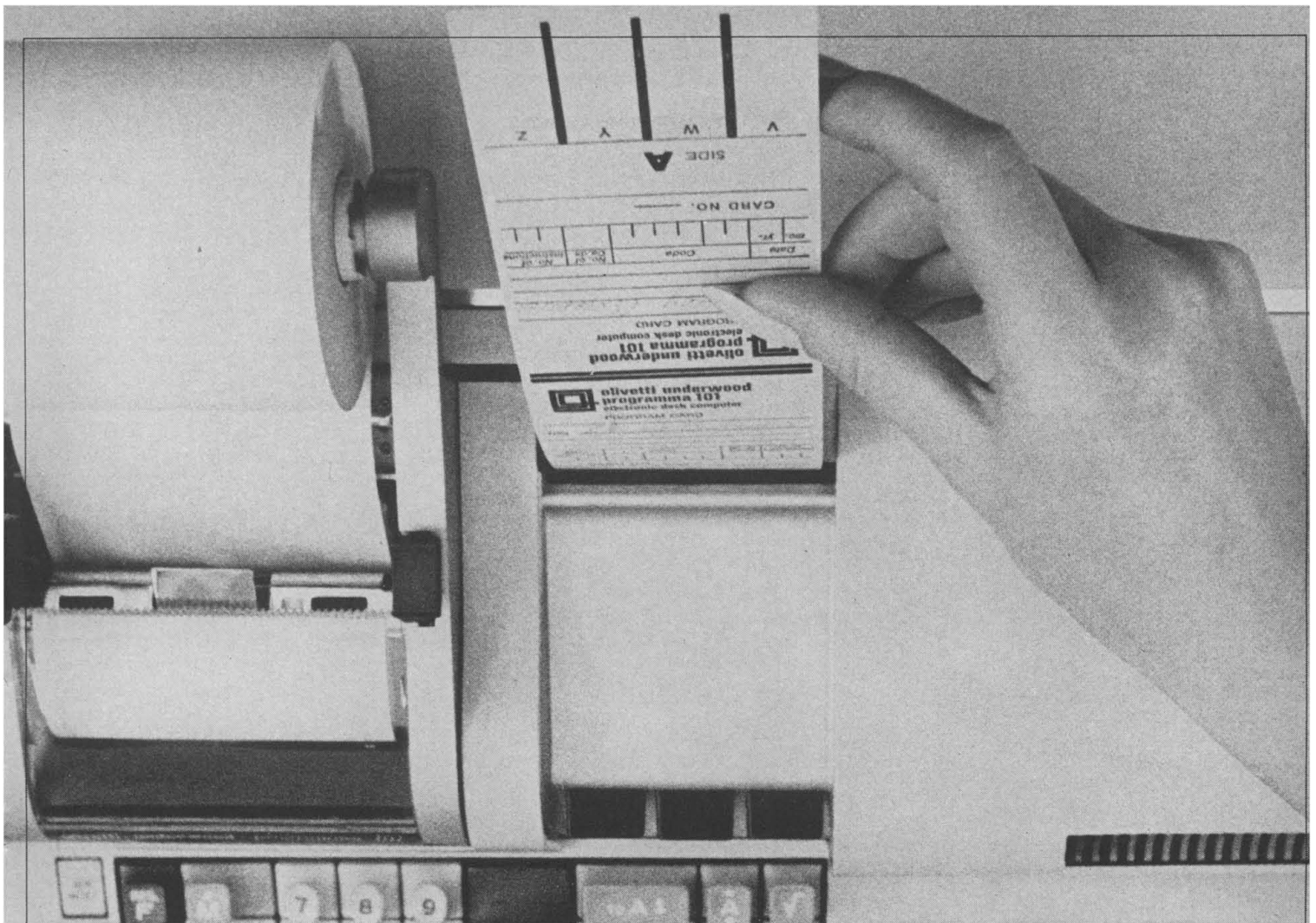
trained in interdisciplinary R & D, I pursued and completed an academic program leading to three advanced degrees in the fields of mechanical engineering and law. Recently I interviewed some 50 organizations, including most of the nonprofit "think factories," several of the departments and commissions of the federal government, and the R & D departments of many corporations. In all but three cases I was met with complete indifference to my expressed interest in interdisciplinary R & D. Of the three, one was interested only in one of my disciplines to the total exclusion of the other. The second offered a position of little opportunity and no responsibility. Only the last organization initially expressed serious interest in my interdisciplinary training. Unfortunately they also subsequently lost interest.

Knowledge and devotion are not sufficient when opportunities for gainful employment are nonexistent. Out of necessity I have subsequently taken employment in a field where my academic training goes largely unused.

JAMES M. DEIMEN
1870 Independence Boulevard,
Ann Arbor, Michigan 48104

A friend of mine who went back to school after raising a family is now graduating from college as a biology major at age 37. She has an A average, and straight A's in her biology courses. I have been encouraging her toward graduate school and a Ph.D. Despite her grades and a mark of over 700 on her biology graduate record exam, she has already been turned down by one New York university and has been refused financial aid by another, while awaiting word regarding admission. I know of many students with much lower qualifications who have already been accepted and given financial aid by these schools. The only explanation I can think of is prejudice against her age. Since great strides have been taken to eliminate racial and religious prejudice from admissions policy, it is time to eliminate age prejudice as well. It has been shown many times that more mature people perform as well or better than their younger colleagues, and they still have many productive years ahead of them. Let us not close our field to these potential contributors.

JUDITH S. WEIS
Department of Zoology,
Rutgers State University,
Newark, New Jersey 07102

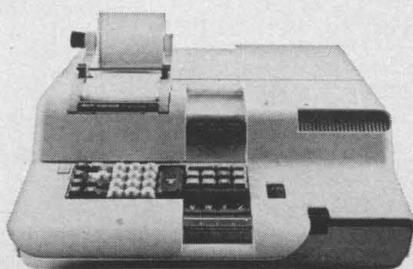


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German Technological Resurgence

By the end of World War II, most of Germany's major cities, together with its industrial capacity, had been destroyed. Scientific research was crippled. Today, most of the scars of war have vanished. The cities and the industrial complexes have been rebuilt. The Deutsche mark is the world's strongest currency. Only 0.5 percent of Germans are unemployed, and there are nearly eight times as many vacant positions as there are jobless. Science is flourishing. During a period when U.S. expenditures on R & D have been static, German outlays have nearly doubled. At a time when the U.S. public is denigrating technology and has wearied of the effort to maintain world leadership in science, the Germans are moving confidently toward becoming No. 1 in science and technology.

In part, the recovery from World War II was due to assistance from the United States. More important was U.S. protection, which freed Germany from making huge arms expenditures. Perhaps most important have been the energy, foresight, and capacity for organized effort of the German people. In a recent tour of 11 major research establishments, I saw no one goofing off. In a comparable sample of U.S. establishments I would have seen scores of idlers. Most impressive, however, were repeated indications of excellent management, both at the institutional level and in the coordination of national efforts.

Scientific activity in Germany is supported by a number of mechanisms. A major source of funds is the Federal Ministry for Scientific Research. This organization has given considerable thought to priorities. High on its list is research likely to result in new technology 10 to 20 years hence. Two other favored programs are oceanography and nuclear studies.

An example of German resurgence resulting from good management is seen in the field of atomic energy. It was not until 1955 that the Germans were permitted to engage in large-scale civilian nuclear development. They quickly procured research and training reactors. German engineers and scientists trained in the United States and elsewhere were brought back to their native land. Special know-how was obtained through licensing agreements. After careful studies, a limited number of projects were chosen and then supported vigorously. Today the German civilian reactor program has caught up with the U.S. program in many respects and has surpassed it in nuclear propulsion of a merchant ship, the *Otto Hahn*. At the moment, the United States leads quantitatively in the field of water-moderated reactors for production of electric power. However, qualitatively our lead, if any, is narrow. Generating facilities with a capacity of 900 megawatts are on line; two 600-megawatt plants of German design are being constructed; and construction of a 1100-megawatt plant has been authorized. The three new installations are designed to compete economically with conventionally generated power. Nuclear power stations designed and built by German engineers for export are already a factor in world trade. In the extremely important effort to develop sodium-cooled breeder reactors, the Germans are moving rapidly. Some highly placed Americans think the United States is falling behind in this competition.

Germany does not compete well with us in some areas of technology—for example, that of computers. A country of moderate material resources and a population of about 60 million can scarcely be expected to do everything. Nevertheless, by temperament the German people are particularly suited to high technology, and they will enjoy an increasingly important and successful role.—PHILIP H. ABELSON

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vances stemming from them. Label from dimethylnitrosamine attached to the 7-position of guanylic acid in DNA and RNA, and minor amounts also to the 1- and 3-positions in adenylic acid and in cytidylic acid. The significance of these interactions in the carcinogenic process remains to be fully documented, but that carbonium ions produced in vivo may lead to neoplasia has led to other tests. Thus, after a single intravenous injection, methyl methanesulfonate gave brain tumors, and the ethyl ester gave kidney tumors.

Boyland (London) discussed activation processes with chemical carcinogens; he emphasized the intermediates derived from the simple molecule ethyl carbamate. A single electron carbethoxy radical, which reacts with cytidylic acid in DNA, may be involved. Also, epoxides from PAH cannot be disregarded as active intermediates despite unfavorable test data in animals. He concluded that DNA is the primary molecular target with a variety of carcinogens.

A key presentation by Miller (Wisconsin) provided evidence that chemical carcinogens ultimately are converted to electrophilic reactants. Carcinogenic al-

kylnitrosamines yield carbonium ions; urethane, a one-electron or carbonium ion intermediate; aromatic amines and azo dyes, *N*-oxy compounds (which as esters yield reactive amidonium ions); and pyrrolizidine alkaloids, a carbonium ion (also with an ester-leaving group). Some metals, such as chromium, cadmium, cobalt, lead, and nickel, are electrophilic.

Troll (New York University) showed that melting temperature, buoyant density, and template activity of DNA with respect to RNA polymerase was lower after treatment in vitro with the carcinogens β -propiolactone and *N*-acetoxy-*N*-2-fluorenylacetamide. *N*-Acetoxy-*N*-1-naphthylacetamide, from non-carcinogenic 1-naphthylamine, did not alter the properties of DNA. Kriek (Amsterdam) discovered an interesting difference in the binding of *N*-hydroxy-*N*-2-fluorenylacetamide with RNA and DNA of rat liver in vivo. Whereas the residue combined at C-8 of guanylic acid in RNA was an acetylamino derivative, it was the amino derivative on DNA.

Roberts (London) examined DNA in HeLa cells damaged by alkylating

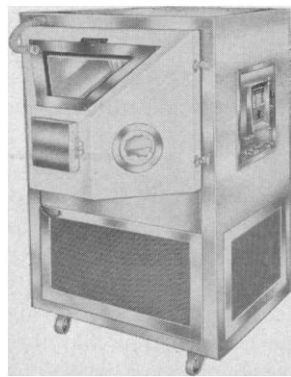
agents such as nitrogen mustard, methyl methanesulfonate, or nitrosomethylguanidine after labeling with bromodeoxyuridine (heavy chains) or thymidine (light chains). Elimination of label gave a clue on repair mechanisms which may also play a role in the carcinogenic process.

Sorof (Philadelphia) spoke on the binding of carcinogens to a specific subfraction of the cell sap of tissues, the h_2 proteins. In several tissues carcinogens labeled proteins with similar charge and molecular size, thus suggesting that the functional consequences of this binding may be alike. Liver h_2 proteins had physical properties like those of arginase, and inhibited certain cells in culture. Heidelberger (Wisconsin) noted that mouse skin had h_2 proteins as found in liver. However, mouse skin arginase had different electrophoretic mobility.

Goldblum (Jerusalem) dealt with viral carcinogenesis, in particular, the incorporation of the genome from SV-40 agent into the DNA of host cells. Infected cells exhibited (i) increased DNA synthesis; (ii) induction of a viral replicase; (iii) induction of an

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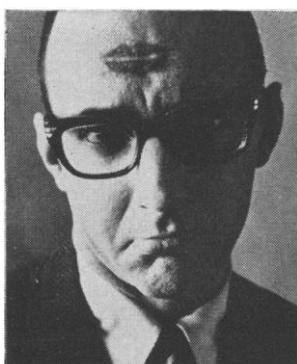
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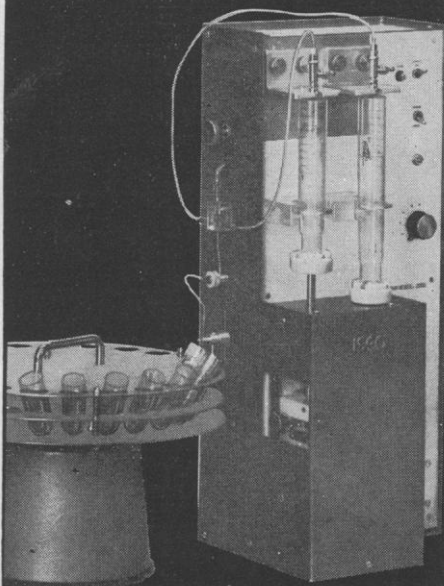
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intranuclear "T" antigen; and (iv) induction of surface transplantation antigens. The purified T antigen had a molecular weight of more than 200,000 and contained RNA. Removal of RNA lowered the molecular weight, thus yielding a pure basic protein containing no sulfur amino acids. The T antigen might be the viral DNA polymerase.

Heidelberger (Wisconsin) reported on a quantitative in vitro system of hydrocarbon carcinogenesis with cells from adult C3H mouse prostate. Transformed cells formed piled-up colonies which gave transformation frequencies related to the carcinogenic potency of eight hydrocarbons, and produced tumors in unconditioned mice.

Clayson (Leeds) found that the mitotic rate in normal bladder measured by direct count or thymidine incorporation was low, and exhibited two peaks—one at 5 hours and one at 18 to 24 hours. Cells were usually diploid, but in bladder tumors they were often heteroploid. After treatment with a new bladder carcinogen, 4-ethylsulfonylnaphthalene-1-sulfonamide, an increased rate of mitotic waves in the epithelial fraction showed peaks at 36 hours. The increased DNA synthesis was preceded by ribosomal RNA synthesis.

Systemic carcinogens were discussed by Weisburger (Bethesda)—in particular the circulatory pathway of carcinogenic *N*-2-fluorenylacetyamide and its active metabolite, *N*-hydroxy-*N*-2-fluorenylacetyamide. After absorption the compounds were metabolized chiefly in the liver. The many products were transported by blood as loosely and as firmly bound metabolites. Urinary excretion occurred after renal filtration. Passage from liver to bile led to additional metabolism in the gut by bacterial action, particularly splitting of conjugates such as glucuronides and sulfate esters. Resorption of free metabolites from the gut explains enterohepatic circulation. Unresorbed materials constitute fecal metabolites.

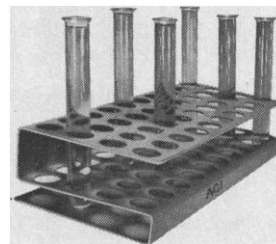
Furst (San Francisco) dealt with induction of cancer in rodents by metal and metal ions, in particular the induction of sarcomas at the site of injection of certain nickel and titanium derivatives. Titanium powder also gave rise to lymphomas.

Berenblum (Rehovoth) saw the induction of tumors as a complex process involving many variables such as chemical structure of agent, biochemical activation and detoxification processes, dosage, mode of administration, and host factors such as species or sex.

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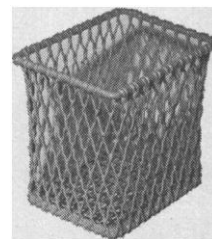
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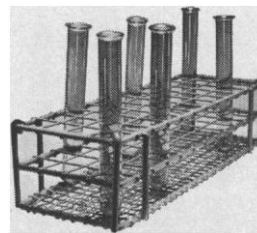
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Thus, quantitative carcinogenic potency is a relative term valid in a controlled experimental setting.

At this symposium important conceptual and practical advances were reported. Theoretical and experimental approaches have led to a consensus that many different types of chemical carcinogens may be considered as electrophilic reagents, produced by synthesis or by biochemical activation. New experimental developments should help pinpoint the target specifically related to carcinogenicity. It need be a cellular or molecular entity with a preference for such electrophilic centers. Additional events in the carcinogenic process leading to tumors deal with host-specific modifying factors, concerned with the multiplication of cells altered by action of an electrophilic reagent with its receptor.

The meeting was held under the sponsorship of the Hebrew University of Jerusalem, the Foundation Edmond de Rothschild of Paris, and the Israel Academy of Sciences and Humanities.

The complete proceedings will appear as a monograph published by the Israel Academy. This first symposium dealing with carcinogenesis will be followed by others in which significant reports on broad multidisciplinary aspects of research develop into advances of an entire field.

J. H. WEISBURGER

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National Meetings

September

2-4. **Comparative Virology**, intern. conf., Montreal, Canada. (K. Maramorosch, Boyce Thompson Inst. for Plant Research, Yonkers, N.Y. 10701)

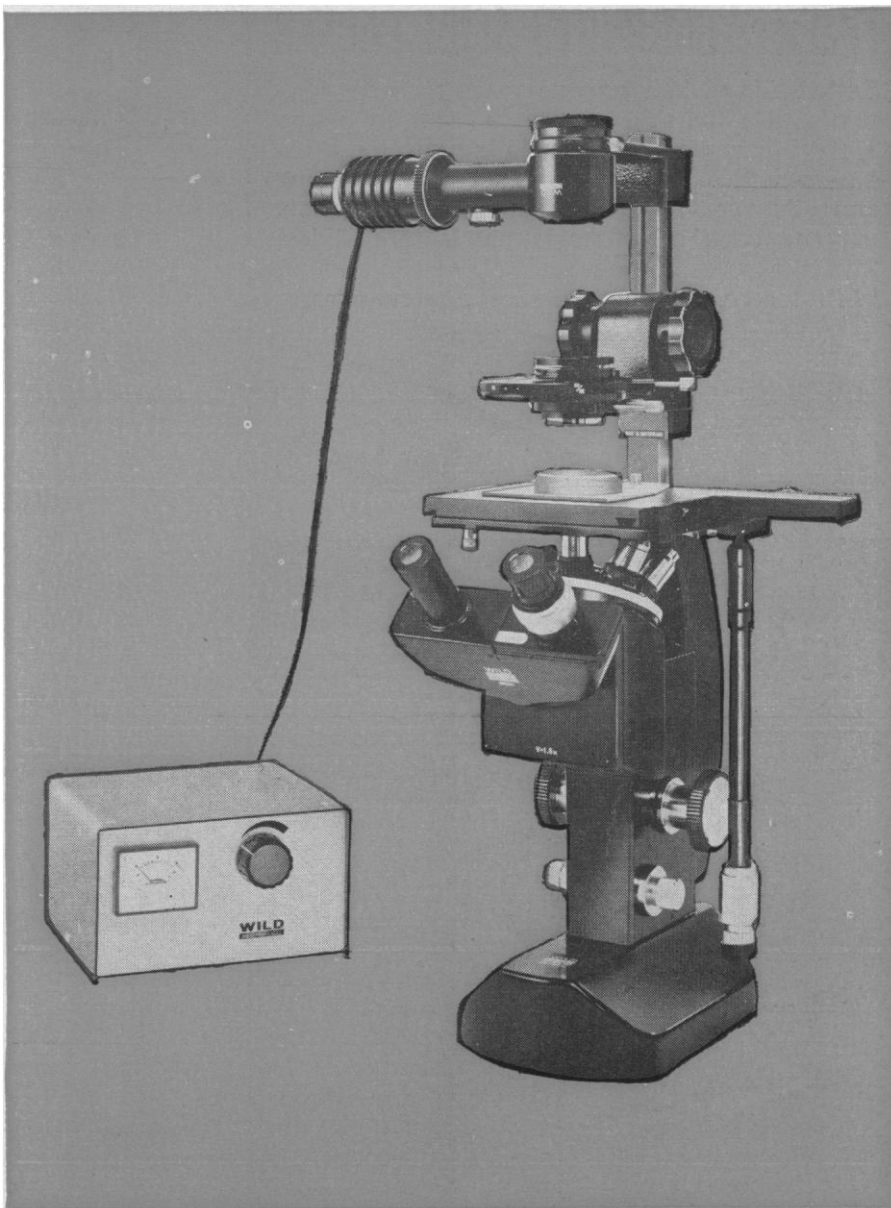
2-6. **Molecular Structure and Spectroscopy**, 24th annual symp., Columbus, Ohio. (K. N. Rao, Physics Dept., Ohio State Univ., Columbus 43210)

2-6. **Tuberculosis**, intern. conf., New York, N.Y. (J. E. Perkins, Natl. Tuberculosis Assoc., 1790 Broadway, New York 10019)

3-5. **Weather Forecasting and Analysis**, 3rd, Virginia Beach, Va. (E. C. Kindle, Navy Weather Research Facility, Bldg. R 48, Naval Air Station, Norfolk, Va.)

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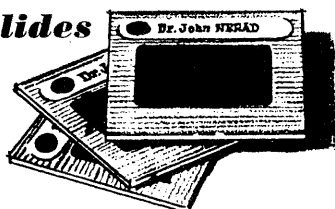
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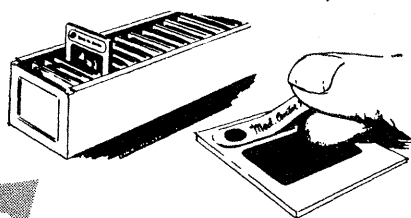
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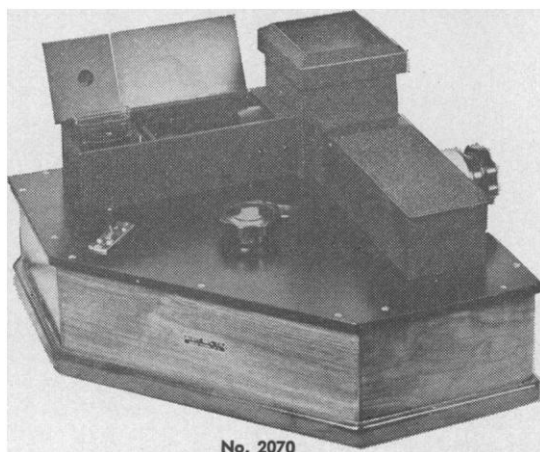
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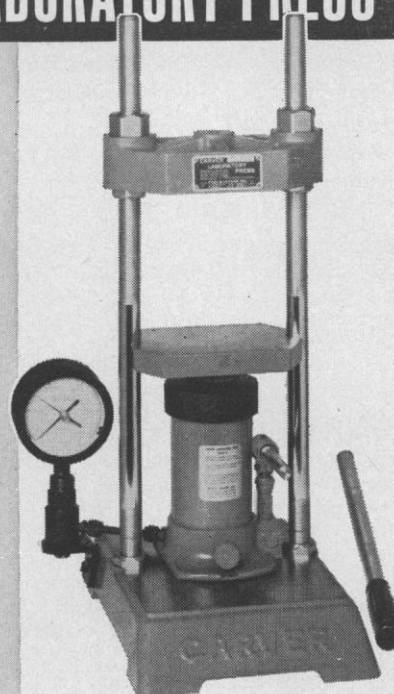
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3-6. Conference on **Biogenic Amines as Physiological Regulators**, Woods Hole, Mass. (B. A. Curtis, Tufts Univ. School of Medicine, 136 Harrison Ave., Boston, Mass. 02111)

3-6. American **Political Science Assoc.**, New York, N.Y. (E. M. Kirkpatrick, APSA, 1527 New Hampshire Ave., NW, Washington, D.C. 20036)

4-6. American Assoc. of **Obstetricians and Gynecologists**, Hot Springs, Va. (R. B. Wilson, 200 First St., SW, Rochester, Minn. 55901)

4-6. **Parapsychological Assoc.**, 12th intern. conv., New York, N.Y. (J. G. Pratt, Box 152, Univ. of Virginia Medical School, Charlottesville 22901)

5-7. Society for the Study of **Amphibians and Reptiles**, 12th annual, Carbondale, Ill. (J. T. Collins, Museum of Natural History, Univ. of Kansas, Lawrence 66044)

7-12. American **Chemical Soc.**, 158th natl., New York, N.Y. (Manager, Natl. Meeting and Divisional Activities, 1155 16th St., NW, Washington, D.C. 20036)

7-12. **Experimental Medicine and Surgery in Primates**, 2nd conf., New York, N.Y. (J. Moor-Jankowski, New York Univ. Medical Center, 550 First Ave., New York 10016)

8-9. Symposium on **Turbulence Measurements in Liquids**, Rolla, Mo. (G. K. Patterson, Dept. of Chemical Engineering, Univ. of Missouri, Rolla 65401)

8-10. **Agriculture Meteorology Conf.**, 9th, Seattle, Wash. (R. J. Hanks, Dept. of Soils and Meteorology, Utah State Univ., Logan 84321)

8-10. **Metallurgy and Materials Science**, intern. conf., Philadelphia, Pa. (G. R. Belton, School of Metallurgy and Materials Sciences, Univ. of Pennsylvania, Philadelphia 19104)

8-10. **Standards Engineers Soc.**, 18th annual, Washington, D.C. (J. M. Ward, 11208 Long Pine Trail, Potomac, Md. 20857)

8-11. **Electrical Insulation Conf.**, 9th, Boston, Mass. (H. P. Walker, Code 6158D, Naval Ship Engineering Center, Washington, D.C. 20360)

8-12. **Dietetics**, 5th intern. congr. (American Dietetic Assoc., 52nd annual), Washington, D.C. (Public Relations, The Association, 620 N. Michigan Ave., Chicago, Ill. 60611)

8-12. American Soc. of **Limnology and Oceanography**, La Jolla, Calif. (G. H. Lauff, W. K. Kellogg Biological Station, Michigan State Univ., Hickory Corners, 49060).

8-13. **High Energy Physics and Nuclear Structure**, intern. conf., New York, N.Y. (S. Devons, Dept. of Physics, Columbia Univ., New York 10027)

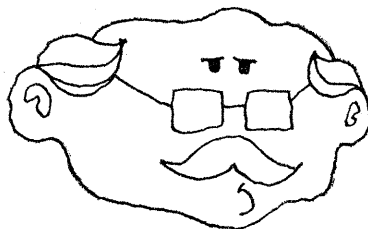
9-10. Society of **Logistics Engineers**, 4th annual, Cape Canaveral, Fla. (G. Dill, Aerospace Services Div., Pan American World Airways, Inc., Patrick AFB, Fla. 32925)

11-12. Symposium on **Sulphur in Nutrition**, Corvallis, Ore. (J. E. Oldfield, Dept. of Animal Science, Oregon State Univ., Corvallis 77331)

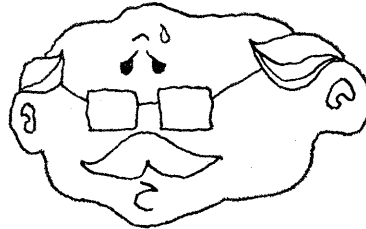
14-17. Association of **Medical Illustrators**, Washington, D.C. (B. J. Melloni, AMI, Georgetown Univ., Washington, D.C. 20007)

14-20. College of American **Pathol-**

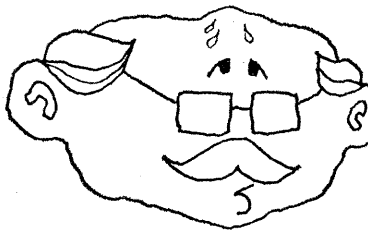
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SIMPLE ABOUT RUNNING
THIS LAB.**



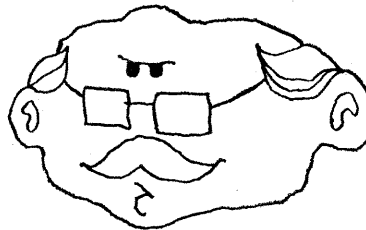
**IT'S
DECISIONS,
DECISIONS,
DECISIONS.**



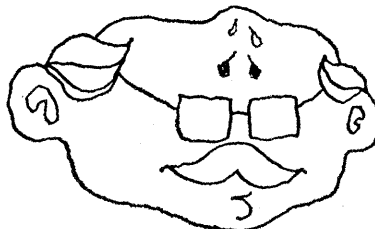
**WHAT TESTS
TO RUN WHEN.
WHO GETS
PAY RAISES.**



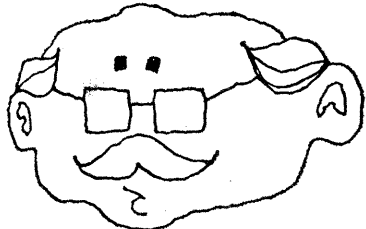
**SOMETIMES
I EVEN HAVE TO
ARBITRATE
COFFEE BREAKS.**



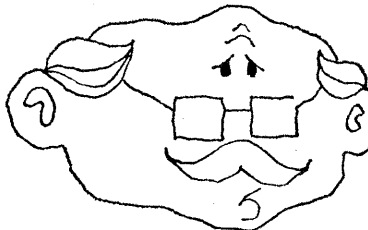
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ogists and American Soc. of Clinical Pathologists, joint annual mtg., Chicago, Ill. (O. Neibel, CAP, 230 N. Michigan Ave., Chicago 60601)

15-17. Woodhandling, 2nd symp., Ottawa, Ont., Canada. (Technical Section, Canadian Pulp and Paper Assoc., 2280 Sun Life Bldg., Montreal 110, P.Q.)

17-19. American Science Film Assoc., Washington, D.C. (B. J. Melloni, ASFA, Georgetown Univ., Washington, D.C. 20007)

17-19. Blood and Tissue Antigens, intern. symp., Ann Arbor, Mich. (D. Aminoff, Simpson Memorial Inst., Univ. of Michigan, Ann Arbor 48104)

17-19. Industrial Research, 5th natl. conf., Chicago, Ill. (V. J. Danilov, Industrial Research Bldg., Beverly Shores, Ind. 46301)

18-20. Chemical Marketing Research Assoc., Lake Placid, N.Y. (P. E. Levesque, FMC Corp., 633 Third Ave., New York 10017)

18-20. Symposium on Coniferous Forests of the Northern Rocky Mountains, Missoula, Mont. (Center for Natural Resources, Univ. of Montana, Missoula 59801)

21-24. American Assoc. of Medical Clinics, New York, N.Y. (E. M. Wurzel, Executive Director, The Association, 421 King St., Alexandria, Va. 22314)

21-24. Petroleum Mechanical Engineering Conf., Tulsa, Okla. (H. E. Broadbent, Atlantic Richfield Co., P.O. Box 8138, Philadelphia, Pa. 19101)

21-25. Comparative Leukemia Research, 4th intern. symp., Cherry Hill, N.J. (R. M. Dutcher, School of Veterinary Medicine, Univ. of Pennsylvania, New Bolton Center, Kennett Square 19348)

22-24. National Conf. on Packaging Wastes, San Francisco, Calif. (M. Li, Food Protection and Toxicology Center, Univ. of California, Davis 95616)

22-26. Combustion-Generated Air Pollution, Berkeley, Calif. (Continuing Education in Engineering, University Extension, Univ. of California, Berkeley 94720)

22-26. International Simulation and Training Conf., Montreal, Canada. (W. I. Marble, SAE Hq., Meetings Manager, 2 Pennsylvania Plaza, New York 10001)

23-25. Physics and Nondestructive Testing, 9th annual, Chicago, Ill. (W. J. McGonnagle, Symp. Coordinator, P.O. Box 554, Elmhurst, Ill. 60126)

24-26. IEEE Ultrasonics Symp., St. Louis, Mo. (D. I. Bolef, Inst. of Electrical and Electronics Engineers, Ultrasonics Symp., Dept. of Physics, Washington Univ., St. Louis 63130)

26-3. American Acad. of General Practice, Philadelphia, Pa. (M. F. Cahal, The Academy, Volker Blvd. at Brookside, Kansas City, Mo. 64112)

28-1. Society of Petroleum Engineers of AIME, 44th annual, Denver, Colo. (J. R. Dempsey, Northern Natural Gas Co., P.O. Box 308, Omaha, Neb. 68102)

29-1. International Conf. on Bioelectrical Impedance, New York, N.Y. (S. E. Marovich, The Conference, 1150 NW 14th St., Miami, Fla. 33136)

29-3. American Soc. of Photogrammetry, Portland, Ore. (L. P. Jacobs, 105 N. Virginia Ave., Falls Church, Va. 22046)



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Foreign Meetings

September

1-4. International Soc. of **Geographical Pathology** Conf., Jerusalem, Israel. (I. S. Levij, Dept. of Pathology, Hebrew Univ., Hadassah Medical School, P.O. Box 1172, Jerusalem)

1-5. British **Pharmaceutical** Conf., Belfast, Northern Ireland. (Secretary, The Conference, 17 Bloomsbury Sq., London, W.C.1, England)

1-5. International Soc. of **Neurochemistry**, 2nd, Milan, Italy. (R. Paoletti, Scientific Secretary, Inst. of Pharmacology, Univ. of Milan, via Andrea del Sarto 21, 20129 Milan)

1-5. **Phenomena in Ionized Gases**, 9th intern. conf., Bucharest, Rumania. (E. Badareu, Inst. of Physics, Acad. of Science, Bucharest)

1-10. **Non-Linear Continuum Theories in Mechanics and Physics and Their Applications**, Padua, Italy. (D. H. Rivlin, Center of Applied Mathematics, Lehigh Univ., Bethlehem, Pa. 18015)

1-12. International Assoc. of **Geomagnetism and Aeronomy**, Madrid, Spain. (P. A. Romana, Observatorio del Ebro, Apdo 9, Tortosa, Spain)

1-19. **Geophysical Fluid Dynamics**, Bangor, N. Wales. (G. E. R. Deacon, Natl. Inst. of Oceanography, Wormley, Godalming, Surrey, United Kingdom)

2-4. **Hyperbaric Medicine**, 4th intern. congr., Sapporo, Japan. (T. Iwa, Dept. of Thoracic and Cardiovascular Surgery, Sapporo Medical College and Hospital, So. 1. West 16, Sapporo 060)

3-11. International Assoc. of **Statistics in Physical Sciences**, London, England. (J. Neyman, Dept. of Statistics, Univ. of California, Berkeley 94720)

4-9. **Ferroelectricity**, 2nd intern. conf., Tokyo, Japan. (H. Takahashi, Faculty of Science, Univ. of Tokyo, 7 Hongo, Bunkyo-ku Tokyo, Japan)

4-12. Symposium on **Periodic Orbits, Stability and Resonances**, São Paulo, Brazil. (G. E. O. Giacaglia, Caixa Postal 8174, São Paulo)

5-10. International **Clay** Conf., Tokyo, Japan. (S. Iwao, Secretary General, Organizing Committee, The Conference, Science Council of Japan, Ueno Park, Tokyo 110)

7-12. Conference on **Atomic Collision Phenomena in Solids**, Brighton, England. (Meetings Office, Inst. of Physics and the Physical Soc., 47 Belgrave Sq., London, S.W.1, England)

7-12. **Pharmaceutical Sciences**, 29th intern. congr., London, England. (J. C. Bloomfield, Pharmaceutical Soc. of Great Britain, 17 Bloomsbury Sq., London, W.C.1)

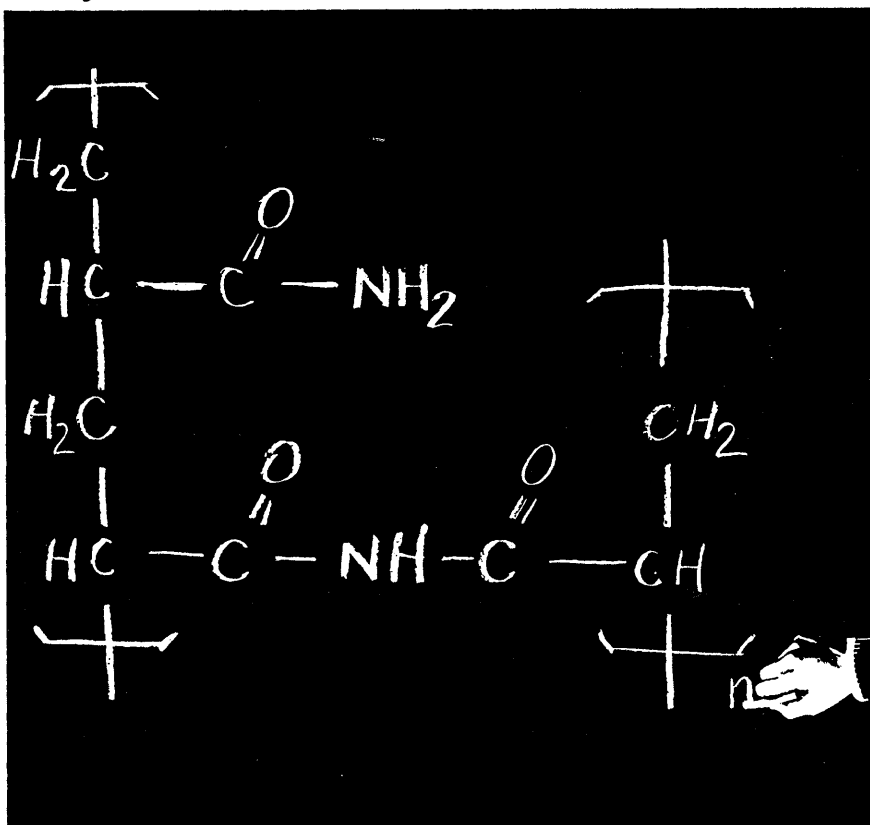
7-14. International Symp. on **Unproven Methods of Cancer D'agnosis and Treatment**, São Paulo, Brazil. (A. C. C. Junqueira, % Hospital A.C. Camargo, P.O. Box 5217, São Paulo)

8-12. **Congenital Malformations**, 3rd intern. conf., The Hague, Netherlands. (Local Secretary, % Holland Organizing Centre, 16, Lange Voorhout, The Hague)

8-12. **Fiscal Assoc.**, 23rd intern. congr., Rotterdam, Netherlands. (Local Secretary, Holland Organizing Centre, 16, Lange Voorhout, The Hague, Netherlands)

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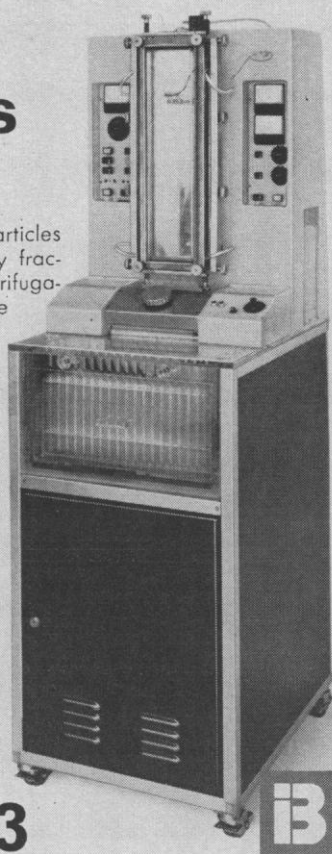
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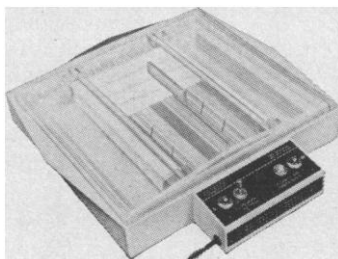


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BOOKS RECEIVED

(Continued from page 385)

A History of Japanese Astronomy. Chinese Background and Western Impact. Shigeru Nakayama. Harvard University Press, Cambridge, Mass., 1969. xvi + 334 pp., illus. \$10. Harvard-Yenching Institute Monograph Series, vol. 18.

Houdini. The Untold Story. Milbourne Christopher. Crowell, New York, 1969. vi + 282 pp. + 32 plates. \$6.95.

How To Manage Your Information. Bart E. Holm. Illustrated by Ned Beard. Reinhold, New York, 1968. viii + 296 pp. \$10.

How To Teach Mathematics in Secondary Schools. Herbert Fremont. Saunders, Philadelphia, 1969. xviii + 574 pp., illus. \$10.50. Saunders Science Teaching Series.

Importance of Fundamental Principles in Drug Evaluation. Proceedings of a symposium of the American Pharmaceutical Association, 1968. David H. Tedeschi and Ralph E. Tedeschi, Eds. Raven, New York, 1968. xvi + 496 pp., illus. \$18.95.

Induction and Intuition in Scientific Thought. Peter Brian Medawar. American Philosophical Society, Philadelphia, 1969. xii + 64 pp. \$2. Jayne Lectures for 1968. Memoirs of the American Philosophical Society, vol. 75.

An Introduction to Chemical Energetics. J. J. Thompson. Houghton Mifflin, Boston, 1968. x + 110 pp., illus. Paper, \$1.75. Concepts in Chemistry.

An Introduction to Hominology. The Study of the Whole Man. Theodore C. Kahn, Thomas, Springfield, Ill., 1969. xvi + 368 pp., illus. \$12.50.

Introduction to Probability Theory and Statistical Inference. Harold J. Larson. Wiley, New York, 1969. xii + 388 pp., illus. \$10.95. Wiley Series in Probability and Mathematical Statistics.

Introduction to the Thermodynamics of Charged Polarized Layers. A. Sanfeld. Interscience (Wiley), New York, 1968. xxiv + 264 pp., illus. \$11. Monographs in Statistical Physics and Thermodynamics, vol. 10.

Invention, Discovery, and Creativity. A. D. Moore. Anchor (Doubleday), Garden City, N.Y., 1969. xiv + 186 pp. + 10 plates. Cloth, \$4.95; paper, \$1.45 Science Study Series.

Invention of the Meteorological Instruments. W. E. Knowles Middleton. Johns Hopkins Press, Baltimore, 1969. xiv + 370 pp., illus. \$12.

Isoenzymes in Biology and Medicine. Albert L. Latner and Andrew W. Skillen. Academic Press, New York, 1968. x + 290 pp., illus. \$11.50.

Laboratory Manual for General Botany. Lawrence C. Bliss, Margaret K. Balbach, and Harry J. Fuller. Holt, Rinehart and Winston, New York, ed. 4, 1969. xvi + 288 pp., illus. Paper, \$4.95.

Laminar Motion of Multiphase Media in Conduits. Dzharulla F. Faizullaev. Translated from the Russian edition (Tashkent, 1966). Consultants Bureau, New York, 1969. vi + 146 pp., illus. Paper, \$22.50.

Leopold Kronecker's Werke. In five volumes. K. Hensel, Ed. Vol. 1 (xii + 486 pp.); vol. 2 (vi + 550 pp.); vol. 3

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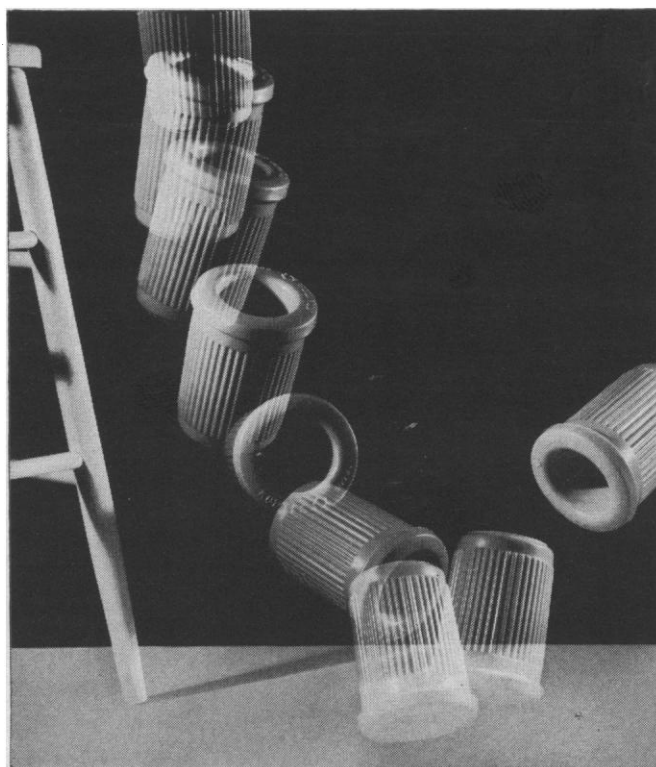
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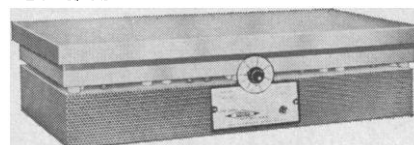
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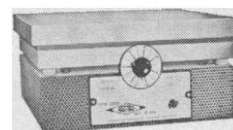
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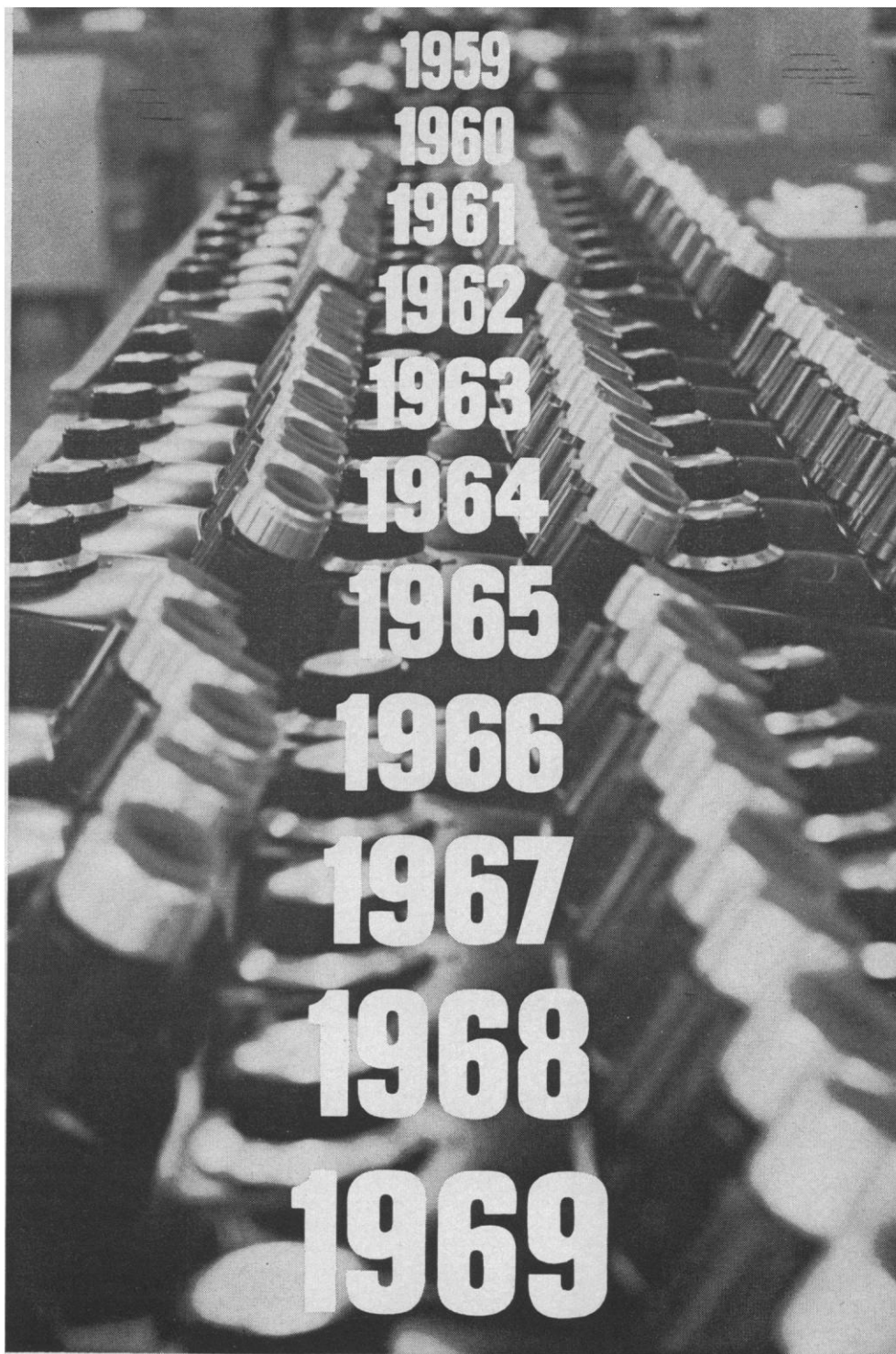
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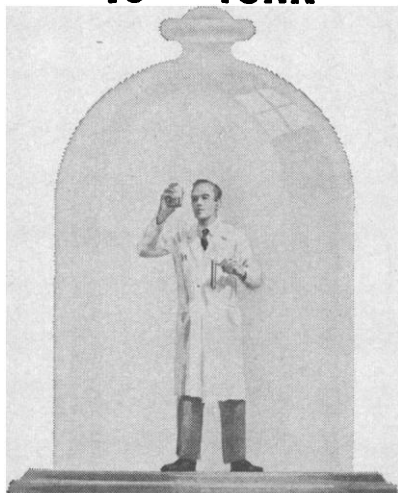
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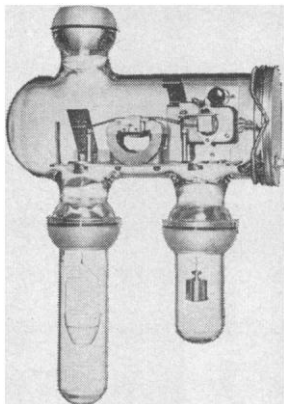
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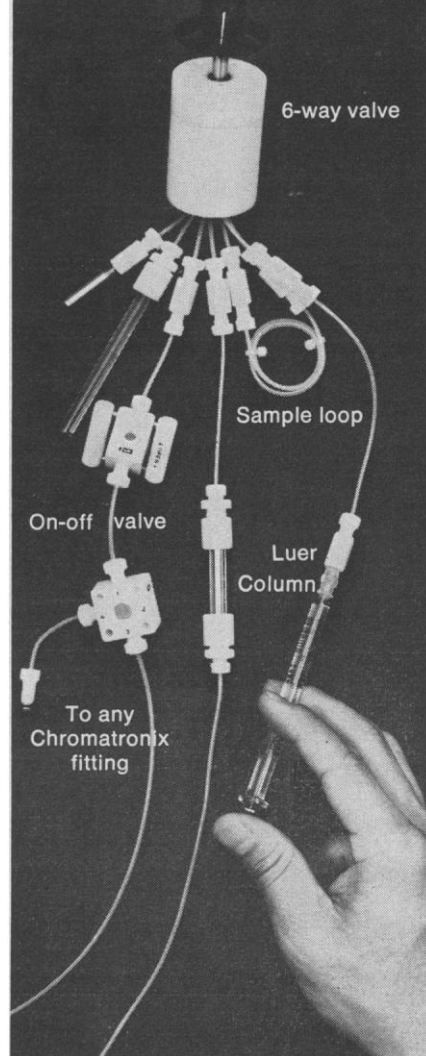
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