fore, that the safest way to build up a population of foreign oysters or other useful bivalves, would be to import a small number of adults, which upon arrival should be kept under such conditions that undesirable forms, incidentally brought along with them, would not gain entrance to the native waters. Later, by using the modern methods of lamellibranch culture (*6*), the spawn of these adults could be used for rearing, under rigidly controlled laboratory conditions, a sufficient number of pest-free individuals for the establishment of initial spawning beds.

References and Notes

1. I wish to express thanks to my colleagues at Milford Laboratory for cooperating with me in many phases of these studies, to the members of the Fish and Wildlife Service at Boothbay Harbor and of the State of Maine Sea and Shore Fisheries who made numerous observations on the oysters planted in Maine, and to C. E. Lindsay of the State of Washington for informing me of the fate of the seed oysters which we shipped there.
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News and Notes

Solar Energy and Wind Power

The Government of India organized a symposium on *Wind Power and Solar Energy* in New Delhi, India, 22–26 Oct. The UNESCO Committee on Arid Zone Research joined with India in sponsoring this conference, the purpose of which was to study the possibilities of using wind power and solar energy, particularly in arid regions.

The 28 scientists from 20 different nations included physicists, engineers, chemists, meteorologists, and botanists, each offering his experience and specialized techniques in an attempt to provide more power and more comforts for people who live in areas where fuels for mechanical power are limited or nonexistent. The difficulty with using sunlight is the low intensity of energy and the large area that has to be covered with any energy-receiving material.

Solar heaters for cooking, house heating, and operating engines were described in detail. Several solar cookers that gave heat equivalent to 350 watts were demonstrated at the National Institute of Physics of India. The parabolic mirrors were about 3 ft in diameter. Another type, developed by L. Gardner of New Delhi, consisted of many small flat mirrors attached to wooden arms with parabolic edges, arranged in such a way that each arm is adjusted at frequent intervals, to focus the sunlight onto a vessel of boiling water. The solar cookers were regarded as important because, if they can be made cheaply enough, they can be used in rural houses instead of the stoves that now burn cow dung or shrubs and grass. The dung should be used for fertilizer and the vegetation should be used to protect the soil against erosion. The present selling price of the solar cooker in India is $14, but this is too high and it was generally agreed that solar cookers would have to be sold for $5 or less in order to be widely accepted. Thin mirrorized plastics in parabolic shapes were suggested in place of the metallic reflectors.

In heating houses with solar energy the problem is simplified by the fact that high temperatures are not needed and no focusing device is required. The heat can be stored in hot water tanks, in beds of small rocks, or in chemicals such as hydrated salts. A large expansion in the number of solar-heated houses is expected in the colder climates and here again valuable trees, shrubs, and grass can be conserved if cheap solar heating equipment can be developed. The problem is to find a way of collecting and storing the sun's heat with a minimum of invested capital. Thin plastics offer promise as a cheap material.

House cooling and refrigeration are also important. V. A. Baum of the U.S.S.R described a refrigerating machine in which a solar engine produced 250 kg of ice per day.

The solar distillation of salt water was reviewed; it seems likely that distillation can be economical in areas where fresh water is at a high premium. Here again, the new hope lies in using thin plastic tubes of large area. Extensive tests will be carried out in several different laboratories to test the length of life of plastic materials under operating conditions in bright sunlight. It was pointed out that there are several areas in Asia and Africa where the solar distillation of sea water and brackish water from wells would be of great help. It was emphasized in one specific case that 2000 gal/day are needed for a fish cannery on the eastern coast of Africa and that this water is now brought long distances by ship. Production of this amount of water by solar distillation could be started soon.

Perhaps the greatest emphasis of the conference was placed on solar engines. Most of the work described involved the use of large parabolic mirrors focusing the light onto water boilers. K. N. Mathur and F. Khanna of the Indian National Institute of Physics demonstrated several different models. V. A. Baum of U.S.S.R. described large installations that generate steam for engines up to 7 atm and he gave plans for still larger installations. Several additional applications of solar energy were shown by Baum with the help of motion pictures.

Steam engines with flat plate collectors instead of parabolic mirrors were discussed and a type of gas engine was mentioned in which the gas could be alternately expanded and contracted by intermittent exposure to sunlight.

Three papers were devoted to meteorology and the recording and interpretation of solar data. Particu-

larly significant data including the importance of scattered radiation from clouds was reported by A. E. H. Bleksley of South Africa. The water problems in northwest India were described in detail and it was pointed out that many arid regions have water below the surface that can be used for irrigation if solar power and wind power are available.

H. Masson of French West Africa described fundamental studies on the heating of water in various types of troughs.

It is an anomaly that although solar energy is difficult to use because it is so low in intensity, it nevertheless can be used for experimental furnaces of the highest temperatures under conditions where fuel gases and electric heating coils are not a source of contamination. F. Trombe of France described in detail the very large parabolic reflectors and the high temperatures he is obtaining for experimental purposes. He described the technique of putting together many small flat mirrors to give an effective parabolic mirror of large area.

Power for simplified steam engines from the burning of leaves and vegetation was discussed. N. W. Pirie of England made the point that small plants, such as beans, might well be more effective in utilizing solar energy than algae. Plants that cover an entire area with green leaves may well compete with algae for mass production by photosynthesis and they are less subject to contamination than algae and can be readily harvested. Pirie suggested the squeezing of vegetable material of this type to extract soluble, edible carbohydrates and proteins. The residue of cellulose and other materials would be used for fuel. He suggested that water narcissus might well give very large yields of organic material per year and pointed out that to get maximum productivity from photosynthesis an area must be covered with green material throughout the whole growing season—in the tropics the growing season would be the whole year.

Nearly half of the symposium was devoted to wind power. I. D. Dresden of the Netherlands, U. Hütter of West Germany, and J. Juul of Denmark, and E. W. Golding of England led in these discussions. Much greater refinement is needed in reporting wind velocities in an area where windmills are under consideration. Many observations in a given area have shown that wind velocities may often be much more favorable for windmills than indicated by the wind velocities that are being reported from the present weather observatories. There were several suggestions, both with regard to wind and sun, that the science of micrometeorology should be expanded.

It was pointed out that windmills must have velocities of 10 mi/hr or more in order to be really useful. It was reported that winds greater than 10 mi/hr are not frequent in India and the outlook for windmills did not seem to be very hopeful there except in particular areas. Suggestions for some different types of windmills were made. The hope of using windmills and solar engines in the nonindustrialized areas depends on making the equipment so simple that the capital investment is low. Golding reported a new expansion of windmills and rural electrification in England and in other parts of the world. The possibilities of working electric generators and windmills into a rural electrification grid system were discussed. Hütter emphasized the importance of storing energy from intermittent windmills and solar engines. Among other suggestions was the use of a large sphere of cast iron to be heated by electric heating coils, to 600 or 700°C. The large heat capacity and the small area would tend to conserve heat which could later be used for operating vapor engines.

The organization and arrangements for the symposium were carried out by J. Swarbrick of the UNESCO office in Paris, and W. J. Ellis and Philip Young of the UNESCO office in India. M. S. Thacker of Bangalore was the able chairman of the committee on arid zone research and shared with Krishnan of the National Physical Laboratory the duties of chairman for the symposium. The participants of the conference were grateful for the opportunities of the conference and the study tour and for the splendid Indian hospitality arranged by Thacker and his associates.

After the symposium was completed, the group of 28 scientists was taken on a study tour as guests of the Government of India. The arid regions of northwest India were visited and the great need for developing solar engines or some means for raising water for irrigation was clearly evident. In many areas teams of bullocks were used for raising the water for irrigation and it is to be hoped that some of this labor can be replaced.

It was emphasized constantly that high efficiency of solar devices is relatively unimportant in sunny nonindustrialized areas. Low cost of installation per unit of power is much more important than the amount of power produced by a ton of coal or a gallon of gasoline. The solar energy is essentially free and it is available everywhere. Although solar energy and wind power cannot now compete with fossil fuel in an industrialized community where fuel is plentiful, they may compete with animal and man power.

FARRINGTON DANIELS

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Typhoons

A UNESCO symposium on *Typhoons* was held in Tokyo 9–13 Nov. 1954. Attending were official delegates from 13 countries of southern and eastern Asia from Pakistan to Japan and representatives of the American Armed Forces, U.S. Weather Bureau, and universities. All countries endangered by typhoons in the area were represented except Ceylon and Russia, neither of which sent delegates, and Red China, which is not a member of UNESCO. K. Wadati of Japan was elected chairman, and G. S. P. Heywood of Hong Kong, vice chairman.

After the introductory organizational meeting, the discussion turned to the "Prevention of disaster

caused by typhoons." Three main forces were examined: the force of the wind itself and the resulting damage, the floods caused by the heavy rains, and the high storm tides that sometimes occur. In each case the topography of the land or the sea floor was shown to affect the intensity of the damage.

One day was devoted to the "Structure of typhoons." The highlight of this session was a discussion of the structure of hurricanes off the east coast of the United States as explored by weather reconnaissance planes. R. H. Simpson of the U.S. Weather Bureau ended his talk by showing several colored slides he had taken in the eye of a typhoon south of Bermuda.

On the third day the "Formation and development of typhoons" and the "Movement of typhoons" were considered. Progress in determining why one tropical depression will develop into a typhoon and an apparently similar one will not is slow and controversial. A promising development for forecasting the movement of typhoons appears to be the modification of numerical forecasting methods now used for the westerlies [*Science* **120**, 408 (1954)] to tropical latitudes.

The status of present and planned research on typhoons was discussed on the fourth day. Only the larger organizations such as those in the United States and Japan can support extensive research; the smaller countries such as Macao and the Philippines have neither the money nor the manpower to do more than routine work.

Perhaps the outstanding feature of the symposium was the emphasis on the practical aspects of the problem. In this region where communication between scientists is comparatively poor and the exchange of information by means of journals is rendered difficult by government currency restrictions, the conference served as an inspiration and as a place to exchange information that can be adapted by each participant to his local problems. It is hoped the proceedings of the symposium will be published by spring.

A. D. PETERSON

Pan American Airways, Tokyo, Japan

Science News

The Scientists' Committee on Loyalty and Security of the Federation of American Scientists has issued an appeal for information concerning **cases in which grants to individual scientists have been denied** by the U.S. Public Health Service because of questions regarding loyalty. According to the committee, the fact that grants have been withheld has been established in one or two instances, and, on 21 Apr., Secretary Hobby confirmed that such action had taken place but indicated that the cases were limited in number. The committee has stated that it does not wish to criticize any division of the Government without being quite certain that there is adequate cause for criticism. Information should be addressed to Ernest Pollard, chairman, 2153 Yale Station, New Haven, Conn.

Orda Plunkett, Robert Lubarsky, and Frank Swatek of the department of botany at the University of California at Los Angeles report that, contrary to previous belief, wild rodents are not an important reservoir for organisms that cause valley fever, or **coccidioidomycosis**—a respiratory disease found in the Southwest. More than 1100 wild rats, mice, and rabbits were trapped in various southern California areas. Only eight of the animals, 0.7 of 1 percent, yielded evidence of infection.

British surveyors set 29,002 ft as the **official height of Mount Everest** more than 100 yr ago; however, for some years few experts have considered the figure accurate. Even so, it has stood because none of the many subsequent and higher estimates seemed precise. Recently a new computation of 29,028 ft was reported to the National Geographic Society by I. H. R. Wilson, Surveyor General of India, as the measurement now officially accepted by the Government of India. The new figure may be off 10 ft either way because of seasonal fluctuations in the snow depth on Everest's limestone summit.

According to a recent study of students who traveled to Europe during the summer of 1953, the American tourist is no more likely to acquire a serious parasitic intestinal infection in Europe than he would traveling within the borders of his own country. There also appears to be little scientific basis for the widespread view that "water, change in diet or viruses" cause the minor, but annoying **diarrhea that harasses the American tourist** overseas. B. H. Kean, assistant professor of public health and preventive medicine, and Wilson G. Smillie, professor of public health and preventive medicine, both of Cornell University Medical College, conducted the survey with the aid of a grant from the New York Hospital–Cornell University Medical College Research Fund; their findings are reported in the 16 Sept. 1954 issue of the *New England Journal of Medicine*.

Only six students (2.7 percent) acquired amebic infection in a group of 222 American students who volunteered for both series of tests conducted on eastbound and westbound voyages. It is likely, the report observes, that examination of a comparable group of students "who took their vacations anywhere in the United States would reveal an equally high percentage."

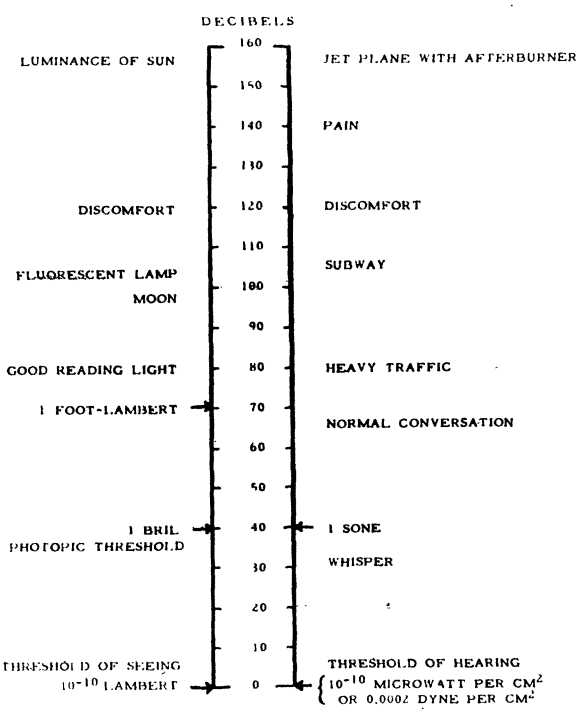
Another group of 360 students also cooperated in this study of intestinal protozoans. Evidence indicates that the diarrhea which was reported by more than half the students might be due not to unaccustomed food or water, but to eating substances containing "toxins such as those produced by staphylococci." Because the incidence of diarrhea was considerably higher (71 percent) in students who visited Mediterranean countries than in those who visited only non-Mediterranean countries, it was suggested that warmer climate and poorer refrigeration might be major factors. However, there was no significant difference in

the occurrence of serious intestinal infection in the two groups of travelers.

Facilities for this study were provided by the Council on Student Travel, New York, a nonprofit educational corporation with a nation-wide membership of 34 educational and religious organizations. These organizations conduct international student travel programs that send abroad 5000 students annually.

Soon to be published in *Science* is an article by Herzog, Nobile, Tolksdorf, Charney, Hershberg, Perlman, and Pechet, describing the physical characteristics of two new biologically active steroids with cortisonelike activity. The structures of these **new antiarthritic drugs** are as follows: metacortandracin (Meticorten, Schering) Δ1,4-pregnodiene-17α,21-diol-3,11,20-trione; and metacortandralone (Metacortalone, Schering) Δ1,4-pregnadiene-11β,17α-21-triol-3,20-dione. The use of these drugs in the treatment of rheumatoid arthritis was discussed by J. J. Bunim, National Institutes of Health, at a conference at the New York Academy of Sciences on 26 Jan. The new drugs were synthesized in the laboratories of the Schering Corporation, Bloomfield, N.J.

A comparative decibel rating **chart for varying intensities of sight and sound** has been developed by S. S. Stevens, director of the Psycho-Acoustic Laboratory at Harvard University. The chart compares the pain experienced by looking directly at the sun (left scale of chart) with a sound equivalent, the noise of a jet plane at full power (right scale of chart), and places these at the extreme discomfort level. Other sight-sound comparisons on the chart range downward to zero, the threshold point of normal vision and hearing.



Increased interest in the **conservation of fine art objects** (or restoration, as the process is more popularly known) has resulted, according to R. L. Feller, Mellon Institute, Pittsburgh, from the foundation of grants and fellowships at various art institutes for research in the field. Feller, who is the author of a technical paper on "Dammar and mastic infrared analysis" [*Science* **120**, 1069 (1954)] informs us that

> . . . An extensive literature has developed in the last 25 yr owing to technical studies in the fine arts, particularly at laboratories in museums in Boston, London, and Brussels. . . . In 1950, the National Gallery of Art, Washington, D.C., established a fellowship at Mellon Institute, Pittsburgh, Pa., to investigate new materials for the fine arts, both for original works and for conservation. In England, the Nuffield Foundation has also established a grant for fundamental research at the National Gallery, London. At Mellon Institute, chemists have devoted first attention to a special study of lacquer or spirit-type varnishes. . . . The traditional materials of the artist, natural resins, drying oils, gums, and "secret formulas," are generally complex mixtures which present a challenging problem to the analyst.

The use of radar to supply information about the structure, density, and movements of flying swarms of locusts is reported in the 8 Jan. issue of *Nature* by R. C. Rainey of the Desert Locust Survey Headquarters, Nairobi, Kenya. The first **radar-sighting of locusts** was recorded on 22 Mar. 1954 in the Persian Gulf by H.M.S. *Wild Goose*. Radar data make it possible to combat swarms by spraying them in midair from airplanes.

Discovery of a **diet that will raise the I.Q.** of mentally defective children suffering from the rare condition, phenylketonuria, is announced by L. I. Woolf, Ruth Griffiths, and Alan Moncrieff of the Hospital for Sick Children, London, in a recent issue of the *British Medical Journal*. Three small children, two of them idiots and one an imbecile, have been fed this diet for from 4½ to 10 mo. The mental ages of all three have increased at a marked rate, and they may reach an intelligence level that will allow them to attend school.

The previous lack of mental development in these children was the result of a defect in the way their bodies handled the amino acid phenylalanine. About four out of every 100,000 population are born with this defect. Since phenylalanine poisoning caused the mental deficiency, Woolf decided to devise a diet that would not contain this material. Since all dietary proteins are about equally rich in content of this particular amino acid, Woolf used an acid hydrolysate of the protein, casein, which contains all amino acids necessary for good nutrition, and treated it with charcoal to extract the unwanted phenylalanine. This treatment also removed tryptophan and tyrosine, both of which were replaced in the mixture.

The material was fed as a soup cooked with starch and water. Since the patients were young and backward, the oldest being 5 yr old, with a mental age of

8 mo, soup feedings were particularly suitable for them. As they progressed in mentality, a special kind of sugar cookie was allowed. The patients were also fed as much water, orange juice, and sugar-water as they wanted, as well as vitamins and minerals. For a child with a mental age of more than 2 yr, potatoes, carrots, and cabbage were added to the diet and the amino acid mixture was fed as a thick gravy flavored with tomato puree. Some patients with epilepsy might also be helped, the studies suggest, since one of the three children stopped having attacks of epilepsy, which had also afflicted him.

Scientists in the News

James M. Mitchell, Deputy Assistant Secretary of Defense, has become assistant to the director of the National Science Foundation. The appointment was announced by Alan T. Waterman, director of the Foundation. Mitchell will be concerned with the foundation's program of fact-finding studies on scientific activities and manpower in government, industry, and universities.

Robert A. Ramey, Jr., manager of the magnetic development section of the materials engineering department of the Westinghouse Electric Corp., Pittsburgh, has been appointed visiting Webster professor of electrical engineering at Massachusetts Institute of Technology for the second semester of the current academic year. During his stay at M.I.T., which commences 1 Feb., Ramey will participate in the development of teaching and research in the new area of solid state nonlinear devices and their applications to power modulators.

Ludwig Biermann has been appointed visiting professor of astrophysics at California Institute of Technology for the current term. One of the leading theoretical astrophysicists in Europe, Biermann is on leave from the Max Planck Institute and the University of Göttingen in Göttingen, Germany. He will conduct a graduate course on the astrophysical theory of stellar magnetism and plasma physics.

Frank H. Riddle, vice president of the Champion Spark Plug Co., Detroit, Mich., has been named 1955 recipient of the Albert Victor Bleininger award. The award is the highest honor conferred in this country for distinguished achievement in the field of ceramics and is given annually by the Pittsburgh section of the American Ceramic Society. The presentation will take place in March.

Ernest M. Gruenberg, executive director of the New York State Mental Health Commission, has resigned to accept a position with the Milbank Memorial Fund. He assumed his duties as a senior member of the technical staff in charge of the fund's mental health activities on 1 Jan.

Carl J. Wessel, associate director of the Prevention of Deterioration Center, Division of Chemistry and Chemical Technology, National Research Council, Washington, D.C., has been appointed director.

Frederic W. Heimberger, vice president for faculty, curriculum, and research, Ohio State University, has been named chairman of the university's newly created Advisory Council on Research. The new 16-member council will serve as a central campus agency to encourage, assist, and give broad direction to the total research effort of the university. Some of the other members are **J. M. Birkeland,** department of bacteriology, **E. L. Bowers,** department of economics, **F. E. Deatherage,** department of agricultural biochemistry, **M. S. Newman,** department of chemistry, **W. G. Venzke,** department of veterinary science, **G. L. Von Eschen,** department of aeronautical engineering, **G. B. Carson,** College of Engineering, **C. A. Doan,** College of Medicine, and **O. C. Woolpert,** executive director of the Research Foundation.

Kenneth S. Cole, former technical director of the Naval Medical Research Institute, Bethesda, Md., has been appointed chief of the laboratory of biophysics, National Institute of Neurological Diseases and Blindness of the National Institutes of Health. His new duties will involve the direction and coordination of a fundamental biophysical research program in the fields of neurological diseases and sensory disorders.

Leland G. Butler, agronomist, has been appointed director of technical service and development in the eastern United States for Standard Agricultural Chemicals, Inc., Hoboken, N.J. Butler recently spent a year in Venezuela experimenting with chemical weed control among food crops as a fellow of the research institute of the International Basic Economy Corp.

Lawrence R. Hafstad, who retired recently as director of the Atomic Energy Commission's division of reactor development [*Science* **120**, 967 (10 Dec. 1954)], has been granted the AEC's distinguished service award.

S. Norman Feingold, executive director of the Jewish vocational service of greater Boston, has been appointed by Governor Herter of Massachusetts to a newly established council on the employment of the aging. His appointment is for 2 yr.

William Q. Wolfson is on military leave from his position as director of the unit for metabolic research at Wayne University College of Medicine and is at present serving as chief of professional services of the U.S. Army Hospital located at American Hospital in Paris. Mail originating in the U.S. should be addressed to Maj. William Q. Wolfson 01934624, U.S. Army Hospital, Paris, France, A.P.O. 55, N.Y.

The Astronomical Society of the Pacific has awarded its Catherine Wolf Bruce gold medal for 1955 to **Walter Baade** of the Mount Wilson and Palomar Observatories. He was chosen for the award by the directors of the Astronomical Society from a list of nominees submitted by the directors of six large observatories, three in the United States and three abroad. He is being honored for his investigations of the structural features and stellar content of systems of stars.

Necrology

Maurice A. Bigelow, 82, author and professor emeritus of biology at Columbia University, New York, 6 Jan.; **Harry Freund,** 49, author and specialist in internal medicine, Brooklyn, N.Y., 9 Jan.; **Albert P. Godsho,** 60, engineer of transmission and protection for Bell Telephone Co., Philadelphia, 7 Jan.; **Doris Harrison Holtzman,** 33, assistant professor of biology at Long Island University, Brooklyn, N.Y., 26 Dec.; **Dwight L. Hopkins,** 55, protozoologist and professor of biological sciences at the University of Illinois, Chicago, 10 Jan.; **Max Jakob,** 75, authority on heat transfer, author, and research professor in the mechanical engineering department of Illinois Institute of Technology, Chicago, 4 Jan.

Arthur B. Keith, 88, anthropologist, author, former rector of the University of Aberdeen, former president of the British Association for the Advancement of Science, and master of Buxton Browne Research Farm, Downe, Kent, England, 7 Jan.; **Thomas F. Manns,** 78, professor emeritus of plant pathology and soil bacteriology at the University of Delaware, Newark, Del., 22 Dec.; **Lionel S. Marks,** 83, authority on engine design, pioneer in combustion engine development, author, and Gordon McKay professor of mechanical engineering emeritus at Harvard University, Cambridge, Mass., 6 Jan.; **Miner R. Salmon,** 45, former teaching assistant at Columbia University and research food chemist for Thomas J. Lipton, Inc., Hoboken, N.J., 6 Jan.; **John W. Schlegel,** 76, retired chief chemist for the National Sugar Refinery, Long Island City, Queens, N.Y., 13 Jan.; **James W. Sherrill,** 64, authority on diabetes treatment and medical director of the Scripps Metabolic Clinic, La Jolla, Calif., 4 Jan.; **Paul Wallworth,** 64, pioneer in the development of modern rice farming methods, Stuttgart, Ark., 6 Jan.

Meetings

"More realistic science teaching—toward what ends?" will be the theme of the 1955 national convention of the **National Science Teachers Association** that will be held 24–26 Mar. at the Netherland Plaza Hotel, Cincinnati, Ohio. Special sections for elementary science as well as high school and college science will be included in the symposiums, panels, clinics, and "Here's-how-I-do-it" sessions. There will be some 13 work-discussion groups, and showings of science teaching films will be offered in several continuous sessions. A new program feature will be the sessions devoted to reviews of recent research in science and the implications for the use of such research results in the strengthening of teaching.

Among the speakers for general sessions are Robert Havighurst, University of Chicago, "Science and intelligent choice;" Harold Fawcett, Ohio State University, "Science and the nature of proof;" and Hubert N. Alyea, Princeton University, who will present one of his popular lecture demonstrations. The AAAS will be represented by its new president, George W. Beadle, California Institute of Technology.

Among the science educators who will be leading the symposiums are Gerald S. Craig, Teachers College, Columbia University, for elementary science; James G. Harlow, University of Chicago, for teacher education; Hubert Evans, Teachers College, Columbia University, for research in science education; Philip G. Johnson, Cornell University, for sponsored programs for improving teaching.

Among those participating in the clinic sessions will be Paul Brandwein, Forest Hills High School, New York City, "Science teaching for gifted high school students;" Harold Alberty, Ohio State University, "Science and the core program;" Rose Lammel, New York University, "Science for elementary children."

The 3rd International Congress of Biochemistry organized by the Belgian Society of Biochemistry under the auspices of the International Union of Biochemistry will convene in Brussels 1–6 Aug. 1955. The scientific program will include (i) 32 symposium sessions, (ii) sessions for members' communications, and (iii) general lectures. Registration accompanied by the appropriate fees must be made *not later than 31 May 1955* at any of the branch offices of the American Express Co. from whom may also be secured any further information concerning the congress.

The **Aero Medical Association** will hold its 26th annual meeting at the Hotel Statler, Washington, D.C., 20–23 Mar. Medical people from many countries are expected to participate. For information, communicate with the head of the association, Gen. Otis O. Benson, Jr., of the U.S. Air Force Medical Service, Washington 25, D.C.

The following paragraphs concerning a meeting on **race relations,** which were abstracted from an item in *News from the Pacific* (vol. 5, Nos. 3 and 4), appeared in the December *Information Bulletin* of the Pacific Science Association.

During July 1954 some 40 sociologists, anthropologists, historians, economists, students of government, and other social scientists gathered at the University of Hawaii for a 4-wk study of race relations in world perspective. Supported by grants from the Ford and McInerny Foundations and jointly sponsored by the universities of Chicago, California, and Hawaii, the conference sought "to re-

view the state of scientific knowledge about race relations in world-wide perspective" and thus to establish facilities for a continuing sharing of knowledge concerning the nature of race relations. Students of the racial situation on six continents attended.

The immediate results of the conference will appear in two volumes to be published within the next year. One of the major achievements of the meeting was the founding of the International Society for the Scientific Study of Race Relations to carry on the activities inaugurated at the conference and to encourage research in race relations in those critical areas of the world where such activities are now limited or nonexistent.

The 6th **National Gastrointestinal Cancer Conference** will be held in the New York Academy of Medicine, New York, 4–5 Apr., with the New York Cancer Society acting as host. The conference is sponsored by the gastrointestinal cancer committee of the National Advisory Cancer Council, National Cancer Institute, Bethesda, Md., and is a continuation of the committee's activities in stimulating the interest of investigators in, and disseminating information about, the gastrointestinal cancer problem. Clinical aspects of the subject will be emphasized in the program of the conference. All interested scientists are invited to attend.

The **Symposium on Molecular Structure and Spectroscopy** will be held in the department of physics and astronomy at Ohio State University, 13–17 June. There will be discussions of both the interpretation of molecular spectroscopic data and the methods for obtaining such data. In addition, there will be sessions devoted to other phases of spectroscopy. A dormitory will be available for those who wish to reside on the campus during the meeting. For further information, or for a copy of the program when it becomes available, write to Prof. H. H. Nielsen, Dept. of Physics and Astronomy, Ohio State University, Columbus 10.

Education

The **John A. Hartford Foundation** has awarded **Yale University** $3,160,000 for research and training in biophysics and for the construction of a new 10,000-ft² research laboratory. Yale will receive the funds in the form of an annual grant of $180,000 for the next 15 yr; an allotment of $460,000 will be provided for construction of the new laboratory, which will be located on the Hartford Foundation's property in Valhalla, N.Y., near White Plains. The instructional phase of the new biophysics program will be centered in New Haven, while research activities are to be conducted both at Yale and at Valhalla.

Ernest C. Pollard, professor of biophysics at the university and a leading figure in this recently developed science, will be chairman of a new department of biophysics. Until now, biophysics at Yale has been predominantly a part of the physics department. The staff of the new department will be almost double the present faculty now interested in biophysics. It will include physicists, chemists, biologists, and physicians. Franklin Hutchinson, assistant professor of radiation phyics at Yale, will be resident director of the Valhalla laboratory next year, a position that will be filled on a rotating basis.

During a half-year leave of absence from Yale starting on 1 Feb., Pollard will spend some time at the Hartford Foundation's house in Valhalla. This house will be used as the library and living quarters for the biophysics laboratory staff. The remainder of Pollard's leave will be devoted to studying biophysics in the Radiological Research Unit of the Mt. Vernon Hospital and Radium Institute in London, where he will work with L. H. Gray.

In explaining the importance of the Hartford Foundation's support of the new research program, Pollard said that biophysics is "the real frontier of science today. The grant will enable biophysics to apply the methods of atomic and nuclear physics to a purely humanitarian and constructive end."

The **George B. Wallace Laboratories of Pharmacology** on the fourth floor of the Medical Science Building of the New York University-Bellevue Medical Center were formally dedicated on 12 Jan. Alfred Newton Richards, emeritus professor of pharmacology at the University of Pennsylvania, delivered the principal address. Richards' association with Wallace began in 1902 during the first of Wallace's 44 yr as head of the N.Y.U. department of pharmacology. A close friendship continued between these two eminent pharmacologists until Wallace's death in 1948.

A new unit for the expansion of medical research through the investigation of problems in microbiology and medicine has been set up in the laboratories of the **Wistar Institute of Anatomy and Biology** under the joint auspices of the institute and the University of Pennsylvania. The new unit is under the direction of Geoffrey W. Rake, research professor of microbiology in medicine at the university and staff member of the institute. Studies are being undertaken in infectious disease processes and the host cell-parasite relationship in man and animals.

The **Samuel Sackett Foundation,** established recently for scientific research, has selected as its first project an investigation of rheumatic fever and its related diseases that will be conducted in the **Northwestern University** medical school. Studies will be supported by income from the $500,000 foundation created by Mr. and Mrs. Samuel J. Sackett of Evanston, Ill., and their daughter, Elizabeth Sackett Crocker, of Houston, Tex. Foundation trustees are Sackett; Frank T. Murray, Chicago attorney, and Lowell D. Snorf, Northwestern University professor of medicine.

Laboratory facilities for the studies will be provided in the new Morton Medical Research Building, scheduled for completion in April at the Northwest-

ern Medical Center on the university's Chicago campus. The project will be directed by a senior investigator, yet to be appointed, within the medical school's department of medicine. A broad and continuing investigation is planned, rather than any specific study related to a limited aspect of rheumatic fever. Thus it is hoped to develop a cohesive and imaginative research program that will furnish a background for specific studies.

The first course ever to be offered in **engineering information sources** and literature will be given by the Columbia University School of Library Service during the regular summer session, 5 July–12 Aug. Tuition and registration fees are $82. Russell Shank, librarian of the Engineering and Physical Science Libraries at Columbia, will teach the course, which will survey and evaluate library resources in engineering and physical sciences. It is designed to meet problems of academic and industrial librarians. It will also discuss methods of obtaining house organs, trade journals, memorandums from industrial corporations, press releases (and how to use them), industrial films and mimeographed documents and reports on government-sponsored research by industry, universities, and government agencies.

Available Fellowships and Awards

The **Society for Psychical Research** (parapsychology) offers a prize of $140 for an essay on a subject that falls within its field. The essay may present original ideas or criticism or describe a recent piece of experimental work, and preferably should not exceed 3000 words. Entrants should submit their essays under a pseudonym, enclosing their name and address in a sealed envelope. Entries should be typed double space on one side of the paper only, and must be *submitted by 30 June 1955* to the Secretary, Society for Psychical Research, 31 Tavistock Sq., London W.C.1.

The **Darbaker Prize Committee** of the Botanical Society of America will accept nominations for an award to be announced at the annual meeting of the society in 1955. Under the terms of the bequest the award is to be made for meritorious work in the study of the algae, particularly the microscopic algae. The committee will base its judgement primarily on the papers published by the candidate during the last two full calendar years previous to the closing date for nominations. Only papers published in the English language will be considered. Nominations for the 1955 award accompanied by a statement of the merits of the case and by reprints of the publications offered as evidence in support of the candidacy should be sent to the chairman of the committee, Wm. Randolph Taylor, Dept. of Botany, University of Michigan, Ann Arbor, Mich., *by 28 Feb.* The value of the prize for 1955 will depend on the income from the trust fund, but is expected to be about $150.

Fellowships and assistantships are now available at the **Baylor University Graduate Research Institute** for students wishing to work toward the M.S. and Ph.D. degrees. The Graduate Research Institute, housed in the newly constructed Wadley Research Institute and Blood Center, is located in Dallas, Tex., on the grounds of the Baylor University Hospital. Degrees are being offered in chemistry, bacteriology, cytology, immunology, and human genetics. Attention is drawn to the unusual opportunity for patient studies. Inquiries and applications should be directed to Dr. J. M. Hill, Baylor University Graduate Research Institute, 3600 Gaston Ave., Dallas, Tex.

Teaching assistantships and graduate fellowships are available in most departments of the **College of Engineering and Science, Carnegie Institute of Technology,** for able graduate students. Normally, the duties assigned entail 9 to 12 hr/wk of laboratory instruction. Assistants are permitted to carry from two-thirds to seven-eighths of a full load of graduate work. The stipend is $1680 per academic year for the first year and $1780 for the second, from which the student must pay his tuition. A few assistantships entailing more work and a correspondingly higher stipend are available.

Several departments and research laboratories employ research personnel for part-time research under the supervision of a member of the staff. Part-time research assistantships carry stipends comparable to teaching assistantships.

Graduate fellowships, supported by outside agencies and special institute funds, carry liberal grants based upon need, in addition to tuition. These fellowships are offered by most departments in the college. They are awarded to outstanding graduate students to permit them to devote full time to advanced study and research. In general, fellowships are not awarded to beginning graduate students.

Applications for admission to graduate study and for assistantships or fellowships, together with transcripts of record and other supporting evidence, should be submitted as early as possible, preferably *not later than 1 Mar. 1955.* However, applications from able and well-qualified candidates will be considered if received at a later date. Address all inquiries to: Dean of Graduate Studies, Carnegie Institute of Technology, Pittsburgh 13, Pa.

The following are the 1955–56 graduate opportunities in **botany at Columbia University.**

Industrial fellowship in plant biochemistry. An industrial fellowship for the study of polyphenolic pigments in plants. R. F. Dawson.

Research assistantship in cytogenetics and cell physiology. An Atomic Energy Commission grant for the study of nucleic acid and nucleoprotein metabolism in cells using radioisotopes and autoradiographs. $1800.

Higgins fellowship in botany. For graduate work in

any field of botany. Approximately $2000. *Applications due 20 Feb.* Forms may be obtained from the Office of Admissions, 322 University Hall, Columbia University, New York 27.

Teaching assistantships in various areas of botany. These have stipends of $1300 with free tuition. General botany (Columbia College), E. B. Matzke; general botany (Barnard College), D. D. Ritchie; microbiology (Barnard College), Helen B. Funk; morphology and cellular morphology, E. B. Matzke; mycology, L. S. Olive; physiology and biochemistry of fungi or higher plants, R. F. Dawson; physiology, S. F. Trelease.

Inquiries, except for the Higgins fellowship, should be addressed to the professor concerned. Fellowships and assistantships for Columbia are also available at the New York Botanical Garden and at the Boyce Thompson Institute for Plant Research.

Grants and Fellowships Awarded

The **Atomic Energy Commission** has announced the award of 34 unclassified physical research contracts, most of which are for 1 yr.

University of California. C. D. Jeffries. Nuclear moments, $10,260.

Florida State University. A. E. S. Green and M. A. Melvin. Analysis of nuclear forces, $6825.

University of Michigan. R. B. Bernstein. Fundamental research on isotopic reactions, $9450.

University of Arizona. E. B. Kurtz, Jr. Uranium accumulation in plants, $5200.

California Institute of Technology. N. Davidson. Complex ions and reaction mechanisms in solution, $12,000.

University of California. J. A. Pask. Mechanics of metal-ceramic bonding, $16,015.

University of California. R. A. James. Nuclear chemistry research, $12,382.

Carnegie Institute of Technology. J. E. Goldman. Research on properties of rare metals, $4500.

Carnegie Institute of Technology. E. Creutz. 400-Mev synchrocyclotron and associated research, $450,000.

Carnegie Institute of Technology. G. Derge. Electrochemical studies of nonaqueous melts, $32,184.

University of Colorado. J. R. Locher and J. D. Park. Thermochemical studies of organic fluorine compounds.

Columbia University. J. M. Miller. Research in radiochemistry, $19,728.

Columbia University. T. I. Taylor. Separation of isotopes by chemical exchange, $23,500.

University of Florida. G. B. Butler and A. H. Gropp. Studies in the preparation and properties of quaternary ammonium ion exchange resins, $10,800.

Illinois Institute of Technology. T. J. Neubert. Investigation of imperfections in solids, $7000.

University of Illinois. F. Seitz and D. Lazarus. Studies on the mechanism of substitutional diffusion in metals, $23,743.

State University of Iowa. L. Eyring. Preparation of rare earth oxides, $10,000.

Massachusetts Institute of Technology. B. E. Warren, Radiation damage in materials, $13,000.

Massachusetts Institute of Technology. G. R. Harrison. Echelle spectroscopy, $7500.

Massachusetts Institute of Technology. P. M. Hurley. Investigations of isotopic abundances of strontium, calcium, and argon in certain minerals, $32,210.

University of Michigan. P. J. Elving. Polarographic behavior of organic compounds, $8964.

University of Pennsylvania. K. R. Atkins. Three experiments on liquid helium, $4994.

University of Pittsburgh. R. Levine. Synthesis of β-diketones and β-ketoesters with heterocyclic nuclei, $8833.

Purdue Research Foundation. H. C. Brown. Chemistry of polyvalent metal halides, $14,400.

Massachusetts Institute of Technology. F. H. Norton and W. D. Kingery. Measurement of thermal conductivity of refractories, $34,420.

Rutgers University. E. R. Allen. Polar inorganic molecules, $10,984.

University of Southern California. H. L. Friedman. Solutions of inorganic electrolytes in solvents of low dieletric constants, $10,100.

Syracuse University. L. Gordon. Coprecipitation studies, $12,500.

University of Texas. E. F. Gloyna. Effects of biological slimes on sea water, $9990.

University of Texas. G. W. Watt. Unusual oxidation states of transitional elements, $18,000.

University of Utah. A. L. Wahrhaftig. Ionization and dissociation of molecules by electron bombardment, $10,780.

Washington University. J. W. Kennedy. Generation of high voltages by means of nuclear radiation, $14,500.

University of Wichita. L. L. Lyon. The permeability method for determining surface areas of finely divided materials, $15,300.

University of Wisconsin. J. R. Dillinger. Low temperature research, $8500.

The **Damon Runyon Memorial Fund for Cancer Research** allocated $60,200 in December.

Sloan-Kettering Institute. R. C. Mellors and O. H. Pearson. Two research projects, $16,000, second year.

New York Academy of Sciences. To support two conferences, Cytology and Cytochemistry, and Oncology, $15,000.

Cancer Institute, Miami, Florida. T. C. Gould and S. A. Gunn. Project, $6600.

Hahnemann Medical College, Philadelphia, Pa. E. C. Bernstorf. Project, $6000.

Johns Hopkins University. F. W. Barnes. Project, $3000.

George Washington University. P. K. Smith. The Metabolism of radioisotope labeled chemotherapeutic agents in cancer, $5800, sixth year.

Immaculata College. S. M. St. Agatha Suter. The cell components of normal and malignant tissues, $2400.

Tufts College of Medicine. Finance a fellowship for W. D. Slingerland, $5400.

The following **AAAS research grants** have been awarded:

Texas Academy of Science to R. J. Baldauf, A. & M. College of Texas. Contributions to the Cranial Morphology of North American Bufonidae (Amphibia, Anura).

Kentucky Academy of Science to O. J. Stewart, University of Kentucky. Study of the homing instinct in pigeons.

Nebraska Academy of Sciences to R. L. Threet, University of Nebraska. Simplified techniques of lighting and copying colored maps and diagrams with 25mm kodachrome.

The Foreign Operations Administration has extended its **program for foreign research scientists,** formerly restricted to 150 candidates, to a total of 185. This program will be administered by the National Academy of Sciences under the same conditions as those that governed the previous program. The European academies have been asked to present applicants as before for review and subsquent placement in American laboratories. These applications may be expected to arrive early in 1955. A list of the most recent awards under this program follows:

From Belgium

Daniel Bermane, electrochemistry—Massachusetts Institute of Technology, with H. H. Uhlig.

From France

Michel Angot, oceanography—Scripps Institution of Oceanography, with Roger Revelle.

Ewald Gondolf, physics—Carnegie Institute of Technology, with Robert F. Mehl.

Christian Wagner, physics—Massachusetts Institute of Technology, with B. E. Warren.

From Germany

Walter Braun, pharmacology—University of Cincinnati, with William D. Lotspeich.

Clemens-August Hackethal, physiological chemistry — The Boston Dispensary of the New England Medical Center, with Gerhard Schmidt.

Walter Harm, genetics—California Institute of Technology, with Max Delbrück.

Lothar Jaenicke, biochemistry—Western Reserve University, with G. Robert Breenberg.

Erich Kessler, plant physiology—University of Chicago, with Hans Gaffron.

Wolfram Keup, biochemistry—New York State Psychiatric Institute, with Heinrich Waelsch.

Martin Klingenberg, biochemistry — University of Pennsylvania, with Britton Chance.

Rüdiger Knapp, botany—California Institute of Technology, with F. W. Went.

Erwin Kreyszig, mathematics — Stanford University, with Stefan Bergman.

Klaus J. Müller, paleontology — State University of Iowa, with A. K. Miller.

Wolfgang Trautwein, physiology — Johns Hopkins Medical School, with Stephen Kuffler.

Gustav Weber, nuclear physics—California Institute of Technology, with Charles H. Lauritsen.

From Italy

Dino Dini, jet propulsion and rockets—California Institute of Technology, with H. S. Tsien.

Giovanni de Franciscis, animal husbandry—Agricultural and Mechanical College of Texas, with H. O. Kunkel.

Alberto Girelli, petroleum chemistry—Bureau of Mines, U.S. Department of the Interior, with John S. Ball.

From Portugal

Pedro Braumann, mathematics — Stanford University, with M. A. Girshick.

José Cardoso, soil genesis—Iowa State College, with Frank F. Riecken.

Antonio da Costa, fisheries—School of Fisheries, University of Washington.

Ramiro Ferrão, animal feeding and meat technology—Agricultural and Mechanical College of Texas, with J. C. Miller.

Antonio Montano, veterinary pathology—Agricultural and Mechanical College of Texas, with Hilton A. Smith.

José Pinto Peixoto, meteorology—Massachusetts Institute of Technology, with H. G. Houghton.

From the United Kingdom

Geoffrey V. Chester, physics—Yale University, with John G. Kirkwood.

Richard Gibbons, biochemistry—Ohio State University, with M. L. Wolfrom.

Charles G. James, physical chemistry—University of California, Berkeley, with Leo Brewer.

Ian M. Mills, infrared spectroscopy—University of Minnesota, with Bryce Crawford, Jr.

Gordon Squires, physics—Institute for Advanced Study, with Robert Oppenheimer, and University of Chicago, with John and Leona Marshall.

Miscellaneous

A list of references on the general subject of **the preservation of living cells** by freezing in glycerine solutions has been compiled by the Glycerine Producers' Association. Three main aspects of the subject are covered: blood cell preservation, sperm cell preservation, and tissue preservation. The references cite articles published in, as well as individuals and publications concerned with, the field. Copies of the list may be obtained from the Glycerine Producers' Association, 295 Madison Ave., New York.

Science as a social and historical phenomenon is the central theme of the following four articles in the February issue of ***The Scientific Monthly***: "Some aspects of science during the French Revolution" by Henry Guerlac; "Dual role of the Zeitgeist in scientific creativity" by Edwin G. Boring; "Influence of philosophic trends on the formation of scientific theories" by Alexandre Koyré; and "Alternative interpretations of the history of science" by Robert S. Cohen. These articles are based on papers that comprised the last part of a symposium held in Boston, 27–30 Dec. 1954, on the general subject *Validation of Scientific Theories.* The papers in the other four sessions appeared in preceding issues.

The other articles that appear in this issue include "The United Nations in perspective" by John B. Whitton *et al*; "Sperm maturesence" by David W. Bishop; "Philippine hydroelectric development" by Wallace E. McIntyre; and "Why science attachés?" by Robert L. Loftness. "Atoms for export" is the picture story in the "Science on the march" section, and it deals with the improved facilities at the British Radiochemical Center at Amersham, near London. There are 16 book reviews in this issue.

March 1955 is the scheduled release date for the **first issue of *Forest Science,*** an international journal of research and technical progress in forestry. The journal will appear quarterly under the auspices of the Society of American Foresters and will feature articles of interest to research, teaching, and administrative personnel in the field of forestry.

A grant of $2000 from the Horace H. Rackham fund of the University of Michigan has been set aside for the initial publication of the journal. The three-man board of editors consists of Henry Clepper, executive secretary of the Society of American Foresters; V. L. Harper, assistant chief, Forest Service, USDA; and Stephen H. Spurr, professor of silviculture at the University of Michigan. For information concerning subscriptions or manuscripts, write to Stephen H. Spurr, School of Natural Resources, University of Michigan, Ann Arbor.

Notice is hereby given that, *beginning 30 June 1955,* the **International Commission on Zoological Nomenclature** will start to vote on the following cases involving the possible use of the plenary powers for the purpose specified against each entry. Full particulars of these cases were published on 30 Dec. in parts 10 and 11 of vol. 9 of the *Bulletin of Zoological Nomenclature.* (i) *Dama* Frisch, 1775 (cl. Mammalia), validation of, for use for the name for the Fallow Deer of Europe; (ii) *Helicella* Férussac, 1821 (cl. Gastropoda), validation of; (iii) *rufa* Linnaeus, 1761 (*Formica*), validation of, and designation as type species of *Formica* Linnaeus, 1758 (cl. Insecta, order Hymenoptera); (iv) *Carinifex* Binney, 1865 (cl. Gastropoda), validation of; (v) *Discias* Rathbun, 1902, *Upogebia* Leach, 1814, *Processa* Leach, 1815, XANTHINAE Dana, 1851, UPOGEBIINAE Borradaile, 1903, and PROCESSIDAE Ortmann, 1896 (cl. Crustacea, order Decapoda), validation of.

Comments on the afore-mentioned cases should be sent as soon as possible to Francis Hemming, secretary to the commission, 28, Park Village East, Regent's Park, London, N.W. 1.