

SCIENCE

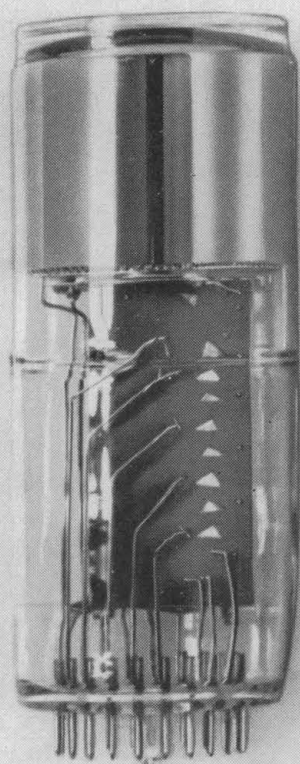
13 November 1964

Vol. 146, No. 3646

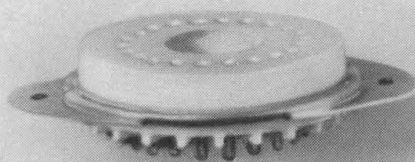
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The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion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

COVER

Migratory white-crowned sparrow (*Zonotrichia leucophrys gambelii*) at its wintering ground near San Jose, California. Birds of this species nest in northern Canada or Alaska and return each fall to the same location in California. They also have the ability to go back to the same winter home after artificial displacement across the continent. See page 941, [William K. Kirsher, Menlo Park, California]

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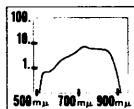
Try crazy color



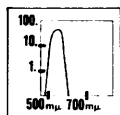
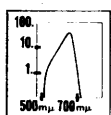
Pictures like these are seen in *Life*, *Look*, and *The Saturday Evening Post* as they should be seen—in color. There we boast of film to renew your conviction that the world is beautifully colored. Here we advise of another color film of ours carefully designed to show chlorophyll as magenta, a film that depicts the works of nature and of man in colors thoroughly false, generally ugly, and possibly useful.

As put up for use in aerial cameras, this KODAK EKTACHROME Infrared Aero Film runs no less than around \$110. We have learned that there are still some people around who are shy about laying out that kind of money on precious little assurance of success in their endeavors. We have therefore put it up in 135 form so that they can try out 20 shots in a KODAK RETINA Reflex Camera or such other 35mm still camera as the less fortunate find at hand.

A note to Eastman Kodak Company, Special Sensitized Products Division, Rochester, N. Y. 14650, will start one or more cassettes toward the Kodak dealer you name. We'll also tell you what to do about processing the film for the projector, just like real color film.



An energy distribution like will come out red;



, green; and , blue. The first is the most interesting. If you would like to be able to pick out from the rest of a scene of cropland or forest or a specimen of tissue or a patient's epidermis or a single cell at work—if you would like to pick out the parts that particularly absorb in this band, or particularly fail to absorb in this band, then this crazy film (aided by a wise choice of filter) fits you with the right kind of eyes, cheaply and simply. The ASA Exposure Index to daylight or electronic flash is 100 with a KODAK WRATTEN Filter No. 12 over the lens.

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We use 1,1,1,3,3,3-Hexamethyldisilazane (EASTMAN 9151) ourselves in our research on oil-soluble vitamins and food monoglycerides. It makes them volatile. Almost any hydroxyl-containing organic molecule that is not a high polymer becomes airborne at its kiss.* Almost any such compound one tries seems to turn into an ideal subject for sharp-cutting gas-liquid chromatography when made a trimethylsilyl ether. It is like replacing the proton of each hydroxyl with a bunch of balloons that protect it and lift it away from the grasp of hydrogen bonds. Maybe we would have missed the chance to base a business on high-vacuum distillation of heat-labile substances if silanization had been discovered 30 years ago.

Silanization, if the truth were known, drifted into our ken in the late summer of '63. A chemical news story told that a team at a medical school in Pittsburgh was having great good luck purifying carbohydrates and related polyhydroxy compounds by GLC with the trimethylsilyl derivatives. Without further ado we turned to the bench and enjoyed the same good luck with it on our vitamins and monoglycerides. Others had spectacularly good luck in their fields. Papers are popping all over on GLC of silanized fatty acids, steroids, plant sterols, bile acids, alkaloids, barbiturates. There has also been one (*Ann.* 659, 190) on silanization for peptide synthesis. The best is yet to be, now that we announce the easy availability of 25 grams of EASTMAN 9151 for \$14.65.

And to whom are we all indebted? In part, to the U. S. Congress for voting tax money to help the coal industry compete in liquid fuels. In carrying out this mandate of the people, the U. S. Bureau of Mines found trimethylsilyl derivatives useful in analysis, identification, and purification of phenols and pointed out the applicability of GLC to the problem. Even an explanation of why chlorotrimethylsilane catalyzes the reaction comes from the Bureau. True, the Bureau was probably being influenced by organosilicon research sponsored by a glass company and two other big companies that happen to make silicones.

EASTMAN 9151 also inactivates GLC support materials against adsorption of the gaseous solute in competition with the stationary-phase liquid. This was discovered in the non-political, non-commercial, prestige-covered halls of Cambridge University, alma mater to Isaac Newton. The boys were grinding up firebrick and taking their lead from the U. S. Bureau of Mines on the affinity of hexamethyldisilazane for the hydroxyls in the stuff.

To find out about all the EASTMAN Organic Chemicals and their prices, write *Distillation Products Industries, Rochester, N. Y. 14603* (Division of Eastman Kodak Company).

* We kiss as follows: to 10 mg. of material, add 1.0 ml. of *Pyridine* (EASTMAN 214), 0.2 ml. of EASTMAN 9151 and 0.1 ml. of *Chlorotrimethylsilane* (EASTMAN P8710). Shake for 30 sec. and let stand for 5 min. while NH_4Cl precipitate settles. Take aliquot for GLC. To save for future reference, continue washing with alternate 5 ml. portions of water and *Hexane* (EASTMAN P1135) until pyridine odor is gone.

For background on how many milliroentgens film can distinguish from natural background

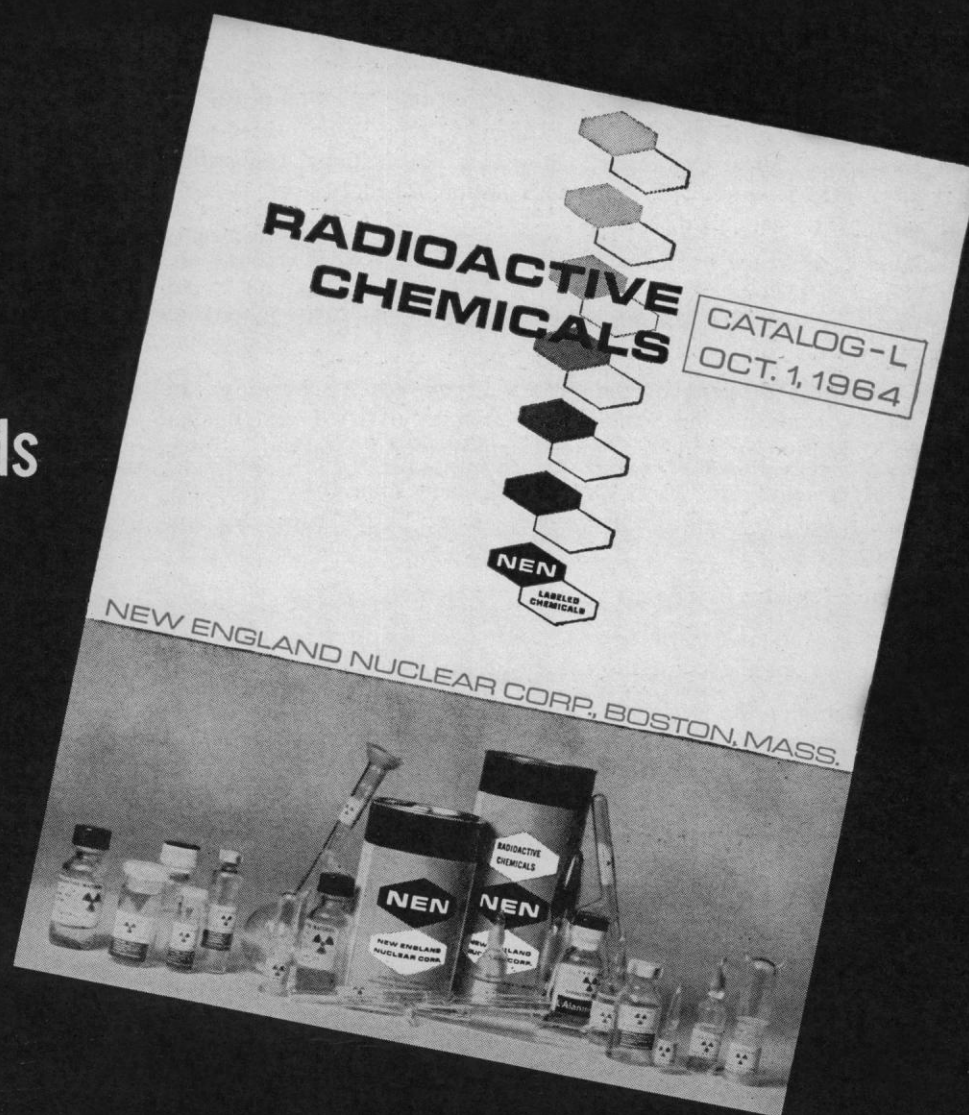
A new free pamphlet on personal monitoring films is available from Eastman Kodak Company, Special Sensitized Products Division, Rochester, N. Y. 14650. It contains a bibliography.

For background to the need for background on monitoring against background

Film-badge services rely on agreed "safe" levels of personal exposure. The arrangement permits the customer to treat the whole thing as routine. Is there any obligation to reopen the subject merely because a newer Kodak film happens to

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Moving Frontiers of Science V. C. Wynne-Edwards on self-regulating systems in animal populations; J. M. Harrison on nonrenewable world resources; Philip Morrison, "New Channels in Astronomy"; and Clement L. Markert on role of genes in embryonic development.

Interdisciplinary Symposia Possible meteoric or lunar influences on meteorological phenomena; basic concepts of biochemical differentiation; medical geology and geography; history of the popularization of science.

Special Sessions AAAS Presidential Address by Alan T. Waterman; the Joint Address of Sigma Xi and Phi Beta Kappa by René Dubos; the George Sarton Memorial Address by Lloyd G. Stevenson; the National Geographic Society Illustrated Lecture; and the AAAS Distinguished Lecture by Lord Brain, retiring president, British AAS.

International Conference on Primate Behavior Three AAAS sections and the combined ESA and ASZ Section on Animal Behavior and Sociobiology are sponsors. Six sessions, open to the public, will include 37 speakers from four continents.

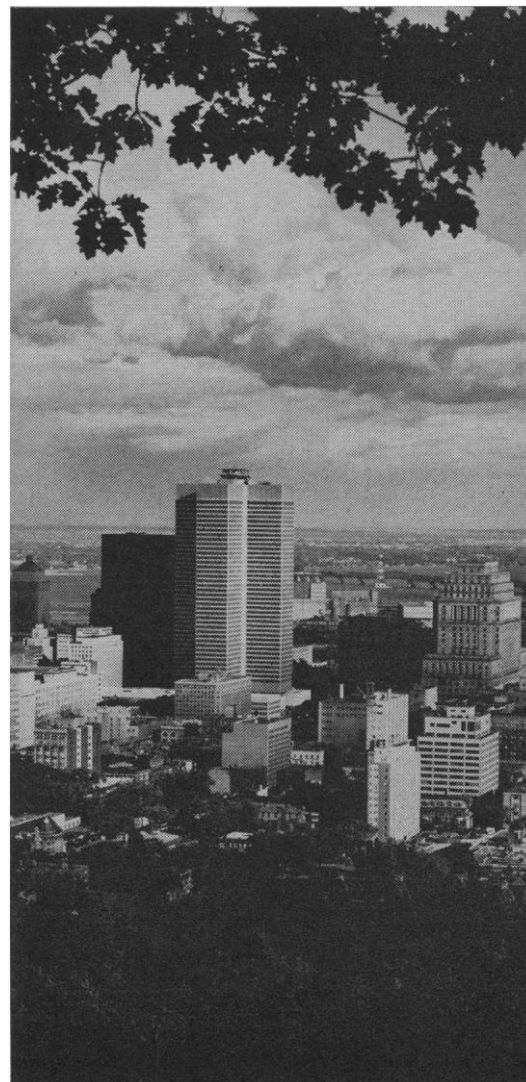
AAAS Committees Sessions of the AAAS Committee on Meetings, including two sessions on the sociology of science arranged and chaired by Robert K. Merton; and the Commission on Science Education.

Sections and Societies The 20 AAAS Sections and some 76 participating societies are scheduling specialized symposia; some have sessions for contributed papers.

AAAS Science Theatre The latest foreign and domestic films.

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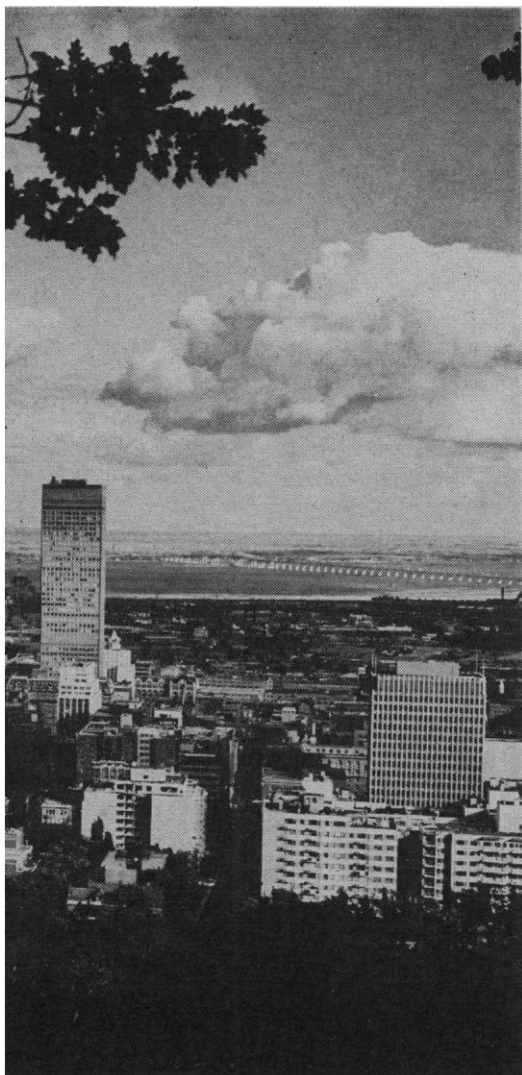
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MEETING • 26-31 DECEMBER

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Make sure you have the accommodations you prefer. A list of headquarters hotels of participating societies appears on page 299, 17 July, *SCIENCE*. The AAAS headquarters is the Queen Elizabeth.

The hotels for the AAAS Montreal meeting have established special, low rates and have reserved large blocks of rooms for the meeting.

Use the coupon below to make your hotel reservation in Montreal. Send your application to the AAAS Housing Bureau in Montreal, not to any hotel. Give a definite date and estimated hour of arrival, and also probable date of departure. The Housing Bureau will make the assignment and send you a confirmation promptly.

A rollaway bed can be added to any room at \$3.00 per night. Mail your application now to secure your first choice of accommodations.

Hotels with asterisks have unlimited free parking for guests. The Windsor has overnight free parking for guests, but not between the hours of 9 A.M. and 4 P.M.

HOTEL RATES

For a list of the headquarters of each participating society and section, see page 299, 17 July, *SCIENCE*.

Hotel	Single	Double	Twin	Suite
*Queen Elizabeth	\$ 8.50, 10.00	\$15.00	\$15.00	\$30.00-\$50.00
*Sheraton-Mount Royal	8.50, 10.00	15.00	15.00	25.00- 45.00
Windsor	8.50	15.00	15.00	25.00- 45.00
*Laurentien (Sheraton)	7.50	12.00	12.00	21.00- 30.00
Ritz Carlton	10.00	15.00	15.00	35.00
Berkeley	7.00	10.00	10.00	17.50

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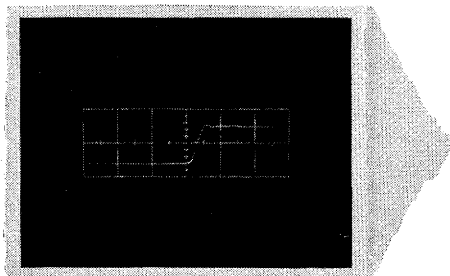
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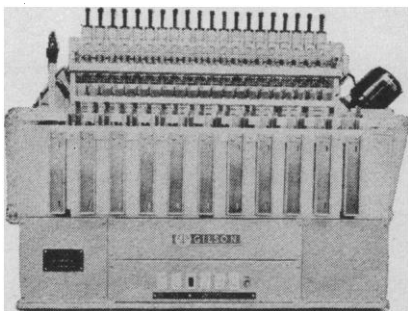
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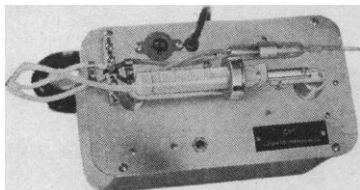
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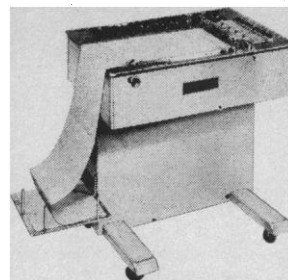
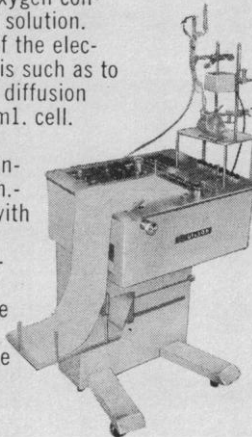


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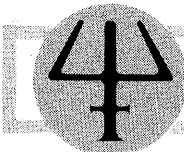
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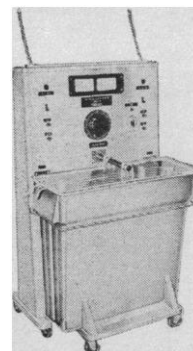
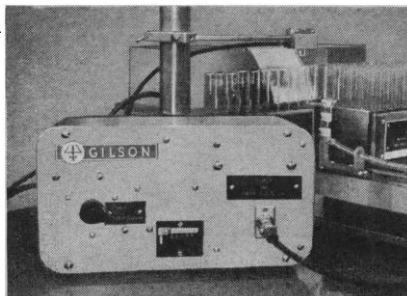
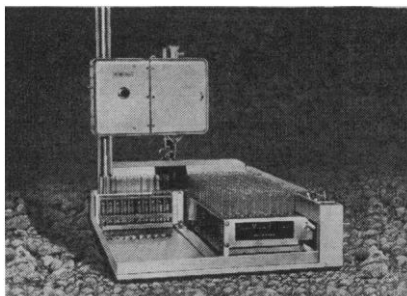
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Basic Research Journals

Two recent reports from the National Science Foundation, *Characteristics of Scientific Journals, 1949-1959*, and *Characteristics of Professional Scientific Journals, 1962*, contain a good bit of information about the 500 U.S. journals that serve an important scientific function by devoting more than half of their space to reports of basic research (not including technology, agriculture, and medicine). Typically these journals are small, with an average size of 1050 pages a year, 4400 subscribers (3300 domestic and 1100 foreign), and annual expenses of \$31,500.

Analysis of the more detailed figures shows clearly that some of these journals are in trouble. Some are probably doing as well as can be expected. But others face a continuing struggle. Evidence comes from the efforts that editors have made to keep up with their problems. The average length of article has been decreased substantially since 1949. Format changes have allowed printing of a greater number of words per page. Half of the editors receive no compensation for the average of 800 hours a year they devote to their editorial duties. Advertising revenue for journals owned by scientific societies increased from 8 percent of all income in 1949 to 13 percent in 1959. Subscription charges, on a cost-per-word basis, were increased 37 percent from 1959 to 1962. Despite these efforts, many journals run at a loss; in 1962, 40 percent of the university-owned journals and nearly 20 percent of the society-owned ones were partially supported by subsidies or special grants.

Comparisons among the different groups of journals suggest some ways in which the weaker ones might achieve improvements, economies, or additional income.

Journals in engineering, physics, and chemistry have the most economical formats; those in biology and the social sciences, the most expensive. Among the society-owned journals, the cost to subscribers was lowest in physics (\$0.67 a year per 100,000 words of research reports) and highest in the social sciences (\$2.98 per 100,000 words). Costs were still higher for commercial journals, which typically have small circulations (\$3.94 per 100,000 words).

The leadership of the American Institute of Physics in levying page charges against the authors' institutions is now being followed by some other journals, but most have not yet turned to this source of income.

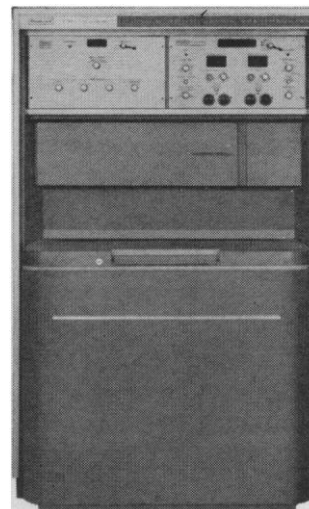
As circulation increases, and as the total amount of material published per year goes up, unit costs come down. There are difficulties in consolidating existing journals, but a change to fewer and larger journals would effect some economies. Studies of circulation overlap and patterns of subscriptions should turn up a number of candidates for journal mergers that could be published more economically than are the separate journals. Most scientists find it necessary to subscribe to several journals. But 500 journals provide fantastically more different combinations than there are scientists. If we assume that no individual subscribes to more than five journals (by no means an unusual number), then 500 journals provide approximately 2.5×10^{21} different combinations to satisfy the individualistic needs of some 2.5×10^5 scientists. Surely fewer journals would suffice, and the merged ones would be stronger and healthier.—DAEL WOLFE

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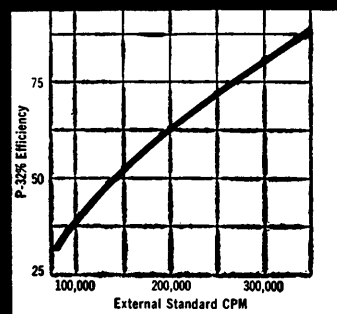
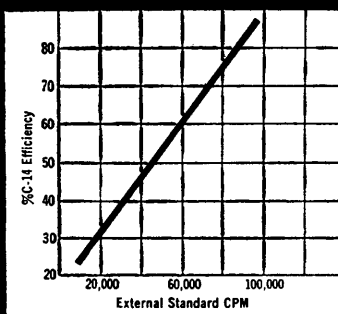
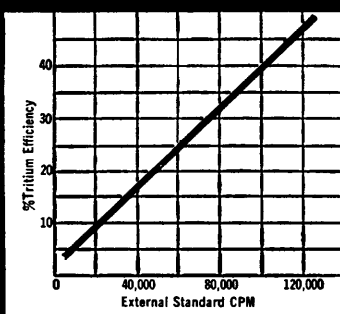
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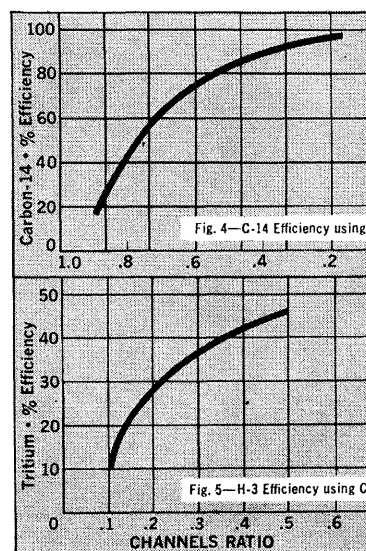


Fig. 4—C-14 Efficiency using Channels Ratio

Fig. 5—H-3 Efficiency using Channels Ratio



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RADIOLOGICAL HEALTH AND SAFETY IN MINING AND MILLING OF NUCLEAR MATERIALS

Proceedings of a symposium held in Vienna, August 26-31, 1963, by IAEA in cooperation with ILO and WHO. Contents: (Vol. I) Historical review and epidemiology; General health and safety problems; Toxicology; Maximum permissible radiation levels and concentrations. (Vol. II) Technical problems of radiological protection; Waste management; Monitoring programmes in mines and mills and the environment; Medical supervision and assessment of internal contamination; Standards and regulations; Closing summary.

(1964) Vol. I: 480 pp., \$10.00 Vol. II: 560 pp., \$11.00

NEW NUCLEAR MATERIALS INCLUDING NON-METALLIC FUELS

Proceedings of an IAEA conference held in Prague, July 1-5, 1963. Principal subjects: ceramic fuels such as oxides and carbides of uranium, their fabrication and properties; fabrication of reactor components with new materials such as beryllium-oxide powder and silicon-impregnated carbon.

(1963) Vol. I: 564 pp. Vol. II: 568 pp. \$11.00 per volume

RADIOISOTOPES IN HYDROLOGY

Proceedings of an IAEA symposium held in Tokyo, March, 1963. Subjects: water tracers, flow and course changes in rivers, flow and stratification and age of ground water, and silt movement in rivers and harbours.

(1963) 459 pp. \$9.00

DIAGNOSIS AND TREATMENT OF RADIOACTIVE POISONING

Report of a scientific meeting convened by IAEA and WHO in Vienna, October, 1962. Contents: Early evaluation; Radium; Strontium; Other fission products and radio-nuclides; Plutonium and other transuranium elements; Treatment.

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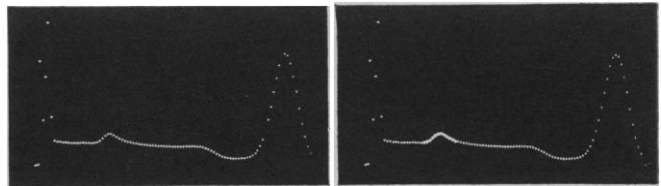
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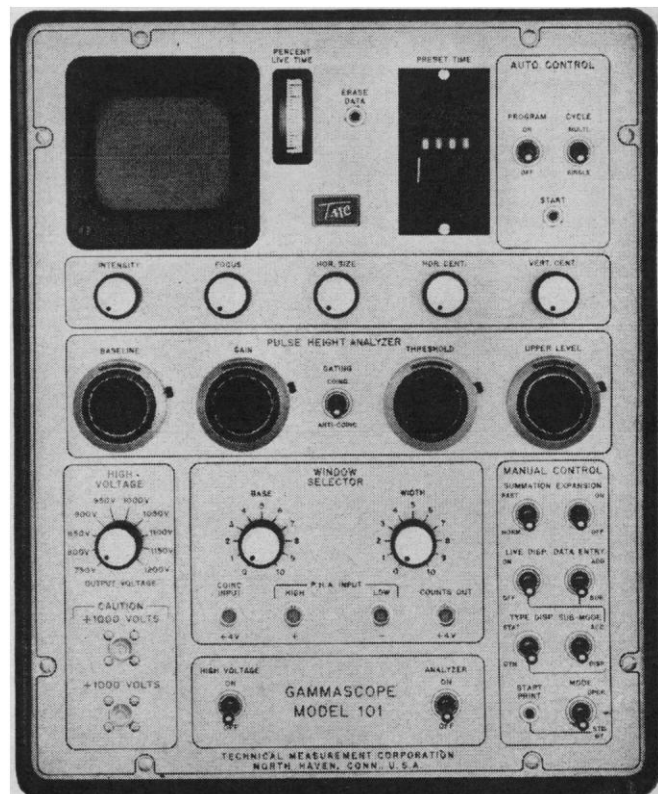
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involve the formation of an intermediate between DPNH and triphosphopyridine nucleotide (TPN).

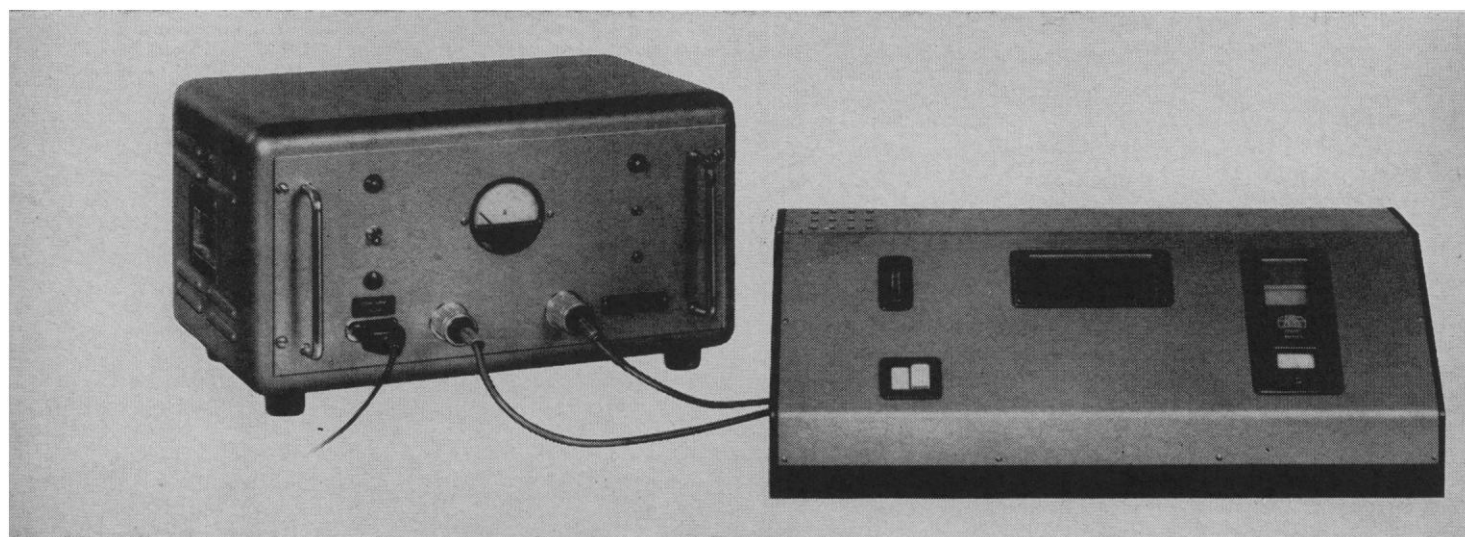
A second session, chaired by E. C. Slater, continued the discussion of mitochondrial compartmentation. Van Dam's determination of the relationship between the amplitude of the "ATP (adenosine triphosphate) jump" in rat liver mitochondria and the simultaneous appearance of diphosphopyridine nucleotide (DPN) leads to the tentative conclusion that the jump in ATP does not provide, as heretofore believed, evidence for high-energy intermediates of the respiratory chain. However, the need for verifying in terms of oxygen utilization the oxidation of DPNH and the consequent synthesis of ATP was emphasized by Estabrook. The difficulties of carrying out this experiment at low temperatures where the reactions of ADP are slow were pointed out.

As a second topic, the site of inhibition by atractylate was discussed. M. Klingenberg and his co-workers and A. Kemp and E. C. Slater presented evidence that, unlike oligomycin, atractylate does not inhibit the phosphorylation of mitochondrial ADP by

inorganic phosphate, but that it prevents the interaction of external nucleotides with the internal mitochondrial pool of the mitochondria. This conclusion, which disagrees with those presented at the Sixth International Congress by Azzone and Bruni and by P. Vignais, is in agreement with Bruni's finding that stractylate prevents the binding of adenine nucleotides to the mitochondrial membrane, and J. B. Chappell's observation that all mitochondrial reactions supported by ATP (with the exception of adenylate kinase) are inhibited by atractylate. W. C. Hülsmann presented experiments suggesting that carnitine can stimulate mitochondrial respiration by relieving a block in the Krebs cycle at the α -ketoglutarate step, caused by a high ratio of acyl-CoA to free CoA.

A session devoted to cation uptake by mitochondria was chaired by H. Rasmussen, who emphasized the similarities and differences of calcium and magnesium uptake. B. C. Pressman discussed the structures of a number of antibiotics, among them valinomycin and gramicidin, in relation to the stimulation of active transport of sodium and potassium in mitochondria.

Carafoli and Lehninger described the concomitant uptake of ATP with calcium in mitochondria with an observed stoichiometry of about 1 ATP for every 10 Ca^{++} . This uptake of adenine nucleotide served to balance in part the electrostatic charges associated with calcium accumulation. Klingenberg presented similar data on the concomitant uptake of adenosine diphosphate (ADP) during calcium accumulation; apparently a difference in results exists. The possibility that other cations such as sodium or potassium were transported during oxidative phosphorylation was considered, as was the nature of the high-energy compound which contributes the energy source for ion uptake. Chappell described experiments similar to those of Pressman in which gramicidin was used to stimulate potassium uptake and hydrogen ejection, and proposed a mechanism whereby hydrogen-ion transport out of the mitochondria might be accompanied by the uptake of divalent cations such as calcium and strontium or of monovalent cations such as potassium or ammonium ion, with or without the concomitant uptake of phosphate. In the case of



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ammonium ion uptake, charges are balanced and proton ejection was not to be expected, while proton ejection could be observed in the case of divalent cations. Chappell and Chance emphasized the lack of respiratory stimulation in the reaction of potassium with the mitochondrial constituents. The sites of ion accumulation were actively discussed by Chappell, L. Peachey, J. Brierley, and Klingenberg, and it was concluded that the deposits of calcium can be observed in mitochondria associated with the membrane subunits (IMS) on the membranous part as well as in the matrix. The general hypothesis that the matrix compartment is the area where cation accumulation occurs was presented, and Peachey emphasized that the normal granules of the matrix space provide a suitable point for calcium accumulation. The possible relation between ion uptake in mitochondria and in the whole cells was discussed by A. Kleinzeller, who emphasized the possible usefulness of the concepts developed from studies with whole cells to the mitochondrial problems.

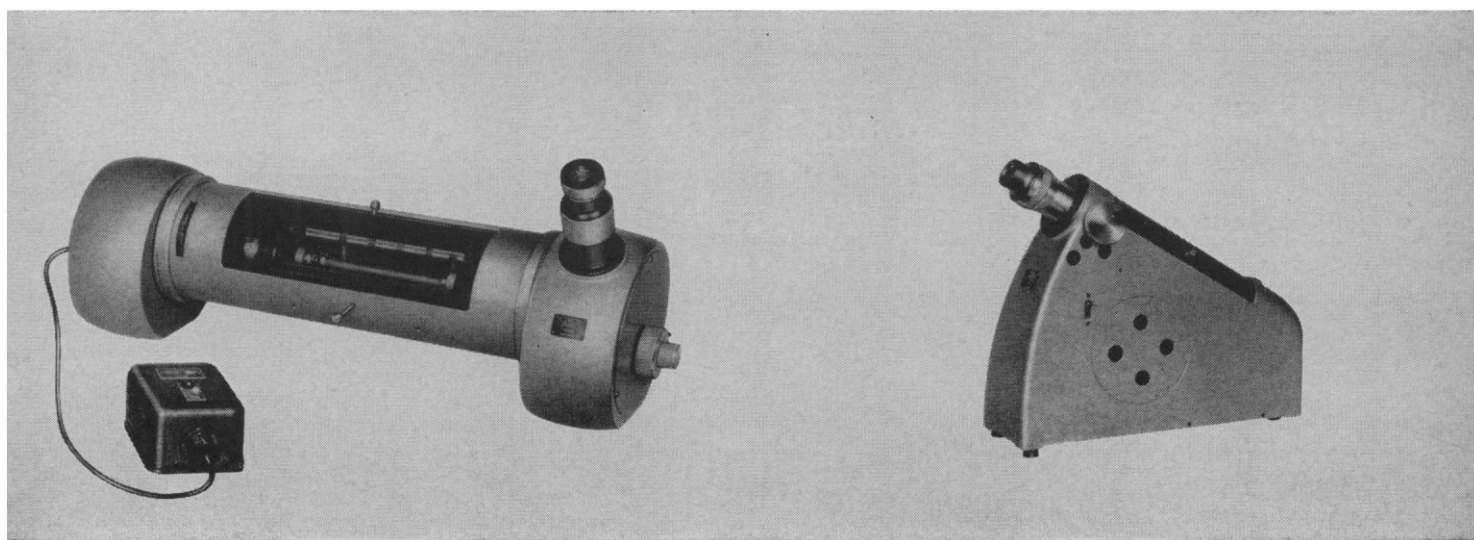
In the session on the swelling of mitochondria, chaired by A. Lehnin-

ger, a number of factors affecting large-amplitude swelling were discussed by Hunter, Azzone, and Lehninger, with particular reference to the properties of peptides such as oxytocin and gramicidin (the latter participates in cation transport). The present status of contractile protein was evaluated by Azzone and Lehninger and compared with properties of the cold labile adenosine triphosphatase and actomyosin.

The effect of a soluble relaxing-factor preparation upon mitochondrial contraction caused by the addition of ATP and magnesium was discussed by H. Baltscheffsky, and experiments illustrating the temporary inhibition of contractility were presented. Lastly, the physical changes that occur in mitochondria in large-amplitude swelling were described by Lehninger, with particular emphasis on the fact that the basic lipid bi-layers of which the cristal membrane may well be composed cannot stretch to the degree required to explain large-amplitude swelling. The general question of the shape of the cristae in nature was evaluated critically, and it was pointed out that fewer cristae are observed in

0.44M than in 0.32M sucrose. A number of properties of mitochondria prepared in a high concentration of sucrose differ from those prepared in low sucrose concentration, particularly their high content of endogenous substrate and the relatively small response to added ADP. Chance presented the hypothesis that cristae may well be in the "collapsed" state as observed by Stoeckenius. The cristal structure would be held in this condition by cross-links between adjacent crista, which may well involve portions of the projecting subunits, that is, either a zipper-like interlocking of the heads or (in view of the evidence suggesting that the subunits project into the matrix space) an extension of these cross-links, allowing for a reasonable amount of swelling and shrinkage; in large amplitude swelling the cross-links may be entirely broken.

All in all the "compostium" a (polyglot term created by Bücher) appeared to be highly successful. The presence of experts on morphology as well as on enzymology helped to focus on the major areas currently under active investigation. A greater appreciation of the two approaches was achieved. In brief, the



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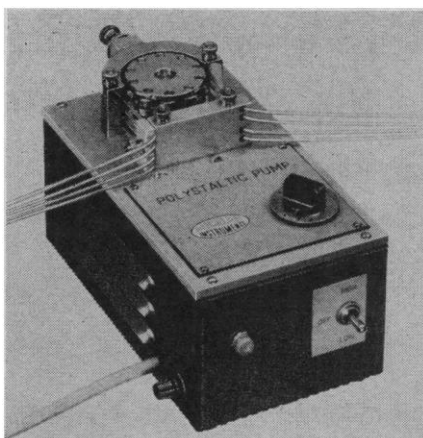
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meeting, although loosely organized, served as a forum for the extensive discussion in depth of current hypotheses dictating the direction of research in mitochondrial structure, biological oxidations, and associated energy-transfer reactions.

The organizers of the Malvern meeting are deeply indebted to Mrs. L. S. L. Chance and to the panel chairmen, Drs. Linnane, Palade, Ernster, Slater, Rasmussen, and Lehninger. The ability of these discussion leaders to set the rapid tempo of the meeting was the direct factor responsible for the success of this postcongress discussion session.

B. CHANCE
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Forthcoming Events

November

21-22. American Geological Inst., Miami Beach, Fla. (L. Hoover, 1444 N St., NW, Washington, D.C. 20005)

21-24. American Speech and Hearing Assoc., San Francisco, Calif. (K. O. Johnson, 1001 Connecticut Ave., NW, Washington, D.C.)

23-24. Water for Texas, 9th annual, Texas A&M Univ., College Station. (E. T. Smerdon, Water Resources Inst., Texas A&M Univ., College Station)

23-25. American Physical Soc., Fluid Dynamics Div., Pasadena, Calif. (R. J. Emrich, Dept. of Physics, Lehigh Univ., Bethlehem, Pa.)

23-27. Dosimetry of Irradiations from External Sources, intern. symp., Health Physics Soc., French section, Paris, France. (M. Gras, 5, rue Armand, Gauthier, Paris 18°)

23-27. Use of Radioisotopes in Animal Nutrition and Physiology, symp., Intern. Atomic Energy Agency, Food and Agriculture Organization of the UN, Prague, Czechoslovakia. (Symp. Secretariat, Kärntnering 11, Vienna 1, Austria)

23-28. Internal Medicine, 8th intern. Congr., Buenos Aires, Argentina. (Secretariat, Melo 2081, Buenos Aires)

24. Manufacturing Chemists' Assoc., 14th conf., New York, N.Y. (Manufacturing Chemists' Assoc., 1825 Connecticut Ave., NW, Washington, D.C.)

26-28. Central Assoc. of Science and Mathematics Teachers, 64th annual, Detroit, Mich. (Sister Mary Ambrosia, Gesu Convent, 17180 Oak Drive, Detroit 48221)

27-28. National Council for Geographic Education, Minneapolis, Minn. (L. Kenamer, Univ. of Texas, Austin)

29-1. Applications of Fundamental Thermodynamics to Metallurgical Processes, conf., Pittsburgh, Pa. (G. R. Fitterer, Engineering Research Div., Schools of Engineering and Mines, 405 Engineering Hall, Univ. of Pittsburgh, Pittsburgh)

29-1. Association for Research in Oph-

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thalmology, Minneapolis, Minn. (H. Kaufman, J. Hillis Miller Health Center, Univ. of Florida, Gainesville)

29-4. **American Soc. Mechanical Engineers**, annual, New York, N.Y. (D. J. Sengstaken, ASME Nuclear Engineering Div., Long Island Lighting Co., 175 Old Country Rd., Hicksville, L.I., N.Y.)

29-4. **Radiological Soc. of North America**, Chicago, Ill. (M. D. Frazer, 1744 S. 58 St., Lincoln, Neb.)

30. **Food and Drug Administration and Law Inst.**, 8th annual conf., Washington, D.C. (S. T. Grey, Bureau of Education and Voluntary Compliance, FDA, Washington 25, D.C.)

30-1. **Mechanisms of Dental Caries**, New York Acad. of Sciences, New York, N.Y. (J. F. Fredrick, New York Research Laboratories, 3425 Boston Post Rd., Bronx, N.Y. 10469)

30-2. **New Horizons in Solid State Electronics**, seminar, Rochester, N.Y. (A. DeWinter, Rochester Inst. of Technology, Extended Services Division, Rochester 8)

30-2. **Pacific Air Force Medical conf.**, Fuchu Air Station, Tokyo, Japan. (Lt. Col. R. J. Carter, 14th PACAF Medical Conf., USAF Hospital Tachikawa, APO 323, San Francisco, Calif.)

30-2. **Thalamic Regulation of Sensorimotor Activities**, symp., New York, N.Y. (M. D. Yahr, New York Neurological Inst., 710 W. 168 St., New York 10032)

30-3. **Atomic Industrial Forum**, annual, San Francisco, Calif. (Atomic Industrial Forum, 850 Third Ave., New York, N.Y.)

30-3. **Entomological Soc. of America**, annual, Philadelphia, Pa. (ES, 4603 Calvert Rd., College Park, Md.)

30-3. **American Nuclear Soc.**, winter meeting, San Francisco, Calif. (W. H. Nutting, Pacific Gas and Electric Co., 245 Market St., San Francisco)

December

1. **Food Standards**, symp., Washington, D.C. (Food Law Inst., Inc., 205 E. 42 St., New York 10017)

1. **New Polyolefin Copolymer Plastics**, regional technical conf., Philadelphia, Pa. (E. A. Jeffreys, Registration Chairman, c/o Allied Chemical Corp., 901 Catalapa Rd., Warminster, Pa.)

2-4. **Communication Wires and Cables**, 13th annual symp., Atlantic City, N.J. (J. Spergel, WCS, U.S. Army Electronics R&D Laboratories, Fort Monmouth, N.J. 07703, Attn: SELRA/PEE)

2-5. **Crystalline Lens**, symp., Minneapolis, Minn. (J. E. Harris, Dept. of Ophthalmology, Univ. of Minnesota Medical School, Minneapolis 55455)

3-5. **American Chemical Soc.**, 20th annual southwestern regional meeting, Shreveport, La. (ACS, 1155 16th St, NW, Washington, D.C. 20036)

3-5. **Sociological Questions Pertaining to the Medical Field**, East German Hygiene Soc., symp., Berlin, East Germany. (German Acad. of Sciences, Mohrenstrasse 39, Berlin W.8.)

3-5. **Texas Acad. of Science**, annual, Dallas. (S. O. Brown, Texas A&M Univ., Box 33, College Station)

4. **Central States Society of Industrial Medicine and Surgery**, Iowa City, Iowa.

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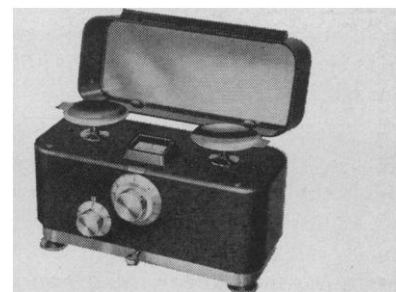
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4-5. **American Rheumatism Assoc.**, annual, Washington, D.C. (J. A. Coss, Jr., 20 E. 76 St., New York 10021)

4-5. **American Rheumatism Assoc.**, 11th interim scientific session, National Institutes of Health, Bethesda, Md. (G. W. Speyer, ARA, 10 Columbus Circle, New York 10019)

4-5. **Association for Research in Nervous and Mental Diseases**, New York, N.Y. (R. J. Masselink, ARNMD, 700 W. 168 St., New York 10022)

4-5. **Oxygen in Biosystems**, basic science symp., New York, N.Y. (Miss J. Newkirk, New York Heart Assoc., 10 Columbus Circle, New York 10019)

4-5. **Oxygen**, symp., New York, N.Y. (A. P. Fishman, New York Heart Assoc., 10 Columbus Circle, New York 10019)

4-5. **Southern Soc. for Pediatric Research**, Houston, Tex. (F. K. Edwards, Emory Univ. School of Medicine, Thomas K. Glenn Memorial Bldg., 69 Butler St., Atlanta, Ga. 30303)

4-6. **American Psychoanalytic Assoc.**, fall meeting, New York, N.Y. (APA, 1 E. 57 St., New York 10022)

4-9. **American Acad. of Dermatology**, Chicago, Ill. (S. E. Huff, AAD, 636 Church St., Evanston, Ill.)

5-6. **Academy of Psychoanalysis**, mid-winter meeting, New York, N.Y. (A. H. Rifkin, AP, 125 E. 65 St., New York)

6. **American Acad. of Dental Medicine**, mid-annual meeting, New York, N.Y. (S. C. Conrad, 133-28 228th Street, Laurelton, L.I.)

6-10. **American Inst. of Chemical Engineers**, annual, Boston, Mass. (J. Henry, AIChE, 345 E. 47 St., New York 10017)

6-12. **Latin American Congr. on Microbiology**, 3rd, Bogota, Columbia. (O. Juliao, Instituto Nacional de Salud, Aptdo, Aereo 3495, Bogota)

7. **American Institute of Mining, Metallurgical and Petroleum Engineers**, annual, Tucson, Ariz. (H. N. Appleton, AIME, 345 E. 47 St., New York 10017)

7-9. **Performance of High Temperature Systems**, Pasadena, Calif. (G. S. Bahn, 16902 Bollinger Dr., Pacific Palisades, Calif. 90272)

7-9. **Southern Surgical Assoc.**, meeting, Hot Springs, Va. (G. H. Yeager, University Hospital, Baltimore 1, Md.)

7-11. **Chemical Effects Associated with Nuclear Reactions and Radioactive Transformations**, symp., Vienna, Austria. (P. Ghelardoni, Div. of Scientific and Technical Information, International Atomic Energy Agency, Karntnerring 11, Vienna 1)

8-9. **Ciba Foundation Guest Symposium on Measurement of Oxygen Tension**, London, England. (Ciba Foundation, 41 Portland Pl., London, W.1)

8-11. **American Soc. of Agricultural Engineers**, New Orleans, La. (J. L. Butt, ASAE, 420 Main St., St. Joseph, Mich.)

9-11. **Antiviral Substances**, conf., New York Acad. of Sciences, New York, N.Y. (B. K. Forscher, Publications Section, Mayo Clinic, Rochester, Minn.)

12-15. **American Acad. of Optometry**, annual, Columbus, Ohio. (C. C. Koch, AAO, 1506-08 Foshay Tower, Minneapolis 2, Minn.)

14-16. **Hahnemann Medical College**, 13th symp., Philadelphia, Pa. (J. H. Moyer, Dept. of Medicine, Hahnemann Medical College, Philadelphia)

14-16. **Reticuloendothelial Soc.**, meeting, New York, N.Y. (N. R. Di Luzio, Univ. of Tennessee Medical Units, Memphis)

14-17. **Adipose Tissue Metabolism and Obesity**, conf., New York, N.Y. (B. N. Brodoff, New York Acad. of Sciences, 2 E. 63 St., New York)

14-18. **Conference on Nuclear Electronics**, Bombay, India. (International Atomic Energy Agency, Karntnerring 11, Vienna 1, Austria)

14-22. **International Geological Congr.**, 22nd, New Delhi, India. (Secretary-General of the Congress, c/o Geological Survey of India, 27, Chowringhee, Calcutta 13)

14-22. **International Mineralogical Assoc.**, 4th general, New Delhi, India. (J. V. Smith, c/o Dept. of Geophysical Sciences, University of Chicago, Chicago, Ill.)

15-16. **Periodic Functions in Live Matter**, Czechoslovak Meteorological Soc., conf., Prague. (J. Novak, First "Prof. Konopik" Dermatology Clinic, Prague 2, Apolinarska 4)

15-18. **High Energy Astronomy**, symp., Univ. of Texas, Austin. (Office of Aerospace Research, 4th and Independence Avenue, SW, Washington, D.C. 20233)

15-18. **Relativistic Astrophysics**, symp., Univ. of Texas and Southwestern Center for Advanced Studies, Austin. (Mrs. J. Wardlaw, Dept. of Physics, Physics Bldg. 438, Univ. of Texas, Austin 78712)

16-21. **Inter-American Congr. of Psychology**, 9th annual, Miami, Fla. (V. D. Sanua, Yeshiva Univ., 110 W. 57 St., New York 10019)

20-24. **Theoretical and Applied Mechanics**, congr., Kanpur, India. (M. K. Jain, Indian Inst. of Technology, Kharagpur, India)

21-23. **American Physical Soc.**, Berkeley, Calif. (W. Whaling, California Inst. of Technology, 1201 East California St., Pasadena)

21-23. **Biology of Marine Microorganisms**, conf., Univ. of California, Berkeley. (R. Newton, Letters and Science Extension, Univ. of California, Berkeley 94720)

26-29. **Society of Systematic Zoology/American Soc. Zoologists/Herpetologists' League**, annual, Univ. of Tennessee, Knoxville. (J. G. Rozen, Jr., Dept. of Entomology, SSZ, American Museum Natural History, Central Park West and 79th St., New York, N.Y.; A. G. Richards, ASZ, Dept. of Entomology, Univ. of Minnesota, St. Paul 55101; J. M. Legler, HL, Dept. of Zoology, Univ. of Utah, Salt Lake City)

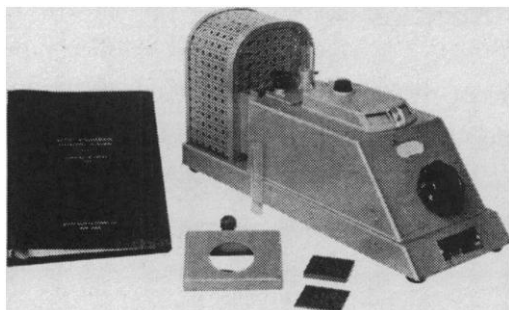
26-31. **American Assoc. for the Advancement of Science**, annual, Montreal, Canada. (R. L. Taylor, AAAS, 1515 Massachusetts Ave., NW, Washington, D.C. 20005)

The following 45 organizations will meet in conjunction with the AAAS annual meeting in Montreal, Canada, 26-31 December:

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Academy of Psychoanalysis (M. Ullman,

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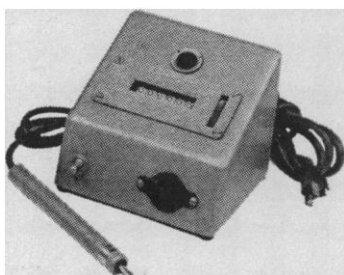


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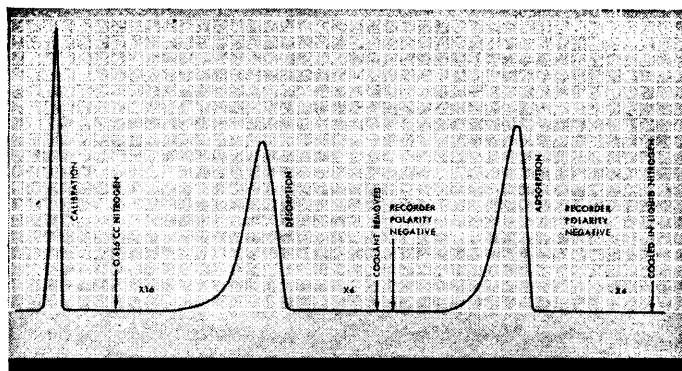
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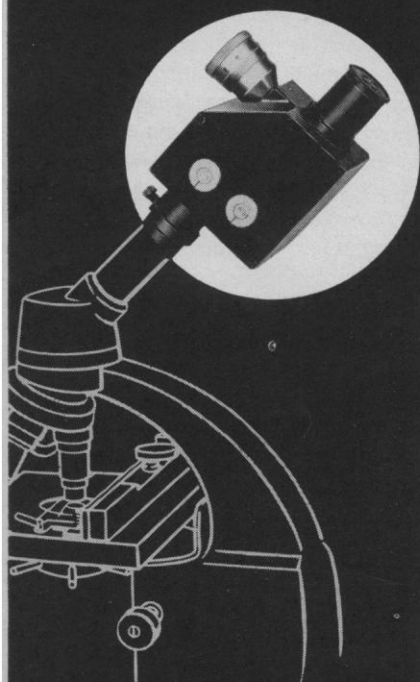
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American Astronautical Soc. (E. van Dreist, Director, Space Science Laboratory, North American Aviation, Downy, Calif.)

American Astronomical Soc. (G. C. McVittie, Univ. of Illinois Observatory, Urbana)

American Economic Association (H. E. English, Private Planning Assoc., 712 Sun Life Bldg., Montreal 2)

American Meteorological Soc. (K. C. Spengler, AMS, 45 Beacon St., Boston, Mass.)

American Nature Study Soc. (V. Rockcastle, Cornell Univ., Ithaca, N.Y.)

American Soc. of Naturalists (S. Granick, Rockefeller Inst., 66th St. and York Ave., New York 10021)

American Political Science Assoc. (E. B. Skolnikoff, Massachusetts Inst. of Technology, Cambridge)

American Soc. of Criminology (W. C. Reckless, Dept. of Sociology, Ohio State Univ., Columbus)

American Soc. for Microbiology (S. J. Ajl, Director of Research, Albert Einstein Medical Center, York and Tabor Rds., Philadelphia 41, Pa.)

American Soc. of Zoologists, Animal Behavior and Sociobiology Div. (G. W. Barlow, Vivarium Bldg., Wright and Healey Sts., Univ. of Illinois, Champaign)

American Sociological Assoc. (W. E. Moore, Russell Sage Foundation, 230 Park Ave., New York, N.Y.)

Animal Behavior Soc. (J. P. Scott, Jackson Laboratory, Hamilton Station, Bar Harbor, Maine)

Association canadienne-française pour l'Avancement des Sciences (M. J. Beauregard, ACFAS, C.P. 6128, Univ. of Montreal, Montreal)

Association for Computing Machinery (M. Woodbury, New York Univ. Medical Center, New York, N.Y.)

Biometric Soc. (D. S. Robson, Cornell Univ., Ithaca, N.Y.)

Canadian Aeronautics & Space Inst. (H. C. Luttman, CASI, 77 Metcalf St., Ottawa 4)

Canadian Assoc. of Geographers (J. T. Parry, Morrice Hall, McGill Univ., Montreal)

Canadian Assoc. of Physicists (A. C. H. Hallett, Dept. of Physics, Univ. of Toronto, Toronto 5)

Canadian Science Fairs Council (H. I. Bolker, Pulp & Paper Research Inst. of Canada, 3420 University St., Montreal 2)

Ecological Soc. of America (G. M. Woodwell, Brookhaven Natl. Laboratory, Upton, L.I., N.Y.)

Engineering Institute of Canada (G. T. Page, EIC, 2050 Mansfield St., Montreal 2)

Entomological Soc. of Canada (I. S. Lindsay, Defence Research Board, 125 Elgin St., Ottawa)

General Systems Knowledge (O. Wing, Columbia Univ., Dept. of Electrical Engineering, New York 10027)

History of Science Soc. (J. E. Murdoch, Harvard Univ., Cambridge, Mass.)

Institute of Management Sciences (B. V. Dean, Dept. of Management, Case Inst. of Technology, Cleveland, Ohio)

Medical Geology and Geography (H. V. Warren, Dept. of Geology, Univ. of British Columbia, Vancouver 8, B.C.)

Metric Assoc. (R. P. Fischelis, Ohio Northern Univ., Ada)

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National Council of Teachers of Mathematics (J. Gates, NCTM, 1201 16th St. NW, Washington, D.C.)

National Geographic Soc. (R. W. Gray, NGS, 16th and M Sts., NW, Washington, D.C.)

National Inst. of Social and Behavioral Science (D. P. Ray, NISBS, 863 Benjamin Franklin Station, Washington, D.C.)

National Science Teachers Assoc. (A. F. Eiss, NSTA, 1201 16th St., NW, Washington, D.C. 20006)

Pharmacological Soc. of Canada (C. W. Nash, Dept. of Pharmacology, Univ. of Alberta, Edmonton)

Sigma Delta Epsilon (S. C. Stevens, VA Hospital, Lincoln, Neb.)

Society for Computer Programs in Biology and Medicine (R. S. Ledley, Natl. Biomedical Research Foundation, 8600 16th St. NW, Silver Spring, Md.)

Society for Economic Botany (Q. Jones, New Crops Research Branch, Plant Industry Station, Beltsville, Md.)

Society for General Systems Research (J. H. Milsum, Dept. of Electrical Engineering, McGill Univ., Montreal)

Society for the History of Technology (J. J. Beer, Dept. of History, Univ. of Delaware, Newark)

Society of the Sigma Xi (T. T. Holme, Sigma Xi, 51 Prospect St., New Haven, Conn. 06511)

Society of Technical Writers and Publishers (G. Marx, Director of Communications, Illinois Inst. of Technology, Research Inst., Chicago)

27-29. **American Philosophical Assoc.**, Boston, Mass. (L. E. Hahn, Dept. of Philosophy, Southern Illinois Univ., Carbondale 62903)

27-30. **American Statistical Assoc.**, Chicago, Ill. (D. C. Riley, ASA, 810 18th St., NW, Washington, D.C. 20006)

28-30. **American Economic Assoc.**, annual, Chicago, Ill. (H. F. Williamson, AEA, 629 Noyes St., Evanston, Ill.)

28-30. **American Geophysical Union**, Seattle, Wash. (W. W. Kellogg, Rand Corporation, 1700 Main St., Santa Monica, Calif.)

28-30. **Linguistic Soc. of America**, New York, N.Y. (A. A. Hill, Post Office Box 8120, University Station, Austin, Tex. 79712)

28-30. **Western Soc. of Naturalists**, Univ. of Washington, Seattle. (I. A. Abbott, Hopkins Marine Station of Stanford Univ., Pacific Grove, Calif.)

30. **Scientific Research Soc. of America**, Cleveland, Ohio. (D. B. Prentice, 51 Prospect St., New Haven 11, Conn.)