and citizens' groups organized to act effectively."

Paul Sears, president of the AAAS, and Detlev W. Bronk, president of the National Academy of Sciences, are two of the 17 representatives of education, the professions, foundations, industry, and labor that make up the new committee. Howard L. Bevis, president of Ohio State University, is chairman of the committee, and Eric A. Walker, dean of the College of Engineering and Architecture at Pennsylvania State University, is vice-chairman.

In a letter to Bevis, the President said he hoped the new committee would:

"1) Assist the Federal Government in identifying the problems associated with the development of more highly qualified scientists and engineers.

"2) Enlist the cooperation of all interested individuals and groups in analyzing the problem and developing programs to deal with it, and to take the lead in coordination of interested organizations outside the Federal Government.

"3) Make available to all interested organizations information on effective ways of overcoming the obstacles to the training of more qualified scientists and engineers.

"4) Publicize the problem and possible solutions in order to stimulate widespread public understanding and support.

"5) Provide the President, from time to time, with a report of progress."

Transmission-Type Photomultiplier

A new-type photomultiplier tube, which obtains its electron multiplication by the use of thin, plane-parallel, nonmetallic films instead of conventional metal dynodes, has been developed by E. J. Sternglass and M. M. Wachtel of the Westinghouse Research Laboratories. The tube is finding particular application in high-speed pulse counting. Preliminary measurements indicate it should be capable of timing atomic events, such as the time of flight of a proton or neutron over a fixed distance, down to 10^{-10} second—a fiftyfold gain in speed over conventional photomultipliers.

In a conventional tube, the secondary electrons—which give photomultipliers their amplifying effect—are obtained from thick metal plates. An electron, striking the front surface of the plate, ejects several secondary electrons from that surface. These electrons must be directed through complicated paths of varying lengths to additional stages composed of such plates. Because of this, the electrons tend to "straggle" through the tube as they progress from stage to stage and do not give as sharp an amplified electron pulse at the output of the tube as is required for studying physical phenomena that take place in less than one-hundredth of a microsecond.

In contrast, the new photomultiplier obtains its secondary electrons from the rear surfaces of thin films composed of alkaline earth oxides or alkali halides. The tube has a straight-through construction, with the films placed parallel to one another. The secondary electrons, therefore, always move straight ahead as they are accelerated from stage to stage. This shortens their transit time through the tube, minimizes electron "straggling," and produces a sharp output pulse with exceedingly short rise time.

By using nonmetallic films, such as KCl, the new photomultiplier also takes advantage of the fact that such materials have a secondary electron yield many times larger than those from any known metal.

The nonmetallic films used in the transmission photomultiplier are about two-millionths of an inch in thickness. The films are evaporated in a vacuum onto a film of SiO that is five times thinner, which helps give strength to the KCl. Between these two films is deposited a third film of gold that is only a few atomic layers thick. The whole three-layer "sandwich" is supported on an electroformed metal screen of 100–200 holes per linear inch and 50 percent open area.

Measurement of the pulse amplifying characteristics have been carried out with a transmission photomultiplier of seven stages. The total transit time of the electron pulse through the tube was found to be only 3×10^{-9} second. The agreement of measured and calculated values for the transit time indicates no intrinsic delay in secondary emission beyond 10^{-10} second. Thus, an extension of time interval measurements down to this figure appears feasible.

News Briefs

■ A subcommittee of the National Committee on Radiation Protection has been appointed to deal with problems of protection against high-intensity electron radiation produced by accelerators. Members will solicit data and prepare recommendations for installations where radiation-producing machines, such as betatrons, Van de Graaf generators, and linear accelerators, are used. This activity will be an extension of the earlier work of the NCRP in related fields.

Lester Skaggs, Argonne Cancer Research Hospital, Chicago, is chairman. The members are E. A. Burrill, High Voltage Engineering Corporation, Cambridge, Mass.; H. W. Koch, Betatron Laboratory, National Bureau of Standards, Washington, D.C.; J. S. Laughlin, Memorial Hospital, New York; R. F. Post, Radiation Laboratory, University of California, Livermore; and E. D. Trout, X-ray Department, General Electric Company, Milwaukee, Wis.

■ By changing its tools—a matter that requires a few hours—a new automatic assembly machine, the Multra Machine, designed and built by the Multra Corporation, a subsidiary of Barnes Engineering Company, can be used to assemble a variety of products. Usually, assembly machines are built to do specific jobs.

An example of true automation, Multra has a feedback system. The machine feeds, sorts, sizes, forms, orients and inspects the parts to be assembled. If a part should fail to be inserted into a subassembly, then no further parts are fed into that subassembly and it is rejected at a late station.

A Multra machine is now in use assembling mercury batteries for P.R. Mallory and Company. The machine performs all of the battery assembly operations that formerly required a human operator, turning out between 15,000 and 20,000 batteries per 8-hour shift.

■ The use of an experimental heart-lung machine to reduce the risk of at least one serious heart operation has been reported by a group of Rochester, Minn., researchers. The machine shunts the blood past the heart and lungs, supplying it with oxygen before returning it to the body.

The physicians used the machine during surgery on 20 patients who had congenital defects in the wall of one heart chamber, complicated by high blood pressure in the lungs. Sixteen of the patients, including 15 children under 12 years and one 29-year-old man, survived and showed pronounced improvement. Four children died of pulmonary complications.

According to the group making the report, the results of the operations show that the surgical risk to the patient is "acceptably low, considering the severity of the condition." The risk depends on the age, general health, and the presence or absence of cardiac failure and pulmonary complications.

Mayo Clinic and Mayo Foundation staff members who made the report are James W. DuShane, John W. Kirklin, Robert T. Patrick, David E. Donald, Howard R. Terry, Jr., Howard B. Burchell, and Earl H. Wood.

■ The latest financial report of the Atomic Energy Commission states that appropriations for fiscal years 1940 through 1955 amounted to $14.4 billion. Assets amount to $9.1 billion as of 30 June. These figures are not complete, however, because for security reasons inventories of stockpiles are not included.

■ The generating station at the Shawinigan Water and Power Company's new hydroelectric development at Rapide Sans Nom, Quebec, will be of the most modern outdoor type, without superstructure. Construction will start this spring on the St. Maurice River.

The plant will operate under a head of 125 feet and is designed for six generating units with a total capacity of 248,000 kilowatts, or 330,000 horsepower. Rapide Sans Nom is about 10 miles upstream from La Tuque.

Since the new dam will raise the river level some 110 feet, a 9-mile diversion of the Canadian National Railways transcontinental main line will be necessary.

■ A petrified tree stump with an estimated age of 80 million years has been excavated by workmen on the site of the Army's Nuclear Power Package Reactor at the Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va.

A left-over of the Cretaceous age, the stump could be as much as 130 million years old, according to Roland Brown, a U.S. Geological Survey paleobotanist who identified it at the Smithsonian Institution. The stump predates the Ice Age by many millions of years. A cypress-type tree that was found in the "Potomac group," a sedimentary formation of river sand and clay with minor gravel lenses, it measures 4 feet by 18 inches.

■ Of the $164 million spent in 1953 by the 77 large privately endowed foundations, $26 million was spent for scientific research. These figures are drawn from a recent survey made by the Russell Sage Foundation for the National Science Foundation. The private foundation expenditures for science are less than 1 percent of the estimated national total for all research and development. Forty three of the 77 major foundations supported scientific research.

■ In agreement with the United Kingdom and the Commonwealth of Australia, Canada is to participate in the series of atomic trials to be held in Australia in late 1956. Members of the Canadian forces and the Defense Research Board will assist in the trials, and items of Canadian service equipment will be exposed to the effects of the nuclear weapons.

■ The U.S. Atomic Energy Commission has removed a suspension order on gem irradiations that has been in effect since 1953. The commission will now treat requests for irradiation of gems in the same manner as requests for irradiation of other materials.

As is well known, irradiation may change the color of gems. Radiations from a particle accelerator may produce blue or blue-green colors in diamonds. Irradiation in a nuclear reactor may produce a green color, which may turn brown under certain conditions of heating. Although diamonds irradiated in a nuclear reactor become radioactive, this activity decays in a few days to an insignificant level.

■ The Republic of the Philippines has been chosen as the site for the new Asian Nuclear Center. The choice was made public by the State Department on 15 Mar. This center was proposed by the United States at the Colombo Plan meeting that was held in Singapore last October. The State Department's announcement concluded:

"The United States is now preparing to move rapidly with initial plans for the establishment of this center as a means of putting atomic energy to work for the economic and social progress of Asia. This action will represent an important step toward the further advancement of President Eisenhower's atoms-for-peace program."

Scientists in the News

The National Academy of Sciences will make the following awards at its annual meeting in Washington, D.C., 23–25 Apr.

ALFRED C. REDFIELD, associate director of the Woods Hole Oceanographic Institution and professor of physiology at Harvard University, received the Agassiz medal for his contributions to oceanography.

ARCHIE CARR, professor of biological sciences at the University of Florida, received the Daniel Giraud Elliot medal in recognition of his work, *Handbook of Turtles,* an account of all of the kinds of turtles found in the area north of Mexico, but including Lower California.

SEWALL WRIGHT, professor of genetics at the University of Wisconsin, received the Kimber medal for his contributions in both theoretical and experimental genetics.

ALEXANDER ROMER, Alexander Agassiz professor of zoology and director of the Museum of Comparative Zoology at Harvard University, received the Mary Clark Thompson medal, which is awarded for distinguished services to geology or paleontology.

CHESTER B. WATTS, director of the 6-inch transit circle division of the Naval Observatory, received the James Craig Watson medal for his contributions to astronomical research.

H. C. VAN DE HULST, professor of theoretical astronomy at the University of Leiden, has received, in absentia, the Draper medal for his contributions to radio astronomy.

SAM L. CLARK, head of the department of anatomy at Vanderbilt University School of Medicine, delivered the annual Robert J. Terry lecture on 21 Mar. at the Washington University School of Medicine (St. Louis). The lectureship, established in 1938, honors Terry, professor emeritus of anatomy who was head of the department of anatomy from 1900 until his retirement from teaching in 1941. He still is active in research.

LLOYD McCLAIN PARKS has been appointed dean of the College of Pharmacy at Ohio State University. He was formerly professor of pharmaceutical chemistry at the University of Wisconsin.

Two physicians were presented with Ross awards of $1000 each by the Academy of General Practice during its recent national convention. The awards are given annually for the most important contributions to scientific literature by physicians in general practice.

The recipients were CECILE L. FUSFELD of Washington, D.C., for a paper on detection of cancer of the reproductive tract during routine examination of women who had no clinical signs of the disease; and EDWARD SETTEL of Forest Hills, N.Y., for reporting on the use of chlorpromazine for tranquilizing disturbed senile patients.

CLIFFORD BECK, head of the department of physics at North Carolina State College, will take a year's leave of absence in June to become scientific adviser to the director of the Atomic Energy Commission's Division of Civilian Application.

A.C.S. VAN HEEL of the Technical University, Delft, Netherlands, is giving a series of lectures on polarized light at the National Research Council of Canada, where he will work several months on such problems as (i) measuring the optical path differences in microscopic and macroscopic objects and (ii) precision alignment and its technical applications to the setting up of machinery.

EGER V. MURPHREE, president of the Esso Research and Engineering Company, has been appointed to the newly created position of Special Assistant to the Secretary of Defense for Guided Missiles.

PAUL R. BURKHOLDER, head of the department of bacteriology at the University of Georgia, has been appointed director of research at the Brooklyn Botanic Garden, effective 1 July.