courses the satellites would range from 800 to 200 miles from the earth.

Although the exact shape and size of the satellite itself has not yet been determined, it will be small but large enough to contain a number of instruments and to be tracked from the ground by optical and radio devices.

Vanguard, the first vehicle, will be established in its orbit around the earth in the following general manner: the first rocket will start the entire assembly vertically on the first part of its flight. When its fuel is exhausted, the first stage will drop off and the second rocket, deflected from the vertical, will continue the satellite upward.

The third rocket, carrying the satellite proper, will accelerate it to a top speed of about 18,000 miles an hour, which will establish the satellite in its orbit, where it will continue under its own momentum.

The satellite's orbit will be elliptical rather than circular, and, at its perigee, may be approximately 200 miles distant. The satellite will revolve about the earth once every 1 or 2 hours for several days.

The cumulative effect of the drag of the earth's atmosphere, thin though it is at a 200-mile altitude, will still be sufficient to bring the satellite gradually closer to the earth. The friction of the air will cause the satellite to disintegrate as it enters the denser atmosphere.

■ The research vessels *Spencer F. Baird* and *Horizon* of the University of California's Scripps Institution of Oceanography have sailed from San Diego on the first leg of an oceanographic expedition to the waters of Central South America. The scientific leader of the voyage, which is called the Eastropic Expedition, is Townsend Cromwell, oceanographer for the Inter-American Tropical Tuna Commission, and a research associate at Scripps. He is aboard the *Baird*. Chief scientist aboard the *Horizon* is John A. Knauss of Scripps.

The ships will join vessels from the California Department of Fish and Game and from the U.S. Fish and Wildlife Service group at Honolulu for work in the eastern tropical Pacific. A vessel from the Peruvian Navy may participate in investigations off Peru. The Scripps vessels are due to return to San Diego on approximately 15 Dec.

In addition to regular oceanographic survey work, the expedition will make detailed studies of several areas in the tropical Pacific, including a rich tuna-fishing region off Costa Rica.

■ The first coelacanth that has thus far been observed alive lived less than a day after capture. Its death has been ascribed by J. Millot [*Nature,* **175,** 362 (26 Feb. 1955)] to decompression combined with rise in temperature of the water. J. Smith, however, doubts this diagnosis, for in 1938 the first of these fishes ever secured lived for more than 3 hours out of water on a trawler's deck during an unusually hot day [*Nature* **176,** 473 (3 Sept. 1955)].

Smith points out that large fishes taken alive on a line after struggling, despite the absence of any visible injury, rarely live for more than a short time even when they are set free. Curiously, fishes that have been harpooned, even though severely gashed, have a greater incidence of survival than those caught on hooks.

Smith suggests that "high nervous tension" produced by the conditions under which the coelacanth was kept after its capture may have contributed to its early demise. He also doubts the reported extreme photophobia of the animal, and regards its reactions to sunlight as merely natural uneasiness toward unfamiliar surroundings that became increasingly obvious to observers from dawn onward.—W.L.S., JR.

■ Understanding of superconductivity, the property of certain materials at a sharply defined low temperature to show immeasurably small electric resistance, presents a great challenge to solid-state physics. In recent years a number of new superconductors have been prepared and some successful attempts to formulate a theory have been made.

W. Buckel of Göttingen, Germany, [*Naturwissenschaften,* **42,** 451 (August 1955)] reviews new experimental results in the field of superconductivity. This article, which has 125 references, discusses (i) new superconductors; (ii) change of physical properties at the onset of superconduction; (iii) the isotope effect; (iv) the effects of pressure and lattice effects on the characteristic properties of superconductors; (v) the transition state; (vi) experiments on the phenomenological theory of superconduction; (vii) theory; and (viii) application of superconduction.

Superconductors have been used as bolometers and radio detectors, and a superconducting galvanometer with an inner resistance of 10^{-7} ohms has been constructed so that a sensitivity of 10^{-12} volts can be reached. Particularly important is the use of superconducting switches in thermostating at temperatures below 1°K.

■ The U.S. Naval Radiological Defense Laboratory, an $8 million facility for studying protective measures against radiation, was dedicated at the Hunters Point Naval Yard in San Francisco on 14 Oct. The decision to establish the laboratory was a result of the Bikini nuclear explosion and the attempt to decontaminate ships used in the tests.

Scientists in the News

ALBERT SCHWEITZER, scientist, missionary, musician, philosopher, and Nobel prize winner who for 41 years has been physician to lepers of the Congo area, was honored on 19 Oct. by Queen Elizabeth with the insignia of an honorary member of the Order of Merit. This order may be held by only 24 living Britons. The only other living non-Briton to be an honorary member is President Eisenhower. The presentation took place at a full-scale state ceremony.

Schweitzer's visit to England from his home in Alsace has received a great deal of attention in the London newspapers. In one encounter with the press, he interviewed himself.

"You will ask me where I have been lately," he said. "In Gunsbach in Alsace. There I meet old friends and recognize big trees which were only saplings when I was a boy.

"When do I go back to Africa? In December . . . after finishing some manuscripts.

"Then you ask what the manuscripts are about. But no, that I will not tell you."

ALBERTO F. THOMPSON has been named head of the Office of Scientific Information of the National Science Foundation, and CLYDE C. HALL, public information officer. Thompson, a chemist, joins NSF from the Atomic Energy Commission, where he has served for the past years as chief of technical information. He was in charge of the United States exhibit at the recent International Conference on the Peaceful Uses of Atomic Energy in Geneva.

Hall has been serving as special placement representative for the Civil Service Commission, where his major responsibilty was the identification and placement of management specialists in the Federal services.

SANFORD S. ATWOOD, plant scientist and dean of Cornell University Graduate School, has been named provost of the university. He succeeds FORREST F. HILL, who will join the Ford Foundation as vice president in the area of overseas operations. Atwood will retain the deanship until a successor has been selected.

LEE DE FOREST, whose pioneering efforts in electronics have led to modern instrumentation and automation, was presented the first ISA achievement award by the Instrument Society of America at its 10th annual Instrument-Automation Conference and Exhibit in Los Angeles, Calif., 12–16 Sept. De Forest is widely known for his invention 50 years ago of the first radio vacuum

tube—the Audion tube, which was the first three-electrode tube with a wire grid between anode and cathode. In 1912 he invented the Oscillion, which incorporated feedback principles.

He then began regular radio broadcasts in the New York area and later on a larger scale in San Francisco. After failing to convince the movie industry that sound movies were possible, de Forest returned to New York and produced his own talking pictures. Since 1930, de Forest has devoted most of his time to the field of high-frequency therapy.

THEODORE SHEDLOVSKY of the Rockefeller Institute was this year's McGregory lecturer at Colgate University. On 3 Nov. he spoke on "Electrochemistry in biology and medicine."

Thirteen physicians and surgeons from 12 countries are making a 5-week tour of atomic medical facilities in the United States under the sponsorship of the Atomic Energy Commission and the Department of State. The American Council of Education is in charge of arrangements for the group. A similar tour in June and July of this year included 23 medical men from 12 nations.

The visitors are studying the uses of isotopes, reactors, and atomic medical and research techniques, particularly those concerned with cancer research and treatment. The group is visiting laboratories, hospitals, and research centers in and near Chicago, San Francisco, Boston, and New York. The group includes the following representatives:

Burma: PONDICHERY R. MOHAN of the Rangoon General Hospital and the Rangoon Medical College.

Chile: CARLOS S. ELIZALDE of the Radium Institute, Santiago.

Ecuador: TEODORO S. ZAMBRANO of the School of Medical Sciences, Central University.

France: JEAN CANIVET of the French Atomic Energy Commission.

Guatemala: ALBERTO V. DAVILA of the Ministry of Public Health and the Guatemala General Hospital.

Indonesia: BAGINDA S. RASAD of the University of Indonesia.

Lebanon: NEGIB C. SAAD of Beirut.

Luxembourg: RAYMOND SCHAUS, at present attached to the Washington University School of Medicine (St. Louis).

Paraguay: MANUEL RIVEROS of National University of Asunçion.

Portugal: MANOEL DE MENDONCA CORTE-REAL of the Civil Hospitals of Lisbon.

Uruguay: MARTIN MIQUECO-NARANCIO of the Uruguayan Cancer Control Society.

Turkey: FATMA P. CAMBEL of the Ankara Numune Hospital.

AUGUSTINE R. MARUSI, president of the Borden Company's chemical division, has been elected a vice president of the company. As president of the division, Marusi has charge of 18 plants, 11 in the United States and seven abroad, as well as the General Research Laboratory in Philadelphia, Pa. The plants produce adhesives, caseins, resins, molding compounds, and industrial chemicals.

THOMAS D. PHILLIPS has retired from the Marietta College faculty after 35 years' service as a member of the physics department. Head of the department for many years, Phillips' retirement was effective on 10 Oct. WILLIAM H. DAVIS has been promoted to professor and will assume duties as department head. Phillips' retirement date was advanced by several months in order that he might accept a position as technical writer with the Potomac River Naval Command, Indian Head, Md.

Phillips first joined the Marietta faculty as an instructor in 1920. He served as assistant professor during 1923–24 and 1927–30, then was made professor in 1930. He graduated from Oberlin College in 1916, where he was elected to Phi Beta Kappa. He received his master-of-science degree from the University of Michigan in 1923, and his doctorate from Boston University in 1934.

ROBERT C. HERMAN is serving as visiting professor at the University of Maryland for the academic year 1955–56 while on leave from his permanent position as consultant to the director of the Applied Physics Laboratory of Johns Hopkins University. During his year at Maryland, Herman will teach advanced courses in modern physics and will collaborate with several of the research groups in the physics department. He also will continue his previous study of imperfection centers in alkali halides, of rotational-vibrational spectra, and of the origin of the elements.

WILLARD P. CONNER, manager of the physics division at Hercules Powder Company's Experiment Station, has been loaned by Hercules for 1 year to serve as acting technical director of the materials testing reactor that is operated at the National Reactor Testing Station near Arco, Idaho.

I. I. RABI of Columbia University, Nobel laureate and physicist, delivered the first public, nontechnical Morris Loeb lecture at Harvard University on 21 Oct.; his topic was "Science and the humanities." Heretofore the Loeb lectures have been technical and have been addressed to invited audiences of scientists. Rabi also presented four scientific lectures under the Loeb lectureship on the general theme, "Molecular beam experiments."

FRANKLIN K. MOORE has been appointed head of the aerodynamic research department at Cornell Aeronautical Laboratory, Inc. He was formerly a consultant to the supersonic propeller division of the Lewis Propulsion Laboratory, National Advisory Committee for Aeronautics, Cleveland, Ohio. He succeeds ALEXANDER H. FLAX, who was recently appointed assistant director of Cornell Aeronautical.

W. E. HEMING of Ontario Agricultural College, Canada, has been appointed head of the department of entomology and zoology. He succeeds A. W. BAKER, who retired recently.

The Franklin Institute of the State of Pennsylvania awarded 11 achievement medals at its annual Medal Day ceremonies on 19 Oct. Those honored were the following:

CLAUDE E. SHANNON of Bell Telephone Laboratories received the Stuart Ballantine medal for his development of an algebra that is used in the design and analysis of computers, telephone offices, and other automatic devices. He was also the guest speaker.

CHARLES S. LEOPOLD, a Philadelphia consulting engineer, received the Frank P. Brown medal for his contributions to air conditioning.

DAVID ALBERT HUFFMAN, assistant professor of electrical engineering at Massachusetts Institute of Technology, received the Louis E. Levy medal for his paper, "Synthesis of sequential switching circuits."

CECIL WALLER of Ilford, Ltd., and ROBERT BERRIMAN of Kodak, Ltd., English emulsion chemists, received Edward Longstreth medals for their contributions to "the development of photographic emulsions especially designed for the study of nuclear particles and events, which have made possible important new advances in this field, including the discovery of new nuclear particles and a better understanding of cosmic rays." The two worked entirely independently; their work is in the same field and is complementary.

F. P. BOWDEN, physical chemist of the University of Cambridge, England, received the Elliott Cresson medal for his "extensive experimental investigations which combine simplicity and clarity, and for his findings regarding the detailed nature of the processes involved when one metal slides over another."

RENÉ A. HIGONNET and LOUIS M. MOYROUD, French communications engineers, both of Cambridge, Mass., received John Price Wetherill medals for their concep-

tion and development of the Photon type-composing machine.

JACQUES Y. P. SEJOURNET, managing director of Comptoir Industriel d'Etirage et Profilage de Metaux, Persan, France, also received a John Price Wetherill medal for his invention of the Ugine-Sejournet extrusion process for metals, which stressed the utilization of glass as a lubricant.

RICHARD Y. CASE, assistant manager and chief engineer for the power transmission department, United States Rubber Company, received an Edward Longstreth medal for his invention of a timing belt for precision timing among shafts of industrial machines.

CARLETON K. STEINS, a mechanical engineer for the Pennsylvania Railroad, received the George R. Henderson medal for inventions that have contributed to the progress and efficiency of the railroad transportation system.

The following are among those who have received honorary doctoral degrees.

McGill University, Montreal: J. B. COLLIP, dean of medicine at the University of Western Ontario and director of the division of medical research, Canadian National Research Council; OTTO MAASS, a principal research officer in the division of pure chemistry of the Canadian National Research Council; E. G. D. MURRAY, bacteriologist, research professor at the University of Western Ontario.

Lehigh University: HOWARD A. RUSK, chairman of the department of physical medicine and rehabilitation of the New York University–Bellevue Medical Center.

The following appointments to assistant professor have been announced. State University of Iowa: IAIN MACLEAN SMITH and JACK M. MARTT, internal medicine.

Necrology

SIEGFRIED BLOCK, New York, N.Y.; 73; neurologist and psychiatrist; instructor in nervous and mental diseases at Long Island Medical College; advocate of children's courts; 18 Oct.

LEWIS R. BURDICK, Silver Spring, Md.; 54; senior fuels engineer with the branch of bituminous coal, Bureau of Mines, Washington, D.C.; 13 Oct.

HARRY B. HUMPHREY, Los Altos, Calif.; 82; retired U.S. Department of Agriculture plant pathologist; 13 Oct.

CARL R. MOORE, Chicago, Ill.; 62; chairman of the department of zoology at the University of Chicago; international authority on the biology of sex; 1943 vice president for AAAS Section F —Zoological Sciences; 16 Oct.

GEORGE T. RENNER, Leonia, N.J.; 55; professor of geography at Teachers College, Columbia University; author or co-author of 19 books and numerous papers and pamphlets; 14 Oct.

Education

■ The 100th anniversary of the founding of the department of metallurgy at Yale University was celebrated on 14 and 15 Oct. The convocation also marked the 50th anniversary of the university's Hammond Metallurgical Laboratory.

■ The Research Unit of the Blue Bird Children's Clinic for Neurological Disorders, Houston, Tex., was officially opened on 15 Oct. This unit is for fundamental research in the physiology of the nervous system. The clinic and research unit are affiliated with Baylor University College of Medicine and Methodist Hospital, Houston, Tex.

Claude Fortier has been appointed director of the laboratories of neuroendocrinology, the first section of the Research Unit to be activated. Fortier was formerly assistant professor in the Institute of Experimental Medicine and Surgery at the University of Montreal and more recently research associate in the department of neuroendocrinology at the Institute of Psychiatry, University of London. In addition to his appointment in the Blue Bird Children's Clinic, Fortier has been appointed to the faculty of Baylor University College of Medicine as associate professor of physiology.

■ Operation of the high-altitude wind tunnel has begun at the University of California's Engineering Field Station in Richmond. The tunnel is four times more powerful than the university's former model. Under the supervision of F. C. Hurlbut, a physicist, the new facility will be used to study the behavior of objects traveling more than six times the speed of sound at altitudes 20 to 80 miles above the earth. Support for the research program comes from the Office of Naval Research, the National Advisory Committee for Aeronautics, and the Office of Scientific Research and the Air Research and Development Command of the U.S. Air Force.

■ The University of Michigan has initiated a new and more liberal foreign language requirement for Ph.D. candidates. The plan will permit students in certain departments to substitute an integrated program of graduate course work—at least 9 hours—for one of the languages usually required for the doctorate. In other cases students will be permitted to substitute another foreign language for the customary French or German. Also, a student whose native language is not English, and who plans to return to his home country at the completion of his study, will be permitted to offer English as one language toward the requirement.

Individual departments of the graduate school are now submitting suggested programs of course work that might be substituted for a language. Two departments have had such programs approved —psychology and fisheries. Examples of course-work areas that have been approved in psychology are: mathematics, including statistics; anthropology; biochemistry; comparative literature; and programs in various area studies.

The new plan is in line with a general trend toward liberalizing doctoral language requirements. Institutions that have already established similar plans include Harvard University, Columbia University, the University of Chicago, and the University of Minnesota.

Grants, Fellowships, and Awards

■ Nominations are invited for the $1000 Osborne and Mendel award, which was established by the Nutrition Foundation, Inc., for the recognition of outstanding accomplishments in the general field of exploratory research in the science of nutrition. It shall be given to the investigator who has made the most significant published contribution in the year preceding the annual meeting of the American Institute of Nutrition, or who has published a series of contemporary papers of outstanding significance. The award will be presented at the institute's annual meeting.

As a general policy, the award will be made to one person; however, if in the judgment of the jury of award an injustice would otherwise be done, it may be divided among two or more persons. Normally, preference will be given to research workers in the United States and Canada, but investigators in other countries, especially those sojourning in the United States or Canada for a period of time, are not excluded from consideration. Membership in the Institute of Nutrition is not a requirement for eligibility and there is no age limitation.

Nominations may be made by anyone. Nominations for the 1956 award, accompanied by data relative to the accomplishments of the nominee, must be sent *before 1 Jan. 1956* to the chairman of the nominating committee, Dr. Otto A. Bessey, Department of Biochemistry and Nutrition, University of Texas Medical Branch, Galveston, Tex.

■ The School of Mathematics of the Institute for Advanced Study will allocate a small number of grants-in-aid to gifted young mathematicians and mathemati-