SCIENCE

28 March 1958, Volume 127, Number 3300

Meeting of Minds

A convenient property of the five problems discussed by the recent AAAS-sponsored Parliament of Science is that they all admit of much the same answer. In each case something about science needs to be increased or improved or both—its support, its organization, its communication, its students, its teachers. But this is just to recognize the present need to help science help the nation. A balancing of other considerations comes into play in deciding upon the best means to achieve these ends. And so on 15, 16, and 17 March the parliament was held. And accordingly, it proved to be a lively, if sometimes frustrating, gathering.

The question of means most hotly debated was that of defining the proper place of the Federal Government in research and education. Some participants urged increased federal aid. Others argued that responsibilities in this area belong to the state and local governments and to private agencies. But whatever position members took on this and similar matters, all were at pains to distinguish between questions of policy and questions of fact and between their roles as citizens and their roles as scientists.

To arrive at a set of recommendations, the parliament, which numbered something like 100 members, split up into five working subgroups, one for each of the problems tackled. The subgroups then reported back to the collected assembly with sets of proposals, which were discussed and put to vote. Although the parliament constituted a distinguished and representative body of scientists and thinkers, it did not claim to speak for any group other than itself. In fact, it spoke only for its own majority, for the rules of the meeting did not insist upon unanimous agreement. Among the final recommendations was one opposing the creation in the Government of a separate Department of Science and another endorsing the coordinating function of the National Science Foundation. The official report of the parliament is now in preparation and will appear in a subsequent issue of Science.

As a first effort at this kind of operation, the parliament experienced several difficulties. One difficulty arose from the large size of the working groups and the shortness of time. The result was that, in the interests of agreement, important details of how much, of where, and of when had to be left unspecified. Another difficulty arose from the parliament's attempt to address a very broad audience. The result was that considerable effort was devoted to saying a lot of things that most of its members would ordinarily have taken for granted. The fear was that if the parliament came out in favor of A, without mentioning B, in which it was also in favor, then some people might interpret the omission of B as the rejection of B.

How effective was the parliament in helping science help the nation? Certainly, it gave the participants an opportunity to benefit from each other's knowledge and experience. And certainly, it served as a demonstration that the scientific community, and in particular the AAAS, is much concerned about the problems of fostering and utilizing science. But any full evaluation of the impact of the parliament will have to await future developments. We shall have to see whether any of its more specific recommendations find their way into public policy, and, if so, how they work out.—J. T.
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Letters

Plan for Producing Significant Research

The appearance of man-made moons, shot up from the U.S.S.R., dramatically highlights the problem of the development of new knowledge in the United States. The situation can be summed up with the statement that the professional, as a rule, beats the amateur. In the modern sense, we have neither positions nor institutions whose primary task is to develop new knowledge. Thus, we have no professional science. We have a fairly good training program for developing scientists, but, after they have been trained, we have no positions for them as creative scientists. They are either employed by industry to develop commercial products or in medical institutions to find a cure for some disease, or they may obtain a teaching position at some university. In all these places creative research occupies a secondary role. The net return of fundamental knowledge compared to the talent invested is insignificant.

Until recently, this method worked, but the development of the professional scientist in the Soviet Union, placed in institutions whose primary object is to develop new knowledge, renders our present method as obsolete as was the bow and arrow when gunpowder was invented and applied to warfare.

Historically, there has been one example of a professional science organization in the United States, established by private funds. In 1902 the Rockefeller Institute for Medical Research was organized for the development of new knowledge. In the next few years, about twelve key men were employed to search for new knowledge in the medical area. Each one of these men had an appropriate number of associates, assistants, and technical services; the administration's role was to create psychological and physical conditions which would stimulate the development of new knowledge. The salaries paid these men were ample to provide a high standard of living. The accomplishments of these few men, during 25 years of operation under this system, changed medical history throughout the world. To cite a few examples: D. D. van Slyke, practically single-handed, created the science of clinical chemistry which is now an integral part of medicine and has saved innumerable lives. Karl Landsteiner established the knowledge of blood-groups and immunochemistry. This laid the foundation for blood transfusions and a better understanding of vaccination. The indications are that this fundamental work will continue to serve as a reservoir for other practical applications. Alexis Carrel contributed significantly to the field of tissue culture, from which an untold number of discoveries were derived; the Salk vaccine is based on this knowledge. P. A. Levene, a giant intellect, elucidated the structure of nucleic acid, which is the basic unit of heredity and viruses and which is involved in the synthesis of proteins. J. Loeb laid a better foundation for the understanding of proteins, which are the key materials of life.

Later, this program became diluted by a departure from the original principles, resulting in a lowered production of basic knowledge, and thus this scientific institution, although still outstanding, no longer serves as an example of an ideal professional scientific organization. This example serves to illustrate, however, that science on a professional basis in a free society will be highly creative.

The proposal which I have in mind is to establish productive scientific study organized around a relatively small number of unusually gifted investigators—about a hundred of them in each of ten new institutions covering various branches of knowledge. Each one of these scientists should have an appropriate number of assistants and, in addition, should have
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I agree with Heller and Gournay that the "erection of artificial barriers between research groups cannot but hinder the progress of all." Indeed, this fact is finally being realized even by many non-scientific individuals and is presently the subject of much discussion. However, Heller and Gournay could not have picked a more inappropriate example of the lack of communication between research workers. I have frequently met with all of the people mentioned in the letter and am quite well informed on the nature of their work and results, as they are with my efforts. Furthermore, the value and limitations of both methods of scanning (flying-spot and television-camera tube) are recognized by most of the research workers in this field. In fact, it was recently (22 November) the subject of an excellent symposium and panel discussion on ultraviolet scanning microscopy sponsored by the Philadelphia chapter of the Professional Group on Medical Electronics of the Institute of Radio Engineers.

Both articles published in the instrument issue of Science describe instruments designed for a specific purpose. Although the applications of the techniques described are broad in each case, it was not the intention to publish a general discussion of the field of scanning instrumentation.

Perhaps as further evidence that the respective workers are intimately aware of each others' efforts and contributions it should be mentioned that the automatic bacterial colony counter was developed by Carl Berkley, Y. Yamagami, and H. Mansberg. An article by these authors, describing in detail the circuit techniques, will be published soon (Electronics, in press). One of these authors, Carl Berkley, is now associated with Zworykin and Hatke and is participating in the color-translating microscope program.

Perhaps one reason that Heller and Gournay are not aware of the degree of interchange of ideas in this field is the fact that so many of the investigators are concerned with medical-electronic applications. I believe that these scanning techniques will find increasing use in industrial research applications, and I look forward to seeing more publication of such efforts [see "Flying spot techniques and application," Du Mont Instr. J. (Nov. 1957)].

Finally, I would assure them that no "legal points or competitive business practices" were involved either in the design of these instruments or in the preparation of the articles.

H. P. Mansberg
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THE SPECIES PROBLEM

The symposium was arranged by the Association of Southeastern Biologists and cosponsored by AAAS Sections F and G, as well as four other societies. Most papers are published essentially as given in Atlanta in December 1955. Dr. T. M. Sonneborn, however, undertook a comprehensive survey of the species problem in the protozoans and particularly in the ciliates. His masteryly synthesis comprising more than two-fifths of the volume is a fundamental contribution to the protozoan literature.

This symposium made a solid contribution toward the solution of the species problem. It broadened the base on which to discuss the problem by utilizing new organisms. It led to a clarification of the areas of general agreement among biologists. It presented a clear statement of the various species concepts and frankly stated and enumerated difficulties in their application to different types of natural populations. Finally, it illuminated certain aspects of the agelass species problem that had been neglected previously, and it attempted a statement of still controversial issues. From these papers it should be evident that the species problem is still one of the important issues in biology.

THE SPECIES PROBLEM

AAAS SYMPOSIUM VOLUME NO. 50
Edited by Ernst Mayr, Harvard University
6 x 9 in., 404 pp., references, index, clothbound, October 1957
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Hampton L. Carson, Washington University

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Verne Grant, Rancho Santa Ana Botanic Garden and Claremont Graduate School

The Species Problem in Freshwater Animals
John Langdon Brooks, Yale University

The Species Problem with Fossil Animals
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Meetings

**Palaeontological Research**

The Palaeontological Research Institution, a recent affiliate of the AAAS, was founded in 1932 by the late Gilbert D. Harris of Cornell University, at Ithaca, New York. A provisional charter was granted in 1933 by the University of the State of New York; the absolute charter, in 1936.

Since its founding in 1932, the institution has made and conducted scientific explorations, researches, investigations, and experiments. In addition to its library of books and journals, it has collected and preserved scientific data, reports, graphs, maps, and documents, making all information at its disposal available by publication, exhibits, lectures, and other means. The institution has held in trust and dispersed certain funds provided for research and scholarships and, in general, has acted so as to stimulate interest and to increase and disseminate scientific knowledge, with particular reference to palaeontology.

The organization publishes *Bulletins of American Palaeontology* (octavo), now in its 38th volume, and *Palaeographica Americana* (quarto), in its 4th volume, as well as special publications. The *Bulletins* average about a volume a year on any one phase of palaeontology, although special attention has been given to the palaeontology and stratigraphy of the Cenozoic of southern United States, South America, and the Caribbean area. *Palaeographica Americana* consists of detailed descriptive and illustrated monographs of particular groups. Emphasis is placed on well- and fully illustrated papers.

Membership in the institution is obtained by election. At present about one-fourth of the members are from countries other than the United States. Scientists from Canada; from Brazil, Colombia, and Venezuela; from Cuba, Jamaica, Trinidad, and the Dominican Republic; from Czechoslovakia, France, Germany, Norway, Sweden; and from Australia, North Africa, South Africa, and Saudi Arabia are included.

The society maintains headquarters at 109 Dearborn Place, Ithaca, New York. The headquarters building houses between 10,500 and 11,000 type and figured specimens. The publication of a catalog of this material is in progress.

Among its large duplicate collections of invertebrate fossils and the Cenozoic material gathered by G. D. Harris and his students, from South America, the Caribbean, and the United States; the R. H. and D. K. Palmer collections from the West Coast of the United States and from Cuba (*Bull. Am. Palaeontol. 1*, No. 128 locality list); foraminiferal material gathered by H. J. Plummer; Atlantic Refining Company core samples from Haiti and the Dominican Republic; and extensive collections of recent Mollusca.

This is also the headquarters for the publications of the Cushman Foundation for Foraminiferal Research and for those of the late Joseph A. Cushman and the Cushman Laboratory for Foraminiferal Research. Research is carried on at the institution headquarters and by the members at large, under the auspices of the organization.

Meetings of members and trustees of the institution are held at its headquarters the first Saturday of April and October. Election of members is held at that time. New officers are elected at the annual meeting in October. The business meeting is followed by an informal talk and social gathering. A scheduled evening lecture, open to the public, is given by an authoritative speaker on some subject related to geology.

KATHERINE V. W. PALMER

**Palaeontological Research Institution, Ithaca, New York**

**Chemical Society's National Meeting**

Richard Wistar, head of the Mills College department of physical sciences, is general chairman of the 133rd national meeting of the American Chemical Society, which will be held in San Francisco 13–18 April. Five thousand chemists and chemical engineers from all parts of the United States and several foreign countries will take part in sessions sponsored by 21 scientific and technical divisions of the society.

Chemical advances against disease, recent progress in nuclear energy, and new developments in science education are among the subjects of some 1500 reports to be presented at the meeting. Chemical contributions in many other fields, such as food processing, nutrition, agriculture, fuel, plastics, textiles, and sanitation, also will be described at more than 200 half-day sessions during the week.

Glenn T. Seaborg, Nobel Prize-winning chemist of the University of California, is among the many distinguished scientists on the program. Seaborg, who is professor of chemistry and head of the university's radiation laboratory, will be chairman of a symposium on "The New Elements" sponsored by the society's Division of Chemical Education.

**Electronic Waveguides**

Internationally known specialists in electronic waveguides will participate in the eighth of a series of international symposia presented by the Microwave Research Institute of the Polytechnic Institute of Brooklyn on 8, 9, and 10 April in the auditorium of the Engineer-
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Forthcoming Events

April

19–25. Industrial Health Conf., Atlantic City, N.J. (IHC, Room 1313, 28 E. Jackson Blvd., Chicago 4, Ill.)

20–22. American Assoc. of Colleges of Pharmacy, annual, Los Angeles, Calif. (G. L. Webster, College of Pharmacy, Univ. of Illinois, 808 S. Wood St., Chicago, 12.)


20–23. Chemical Engineering Conf., Canada-United States, Montreal, Quebec, (H. R. L. Streight, DuPont Company of Canada, P.O. Box 660, Montreal.)


21–23. American Oil Chemists’ Soc., Memphis, Tenn. (Mrs. L. R. Hawkins, AOCS, 35 E. Wacker Dr., Chicago 1, Ill.)


24–25. Nutrition Conf., 4th annual, Detroit, Mich. (J. M. Orten, Dept. of Physiological Chemistry, Wayne State Univ., College of Medicine, 1401 Rivard St., Detroit 7.)


24–26. Wildflower Pilgrimage, 8th annual, Gatlinburg, Tenn. (A. J. Sharpe, Dept. of Botany, Univ. of Tennessee, Knoxville.)

(See issue of 21 March for comprehensive list)
Equipment

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Science does not assume responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed appears on page 718.

**Angular-acceleration generator** may be continuously adjusted within its range by exchanging or adjusting the position of weights and by varying the winding of the torsion bar that powers the generator. Widely different ranges may be attained by replacing the torsion bar. Acceleration range is thus 0.5 to 200 rad/sec². Motion generated is picked up by a potentiometer of 9000-ohm resistance. (Humphrey Inc., Dept. 9958)

**Digital voltmeter** compares the input voltage to be measured with an internally generated linear sawtooth voltage wave. When voltage coincidence occurs between the input and the generated reference, a pulse is generated. The time interval between the initiation of the sawtooth reference and the occurrence of this pulse is proportional to the input voltage. The time interval is measured and displayed by an oscillator-counter combination. Accuracy of a four-digit model is ± 0.01 percent with encoding rate of 98/sec. Range of 0.1 to 1000 v can be extended to 1 mv by use of external amplifiers. (Servonic, Inc., Dept. 9961)

**Roller micrometer** sorts objects by allowing them to fall between the spaced rollers into a series of bins. Spacing of the two rollers varies from one end to the other so that the objects being sorted fall through the space at a location determined by their size. For example, with spacing differing by 0.001 in. from one end to the other, sorting by groups of 0.00005 in. can be achieved with good consistency. Fragile objects can be handled. (Affiliated Manufacturers Inc., Dept. 9963)

**Pressure transducer** is water-cooled to operate at temperatures of 5000°F or higher. The device combines a diaphragm and a tubular strain gage. Frequency response is constant to 10,000 cy/sec. Accuracy is ± 1 percent of full scale, which may be 1000 or 2000 lb/in². (Norwood Controls Division of American Standard, Dept. 9965)

**Magnetostrictive storage unit** permits access time of 3 nsec. The unit consists of eleven 120-4sec delay lines, ten of which store a total of 600 bits at 1 Mcy/sec pulse repetition frequency. The eleventh line provides synchronization...