SCIENCE

12 January 1962

Vol. 135 No. 3498

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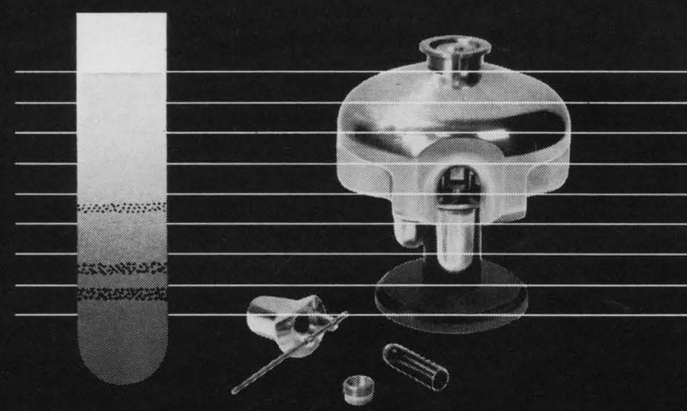

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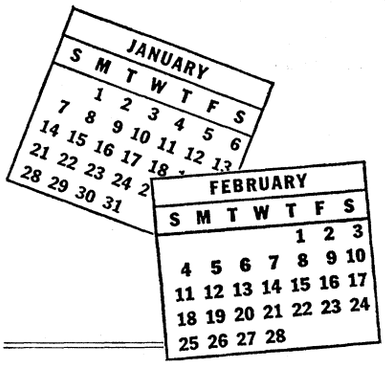

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12 January 1962, Volume 135, Number 3498 **SCIENCE**

Editorial There Ought To Be a Science! 69

Articles Optical Masers in Science and Technology: *G. C. Dacey* 71
Advances in the control of light waves give promise of important applications in science and technology.

Elementary Thinking and the Classification of Behavior: *H. J. Mark* 75
A hierarchy of information-processing abilities parallels development of the brain's reasoning power.

News and Comment Consultants and conflicts. . . . Politics of medical care for the aged. 88

Book Reviews *The American College*, reviewed by *W. C. Fels*; other reviews 93

Reports Anomalous Greying Effect in Mice with Higher Doses of X-rays: *D. B. Galbraith* and *H. B. Chase* 96

Metallic Spherules in Tektites from Isabela, Philippine Islands: *E. C. T. Chao* et al. 97

Unit Responses of the Rabbit Lateral Geniculate Nucleus to Monochromatic Light on the Retina: *R. M. Hill* 98

Licking Behavior of Rats on a Schedule of Food Reinforcement: *A. Weissman* 99

Quantum Efficiency of Cytochrome Oxidation in a Photosynthetic Bacterium: *J. M. Olson* 101

Cerium-144 in Food: *N. Nezu, M. Asano, S. Ouchi* 102

Distribution of Coagulation Proteins in Normal Mouse Plasma: *R. C. Allen, H. Meier, W. G. Hoag* 103

Composition of the Milk from *Zalophus californianus*, the California Sea Lion: *M. E. Q. Pilson* and *A. L. Kelly* 104

Decarboxylase Inhibitors Affect Convulsion Thresholds to Hexafluorodiethyl Ether: *E. B. Truitt, Jr.*, and *E. M. Ebersberger* 105

Evidence for Oceanic Frontogenesis off Oregon: *J. G. Pattullo* and *W. B. McAlister* 106

Uptake of Catecholamines by a Particulate Fraction of the Adrenal Medulla: *N. Kirshner* 107

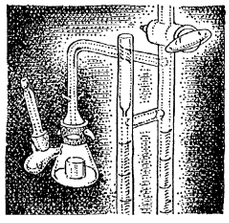
Departments Protozoology; Forthcoming Events 110

New Products 114

Cover Logarithmic spiral of a snail shell. [Victor B. Scheffer, Bellevue, Wash.]

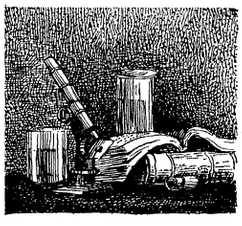
IT HAPPENED THIS MONTH...

a glance at yesterday in relation to today



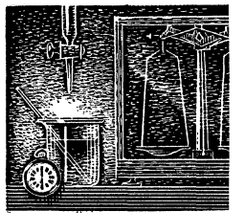
IN JANUARY—(1799)—Mr. Cruickshank makes some observations about sugar and fermentation. His experiments indicate that sugar is composed solely of carbon, hydrogen and oxygen. There is now reason to suppose that only substances composed of these three elements are susceptible to fermentation and that combination with a fourth element renders the process impracticable.[1]

Modern carbohydrate chemists know that the first step in the fermentation of any monosacharride involves combination with "a fourth element" — phosphate. For researchers in this field, Schwarz BioResearch has a variety of sugars and sugar phosphates — many labeled with C^{14}. Phosphorylated sugars are available on special order, labeled with P^{32}. Also available are a number of carbohydrate-metabolism coenzymes, yeast polysacharrides, and yeast cells, labeled with C^{14} or S^{35}.



IN JANUARY—(1913)—*South African Journal of Science*[2] reports a talk by Sir Oliver Lodge, in which he says: "If potentially living matter is ever artificially produced, by placing things in juxtaposition and bringing natural physical resources to bear upon the assemblage — which is all that we can do — then it may become alive. But if this last step is taken, it will be because something beyond matter, and outside the region of physics and chemistry, has stepped in and utilised the material aggregate provided — in the same way, presumably as that in which it now steps in and utilises the material provided, say, in an egg or a seed. That is my belief, and only in that sense do I anticipate that the artificial incarnation of life will ever be possible."

Advances in the fields of protein and nucleic acid biosynthesis make "artificial incarnation of life" seem more probable than in 1913, but meanwhile there are many intermediate problems which challenge the imagination of biological scientists. For investigations of living systems Schwarz BioResearch supplies many useful compounds. Of special significance for studies of cell replication are our C^{14} and H^3 labeled precursors of RNA and DNA — the latest of these are the 5′ nucleotides.



IN JANUARY—(1949)—there is published[3] a partial analysis of the amino acid composition of pure crystalline lysozyme. The analysis, expressed in residues per molecule, shows: tryptophan 5, tyrosine 3, phenylalanine 2, aspartic acid 11, glutamic acid 3, arginine 11, histidine 1, lysine 5. The figures, especially those for histidine and tyrosine, permit the determination of a molecular weight in excellent agreement with that calculated from x-ray diffraction spectra.

For those interested in protein structure, Schwarz can supply a wide range of C^{14}, H^3, and O^{18} labeled, optically standardized, amino acids of high specific activity. As sales representatives of Yeda we can supply an extensive list of polyamino acids and amino acid derivatives.

1. Mr. Cruickshank: Experiments and observations on the nature of sugar. Phil. Mag. *2*:364 (Jan.) 1799. 2. Lodge, O.: Modern tendency of physical science. South African J. Sc. *9*:127 (Jan.) 1913. 3. Fromageot, Cl., and Privat de Garilhe, M.: La composition du lysozyme en acides amines. I. Acides aromatiques, acides dicarboxyliques, et bases hexoniques. Biochim et Biophys. Acta *3*:32 (Jan.) 1949.

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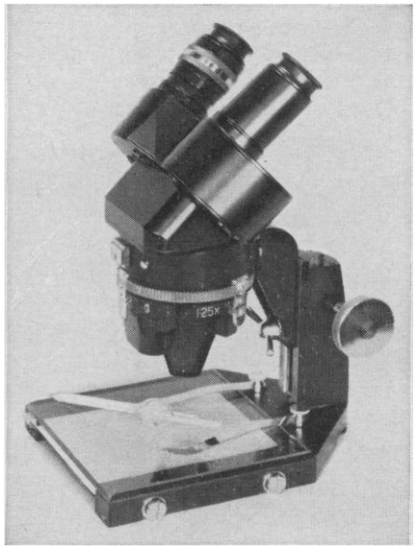

Although in the past few years there has been much design activity related to improvements in the convenience and speed of use of low power binocular microscopes, it seems generally agreed that the superb optical qualities of the conventional Greenough type of instrument have not been surpassed. The optical performance of the Cooke M6000 Stereoscopic Microscope will satisfy the most critical user. Moreover, a very complete selection of ancillary equipment is offered which fits instruments of the M6000 series for special techniques of observation not always possible with instruments available from other makers. Some examples follow:

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Often in routine work specimens must be examined in tanks or immersed in trays. Reflections from the liquid surface can be troublesome and detract from image quality. For such circumstances Cooke supplies a paired objective of 7.5X initial magnification (working distance, 35mm) which can be immersed in water, thus substantially improving observation conditions. The objective is also useful when working distance considerations would prevent use of a standard objective because of depth of water cover.

The camera lucida

Sometimes a drawing, which can be selective as to detail, is preferable to a photomicrograph. Certainly for advanced instructional work the student can learn more by exactly drawing an object than by merely photographing it.

A special adaptor fits our camera lucida to the inclined, large diameter, eyepiece tube of the M6000 binocular body. A hardwood drawing board, tilted at an angle matching the eyepiece tube inclination, is provided.

In the camera lucida the image is seen as apparently superposed and lying in the same plane as a sheet of drawing paper. Thus, the moving drawing pencil is presented to the observer's eye, tracing being accomplished while he looks directly at the object. To those who have never used one, it can be recommended as a most satisfactory and convenient way of working.

Use of low-power bright and dark ground condensing systems

Proper illumination of transparent specimens at low powers can be a problem. In some cases a substage condensing system (similar to that regularly employed on high power compound microscopes) may be helpful; we supply one with a 2″ focal length.

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For best results in the examination of holes — and the plane, highly reflective surfaces encountered in metallurgy — illumination straight down the optical axis is most suitable. Most built-in top lighting systems give, at best, oblique illumination which is less oblique than that obtained by an exterior light arrangement.

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The Cooke-A.E.I. Long Working Distance Objectives, previously mentioned here, cannot be used in some applications. They are sensitive to deviations from standard cover glass thickness and are unsuitable (because of their mirror element) for use with normal incident illumination.

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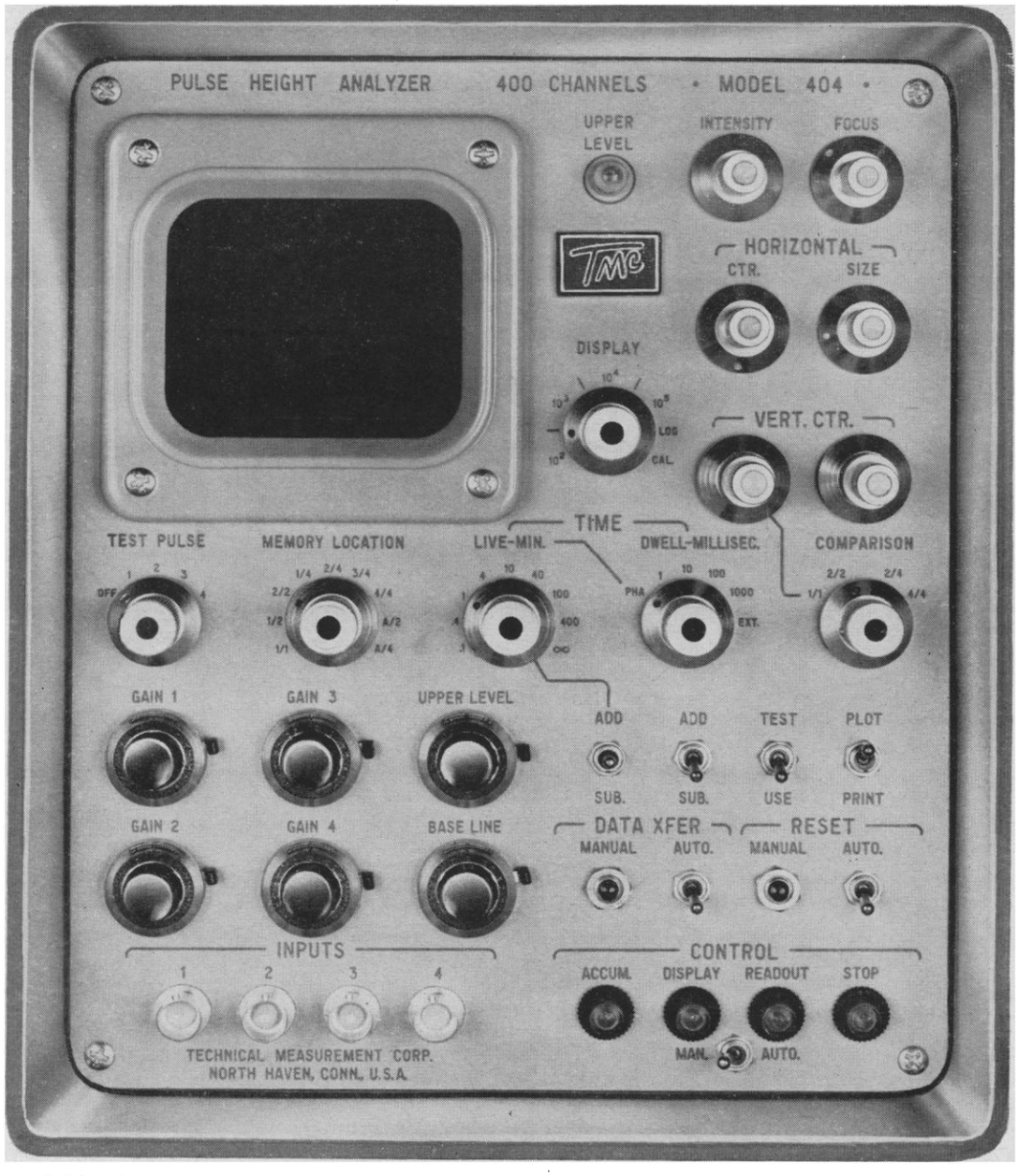

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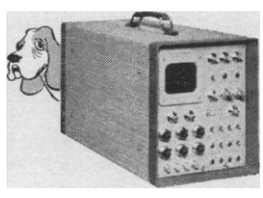

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12 January 1962, Volume 135, Number 3498

SCIENCE

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There Ought To Be a Science!

The call for a "new collaborative science, the science of human survival," which was published two weeks ago in this journal, expressed the views of its six authors, who wrote as individuals and not as representatives of the AAAS. The article was published "to stimulate further discussion." This editorial, which is a contribution to that discussion, expresses the views of one person, who also writes as an individual and not as a representative of the AAAS.

The article "Science and human survival" assures us that it "lies within the power of science . . . to discover social inventions to replace [modern war]." The authors admit, and, in fact, are at pains to stress, the great complexity of the problem of finding an alternative to war as a means of settling disputes among nations. They are not entirely dismayed, however, claiming that the "problem of modern war is of a type that is not wholly new to science." Entirely new the problem is not, but there is also a certain lack of novelty in the proposed approach to a solution.

What is being offered is simply a new variety of the familiar claim that we can solve social problems scientifically, if only. . . . We are in a bad way, the argument runs, and the hour grows late. Science has dealt successfully with things, but it has been applied only in bits and pieces to man. What is needed to bring the pieces together is a big interdisciplinary push. We can succeed, the argument concludes, if only we bring together experts from a wide variety of fields. In this new variety of the claim, the specific problem is modern war, and the experts who will solve the problem, if only they are brought together, include not only workers in the social sciences—anthropologists, psychologists, and economists—but also workers in the natural sciences—physicists and biologists.

Just how the various disciplines are to be brought together has not been made clear in previous calls to action, and the present call is no exception. What is more, by including the natural sciences, the present call has the added burden of showing how these sciences are even relevant to the task of dealing with social problems scientifically.

A few examples of interdisciplinary projects are cited, it is true, but these examples illustrate nothing that bears on the task. Thus, the authors mention the International Geophysical Year, but this effort was feasible not in spite of, but because of, its complexity—a complexity of a rather special sort. What was needed were vast masses of data collected simultaneously all over the earth, data such as the declinations of magnetic needles. What made us want to make such measurements and lent them meaning once made was the presence of comprehensive physical theories, such as electromagnetic theory.

Where, however, are the counterparts to such theories that are to direct the work of the science of survival? There are at hand impressive techniques of measurement, such as the measurement of intelligence in psychology, and some impressive theories, such as the theory of marginal utility in economics. But there exist no theories—comprehensive and commanding the general acceptance so common in the natural sciences—to do for the study of human survival what the theories of physics did for the study of the earth.

This call to action contributes little to science or to survival, and it may do some mischief. These are times when public understanding of the results and methods of science is growing in importance. It does not help such understanding when a document aimed indirectly at the general public implies that it is merely a lack of will and togetherness that prevents us, in the science of man, from moving from the vestibule into the edifice proper.—J.T.

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Meetings

Protozoology

The 1st International Conference on Protozoology was held in the Hotel International, Prague, Czechoslovakia, from 22 to 31 August 1961, in conjunction with the 13th meeting of the Society of Protozoologists, an international organization. The Czechoslovak Academy of Sciences provided strong and effective support, which made the conference possible and played a major role in its outstanding success. In the United States, the National Science Foundation and, to a lesser extent, the National Institutes of Health granted funds to the Society of Protozoologists to help defray the travel expenses of 37 American scientists. This enabled a representative group of young protozoologists, as well as others who were more mature, to attend the conference.

About 200 scientists from 24 countries attended; many brought their wives and children. The largest contingent (56) was from the United States. Other representatives were from Czechoslovakia (40), Poland (26), the U.S.S.R. (18), England (17), East Germany and West Germany (15), France (10), Denmark (8), India (6), Hungary (5), and Egypt (3). There was one representative from each of the following countries: Argentina, Bulgaria, the Congo, Côte d'Ivoir, Japan, the Netherlands, New Zealand, Sweden, Switzerland, and Venezuela.

The chairman of the organizing committee was academician Otto Jirovec (Prague). Cosecretaries were J. Ludvik and J. Weiser, both of Prague. Other members of the committee were E. M. Cheissin (Leningrad), John O. Corliss (Urbana, Ill.), J. Kramář and K. Kučera (Prague), Norman D. Levine (Urbana), J. Lom (Prague), S. Moshkovski (Moscow), G. Poljanski (Leningrad), B. Ryšavý and R. Šrámek-Hušek (Prague), William Trager (New York), and J. Vávra (Prague). Members of the American subcommittee were Trager (chairman), Corliss, Levine, Clay G. Huff (Bethesda, Md.), S. H. Hutner (New York), and Ira Singer (Washington, D.C.).

The official languages of the conference were Czech (or Slovak), English, French, German, and Russian; simultaneous translation of the lectures and papers into these langauges was provided.

In addition to the opening and closing sessions, there were six and a half days of technical sessions. Opening speeches were given by I. Malek (vice-president of the Czechoslovak Academy of Sciences), O. Jirovec, Trager, and E. M. Cheissin. The technical sessions each consisted of one or two invited lectures and a series of short papers. Invited lectures were given on the taxonomy of protozoa (Corliss and Moshkovski); on biochemistry of protozoa (Theodor von Brand, Bethesda, Md.); on cytology of protozoa (I. B. Raikov, Leningrad); on biophysics of protozoa (Poljanski and Hutner); and on ultrastructure of protozoa (Ludvik and P. C. C. Garnham, London).

Movies were shown on several parasitic protozoa of invertebrates (K. G. Grell, Tübingen); on *Sathrophilus muscorum* (J. C. Thompson, Jr., Hollins College); on *Dileptus* as a predator (H. P. Brown, Norman, Okla.); on the growth of Foraminifera (J. J. Lee, New York); on the microsporidian spore (Lom and Vavra); on protozoa of ruminants (R. E. Hungate and R. A. Mah, Davis, Calif.); on the growth of *Toxoplasma gondii* in cell cultures (E. Lund, E. Lycke, and P. Sourander, Gothenburg, Sweden); on interactions between strains of parasitic amebae (R. E. Reeves, New Orleans); and on sexuality and other features of the flagellate parasites of *Cryptocercus* (L. R. Cleveland, Athens, Ga., in absentia). The movies were of unusually high caliber, and many of them were exceptionally striking.

Current work reported in the short papers was concerned with all aspects of protozoology. Of particular interest to biology as a whole were recent findings along biochemical lines and some remarkable discoveries in the electron-microscopy of protozoa.

One evening was devoted to a vigorous discussion of the draft of a unified scheme of classification of the Protozoa, which had been proposed by the Society of Protozoologists' committee on taxonomy and taxonomic problems. Various views were presented and defended at this public session and at subsequent private discussions, and the committee now has the task of synthesizing them.

At the closing session Levine delivered the address of the past president of the Society of Protozoologists, and there were speeches by Weiser, Poljanski, and Z. Kozar (Wroclaw, Poland). A series of resolutions presented by

Recent AAAS Symposium Volumes

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#63. **Congenital Heart Disease.**

1960. 372 pages. 147 illustrations.
Edited by: Allan D. Bass and Gordon K. Moe.
"Should serve as a valuable and concise summation of the more important aspects of congenital heart disease."—*American Journal of Cardiology*, August 1961

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Retail Price: $5.75. *AAAS Member's Cash Price*: $5.00.

#55. **Photoperiodism and Related Phenomena in Plants and Animals.**

1959, 2nd printing 1961. 922 pages. 256 illustrations.
Edited by: Robert B. Withrow.
". . . contains very many excellent papers. There are few biologists who will not peruse it with pleasure and profit."—*Science Progress*, July 1960

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Corliss and P. C. C. Garnham was approved. These included support of the proposal made by Weiser that international depositories be established for type specimens of protozoa, commendation for the efforts of the committee on taxonomy and taxonomic problems, and the suggestion that a second international conference on protozoology be held in 4 years, possibly in London.

In addition to the scientific sessions, there was a sight-seeing trip through Prague and an excursion to the world-famous spas at Karlsbad and Mariánské Lázně.

The transactions of the conference will be published by the Czechoslovak Academy of Sciences in the summer of 1962.

This conference was a milestone in the history of protozoology. Its greatest value lay in the opportunity that it provided for its participants to meet, for the first time, the people whom they had known merely as names on research reports. Each member of the conference was able to meet and discuss mutual problems with as many others as he wished. As a result, the tempo and quality of protozoological research and of interchange of information will increase, and all protozoologists will benefit, whether or not they attended the conference.

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Forthcoming Events

February

1–2. Industrial Management Engineering Conf., Chicago, Ill. (F. A. Judd, Technology Center, Illinois Inst. of Technology, Chicago 18)

1–3. Congress on Hospital Administration, 5th annual, Chicago, Ill. (American College of Hospital Administrators, 840 N. Lake Shore Dr., Chicago)

4–7. American Inst. of Chemical Engineers, natl., Los Angeles, Calif. (American Petroleum Inst., 1271 Avenue of the Americas, New York 20)

5. World Meteorological Organization, Working Group on Networks of the Commission for Synoptic Meteorology, Geneva, Switzerland. (Secretary, WMO, Geneva)

5–6. Gustav Stern Symp. on Perspectives in Virology—III, New York, N.Y. (M. Pollard, Lobund Inst., Univ. of Notre Dame, Notre Dame, Ind.)

5–7. American Acad. of Allergy, annual, Denver, Colo. (Scientific Liaison Office, Natl. Research Council, Sussex Dr., Ottawa, Ont., Canada)

5–9. Electroforming Applications, symp., American Soc. for Testing and Materials, Dallas, Tex. (ASTM, 1916 Race St., Philadelphia 3, Pa.)

6–7. Vertebrate Pest Control Conf., Sacramento, Calif. (M. W. Cummings, Univ. of California, Davis)

6–8. Society of the Plastics Industry, Reinforced Plastics Div., Chicago, Ill. (Scientific Liaison Office, Natl. Research Council, Sussex Drive, Ottawa, Ontario, Canada)

7–9. Military Electronics, Inst. of Radio Engineers, Los Angeles, Calif. (M. E. Brady, Space Technology Laboratories, P.O. Box 95001, Los Angeles)

7–10. American College of Radiology, annual, New York, N.Y. (ACR, 20 N. Wacker Dr., Chicago 6, Ill.)

8. Problems in Food Processing, Assoc. of Vitamin Chemists, Chicago, Ill. (H. S. Perdue, Abbott Laboratories, North Chicago, Ill.)

8. Tissue Homotransplantation, 5th biennial conf., New York, N.Y. (W. Dameshek, New England Center Hospital, 171 Harrison Ave., Boston 11, Mass.)

9–11. National Open Hearth and Blast Furnace Conf., American Inst. of Mining, Metallurgical, and Petroleum Engineers, Detroit, Mich. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 17)

12–16. Management of Science Information Centers, Inst. on Information Storage and Retrieval, 4th, Washington, D.C. (L. H. Hattery, Center for Technology and Administration, American Univ., 1901 F St., NW, Washington 6)

12–23. Latin American Seminar on Irrigation, 2nd, Panama City, Panama. (J. Melendez, Jefe, Depto. de Ingenieria, Ministerio de Agricultura, Comercio e Industrias, Panama City)

13–14. Sanitary Engineering, 4th conf., Urbana, Ill. (B. B. Ewing, Dept. of Sanitary Engineering, Univ. of Illinois, Urbana)

14–16. Biophysical Soc., 6th annual, Washington, D.C. (D. Cowie, Dept. of Terrestrial Magnetism, Carnegie Institution of Washington, 5241 Broad Branch Rd., NW, Washington 15)

14–16. Solid State Circuits, intern. conf., Philadelphia, Pa. (L. Winner, 152 W. 42 St., New York 36)

14–17. National Soc. of College Teachers of Education, Chicago, Ill. (E. J. Clark, Indiana State College, Terre Haute)

16–18. Medical Congr. in Honor of the Centennial of Bretonneau, Tours, France. (Directeur, École Nationale de Médecine, Tours)

17–24. Pan American Medical Women's Alliance, 8th congr., Manizales, Colombia. (C. Carthers, 1661 Riverside Ave., Suite B, Jacksonville, Fla.)

18–22. American Inst. of Mining, Metallurgical, and Petroleum Engineers, annual, New York, N.Y. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 17)

18–22. Technical Assoc. of the Pulp and Paper Industry, annual, New York, N.Y. (TAPPI, 360 Lexington Ave., New York 17)

19–21. American Educational Research Assoc., Atlantic City, N.J. (G. T. Buswell, 1201 16 St., NW, Washington 6)

(See 22 December issue for comprehensive list)