neering Laboratories at Fort Monmouth, N.J., and by Continental Electronics, Inc., of Dallas, Tex. The new equipment is almost 50 times more effective than the loudest commercial broadcasting station.

It owes its great power to single sideband design. This is an electronic technique that concentrates the power of a transmitter's signal. Conventional transmitters broadcast three separate signals —a carrier wave and two duplicate sidebands. Single sideband circuits filter out the carrier wave and one sideband, thus funneling all of the power into the remaining sideband. This provides 8 times the strength of conventional transmitters with the same power supply. With ordinary design the World Spanner would have a power of 300,000 watts; with the new single sideband refinements and a new beam antenna now under development, effective power will reach 24 million watts.

Changing channels on a high-power station is usually a major job, but the new transmitter will be almost as easy to tune as a push-button radio. An operator can go on the air at any one of ten previously set frequencies by turning a single switch. The new facility can easily send 64 teletypewriter messages or four separate voices at the same time. It also can transmit at any frequency in the short-wave spectrum from 4 to 30 megacycles, and a second version will cover the range from 20 to 65 megacycles.

Compact design makes the unit smaller than transmitters with far less power; it can be housed in a 50-foot square room. Development of the transmitter was directed by Ralph O. Johnson of the U.S. Army Signal Engineering Laboratories Radio Division.

Proposed Legislation

Of the many bills introduced in Congress, some have a special relevance to science and education. A list of such bills introduced recently follows:

S 1242. Amend National Science Foundation Act to authorize award of scholarships and graduate fellowships to individuals who are not citizens of United States. Jackson (D Wash.) Senate Labor and Public Welfare.

S 1157. Authorize and request President to undertake to mobilize in U.S. an adequate number of world's outstanding experts; coordinate and utilize their services in a supreme endeavor to discover means of curing and preventing cancer. Neely (D W. Va.) Senate Labor and Public Welfare.

HR 4646. Provide for additional research and technical assistance on public health problems created by mosquitoes and other blood-sucking arthropods. Dixon (R Utah) House Interstate and Foreign Commerce.

HR 4820. Provide for research, study and prevention and treatment of effects of atomic and nuclear radiation on human health, development, and living conditions. Porter (D Ore.) House Interstate and Foreign Commerce.

HR 4752. Amend titles I, IV, X, and XIV of Social Security Act to further assist states in extending aid for medical care to persons eligible for public assistance under such titles. Burns (D Hawaii) House Ways and Means.

HR 4638. Provide a defense cloud-modification program. Berry (R S.D.) House Armed Services.

S 1176. Establish on public lands of U.S. a National Wilderness Preservation System and a National Wilderness Preservation Council. Humphrey (D Minn.), *et al.* Senate Interior and Insular Affairs.

HR 4819. Establish a National Outdoor Recreation Resources Review Commission to study the outdoor recreation resources of public lands and other land and water areas of U.S. Pfost (D Idaho) House Interior and Insular Affairs.

S 1262. Amend Federal Water Pollution Control Act to remove $250,000 limitation on construction grants under such act. Allott (R Colo.) Senate Public Works.

Scientists in the News

PAUL C. AEBERSOLD, who has been director of the Atomic Energy Commission's Isotopes Extension at Oak Ridge, Tenn., has been transferred to the commission's Washington headquarters as assistant director for isotopes and radiation, Division of Civilian Application. E. E. FOWLER, deputy director of the Isotopes Extension before his transfer to Washington last year, becomes deputy assistant director. The isotopes Extension was made part of the Division of Civilian Application in January 1956, when administrative responsibility for the isotopes distribution program was transferred to the division from the Oak Ridge Operations Office.

CLIFFORD GROBESTEIN, biologist at the National Cancer Institute, Bethesda, Md., has been appointed professor of biology at Stanford University. He is a specialist in developmental physiology and tissue culture.

ROGER ADAMS, past president of the AAAS and head of the chemistry department at the University of Illinois from 1926 to 1954, will be awarded an honorary degree of doctor of science by the university at its June commencement. Adams, who asked in 1954 to be relieved of administrative duties in the chemistry department to devote full time to research, will retire this fall. He has been a member of the Illinois faculty since 1916.

GAIL M. DACK, director of the Food Research Institute and professor of bacteriology at the University of Chicago, has won the 1957 Pasteur award, which is presented annually by the Society of Illinois Bacteriologists, Inc., to an outstanding bacteriologist in the Midwest.

DESMOND D. BONNYCASTLE, formerly professor of pharmacology at Yale University, is professor and director of the department of pharmacology at Seton Hall College of Medicine and Dentistry.

Another appointment at Seton Hall is that of HUGH G. GRADY as professor and director of pathology, effective 1 June. He is at present scientific director, American Registry of Pathology, Armed Forces Institute of Pathology, Washington, D.C., and professor of pathology (part time) at Howard University Medical School.

EDWARD P. ABRAHAM of Oxford University, Oxford, England, presented the recent CIBA lectures in microbial biochemistry at the Institute of Microbiology at Rutgers University. At present senior research officer at the Sir William Dunn School of Pathology, Oxford, Abraham is known for his contributions to the chemistry of antibiotic substances, especially for his early work on the chemical structure of penicillin and his more recent studies of the chemical composition of peptide and steroid antibiotics, including those of the bacitracin and cephalosporin types.

Distinguished Civilian Service awards, the highest civilian honor in the Department of Defense, have been presented by the Secretary of Defense to six employees. Recipients included WERNHER VON BRAUN and OTTO WALCHNER, German scientists who came to the United States after World War II. Von Braun is director, Development Operations Division of the Army Ballistic Missile Agency, Huntsville, Ala.; Walchner is a physicist with the Air Force's Air Research and Development Command, Wright Air Development Center, Wright-Patterson Air Force Base, Dayton, Ohio.

The other recipients were ROBERT E. MIEDEL, deputy director of procurement, Headquarters, Air Research and Development Command, Baltimore, Md.; HARRY KRUTTER, chief scientist, Naval Air Development Center, Johnsonville, Pa.; MAURICE R. HILLEMAN, supervisory bacteriologist, Communicable Diseases Division, Army

Medical Service Graduate School, Walter Reed Army Medical Center, Washingotn, D.C.; and F. REED DICKERSON, Office of General Counsel, Department of Defense.

WALTER O. ROBERTS, director of the High Altitude Observatory of the University of Colorado, has recently been appointed professor of astrogeophysics and head of the university's newly created graduate department of astrogeophysics. He will continue as director of the observatory.

MAURICE EWING, director of the Lamont Geological Observatory of Columbia University, has been awarded the degree of doctor of science by the State University at Utrecht, the Netherlands. The honorary degree was conferred on Ewing by H. W. Obbink, rector of the State University, on the occasion of its 321st anniversary.

LEO A. WALL, a chemist at the National Bureau of Standards, has been presented with the Arthur S. Flemming award, which is given annually to ten outstanding young men in Government by the District of Columbia Junior Chamber of Commerce. Five of the awards are in the administrative field and five in science. Other winners in the scientific field were as follows: ALFRED J. EGGERS, JR., National Advisory Committee for Aeronautics; MAURICE R. HILLEMAN, Department of the Army Medical Corps; HERBERT TABOR, Department of Health, Education, and Welfare; and MANUAL F. MORALES, Naval Medical Research Institute.

EDWIN G. BORING, an experimental psychologist, and ALFRED C. REDFIELD, a physiologist and oceanographer, will retire this summer from the faculty of Harvard University. Boring, who is Edgar Pierce professor of psychology, is the recognized historian of modern experimental psychology. He served as director of the psychological laboratories at Harvard for 25 years and was the first chairman of the psychology department when it became independent of philosophy in 1934. Harvard named him Lowell Television lecturer for 1956–57.

His research has been focused on the field of sensation and perception. In his early work on cutaneous sensitivity, he cut a nerve in his own arm for experimental purposes. His *History of Experimental Psychology* was first published in 1929 and again in a revised edition in 1950. A second volume, *Sensation and Perception in the History of Experimental Psychology*, appeared in 1942.

Boring studied mechanical engineering at Cornell University, and then shifted to psychology as a graduate student under E. B. Titchener. From Cornell he received the M.E. degree in 1908, the A.M. degree in 1912, and the Ph.D. degree in 1914. He taught at Cornell and at Clark University before joining the Harvard faculty in 1922. He has served as president of the American Psychological Association, as vice president of the American Association for the Advancement of Science, as secretary of the International Congress of Psychology, and as chairman of the Section on Psychology of the National Academy of Sciences. He received honorary doctorates from Clark University in 1956 and from the University of Pennsylvania in 1956.

Redfield, professor of physiology, is a specialist in the functions of the blood. As an oceanographer, he applied the disciplines of physiology to the study of the marine environment in which water and organisms interact. In addition to his Harvard work, he has been associate director and senior oceanographer of the Woods Hole Oceanographic Institution.

Redfield has received the Agassiz medal of the National Academy of Sciences and an honorary degree from the University of Oslo; in addition, he was elected an honorary member of the Marine Biological Association of the United Kingdom last year for his distinguished contributions to oceanography. He made important contributions to the physiology of human and animal organisms before devoting his attention to studies of the sea. His analyses of biochemical cycles in the sea, of the distribution of organisms, and of the products of biological activity led to interpretations of the oceanic circulation incorporating physical, chemical, and biological cycles.

At Harvard, where he began teaching in 1921, he served as the first director of the Biological Laboratories in 1934 and as chairman of the department of biology from 1935 to 1938. He taught for a year at the University of Toronto before joining the Harvard faculty and was, for a summer, visiting professor at Stanford University and later at the University of Washington.

Redfield has been secretary of the American Physiological Society, president of the Ecological Society of America and the American Society of Limnology and Oceanography, chairman of the Natural Resources Council of America, and president of the oceanographic section of the American Geophysical Union. He was on the editorial boards of the *Journal of Comparative and Cellular Physiology* and the *Biological Bulletin* and subsequently became managing editor of the latter.

He studied at Haverford College and at Harvard, receiving Harvard's B.S. degree in 1914 and Ph.D. degree in 1917. He continued his studies at Cambridge University, England, and at the University of Munich.

CHARLES W. CREASER of Wayne State University has been awarded a sabbatical leave for 1957–58. Also, his request has been granted that he be relieved of the chairmanship of the depart- of biology at the end of the current academic year in order to devote more time to research and teaching upon his return.

STEWART T. GINZBERG, chief of the psychiatry division in the Veterans Administration central office at Washington, D.C., resigned on 1 May to become commissioner of mental health for the state of Indiana. He also will hold an appointment as professor of psychiatry at the Indiana University School of Medicine in Indianapolis.

Recent Deaths

GLACE BITTENBENDER, Jackson, Miss.; 45; professor of anesthesiology at the University of Mississippi Medical Center; 15 Apr.

EDWARD FRANCIS, Washington, D.C.; 85; retired U.S. Public Health Service officer who identified and developed methods to combat tularemia; 14 Apr.

PAVEL P. LAUPMAN, Moscow, U.S.S.R.; 70; leading engineer who worked on the Dnieper hydropower complex, the Kuibyshev and Stalingrad hydropower stations, and the Moscow and Volga-Don canals.

RICHARD S. LULL, New Haven, Conn.; 89; retired paleontologist at Yale University; former director of Yale's Peabody Museum; 22 Apr.

OAKLEY A. MORHOUS, Larchmont, N.Y.; 80; retired chief chemist at the Consolidated Gas Company of New York; 20 Apr.

SEYMOUR OPPENHEIMER, New York, N.Y.; 85; retired specialist in ear, nose, and throat diseases and in plastic surgery; wrote *Surgery of the Middle Ear*; 21 Apr.

WILLIAM G. SAWITZ, Philadelphia, Pa.; 63; professor of parasitology and an associate in medicine at Jefferson Medical College; 19 Apr.

JAMES S. SHAND, Dundee, Scotland; 75; professor emeritus of geology at Columbia University; former professor of geology and mineralogy at the University of Stellenbosch, South Africa; 20 Apr.

WILLIAM F. VERDI, New Haven, Conn.; 84; clinical professor emeritus of surgery at the Yale Medical School and former chief surgeon at St. Raphael's Hospital; 21 Apr.