(ii) Account must be taken, however, of the *internal* radiation from the radioactive strontium which is beginning to accumulate in bone. At its present level, no detectable increase in the incidence of ill effects is to be expected. Nevertheless, recognizing all the inadequacy of our present knowlege, we cannot ignore the possibility that, if the rate of firing increases and particularly if greater numbers of thermonuclear weapons are used, we could within the lifetime of some now living, be approaching levels at which ill effects might be produced in a small number of the population.

5) *Recommendations regarding specific uses of radiation.* (i) All sources of radiation, both medical and industrial, should be under close inspection, in order to insure that the high standards of protection now attainable against the absorption of ionizing radiations, and against radioactive materials, are generally observed. Those using radiations should be instructed in the precautions to be taken, and no unnecessary or unauthorized person should be allowed to engage in such occupations. A personal record, not only of doses of radiation received during occupation but also of exposures from all other sources, such as medical diagnostic radiology, should be kept for all persons whose occupation exposes them to additional sources of radiation. (ii) Present practice in medical diagnostic radiology should be reviewed, with the object of clarifying the indications for the different special types of examination now being carried out and defining more closely, both in relation to the patient and to the operators, the conditions which should be observed in their performance. (iii) The uses of radiotherapy in nonmalignant conditions should be critically examined. (iv) The small amounts of irradiation from miscellaneous sources, such as x-ray machines used for shoe-fitting, luminous watches and clocks, and television apparatus, should be reduced as far as possible.

6) *Collection of vital statistics.* As an essential basis for future studies of the genetic effects of radiation, further data are required on the genetic structure of human populations; to this end, there is an urgent need for the collection of more detailed information, when births, marriages, and deaths are registered.

Anticlotting Drug

A new drug, polybrene, to counteract the anticlotting effect of heparin is reported by three Northwestern surgeons, Frederick W. Preston, Robert Hohf, and Otto Trippel, in the current issue of the *Quarterly Bulletin* of Northwestern University Medical School. The new drug was found to be "a suitable antiheparin drug for clinical use."

In a study of 33 patients, it was found that "polybrene promptly neutralized the anticoagulant effect of heparin." Heparin, which normally occurs in the body, prevents blood from clotting. When the heparin mechanism is disturbed, abnormal bleeding occurs, as in hemorrhage after birth, in leukemia, and in bleeding under the skin that causes bruiselike purple patches. In such cases antiheparin agents such as polybrene are useful in neutralizing heparin and, thus, permitting the blood to clot and the bleeding to stop.

Polybrene is similar to two other antiheparin drugs, protamine sulfate and toluidine blue, but "polybrene is more potent than either. It is stable and may be stored for long periods of time." Polybrene "must be given intravenously, slowly, and in dilute solution to prevent toxic effects."

Reactors for Denmark and the Netherlands

The U.S. Atomic Energy Commission has announced that the United States Government will contribute $350,000 toward the cost of a nuclear research reactor project to be undertaken by the Netherlands Centre and a similar amount for a similar project to be conducted by the Danish Atomic Energy Commission.

The American Car and Foundry Industries, Inc., of New York has been selected by the Netherlands to design, engineer, and construct the reactor. The buildings will be designed and constructed by a Netherlands firm. The project will be administered by the Netherlands Reactor Centre, a foundation established within the Netherlands Government in July 1955.

Cost of the reactor is estimated at $2 million or more, and cost of the entire project may run to $3 million. The schedule calls for completion of construction in 21 months following establishment of general specifications for the reactor and its associated equipment and buildings.

The reactor is to be a modified pool type similar to the new Oak Ridge (Tenn.) research reactor now under construction. It will be cooled and moderated with ordinary water and fueled with uranium containing approximately 5.7 kilograms of uranium-235.

The reactor will be used for research in agriculture, medicine, physics, and chemistry and to train people in the design and operational technology of both research and power reactors. Supporting facilities planned by the Netherlands include research laboratories and "hot" caves for handling radioactive material.

The Foster-Wheeler Corporation of New York will design and construct the mechanical components of the Danish reactor. Assembly and installation will be done by Danish firms in cooperation with Foster-Wheeler.

The Danes are planning a nuclear research center on a peninsula near Roskilde, some 20 miles west of Copenhagen. All laboratories and other facilities will be designed and built by Danish companies. The entire project will be operated by the Danish Atomic Energy Commission.

The reactor will be fueled with uranium containing approximately 5.7 kilograms of uranium-235 to be made available to Denmark by the United States. It will be cooled and moderated with ordinary water and will be similar to the Livermore (Calif.) pool-type reactor being constructed for the U.S. Atomic Energy Commission by the Foster-Wheeler firm. Initial cost of the reactor and its associated facilities is estimated to be approximately $1.4 million.

Two members of the Danish scientific staff to be assigned to the center are currently studying at the International School of Nuclear Science and Engineering near Chicago, Ill., which is operated for the U.S. Atomic Energy Commission by Argonne National Laboratory. Another staff member has had 6 months' experience in reactor technology at Brookhaven National Laboratory.

The Danish Atomic Energy Commission has plans to use the reactor for research and training in reactor physics, solid-state physics, metallurgy, reactor technology, radiochemistry, and production of radioisotopes for use in medicine, industry, and agriculture.

Priorities for Polio Vaccine

The U.S. Public Health Service recently recommended that state health agencies extend priority age groups for poliomyelitis vaccine to include all people under 20 and pregnant women as soon as the supply of vaccine warrants such action.

This announcement reiterates a recommendation made by the National Advisory Committee on Poliomyelitis Vaccine last April. The committee at that time recommended that states concentrate their polio program on children under 15 and pregnant women until maximum coverage of this group had been achieved. The Public Health Service, in accepting the committee's recommendation, said that the states should immediately broaden their priority group when this goal was reached.

In announcing the recommendation, Leonard A. Scheele, surgeon general, said: "To date, more than 72 million

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."