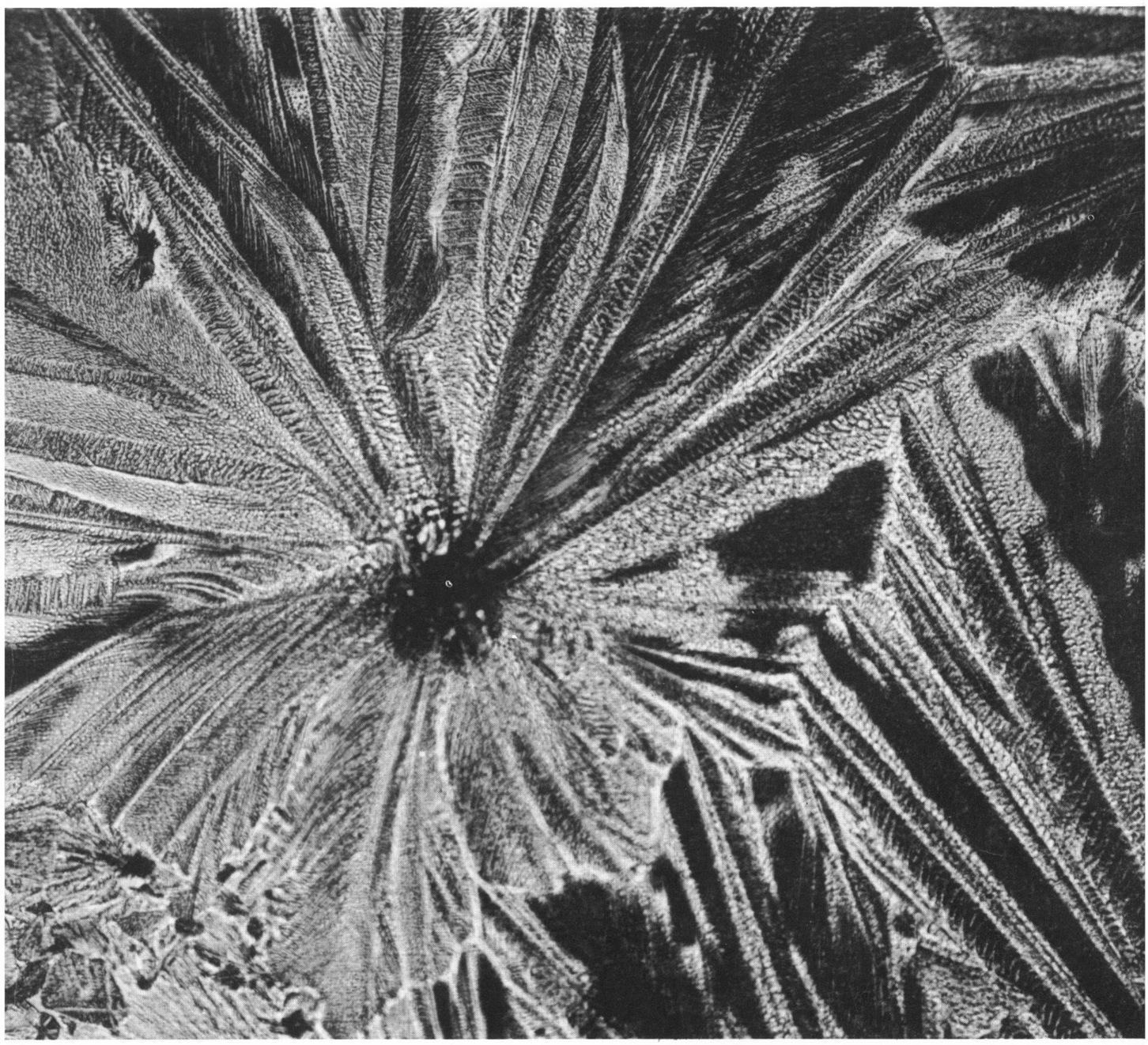
SCIENCE

17 February 1961

Vol. 133, No. 3451

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Proceedings Issue

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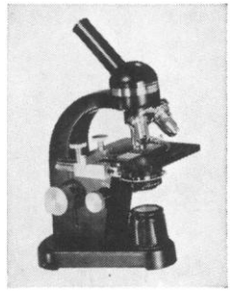

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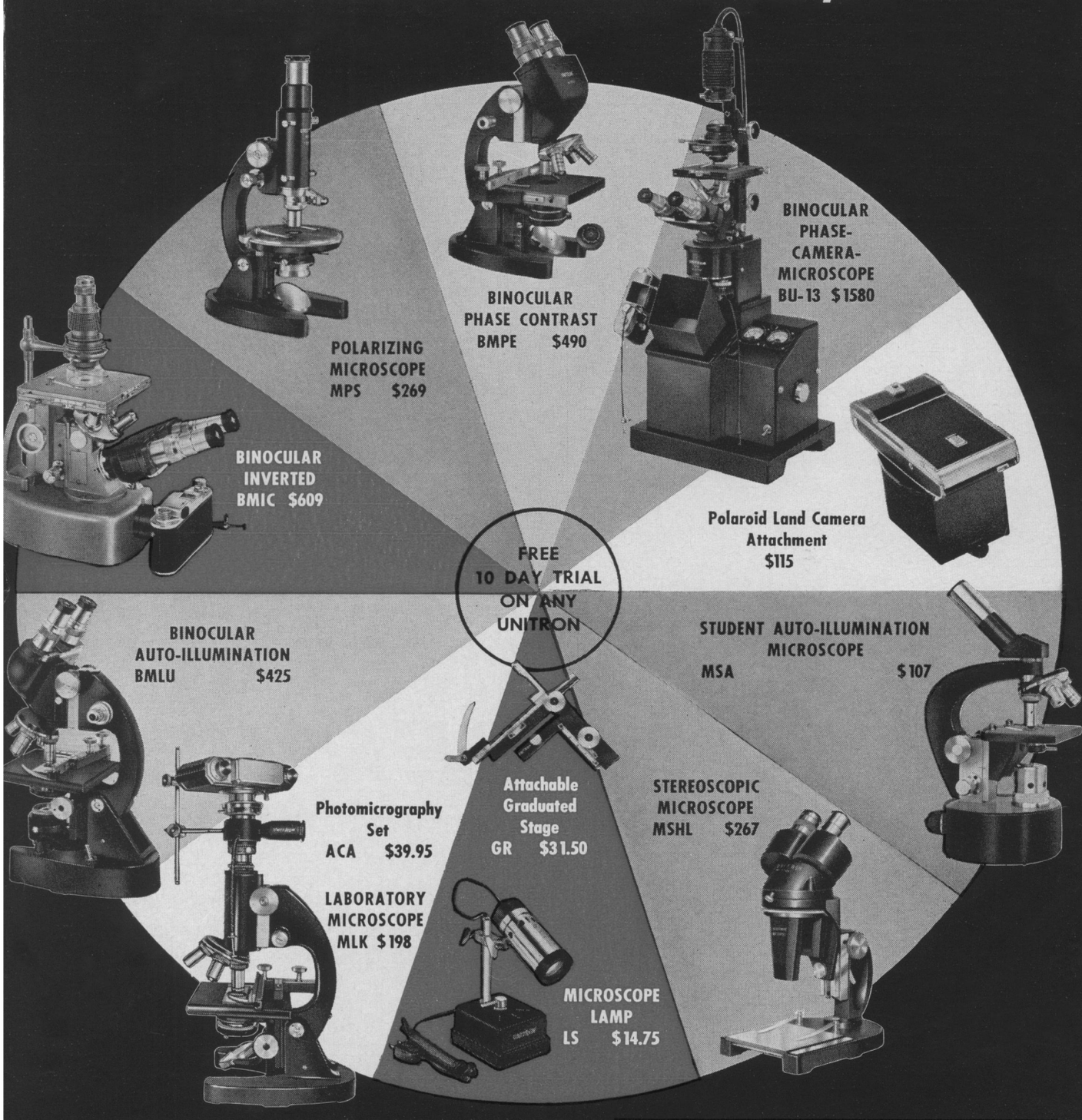

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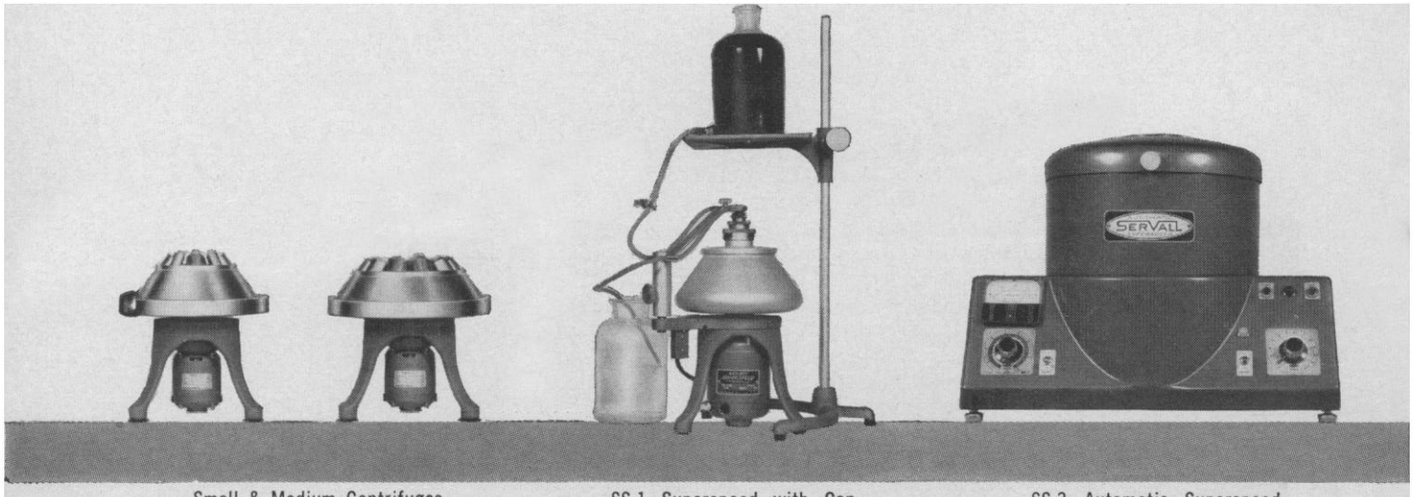

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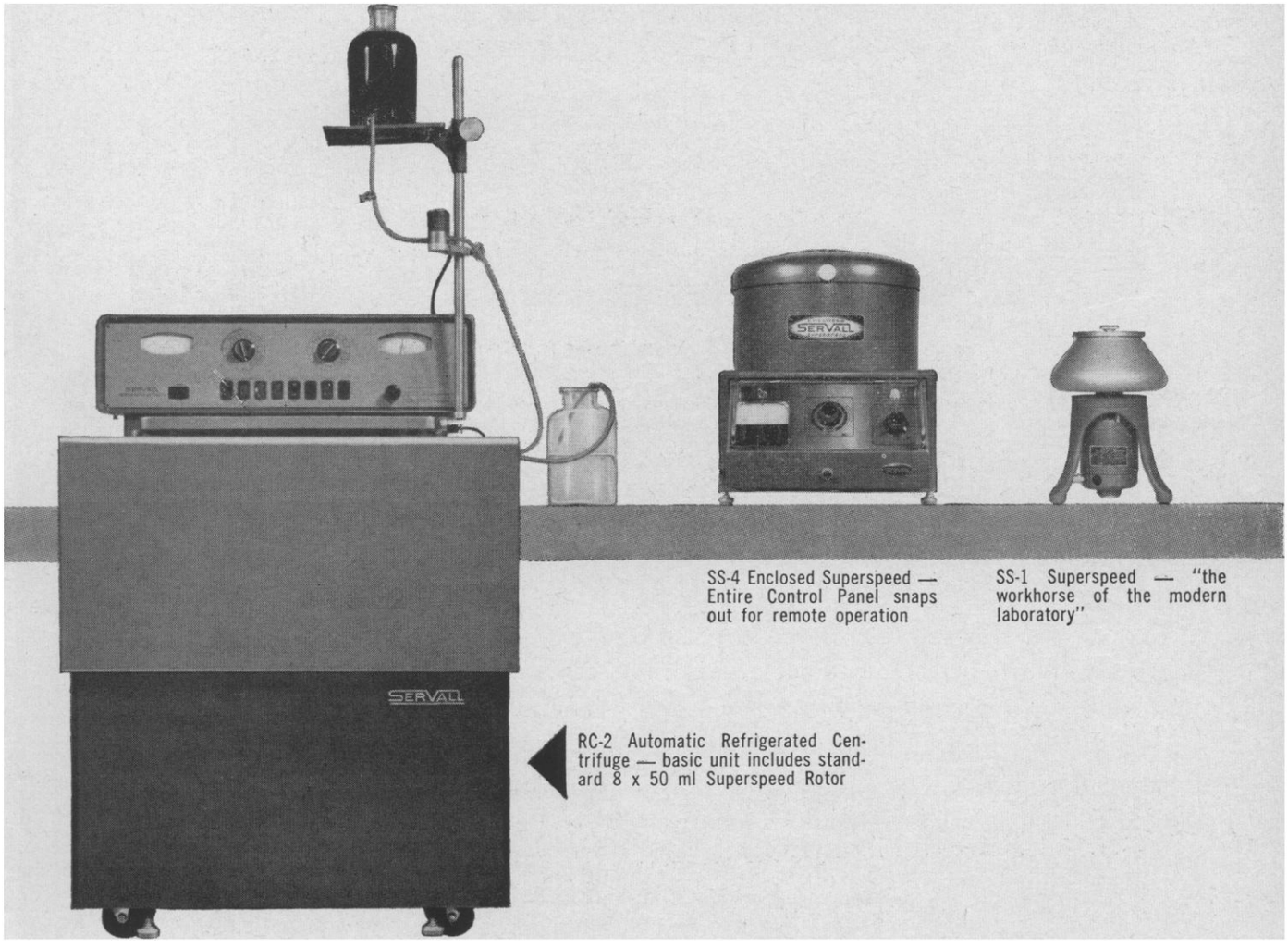

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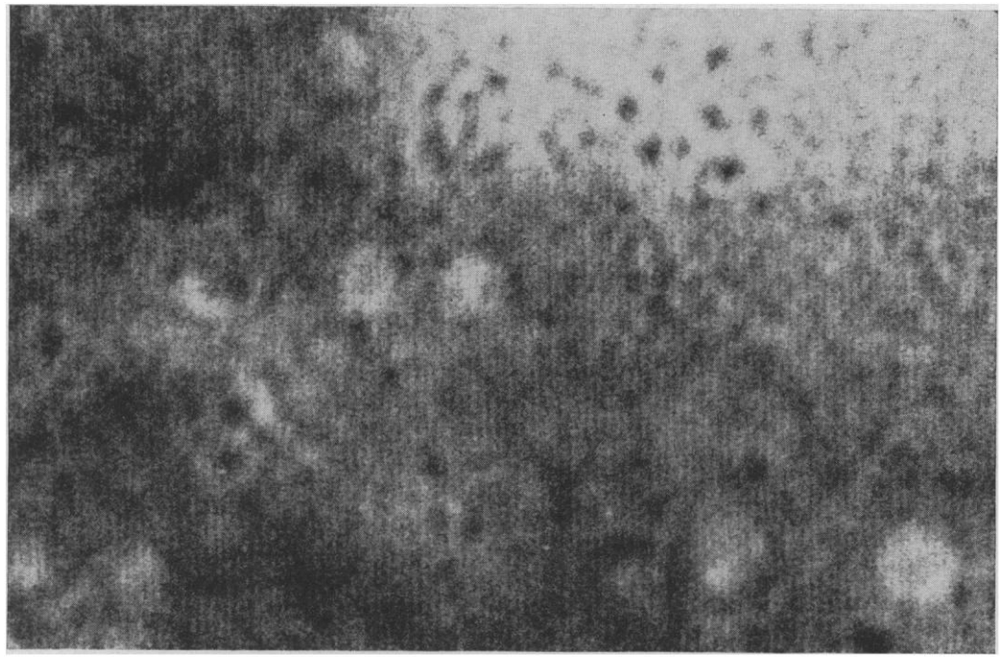

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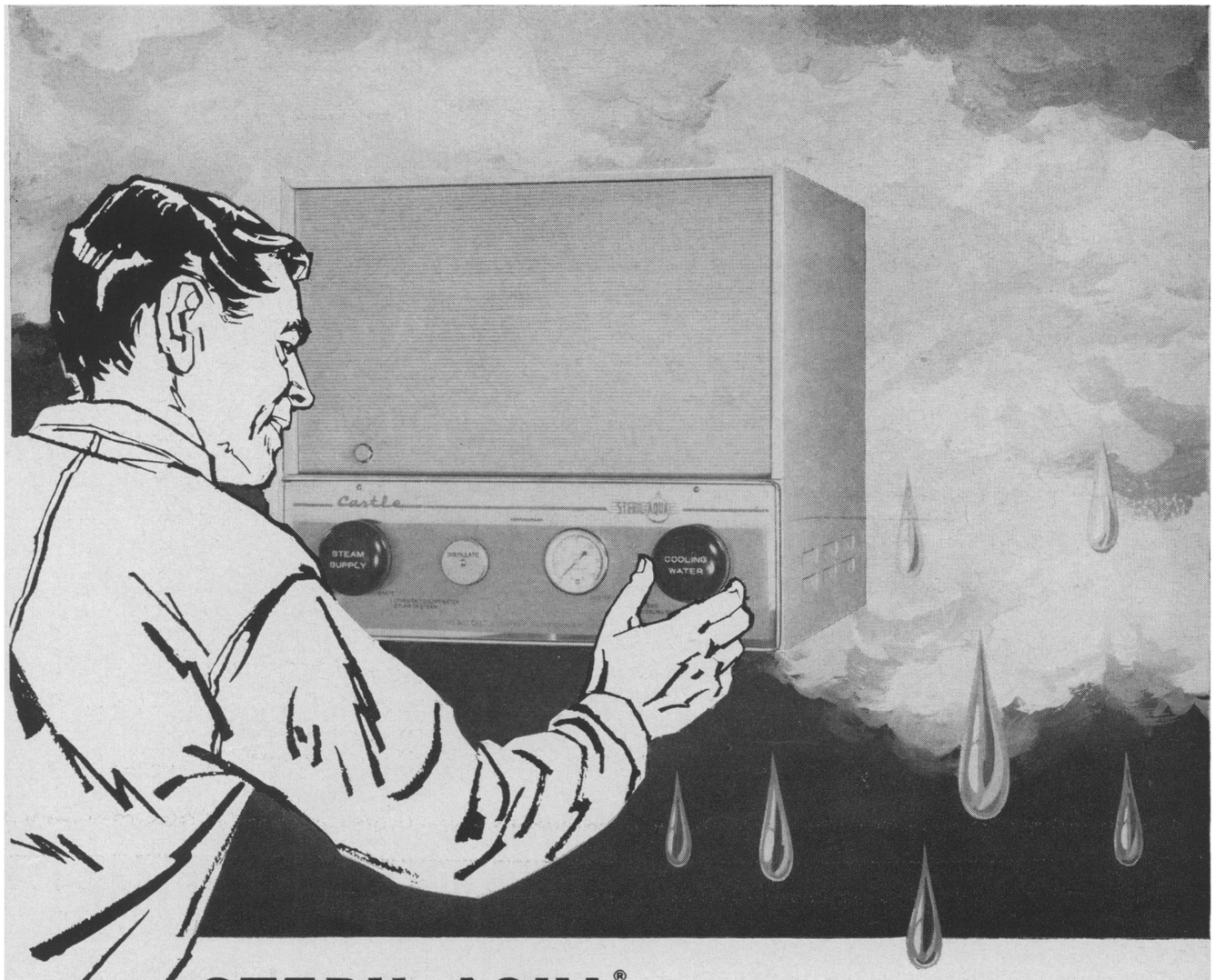

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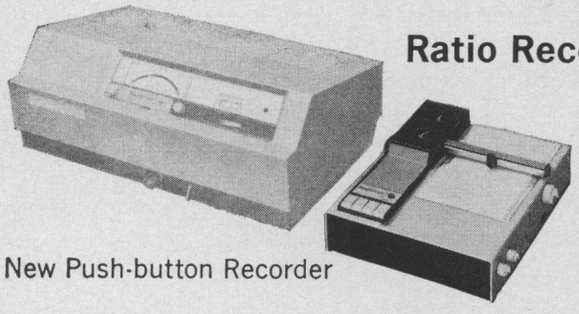

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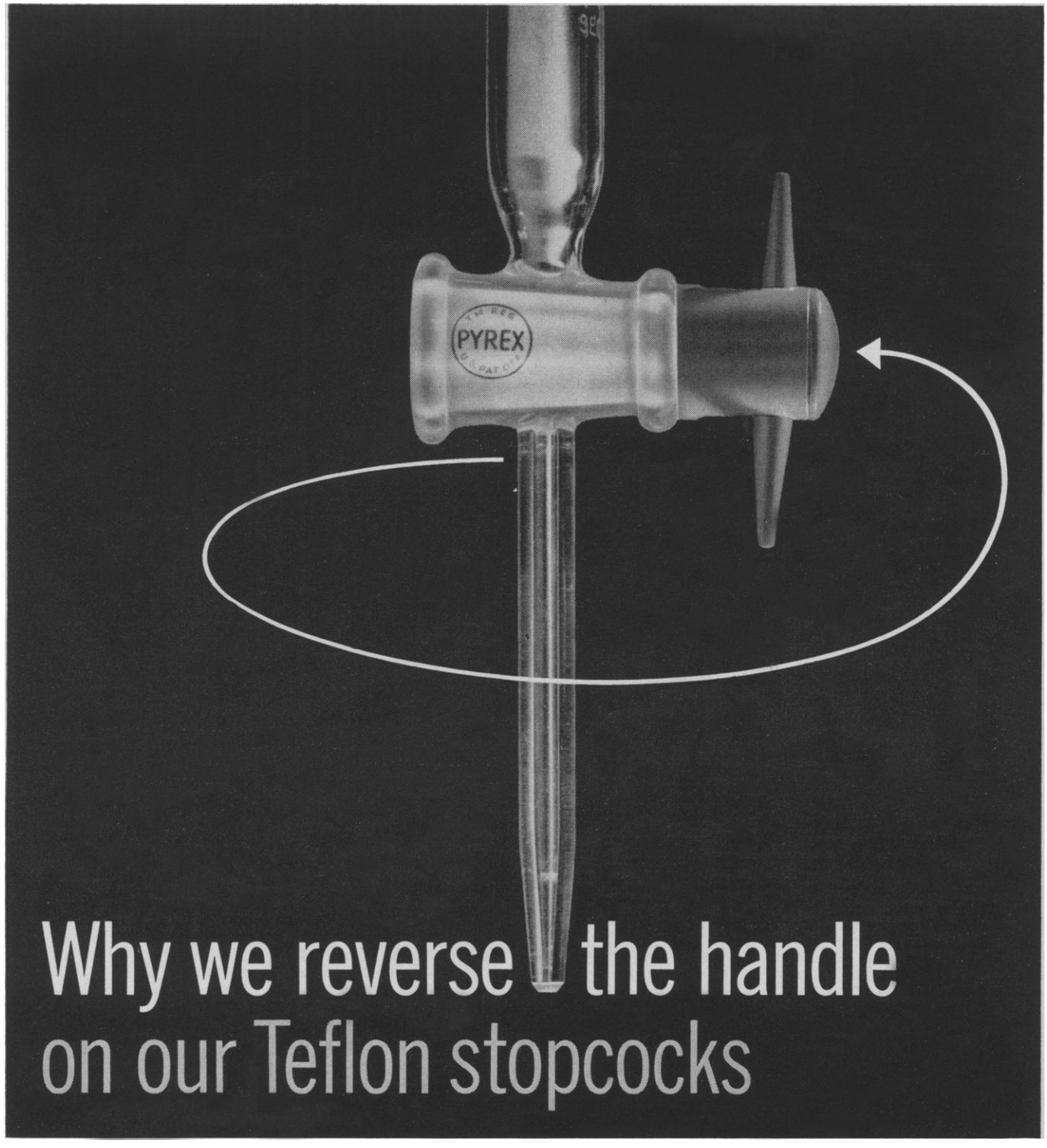

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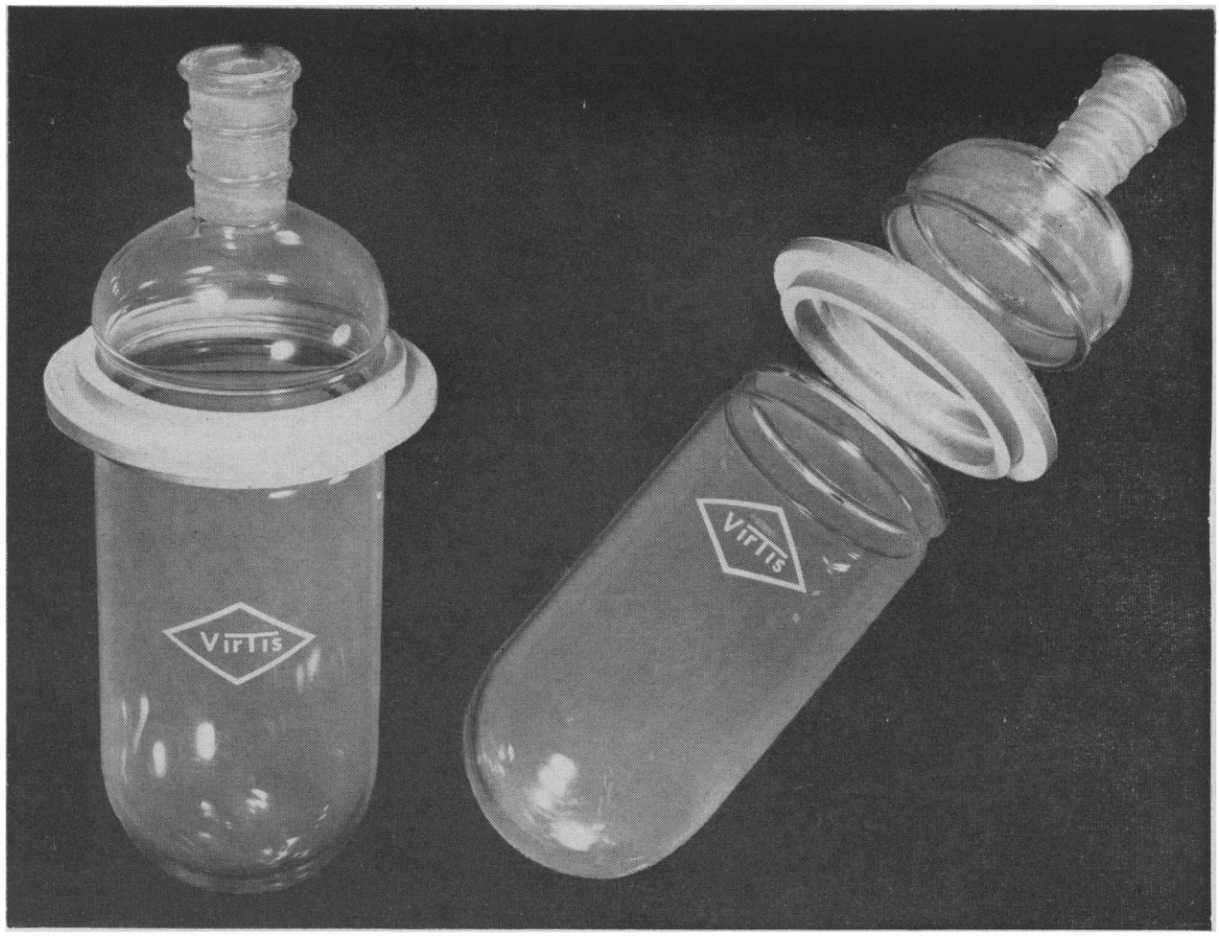

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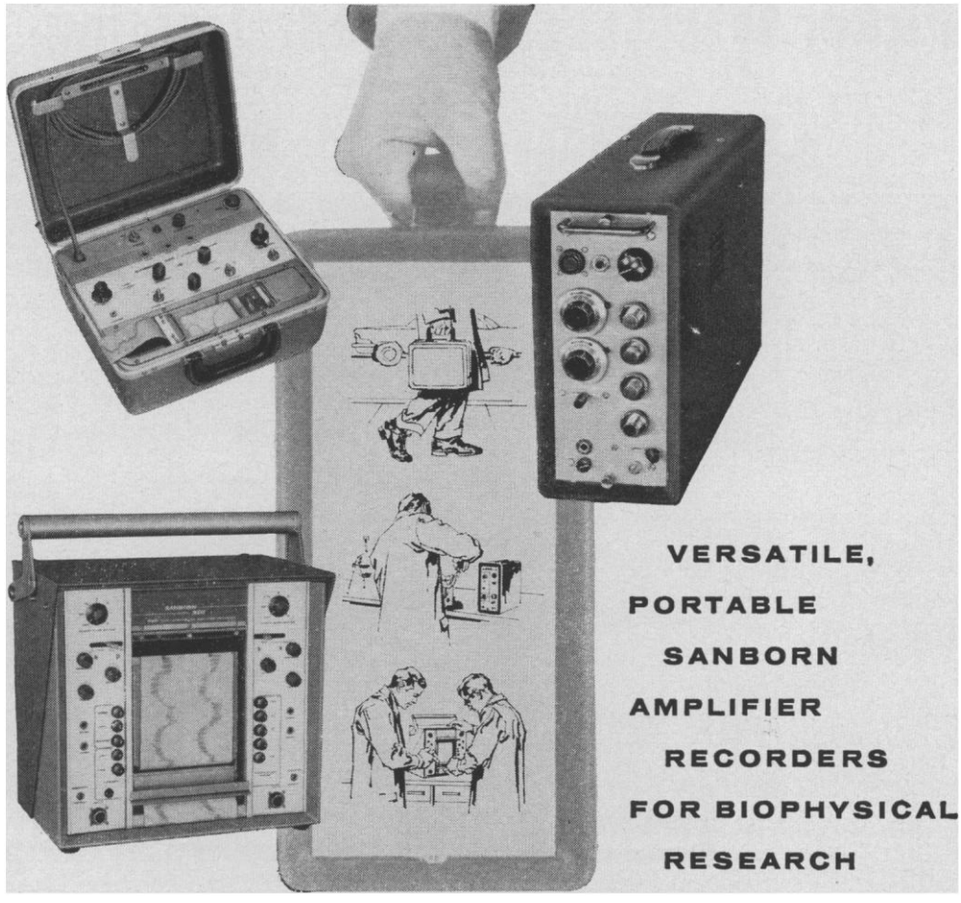

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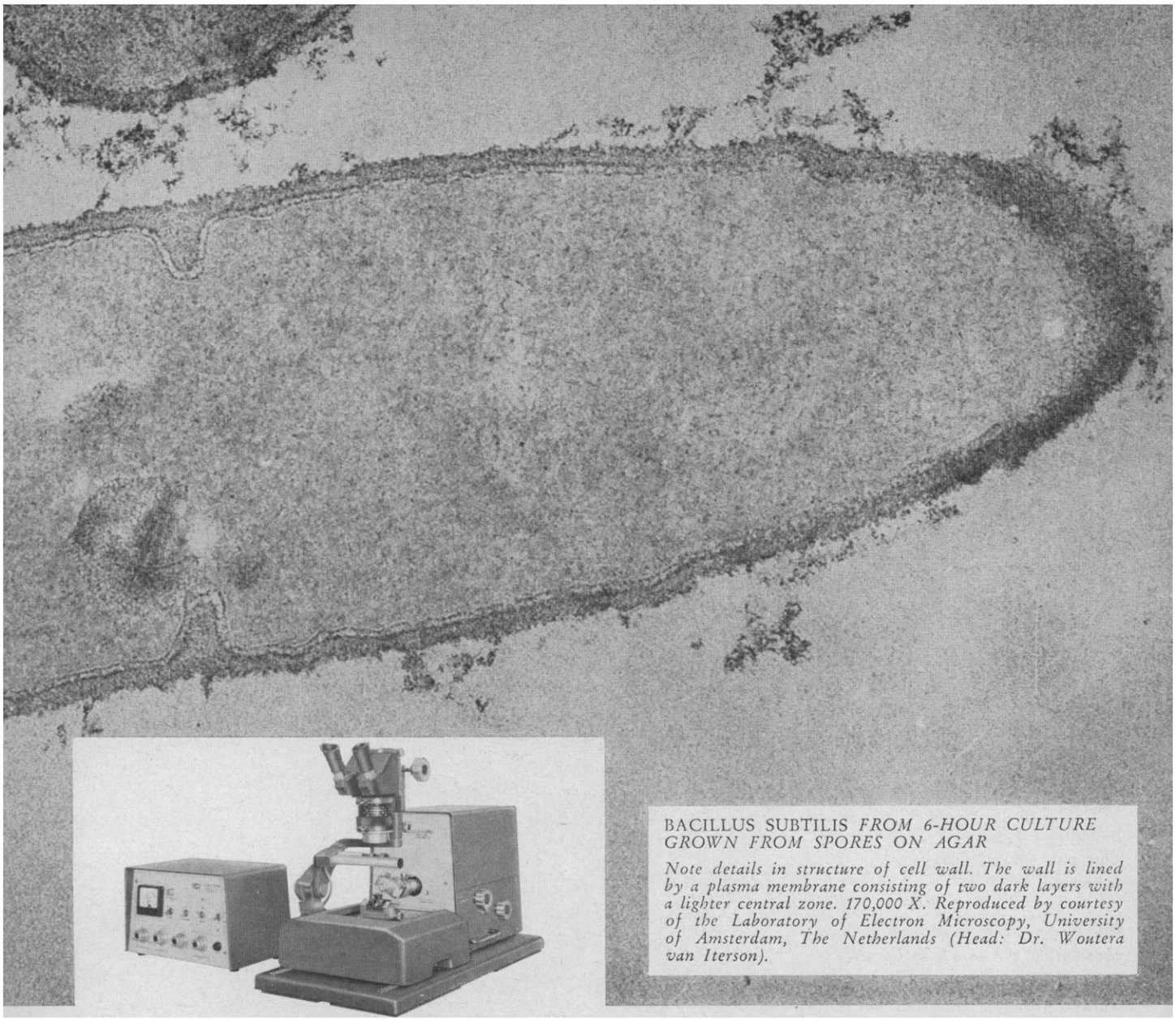

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Note details in structure of cell wall. The wall is lined by a plasma membrane consisting of two dark layers with a lighter central zone. 170,000 X. Reproduced by courtesy of the Laboratory of Electron Microscopy, University of Amsterdam, The Netherlands (Head: Dr. Woutera van Iterson).

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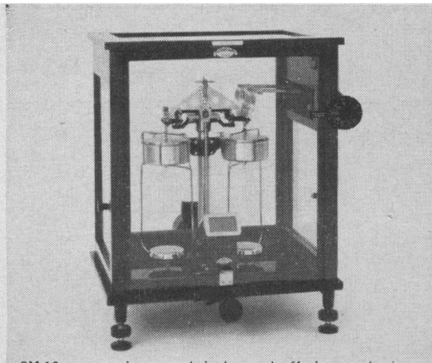

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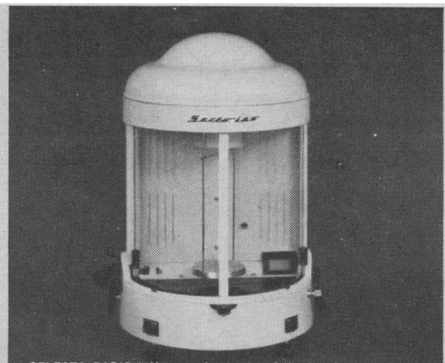

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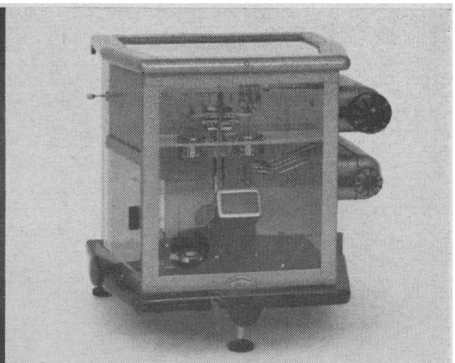

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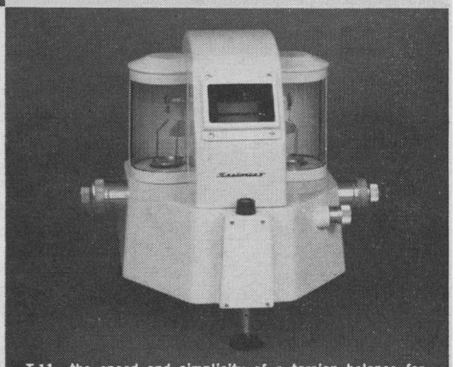

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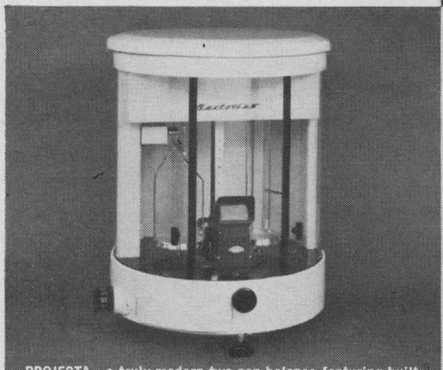

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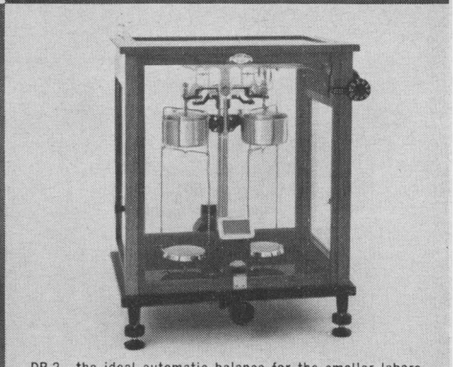

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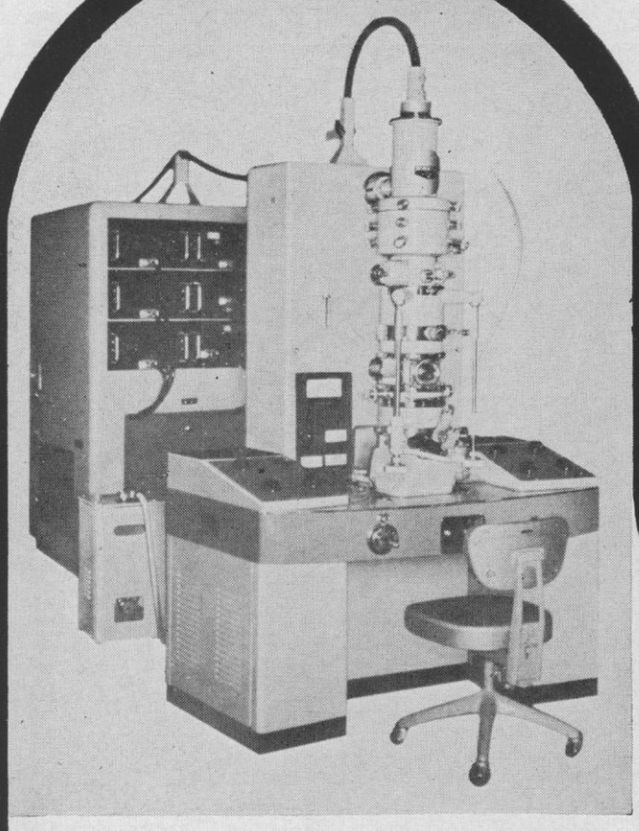
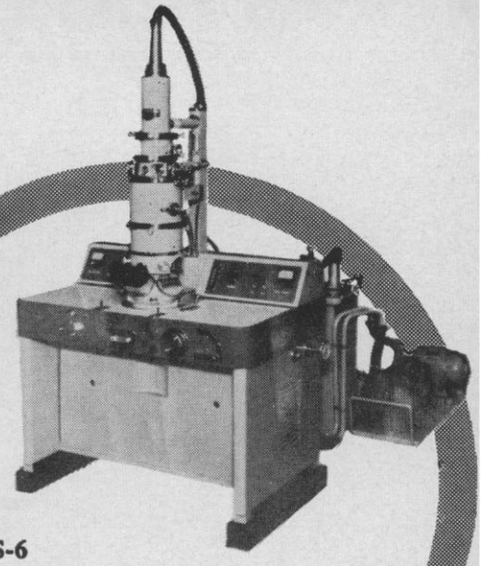


HU-11



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Suitable for medical purposes
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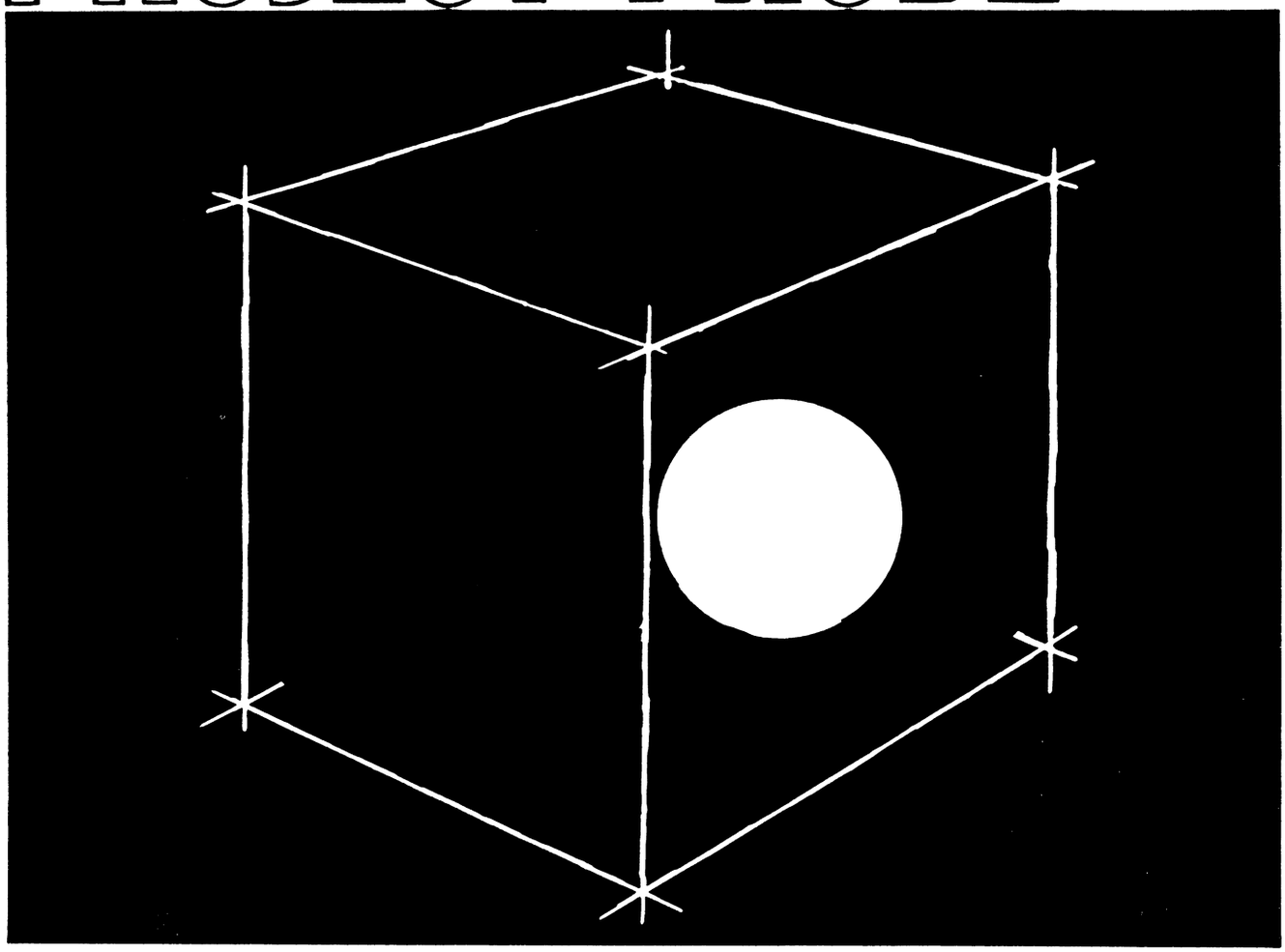

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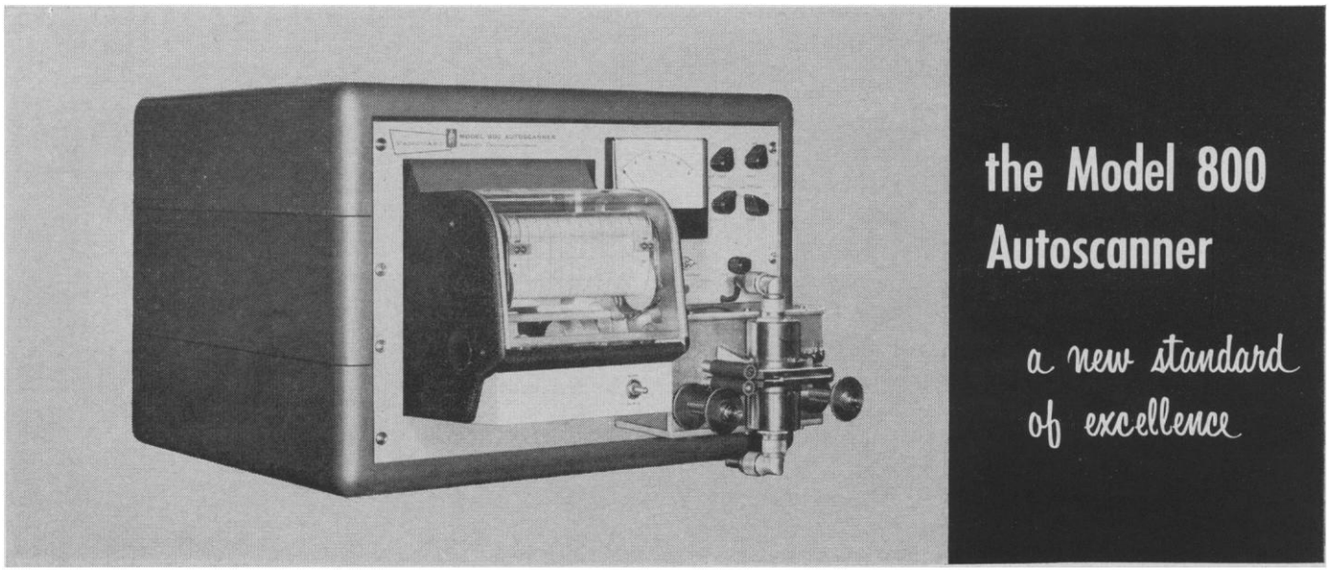

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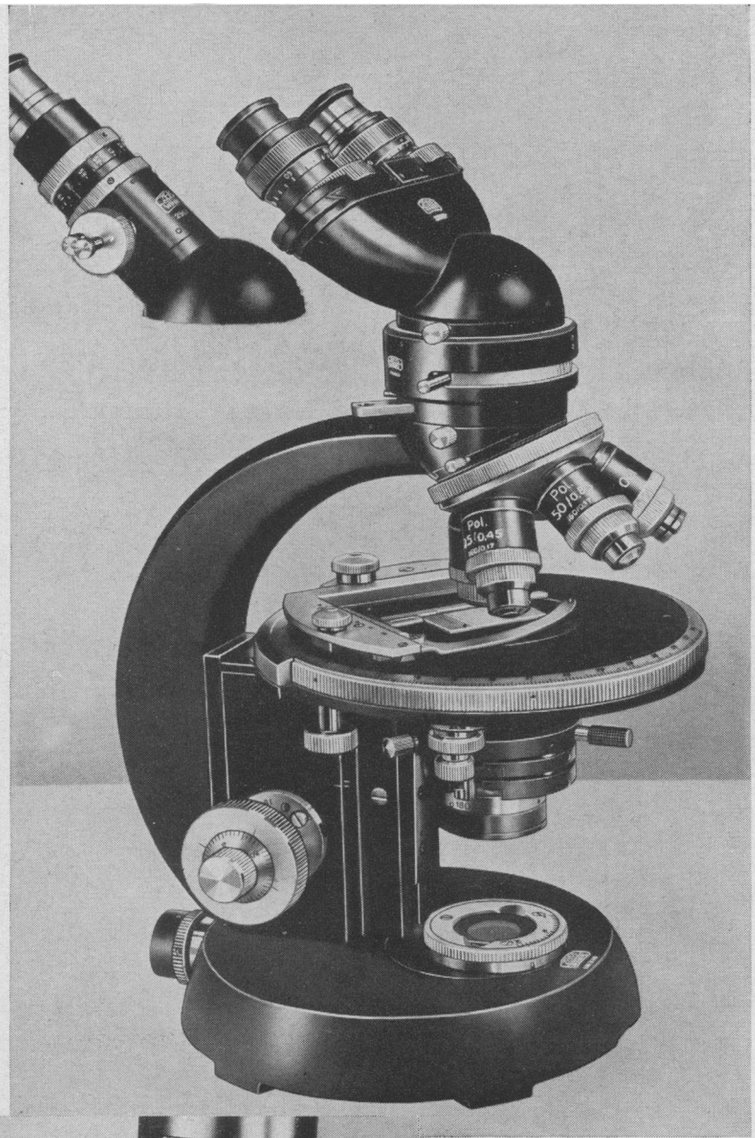

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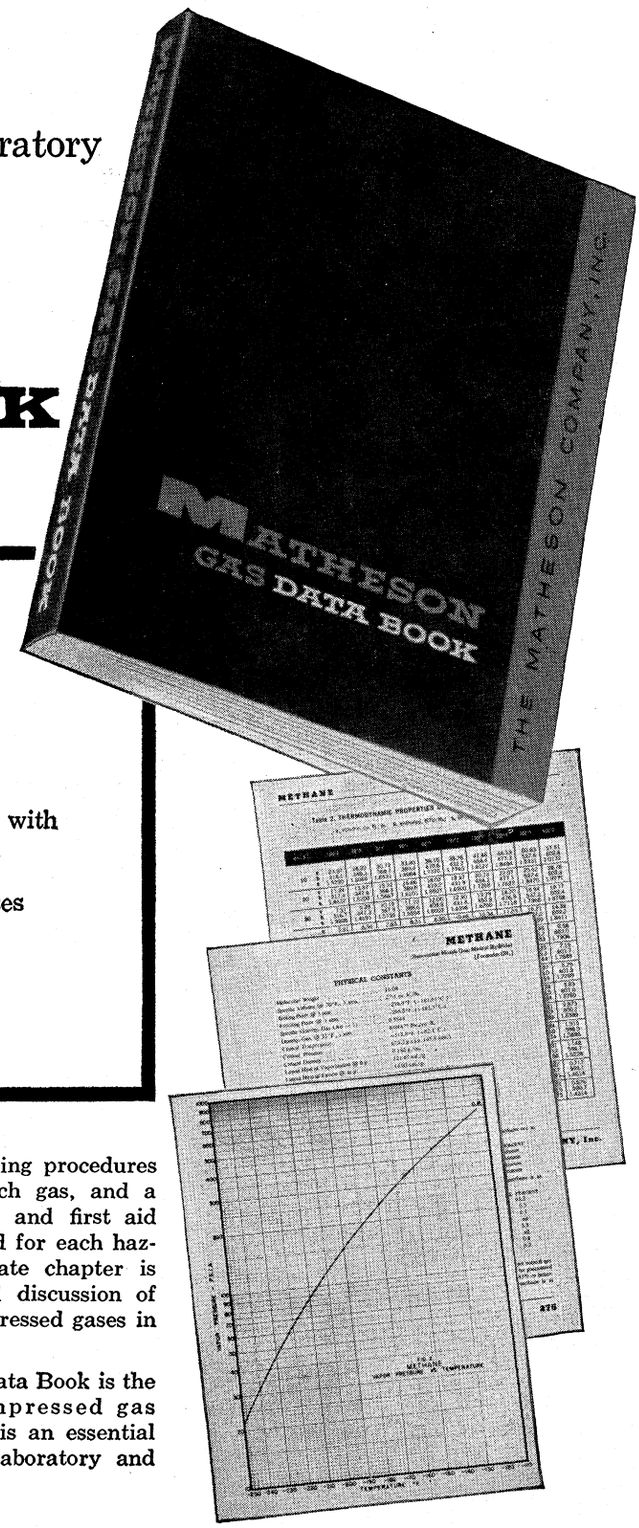

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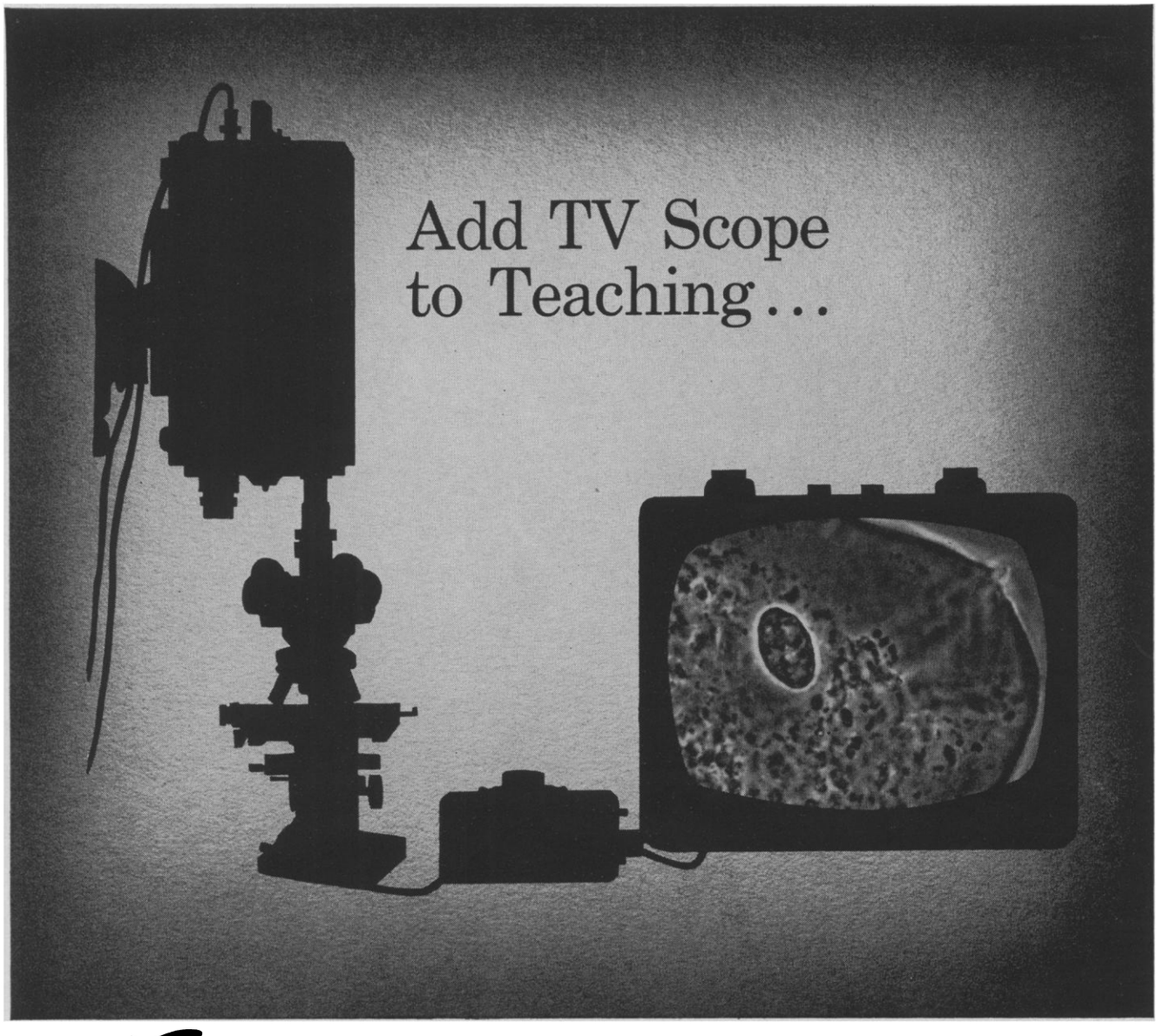

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(1.) Beerthuis, R. K., and Recourt, J. H., *Nature*, 186, 372-374 (1960).
(2.) *Martin, A. J., Euston, C. B., and Martinez, F. W., Jr., "The Design and Evaluation of a Linear Programmed Temperature Gas Chromatograph Featuring a Hydrogen Flame Ionization Detector," presented at the Detroit Anachem Conference, October 1960.
(3.) VandenHeuvel, W. J. A., and Horning, E. C., *Biochem. Biophys. Research Commun.*, 3, 356-360 (1960).

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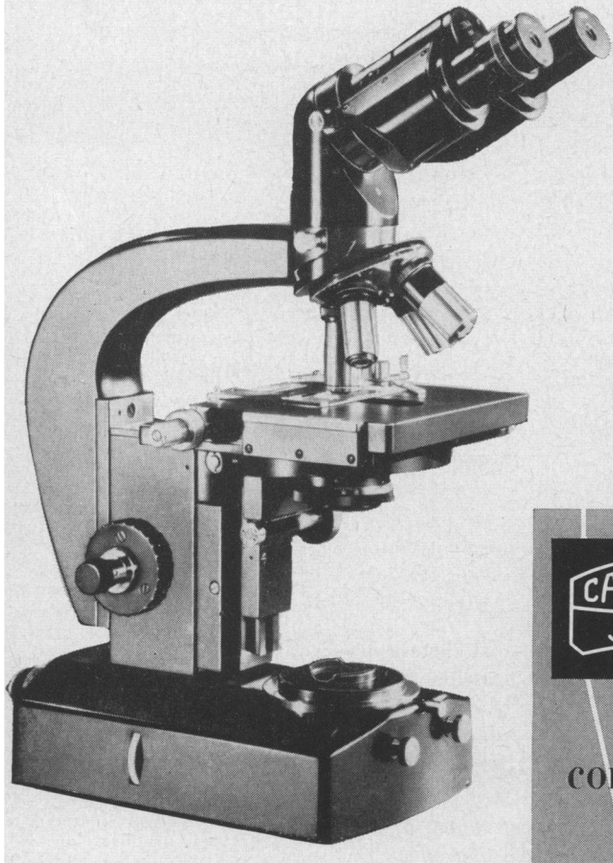

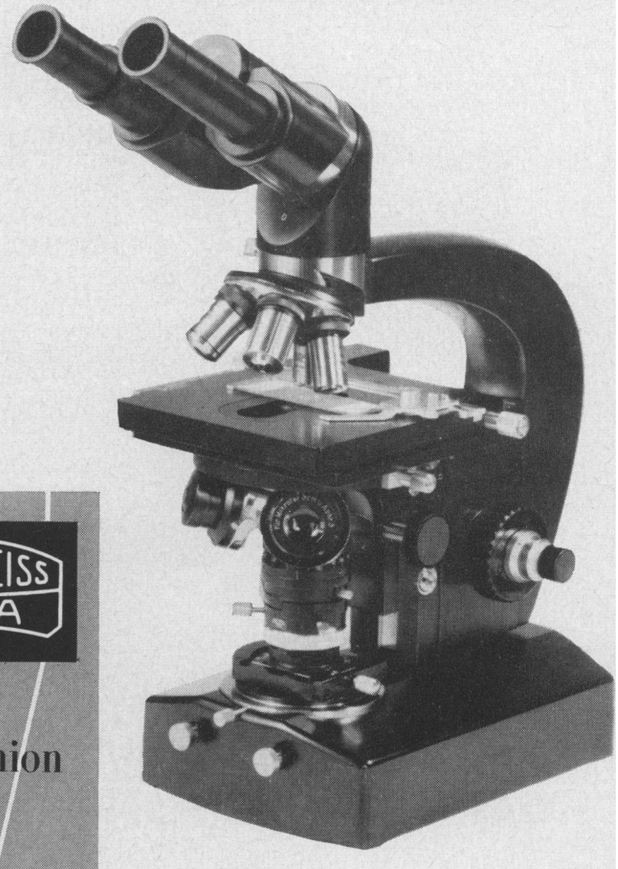

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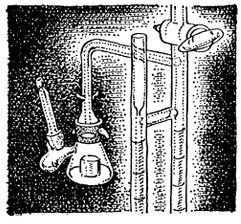
a glance at yesterday in relation to today



IN FEBRUARY—(1914)—investigation of the chemical structure of nucleic acids continues. Two years ago, Walter Jones (Johns Hopkins) reported the formation of guanylic acid from the hydrolytic action of pig pancreas on yeast nucleic acid, but this experiment "can be repeated with only occasional success. . . ." By substituting Lebedew's commercial yeast for pig pancreas, Jones and Richards have now developed a procedure "which involves no judgment on the part of the experimentor." Since by this new method, guanylic acid is invariably obtained as an end product, it is definitely a constituent of yeast nucleic acid.[1]

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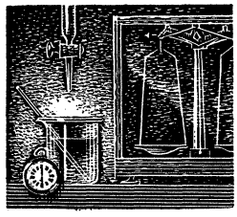

IN FEBRUARY—(1934)—a famous physical chemist writes about the effects of heavy water upon tobacco seeds, yeasts, molds, flatworms and mice.[2] G. N. Lewis finds that heavy water is tolerated in high concentrations by the lower organisms, but the rate of vital processes appears to vary inversely with the percentage of H^2. This is not surprising, since substitution of H^2 for H^1 reduces the rate of *all* physico-chemical processes.

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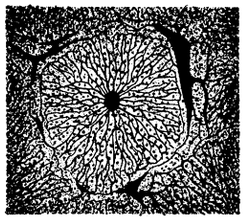

IN FEBRUARY—(1950)—Sanadi and Greenberg[3] report on the metabolism of tyrosine and phenylalanine in experimental diabetes. These had previously been considered ketogenic substances since they increase ketonuria in phlorhizinized animals and produce acetoacetate when incubated with liver slices. However, when the authors administered C^{14}-labelled phenylalanine and tyrosine to phlorhizinized rats, both the urinary glucose and ketone bodies were found to contain radioactivity. Therefore, the two amino acids should be considered *glycogenic* as well as *ketogenic.*

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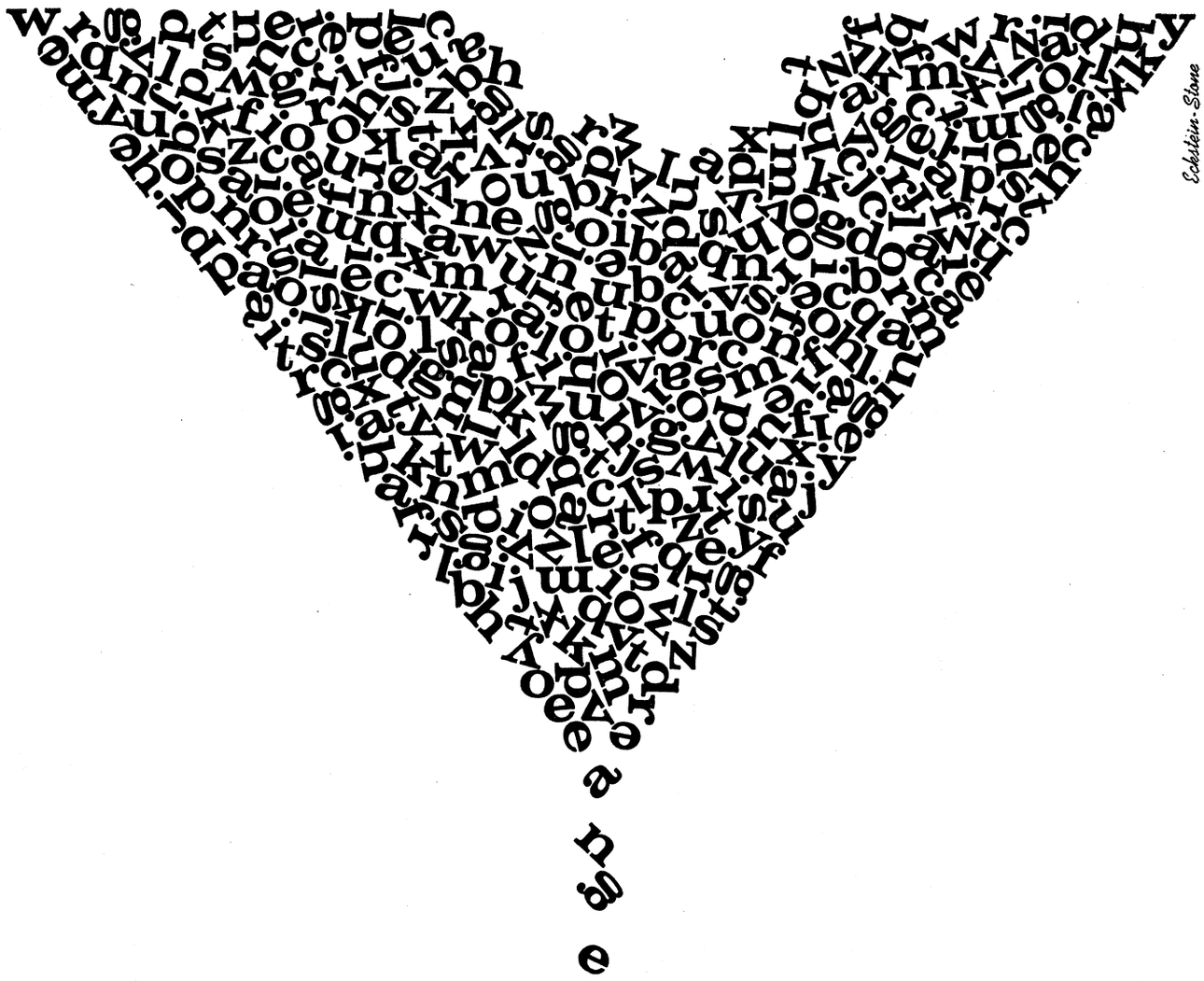

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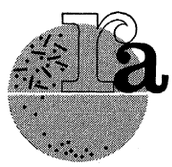

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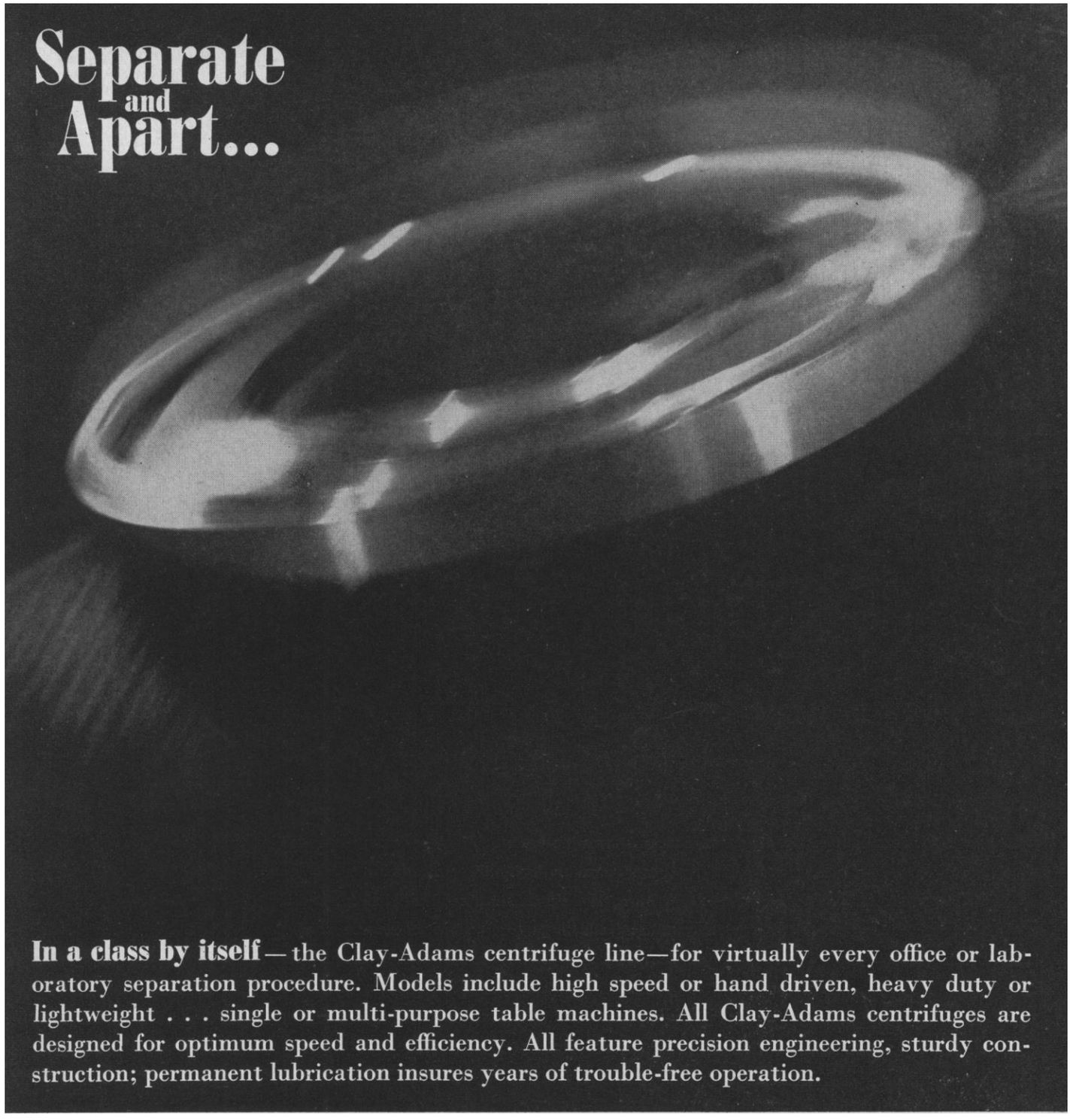

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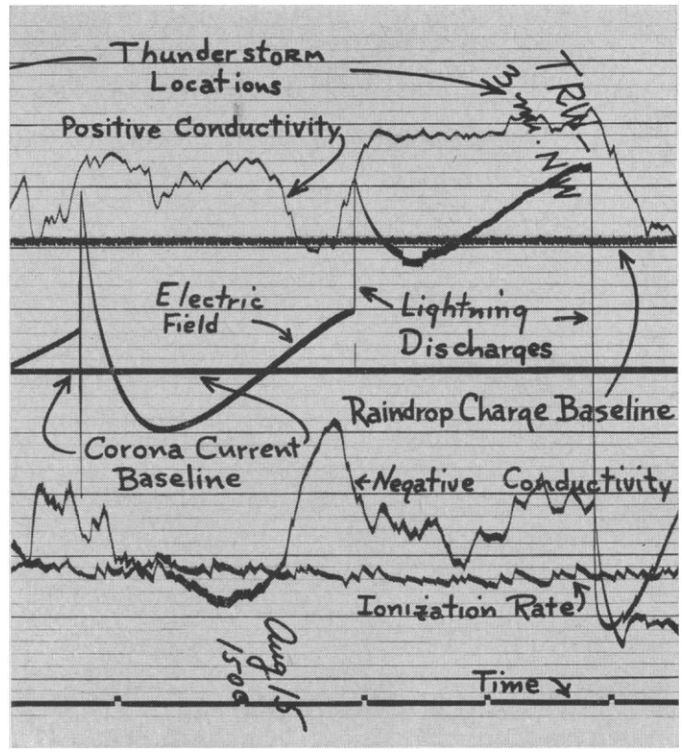

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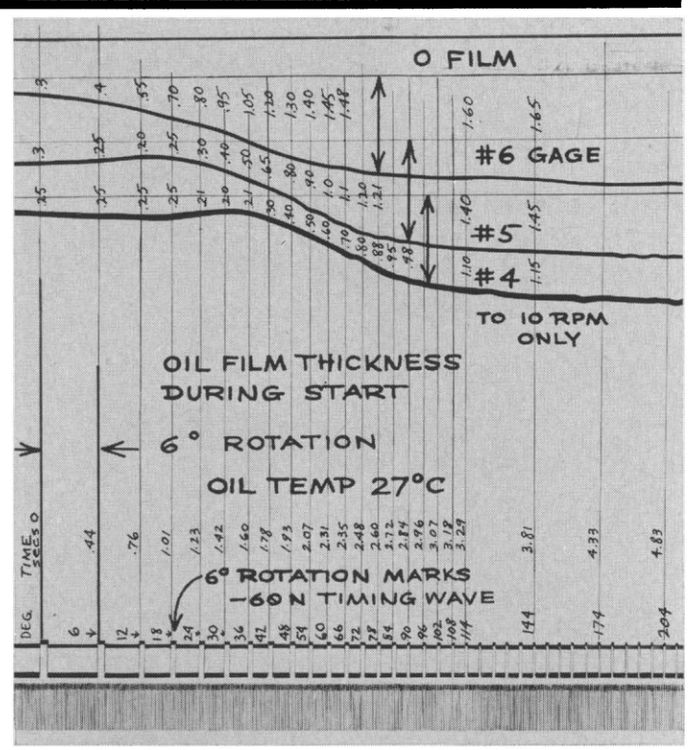

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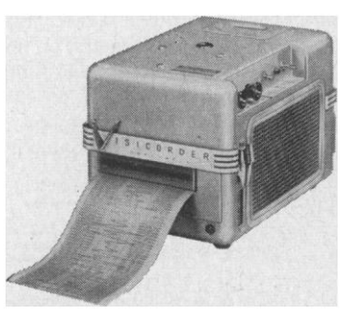

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A Question of Degrees

The degree of doctor of philosophy was awarded for the first time in this country by Yale University 100 years ago tomorrow. It was modeled after the German Ph.D. and was designed to be the highest earned academic degree and to certify mastery of a subject-matter field and the performance of original research.

The degree is now well established, and it is one of the best known of the 1600 different degrees currently awarded. But this was not always so: in its early days the high prestige of the degree led some universities and colleges to begin awarding it as an honorary degree, a practice that blurred its significance as an earned degree with a research requirement. The number of honorary Ph.D.'s steadily increased and reached a peak of 50 in 1889. Even by 1881 the abuse had become so flagrant that the American Philological Association passed a resolution, concurred in by the AAAS, which deprecated "the removal of this degree from the class to which it belongs . . . and its transfer to the class of honorary degrees." By 1896 the organization of graduate schools (Federation of Graduate Clubs) resolved that "the degrees of Ph.D., Sc.D., M.D. and Pd.D. should never be given *honoris causa* or in absentia." Despite this caveat and others, the number of honorary Ph.D.'s showed no rapid decline; there were 23 in 1900, 35 in 1901, and 20 in 1907.

The battle to maintain the integrity of the degree was won—or nearly won—as a consequence of the academic outcry that arose when Gonzaga University conferred an honorary Ph.D. on Harry L. (Bing) Crosby in 1937. Few institutions have had the temerity to award one since.

The number of earned doctorates (and from 1920 on this includes the degree of Doctor of Education) has shown a continuous increase. About 177,000 were awarded between 1861 and 1960. In 1920, the number was 615; in 1930, 2299; in 1940, 3290; in 1950, 6633; and in 1960, more than 10,000 (the compilation of figures is not yet complete).

So much for statistics; but what do you call a Ph.D. to his face, Mister or Doctor? Everyone knows that a surgeon is called "Mister" in England, but that physicians are called "Doctor" both socially and professionally in the U.S. The British novelist Pamela Hansford Johnson, in an article entitled "It's Easy to Get Americans All Wrong," in the *New York Times Book Review* on 1 January, confesses her bafflement about academic titles. "In America, the usage seems to vary from campus to campus. On some, 'Professor X' or 'Doctor' gives way to the over-all 'Mister'. On others, the title is used, and is expected to be used. How shall a foreigner . . . get these things right?" The confusion is not confined to foreigners. In some universities the administrators call all Ph.D.'s "Mister," but students and colleagues call them "Doctor." Often, but not always, Ph.D.'s are "Misters" socially. In industry and government, both socially and professionally, they are "Doctors," as they are also in the pages of the *New Yorker, Time,* the *Saturday Review,* and the New York *Times.* The Washington *Post* reserves the title for those in the health fields, but occasionally slips up on Dr. Wernher von Braun and Dr. George Gallup.

We hope this brief essay will add nothing to the confusion of either natives or foreigners. Doubtless during the next century the number of Ph.D.'s will continue to increase, and some stabilization in the form of address will occur.—G.DuS.

[The information given above was derived largely from *Academic Degrees,* by W. C. Eells and H. A. Haswell (U.S. Government Printing Office, 1960), and *American Universities and Colleges,* Mary Irwin, Ed. (American Council on Education, ed. 8, 1960). The figures for 1960 were supplied by L. R. Harmon of the National Academy of Sciences–National Research Council.]

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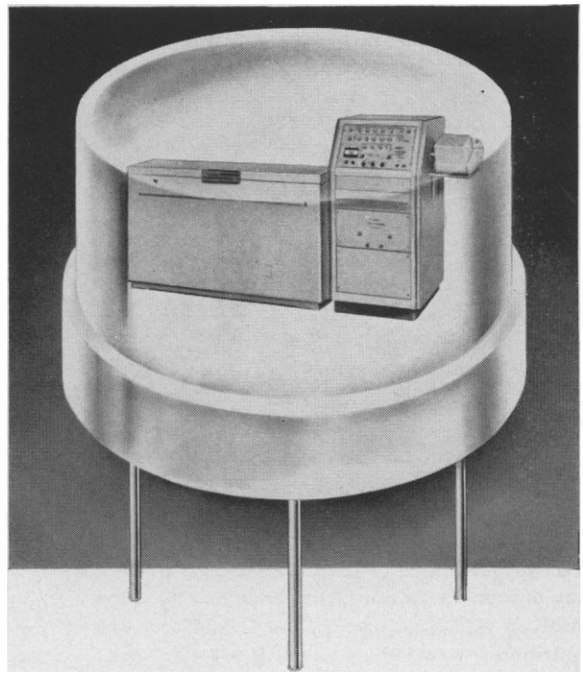

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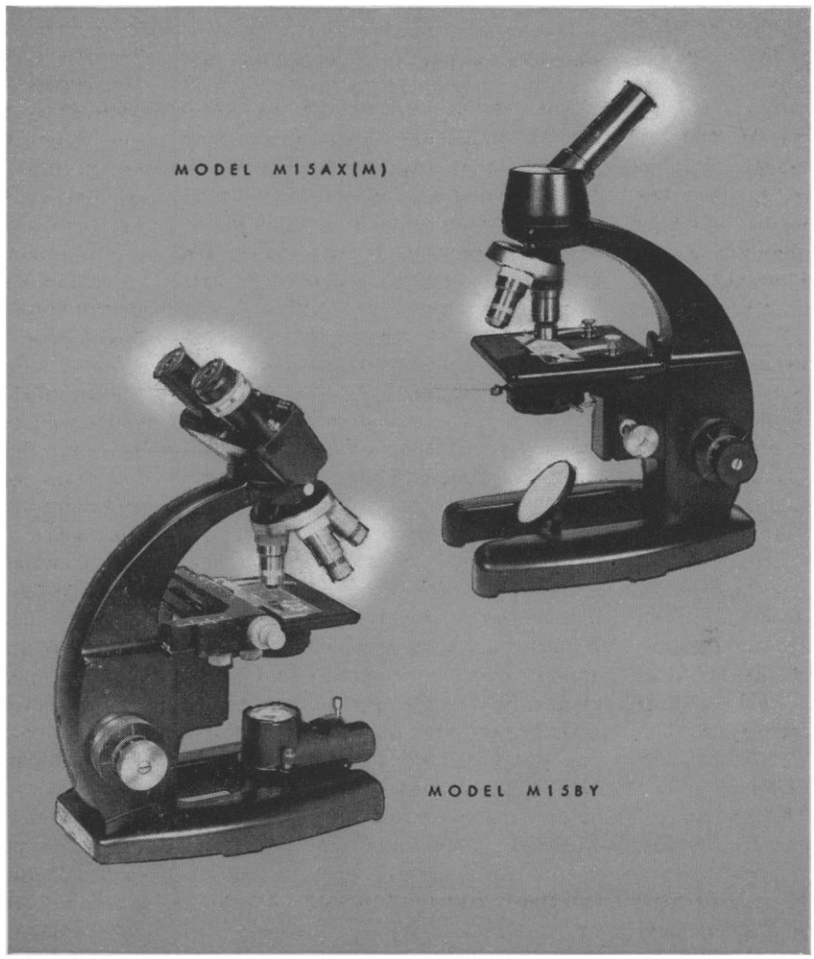

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mission of the felony for which convicts were serving sentences in Raiford (Florida) State Prison (Shaw Grigsby, University of Florida).

Also, containment is posited as a new operational theory for criminology (Walter Reckless, Ohio State University). A scientific concept for criminal responsibility is perhaps the most crucial issue in contemporary criminology (Frank Hartung, Wayne State University). A complete reorganization and reorientation of the Liberian National Police becomes effective in 1961, reflecting the influence of an ICA survey and the increasing urbanization and westernization of the Liberian population (Stephan Horton, Liberian National Police). International exchange of information is as basic to advances in criminal law and criminology as it is to advances in other scientific fields (Horst Schroder, University of Tübingen). The International Penal and Penitentiary Commission contributed significantly to advances in penology during the past century, and its files and reports, now indexed, are a gold mine for penological researchers (Thorsten Sellin, University of Pennsylvania). August Vollmer introduced scientific experimentation and professional standards to American policing and is outstanding among 20th-century contributors to criminological and police science (John Kenney, University of Southern California). Study of some 600 murders during a 4-year period in Philadelphia has introduced new methodological techniques of value in criminological research and has called into question certain commonly held, though unvalidated, assumptions as to the previous arrest and conviction records of murderers (Marvin Wolfgang, University of Pennsylvania).

The 1959 annual award of the American Society of Criminology was presented to Thorsten Sellin, president of the International Society of Criminology, for distinguished contributions to the science of penology. August Vollmer awards for research in criminology were presented to Paul Bohannan, Northwestern University anthropologist, for his *African Homicide and Suicide*, and to Marvin E. Wolfgang (University of Pennsylvania) for his *Patterns in Criminal Homicide*.

Officers of the American Society of Criminology for 1961 are as follows: president, Donal E. J. MacNamara (dean, New York Institute of Criminology); vice-presidents, Karl Menninger (Topeka, Kansas), Sheldon Glueck (Harvard), Gordon Barker (University of Colorado), and Pedro M. Velez (director of special investigations, Commonwealth of Puerto Rico); executive board member, John Kenney (University of Southern California); secretary-treasurer, Jacob Chwast (chief consulting psychologist, Educational Alliance, New York). Marcel Frym, the outgoing president, was named principal program consultant for the 5th International Congress of Criminology, to be held in Los Angeles in 1962. Charles Newman (University of Louisville) was appointed coordinator of research and studies for the congress, and Clyde Vedder (Northern Illinois University) was appointed liaison officer, to work with the sociology departments of American universities.

JACOB CHWAST, *Secretary-Treasurer*

Sociology of Science

The session on "Sociology of Science: The Organization of Research" was cosponsored by Section K and the American Sociological Association. The session was organized by Vincent H. Whitney (University of Pennsylvania) and chaired by Simon Marcson (Princeton and Rutgers). Marcson also reported on the organization of an industrial research laboratory and the relation of authority to organization.

William Evan (Bell Telephone Lab-

oratories) continued the discussion of the industrial laboratory in terms of the pressures and role strains created by a specific organizational form. David N. Solomon and Silvia Lamb of McGill University reported on a study of industrial scientists (chemists) and their values vis-à-vis science. Norman Kaplan (Cornell) compared the role of the research administrator in the Soviet Union with that of his counterpart in the United States and pointed out differences which suggest the possibility of a simplification of administrative practices in large-scale research organizations in this country.

A vigorous discussion followed, with participation from the floor.

VINCENT H. WHITNEY,
Program Chairman

Population Trends and Policies

The session on population trends and policies in the Communist countries was cosponsored by Section K, the American Sociological Association, and the Population Association of America. The growth of population, changes in population structure and distribution, and the consequences of these developments were discussed for three major regions with Communist governments. Jerry W. Combs, Jr., (Foreign Manpower Research Office, U.S. Bureau of the Census) reported on Eastern Europe; John F. Kantner (Population Council) analyzed changes in the Soviet Union; and Irene Taeuber (Office of Population Research, Princeton) discussed mainland China in terms of three interrelated factors—political philosophy, culture, and population. Irene Taeuber also served as chairman of the session, which was organized by Vincent H. Whitney of the University of Pennsylvania.

VINCENT H. WHITNEY,
Program Chairman

American Statistical Association (K5)

The New York Area Chapter of the American Statistical Association and AAAS Section K jointly sponsored a program on hospital statistics in community planning, arranged by Monroe Lerner (Health Information Foundation, New York). Paul M. Densen, deputy commissioner of health, New York City, presided.

J. Douglas Colman (Associated Hospital Service of New York) described research opportunities in the use of data routinely collected for administrative purposes by health agencies. Careful analysis of such data could provide answers to questions about comparative rates of hospital utilization, trends in the type and amount of hospital services, the impact of repeated admissions on hospital use, and so on. Such data are available at relatively little additional effort or cost from records or from already existing tabulations.

Paul Sheatsley (National Opinion Research Center, University of Chicago) discussed some methodological problems in a survey of the pattern of hospital use in Massachusetts. Interviews were conducted with 2500 patients (a sample of all admissions in the state over a 12-month period), with the physicians and hospital administrators involved, and with a sample of the general population. The purpose was to reconstruct the exact chain of events—physiological, socioeconomic, and psychological—leading to the decisions to hospitalize the patient and, subsequently, to discharge him from the hospital.

Monroe Lerner (Health Information Foundation) discussed some preliminary results of a survey comparing hospital utilization under Blue Cross in Indiana during 1956 and under a government insurance program in Saskatchewan during 1957. This survey was offered as an example of the use of already existing data. Hospital use was higher in Saskatchewan than in Indiana; this was especially true for obstetrical and respiratory cases, but was true to some extent for cases of all kinds.

Marta Frankel (New York City Department of Hospitals) described patterns of hospital utilization by the aged in New York City's municipal hospitals. The data were derived from administrative reports of individual hospitals and from patients' medical charts. The aged account for 18 percent of all patients discharged from these hospitals and for 35 percent of the hospital population in a randomly selected day. Diseases of the circulatory system constituted the most important cause of hospitalization in these patients.

MONROE LERNER, *Program Arranger*

The AAAS and the New York Area Chapter of the American Statistical Association held a joint session on "Some Statistical Problems in Social Insurance Research." Mortimer Spiegelman (Metropolitan Life Insurance Company) was chairman. Harry Malisoff (Brooklyn College) spoke on "Some invarient characteristics of unemployment in-

surance beneficiary experience"; David Robbins (Health Insurance Association of America), on "Some statistical problems in medical insurance programs"; A. Berman (New York State Labor Department), on "Selected studies in the field of workmen's compensation"; and A. J. Jaffe (Columbia University), on "The family and social insurance programs."

A. J. JAFFE, *Program Arranger*

Metric Association (K6)

The Metric Association held a symposium on 27 December, with J. T. Johnson, president of the association, as moderator and with the following participants: Lewis L. Strauss (former Secretary of Commerce), Carl F. Kayan (Columbia), Robert P. Fischelis (National Drug Trade Conference), and Karl E. Ettinger (research counselor, New York). Fred J. Helgren, secretary of the association, was unable to be present.

Strauss emphasized the importance of immediate consideration of the question of adopting the metric system. The following quotation gives the gist of his remarks: "Most of us in this room probably share the conviction that eventual change to the metric system is inevitable, and if inevitable, then most of us would wish this to occur before we have suffered more severely in our relationship with metric system countries than today has been the case, this in spite of the fact that we are aware that the change will be expensive and, in instances, difficult. We are fortunate in having a very able and distinguished scientist as Director of the National Bureau of Standards, Dr. Allen Astin. Dr. Astin has assigned Dr. A. T. McPherson, his Associate Director, the responsibility of conducting studies on the problem of conversion. The Bureau expects to explore the progress realized in Japan and India and the problems encountered in transfer to the metric system by those great populations."

The luncheon was attended by 15 of the 30 members present for a business session. A group was organized to act as an interim committee of trustees to organize the Metric Association for new and wider activities, international in scope, during the next two months. Members of this committee are as follows: Robert P. Fischelis (Washington, D.C.), chairman; Carl F. Kayan (New York City); Frank Y. Speight (American Society for Testing Materials, Phil-

adelphia); Floyd W. Hough (Committee for Study of Metric System under Auspices of American Geophysical Union); and Karl E. Ettinger.

J. T. JOHNSON, *President*

National Academy of Economics and Political Science (K7)

The National Academy of Economics and Political Science, with the collaboration of the national social science honor society Pi Gamma Mu, presented a program on "The Research Revolution and Public Policy." Leonard S. Silk, author of the recent book, *The Research Revolution*, presented a paper on "The research revolution and its economic implications," and Jacob Perlman of the National Science Foundation contributed one on "Public policy and the inter-sectoral flow of funds for research and development in the United States."

In his analysis of the growth of our economic system, Silk related the easing of the pains of technological change to further scientific and technological progress. After stating that "the present situation, in which international military and political conflict also involve a race for scientific and technological supremacy, has made the formulation of science policy one of the major public issues of our time," Perlman outlined the results of a program of surveys of expenditures and manpower involved "in basic and applied research and development throughout the economy"—surveys which he and his associates at the National Science Foundation made in order to provide the data essential to the formulation of science policy.

John C. Green, director of the Office of Technical Services of the U.S. Department of Commerce, presided and, through his practical experience and services of many years, contributed ably to the discussion. The two papers were exceptionally well received, and the academy plans to give them the widest possible distribution.

AMOS E. TAYLOR, *Chairman*

History of Science Society (L2)

The History of Science Society had a successful and well-attended meeting. The highest honor of the society, its Sarton medal, was presented to Owsei Temkin, professor of the history of medicine, Johns Hopkins. The Schuman prize, given for the best published book in the field, went to Mar-

shall Clagett (University of Wisconsin) for his book *The Science of Mechanics in the Middle Ages* (University of Wisconsin Press, 1959), and the Pfizer prize was awarded to Harold L. Burstyn, a graduate student at Harvard, for his research on Galileo, which is to be published in a forthcoming number of *Isis*.

In his address as outgoing president, Henry Guerlac stated that professional emphasis on the history of science had increased enormously during his period of office. The society now has a central core of university teachers of the subject, as well as a band of distinguished amateurs. I. Bernard Cohen (Harvard) was elected president for the current term of office. A special feature of the meeting was the first George Sarton Memorial Lecture, delivered before the AAAS by Rene Dubos of Rockefeller Institute. It was a noteworthy beginning for a series that will undoubtedly prove to be one of the major attractions at future AAAS meetings.

Two of the sessions of contributed papers deserve special mention. One, on the sociology, psychology, and economics of science, with papers from Bernard Barber, Karl Deutsch, and Anne Roe, was something of an innovation and displayed how important these interdisciplinary areas are for the historian of science. It is hoped that the proceedings of this session may be published in their entirety. A second innovation for the society was a session comprised of 15-minute papers on work in progress. This was most successful and gave the members an opportunity to hear from a large number of their younger colleagues, and from several projects whose final results will not be available for some time.

Unfortunately Anne Roe and Martin Dyck were unable to attend because of illness. Dr. Roe's paper was read for her by Mr. Mendelsohn, of Harvard University.

DEREK J. DE SOLLA PRICE,
Program Chairman

Society for the History of Technology (L5)

Emphasis upon technology as a causative factor in historical development and upon the sociological and scientific interrelations of technological change marked the third annual program of the Society for the History of Technology.

In a joint session with the American Historical Association on the topic "Technology as Cause in History," Roger Burlingame pointed out that technology is a "neglected clue to historical change," for historians have written of wars, economic theory, explorations, and the like, without expounding on the technological developments which lay at the foundation of the historical events. As counterpoint to Burlingame's thesis, Lewis Mumford claimed that history was a "neglected clue to technological change," for the historian of technology must open his eyes to the whole cultural milieu in order to understand technical change. Mervin J. Kelly, retired president of the Bell Telephone Laboratories, presided over this session, and H. Stuart Hughes (Harvard) commented on the papers of Burlingame and Mumford, indicating that the history of technology is not merely a specialized area of history of technology but is itself a way of understanding the past.

Papers on the development of automation, by John Diebold (industrial consultant, New York) and by James R. Bright (Harvard Graduate School

of Business Administration), led to a spirited discussion on the impact of automation on society. A. J. Jaffe (Columbia) stimulated the discussion by his trenchant commentary on the prepared papers. Preston R. Bassett (former president of the Sperry Gyroscope Corporation) served as chairman of this session held jointly with AAAS sections L and M.

Another highlight of the meeting was the day-long symposium on "Patents and the Advancement of Knowledge," an outgrowth of the controversy on inventing and patenting which appeared in a recent issue of *Technology and Culture* (Summer 1960). In this session, cosponsored by the society and by Section L, there was sharp criticism as well as strong defense of the existing patent system as a factor in the advancement of knowledge. J. William Hinkley (Research Corporation) presided over the first part of the symposium, in which Jacob Rabinow (Rabinow Engineering Company), Richard P. McGrail (American Cancer Society), and Johan Bjorksten (American Institute of Chemists) gave papers on various aspects of this subject.

Because of illness, Harry Woolf's scheduled vice-presidential address on "The evils of secrecy" was not given; an additional symposium panel was substituted, in which Melvin Kranzberg, editor-in-chief of *Technology and Culture,* introduced S. Colum Gilfillan (research sociologist) and I. Jordan Kunik (patent attorney, New York), who presented statements of their positions in the original controversy.

Robert L. Johnson (Temple) presided over the final session of the symposium, wherein Fritz Machlup (Princeton) and Charles C. Price (University of Pennsylvania) presented papers dealing with the economic and scientific incentives of the patent system. Rudolph F. Bannow (National Association of Manufacturers) introduced Robert C. Watson, who concluded the symposium by summing up some of his personal experiences as head of the U.S. Patent Office.

In a session on 19th-century technology, held jointly with AAAS sections L and M and presided over by Sidney Withington, Arnold R. Daum (Loyola) presented some new evaluations in the history of the petroleum industry and Thomas P. Hughes (Washington and Lee) indicated that the lag in the British electrical industry during the period 1882 to 1888 was caused by factors more complex than the legislation of

1882, to which it is customarily attributed. Bern Dibner of the Burndy Library commented on the papers.

A session held jointly with the History of Science Society featured a paper by Alexander M. Ospovat (University of North Dakota), on "Abraham Gottlieb Werner's ideas on science and education," and one by Harold I. Sharlin (Polytechnic Institute of Brooklyn), on "The engineering gap between Faraday's discovery of electro-magnetic induction and the electric dynamo."

Despite its formidable title—"Eilmer of Malmesbury: An eleventh-century aviator, a case study of technological innovation, its context and tradition"—Lynn White's presidential address enlivened the annual luncheon of the society. In a truly virtuoso performance, with wit and erudition, White showed how technological error persists despite the records of human experience. This luncheon was the capstone of this third annual meeting—a meeting which demonstrated the vast range of interests of this interdisciplinary organization, the advantages to be derived from bringing together the academician and the practicing technologist, and the vitality of this young and fast-growing society.

MELVIN KRANZBERG, *Secretary*

Nuclear Engineering

Nuclear engineering and its role in the engineering curriculum were the subjects of a panel discussion arranged by Section B (Physics) and Section M (Engineering) and held at the Biltmore Hotel, New York, on the morning of 30 December. John W. Healy (General Electric Company, New York) presided over a spirited discussion among the four panel members—Thomas B. Drew (Columbia), Irving Kaplan (Massachusetts Institute of Technology), John Lamarsh (Cornell), and V. Lawrence Parsegian (Rensselaer Polytechnic).

Nuclear engineering was generally defined as the branch of engineering involved with nuclear processes, and the nuclear engineer, as one with over-all competence in these processes. There was a difference of opinion among the panel members as to the distinction between nuclear engineering curricula and curricula of scope and depth in physics and in chemical, mechanical, and metallurgical engineering, particularly at the undergraduate level. In the graduate area, departments of nuclear engineering have a definite field of usefulness.

CLARENCE E. DAVIES, *Chairman*

Medical Sciences (Section N)

Section N held its annual symposium, organized along the conventional lines of an interdisciplinary discussion, from 26 to 29 December. The subject of the symposium, arranged by Abraham M. Shanes, was "Biophysics of Physiological and Pharmacological Actions." There were five half-day sessions.

The first session covered elementary systems. The chairman of this session was T. Shedlovsky (Rockefeller Institute). J. F. Hoffman reviewed the use of red-cell ghosts in studying transport phenomena. Robert L. Post (Vanderbilt) presented a very interesting concept of the relationship of adenosine triphosphatase activity to red-cell permeability. Existing relationships between this adenosine triphosphatase and the sodium pump were discussed. T. Hoshiko gave a lucid description of electrogenesis in frog skin. He emphasized that the transport mechanism for sodium is located at the corium facing membrane of the epithelial cell. S. Dikstein, of Jerusalem, presented evidence to show that model systems employing monomolecular layers of lipids gave characteristic actions of drugs that could be studied in relationship to the spatial distribution of functional groups. It will be interesting to follow the development of this approach to the mechanism of drug action.

The second session, which was concerned primarily with nerve, opened with a paper by J. D. Robertson (McLean Hospital, Boston). The current knowledge of intimate nerve structure as determined by electron-microscopic techniques was presented. In three papers which followed, the characteristics of the resting nerve cell, the theories of spike generation, and the current concepts of afterpotentials were reviewed and discussed. Of particular interest was the point made by F. A. Dodge, that the reduction of calcium and small depolarizations cause similar membrane changes. Very interesting evidence was presented by K. Kotetsu (University of Illinois) that sodium is dispensable for membrane excitation in certain excitable tissues. This complicates interpretation of many of the currently held concepts in this field.

The third session was concerned with a discussion of muscle. After presentation of the classical concepts of the properties of striated muscle, discussions on electrochemistry, the coupling of excitation and contraction, and the modification of action potentials were

presented. Of particular interest was a paper by W. Freygang on work done in collaboration with R. H. Adrian, in which he discussed anomalous rectification in muscle fibers. C. Paul Bianchi presented information on the action of caffeine on muscle contraction. He showed that caffeine may act through an action on calcium influx, which can occur in the absence of depolarization. A. M. Shanes (National Institutes of Health), who presented work on slow fibers, confirmed the importance of calcium as perhaps the most intimate link between membrane phenomena and muscle contraction. This is an extension of his earlier work on twitch fibers.

In the fourth session, on the contractile properties of muscle, the authors of papers attempted to correlate structure and function, but quite clearly this is a field which needs much more concentrated effort before even tentative relationships are well established. This is in no way meant to indicate that great strides have not been made in the energetics of muscle contraction.

The fifth and final session was concerned with cardiac muscle and smooth muscle. Brian Hoffman summarized the recent evidence bearing on the question of whether heart muscle, functionally, should be thought of as a syncytium or a group of individual cells. He also reviewed at some length the differences and similarities between the properties of nodal fibers and those of cardiac muscle fibers. J. W. Woodbury discussed the cardiac action potential and indicated, on the basis of electrochemical evidence presented, that it seems unlikely that the repolarization phase can be entirely explained on the basis of the rate of potassium efflux from the depolarized tissue. Leon Hurwitz (Vanderbilt) reviewed the electrochemistry of smooth muscle and its relationship to contraction. He emphasized that the calcium ion appears to have a depressing action on smooth-muscle excitability but at the same time is essential for smooth-muscle contraction. It would therefore appear that in striated, cardiac, and smooth muscle, depolarization is associated with calcium influx. L. Barr (University of Michigan) presented evidence of the importance of potassium in the functional activity of arterial smooth-muscle strips. When dog carotid artery strips were stored at 4°, he found that sodium was gained and potassium was lost. The ability to respond to stimuli was also lost. As the potassium ion concentration increased, contractility and the rate of relaxation following a stimulus increased, yet an optimum K_i/K_o was necessary for maximum excitability.

Although the title of the symposium included the "physiological and pharmacological actions," it was apparent from the papers presented that we are only now beginning to consider the pharmacological events at the cell membrane or in muscle tissue itself. It would appear that the more basic concepts of ion movement across cell membranes are reasonably well established. However, there is much to be learned before action potential, contraction of muscle, and so on can be thoroughly correlated with membrane activity. It would appear that pharmacological agents have been used less extensively than they might have been in the elaboration of mechanisms in these systems. The use of caffeine by Bianchi, cocaine by Shanes, and alcohol by Hurwitz indicates the valuable contributions of chemical agents employed as tools.

ALLAN D. BASS, *Secretary*

Expression of the Emotions in Man

The symposium "Expression of the Emotions in Man," sponsored by the American Psychiatric Association and cosponsored by AAAS Section I (Psychology) and the American Psychoana-

lytic Association, centered around methods of study and psychological classification of certain emotional phenomena in the adult human being. A historically oriented introduction by P. H. Knapp, program chairman, stressed the need for convergence between biologic (particularly neurophysiologic) and psychologic (particularly psychoanalytic) advances in the study of emotional phenomena.

Papers by P. MacLean, on neurophysiologic interrelations between sexual, oral, and aggressive responses in the monkey and their progressive socialization during phylogenesis, and by Spitz, on the origins of emotional responses in infancy, continued the introductory theme. The symposium then focused on approaches to emotional expression within the evolutionary frame of reference by the use of newer media. A short film by F. Deutsch served to introduce discussion of the study of expressive manifestations at various levels—the lexical and linguistic, discussed by G. Mahl; the kinesic, discussed by R. Birdwhistell; and the visceral, discussed by J. Lacey, who brought forward the evidence of adaptive cardiovascular patterns facilitating intake or exclusion of environmental input.

In closing sessions K. Pribram discussed the neuropsychologic model which Freud had advanced in his *Project for a Scientific Psychology* as a sophisticated precursor of the type of unified model urged in the introductory presentation—a type which present-day communication theory is serving to elaborate. G Engel discussed problems of classifying emotions. D. Hamburg, in a paper amplified by M Mead, discussed evidence from contemporary primitive cultures, from historical anthropological investigations, and from animal studies, stressing the evolution of emotions and their adaptive role, particularly in forming social bonds.

PETER H. KNAPP, *Program Chairman*

Alpha Epsilon Delta (N1)

The symposium on "Career Opportunities in Medicine and Dentistry" cosponsored by Sections C–Chemistry, F–Zoological Sciences, N–Medical Sciences, and Nd–Dentistry, attracted an attendance of about 200 persons, including premedical and predental advisers and students. An exceptional program featured W. H. Stewart, chief of public health methods, U.S. Depart-

ment of Health, Education, and Welfare, and director of the study staff of the surgeon general's consultant group on medical education, whose report "Physicians for a Growing America" was recently published. Stewart presented a cogent outline of the physician needs for the future. The need for dentists was outlined by Shailer Peterson, secretary, Council on Dental Education, American Dental Association, and assistant secretary of the Association for Educational Affairs, who works very closely with the Association of American Dental Colleges on these problems. A panel discussion on opportunities in dentistry was moderated by Raymond J. Nagle, dean, New York University College of Dentistry, while the panel on opportunities in medicine was moderated by James O. Pinkston, associate dean and professor of physiology, Downstate Medical Center, State University of New York, Brooklyn.

A wide variety of career opportunities in medicine and dentistry were brought out during the discussion and in the question-and-answer period that followed. After the luncheon, I. S. Ravdin, vice-president for medical affairs, University of Pennsylvania, discussed "The doctor's dilemma" in solving the numerous complex scientific, professional, and social problems facing the medical and dental professions today in providing health care for the American people. The afternoon was devoted to informal conferences with admissions officials in attendance and visits to the medical and dental schools in the city.

Tentative plans are under way to sponsor a similar program at the Denver AAAS meetings in December 1961.

MAURICE L. MOORE, *Secretary*

Dentistry (Section Nd)

In keeping with the general program scheme of recent years, Section Nd again organized a multidisciplinary symposium on a topic basic to oral biology—*fundamentals of keratinization.*

The two-session symposium, held at the Biltmore Hotel on 30 December, was organized under the direction of Earl O. Butcher (New York University School of Dentistry), with cosponsorship by Section N (Medicine), the International Association of Dental Research (North American Division),

the American Dental Association, and the American College of Dentists.

During the morning session (moderated by Butcher, section program chairman), various aspects of keratinization were discussed: (i) sequential mechanisms involved (A. G. Matoltsy, University of Miami); (ii) distribution of SH and SS reactions in various vertebrate keratins (R. J. Barrnett, Yale; R. F. Sognnaes, University of California, Los Angeles; G. Pettengill, Harvard); (iii) tissue culture keratinization (G. Szabo, Harvard); (iv) ultrastructure of keratinizing tissues (J. A. Rhodin and E. J. Reith, New York University); and (v) the effects of vitamin A on keratinizing tissues (H. A. Bern and D. J. Lawrence, University of California, Berkeley; J. P. Parnell and B. Sherman, State University of New York).

The afternoon session (moderated by Sognnaes) began with a discussion of physical properties of cornified epithelium (I. H. Blank, Massachusetts General Hospital) and proceeded to deal with structural and chemical aspects of oral epithelial derivatives—keratinization of the oral mucosa (J. Meyer and H. Medak, University of Illinois); keratin formation in dental cysts (J. J. Pindborg, Royal Dental College, Copenhagen); environmental and genetic effects on oral cornification (C. J. Witkof, Jr., National Institute of Dental Research); ultrastructural demonstration of the extracellular deposition of enamel (M. L. Watson, University of Rochester); and the microchemical constituents of the enamel protein (K. A. Piez, National Institute of Dental Research).

The symposium was well attended; at times the Biltmore Suite was filled to capacity (150), and there was a good deal of audience participation. During the morning session discussion centered around the definition of keratinization versus cornification, and the appropriateness of the classical terms "hard" and "soft" keratin. On the basis of the distribution of SH and SS reactions, a classification by site and origin was suggested as most appropriate by one discussant (Barrnett). During the afternoon session discussion of the enamel protein resulted in rejection of the views that this curious epithelial product is either a typical keratin or a collagen. It arises extracellularly, unlike typical keratins, and it contains no hydroxyproline, unlike collagen. One discussant (Pautard, Leeds University) even suggested that the enamel matrix may resemble a silk protein in structure. This may have important implications with respect to concepts of calcification.

In addition to sponsoring its own program, Section Nd cosponsored a meeting on career opportunities in medicine and dentistry, arranged by Alpha Epsilon Delta, which attracted a large audience on the morning of 29 December in the music room of the Biltmore. After introductory remarks (C. V. Reichart, Providence College), two comprehensive reports were presented, on future needs for physicians (W. H. Stewart, U.S. Department of Health, Education, and Welfare) and future needs for dentists (S. Peterson, American Dental Association). The remainder of the morning was devoted to two panel discussions on challenges in store for psysicians and dentists. The panel dealing with career opportunities in dentistry was moderated by R. Nagle (New York University College of Dentistry), with discussants from several Eastern dental schools—J. A. Cuttita (Columbia), M. M. Maxwell (Seton Hall), W. A. Wilson (Fairleigh Dickinson), J. H. Oaks (Harvard), L. W.

Burket (Pennsylvania), and L. Herman (Temple).

After a group luncheon, with an address by vice president I. S. Ravdin (University of Pennsylvania), opportunity was provided for individual conferences with college admission officials and for visits to local professional schools.

Harold J. Noyes, dean of the University of Oregon Dental School, was elected to succeed Joseph L. T. Appleton as vice president and chairman of Section Nd (for 1961). Albert A. Dahlberg (Zoller Memorial Dental Clinic and department of anthropology, University of Chicago) was elected committeeman-at-large, to succeed Joseph C. Muhler, who has completed his 4-year term of office.

The secretary took official notice of the great loss the organization had sustained in the untimely death of two very distinguished members—Balint Orban and Joseph P. Weinmann, both of the School of Dentistry, University of Illinois, and both active researchers in the area covered by the symposium on keratinization.

REIDAR F. SOGNNAES, *Secretary*

Pharmacy (Section Np)

Section Np held eight sessions from 27 through 30 December. A total of 43 contributed papers on various studies was reported, and one symposium was held jointly with the Committee on Cosmetics of the American Medical Association. Over 450 persons registered as having attended one or more of the section meetings.

The AAAS Council, the governing body of the Association, elected Joseph A. Oddis (American Society of Hospital Pharmacists) a vice president of the Association and elected Lee H. MacDonald (Upjohn) to serve on the committee-at-large of the section for a 4-year term. Oddis will serve as chairman of the section for the coming year and will preside at the Denver meeting in December 1961. John E. Christian (Purdue) continues to serve as secretary of the section.

Of major interest to the group in attendance was a stimulating vice-presidential address entitled "Dedication to Pharmacy," presented by Joseph V. Swintosky. A symposium entitled "The Scientist's Contribution to the Safe Use of Cosmetics" also attracted considerable interest, not only on the part of the pharmaceutical scientists in

attendance but also on that of many individuals from other scientific disciplines and of cosmetic scientists located in the New York area. Over 300 persons attended each of the two sessions.

In addition, the hospital pharmacy group had a most informative and well-attended full-day session of discussions and contributed papers on the scientific aspects of hospital pharmacy, under the guidance of George F. Archambault and Joseph A. Oddis. The following groups were represented: the American Society of Hospital Pharmacists, the American Pharmaceutical Association, the New York State Council of Hospital Pharmacists, the American Hospital Association, and the American Association of Colleges of Pharmacy. Luncheon, entertainment, and dinner were sponsored by E. R. Squibb and Sons, Wyeth Laboratories, and McKesson and Robbins, respectively.

John Autian (College of Pharmacy, University of Texas) opened the first session for contributed papers which consisted of presentation of the results of original scientific investigations. Norman J. Doorenbos and his coworkers at the University of Maryland presented a series of six papers describing work recently completed on the synthesis of aza steroids. C. E. Breckinridge (Oak Ridge National Laboratory) and J. E. Christian (Purdue) discussed a new method for isotope dilution analysis of chlorotetracycline. The polarographic properties of some pyridine derivatives were explained by Nicholas G. Lordi (Rutgers).

The effects of corticosteroids and tranquilizers on experimental amebiasis was discussed by James Ingalls (Long Island University). Lee H. MacDonald (Upjohn) described comparative testing of preservative systems. Other papers presented before the first session were "Comparative pharmacology of diphenylmethane derivatives," "Modification of the action of chloral hydrate in mice by the prior administration of nicotinamide," "Facilitation of metrazol-induced seizures by iproniazid," "Structural consideration of steroid borates," "The effect of ultrasound on the production of microcrystalline progesterone," and "Evaluative procedures for film-forming materials used in pharmaceutical applications." These papers were presented by Arlan G. Roberts (J. B. Roerig and Company), Robert G. Brown (University of Texas), Albert M. Ellman (Rutgers), George M. Sieger (Led-

erle), Donald M. Skauen (University of Connecticut), and Joseph L. Kanig (Columbia), respectively.

Lee H. MacDonald opened the second session of contributed papers and presided over the meeting. The papers presented were as follows: "A discussion of the electro-magnetic wave theory," "A comparison of operating characteristics of a liquid and plastic scintillator," Sterilization of regenerated collagen with beta-propiolactone," "Re-evaluation of certain atomic refractions," "Growth of medicinal plants in culture," "Description of a volatile oil obtained from a plant indigenous to Louisiana," "A continuous practical method for production granulation," "Binding of cations and anions by a nonionic surface active agent," "A technique for studying thermally induced phase transitions," and "The synthesis of 2-methyl-2-phenyl-3-(dialkylaminoalkyl) benzothiazolines and 2,2, - dimethyl - 3 - (dialkylaminoalkyl) benzothiazolines as potential tranquilizers." These papers were presented by Harry Lobel (Nebraska Iowa Electrical Council), George Foster (Purdue), Edwin L. Ball (Lederle), P. J. Jannke (University of Connecticut), A. E. Demaggio (Rutgers), John T. Goorley (Northeast Louisiana State College), E. T. Martin (Merck, Sharp, and Dohme), P. P. De Luca (Temple), D. R. Reese (Smith, Kline, and French), and C. S. Davis (Purdue), respectively.

This was one of the most successful meetings Section Np has held and was exceedingly well attended.

JOHN E. CHRISTIAN, *Secretary*

Safe Use of Cosmetics

The symposium, "The Scientist's Contribution to the Safe Use of Cosmetics," cosponsored by the Committee on Cosmetics of the American Medical Association and Section Np (Pharmacy) of the AAAS, met for two sessions on 29 December. Nine papers were presented, indicating ways in which the research biologist, the dermatologist, and the cosmetic chemist could work together to formulate safer cosmetics and outlining the responsibilities of manufacturers and the government with respect to the marketing of cosmetic products.

In presenting the research biologist's view, William Montagna (Brown) discussed some problems of biological research related to the development and use of cosmetics, with particular refer-

ence to the degree to which the ingredients of various cosmetics penetrate human skin. Kenneth Wilson (U.S. Army Chemical Research and Development Laboratories) discussed new methods for the study of percutaneous absorption. He presented slides and a film illustrating the methods that he uses to study skin penetration, including radioisotope tracer methods and an improved technique of preparing a perfused skin flap. William Bousquet (Purdue) discussed the general properties of radioactive isotopes as well as ways in which tracer techniques should prove valuable to the cosmetic scientist and manufacturer. Glen Sperandio (Purdue) discussed the qualifications of a cosmetic chemist, standards for a "safe" cosmetic, and a formulation technique that can be used to achieve such standards.

Allan Lorincz (University of Chicago), speaking from the standpoint of the dermatologist, stated that dermatologic research should play a fundamental guiding role in the formulation of cosmetics. Types of reactions which the dermatologist encounters in his practice were discussed by Howard T. Behrman (New York) along with causal mechanisms, clinical features, diagnosis, and therapy. Adolph Rostenberg (University of Illinois) gave an evaluation of currently used methods of appraisal for potential hazard, indicating their limitations and the need for better screening techniques.

Willard Bright (Lever Brothers) indicated that the industry wants to market only safe cosmetic products and, to this end, is sponsoring ever-expanding company research programs and cooperating more and more extensively with both scientific investigators and U.S. Food and Drug Administration representatives. Irvin Kerlan (U.S. Food and Drug Administration) outlined the government's role in the control of cosmetics.

Extensive and lively discussion periods followed the afternoon and evening programs.

JOSEPH B. JEROME,
Symposium Secretary

Agriculture (Section O)

Section O followed the precedent of recent years in designing a symposium program to illuminate a major national problem of great concern to everyone, but one in which leadership may well rest with the agricultural segment of

the economy of the United States. This year's symposium, "Land Zoning in Relation to Agricultural, Suburban, Industrial, Forest, and Recreational Needs of the Future," was divided into five sessions of a half-day each, synchronized with an additional AAAS-sponsored half-day session on urban redevelopment (the complementary phase of land planning and use).

The entire symposium involved a wide range of disciplines; thus AAAS members affiliated with Section O were given an opportunity to review broad subject-matter areas in a way not generally provided by any individual scientific society in its own programs. The attendance at the various sessions totaled about 625. These audiences were composed of responsible professional, scientific, and civic leaders from many states, who are deeply concerned with land planning, land zoning, and land use to meet the needs of the whole population in the near future and the decades beyond.

The entire program was developed and directed by vice president Firman E. Bear, 1960 section chairman. The excellence of the program was insured by the participation of speakers of outstanding ability who have made notable contributions in this field. Part 1 dealt with rural land zoning, with Wallace D. Bowman of the Conservation Foundation serving as chairman. Speakers at this session were D. A. Williams (Soil Conservation Services), E. D. Solberg (Agricultural Research Service, U.S. Department of Agriculture), Karl J. Belser (Santa Clara County, California, Planning Department), and T. W. Schulenberg (Department of Commerce and Public Relations, Indiana).

Part 2 dealt with suburban planning, under the chairmanship of Louis Wolfanger (Michigan State University). Four phases of this subject were developed by H. R. Pomeroy (West Chester, N.Y., County Planning Department), L. J. Bartelli (U.S. Soil Conservation Service), Marion Clawson (Resources for the Future, Inc.), and G. F. Whitehead and Robert Kates (University of Chicago).

Part 3, which followed the AAAS program on urban renewal, concentrated on community planning, under chairman Byron E. Munson (Ohio State University). Rural, county and regional, and small city communities were included. The speakers were H. H. Smith (Community Planning Associates), G. H. Deming ([New York]

Conference on Metropolitan Area Problems), S. S. Farness (Tri-County Regional Planning Commission, Lansing, Michigan), and W. J. Wayne (Indiana Geologic Survey).

Part 4 on forest and recreational planning, was presided over by Edward Higbee (University of Delaware). Four phases of this subject were discussed, by Paul B. Sears (chairman, conservation program, Yale), Charles W. Eliot (planning consultant, Cambridge, Massachusetts), Edward C. Crafts (U.S. Forest Service), and Raleigh Barlowe (Michigan State University).

Part 5 concluded the symposium with a program on "Government as Land Owner and Redistributor"; William Miller (New York University) was chairman of the session. The following four speakers developed this subject: Max S. Wehrly (Urban Land Institute), Shirley A. Siegel (Assistant Attorney General for New York State), Charles Abrams (planning consultant, New York City), and Robert E. Lowry (Tennessee Valley Authority).

The symposium was most successful in bringing the problem of land planning and land use for the public welfare into sharp focus. The many aspects of the subject were clearly presented; the amount of information and experience already available from regional and national leaders and specialists is substantial and all that is now needed is the dissemination of this information to communities and regions that will carry the responsibility for action.

The election of Wynne Thorne as a vice president of the AAAS and 1961 chairman of Section O was confirmed by the Council. Thorne succeeds Firman E. Bear, who was elected to a 4-year term as a committeeman-at-large. Thorne, director of the Utah Agricultural Experiment Station, has accepted the responsibility for developing a symposium program for the 1961 Denver meeting on the agricultural potential and development of the Great Plains and the Intermountain Regions.

HOWARD B. SPRAGUE, *Secretary*

Education (Section Q)

The New York meeting was the most successful meeting for Section Q in many years. The programs attracted a large attendance. At meeting after meeting there was standing room only, and in some instances substantial numbers had to be turned away, though one program—an evening program on 30 December—was poorly attended.

The quality of the programs seemed better than in former years. It was gratifying to note the attendance and the vigorous and constructive contributions of colleagues from the academic disciplines in many of the Section Q programs.

Section Q cosponsored two sessions with the Council for Exceptional Children and two sessions with the American Educational Research Association. The teaching societies sponsored their usual extensive and diversified programs. Section Q sponsored four sessions of contributed papers and the vice-presidential address. One session of contributed papers was concerned with problems associated with education of the gifted student. Another focused on the instructional problems associated with the use of educational television. The other two sessions were more varied but reflected interest in the cultural and social factors associated with discipline and vandalism, at-

titudes, vocational choices, and other problems.

A symposium on data-processing machines and educational research was provocative and stimulating. John C. Flanagan's vice-presidential address was devoted to a discussion of the educational implications of the research investigation "Project Talent," which he directs.

The section committee met formally on the day prior to the annual business meeting and met again, informally, after the business meeting. Problems of communication, future programs, and other matters were discussed.

The business meeting was probably the best attended in the history of the section. Participation was excellent, and great interest in section affairs was evinced. A number of helpful suggestions were made, which will guide the Section officers in meeting their responsibilities.

HERBERT A. SMITH, *Secretary*

The Retarded Child

The joint session of Section Q and the Council for Exceptional Children, on 26 December, was very successful. There were about 175 persons in the audience. Margaret Giannini, talked on the etiological and diagnostic aspects of the retarded child. She made it very clear that mental retardation is not an illness in itself, and that we must know about the pathological causes of retardation in order to truly understand and plan a program for mentally retarded children.

Lawrence Taft discussed "pseudoretardation." He stressed the importance of team work in diagnosis and in clinical therapy. Elsa Haussermann made a plea for a thorough evaluation and a team of professional persons to work with retarded children, especially with children who have serious multiple handicaps—children that she called "special specials." William C. Barger stressed the importance of team work, then narrowed his discussion to aphasiac children and told of success in using the mirror board with these children. The audience asked many questions, and nearly half of them remained to see special slides of work with aphasiac children.

The audience of the morning session on 27 December was smaller but gave close attention to the speakers. Emphasis at this session was on the education of handicapped children, although two of the speakers discussed problems

with gifted children. Raphael F. Simches listed trends in the education of special children and then discussed briefly some of the problems that are arising because of these trends and described expansion of work with the special children.

Romaine P. Mackie discussed research that is needed in working with all types of special children. She said that a terminology is very important, in order that mechanical cards can be used in research. She said that research is needed for the child, for parents and their needs, and for the teachers. She urged that research be reported in such a way that it can be understood.

I. I. Goldberg gave a description of a research project with preschool, mentally retarded children. The study will compare children in regular classes who have had this preschool training with others who have not had the training.

The audience asked many questions of all three speakers, and time was called before all of the questions could be heard. This seems to be one proof of an excellent meeting.

KATHERINE D. LYNCH,
Program Chairman

Research Symposium (Q4)

"Research and implications in teaching science," in the elementary school, in the secondary school, and at the college level, was the subject of the Research Symposium of the National Association for Research in College Teaching. The speakers were Cyrus W. Barnes (New York University), Hubert M. Evans (Teachers College, Columbia University), and Nathan S. Washton (Queens College).

NATHAN S. WASHTON, *Program Arranger*

National Science Teachers Association (Q5)

The theme of the sessions of the National Science Teachers Association meeting with the AAAS was "The New Science—A Teaching Challenge." The papers, each by a distinguished scientist, presented recent developments in five different areas of science. Each paper was followed by a discussion, by educational specialists, of the significance of the information presented by the speakers for elementary and secondary classrooms.

Alfred B. Garrett (Ohio State University) spoke on "The new chemistry." Wasley S. Krogdahl (University of Kentucky) dealt with "The new astronomy." Hugh Odishaw (U.S. Na-

tional Committee for the International Geophysical Year) spoke on discoveries in earth science resulting from IGY activities. Harry Wexler (U.S. Weather Bureau) discussed recently developed methods in weather forecasting. The fifth paper in the series, by Irvin J. Kopin (National Institute of Mental Health), was "The biology of the mind." Kopin discussed the biochemical bases for human behavior.

In addition, three IGY films were shown and a program on current NSTA activities was presented.

The coffee hour for members of the American Nature Study Society, the National Association of Biology Teachers, the National Association for Research in Science Teaching, and NSTA was a pleasant occasion and was well-attended by members of all four societies.

MARGARET J. MCKIBBEN,
Program Chairman

Academy Conference (X1)

The Academy Conference program opened on 26 December with a session on junior academies, with E. M. Gurr (Central High School, Phoenix, Arizona) presiding. The status of the junior academy movement and problems of organization and operation were discussed by Harry Bennett and Wayne Taylor, respectively. This presentation was followed by a panel discussion on the projected programs of junior academies, with Gerald Acker, Bennett, Elnore Stoldt, Taylor, and Floyd West as participants.

The morning of 27 December was given over to the business meeting and discussion of activities of the academies of science. A considerable part of the discussion centered around the relationship of junior academies to senior academies and the sponsorship of all junior science programs. The consensus was that the senior academies were in the best position to head up the varied programs directed toward the development of future scientists. The meeting was closed with the election of officers. E. Ruffin Jones (University of Florida) and J. Teague Self (University of Oklahoma) were chosen as president-elect and secretary, respectively.

The afternoon session was devoted to a discussion of the utilization of National Science Foundation grants by academies of science. Programs of four states were discussed by James Rutledge (University of Nebraska), John

Yarbrough (Meredith), and Arlo Smith (Southwestern University of Memphis). Charles La Motte (Texas A. and M.), who was to have been the fourth participant, was unable to be present but provided copies of his talk.

The traditional banquet featured the presidential address by John G. Arnold, Jr. (Loyola). His topic was "The fate of our junior scientists."

A. M. WINCHESTER,
Program Chairman

Junior Scientists' Assembly

At the 14th annual Junior Scientists' Assembly, held in the auditorium of the American Museum of Natural History on 27 December, each of the first 500 "early birds" received a copy of a Science Study Series paperback donated by Doubleday and Company.

Miss Evelyn Morholt welcomed the audience of some 1100 students (and some parents). Donald Barr (School of Engineering, Columbia) spoke on the "Image of the scientist."

Two students reported on their own research, conducted at Roscoe Jackson Memorial Laboratory: Judy Dick (Erasmus High School) described her work on learning in mice and on socialization of puppies; Robert Kamen (Andrew Jackson High School) told of the effects of nitrogen mustards on congenital deformities in mice and used slides to illustrate his talk. John Fuller, assistant director of the student-training program, described the objectives of the laboratory program for high school students, emphasizing the opportunity the program gives them to read original sources and do creative work.

Barr described the objectives of the Saturday Honors Program in Science, sponsored by the School of Engineering at Columbia University, and two students in this program described their work. Michael Steinitz (Harrison High School) described work on sapphire crystals and Erwin Morton, Jr., (Horace Mann High School) spoke of problems of thrust and fuels for rockets.

Conrad Ronneberg described the aims of the National Science Foundation in providing summer science institutes for high school students and described the kinds of courses to be offered in 1961.

During a closing question period, students (and some parents) asked questions about the supervision of students in out-of-town National

Science Foundation courses; about methods of selecting students for honors programs under the foundation; and about specific problems in the papers presented by the four students.

EVELYN MORHOLT,
Program Chairman

American Association of Scientific Workers (X2)

The American Association of Scientific Workers held a round-table discussion on "Obstacles to the Application of Science to Human Welfare," on 27 December. Topics discussed were the economic and social factors that impede possible applications of science to human welfare; the misdirection of science into destructive channels; and the responsibilities of scientists in removing these obstacles, furthering human welfare, and maintaining peace and human freedom.

The main speakers were Otto Nathan (New York University), who spoke on "Science and peace"; Theodor Rosebury (Washington University), who spoke on "Reflections on the crisis in medicine"; Nathan S. Kline (Rockland State Hospital, Orangeburg, N.Y.), who spoke on "Cybernetics and human welfare"; and William H. Meyer (U.S. Representative from Vermont), who spoke on "Deficiencies in science and man."

A period of discussion followed; members of the panel were David Singer (University of Michigan), Lawrence Scott (Fellowship of Reconciliation), and George Yevick (Stevens Institute of Technology).

MIRIAM L. YEVICK,
Program Chairman

American Geophysical Union (X4)

The symposium on the impact of space research on science was held 27 December in the Bowman Room of the Biltmore Hotel, with E. Purcell of Harvard University and Brookhaven National Laboratory presiding. The hall was filled to capacity.

Gordon MacDonald (University of California, Los Angeles; currently on leave to the Goddard Space Flight Center, National Aeronautics and Space Administration) led off the symposium with an excellent account of the relationship between the earth sciences and the space program. He surveyed

the geodetic data resulting from the satellite orbit analyses and the implications of the satellite results for the structure of the earth's interior. He discussed the satellite meteorology program, emphasizing the importance of infrared detectors in future NASA weather satellites, as opposed to the cloud-cover photographs on which emphasis was placed in the preliminary Tiros operation. MacDonald also discussed the determination of atmospheric properties from the analysis of satellite orbits. He pointed to the possibility of a magnetic drag as a source of the fluctuations in satellite deceleration at altitudes above 400 kilometers.

In the second lecture, Philip Abelson, director of the Geophysical Laboratory of the Carnegie Institution, discussed the suitability of extraterrestrial environments for the growth of living organisms. Abelson summarized the available body of information on the atmospheres of the moon, Mars, and Venus, in the context of conditions known to be suitable for the development of living organisms on earth. He stressed the improbability of finding living organisms on or near the surface of the moon, in view of the almost certainly dehydrated condition of the surface of that body. He considered it probable that the surface of Venus is also barren, as a consequence of the high temperatures which have been reported for that planet by radio astronomers. Abelson concluded with a critique of the evidence for the existence of living organisms on Mars. He pointed out alternative explanations in terms of reactions involving inert substances only.

In the concluding lecture, Martin Schwarzschild, of the department of astronomy, Princeton, discussed some of the benefits which would accrue to astronomy from the availability of orbiting telescopes. Schwarzschild envisioned that almost every field of astronomy would benefit substantially from the space program. One of the more fundamental problems that he discussed pertains to the amount of matter in the universe. There is indirect evidence for the existence of some ten times more matter than can be directly observed by currently available techniques. It is a matter of the greatest interest and importance to determine whether nine-tenths of the matter in the universe is in fact unaccounted for as yet, and if this is the case, what the composition of this missing matter may be. Current speculations center on the possibility that the unseen matter may be molecular hydrogen or deuterium. It is expected that the answer to this question will be obtained when satellite telescope spectrographs become available, a few years hence. Schwarzschild also discussed several questions of general interest to the scientific community, including the relative merits of manned and unmanned space exploration and the general benefits which may accrue to science as a whole from the investigations now being undertaken in support of space research.

ROBERT JASTROW, *Program Arranger*

American Nature Study Society (X5)

The 53rd annual meeting of the American Nature Study Society had a program indicative of the American people's increasing interest in interpretive nature programs for their schools. Sessions on outdoor laboratories, on nature projects of members, and on glaciation, and the showing of

kodachromes, attracted over 100 people.

The field trip to the Brooklyn Botanical Gardens, jointly sponsored by the Society and the National Association of Biology Teachers, was led by Charles Mohr and Shirley Miller. At the gardens, Frances Miner and George Avery, aided by staff members and children, explained and demonstrated their youth program.

Approximately 80 members and guests attended the annual banquet, arranged by John Ripley Forbes. Emery L. Will, president, introduced the speaker, Edwin Way Teale, who gave an illustrated talk on his *Journey Into Summer*.

On the last morning a joint session, arranged by Mohr, with the Photographic Society of America centered on new approaches, techniques, and evaluation in nature photography. During the final session a panel discussed writing, illustrating, and publishing for the nature audience.

The council held four meetings. Eva L. Gordon and C. M. Goethe were made honorary life members in recognition of their service to the cause of nature education. E. L. Palmer was reappointed representative to the AAAS Council. A committee was appointed to develop, in cooperation with the American Camping Association, criteria for certification of nature counselors. It was also planned to expand the services of the society through its newsletter and through development of a broader interpretive program at the local level.

STANLEY MULAIK, *Program Arranger*

Conference on Scientific Manpower (X7)

This year's general topic for the conference was "Developing Student Interest in Science and Engineering." Five papers were presented, in a morning session on 27 December.

Samuel Schenberg (New York City Board of Education) served as conference chairman. Harold H. Edgerton (Richardson, Bellows, Henry and Company) discussed "Summer research experience for high school students." John C. Flanagan (American Institute of Research) discussed the development of scientific aptitude tests and "Project Talent" as a means of identifying scientific abilities in high school students. M. H. Trytten and Lindsey Harmon of the National Research Council reported on a recent

study of the high school backgrounds of recipients of doctoral degrees in 1958, from the standpoint of ability levels, region, class size, and field of study. Phoebe H. Knipling (Arlington County, Virginia, Public Schools) discussed the beneficial motivational aspects of science fairs. Finally, Richard T. Fallon (Michigan State University) described the program of the Junior Engineering Technical Society.

The conference was sponsored by the Engineering Manpower Commission, the Scientific Manpower Commission, the National Research Council, the National Science Foundation, and AAAS Section M. Papers delivered at the conference will be published and will be available in limited numbers from the National Science Foundation, Washington, D.C.

THOMAS J. MILLS, *Program Chairman*

National Association of Science Writers (X9)

Earl Ubell, president, conferred honorary membership certificates on Henry A. Wallace, Warren Weaver, and Paul Dudley White for exceptional cooperation in communicating science news to the public.

Lifetime membership certificates were awarded to Watson Davis, David Dietz, Thomas R. Henry, William L. Laurence, Herbert B. Nichols, Robert D. Potter, Allen Shoenfield, Jane Stafford, and Marjorie van de Water.

Watson Davis, director of Science Service, was named the association's 1960 nominee for the Kalinga prize, international award for popularizing science.

The members authorized an increase in annual dues from $10 to $15 and publication of a sample issue of what may become a regular supplement to the NASW *Newsletter*, to include samples of current newspaper and other science writing throughout the country. The members also authorized consideration of an amendment to open associate membership to those who spend a "substantial" rather than a "principal" part of their time in science communication.

VICTOR COHN, *Vice President*

The National Association of Science Writers' annual dinner and presentation of the AAAS-Westinghouse science-writing awards was staged 27 December in the East Ballroom of the Hotel Commodore. Earl Ubell, NASW

president and science editor of the New York *Herald Tribune*, presided.

Ubell also was recipient of the $1000 newspaper division award for nonmedical science writing. Philip Morrison, Cornell University physicist, received a similar award in the magazine division.

William Hines, of the Washington, D.C., *Evening Star*, and Edwin Diamond, science editor of *Newsweek*, were given honorable mention certificates in the newspaper and magazine divisions, respectively.

NATE HASELTINE, *Secretary-Treasurer*

Meetings

Forthcoming Events

March

12–17. American College of Allergists, annual, Dallas, Tex. (P. Gottlieb, 818 Medical Arts Bldg., Philadelphia, Pa.)

13–17. National Assoc. of Corrosion Engineers, annual, Buffalo, N.Y. (W. A. Mapler, 18263 W. McNichols Rd., Detroit 19, Mich.)

13–24. Radiological Health, course in, Cincinnati, Ohio. (Chief, Training Program, Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26)

14–16. Clinico-Pathological Significance of Renal Biopsy, Ciba Foundation symp. (by invitation only), London, England. (Ciba Foundation, 41 Portland Place, London, W.1)

14–16. Inter-Station Supersonic Track Conf., 6th symp., China Lake, Calif. (U.S. Naval Ordnance Test Station, Code 307, China Lake, Calif.)

15–17. Medical Photography and Cinematography, intern. cong., Cologne, Germany. (Deutsche Ges. für Photographie, Neumarkt 49, Cologne)

16–17. Textile Engineering Conf., American Soc. of Mechanical Engineers, Clemson, S.C. (ASME Meetings Dept., 29 W. 39 St, New York 18)

16–18. Aviation/Space Education, 5th natl. conf., Washington, D.C. (Natl. Aviation Education Council, 1025 Connecticut Ave., NW, Washington 6)

17–19. International Medical Conf., Liège. Belgium. (Medical Commission of the FIR, Castellezgasse 35, Vienna II)

19–25. American Soc. of Photogrammetry, American Cong. on Surveying and Mapping, Washington, D.C. (C. E. Palmer, ASP, 1515 Massachusetts Ave., NW, Washington 5)

19–25. Caribbean Region, American Soc. for Horticultural Science, 9th annual, Miami, Fla. (E. H. Casseres, Londres 40, Mexico 6, D.F., or W. H. Krome, Box 596, Homestead, Fla.)

20–22. American Physical Soc., Monterey, Calif. (W. A. Nierenberg, Univ. of California, Berkeley 4)

20–23. Institute of Radio Engineers, 1961 intern. convention, New York, N.Y. (E. K. Gannett, IRE, 1 E. 79 St., New York 21)

20–24. American Surgical Assoc., Boca Raton, Fla. (W. A. Altemeier, Cincinnati General Hospital, Cincinnati 29, Ohio)

20–24. National Health Council, forum and annual meeting, New York, N.Y. (NHC, 1790 Broadway, New York 19)

20–24. Western Metal Cong. and Exposition, 12th, Los Angeles, Calif. (A. R. Putnam, American Soc. for Metals, Metals Park, Ohio)

21–23. American Meteorological Soc., general meeting, Chicago, Ill. (E. P. McClain, Dept. of Meteorology, Univ. of Chicago, Chicago 37)

21–23. American Physical Soc., Division of High-Polymer Physics, 21st, Monterey, Calif. (D. W. McCall, Bell Telephone Laboratories, Murray Hill, N.J.)

21–23. American Power Conf., 23rd annual, Chicago, Ill. (W. C. Astley, Philadelphia Electric Co., 900 Sansom St., Philadelphia 5, Pa.)

21–24. American Assoc. of Anatomists, 74th annual, Chicago, Ill. (O. P. Jones, Dept. of Anatomy, Univ. of Buffalo, Buffalo 14, N.Y.)

21–30. American Chemical Soc., 139th, St. Louis, Mo. (A. T. Winstead, ACS, 1155 16th St., NW, Washington 6)

23–25. American Orthopsychiatric Assoc., 38th annual, New York, N.Y. (M. F. Langer, AOA, 1790 Broadway, New York 19)

23–25. Quantum Electronics, 2nd intern. conf., Berkeley, Calif. (J. R. Singer, Dept. of Electrical Engineering, Univ. of California, Berkeley 4)

23–26. International Assoc. for Dental

Research, 39th annual, Boston, Mass. (D. Burrill, IADR, 311 E. Chicago Ave., Chicago 11)

24–29. National Science Teachers Assoc., Chicago, Ill. (R. H. Carleton, NSTA, 1201 16th St., NW, Washington 6)

26–29. American Assoc. of Dental Schools, annual, Boston, Mass. (R. H. Sullens, 840 N. Lake Shore Dr., Chicago 11)

27–31. Temperature—Its Measurement and Control in Science and Industry, natl. symp., Columbus, Ohio. (C. M. Herzfeld, Natl. Bureau of Standards, Washington 25)

30–1. Southern Soc. for Philosophy and Psychology, Atlanta, Ga. (D. R. Kenshalo, Dept. of Psychology, Florida State Univ., Tallahassee)

April

3–6. Massachusetts Institute of Technology, centennial celebration, Cambridge. (Office of Public Relations, M.I.T., Cambridge 39)

3–15. Medical Conference, 11th, Nassau, Bahamas. (Bahamas Conferences, P.O. Box 1454, Nassau)

4–6. Electromagnetics and Fluid Dynamics of Gaseous Plasma, intern. symp., New York, N.Y. (J. Fox, Microwave Research Inst., Brooklyn 1, N.Y.)

4–7. Society of Automotive Engineers, natl. aeronautic meeting, New York, N.Y. (E. W. Conlon and G. W. Periman, 485 Lexington Ave., New York 17)

4–8. National Council of Teachers of Mathematics, 39th annual, Chicago, Ill. (F. A. Janacek, J. S. Morton High School, Cicero 50, Ill.)

5–8. Water Relations of Plants, British Ecological Soc., symp., London. (F. H. Whitehead, Botany Department, Imperial College, Prince Consort Road, London, S.W.7)

6–7. Council on Medical Television, annual, Bethesda, Md. (Institute for Advancement of Medical Communication, 33 E. 68 St., New York 21)

7–8. Eastern Psychological Association, Philadelphia, Pa. (C. H. Rush, P.O. Box 252, Glenbrook, Conn.)

7–9. American Assoc. for Cancer Research, 52nd annual, Atlantic City, N.J. (H. J. Creech, Secretary-Treasurer, Inst. for Cancer Research, Fox Chase, Philadelphia 11, Pa.)

7–9. Fleming's Lysozyme, 2nd intern. symp., Milan, Italy. (R. Ferrari, Organizing Committee, Via Modica 6, Milan)

8–9. Histochemical Soc., 12th annual, Atlantic City, N.J. (H. W. Deane, Albert Einstein College of Medicine, Bronx 61, N.Y.)

9–13. American Assoc. of Cereal Chemists, annual, Dallas, Tex. (J. W. Pence, Western Utilization Research & Development Division, 800 Buchanan St., Albany 10, Calif.)

9–13. American Industrial Hygiene Assoc., Detroit, Mich. (W. S. Johnson, Bethlehem Steel Co., Bethlehem, Pa.)

9–15. American Institute of Nutrition, Atlantic City, N.J. (A. E. Schaefer, ICNND, Bldg. 16A, National Institutes of Health, Bethesda 14, Md.)

10–14. American Soc. of Civil Engineers, Phoenix, Ariz. (W. H. Wisely, 33 W. 39 St., New York 18)

10–14. Detection and Use of Tritium in the Physical and Biological Sciences, intern. symp., Vienna, Austria. (Office of Special Projects, U.S. Atomic Energy Commission, Washington 25, D.C.)

10–15. Federation of American Societies for Experimental Biology, 45th annual, Atlantic City, N.J. (M. O. Lee, 9650 Wisconsin Ave., Washington 14, D.C.)

10–15. Metallic Corrosion, 1st intern. cong., London, England. (Society of Chemical Industry, 14 Belgrave Sq., London, S.W.1)

11–13. Institute of Environmental Sciences, annual, Chicago, Ill. (H. Sanders, Box 191, Mt. Prospect, Ill.)

11–13. Ultrapurification of Semiconductor Materials, conf., A.F. Office of Scientific Research, Boston, Mass. (Miss H. Turin, Conf. Secretary, Electronics Research Directorate, Air Force Cambridge Research Lab., L. G. Hansom Field, Bedford, Mass.)

12–13. Information and Decision Processes, 3rd symp., Lafayette, Ind. (R. E. Machol, School of Electrical Engineering, Purdue Univ., Lafayette)

12–14. Agglomeration, intern. symp., Philadelphia, Pa. (Metallurgical Soc. of the AIME, 29 W. 39 St., New York 18)

12–14. Chemical Soc., anniversary meeting, Liverpool, England. (Chemical Society, Burlington House, Piccadilly, London, W.1)

13–14. Society of Technical Writers and Publishers, 8th annual, San Francisco, Calif. (R. B. Meier, Head Editor, Engineering, Stanford Research Inst., 333 Ravenswood Ave., Menlo Park, Calif.)

17–18. Great Lakes Research, 4th conf., Ann Arbor, Mich. (C. F. Powers, Great Lakes Research Division, 1119 Natural Science Bldg., Ann Arbor)

17–19. Fluid Seal Meeting, intern., Ashford, Kent, England. (Information Officer, British Hydromechanics Research Assoc., South Road, Temple Fields, Harlow, Essex)

17–24. International Congress of Nurses, 12th quadrennial cong., Melbourne, Australia. (Miss D. C. Bridges, Secretary, 1 Dean Trench Street, London, S.W.1, England)

18–20. Chemical Reactions in the Lower and Upper Atmosphere, intern. symp., San Francisco, Calif. (R. D. Cadle, Stanford Research Inst., Menlo Park, Calif.)

18–21. American Geophysical Union and American Meteorological Soc., Washington, D.C. (American Geophysical Union, 1515 Massachusetts Ave., NW, Washington 5, D.C.)

19–21. Southwestern Inst. of Radio Engineers Conf. and Electronics Show, Dallas, Tex. (SWIRECO 61, P.O. Box 7443, Dallas 9)

20–21. Society of Chemical Industry, fungicide symp., London, England. (B. J. Heywood, 103 Harrow Drive, Hornchurch, Essex, England)

20–22. Association of Southeastern Biologists, Lexington, Ky. (H. J. Humm, Department of Botany, Duke Univ., Durham, N.C.)

20–24. Microbial Reactions in Marine Environments, intern. symp., Chicago, Ill. (C. H. Oppenheimer, Inst. of Marine Science, Univ. of Texas, Port Arkansas)