

Indiana Bell Telephone Company for contributing the services of Marjorie N. Pierce as a secretary; to Dorothy Nisely of the Indianapolis Public Library for volunteering as a communications specialist; to Maurice C. Gronendyke of the Indiana State Chamber of Commerce and Charles E. Ehlers of the Claypool Hotel for helping to provide ideal working facilities in the Florentine Room; to Robert Worth and Joseph Sitzman, Eagle Scouts of the Central Indiana Council, Boy Scouts of America, for serving as messengers; to the Indianapolis Press Club for extending guest privileges to out-of-town science writers; to the Florida Citrus Commission and Noyes and Sproul, Inc., for the hospitable serving of fresh orange juice continuously each day; to the General Electric Company Research Laboratory for holding open house each evening for all reporters covering the meeting; to D. H. Radler of the Purdue Research Foundation and Hugh Hazelrigg of the Indiana University News Bureau for helping in many ways to make visiting science writers feel at home in Indian-

apolis; to Reverend Laurence T. Hosie, executive secretary of the Church Federation of Greater Indianapolis, for making arrangements for the Protestant interdenominational service at the Roberts Park Methodist Church on Sunday, 29 December; to Eli Lilly and Company for the reception for reporters at the Severin Hotel on the evening of 27 December; to the Allison Division of the General Motors Corporation for the press reception the following evening; to Herman B. Wells and Frederick L. Hovde, presidents of Indiana University and Purdue University, respectively, for entertaining science writers and their wives at dinner at the Athenaeum on 28 December following the semiannual meeting of the National Association of Science Writers; to the Indianapolis Chamber of Commerce, Pitman-Moore Company, American Tobacco Company Research Laboratory, Indianapolis Power and Light Company, James Whitcomb Riley Memorial Association; and the Indiana University Medical Center for providing luncheons for the press during the meeting; and to the "old-

timers" of the NASW for invaluable technical advice.

Thelma C. Heatwole of Staunton, Virginia, was press room director. After this experience for six consecutive annual meetings of the Association, her services have become invaluable. Wayne Taylor of Austin, Texas, was again the press room photographer, and Foley F. Smith of Richmond, Virginia, served as an associate. James W. Carr and Joseph E. Palmer made their headquarters with us. These individuals and the secretaries mentioned previously arranged 18 press conferences during the week and got source material quickly to reporters to whom, more than to any others, goes the credit for helping to make possible at these annual meetings one of the four principal objectives of the AAAS: to increase public understanding and appreciation of the importance and promise of the methods of science in human progress. The Association is deeply appreciative of the world-wide coverage of its meetings by members of the National Association of Science Writers and other representatives of the Fourth Estate.

Reports of Sections and Societies

Mathematics (Section A)

Section A presented a program of three invited papers on the mathematics of guided missiles on Saturday morning. A. George Carlton of the Johns Hopkins Applied Physics Laboratory outlined a solution to the problem of filtering radio noise in missile guidance. Homer E. Newell, Jr., of the U.S. Naval Research Laboratory gave a popular exposition of satellite orbits. Robert W. Rector of the Ramo-Wooldridge Corporation gave an over-all picture of the American effort in guided missiles.

On Thursday afternoon, two former chairmen of the section gave their retiring addresses. Dean Mina Rees of Hunter College spoke of the various professional opportunities for mathematicians other than in teaching. A. W. Tucker of Princeton University explained a new method in mathematical programming.

On Friday morning the section was cosponsor, with the National Council of Teachers of Mathematics and with the AAAS Cooperative Committee on the Teaching of Science and Mathematics, of a program on the modernization of the mathematics curricula in schools and colleges. In the afternoon Section A and the National Council listened to invited papers on curriculum study.

C. C. MacDUFFEE, *Secretary*

Symposium on Mathematics Instruction. The symposium on mathematics instruction was planned to bring before the scientific community information on current curriculum studies and a statement on the mathematics curriculum in perspective.

R. L. Davis, executive secretary, reported for the Mathematical Association's Committee on the Undergraduate Program (CUP). Davis indicated that CUP was concerned with ways to (i)

bring to college freshmen the calculus which underlies so many of the important applications, (ii) introduce to them the set notions and probability theory basic to so many modern applications, and yet (iii) do all this without making unrealistic demands on students with 2½ years of high school mathematics.

The Committee on the Undergraduate Program has tried to answer these questions by designing and producing whole courses which would accomplish these ends, by sponsoring mathematical expositions for teachers and students, and by studying the design of special courses for teachers. The committee has also designed two types of sophomore courses. One course, for physical science and engineering majors, will save student time because it provides a head start from the first-year course and with further gains in the use of handbooks and tables. The emphasis of the whole course will be shifted to a consistent use of vectors and differential forms in many-variable calculus. The other course for sophomores answers increasing demands from biological and social scientists, covering at first the elements of many-variable calculus and linear algebra. There are also special units on optimum problems and linear programming, probability theory, Markov chains, order relations, and finally, a long unit on mathematical models in the biological and social sciences.

A. W. Tucker reported for the Commission on Mathematics. The College Entrance Examination Board established

the commission, with Tucker as chairman, to consider broadly the secondary school college-preparatory mathematics curriculum and to make recommendations looking toward its modernization, modification and improvement. Likely proposals include: (i) more emphasis on deductive reasoning in algebra and less in geometry; (ii) introduction of coordinates and vectors in plane geometry and trigonometry; (iii) combining concepts with skills to give deeper understanding; (iv) some use of simplifying abstraction-sets, binary operations, relations, functions, and so forth; (v) introductory probability and statistical reasoning as a desirable replacement for formal solid geometry. The commission recommends that a full secondary program lead to calculus in the freshman year of college and that calculus should be taught in high school only as a college-level course for advanced placement.

The Project for the Improvement of School Mathematics of the University of Illinois Committee on School Mathematics was reviewed by Max Beberman, director of the project. This joint venture of the Illinois Colleges of Education and Engineering and the mathematics department is planned to create a four-year program in college-preparatory mathematics which treats mathematics in the manner of contemporary mathematics and which stimulates interest among young people in the continued study of mathematics. The committee has initiated its program in a dozen schools in Illinois, Massachusetts, and Missouri. Teachers receive instruction from the UICSM in conferences on the Illinois campus, during visits to their schools by coordinators, and through textbooks for teachers and students. Textbooks for four years of mathematics include the distinction between numbers and their symbols; the relations of equality and inequality; algebraic manipulations based on generalizations of arithmetic; graphing equations and inequalities; a postulational development of Euclidean geometry involving considerable work with elementary set theory; the ideas of a deductive theory in which models are constructed for various sets of postulates; mathematical induction; exponents and logarithms; complex numbers; integral rational functions; polynomial equations; circular functions.

C. C. MacDuffee of the University of Wisconsin pointed out that the teaching of mathematics is an experimental science and that drastic changes in curriculum or in methods of presentation should not be made on a large scale until they have been thoroughly tested with small groups. He emphasized that it is important that we teach those whose aim is application as well as those who wish to become pure mathematicians. The develop-

ment of mathematical intuition was identified as the common objective of all teachers of mathematics, regardless of how their students hope to use it. MacDuffee stated that real reform in the teaching of mathematics in the high school must begin with the teacher and that more persons of excellent ability and training must be induced to join the profession. From such material, he said, teachers can be produced whose understanding of mathematics will be such that the success which others have had in experimental programs with small groups can be made universal.

JOHN R. MAYOR, *AAAS*

Physics (Section B)

A symposium on spectroscopy highlighted the meeting of Section B. Organized by K. W. Meissner, the day-and-a-half symposium covered the following topics: spectroscopy and quantum electrodynamics, primary and secondary wavelength standards, solar spectra, isotope shifts, electronic states of diatomic molecules, spectroscopy of the rare earths, and the role played by spectroscopy in thermonuclear research.

The vice-presidential address was given by William T. Meggers at a banquet which was jointly sponsored by Sigma Pi Sigma and Section B. The address, which was entitled "Reminiscences in spectroscopy," proved to be entertaining as well as instructive, and many of spectroscopy's great names took on added luster. Raymond T. Birge, current chairman of Section B, presided.

Papers on neutrino physics by Frederick Reines, on solid-state physics by Park Miller, and on high-temperature plasmas by Alan Kolb were given in a session devoted to recent advances in physics. Besides the intrinsic value of the individual papers, the session was impressive in showing that research in physics is making a vigorous advance on many fronts.

J. H. McMILLEN, *Secretary*

Chemistry (Section C)

The programs of Section C featured a session on submitted papers, two sessions on the chemistry of acetylene, and two sessions on pyridine and its derivatives.

The contributed papers included: "The acetylation of imides with ketene," by R. E. Dunbar and Wayne M. Swenson; "Reaction studies of acid halides and ethers," by R. E. Dunbar and Vernon L. Guyer; "The preparation and properties of *t*-alkyl formates," by David W. Young and Eileen Paré; "Enzyme pacemakers, a new concept on the chem-

ical composition and activation of pepsinogen, chymotrypsinogen, and trypsinogen," by Anwar A. Hakim; "Conductance measurement of some salts in anhydrous ethanolamine," by F. C. Schmidt, W. B. Schaap, and P. W. Brewster; "The adrenal response to alcohol intoxication in rats maintained on diets deficient in tryptophan-niacin or in lysine," by J. C. Forbes and G. M. Duncan; and "The nitration of 3-phenylquinoline," by Christian E. Kaslow and Bernard Buchner.

The symposium on acetylene covered the history and current status of acetylene. The following papers were presented: "Commercial acetylene production," by C. K. McLane; "The chemistry of acetylene," by George F. Hennion; "Acetylene derivatives as hydrochloric acid corrosion inhibitors," by R. F. Monroe; "Agricultural uses of acetylene derivatives," by Fred J. Lowes; "A review of the pharmacology of acetylene compounds," by William R. Gibson; "The stereochemistry of nucleophilic additions to acetylene," by W. E. Truce, M. M. Boudakian, J. A. Simms, R. F. Heine, and R. Kassinger; "The acetylene-allene rearrangement," by Thomas L. Jacobs; and "Acetylene in the synthesis of pyridines," by W. R. Wheeler and F. A. Karnatz.

The current status of the chemistry of pyridine was covered in papers such as: "Recovery of pyridine from coal products," by J. H. Wells; "The chemistry of vinylpyridines," by Robert Levine; "Derivatives of vinylpyridine," by Allan P. Gray; "Pyridine-metal salt complexes for clathration separation of aromatic isomers," by W. D. Schaeffer, W. S. Dorsey, D. A. Skinner, and C. G. Christian; "The synthesis and reactions of sterically hindered pyridine bases," by Harold Podall; "Chemistry of pyridine-N-oxide," by E. C. Taylor, Jr.; "Preparation of the pyridolacetones and the inductive effect of nitrogen on the dehydration of the intermediate aldols," by John K. Stille; "Pyrophthalones derived from picolines as intermediates for medicinal agents," by C. H. Tilford, G. L. Krueger, E. D. Amstutz, D. G. Manly, A. Richardson, Jr., and A. M. Stock; and "The chemistry of picolines," by F. E. Cislak.

The next meeting of Section C will be held in Washington, D.C., during the last week of December. Tentatively, it is planned to have one or more sessions of submitted papers, and two series of symposia; one on irradiation and one on free radicals. Now is the time to begin to plan for attending this meeting. Contributed papers should be sent to Dr. F. O. Rice or to Ed. F. Degering, Secretary, Section C, 26 Robinhood Road, Natick, Mass.

Ed. F. DEGERING, *Secretary*

American Association of Clinical Chemists (C1)

The American Association of Clinical Chemists held two scientific sessions at which 16 scientific reports dealing with several aspects of clinical chemistry were presented. Donald E. Bowman, of Indiana University School of Medicine, and Oliver H. Gaebler, of the Edsel B. Ford Institute for Medical Research, presided at these sessions.

A third and very popular session of the clinical chemists was a half-day symposium entitled "Significant Trends in the Chemistry of Disease." At this symposium Harry Weisberg discussed "Electrolytes and acid-base balance," Jack R. Leonards pointed out some of the "Chemical changes involved in the use of artificial organs," Ralph I. Dorfman presented "Recent advances in the understanding of hormonal factors in disease," and Clarence Cohn discussed the "Use of serum transaminase activities in clinical biochemistry."

A clinical chemists' banquet, which was attended by the majority of the clinical chemists at Indianapolis, was held during the meetings. Albert Sobel discussed his views on "Professional research." This was truly a national meeting of clinical chemists, with participants from New York to California.

ROBERT R. SMEBY, ALFRED H. FREE,
Program Chairmen

Astronomy (Section D)

For the second consecutive year Section D had a joint program with the American Astronomical Society. There were 36 contributed papers on the program, one of which ("Solar photographs from 80,000 feet," by Martin Schwarzschild, J. B. Rogerson, Jr., and J. W. Evans) won the \$1000 Newcomb Cleveland Prize. There was also a symposium entitled "The Cepheid Variable Stars."

The Helen B. Warner lecture of the American Astronomical Society was given by Allan R. Sandage (Mount Wilson and Palomar Observatories), on the subject of "Unsolved problems in the quest for the extragalactic distance scale."

All of the sessions for papers were held at Butler University. The symposium and the Warner lecture were held in the World War Memorial Auditorium.

The AAS-Section D dinner was held at the Marott Hotel. Following the dinner Pieter van de Kamp gave the address of the retiring chairman of Section D on the subject of "Facets of astronomy."

FRANK K. EDMONDSON, *Secretary*

Astronomical League (D2)

The program of the Astronomical League was given in the spirit of a public service. As amateur astronomers, most of our members are professionally active in other fields. Therefore no attempt is made to compete with professional astronomers; instead, we confine our activities to maintaining a close relationship with them and their work, in order to satisfy our own thirst for knowledge and to pass it on to the public in general. Through our local societies we provide a platform to introduce astronomy to anyone who is interested. In our junior activities we provide a stimulus to interest juniors in astronomy and give them an opportunity to be active in it and in science in general.

The timing device introduced in the first paper, "An accurate timing device for astronomical observations," was original with the local Indianapolis group and was developed to be used in the local Moonwatch station. It was unfortunate that the paper on "Observations on the Moon" could not be given; the author was not able to be with us at the meeting. Since the author is an authority on this subject, his paper was to have been the highlight of the meeting.

Our junior program is always a surprise to those who are not familiar with the enthusiasm the juniors display. Though only juniors from Indiana participated, the quality and subject matter of the papers was indicative of their devotion to and interest in science. We were delighted with the interest displayed by an audience of about 200 and with the publicity given to this program by the local newspapers and with the television coverage.

The activities of both the junior and senior groups are worthy of public support and are an important stimulus in creating interest in science and in keeping the public informed. For this we need the help of professional astronomers in keeping us informed, and we hope we shall always have a close relationship with them in our common interest, astronomy.

WILHELM GARNATZ,
Program Chairman

Geology and Geography (Section E)

Three symposia were held as part of the Section E program. Attendance ranged from 50 to 300. The symposium on "Continental Glaciation and its Geographic Importance as an Environmental Factor" lasted for 2 days and included 22 papers. Chairmen of the half-day sessions were William D. Thornbury (Indiana University); George W.

White (University of Illinois), Paul B. Sears (Yale University), and Louis L. Ray (U.S. Geological Survey). There was a 1-day symposium on Mississippian and Pennsylvanian rocks of the Midwest, with Henry H. Gray (Indiana Geological Survey) and David H. Swann (Illinois Geological Survey) presiding. Nineteen papers were presented. This symposium was a joint session with the Geological Society of America and the Association of American Geographers. A half-day session, joint with the National Speleological Society and the Geological Society of America, was devoted to "Karst Phenomena." William E. Davies presided, and five papers were presented. In addition to the symposia, a half-day session was held consisting of eight contributed papers in geology and geography.

The vice-presidential address by Paul F. Kerr, entitled "Uranium emplacement in the Colorado Plateau," was presented at the Section E smoker. The smoker was arranged by Claude M. Roberts (U.S. Geological Survey) and was sponsored by the Indianapolis Water Company, Layne-Northern Company, and Mobile Drilling and Engineering Company.

The program of Section E emphasized subjects of interest to earth scientists working in the Middle West. In the symposium on continental glaciation, particular emphasis was placed on the contribution that can be made to our studies of glaciation by fields other than geology and geography. This symposium included papers in the fields of climatology, botany, and zoology.

FRANK C. WHITMORE, JR., *Secretary*

National Speleological Society (E4)

Three sessions were sponsored by the National Speleological Society: a general session for contributed papers and two symposia.

Two papers in the general session dealt with regional, rather than local, development of limestone caves. These papers are indicative of the transition from the purely descriptive to the more theoretical phases of American speleology. J. R. Fisher and W. B. White discussed the morphology and origin of a series of small caves in the Van Port limestone (Pennsylvanian) of the Allegheny Plateau northwest of Pittsburgh, and Richard L. Powell presented a summary of investigations on caverns and karst features in the Mississippian and Silurian rocks of southern Indiana. The structure and possible mode of origin of mud stalactites and stalagmites observed in Elrod Cave, Orange County, Indiana, was the subject of a paper by Reuben Vig. The final paper, given by Thomas

C. Barr, was concerned with the invertebrate fauna of Carlsbad Caverns, Eddy County, New Mexico.

A symposium on the cave fauna of the Ohio River valley, arranged by Thomas C. Barr, served to focus attention on recent developments in the systematics of cavernicolous invertebrates in southern Indiana, central Kentucky and Tennessee, and northern Alabama. [The first attempt at a comprehensive treatment of the cave fauna of this region stemmed indirectly from the first Indianapolis meeting of the AAAS, which was held in August 1871. Among those at that meeting who accepted the invitation of the Louisville and Nashville Railroad to visit Mammoth Cave, was A. S. Packard, Jr., whose subsequent interest in biospeleology led him to publish 21 papers on cave animals, culminating in "The Cave Fauna of North America" *Mem. Natl. Acad. Sci. U.S. No. 1* (1886)]. Groups treated in the symposium were (i) opilionids (C. J. Goodnight); (ii) millipedes (Nell B. Causey); (iii) collembola (Kenneth Christiansen); (iv) pselaphid beetles (Orlando Park); (v) anophthalmid beetles of the family Carabidae (C. H. Krekeler and T. C. Barr); and (vi) silphid beetles of the genus *Ptomaphagus* (T. C. Barr). The concerted efforts of a number of collectors have within the past decade done much to make adequate series of American cavernicoles available to systematists, and thus to make possible this symposium.

A symposium on karst phenomena, arranged by William E. Davies, was co-sponsored with the Geological Society of America.

THOMAS C. BARR, *Program Chairman*

Zoological Sciences (Section F)

The Section F meetings at Indianapolis in 1957 were especially successful in the very wide coverage of subjects of the symposia and contributed papers. Most of the special fields of research interest of the large membership were represented in the program. The attendance was good throughout the program.

There were about 75 present for the first session of contributed papers selected for extended presentation on Friday morning, at which L. S. Dillon (A. & M. College of Texas) outlined a new statement of evolutionary relationships between microorganisms, higher plants, and animals, and R. H. Foulkes (St. Louis University) described the Vatican film library of historically valuable scientific documents being assembled at St. Louis University. At the symposium that evening before an audience of 200, W. R. Breneman (Indiana University) and his colleagues outlined for the nonspe-

cialist the current understanding of pituitary function.

On Saturday morning the regular session for contributed papers was attended by 40 to 75 members. The papers which drew the most interest, as indicated by the discussion, were those on electrophoretic analysis of animal sera as a method for determining relationship, by K. R. Woods (New York Hospital-Cornell Medical Center) and E. Paulsen and colleagues (Rutgers University), and the papers on radioactive isotopes in human cadavers by A. R. Schulert and A. Walton and their associates (Columbia University).

On Saturday afternoon the first session of the joint symposium with Section G on "Some Unsolved Problems in Biology" drew the largest attendance of the Section F meetings—nearly 300 members. This session consisted of six papers on the geographic distribution of contemporary organisms by P. S. Martin (University of Montreal), A. J. Sharp (University of Tennessee), H. H. Ross (Illinois Natural History Survey), W. F. Blair (University of Texas), K. C. Parkes (Carnegie Museum, Pittsburgh, Pa.), and E. L. Cockrum (University of Arizona). There was much discussion after each paper. It is expected that the papers at this session will be published in a single monograph. The second session of this symposium was held on Sunday morning, and it is being covered by the report of the secretary of Section G.

On Sunday afternoon members enjoyed a get-together in the headquarters room of the Society of Systematic Zoology, where many appreciated the opportunity to examine the excellent collection of books of all publishers in all fields of zoology assembled by the secretary of the society, R. E. Blackwelder. This recurring exhibit continues to be one of major interest to all biologists, and it should be encouraged.

On Sunday evening the annual zoologists' dinner was held under the joint sponsorship of Section F and the Society of Systematic Zoology. The challenging address of the vice-president of the AAAS for Section F, E. R. Hall (University of Kansas), was given after this dinner, on the subject "Conservation and the animal biologist." An interesting coincidence was that the subject was somewhat similar to that of the presidential address of the retiring president of the AAAS, Paul B. Sears. The two addresses covered different ground, yet they demonstrated that the theme of conservation is of major importance to biologists at the present time.

The Section F program was concluded with the two sessions on Monday on the subject of the effects and the social consequences of low-level irradiation developed by fallout from nuclear detonations.

This program was arranged by A. M. Brues and his colleagues of Argonne National Laboratory. The papers included the newest reviews of the scientific data from all angles, discussions of the responsibilities of the Public Health Service, of the press, of legislators (presented by Chet Holifield, Congressman from California), and an estimate of scientists' ethical responsibilities (given by C. W. Churchman). That this is still a subject of very widespread interest to scientists and the public was shown by the large attendance (100 at each session) and by the wide local press coverage at this and the Sunday afternoon sessions of AAAS on a similar subject, under the chairmanship of C. D. Leake. It is hoped that both of these programs will be published shortly.

HAROLD H. PLOUGH, *Secretary*

Society of Systematic Zoology (F2)

The Society of Systematic Zoology held its 10th annual meeting at Indianapolis. As usual, the activities centered around the book lounge, where there were displayed about 1000 books, representing the zoological output of nearly 90 publishers. This unique assemblage of books gives opportunities for close examination, comparison, and discussion of books that are not otherwise available. It again proved popular, especially among teachers at all levels.

A new feature was a special table of books published during 1957. The number of outstanding books in this category emphasized the extent of current commercial publication, just as the exhibit as a whole demonstrated both the great diversification of biology and the essential unity of its concepts.

A brief session for contributed papers demonstrated the interest of members in discussing the subjects presented and may lead to regular provision for more extended presentation of papers.

The future activities of the society were the subject of much planning, especially in the council meetings. There was determination to continue the society's interest in the broader aspects of biology, relating systematics to other fields. A new constitution was made ready for submission to the members, and many plans were made for an extensive program at the 1958 annual meeting, to be held with the AAAS in Washington, D.C., 27-30 December.

Other sessions were held in collaboration with the other biological societies present, and our member E. R. Hall gave the address at the zoologists' dinner as vice-president of the AAAS for Section F, on the subject "Conservation and the animal biologist."

R. E. BLACKWELDER, *Secretary*

Beta Beta Beta Biological Society (FG2)

Beta Beta Beta Biological Society held its biennial convention in Indianapolis, Ind., 27 Dec. 1957. This society is an affiliated society of the American Association for the Advancement of Science. The most important action taken at the business meeting was the election of a new president to succeed B. R. Weimer of Bethany College. Weimer had completed his two terms as president.

The new president is George H. Mickey, professor of biology at Louisiana State University. Mickey's field of research is cytogenetics. His doctorate is from the University of Oklahoma. He has been a Guggenheim fellow and has a distinctive research to his credit.

Following the luncheon of Beta Beta Beta at the Claypool Hotel, a large group of members listened to the address of Harry J. Fuller of the University of Illinois. His subject was "The psychology of plants."

MRS. FRANK G. BROOKS, *Secretary*

Biometric Society, Eastern North American Region (FG3)

The Biometric Society (Eastern North American Region) presented two sessions on 27 Dec. in Indianapolis as a part of the annual meeting of the American Association for the Advancement of Science. These sessions were cosponsored by the Ecological Society of America and the American Statistical Association. The first session, presided over by Boyd Harshbarger, was devoted to a special invited address, given by Sir Ronald A. Fisher (Cambridge University), entitled "Smoking and lung cancer: an example of the interpretation of statistical data in the observational sciences."

The second session, presided over by T. A. Bancroft, included seven contributed papers: "Cumulatively grouped response times in quantal response data," by Robert F. White (Iowa State College); "Some uses of statistical analysis in classifying races of the American shad (*Alosa sapidissima*)," by Donald R. Hill (Minnesota Mining and Manufacturing Company, St. Paul); "The analysis of groups of similar experiments," by Basilio Rojas (Iowa State College); "Estimation of risk when units are sacrificed periodically during the follow-up interval," by D. Kodlin (Graduate School of Public Health, University of Pittsburgh); "The use of idempotent matrices in regression problems involving linear restrictions," by John S. Chipman and Malempati Rao (University of Minnesota); "Monitoring and evaluating treatment effects in epileptics by a graphical sequential test," by Eugene A.

Johnson (University of Minnesota); and "The use of an inverse matrix in the analysis of crossbreeding data," by R. W. Touchberry (University of Illinois).

T. A. BANCROFT, *Program Chairman*
E. P. KING, *Chairman of Local Arrangements*

Ecological Society of America (FG4)

The concurrent sessions of contributed papers in plant ecology and in human, general, and animal ecology were noteworthy for the diversity of topics and for the wide geographic coverage of the research reported. Donald B. Lawrence presided over a botanical session in which areas ranging from the Arctic to Brazil were covered. In the session presided over by Orlando Park, zoological papers based on regions in Africa, Thailand, and the Caroline Islands were presented; this session included an outstanding report by Frank B. Golley on productivity in a Michigan old-field food chain. These sessions were each attended by approximately 80 persons.

Cutting across interdisciplinary boundaries, the session of invited papers on sexual behavior, under the chairmanship of John Emlen and sponsored by the society's section on animal behavior and sociobiology, attracted an audience of about 200.

Several symposia which were cosponsored by the Ecological Society of America were considered highly valuable by the large numbers of our membership in attendance. It will be the hope of all ecologists who heard the pertinent address of the retiring AAAS president, Paul B. Sears, that the address will receive the public attention that the times require for the thoughts presented.

ALTON A. LINDSEY, *Program Chairman*

National Association of Biology Teachers (FG6)

Over two hundred members of the National Association of Biology Teachers were in attendance at the annual meeting. The session on "Outdoor Biology" developed the need for more and better use of outdoor laboratories in the areas of soil studies, aquatic biology, ornithology, and ecology. Program participants included John Brainerd, H. Seymour Fowler, John C. Ayers, Walter H. Brown, Rex Conyers, and Robert Bullington.

Highlight of the luncheon, at which the new officers were installed, was the address on "Germ-free laboratory animals" by James Reyniers, director of the Lobund Institute, University of Notre Dame. The afternoon session was devoted to a symposium on "Teaching

Problem Solving in Biology" led by J. Darrell Barnard, with high-school teachers Dorothy Vaughn, Wallace Good, James Otto, and Elizabeth Crider contributing papers.

The association held two 1-hour sessions for the presentation of science-teaching films. These sessions were arranged by Emery Will. The association also cosponsored the joint symposium of all teaching societies on "Teaching the Major Concepts: Relativity, Evolution, and Individuality of Man."

The final day was spent on a joint field trip with the American Nature Study Society to Bradford Woods and to the headquarters of the American Camping Association, where members learned much of the natural history of the area from leaders Max Forsythe, Howard Weaver, and E. L. Palmer.

Other sessions included a membership committee meeting at which nine state chairmen were present, an open committee meeting on "Outdoor Laboratories" attended by 30 members, and editorial and executive board meetings. Plans were made to meet with the American Institute of Biological Sciences, at Bloomington, Ind., in August, and with the AAAS in Washington, D.C., in December.

IRENE HOLLENBECK, *President*

Botanical Sciences (Section G)

The program of Section G at Indianapolis represented a continuation of a tendency in a direction of symposia of wide interest to botanists and other biologists. This year a highly successful symposium on "Polarity, Heads or Tails?" was organized by Dr. A. C. Leopold (Purdue University), who presided. A series of searching papers on this important phenomenon was presented before an audience of more than 100.

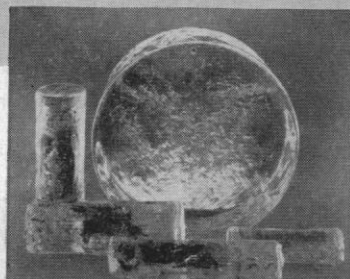
On the following day Section G, together with Section F, held the second of what promises to be a series of annual symposia on "Unsolved Problems in Biology," the first of which was held in 1956. In this symposium speakers directed attention to unresolved issues in a series of major problems of interest to biologists. The papers were well received and provoked a good deal of interesting discussion. Attendance amounted to several hundred. There appears to be good reason to continue this type of symposium in the future.

A high point of the meeting was the annual Botanists' Dinner, the success of which was largely due to the efforts of M. T. Hall (Butler University). About 80 botanists and friends attended to hear the retiring chairman of Section G, Harry J. Fuller (University of Illinois), present a delightful account of

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some of his incisive thinking on botanical teaching. In addition to the foregoing the section program included 17 contributed papers which were presented at two separate sessions.

BARRY COMMONER, *Secretary*

Psychology (Section I)

The program at Indianapolis, like those of recent years, consisted of a vice-presidential address and six symposia on research of current interest. Neal E. Miller (Yale University) delivered the vice-presidential address on "Experiments on fear and conflict." The symposia of invited papers were on the general topics of human engineering, psychopharmacology, early experience, psycholinguistics, signal detection, and statistical learning theory. The section plans to present about the same kind of program, but on different topics, at the Washington meeting in 1958. The vice-president for 1958 is B. F. Skinner (Harvard University), and the new committeeman-at-large is L. H. Lanier (University of Illinois).

CLIFFORD T. MORGAN, *Secretary*

Social and Economic Sciences (Section K)

The program of the AAAS Section on Social and Economic Sciences at the annual meeting in Indianapolis included, for the first time, participation by all four major social science organizations—the American Economic Association, the American Political Science Association, the American Sociological Society, and the American Statistical Association. Another first for the section was registered by a successful session for contributed papers as a climax to the general program.

The American Economic Association, the National Academy of Economics and Political Science, and Section K, with the National Social Science Honor Society Pi Gamma Mu collaborating, presented a symposium on "Social Aspects of Urban Agglomeration. The final address of this session comprised the vice-presidential address of Stuart A. Rice (Stuart Rice Associates). The other participants in the session were Luther H. Gulick (Institute of Public Administration) and Coleman Woodbury (University of Wisconsin), with Carroll L. Christenson (Indiana University) presiding on behalf of the American Economic Association. The papers of this meeting were of exceptional quality, and the provocativeness of the speakers prompted lively comment in the discussion period.

The American Political Science Association conducted a symposium on

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CONTRIBUTORS—Jerome S. Bruner, Egon Brunswik, Leon Festinger, Fritz Heider, Karl F. Muenzinger, Charles E. Osgood, David Rapaport. Work in cognition has received little professional attention in recent years, and it is the purpose of this book to stimulate research in the field through the presentation of the studies of six noted psychologists. Among the papers: Scope and Aspects of the Cognitive Problem; A Behavioristic Analysis of Perception and Language as Cognitive Phenomena; The Relation Between Behavior and Cognition; Trends in Cognitive Theory. Illustrated. \$4.00

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"Studies in Electoral Behavior" in a joint session with the Midwest Conference of Political Scientists and Section K. Papers were presented by James A. Robinson (Congressional fellow of the American Political Science Association) and Warren E. Miller (University of Michigan). Discussants were Jean Driscoll (University of Wisconsin), Frank Munger (Syracuse University), and Philip S. Wilder (Wabash College). Charles S. Hyneman (Indiana University), who arranged the program, presided.

A symposium on "Current Research on Population" was presented by the American Sociological Society, jointly with Section K. An exceptionally distinguished group of authorities on population problems gave papers and contributed to the discussion. These included Philip M. Hauser and Otis D. Duncan (University of Chicago), T. Lynn Smith (University of Florida), Pascal K. Whelpton and Arthur A. Campbell (Miami University), and Ronald Freedman (University of Michigan). The presiding officer of this session, and the arranger of the program, was Vincent H. Whitney (Brown University). The American Sociological Society, along with Section K, also cosponsored the program of the American Psychiatric Association on "Rehabilitation of the Mentally Ill: Social and Economic Aspects, Parts I-IV."

The American Statistical Association and Section K cosponsored an address by P. E. Irick (AASHO Road Test) on "A statistically designed highway experiment." Discussant on this program was C. F. Kossack (Purdue University); H. W. Norton (University of Illinois) presided. A second address featured C. R. Hicks (Purdue University) on "Application of a mathematical model in plastic tooling research." Discussants were E. P. King (Eli Lilly and Company) and I. W. Burr (Purdue University). Presiding was D. L. Cheak (U.S. Naval Ordnance, Indianapolis).

The American Statistical Association also cosponsored a special address with the Biometric Society and the Ecological Society of America, given by Sir Ronald A. Fisher (Cambridge University) on "Smoking and lung cancer: an example of the interpretation of statistical data in the observational sciences." Presiding at this session was Boyd Harshbarger (Virginia Polytechnic Institute). In addition, a joint session for contributed papers of the American Statistical Association and the Biometric Society was held, with T. A. Bancroft (Iowa State College) presiding. The program chairman for the sessions of the American Statistical Association was Virgil L. Anderson (Purdue University).

The session for contributed papers of Section K entertained papers presented by Charles G. Hamilton (College of the



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Ozarks) on "Southern public opinion and the Supreme Court," Fred Masserik (University of California) on "Understanding others: theory and research on a cultural *leitmotif*," and Harold Garfinkel (University of California) on "A study of decision-making in complex situations: an analysis of one chess tournament." Donald P. Ray (National Academy of Economics and Political Science), secretary of the section, presided. The success of this session of contributed papers indicates this type of presentation will be useful at future meetings as part of the sectional program. The occasion can provide an approach, at least, to

limiting the problem of overspecialization among, as well as within, the fields of social science.

The Metric Association, an affiliated organization in Section K, presented a round-table discussion on "Metric Implementation in Pharmacy, Medicine, and Chemistry," held jointly with AAAS Section Np-Pharmacy. John T. Johnson (University of California) presided. Other sessions in which Section K participated were "Science, Technology, and General Welfare in a Capitalistic Society" with AAAS Section P, together with the vice-presidential address of this section; and the joint symposia series of

the Society for the Advancement of Criminology, the Association for the Psychiatric Treatment of Offenders, and the Institute for Research on Crime and Delinquency.

The section officers are deeply appreciative of the efforts of all who participated in the section program and made the Indianapolis sessions a notable success.

Two joint sessions were held by the section during the past year with the regular spring and fall sessions of the National Academy of Economics and Political Science at the Brookings Institution in Washington, D.C. The spring sessions were on "The Middle East and Free World Security," and the fall sessions on "The Economy of the U.S.S.R." The National Social Science Honor Society Pi Gamma Mu collaborated with the National Academy and Section K in these meetings. The proceedings have been published by the National Academy.

Section K was fortunate in 1957 to have had the leadership provided by the distinguished social-statistician, Stuart A. Rice, as chairman. This year the equally distinguished economist, Joseph J. Spengler (Duke University) will serve as chairman, and another eminent economist, Solomon Fabricant (National Bureau of Economic Research), will begin initial service as a member-at-large of the section committee.

DONALD P. RAY, *Secretary*

American Sociological Society (K4)

Population analysis and change, referred to in various other section meetings and in Paul B. Sears' presidential address, received direct attention in three papers presented during a symposium on "Current Research on Population." Philip Hauser and Otis Dudley Duncan (University of Chicago) presented materials on demography as a science from the forthcoming volume *The Study of Population: An Inventory and Appraisal*. They concluded that demography fits the criteria for an observational science and that, despite the early stage of development of its data, methods, and accumulated knowledge, it can offer explanation and prediction of events at least in the short run.

T. Lynn Smith (University of Florida) demonstrated that official data on fertility are generally defective or lacking in Latin America. Presently the best approximations are obtained through the use of fertility ratios. Fertility is clearly very high throughout the area and is likely to remain so for several decades. Fertility in rural areas is generally higher than that in urban areas and, in Brazil at least, fertility rates for whites exceed those for colored.

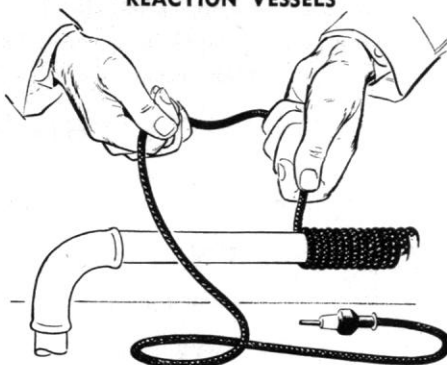
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P. K. Whelpton (Scripps Foundation), with Arthur Campbell and Ronald Freedman, reported on a national probability sample of married white women, aged 18 to 39, in terms of their fecundity, sterility, use of contraceptives, and expected family size. The study was undertaken in part to provide needed understanding of the extent to which the higher postwar fertility in the United States reflects an increase in family size as opposed to a mere change in the timing of marriages and births. The latter appears to be the more important; nevertheless, family size, as measured by completed fertility, may be rising by nearly one child over prewar levels.

VINCENT H. WHITNEY,
Program Chairman

American Statistical Association (K5)

During the morning session of the American Statistical Association there were 25 people present. The room had very adequate facilities—in fact, two chalkboards were made available for this session. The program was very stimulating. P. E. Irick presented the material on "A statistically designed highway experiment" in an excellent manner, and the audience participated actively. The paper was 1 hour in length; the formal discussion and the audience discussion took another hour and three quarters. The whole problem of highway experimentation by means of statistical designs and techniques should be of interest to every citizen when one considers the size of the highway projects in the United States. Just this relatively small project is costing over \$15 million.

The afternoon session, on "Application of a mathematical model in plastic tooling research," was poorly attended; this was disappointing because the Indiana Chapter of the ASA, as well as the ASQC, had indicated an interest in this subject. I suspect that the scheduling of sessions on a Saturday afternoon is not conducive to attendance, especially if people are not paid by their companies to attend sessions during this time. This conclusion is a bit disturbing but, I believe, realistic. Anyway, the session was modified a bit because only professional people were present and the paper had been written primarily for engineers, who could apply the statistical techniques to their problems.

VIRGIL L. ANDERSON,
Program Chairman

History and Philosophy of Science (Section L)

In 1957 Section L was greatly handicapped by the illness of its secretary, Jane Oppenheimer, who broke her hip.

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However, good friends of the section in the AAAS headquarters and in other sections lent support, and at the annual meeting Section L held two sessions on Sunday, cosponsored by Section Np (Pharmacy) and the Philosophy of Science Association, and one session on Monday, cosponsored by the Philosophy of Science Association.

The Sunday morning symposium, "Can Science Provide an Ethical Code?", presided over by Hermann J. Muller, was exceptionally well attended. Because Henry Margenau was ill, his paper was read by Lewis K. Zerby. The answer to the symposium question is "yes," as was ably argued by the speakers, who included Chauncey D. Leake and Richard Rudner. The prepared papers were followed by general discussion.

Each of the three very different papers of Sunday afternoon—on Albertus Magnus' scientific method by Father William H. Kane, on pharmaceutical manufacturing by K. K. Chen, and on the thermometric scale by D. J. Lovell—was followed by questions which served to bring further elucidation from the speakers. Norwood Russell Hanson presided.

On Monday morning, a view of man-machine systems, presented by George O. Wright, was followed by a survey by Dorrit Hoffleit of astronomy's development in the 20th century and by a talk by Karel Hujer describing the emphasis on dialectical materialism in the treatment of the physical sciences behind the iron curtain. I. Bernard Cohen's vice-presidential address on "The history of science and the problems of understanding the science of today" concluded the series of papers. C. Doris Hellman presided.

At a business meeting immediately following the papers, regret at Jane Oppenheimer's illness was expressed, and the names of the new section chairman, Carl B. Boyer, and the new committee-member-at-large, Adolf Grünbaum, were announced. It was reported that a national committee for the history and philosophy of science was being formed under the auspices of the National Academy of Sciences-National Research Council and that this committee would become the adhering body for the International Union of History and Philosophy of Science.

C. DORIS HELLMAN, *Acting Secretary*

A. Rapoport) was concerned with the conditions under which Prigogine's theorem of minimum entropy production could be applied to nonisolated systems of known internal structure. It was shown that, if a minimum exists, certain constraints upon the topological arrangement of the feedback loops are implied. M. Kochen presented a procedure for treating an organized system with discrete, synchronized information transfer between its parts, formalizing certain aspects of cooperative group behavior so that it is possible to describe how sub-units can be selected and interconnected so as to produce a system with specified behavior.

K. E. Boulding took up the implications of such efforts in his presidential address. He suggested that four levels of systematic knowledge could already be discerned, including (i) purely empirical systems based upon constant interaction; (ii) maps, and blueprints, and plans; (iii) systems used for the design of artifacts; and (iv) theoretical models which explain and predict the "inner workings" of the other systems. General systems research aims at a fifth level—systems of theoretical systems. As these are found, it is expected that marked economies would result in work directed at the first four levels. This should have important consequences in the conduct of the affairs of national states.

As long as the possessors of scarce knowledge were restricted to physical and biological systems, the skills for operating the state could be purely empirical (for example, politics, business, and law) and scientists would perform as specialized experts. But with progress in operations research, administrative science, and other general systems approaches, a conflict may be foreseen between the "folk" culture and the scientific subculture embedded in it.

How do "the people" control the specialists? Democratic theory is based upon the assumption that the kind of knowledge required for government is not scarce or difficult. Are we doomed to another Middle Ages, with Science as the Church and the Military as the King? A growing self-consciousness of science itself as a social system may offer means for resolving such conflicts and preventing such eventualities.

RICHARD L. MEIER, *Secretary-Treasurer*

Medical Sciences (Section N)

This program was the first symposium on the human integument that had been arranged before an AAAS meeting. The title was "The Human Integument—Normal and Abnormal." The program was organized as a symposium with four half-day sessions, jointly with the AMA

General Systems Research (L2)

Two of the contributions to the symposium, "Organization for Humans, Cells, and Artifacts," were basically mathematical. A paper by C. Foster, A. Rapoport, and E. Trucco (presented by

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The first session was on "The integument as an organ of protection." In this session considerable attention was given to the cells forming the barrier to absorption of various molecular structures. A very interesting and informative paper by Robert D. Griesemer (Harvard Medical School) (outlined in terms of the physical chemistry of membranes some of the problems related to the transfer of molecules across the skin barrier. It was clearly evident from the discussion how anatomical considerations make precise studies of this nature very difficult.

In the second session of the symposium, "Circulation and vascular reactions," Benjamin W. Zweifach (New York College of Medicine) outlined some very fascinating experimental studies on the hemodynamics of skin circulation and the pharmacological effects produced by toxins and drugs such as epinephrine, which is a well-known vasoconstricting substance, and a very interesting synergistic action between epinephrine and bacterial toxins in tissues which had been depleted of histamine and serotonin was described. Alan C. Burton (University of Western Ontario) reviewed the physiological considerations of cutaneous circulation.

In the third session of the symposium, "Sebaceous gland secretion," Eugene J. Van Scott (National Institutes of Health) described with beautifully illustrative slides the anatomical structures of the skin and subcutaneous tissues, with particular reference to sebaceous glands. Differences between skin taken from different parts of the body in relationship to the etiology of acne vulgaris were discussed. Allan L. Lorincz (University of Chicago), in a paper describing the biochemical-hormonal aspects of sebaceous secretion, outlined investigations which gave relatively strong evidence that a sebaceous factor exists in secretions of the anterior pituitary.

In the last session, on the "Pathogenetic factors in premalignant conditions and malignancies of the skin," Raymond R. Suskind (Kettering Institute, Cincinnati, Ohio), discussed accelerator substances in the production of skin cancer, showing how certain chemical substances frequently used as solvents, when employed in proper sequence, considerably potentiate the carcinogenic action of well-known coal-tar hydrocarbons.

ALLAN D. BASS, *Secretary*

Dentistry (Section Nd)

Two half-day sessions and one evening session were held by Section Nd; the average attendance was 60. Each of the sessions was devoted to discussions of

recent studies of possible deleterious effects on general health of fluorides as used for the prevention of dental caries. Thirteen papers were presented.

Specific studies were reported on the relation of fluorine intake to enzymes, lipid metabolism, periodontal tissues, and the human skeleton. No significant effects in any of these areas were observed for daily intakes below five parts per million. No toxic effects resulting from communal water fluoridation have been found. Public health surveys covering 32 pairs of cities and thousands of people showed no relation of fluoridation to mortality or to the occurrence of heart disease, cancer, nephritis, and other diseases. Studies related to the sources of fluorine and its excretion from the body were also reported.

The legal counsel of the American Dental Association stated that, in every state in which the legality of water fluoridation has been challenged, it has been established by every state supreme court. The United States Supreme Court has refused to review the actions of the lower courts in the four instances in which the ruling has been appealed.

In none of these presentations was there reported any evidence that questioned the safety or advisability of adding fluoride to communal water supplies.

The consensus of the symposium was expressed by Harold Hodge when he said, "The safety of water fluoridation is sufficiently assured. We recommend that communities proceed to adopt it."

Section Nd also cosponsored and participated in a program on "Premedical and Predental Education" given by Alpha Epsilon Delta.

R. W. BUNTING, *Secretary*

Pharmacy (Section Np)

Section Np held nine sessions, 27-30 Dec., at Indianapolis. A total of 26 contributed papers on original studies were reported, and one round-table discussion and two symposia were held. Over 200 persons registered as having attended one or more of the section meetings.

The AAAS Council, the governing body of the association, elected George F. Archambault, chief of the Pharmacy Branch of the U.S. Public Health Service, as vice-president of the Association and elected J. V. Swintosky, of the Smith, Kline and French Laboratories, to serve on the committee-at-large of the section for a 4-year term. Archambault will also serve as chairman of the section for the coming year.

Of considerable interest was the symposium on "A Pharmacological Approach to Mental Illness," which attracted interest outside the pharmaceutical group in attendance. Various aspects of the pharmacology of mental ill-

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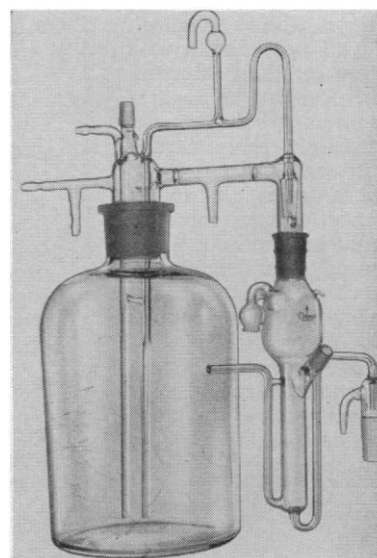
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ness were discussed by five experts in the field. J. I. Nurnberger (Indiana University) served as moderator. I. H. Slater (Lilly Research Laboratories) discussed the general pharmacological aspects. T. Verhave (Lilly Research Laboratories) discussed animal behavioral studies of drugs used in mental illness. N. S. Kline (Rockland State Hospital, Orangeburg, N.Y.) discussed clinical studies of the important drugs used in mental illness. J. Cole (National Institutes of Health) discussed the function and operation of the recently formed Psychopharmacology Service Center at NIH.

R. C. Anderson (Eli Lilly and Company), chairman of the section, opened the contributed papers sessions. The papers presented were of unusual merit. G. I. Jenkins and coworkers (Purdue University) reported on the synthesis of a series of diphenic acid derivatives. The synthesis of epoxide polymers of steroidal compounds was discussed by W. F. Head (Eli Lilly and Company) and W. M. Lauter (University of Florida). H. Schriftman (Wyeth Institute) presented a method of analysis of phenylephrine by use of filter paper chromatography. D. E. Cadwallader (University of Florida) discussed the effect of salts on the permeability of red corpuscles. G. S. Banker and J. E. Christian (Purdue University) presented radioactive tracer techniques for studying the uniformity of distribution of ingredients in tablet matrices. Methods for the measurement of the particle size of powders were reported by J. V. Swintosky. Gastric and intestinal absorption of penicillin was discussed by R. O. Froman, R. C. Anderson, and C. C. Lee (Lilly Research Laboratories). O. B. Myres (Butler University) presented information on the gastrointestinal absorption of isoniazid, PAB, and promizole. C. N. Rice (Eli Lilly and Company) discussed the lymphatic absorption of β -sitosterol and cholesterol. The tissue distribution of salicylamide and the oxidation metabolites of salicylates were reported by W. F. Bousquet and J. E. Christian (Purdue University) and R. E. Crabtree (Eli Lilly and Company).

The Hospital Pharmacy group had a very informative and well-attended full-day session under the direction of G. F. Archambault (U.S. Public Health Service) and J. A. Oddis (American Hospital Association). Representatives of a number of organizations were present and participated in the meeting, discussing several important subjects of direct interest to the hospital pharmacist, including legal and other implications in the labeling of nursing station medication containers, local poison control centers, legislative controls over hospital pharmacy at the state level, hospital pharmacy committees, economics and the profession, and several other

questions. A symposium on "Recent Trends in Medication" included the following participants: C. J. York (Pitman-Moore Co.) spoke on tissue culture; R. H. Behnke (Veterans Consolidated Hospitals) spoke on drug therapy in cardiovascular disease; H. D. Bryan (Mead Johnson & Co.) presented recent trends in pediatric medication; and R. C. Bogash (American Society of Hospital Pharmacists) discussed compatibilities of intravenous and intramuscular admixtures. Luncheon, entertainment, and dinner were sponsored by Eli Lilly and Company, Mead Johnson & Company, and McKesson and Robbins, Inc., respectively.

On Sunday, 29 Dec., the Pharmacy Section held joint sessions with the Sec-

tion on the History and Philosophy of Science and with the Philosophy of Science Association, during which a symposium, "Can Science Provide an Ethical Code," was held.

Ralph W. Ernberger (Eli Lilly and Company) presented a paper on how metric advantages can be and have been implemented in pharmaceutical manufacturing. This was followed by a round-table discussion moderated by J. T. Johnson, president of the Metric Association. R. J. Dille, R. W. Ernberger, J. F. Hollings, J. E. Schneider, and R. G. Weigel participated in the discussion.

Eli Lilly and Company sponsored a luncheon and tour of the pharmacological research facilities on Monday.

JOHN E. CHRISTIAN, *Secretary*

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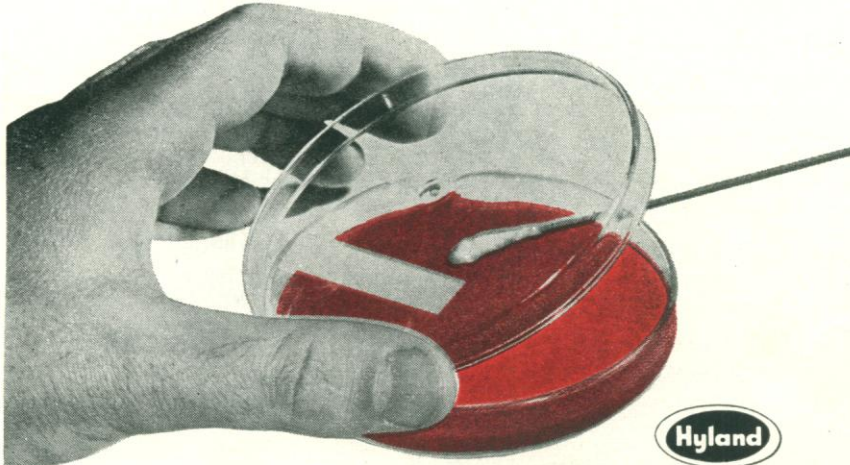
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Agriculture (Section O)

"Biological and Chemical Control of Plant and Animal Pests" was the theme of the 1957 meetings of Section O. The section chairman, Louis P. Reitz (U.S. Agricultural Research Service), arranged a four-part symposium which provided for a rather full discussion of the topic by outstanding workers from the United States, Canada, and Sweden.

The first session covered recent advances in chemical control measures. Included were papers on insecticides, herbicides, fungicides, and bactericides, as

well as on systemic antibiotic chemicals. "Recent advances in biological control measures" were discussed in the second session. There were papers on parasites, predators, pathogens, and irradiation for pest control. Forest insects and diseases were discussed at this session.

Another part of the symposium was devoted to "Inherent resistance to pests," including animal diseases, plant insects, and diseases of field and horticultural crops. One paper covered the relation of host nutrition to pest reaction. The final session included such subjects as biological balance, exclusion and eradication,

education in the use of pesticides, and effects of regulatory control on evaluation of safety and suitability of chemicals. Twenty-one well-prepared papers were presented at the four sessions. Those who attended the meetings were able to get a good understanding of recent developments in the very important field of pest control. As the papers were presented it became evident that, to be successful, all available methods of control must be used. It was also pointed out that, in spite of rapid advances, much more basic research is needed if the pests of the future are to be controlled.

The new AAAS-Campbell Award for Vegetable Research was presented to S. H. Wittwer and F. G. Teubner (Michigan State University), for their basic and applied research on flower formation and fruiting in tomato. The award consisted of \$1500, and a bronze medal was presented by Reitz.

Interest in the topics under discussion was maintained throughout the four sessions, and it is unfortunate that more people were not in attendance.

K. S. QUISENBERRY, *Secretary*

Industrial Science (Section P)

At a dinner on Thursday, 26 Dec., the Section's Annual Industrial Science Achievement Award was presented to P. R. Mallory and Co., Inc., Indianapolis, Ind., in recognition of the development of a new powder metallurgy process, Steelmet, which promises to have widespread industrial application. F. R. Hensel, vice president in charge of engineering, accepted the award on behalf of the company. Harold Sigurdson, director of research and engineering for the Metallurgical Divisions, presented a technical paper describing the new process.

The Friday symposium, arranged by Allen T. Bonnell (Drexel Institute of Technology), section secretary, and chaired by Frank C. Croxton (Battelle Memorial Institute), section chairman, was entitled "Science, Technology, and General Welfare in a Capitalistic Society."

Louis C. McCabe (Resources Research, Inc.) stated that, because of the current shortage of scientific and technological manpower, "general welfare does not fare well." Public agencies are not adequately staffed to set standards for industry, and the drive for competitive advantage often leads companies to introduce products and processes which are harmful, immediately or cumulatively. Urbanization and industrialization have given new dimensions to old pollution problems, and a new pattern of controls is in order.

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and Tube Company), in a review of one industry's program for reducing stream pollution, pointed to the need for accurate fact-finding as a preliminary to further public regulation. Much of the data needed to guide public regulation can be developed by the interested industries. This is one of the challenges to industries, one which they must attempt to meet if they are to be certain that the regulations ultimately adopted accomplish, most economically, the desired objectives.

G. E. Kimball (Arthur D. Little, Inc.) was of the opinion that it was impossible to "maximize profits and to maximize public welfare" simultaneously. Modern management is beset by many problems of which the safeguarding of public welfare is only one. Since the goal of management is now the maximum long-run profit, corporations now have incentive to adopt self-constraint in matters affecting public welfare, especially since a failure to do so may invite external restraints. Eventually, the public must pay the cost of programs designed to enhance public welfare, either in the form of taxes or higher prices.

The Industrial Science Section vice-presidential address was given by Monroe E. Spaght (Shell Oil Co.) at the annual luncheon meeting following the symposium. In discussing "The companies we keep," Spaght traced the historical evolution of the modern corporation and stressed the fact that the unlimited life of the "corporate" citizen tended to impose new responsibilities of "corporate citizenship."

ALLEN T. BONNELL, *Secretary*

Society for Industrial Microbiology, Washington Section (P2)

The Washington Section of the Society for Industrial Microbiology sponsored a symposium on 28 Dec. on "Some Areas in Industrial Microbiology" in conjunction with Section P. A group of papers showed the panorama from fermentation, an old industry in which all operations are essentially industrial microbiology, to mining, another old industry but one in which microbial research is just beginning to be used. W. D. Stewart (Atlantic Research Corporation) presided.

J. E. McClary (Anheuser-Busch, Inc.), in reviewing "Microbiology in the fermentation industries," pointed out that fermentation is the oldest microbial industry and that its microbial problems are similarly the oldest. Present problems include obtaining clean, bright grain, storing it to avoid deterioration, and processing it without damage to quality by microbial contamination.

"Microbiologists in the prevention of

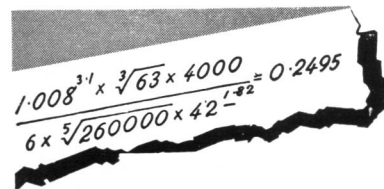
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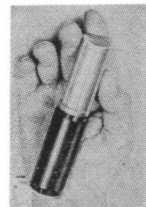
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deterioration" was discussed by Carl J. Wessel (Prevention of Deterioration Center). Damage to materials, particularly in vessels, has been recognized since Biblical times, but this line of work has become a separate discipline, primarily because of the losses of military equipment which have occurred during the past 20 years. Approaches to the problem of preventing damage can be made by fungitoxic treatments, choice of naturally resistant materials, and special design to avoid conditions that favor deterioration.

J. M. McGuire (Lilly Research Laboratories) talked on "Industrial microbiology in the pharmaceutical industry." He noted the trend from immunologic work to chemotherapy (with the introduction of sulfonamides and antibiotics) and now toward microbial manufacture of acids, vitamins, and steroid hormones. Views were shown of detailed procedures, from the isolation of soil organisms to the detection, identification, manufacture up to the pilot-plant stage, and testing of antibiotics from the isolates.

"Microbial research in the bureau of mines" was summarized by Walter N. Ezekiel (U.S. Bureau of Mines). Exploratory studies are under way on the microbiology of coal, on the use of bacteria to recover hydrocarbons from oil shale, and on microbial metallurgy which might provide new approaches for obtaining metals from low-grade ores.

WALTER N. EZEKIEL, *Program Chairman*

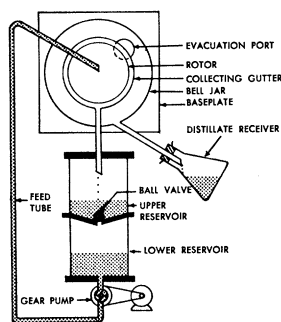
Education (Section Q)

As in preceding years, Section Q cooperated with other agencies in cosponsoring programs of mutual interest. Section Q joined with the International Council for Exceptional Children to present two programs. A session of contributed papers and a panel presentation on "Problems of gifted children," were held. The latter program was especially timely in view of the recent emphasis on better education for the talented. The American Educational Research Association and Section Q also cosponsored programs of contributed papers. The first session was devoted to problems pertaining to higher and adult education, the second to problems of learning and motivation.

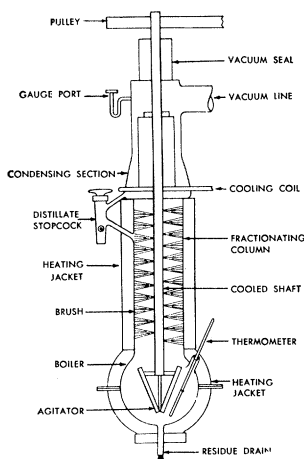
The AAAS Cooperative Committee joined with Section A (Mathematics) and the National Council of Teachers of Mathematics to present a symposium on mathematics instruction. The teaching societies NSTA, NABT, NARST, and ANSS presented an outstanding series of meetings and tours, which were well attended.

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in Section Q. J. Hartt Walsh presented a paper on "The Federal Constitution and judicial philosophy." The vice-presidential address by Arthur E. Traxler was devoted to "An appraisal of American colleges on the basis of men graduates listed in *Who's Who in America*." A business meeting was held after the two addresses. Considerable time was devoted to the discussion of Section Q's function and to the nature of some of the programs which it might be profitable to develop for future meetings.

HERBERT A. SMITH, *Secretary*

Conference on Scientific Manpower (X5)

The theme of this year's Conference on Scientific Manpower was "Scientists and Scientific Research in a Changing Economy." Both morning and afternoon sessions were held on 30 Dec.

Robert C. Turner (Indiana University) presided at the opening session, which included three papers. Yale Brozen (University of Chicago), in discussing the relation of scientific advance to economic change, noted the rich returns to private investors from applied research and suggested that Government funds be concentrated on fundamental research. Julian W. Feiss (Kennecott Copper Co.) emphasized that the new functions being undertaken by scientists had important implications for education to improve training; for government to support education without restricting academic freedom; for industry to assure proper utilization and adequate compensation; and for the scientists themselves to assume positions of public responsibility and leadership. William D. Carey (U.S. Bureau of the Budget) presented a thoughtful paper on "The support of scientific research." After showing the increasing Government support of scientific research, he proposed experimentation with long-range research goals as opposed to a year-by-year determination of program. The intimate relationship between science and national security he believed to be a cause for concern.

The afternoon session, concerned with papers on training and salary levels of scientists, was presided over by Ralph E. Cleland (Indiana University). Herbert E. Longenecker (University of Illinois) spoke of "New dimensions in training scientists" from the standpoint of students, the body of knowledge to be taught, faculty, facilities, and what might be termed some of the "hard realities" in which the educational process operates. Ralph E. Bennett (General Electric Co.) discussed the variety of methods by which industry currently supports training in science and technology; he was hopeful that the challenge to our position of scientific lead-

ership is now being recognized in the home. Thomas J. Mills (National Science Foundation) presented some comparisons between scientific salaries and other economic measures and questioned whether the salary rewards of scientists and engineers might not be a limiting factor on the desired expansion of these professions.

The papers delivered at the conference will be published by the National Science Foundation. A limited number of copies will be available for distribution by that agency.

THOMAS J. MILLS, *Program Chairman*

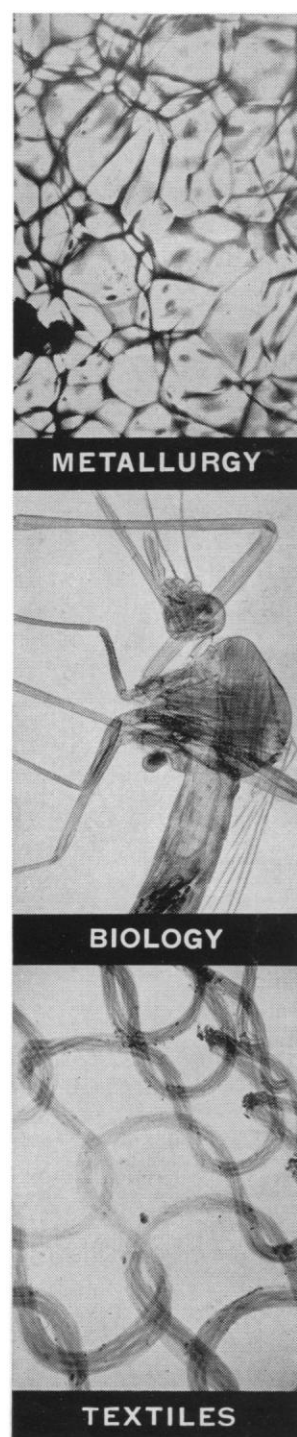
Forthcoming Events

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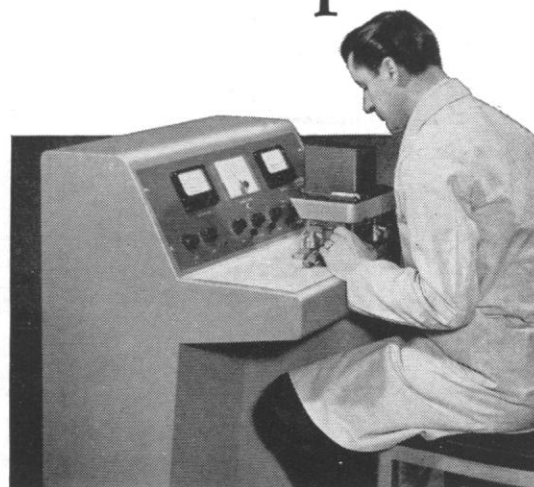
20-22. Michigan Acad. of Science, Arts and Letters, annual, Ann Arbor. (R. F. Haugh, Dept. of English, Univ. of Michigan, Ann Arbor.)

20-22. Pulmonary Circulation Conf., Chicago, Ill. (Wright Adams, Chicago Heart Assoc., 69 W. Washington St., Chicago 2.)

20-23. International Assoc. for Dental Research, annual, Detroit, Mich. (D. Y. Burrill, Northwestern Univ. Dental School, 311 E. Chicago Ave., Chicago, Ill.)



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