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News and Notes

Survey of Biological Abstracting

Perhaps no problem facing the individual scientist today is more defeating than the effort to cope with the flood of published scientific research, even within one's own narrow specialty. The situation offers a grave threat to the international character of science and the integration of scientific knowledge. Much more efficient and universal indexing and abstracting systems become daily more essential; yet instead we have only a multiplicity of such systems operating without coordination of plan, overlapping in great measure and at the same time leaving great areas of the literature scarcely covered at all.

In order to provide a clear conception of the present situation and to indicate the directions in which planning should proceed, a survey of biological abstracting, supported by funds from the National Science Foundation and other agencies, was conducted under a contract with *Biological Abstracts* during the period between August 1952 and January 1954. An advisory committee helped to plan the survey, and a staff of 12 persons was employed for part-time work. I served as director. In order to balance general opinion against evidence, it was decided to undertake a program of two parts: (i) a statistical analysis of the current effectiveness of biological abstracting services, and in particular of *Biological Abstracts*; and (ii) a sampling of opinion among American and foreign biologists with regard to the use, merits, defects, and desired changes in the over-all abstracting program.

The full report of the Survey of Biological Abstracting runs to 63 mimeographed pages. It is hoped that it can be reproduced in full for distribution to all who may need the detailed information. Such persons should write to the office of the American Institute of Biological Sciences, 2000 P St., NW, Washington 6, D.C. A condensed, but still much fuller report than the present notice, will appear in two installments of the *AIBS Bulletin* in the issues of January and April 1955. Inasmuch as many biologists who do not hold membership in AIBS were sent the questionnaire regarding the use of abstracting services and were asked their opinions regarding present service and desired improvements, and yet many of these persons do not see the *Bulletin,* it seems desirable to present here a brief summary of the findings and conclusions and to direct interested persons to the fuller reports.

In order to determine the actual state of current abstracting and indexing—proportion of coverage of the literature, delay in publication of abstracts and indexes, overlapping between services, and so forth—four statistical analyses were conducted. They were intended to answer the following questions: (i) What proportion of the world's biological literature is now being abstracted? (ii) In those journals stated to be covered (by a particular service), what proportion of articles published is actually abstracted, and how long is the average lag between publication of article and publication of abstract? (iii) What is the extent of overlapping between abstracting services—specifically, between *Biological Abstracts* and other individual services? (iv) What is the completeness of coverage of particular subjects by *Biological Abstracts,* in comparison with available, supposedly complete bibliographies?

From the data of the present survey, a general evaluation of the abstracting program of *Biological Abstracts,* chiefly as it was conducted in the years 1947–49, may be made. There were estimated to be about 22,000 current biological and partly biological research and review journals in the world, of which the *Abstracts* covers approximately 10 percent. Of the articles published in this 10 percent of journals, the percentage of biological articles actually abstracted varies from nearly 100 percent in some journals to as low as 30 percent in others. The proportion abstracted does not depend on the importance of the periodical in a scientific sense but instead mainly upon the American, rather than foreign, origin of the periodical and especially upon the provision to *Biological Abstracts* of authors' abstracts. The interval between publication of article and publication of abstract averages two-thirds to nine-tenths of a year for United States periodicals, depending upon whether or not authors' abstracts are supplied. For the foreign journals, it ranges from two-thirds of a year for author-abstracted British journals up to an average of nearly 1½ years for European foreign-language journals. Thus, although the lag in publication of abstracts might be somewhat reduced, the present showing is not bad, in contrast to the very poor showing made in regard to the coverage of articles.

When *Biological Abstracts* is compared with other abstracting services that cover in part the same subjects, the comparison is not unfavorable. *Chemical Abstracts* is often praised as a model abstracting service, yet the survey shows that its coverage of subjects

like chemotherapy and antibiotics, even when limited to the nonclinical and strictly experimental phases of those subjects, is no better than that of *Biological Abstracts*. Each of them covered 42 to 45 percent of the articles on the subject that were covered in the other. The same may be said of most of the other nine abstracting journals compared with the *Abstracts*. Coverage of a subject by *Biological Abstracts* is considerably better than that by some abstracting journals, for example, *Excerpta Medica,* and it is not so good as that by some others, although several of these are indexing journals rather than abstracting journals, for example, *Zoological Record* and *Bibilography of Agriculture*; or they cover a restricted field, as in the case of *Helminthological Abstracts*.

When 10 special bibliographies were checked against coverage of the same subject in *Biological Abstracts,* the weakness of the latter was most strikingly shown. Nevertheless, in those cases where it was possible to check in the reverse direction, *Biological Abstracts* was found to have up to 20 percent of items missing in the special bibliography.

In order to determine the opinions of biologists on matters of abstracting, close to 7000 questionnaires were distributed to a random selection of persons on the mailing lists of the AIBS (4851), the Federation (1000), the Society of American Bacteriologists (594), and the American Association of Economic Entomologists (500). A total of 1854 returns from the United States and Canada and about 180 from abroad was received. Because of possible bias in returns mailed in, a control was secured by obtaining as complete a census of opinion as possible by interviewing the biologists in a metropolitan area (Baltimore), a midwestern agricultural college (Oklahoma A. & M.), and several small and relatively isolated liberal arts colleges. A special survey of the opinions of biological librarians was also made. Several hundred questionnaires were distributed to foreign biologists at two international congresses in Europe, but returns from these were scanty. That there is indeed some bias in the consensus obtained from questionnaires mailed in was clear from the comparison of these with the groups subjected to a relatively complete census; for the former only 2 percent of United States returns stated that no use was made of any abstracts of the biological literature, whereas in the census groups the proportion consistently ran about 10 percent. It is thus evident that returns of questionnaires are made chiefly by those most concerned about the problem under consideration. Those more neutral or indifferent fail to reply. However, in regard to all other questions asked, the census groups agreed very closely with the comparable groups included in the returns by mail.

In general, we find that, in spite of its admitted defects, *Biological Abstracts* is overwhelmingly the leading abstracting service for biologists. This appears to be true for biologists abroad as well as for those in the United States, although a larger and more random sample of foreign biologists is needed to extend the present study. Strangely enough, users of *Biological Abstracts* in the great majority regard its breadth of coverage as satisfactory and express dissatisfaction with the promptness of appearance of the abstracts. This opinion can be only a gross misconception of the real state of affairs, as is indicated in a foregoing paragraph. Overwhelming dissatisfaction is also expressed with regard to the promptness of indexing. In other respects, most users agree that *Biological Abstracts* is reasonably satisfactory. Few biologists rely exclusively on personal copies of the *Abstracts* for use, but those who subscribe to sections seem to regard them as worth the personal cost. There is marked agreement that complete coverage of a selected list of journals, publication of abstracts within ½ year of the appearance of the original articles, and inclusion in each issue of a subject index are "essentials." To speed up the publication of abstracts, a great majority of users approves of the use of authors' abstracts; but the publication of informative abstracts, with limited coverage of journals, meets with more favor than the use exclusively of titles and references in order to secure the widest possible coverage.

The needs of the situation seem to call for four kinds of efforts, along rather obvious lines, to correct and improve existing biological abstracting programs and especially that of *Biological Abstracts*: (i) improvement in coverage to the journals on selected lists, so as to provide as nearly complete coverage of each selected journal as practicable; (ii) improvement in the promptness of publication of abstracts after the original publication of articles; (iii) improvement in promptness of publication of the indexes; and (iv) improvement of the cooperation and coordination between different abstracting services, so as to reduce duplication of effort and to secure a better combined coverage of the world literature in biology. In the April issue of the *AIBS Bulletin,* a world abstracting plan for the coordination and improvement of biological abstracting has been offered.

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Operations Research and Philosophy

One of the most characteristic features of modern science and the humanities is a common urge toward interdisciplinary cooperation. It is no longer unusual to hear of a mathematical theory of economics, a topological model for genetics, or the dependence of metaphysics upon "physicomathematical science criticising itself" (*1*). A recent conference on *Philosophy and Operations Research* further underlines an affirmation of the importance of this general principle.

Operations research, which might be looked upon as scientific method applied to action problems, is a virile

newcomer in the scientific spectrum. Born as a result of wartime necessities during World War II, it has achieved remarkable stature both in its military and its industrial applications as the means by which management can be provided with "a quantitative basis for decisions regarding the operations under their control" (*2*). It has studied the problem of improving foreign economies and minimizing traffic delays at servicing points. It has examined the effectiveness of submarines and has been responsible for a mathematical theory of value. Its concern has ranged from an analysis of machine performance to excursions in defining the over-all objectives of the organization to which it is responsible.

From its very beginning, operations research, or as it is often abbreviated, "opsearch," has been critically reflective upon itself. It has inspected its tools, which range from mathematics and physics to economics and history, for their capabilities and their limitations when applied to action problems. Opsearch has scrutinized its foundations and generated original contributions to metascience—the theories and structure of the sciences. Among these can be counted an investigation of the problem of optimization and suboptimization (*3*). This is a problem in selecting the appropriate boundaries for any investigation and the proper criterions for measurement of payoffs. A second, and more comprehensive, original scheme is a stochastic model for predictions through the use of a value theory and its associated calculus (*4*).

Operations research has proceeded to the point where its broader deliberations have become philosophic in nature. The recognition of this similarity led to the sponsorship by Johns Hopkins University of a conference on *Philosophy and Operations Research*. The sessions were organized by staff members of the Operations Research Office, a member of the Hopkins family engaged in Army opsearch. Henry Margenau (Yale) acted as chairman of the meetings in Washington, D.C., on 1–3 Nov.

The intent of the conference was to explore the ways in which philosophy and operations research might be mutually beneficial. The basis of operations research, scientific method, and model building as an axiomatic venture were examined from both viewpoints. On the final day, a sample problem—that of the morale of a nation—focused the attention of both groups on a working topic.

It soon became apparent, despite the disparity in levels of generalization familiar to the two groups, that the thesis of common interest and mutual concern was justified. It first became obvious after Ellis Johnson's (director, ORO) speech on operations research, when he was pointedly quizzed by the philosophers about the details of a celebrated research study into the growth of garden vegetables. The case in point is the study made by C. W. Thornthwaite (Johns Hopkins) in which a labor problem was transformed out of existence through a systemization of the growth of vegetables at a major farming industry (*5*). The other side of the coin emerged frequently, as when operations analysts discoursed about "P-plane experiences" and "peninsular constructs" following Margenau's presentation of "The competence and limitations of scientific method."

Edward Cushen (ORO) introduced the double-sourced rationale for the conference by emphasizing the philosophical nature of the grounds for opsearch. There is more than a superficial similarity, he suggested, between metaphysical system building and the designing of systematic models of action situations. Both activities postulate elementary constituents in its sphere of interest, and describe relational connections between these "building blocks." The predictions of the theory thus developed are then compared with experimental results, and in both cases the principle of empirical verification provides the basis for acceptance, modification, or rejection of the theory. All the important features of a philosophic system have a strikingly close counterpart in operations research, from an epistemology and a logic to an axiology and an ontology.

One of the important discoveries of the conference was a nearly universal acceptance of the technique of model building as a fruitful tool for investigation in both fields. That the axiomatic method, bold in its attempt to comprehend as many aspects of a problem as possible, formed a common denominator first appeared in Johnson's observation that opsearch "designs conceptual models of the operation itself." Nearly every speaker mused at some length about this axiomatic approach, and an entire afternoon was devoted to examining the use of models in the various disciplines. Philippe Le Corbeiller (Harvard) discoursed upon the meaning of analogy in his paper on "Mathematical models." Models he defined to be an ideal system *analogous* to the actual situation we want to analyze. Alfred Tarski (California) exemplified theory construction in "The notion of a model in contemporary logic and its applications." Charles Hartshorne (Chicago), observed that "metaphysical models" could be regarded as systematic analogies of the utmost generality. Such models, he observed, will affect behavior by imparting a sense of what is important—a sense of relative significance. Of the speakers, only Michael Scriven (Minnesota Center for the Philosophy of Science) seriously questioned the axiomatic approach.

In a presentation of the "Theory of value" for which he was primarily responsible, Nicholas Smith (ORO) set the stage for the discovery of a second important feature common to both groups—a concern for a rational value-structure. Smith observed that the term *value* is to be associated with a state of the system, as contrasted with things in themselves. The value of a thing is a derivative concept that draws its justification only in terms of its differential contribution to the value of the entire complex of circumstances in which it is found.

Smith's value theory, and its associated calculus, is a stochastic model. The values of what could be described as end-states (known as "trapped states")

must be specified. Because of the freedom allowed in the manner of the selection of trapped-state values, the model is one that could be adopted by almost any school in the philosophical spectrum. When these values have been established, and transition probabilities between all the different states have been specified, it becomes possible to calculate the value of any intermediate state in which a system may find itself.

Peter A. Bertocci (Boston University) introduced the discussion on models of national morale. Morale, he observed, is willingness to suffer frustration for what is thought to be important. It assumes strength when supported by a knowledge of both individual and national objectives. His search into "The rationale of democratic morale" led, in the final analysis, to a theistic substructure. Other models, Bertocci observed, may be adequate to provide the proper conditions for a free democracy, but a theistic model imbues the convictions of members of society with the impetus for seeking further achievement of values.

George Pettee (ORO) presented the problem of national morale as it would be likely to arise in an opsearch study. Defining morale in terms of the ratio of the performance of a social group to its capabilities of performance, he pointed out that in a cold or hot war, it becomes important to discover the expected value of this proportion. A model of morale, Pettee suggested, might not require an entire "state-of-the-stystem" structure. A simpler and perhaps equally adequate approach might well be one that dealt directly with differential morale—the changes over periods of time.

Throughout the sessions, the discussions precipitated by the speakers were remarkable in many dimensions—comprehensiveness, intensity, volume, and especially in the excitement of new discovery.

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Science News

On 12 Apr., Thomas Francis, Jr., director of the Poliomyelitis Vaccine Research Center at the University of Michigan, reported on the **effectiveness of the Salk vaccine.** Data were obtained from two types of study areas: observed study areas and placebo study areas. In 127 observed study areas in 33 states, vaccine was administered to 221,998 second-grade children in a study population of 1,080,680 children in the first three grades. In 84 placebo study areas in 11 states, the study population was 749,236 children in the first three grades; 200,745 of this population received vaccine and 201,229 received placebo. The report states:

> . . . If the results from the observed study areas are employed the vaccine could be considered to have been 60 to 80 percent effective against paralytic poliomyelitis, 60 percent against Type I poliomyelitis, and 70 to 80 percent effective against disease caused by Types II and III. There is, however, greater confidence in the results obtained from the strictly controlled and almost identical test populations of the placebo study areas.
>
> On this basis it may be suggested that vaccination was 80 to 90 percent effective against paralytic poliomyelitis; that it was 60 to 70 percent effective against disease caused by Type I virus and 90 percent or more effective against that of Type II and Type III virus. The estimate would be more secure had a larger number of cases been available.

In the total study group of 1,829,916 children, 863 cases of poliomyelitis were diagnosed. Of these, 113 occurred among vaccinated children, of which 71 developed some degree of paralysis. Among the nonvaccinated children, 750 cases occurred, of which 445 developed paralysis. Fifteen deaths occurred among nonvaccinated children and one among vaccinated children.

The report confirms the success and safety of the vaccine that was first announced by Jonas E. Salk of the University of Pittsburgh in 1953. At that time Salk reported hopeful results in preliminary investigations with a triple vaccine prepared from the three types of virus.

The report on the success of the Salk vaccine is the culmination of a long struggle with poliomyelitis, which was first described in 1789 by the British physician Michael Underwood. Modern-day research along the lines that led to the Salk vaccine perhaps began with the work of Karl Landsteiner, who showed in 1909 that the disease is caused by a virus, and who also succeeded in transmitting the disease to monkeys. Other important milestones, in addition to the founding of the Warm Springs Foundation in 1927 and the National Foundation for Infantile Paralysis in 1938, both of which have supported the research of many workers—for example, as the discovery that all known strains of the virus could be classified into three broad types—include the following: David Bodian of Johns Hopkins University and Dorothy M. Horstmann of Yale University, working independently, proved that the virus circulates briefly in the bloodstream before the symptoms of the disease appear; John F. Enders, Thomas H. Weller, and Frederick C. Robbins grew the virus in test-tube culture on monkey tissues of nonnervous origin; William M. Hammon, by means of gamma globulin, found that relatively small amounts of antibodies in the human blood could protect against paralytic poliomyelitis.

An **artificial eye,** operated by magnets that cause it to move and even twinkle as effectively as the living eye it matches, has been developed at the Veterans Administration hospital in Boston, Mass. The "magne-

tic eye" already has been implanted in more than 150 patients. The designers are Everett H. Tomb, chief of the eye, ear, nose and throat section, and Donald F. Gearhart, chief of the plastic eye and restorations clinic at the Boston VA Hospital. After 6 yr of research, Tomb and Gearhart have perfected a magnetized implant, the magnet of which is placed within clear, nonirritating plastic.

Tomb has provided the surgical technique that permits the implant to become completely buried within the eye socket and to which the muscles of the removed eye are directly attached. Wounded or once-diseased eye sockets are then allowed to heal completely over the buried implant before the artificial eye is made.

A permanent magnet is set into the artificial eye during its fabrication to match the magnet of the imbedded implant. These magnets are so aligned that the artificial eye cannot slip out of correct, normal position. The magnets provide excellent anchorage for the eye, which relieves the eyelids of the burden of carrying the weight of the artificial eye.

Silver-copper solder, with titanium hydride as a wetting agent, has been used in the development of a new method for **mounting stones in diamond tools.** In a conventional mount, as much as 90 percent of the diamond used may be buried in the tool in order to gain rigidity and prevent loss of the stone. The new mounts, which were developed by H. Tracy Hall of the General Electric Research Laboratory, permit a considerably smaller diamond to be mounted in a shallow cavity on the surface of a single-point wheel-dressing tool.

The parts are brazed by induction or radiation heating in a high-vacuum system, or in an atmosphere of nearly pure argon or hydrogen. In strength tests, a small diamond tip mounted on a microtone blade and revolved at 56,000 rev/min placed a force of about 50,000 lb/in.^{2} on the bonding area. This force was insufficient to dislodge the diamond.

The advantages claimed for the process include the following: (i) the diamond is more securely anchored to its mount; (ii) the wasted "root," which in many cases is ¾ of the volume of the entire tool point, can be eliminated; (iii) much smaller diamonds can be mounted to provide the same working surface; and (iv) heat transfer is better when a diamond is bonded to metal than when there is only a mechanical connection.

Research workers of the Canadian Department of National Defence have perfected a new **method of processing yarn** that increases the strength and durability of textiles 5 to 10 times that of ordinary material.

The new process, regarded as a major development in the manufacture of textiles, is based on a method of twisting fibers into yarn. The yarn is now being produced commercially for military use. All textile fibers such as cotton, wool, and various synthetics can be used to produce cloth by the new method. The manufactured fabrics benefit to the same degree in strength and durability regardless of the raw material used. In addition, the texture of the fabrics is soft and pleasing. Existing textile equipment can be adapted to handle the new process.

Patent applications covering the new process have been filed in Canada, the United States, and Europe in the names of H. A. Delcellier and J. V. Weinberger by the Department of National Defence.

Sharat K. Roy, chief curator of geology at Chicago Natural History Museum, left on 2 Apr. for El Salvador, where he will conduct an expedition to study **Central American volcanoes** and to collect specimens of volcanic products. He has been engaged in these studies for several years, and this year will conclude his work in El Salvador and extend his activities to volcanoes in Nicaragua. If time permits he may branch out into Guatemala and other parts of Central America.

On previous expeditions to El Salvador, Roy has climbed all the major volcanoes. He was the first explorer to mount to the summit of Izalco, the most active of Central American volcanoes. His research is expected to culminate in a more detailed report than has been available heretofore.

Direct **over-the-horizon transmission at ultra high frequencies,** without the use of relay stations, has been accomplished by scientists of Massachusetts Institute of Technology and Bell Telephone Laboratories. The system requires larger antennas and higher power than conventional microwave systems. Signals are transmitted from 10 kw transmitters and antennas 60 ft in diameter at frequencies in the lower part of the UHF band. Television has been transmitted a distance of 188 mi from Bell's Holmdel, N. J., laboratory to M.I.T.'s Round Hill Research Station near New Bedford, Mass.

Lawrence R. Hafstad, former head of the reactor development program of the Atomic Energy Commission and now director of the atomic energy division of the Chase Manhattan Bank, returned recently from a 5-wk trip through Europe and Asia. He reports that the United States has **lost the lead in the peacetime development of atomic energy** to Great Britain, which has an atomic power plant program that will provide advanced engineering knowledge. He explained that fuel costs in England are high enough for atomic fuel to compete with the conventional sources of power such as coal; whereas in this country fuel is relatively inexpensive, and the cost of building nuclear power plants, as we now know them, is too high to be economical. Nevertheless, Hafstad urged U.S. industry to build atomic plants, even though there is no profit in sight, to gain more knowledge of the field.

Radio waves from Jupiter have been detected by Bernard F. Burke and Kenneth L. Franklin of the Carnegie Institution of Washington, who described their research at the recent meeting in Princeton of the American Astronomical Society. Radio waves from

the sun and the moon have been known for years, but this sound from Jupiter is the first from another planet in the solar system. Although the radio waves come from the planet itself, it is thought that they may be caused by large-scale thunderstorms in Jupiter's atmosphere. Their pattern is entirely random, and they are heard at a frequency of 22 Mcy/sec.

Burke and Franklin reported that Jupiter's radio emission is detected only about 1 day out of 3 during the 6 min the planet crosses the narrow path of their radiotelescope in Seneca, Md. The recording antenna has the form of a large "X," each part of which is 2047 ft long. It was found that the planet's motion through the sky caused corresponding changes in the position of the radio source during a period of several months.

Experimental production of **paper from synthetic fibers** has been announced by the Du Pont Co. Tests indicate that the papers, which are made from nylon, Dacron, and Orlon, can be made commercially. The papers are stronger and far more resistant to folding than those made from wood pulp or rags, and their resistance to chemicals, moisture, molds, bacteria, and light is the same as that of the fibers from which they are made. It is suggested that the papers can be used for the manufacture of such articles as heavy-duty bags, filter papers for corrosive liquids, packaging materials for chemicals, and map and tracing papers.

Ping-Ti Ho, a historian at the University of British Columbia, Vancouver, Canada, has reported in the *American Anthropologist* that the American plants, **the peanut, the sweetpotato, and corn,** have a long history in China but were not introduced there until after America's discovery by Columbus. He presents historical evidence to settle the dispute over whether or not these plants might have been introduced through pre-Columbian contacts between America and the East.

Research on possible **uses of radioactive waste materials** is under way in Yale University's chemical engineering department under the direction of Randolph H. Bretton. These materials, which are now either buried deep in the ground, taken out and dumped into the ocean, or stored until the radiation decays, will become more plentiful as more nuclear power plants are placed in operation.

The engineers, working under an Atomic Energy Commission contract, are experimenting with the effects of gamma radiation produced by the "atomic garbage." Experiments thus far have been conducted on ethylene, acetylene, and vinyl chloride. These materials were chosen because they undergo a chain-type reaction in polymerization.

By using these three gases, engineers can determine the effects of gamma radiation on various chemical compounds. The chemicals and gases under test are placed in test tubes in contact with radiation sources, then subjected to gamma radiation as well as to pressures and high voltages. Prolonged gamma radiation polymerizes both ethylene and acetylene to a waxy powder. There is considerable industrial interest in the manufacture of polymerized ethylene, for present methods of manufacturing polyethylene require high temperature and high pressure. It is possible that gamma radiation could be used to shorten or simplify the manufacturing process. Experiments with acetylene and vinyl chloride are less direct in their application, but they do prove that gamma radiation, coupled with low or high pressure and high voltage, can produce chemical changes that are otherwise difficult to accomplish.

A new society, the **Coblentz Society,** has been formed to further all phases of infrared spectroscopy. The object of the society, which is named in honor of William W. Coblentz, retired chief of the radiometry section of the National Bureau of Standards and pioneer in infrared spectroscopy, is to foster the understanding and application of infrared spectra. It will also provide a communication center and voice for the industrial chemists, scientists, research workers, and teachers who use infrared spectroscopy as a tool.

Norman Wright of the Dow Chemical Co., Midland, Mich., has been appointed chairman. The appointment was made by the executive board of the Committee on Infrared Spectroscopy that was formed at the Ohio State Conference on Molecular Structure and Spectroscopy in Columbus in June 1954. Members of the board include Van Zandt Williams, Perkin-Elmer Corp., Norwalk, Conn., registrar; Howard Cary, Applied Physics Corp., Pasadena, Calif.; Bryce L. Crawford, Jr., school of chemistry, University of Minnesota; R. A. Oetjen of the department of physics and astronomy, Ohio State University; and E. J. Rosenbaum of the Sun Oil Co., Norwood, Pa.

The Coblentz Society will in no way compete with the existing formal societies for the analytic chemist, the physical chemist, physicist, or military specialist. It will cut across the boundaries that separate these fundamental fields and thereby provide an informal mechanism by which those who use infrared can make joint efforts on common problems.

Those interested in belonging to the Coblentz Society should address Dr. V. Z. Williams, Registrar, Perkin-Elmer Corp., Norwalk, Conn., and enclose $1 to cover the enrollment fee.

Scientists in the News

Albert Einstein, 76, internationally renowned theoretical physicist and mathematician, and professor emeritus at the Institute for Advanced Study in Princeton, N.J., died on 18 Apr. in Princeton Hospital of a rupture of the aorta.

Dean Burk, head of the cytochemistry section of the National Cancer Institute, has been elected foreign member, Max-Planck-Gesellschaft zur Förderung der Wissenschaften, with appointment to the Max-Planck-Institut für Zellphysiologie, Berlin-Dahlem.

Selman A. Waksman, Nobel prize winner and professor of microbiology and director of the Institute of Microbiology at Rutgers University, will deliver this year's Dakin memorial lecture at Adelphi College in Garden City, N.Y., on 4 May. His topic is "In search of microbes." This annual lecture was instituted in 1953 after the college received the scientific library, laboratory equipment, and memorabilia of Henry Drysdale Dakin, British-born biochemist who gained world renown for developing the life-saving solution that bears his name.

Viktor S. Vavilov, a member of the staff of the Institute of Physics of the Academy of Sciences of the U.S.S.R., has been appointed deputy secretary general of the conference on the peaceful uses of atomic energy that is to take place in Geneva next August under the sponsorship of the United Nations.

Leroy D. Vandam, for the past 4 yr assistant professor of anesthesiology in surgery at the University of Pennsylvania School of Medicine, has been appointed anesthesiologist-in-chief at Peter Bent Brigham Hospital, Boston, and associate professor of anesthesia in Harvard Medical School. Vandam has conducted research in the physiology and pharmacology of anesthetic agents.

A U.S. Army Chemical Corps certificate of achievement has been awarded posthumously to **Allan P. Colburn,** former provost of the University of Delaware. Colburn was closely associated with the Chemical Corps from 1950 until his death, and was chairman of the Chemical Corps Advisory Council. The certificate gives recognition to his far-reaching advice to guidance of and consultations with the chief chemical officer, all of which contributed measurably to the success of vital chemical corps and national defense programs.

The annual Best Paper award of the Society of Exploration Geophysicists was presented to **Ben F. Rummerfield,** vice president of Century Geophysical Corp., Tulsa, Okla., during the society's recent joint meeting with the American Association of Petroleum Geologists and the Society of Economic Paleontologists and Mineralogists in New York. The paper, entitled "Reflection quality, a fourth dimension," was selected as the outstanding contribution to the advancement of exploration geophysics published during 1954 in *Geophysics,* quarterly journal of S.E.G.

Werner Braun, medical bacteriologist and chief of the variation branch of the Chemical Corps Bacteriological Laboratories at Camp Detrick, Md., has been appointed professor of microbiology and member of the Rutgers Institute of Microbiology. He will be concerned with the study of microbial populations, and his training in medical bacteriology in relation to infectious diseases will enable the institute to enlarge its studies in epidemiology and of microbes as disease-causing agents.

Alexander Silverman, emeritus professor of chemistry at the University of Pittsburgh, has been selected to deliver the 23rd annual Edward Orton, Jr., memorial lecture of the American Ceramic Society at its convention in Cincinnati, Ohio, on 25 Apr. He will speak on "Glass through the ages."

John A. Muntz, associate professor at Western Reserve University School of Medicine, is to succeed **Arthur Knudson** as professor and chairman of the department of biochemistry at Albany Medical College of Union University. Knudson will retire on 1 July. Muntz is a specialist in carbohydrate metabolism and is also interested in the effects of uranium on cell and body function.

Recipients of two awards administered by the American Institute of Nutrition have been announced.

The Borden award of $1000 and a gold medal has been given to **Albert G. Hogan,** professor of animal nutrition at the University of Missouri, for his contributions to the study of the nutritive significance of the components of milk.

E. V. McCollum, professor emeritus of biochemistry at Johns Hopkins University, has received the $1000 Osborne and Mendel award "in recognition of his outstanding discoveries concerning vitamins and mineral nutrients, and his numerous other distinguished contributions to the science of nutrition."

P. L. DeVerter, laboratory head, Inspection Laboratory, at Humble Oil and Refining Co.'s Baytown, Tex., refinery, was awarded a citation for service on 10 Mar. by the American Petroleum Institute.

George W. Beadle, chairman of the division of biology at the California Institute of Technology and president of AAAS, delivered the Nieuwland lectures in botany at the University of Notre Dame, 30 Mar.–1 Apr. "The gene" was the general topic, and Beadle discussed it as a carrier of inheritance, as a controller of function, and as an agent of evolution. This lecture series was established in 1946 in memory of Julius A. Nieuwland, botanist and chemist.

William Christopher Stadie, John Herr Musser professor of research medicine at the University of Pennsylvania, will receive the Kober medal for 1955 during the annual meeting in May of the Association of American Physicians. The medal is awarded annually by the Kober Foundation of Georgetown University, Washington, D.C., to a member of the association who has contributed to the progress and achievement of the medical sciences or the medical profession.

The American Mathematical Society's *Notices* lists the following appointments to assistant professor: Sacramento State College, **S. P. Hughart;** Washington University, **Jack Indritz;** University of New Brunswick, **J. E. L. Peck;** McGill University, **B. A. Rattray;** Illinois Institute of Technology, **R. J. Silverman;** University of Vermont, **R. F. Smith.**

The U.S. Department of Agriculture has approved the appointment of **Paul A. Miller,** vice president of Michigan State College, as director of the agricultural extension service in Michigan. An authority on rural organization and rural health, he was a member of the President's commission on health needs of the nation in 1952.

M. J. Blish, food chemist who until his retirement in 1954 was a research executive with the International Minerals and Chemical Corp., Chicago, has been named research consultant and coordinator to head an industry research program for the Glutamate Manufacturers' Technical Committee. The membership of G.M.T.C. is limited to research and technical service representatives of U.S. producers of monosodium glutamate. An industry-wide investigative program covering all uses and applications of glutamate in foods will be accelerated under Blish's direction.

Samuel C. Kincheloe, professor of the sociology of religion at the University of Chicago, has been elected president of Tougaloo Southern Christian College in Mississippi.

Granville M. Read, chief engineer of E. I. du Pont de Nemours and Co., Inc., Wilmington, Del., has received the American Society of Mechanical Engineers medal for his "outstanding leadership in developing men and in organizing and completing projects of extraordinary national and industrial importance."

Named manager of the war construction division of Du Pont in 1941, Read supervised the erection of 54 wartime ordnance facilities built for the Government at 32 locations. At present he is responsible for the engineering and construction of the $1.3 billion Savannah River project near Aiken, S.C., which is nearing completion under contract with the Atomic Energy Commission.

Benjamin S. Mesick, scientist and engineer and until his retirement last year commanding officer of Watertown Arsenal, Watertown, Mass., has recently joined the staff of Arthur D. Little, Inc., industrial research and consulting firm of Cambridge, Mass. As a senior staff member, his chief responsibility will be to expand the company's activities in titanium fabrication, and to explore the numerous industrial uses of titanium.

Harold C. Weber, professor of chemical engineering at Massachusetts Institute of Technology, has been named chairman of the U.S. Army's Chemical Corps Advisory Council.

Norman Kirk, a staff member of the General Electric Research Laboratory, Schenectady, N.Y., since 1947, has been appointed manager of the laboratory's chemical process research section. He succeeds **A. E. Schubert,** who has been named manager of engineering for G.E.'s chemical materials department, Pittsfield, Mass.

At a dinner in honor of his return from Stockholm, **Linus C. Pauling,** Nobel laureate in chemistry, was given the first Thomas Addis memorial award of the Los Angeles Chapter, National Nephrosis Foundation. The award was made in recognition of Pauling's close association with Dr. Addis, with whom he collaborated in studies concerning the mechanism of proteinuria. Hereafter, the award will be made annually to individuals for outstanding contributions to the knowledge of kidney function, kidney anatomy, and kidney diseases.

At the 8 Apr. meeting in London of the Royal Astronomical Society, **Dirk Brouwer,** Munson professor of natural philosophy at Yale University and director of the Yale Observatory, received the society's gold medal and delivered the George Darwin lecture. He discussed "The motions of the outer planets."

Paul V. Smith, Jr., of the Esso Research and Engineering Co., Linden, N.J., has received the President's award of the American Association of Petroleum Geologists. This award is given annually to the author under 35 yr of age whose article in the association *Bulletin* of the preceding year is judged to be the most significant original contribution to petroleum geology. The winning paper this year is entitled "Studies on origin of petroleum: occurrence of hydrocarbons in recent sediments" and was published in the A.A.P.G. *Bulletin* in March 1954.

The annual Robert J. Terry lecture, established in 1938 and sponsored by Washington University School of Medicine, was given 30 Mar. by **Charles H. Danforth,** professor emeritus of anatomy at Stanford University School of Medicine. His subject was "The scope of anatomy."

A member of Washington's anatomy department from 1908 until he went to Stanford in 1922, Danforth recently was awarded a citation for "outstanding achievements" by the university at its Second Century Convocation.

Harry N. Holmes, emeritus professor of chemistry at Oberlin College and former president of the American Chemical Society, has been chosen to receive the $1000 James Flack Norris award for outstanding achievement in the teaching of chemistry. Presentation will take place on 12 May during a meeting of the Northeastern Section of the A.C.S., which sponsors the award.

J. L. Stair, retired, for many years associated with Curtis Lighting, Inc., will receive the 1955 gold medal of the Illuminating Engineering Society on 12 Sept. during the opening session of the society's annual national technical conference that is scheduled to take place in Cleveland, Ohio.

Douglas B. Vollan, assistant secretary of the Council on Medical Education and Hospitals of the American Medical Association since 1952, became dean of the faculty of the Chicago Medical School on 1 Apr.

Preston M. Kampmeyer has been named chief of the cellophane research section, film research and development department, Olin Film Division, Olin Mathieson Chemical Corp. He was formerly assistant chief of the cellophane research section in New Haven.

The University of Alabama announces the following changes in staff.

Joseph F. Volker, dean of the School of Dentistry, has been appointed director of research and graduate study.

Thomas O. Paul has been promoted to professor of ophthalmology and chairman of the department.

Elmer L. Caveny, who retired from the Naval Medical Corps after 25-yr service, has been appointed professor and chairman of the department of psychiatry. Previously he was head of the psychiatry and neurology branch of the Navy Department.

Thomas Fite Paine, Jr., formerly associate professor of bacteriology and internal medicine at the University of Michigan, has been appointed professor of microbiology and chairman of the department.

William Boyd, professor emeritus of both the University of Toronto and the University of British Columbia schools of medicine, was visiting professor of pathology for the first quarter of 1955.

Mortimer F. Sayre, professor of applied mechanics and chairman of the mechanical engineering department at Union College, will retire from active teaching this June, culminating 41 yr of service to the college. He will be succeeded by **Joseph Modrey,** professor of mechanical engineering and head of the machine design section at Brooklyn Polytechnic Institute.

Meetings

The **British Instrument Industries' Exhibition** will be held at London's Earl's Court, 28 June–9 July. More than 150 of Britain's manufacturers will display scientific and electric instruments, industrial meters, automatic controls, scientific glassware, and so forth. The organizers, F. W. Bridges & Sons, Ltd., Grand Buildings, Trafalgar Square, London W.C.2, will arrange hotel accommodations for overseas visitors. Fullest assistance will be given to foreign guests, and they will be admitted to the exhibition without charge.

A **Colloquium on Theoretical Physics in Honour of Professor P. A. M. Dirac** will be held at the National Research Council of Canada, Ottawa, 9–21 June. The program will consist of lectures by invited speakers and of contributed papers on current research topics. The following is a list of the invited speakers and their topics when known, with the number of lectures indicated in parentheses: H. A. Bethe, "Scattering and photoproduction of π mesons" (2); G. Breit, "Nucleon-nucleon scattering" (2); S. Chandrasekhar, "Problems of stability in hydrodynamics and hydromagnetics" (2), and "Turbulence in hydrodynamics and hydromagnetics" (2); P. A. M. Dirac, "Quantum electrodynamics" (4); J. R. Oppenheimer, "The description of primordial matter" (2); A. Pais, "Fundamental particle problems" (3); G. M. Volkoff, "Overhauser effect and its suggested application to nuclear alignment" (1), and "The Bohr-Mottelson theory of the nucleus" (1); W. H. Watson, topic to be announced (1); V. F. Weisskopf, "The theory of nuclear reactions" (2); G. Wentzel, π-meson-proton scattering (experiment and theory) (2).

All interested persons are welcome to participate in the colloquium, and those wishing to contribute a paper should submit an abstract. Inquiries should be addressed to Dr. T. Y. Wu, Division of Physics, National Research Council, Ottawa 2, Ontario, Canada.

The 16th annual **Biology Colloquium** will be held at Oregon State College on 30 Apr. This year's theme is "Biological systematics—specific and intraspecific categories." Ernst Mayr of the Museum of Comparative Zoology at Harvard University is leader, and other speakers on the program are Theodosius Dobzhansky, Columbia University; Harlan Lewis, University of California at Los Angeles; and Roger Stanier and R. A. Stirton, both of the University of California, Berkeley. For information, address the Sixteenth Annual Biology Colloquium, 107 Commerce Hall, Oregon State College, Corvallis.

The symposium of the **American Fern Society,** scheduled for 4 June at Mistaire Laboratories in Millburn, N.J., will be followed by a general meeting and garden tour. Among the speakers will be Edgar T. Wherry, Mrs. W. D. Diddell, Norman P. Marengo, and Clara S. Hires. Spore photomicrographs, drawings, and models will be displayed. The 3-dimensional spore will be stressed. Further information may be obtained from Clara S. Hires, Mistaire Laboratories, 152 Glen Ave., Millburn, N.J.

The **Institution of Telecommunication Engineers,** established in New Delhi, India, in late 1953, recently held its first general meeting. The annual report described the remarkable growth of the institution, which already has more than 1000 members on its rolls. Membership is drawn from various government-operated communications agencies, the three defense services, research institutes, and industry.

Run by a governing council of 24, the institution, like most professional bodies, prescribes minimum educational qualifications and experience for entry into its several categories of membership; however, direct admission into the lower categories is possible upon successful completion of an examination. A quarterly publication is planned; entitled the *Journal of the Institution of Telecommunication Engineers,* the first issue is already in press. Lectures and discussion meetings are arranged periodically at New Delhi, and similar activities are being arranged at Bombay, Calcutta, Madras, Poona, Bangalore, and Jabalpur. Further details may be obtained from the Honorary Secretary, Institution of Telecommunication Engineers, Post Box No. 481, New Delhi, India.

Society Elections

The **Geological Society of America:** pres. and representative to AAAS Council, Walter H. Bucher, Columbia University; sec. and representative to AAAS Council, H. R. Aldrich, 419 W. 117 St., New York 27, N.Y.; treas., J Edward Hoffmeister, University of Rochester The vice presidents are George S. Hume, Department of Mines and Technical Surveys, Ottawa, Canada; Hans G. Kugler, Trinidad Leaseholds, Ltd., Trinidad, B.W.I.; Harry S. Ladd, U.S. Geological Survey, Washington, D.C.; and George Tunell, University of California, Los Angeles.

International Association for Dental Research: pres., Paul E. Boyle, School of Dentistry, University of Pennsylvania; pres.-elect, Joseph F. Volker, School of Dentistry, University of Alabama; v. pres., Reidar F. Sognnaes, Harvard School of Dental Medicine; sec.-treas., Edward H. Hatton, professor emeritus of Northwestern University; asst. sec.-treas., Dan Y. Burrill, University of Louisville; trustee, Paul C. Kitchin, Ohio State University.

The **Radiological Society of North America, Inc.:** pres., Thomas B. Bond, Fort Worth, Tex.; pres.-elect, Clarence E. Hufford, Toledo, Ohio; sec.-treas., Donald S. Childs, Sr., Syracuse, N.Y.; librarian, Howard P. Doub, Detroit, Mich. The vice presidents are Howard B. Hunt, Omaha, Neb.; Charles M. Gray, Tampa, Fla.; and Sydney J. Thomas, Palo Alto, Calif. Representative to the AAAS Council is Eugene P. Pendergrass, Philadelphia, Pa.

American Anthropological Association: pres., George P. Murdock; pres.-elect, Emil W. Haury; sec., treas., and exec. sec., William S. Godfrey, Jr.

Society of Women Engineers: pres., Katharine Stinson, Civil Aeronautics Administration, Washington, D.C.; v. pres., Dot Merrill, Merrill & Co., Chicago, Ill.; cor. sec., Lois McDowell, Illinois Institute of Technology, Chicago; rec. sec., DeLoris Keister, Los Angeles, Calif.; treas., Isabelle French, Allentown, Pa.

Cushman Foundation for Foraminiferal Research: pres., Fred B. Phleger, Jr., Scripps Institution of Oceanography; v. pres., J. B. Reeside, Jr., U.S. Geological Survey; sec.-treas., Katherine V. W. Palmer, Paleontological Research Institution, 109 Dearborn Place, Ithaca, N.Y. Hans E. Thalmann, Stanford University, was reelected editor for 3 yr.

The Wildlife Society: pres., Justin W. Leonard, Michigan Department of Conservation, Lansing; v. pres., E. L. Cheatum, New York Department of Conservation, Albany; exec. sec., D. L. Leedy, U.S. Fish and Wildlife Service, Washington, D.C.; editor of *Journal of Wildlife Management,* O. H. Hewitt, Department of Conservation, Cornell University; editor of *Wildlife Society News,* Thomas R. Evans, Wildlife Management Institute, St. Paul, Minn.

The **Michigan Academy of Science, Arts, and Letters:** pres., Willis Dunbar, Western Michigan College; pres.-elect, Charles W. Creaser, Wayne University; v. pres., Richard A. Fennel, Michigan State College; sec., George M. McEwen, University of Michigan; treas., Volney H. Jones, University of Michigan; editor, Sheridan W. Baker, Jr., University of Michigan; librarian, Frederick H. Wagman, University of Michigan. Representative to the AAAS Council is A. M. Chickering, Albion College.

Horticultural Society of India: sec., C. S. Randhawa, Indian Agricultural Research Institute, New Delhi; treas., Romesh Chandra, Indian Agricultural Research Institute; editor, D. Chatterjee, Indian Agricultural Research Institute.

Erratum: The officers listed for the American Statistical Association in "Society Elections" for 25 Mar. were incorrectly defined. The names given were those of the officers for the association's Social Statistics Section.

Education

Harvard University has announced that the program leading to the A.M. and Ph.D. degrees in biochemistry will be expanded commencing in the fall of 1955. Qualified students interested in biochemistry will be offered a choice of applying for either of two programs of instruction: (i) the existing program administered by the department of biological chemistry at the Harvard Medical School in Boston, through the Division of Medical Sciences; and (ii) a new program administered by a committee on biochemistry, composed of certain members of the biology and chemistry departments at the University in Cambridge.

Both programs are under the jurisdiction of the Faculty of Arts and Sciences. Students enrolled in either program are free to take instruction in the other, and, where necessary, transfers will be arranged between the two. A student's choice of program will be governed largely by the relationship of his research interests to those of the faculty member concerned. When making application a student should indicate which of the two programs he wishes to enter. Further information concerning both programs can be obtained from the Graduate School of Arts and Sciences, 24 Quincy St., Cambridge 38, Mass.

Three groups of Army and Air Force veterinary officers have completed a special training **course in veterinary radiological health.** A fourth group will begin the course 31 May.

The 2-wk course, which is held at the Oak Ridge Institute of Nuclear Studies, is designed to train veterinary officers to evaluate the effects of ionizing radiation on food and food-producing animals. Under present plans, the course will be repeated at intervals until all veterinary officers of the Army and the Air Force have had an opportunity to attend. Veterinary officers have been responsible for determining the wholesomeness and quality of foods for United States

troops since World War I. The curriculum includes biological aspects of radiation phenomena, dosimetry, radiobioassay in animal tissues, radiation syndromata in domestic animals, and disposition and salvage of radiocontaminated foods. Lectures, applicatory exercises, training films, and demonstrations are the mediums used for presenting the instruction.

A recent 1-wk lecture course in x-ray diffraction, sponsored jointly by **the George Washington University School of Engineering** and **the General Electric Co.**, was attended by 78 prominent physicists. Laboratory demonstrations were conducted at the National Institutes of Health, Naval Research Laboratories, National Bureau of Standards, and Bureau of Public Roads. Chief lecturer at the course was David Harker, director of the Protein Structure Project at Brooklyn Polytechnic Institute.

Other lecturers included Charles L. Christ of the U.S. Geological Survey; Rose C. L. Mooney of the National Bureau of Standards; B. H. Warren of Massachusetts Institute of Technology; and H. S. Liebhafsky, Eileen I. Alessandrini, R. G. Edholm, and H. W. Pickett of the General Electric x-ray and research laboratories.

A $580,000 science administration building was dedicated on the **Oklahoma Baptist University** campus, Shawnee, during recent Founders' Day ceremonies. Two floors are occupied by the biology department, complete with greenhouse, museum, and laboratories, and by the physical science departments and laboratories, mathematics department, and home economics department. The first floor contains a lecture room equipped for all types of audio-visual aids and a greenhouse with darkroom for photosynthesis study.

Because of the ever-increasing interest and use of radioisotopes in medicine and pharmacy, especially in manufacturing laboratories and hospital pharmacies, the Philadelphia College of Pharmacy and Science is offering a special **course in radioisotope techniques.** For four weeks commencing 6 June, 4-hr classes will be held in the chemistry laboratories of the college three times weekly. Arthur Osol, director of the School of Chemistry, will supervise the course work, and instruction will be given by Grafton D. Chase.

The course will consider both the theoretical and the practical aspects of radioisotope techniques. It will include a study of radioactivity units and standards, radioactive decay and decay processes, instrumentation for the measurement of radioactivity, properties of radiation, statistical problems of radiation measurement, methods of radiation characteristization, standardization and calibration of radioactive samples, and problems of health physics and radiologic safety. Biological, chemical, medical, and pharmaceutical applications, as well as special techniques such as autoradiography, kinetic studies, and isotope dilution methods will also be studied. Approximately 20 experiments utilizing special techniques required in the use of isotopes will be performed in the laboratory.

Total cost of the course is $55. Graduates in pharmacy may apply to the Registrar of the Philadelphia College of Pharmacy and Science, Philadelphia 4, Pa.

The Office of Vocational Rehabilitation, Department of Health, Education, and Welfare, has approved a grant of $27,800 to the New York State Psychiatric Institute for establishing a **mental hygiene clinic** for deaf adolescents and adults. The institute will operate in three mental health areas—research, service, and training of others to serve as mental hygiene workers for the deaf, under the directorship of Franz J. Kallman of Columbia University.

Dalmo Victor Co. of San Carlos, Calif., which is primarily known for the design, development, and manufacture of airborne-radar antennas, has become a participant in the honors cooperative program of the School of Engineering of **Stanford University.** Coordination of the program will be handled by Allen S. Dunbar.

Under the terms of the plan, four graduate students, a microwave specialist, a servomechanism engineer, a mechanical engineer, an industrial engineer, will be placed on the company payroll and given regular assignments in the engineering laboratory, except that working hours will be reduced by an amount approximately equal to the time spent in regular daytime graduate classes at Stanford.

Atlanta University offers a limited number of **graduate scholarships,** ranging from $200 to $500, to men and women eligible for graduate study in the departments of biology, chemistry, economics and business administration, education, English, French, history and prehistory, mathematics, political science, social science, sociology and anthropology, library service, and social work. Applications for the academic year 1955–1956 may be secured from the registrar of the university and should be *filed before 15 May 1955.*

Grants, Fellowships, and Awards

The **Lalor Foundation** has announced awards of up to $1100 each to 23 faculty members of American and Canadian colleges and universities for 1955 summer research and study in the biological sciences. Of these appointees, 13 stated that their plans were to carry forward their projects at their own institutions, and 10 expect to work in laboratories of other institutions. Four of the latter group will be at Brookhaven National Laboratory. The availability of these awards for the summer of 1955 was announced last October, and the present appointees have been selected from the 88 applications received.

With only two exceptions, the nominees have positions at the assistant professor and instructor levels. The average age is 31, representing an average of 4 yr out of graduate school. The youngest appointee is

25, and the oldest is 37. Publications per person average 1.1 per year since taking the bachelor's degree. The smaller colleges and universities are represented by 7 appointees; 10 appointees are located at tax-supported institutions and 13 at privately supported ones. The average salary of the group at the tax-supported institutions was $5200, as compared with $4400 at the private institutions.

Geographic distribution shows 2 appointments from the northeastern states, 8 from the Middle Atlantic states, 4 from the southern states, 4 from the central states, 2 from the Far West, and 3 from Canada.

The Marine Biological Laboratory at Woods Hole, Mass., has also announced appointment of 1 senior Lalor fellow and 6 postdoctoral Lalor fellows for the summer of 1955 at the M.B.L. under its agreement with the Lalor Foundation. It is expected that announcement will be made in October regarding the next series of awards.

The **National Science Foundation** has announced the award of 715 predoctoral graduate fellowships in natural sciences for the academic year 1955–56. Successful fellows were selected from 2931 applicants from all parts of the continental United States, Alaska, Hawaii, and Puerto Rico. Honorable mention was accorded 1409 applicants. In addition to the predoctoral fellowships awarded, the foundation also announced the names of 70 winners of postdoctoral fellowships.

Of the predoctoral fellowships, 255 awards were made to first-year graduate students, 291 awards were made to graduate students in the intermediate years, and 169 awards to terminal-year predoctoral students. Recipients include 206 persons who have been NSF fellows during the current academic year. Candidates for renewal fellowships competed on an equal basis with new applicants.

The largest group of predoctoral fellowships, 167, was awarded in chemistry. In other fields the number of awards were: physics 151, engineering sciences 107, mathematical sciences 52, biochemistry 35, zoology 50, earth sciences 30, microbiology 20, psychology 27, biophysics 8, botany 16, agriculture 14, medical sciences 11, astronomy 9, genetics 10, anthropology 5, general biology 3. Of the postdoctoral awards, 26 were made in the life sciences, 15 in chemistry, 15 in physics and astronomy, 11 in the mathematical sciences, 1 in the earth sciences, and 2 in the engineering sciences.

The **American Heart Association** has announced that 114 fellowship awards totaling $695,000 have been made to research workers in the field of heart and blood vessel diseases for studies to be conducted during the 12 mo beginning 1 July. The latest awards raise to more than $10,000,000 the amount given to support of cardiovascular research by the association and its affiliates since the association became a national voluntary health agency in 1948.

The new allocations are the first to be made from contributions by the public to the 1954 Heart Fund campaign. These fellowships represent an increase of more than a third over similar awards made last year, and they will be supplemented later this year by a second group of grants. In all, the association has set aside $1,408,502.77 from 1954 Heart Fund contributions for the national program of research support in which it participates with its affiliates. This is in accord with a Heart Association policy of allotting to research at least half of all funds available to the national office of the organization.

The National Academy of Sciences–National Research Council has awarded the first two **American Chemical Society Petroleum Research Fund** postdoctoral fellowships. These fellowships were inaugurated in 1954 by the ACS to provide advanced scientific education and fundamental research in the petroleum field.

These fellowships are open only to citizens of the United States, and the candidates are selected in nationwide competition. The awards are available in any area of pure science which in the judgment of the reviewing board may afford a basis for subsequent research directly connected with the petroleum field. As used, the term "petroleum field" embraces (i) exploration for, and the production, transportation and refining of, petroleum, petroleum products, and natural gas, and (ii) the production and refining of substitutes for petroleum and petroleum products from natural gas, coal, shale, tar sands, and like materials.

For the first time in the history of the **Damon Runyon Memorial Fund for Cancer Research,** a grant has been made to support research in a medical institution in Peru. The grant, amounting to $4000, was included in the $88,500 that was allocated in March by the Runyon Fund to institutions and research fellows in this country. The South American award went to the Universidad Nacional Mayor de San Marcos in Lima. The money will be used to assist Pablo Mori-Chavez in his investigation of the effect of high altitude on neoplastic growth.

Celanese Corporation of America has announced the establishment of 16 annual graduate followships in 15 colleges and universities for the 1955–56 academic year in its continuing program to assist in the development of adequately trained technical personnel for promising careers in industry. Nine fields of study are covered in the program, including textiles, chemistry, plastics, cellulose, chemical engineeering, organic chemistry, physics, engineering physics, and physical chemistry.

Howard L. Holley, associate professor of medicine at the University of Alabama, received a grant of $97,000 from the National Institute of Arthritis and Metabolic Diseases for a 5-yr study program of joint fluid changes in rheumatic diseases, which he will direct. Part of the grant was used to purchase an ultracentrifuge.

Award of forty-eight unclassified life science research contracts in biology, medicine, biophysics, and radiation instrumentation was announced in March by the **U.S. Atomic Energy Commission.** Eight of the 1-yr awards are for new projects: four in biology, three in the medical sciences, and one in radiation instrumentation. Of the 40 contract renewals, 20 are in biology, 16 in medical sciences, 3 in biophysical research, and 1 in radiation instrumentation.

The Ecole Nationale Supérieure de Chimie, University of Strasbourg, is offering several graduate research **scholarships in chemistry.** Applications must be submitted *before 10 Sept.* to the Cultural Services of the French Embassy, 972 Fifth Ave., New York 21.

The **Lipotropic Research Fund** of New York will receive applications for grants-in-aid for 1956 *until 1 June.* A request for application forms, which should include a short statement describing professional affiliations and experience, may be addressed to the administrative secretary, Dr. L. Lipton, 26 Vark St., Yonkers 1, N.Y.

In the Laboratories

Midwest Research Institute has announced the development of an extensive code library that will greatly enhance the speed and economy with which engineering computations can be completed in its computing laboratory and will enable the institute to offer virtual "mail-order" service. In making the announcement, Midwest noted that, although electronic calculators have enormous capabilities, the extent to which these capabilities have been employed has often been curtailed by prohibitive coding costs. A complex calculation may take only minutes to perform, but the process of coding prior to the calculation may take days, weeks, or months.

Once a code is prepared for a particular engineering problem, however, no further coding is required. Midwest's solution to the high cost of coding was to establish a code library containing the computer's instructions for a wide variety of problems in chemical, civil, electrical, and mechanical engineering. With this system, the client need pay only for the actual time spent in calculation on the calculator, plus a nominal percentage that will be credited to the development of the code library. And with each new problem completed, new codes are added to the library.

A Schmidt-type telescope that is being built in the workshops of the **Upsala Observatory** will be shipped to Australia this autumn to the **Canberra Observatory,** the largest in the southern hemisphere. The instrument has been designed by engineers E. Aulin and F. Thorlin of the Swedish AGA Co., under the supervision of Prof. Gunnar Malmquist, Upsala. The reflector has been aluminized, a process that gives better reflecting properties than the silver coating previously used. A smaller telescope of the same type has already been completed for the Upsala Observatory, and two larger units are under construction. The Canberra telescope will be used for spectral analysis of the southern celestial hemisphere in order to supplement similar observations being made in the northern hemisphere.

This year marks the 75th anniversary of **Schwarz Laboratories, Inc.** of Mount Vernon, N.Y. The organization concentrates particularly in the brewing and organic chemicals fields, and its activities include an extensive analytical and research laboratory; a consulting service; a technical training academy; the manufacture of various kinds of apparatus, brewing specialties, and chemicals; the propagation of special "pure-bred" strains of organisms with carefully guarded genealogies; and the preparation of radioactive materials.

Announcement has been made that **Societé Rhone-Poulenc** has started commercial production of a complete line of silicones in its recently completed plant at St. Fons, near Lyon, France. The $3 million plant, built on a 10-acre site, has up-to-date facilities for research and production on a large scale.

Rhone-Poulenc was the first company in France and possibly in western Europe to undertake production of silicones to meet the growing European demand. It initiated research on silicones in 1942 and was successful in continuing development work secretly during the German occupation. Following years of pilot-plant production, construction of the new plant, known as "Les Carriers," was started last summer.

The **Western Electric Co., Inc.,** has been selected by the U.S. Air Force to build the radar warning system across the Canadian Arctic. The system, the Distant Early Warning line, will extend for 3000 mi across the top of the continent. The United States will meet the full construction cost of the project, estimates for which vary from $200,000 to $1 billion. The contract is said to be a "cost, plus fixed fee" agreement. An American company and two Canadian companies will be subcontractors.

Work on a $3.5 million wind tunnel to test models of aircraft and guided missiles will be started in San Diego this year by the **Convair Division,** General Dynamics Corp., San Diego, Calif. The new trisonic tunnel was included in the budget of more than $8 millon for capital expenditures that was approved recently by the corporation's board of directors. Other items of the budget include more than $1.4 million for new plant equipment and $980,000 for engineering and laboratory facilities.

The test section of the tunnel will be 4 ft^2. Test runs will average 40 sec, with data being recorded electronically. Air speed will be variable from ½ to 4½ times the speed of sound. The new facility is expected to include three spherical storage tanks capable of holding at least 20,500 ft^3 of air at a pressure of 17 atm. During tests the air will be released through a

connecting tunnel to the test section in a two-story aerodynamics laboratory building. A diffuser on the opposite side of the laboratory will channel the high-pressure air to another structure housing the muffler. Pressure in the storage tanks will be built up by a three-stage compressor system.

Other Convair facilities now being either planned or constructed are a flight-test data reduction building, a hydrodynamics model-testing basin, a fuel and oil systems laboratory, an acoustics environmental laboratory, and a high-temperature structural and propulsion laboratory.

Charles Pfizer and Co., Inc., has shipped a $20,000 consignment of antibiotics to President Ramon Magsaysay as a donation for relief of the 11,000 victims of the recent earthquake disaster in the southern Philippines.

Hazelton Laboratories, Inc., has announced the completion of a new laboratory building that provides an additional 8000 ft^2 of floor space for carrying out biological safety evaluation studies of chemicals, drugs, and cosmetics. One floor of the new building is used to provide quarters for some 3000 albino rats that are being used for feeding studies. In order to insure optimum conditions for the experimental animals, special precautions have been taken to guard against extreme cold or sudden changes in temperature. The temperature of the building can be held constant within ½ deg of the desired temperature, except in the extreme heat of summer.

Miscellaneous

A detailed inventory of the equipment needed to **set up a medical school** is now available as the result of a joint undertaking by the World Health Organization and the United Nations Educational, Scientific and Cultural Organization. This reference manual is the latest in a series of inventories of apparatus and materials for teaching science at all levels that was begun by UNESCO in 1949 to promote the introduction of suitable science teaching into schools of war-damaged or underdeveloped regions. Earlier volumes have dealt with the teaching of science in primary, secondary, and vocational schools; the teaching of basic sciences in the universities; veterinary sciences; the agricultural sciences; the teaching of physics and engineering; and the teaching of electrical engineering.

This new publication contains lists of equipment used in the instruction of medical students in eight subjects: anatomy, bacteriology, biochemistry, histology, pathology, pharmacology, physiology and hygiene, and public health. The material listed under each subject represents the consensus of some 20 professors from different parts of the world on the equipment needed. The lists contain rough indications of prices, and each is preceded by a short discussion of teaching methods.

Inventories of Apparatus and Materials for Teaching Science, pt. 5 (Medical Sciences) of vol. III, is available at all UNESCO sales agents at $2.75 a copy; in the United States it can be obtained from Columbia University Press, 2960 Broadway, New York 27, N.Y., and from the United Nations Bookshop.

The **American Academy of Arts and Sciences,** Boston, has announced that it will sell its headquarters at 28 Newbury St. The proceeds of the sale are to be carried in an account of the academy to be known as the Agassiz Fund, in recognition of the Agassiz family to whom the academy is indebted for the building that it has occupied since 1912. Arrangements are being made for quarters in a more suitable locality where the Agassiz name will continue to be commemorated.

To encourage the use of **humane slaughtering devices,** the Animal Welfare Institute, 350 Fifth Ave., New York 1, N.Y., needs funds to purchase humane stunning equipment for testing, distribution, and practical use. Contributions for this purpose, whether large or small, will be most welcome.

The American Museum of Natural History, New York, recently opened its new **Hall of Oil Geology,** probably one of the largest and most complete exhibits of its kind ever constructed. Norman D. Newell, Curator of Historical Geology at the museum, said:

> The exhibits are designed to interpret for the layman the natural processes whereby oil is formed, the exploratory methods employed in the search for oil fields, and the techniques used in extracting petroleum from the ground to meet the growing demands for oil.

The exhibition is the result of a cooperative effort of the museum and the Standard Oil Co., which provided technical guidance and substantial financial support. Many oil service companies also played an important part in the development of the exhibits.

The first issue of *Grana Palynologica,* edited by Gunnar Erdtman of the Palynological Laboratory, Bromma, Sweden, has appeared. This publication is for those who want to be in touch with work done on pollen and spores, including the spores of moss, ferns, and fern allies. The initial issue includes electron microscope pictures of *Lycopodium* spores as well as other features. Copies may be ordered from the publisher, Almqvist and Wiksell, 26 Gamla Brogaton, Stockholm C, Sweden, at a cost of 15 Swedish kronar (about $3) plus postage.

The research committee of the **American Sociological Society** has prepared the *1955 Census of Research,* a list of the current projects that have been reported, together with the names of the members of the society working on each project. This document consists of 67 mimeographed pages, including an index of authors. The projects are classified into 24 subject categories. Copies may be obtained for $1 each from the American Sociological Society, New York University, Washington Square, New York 3, N.Y.