cubic centimeters of vaccine has been released. There are about 53 million persons in the priority group of children under 15 and pregnant women; about 65 million persons would be included as the age limit is extended to 20. In some areas vaccine supplies are beginning to equal, or surpass, the immediate demand. In states where the demand for vaccine for the 0–15 age group continues to be high, it is important to satisfy that demand before broadening the priority group; however, in states where there is a lag in demand in the 0–15 group, every effort should be made to obtain maximum use of the vaccine before the peak of the polio season by extending priorities."

Expanding Universe

Substantial new evidence that the universe is expanding at the same rate in all directions has been obtained in a recently completed 20-year cooperative study by astronomers at the Mount Wilson-Palomar Observatories and the University of California's Lick Observatory. The conclusions are derived from the redshifts of more than 800 extra-galactic nebulae, or galaxies, in the universe beyond the Milky Way.

When interpreted as velocities of recession, redshifts provide the observational material for relativity theories of the expanding universe. Heretofore, uniform expansion of the universe has been inferred from relatively few observations of redshifts, for adequate experimental data have not been available prior to the completion of the present study, which consequently is of fundamental importance in astronomy.

A report has been published in the *Astronomical Journal* by M. L. Humason and A. R. Sandage of the Mount Wilson-Palomar Observatories, and N. U. Mayall of Lick Observatory. The program to determine redshifts was formulated in 1935 by the late Edwin Hubble.

New Atom Smasher

A new type of particle accelerator for study in continuous detail of the nuclear energy levels of heavy elements will be installed at Chalk River early in 1958, Atomic Energy of Canada Limited announced recently. To be known as the Tandem Accelerator, the 10-million-volt machine will consist of two Van de Graaff generators placed end to end in a horizontal position, giving the accelerator an over-all length of 34 feet and a diameter of 8 feet.

The beam of high-speed particles will be focused and deflected in a series of powerful electromagnets into an experimental area 25 feet from the accelerator. The machine will be equipped with a unique switching magnet that will make it possible to shift the particle beam into any one of five directions, depending on the type of study under way. The accelerator will incorporate a unique method of charge exchange whereby the electric charge of a nuclear particle is changed during its acceleration to very high speeds, permitting the same 5-million-volt potential to impart the equivalent of a 10-million-volt speed to the particle.

This system of particle acceleration was originally invented by Willard H. Beams, formerly of Ohio State University and now at Naval Research Laboratory in Washington. It was rediscovered by Luis W. Alvarez of the University of California who produced a 1-million-volt model of this machine, which he called a "swindletron." Essential to the operation of the tandem-style Van de Graaff accelerator is a source of negatively charged hydrogen ions. Credit for the development of such a source is due to R. G. Herb and his associates at the University of Wisconsin. With Herb's source, positive hydrogen ions are made negative before being accelerated into the Van de Graaff. At the halfway point of acceleration, negative ions are stripped of their excess electrons so that they can accelerate "downhill" using the same high voltage. The machine will be developed and built by the High Voltage Engineering Corporation, Cambridge, Mass.

News Briefs

■ The Air Research and Development Command has begun a new study of the jet stream, a current of wind from west to east at altitudes ranging from 25,000 to 40,000 feet; it sometimes attains speeds of more than 250 miles per hour. During the winter months the jet stream frequently occurs over the southern United States, and past tests have used aircraft based in Florida. For the new study, the base of operations has been moved to Wright-Patterson AFB, Ohio, since in the summer months the stream frequently occurs over the northern United States and southern Canada.

The jet stream will be charted by a specially equipped B-47 bomber. It is hoped that it will prove possible to develop more accurate methods of forecasting these winds, so that jet aircraft operating at high altitudes will be able to ride the jet stream.

■ A hydraulics laboratory built at a cost of $125,000 by the Government of India with the aid of the United Nations Educational, Scientific and Cultural Organization is now operating at the Indian Institute of Technology at Kharagpur, 72 miles from Calcutta. Plans for the laboratory were drawn up by Otto Walch, a German engineer and university teacher, who has just completed a 4-year mission to India under the UNESCO technical assistance program.

In the new laboratory, water from a 60,000-gallon tank is pumped through seven flumes—steel troughs varying from 20 to 60 feet in length and equipped with thick plate-glass observation windows in their sides—in order to permit study of the behavior of scale models of dams, locks, canals, and other forms of waterway construction. Delicate measuring instruments have been supplied to the laboratory with the aid of a $30,000 UNESCO grant. As professor of hydraulics and dam construction in the civil engineering department at Kharagpur, Walch had 170 undergraduate students and 20 postgraduate students, nine of whom were specializing in dam construction.

Scientists in the News

HARRY S. COLEMAN, who has been a member of the executive staff of Mellon Institute for 38 years, retired on 30 June from active service. During 1929–37 he was in charge of the planning, engineering features, and constructing of the institute's building. Subsequently he wrote two brochures on research laboratory design, erection, and equipment, and edited a comprehensive treatise entitled *Laboratory Design*, issued in 1951 under the auspices of the National Research Council. Coleman, who was born in Colony, Kan., in 1886, received his professional mechanical engineering education at the University of Kansas.

EDWARD H. SMITH will retire in August from his post as director of the Woods Hole Oceanographic Institution.

H. R. SENF, formerly head of the electronics laboratory in the Missile Systems Division of the Lockheed Aircraft Company, has recently joined the Research and Development Laboratories of the Hughes Aircraft Company at Culver City, Calif. There he heads the experimental systems section of the electronics department.

LEONARD A. SCHEELE Surgeon General of the United States, will resign on 1 Aug. to become president of the Warner-Chilcott Laboratories, a subdivision of the Warner-Lambert Pharmaceutical Company, with offices in Morris Plains, N.J. Scheele stated that he was resigning ". . . in the interest of providing more properly for the security of my family."

HORACE W. MAGOUN, professor of anatomy at the University of California in Los Angeles, has received the Jacoby award of the American Neurological Association. He was honored for his work in basic neurology.

REUBEN L. KAHN has retired after 27 years of service to the University of Michigan as professor of serology in the medical school and director of serologic laboratories in the university hospital. Discoverer of the test for syphilis that bears his name, Kahn plans to devote himself full time to research. His interests include the serology of syphilis, a universal blood test which he developed several years ago, and the role of the body tissues in immunity.

COLIN M. MACLEOD, chairman of the department of microbiology at New York University College of Medicine since 1941, has been appointed John Herr Musser professor of research medicine and chairman of that department in the School of Medicine of the University of Pennsylvania. His special fields of interest are infectious diseases, microbial genetics, and immunology. MacLeod succeeds WILLIAM C. STADIE, who retired as emeritus professor on 30 June.

VLADIMIR WALTERS has been named assistant curator of fishes at the American Museum of Natural History, New York. A research associate in the museum's department of fishes since October 1955, Walters completed 2 years of service with the U.S. Army Chemical Corps in May 1956. He is a specialist in the zoogeography of arctic fishes and has conducted research on the climatic adaptation of arctic and tropical plants and animals.

Walters will work on a special project for the Office of Naval Research, investigating the metabolic efficiency of large, fast-swimming marine fishes. The study, which will last about 3 years, is expected to provide further insight into the movements of objects through media of various densities. This use of biological models to study hydrodynamic characteristics may affect the design of future sea and aircraft.

JOHN A. SCHILLING, assistant professor of surgery at the University of Rochester School of Medicine and Dentistry, has been named professor of surgery and chairman of the department at the University of Oklahoma.

The following members of the Columbia University faculty have retired: WALTER H. BUCHER, Newberry professor emeritus of geology; HANS T. CLARKE, professor emeritus of biochemistry; WALTER A. CURRY, professor emeritus of electrical engineering; HENRY E. GARRETT, professor emeritus of psychology; MICHAEL HEIDELBERGER, professor emeritus of immunochemistry; JOSEPH SCHROFF, William Carr professor emeritus of oral surgery; and ALAN DE FOREST SMITH, professor emeritus of orthopedic surgery.

RICHARD COURANT, head of the graduate mathematics department at New York University and scientific director of the university's Institute of Mathematical Sciences, has been elected to foreign membership in the Royal Netherlands Academy of Sciences and Letters "in view of the great esteem in which he is held by its members."

Another member of the institute staff has also been honored recently. JAMES J. STOKER, JR., associate director, received the $5000 Dannie Heineman prize for his two books, *Non-Linear Vibrations* and *Theory of Water Waves*. The award committee characterized the two volumes as "outstanding contributions to the field of classical mathematical physics and mechanics."

WILLIAM H. ZACHARIASEN, professor of physics at the University of Chicago, has been appointed chairman of the department. Zachariasen, a specialist in x-ray crystallization, succeeds ANDREW W. LAWSON, professor of physics, whose 3-year term as chairman has expired.

JOHN KIRTLAND WRIGHT, director of the American Geographical Society from 1938 to 1949 and a member of its staff since 1920, retired on 1 July. Wright's many contributions to the field of geography have been recognized by several awards in recent years—the Charles P. Daly medal of the American Geographical Society in 1954, the Patron's medal of the Royal Geographical Society in 1955, and the Outstanding Achievement award of the Association of American Geographers in 1956.

RAYE R. PLATT, who joined the society's staff in 1921 and was for many years associated with its Millionth Map of Hispanic America program, also retired on 1 July. During his long service with the society, Platt edited a number of books in its Special Publications and Research Series and most recently has directed the preparation of a series of geographic handbooks on strategic countries, sponsored by the Office of Naval Research.

DAVID LOWENTHAL, formerly chairman of the department of geography at Vassar College, and WILLIAM WARNTZ, assistant professor of economics and geography at the Wharton School of Finance and Commerce, University of Pennsylvania, have accepted appointments as research associates on the staff of the American Geographical Society as of 1 July.

RAYMOND K. APPLEYARD, a British physicist; HENRI P. JAMMET, French radiologist; and EIZO TAJIMA, physics professor from Rikkyo University in Japan, have been appointed to serve on the staff of the United Nations Scientific Committee on the Effects of Atomic Radiation. They will do preparatory work on reports submitted by governments for the consideration of the committee at its meeting on 22 Oct.

JOSEPH C. AUB will retire this summer as professor of research medicine, Harvard University; as chairman of the department of medicine, Harvard Medical School; and as director of the medical school's laboratories in the Collis P. Huntington Memorial Hospital. He will become professor of research medicine, emeritus. Aub was one of the first medical investigators to point out that studies of normal cells could lead to an understanding of abnormal cell growth, including cancer.

As a member of the Cancer Commission of Harvard University, Aub directed research in the roles played by glands of internal secretion in the control of cell growth. The commission's activities are primarily centered in the Huntington Memorial Hospital.

Aub's early research (1917–25) in basal metabolism, led to the discovery of the importance of calcium metabolism in lead colic ("painter's colic") and to investigation of the entire problem of lead poisoning and calcium metabolism in man.

As a teacher, Aub is regarded by his colleagues as having great and continuing influence on both medical students and graduate students. His students are to be found in leading academic roles throughout the world.

Recent Deaths

FLOUENCE CROWLEY, Chester, Pa.; 72; design engineer; 30 June.

WINFRED M. HARTSHORN, New York, N.Y.; 82; emeritus professor of pediatrics at the New York Polyclinic Medical School and Hospital; 2 July.

JAMES D. McCLINTOCK, Pound Ridge, N.Y.; 55; mining engineer; 2 July.

EDGAR M. MEDLAR, Ithaca, N.Y.; 69; principal pathologist for the New York State Tuberculosis Service at Herman Biggs Hospital in Ithaca; research expert on tuberculosis; 30 June.

OSCAR G. MELCHIOR, Ridgewood, N.J.; 58; mechanical engineer;