of underwater swimming and other equally difficult challenges, physical and mental, to preschool youngsters.

He was never happier than when surrounded with youngsters and delighted in getting them to stretch their brains. We need more men like him, and we should devise workable procedures to take advantage of their enthusiastic help wherever programs are under development for leading bright youngsters toward scientific careers. Too little stress has been directed toward drawing the attention of youngsters to the satisfying sense of intellectual achievement which is an integral part of the compensations received by the true scientist. For those who feel that the golden age is past, Langmuir would probably say that it is certainly past for individuals who think this to be true. For the youngsters and the young of heart, he would say that there is no better time than the present, and I am sure he would demonstrate, with many illustrations, the opportunities which abound in all directions for those who have the will to do.

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News of Science

Euratom Agreement

John W. Finney reported in the 8 May *New York Times* that the United States and the European Atomic Energy Community have agreed in principle on a broad-scale cooperative program to promote the development of atomic power in Western Europe. The agreement, which still must be formally approved by both sides, provides for United States technical and financial assistance in the construction of atomic power plants in the six European nations banded together in the atomic energy group known as Euratom. When carried out, the agreement will represent one of the biggest steps yet taken by the United States to implement the policy of atoms-for-peace first proclaimed by President Eisenhower in 1953.

Inspection Issue Solved. In reaching the agreement, the two sides finally succeeded in overcoming the issue of inspection, which had obstructed negotiations in recent months. Previously, Euratom has been insistent that it should perform the inspection to make sure that none of the fissionable materials were diverted to military purposes. The United States, through the Atomic Energy Commission and the State Department, had been demanding inspection rights of its own as a precondition to cooperation.

In the recent negotiations a compromise agreement was reached. The details have not been made public, partly because the issue may still be subject to diplomatic negotiations. The negotiating teams were headed by Max Kohnstamm, special adviser to the Euratom commission, and R. W. Cook, deputy general manager of the Atomic Energy Commission.

Isotope of Element 102

Scientists in the University of California Radiation Laboratory have announced the definite discovery of an isotope of element 102. At the same time they said that in repeated, careful experiments they have been unable to duplicate the work of an international team of scientists who last year reported discovering an isotope of element 102.

The Berkeley research was reported on 5 May in Gatlinburg, Tenn., at a Conference on Reactions between Complex Nuclei, by Albert Ghiorso, a senior nuclear scientist in the Radiation Laboratory. The work was done by Ghiorso, Torbjorn Sikkeland, an exchange scientist from the Joint Establishment for Nuclear Energy Research at Kjeller, Norway; John R. Walton, research chemist; and Glenn T. Seaborg, Nobel laureate and professor of chemistry on the Berkeley campus.

Final identification of the element 102 isotope was achieved early in the morning of April 18, after a sustained 24-hour period of research, climaxing 3 months of experimentation. The element 102 isotope was created by bombarding a rare isotope (mass number 246) of curium (element 96) with carbon-12 nuclei having an energy of 68 million electron volts or carbon-13 nuclei of 75 mev. The new element 102 isotope has a mass number of 254; it decays quickly. Its half-life is 3 seconds. It decays by emitting an alpha particle and turning into fermium-250 (an isotope of element 100). As many as 40 atoms were observed in a single experiment.

The discovery was made by radically new methods of research. As yet the element 102 isotope has not been directly observed—chiefly because of its short half-life. The observations were made on fermium-250, the daughter atom, which has a half-life of 30 minutes. Under the conditions of the experiments, the scientists could deduce that the fermium atoms could arise only from the decay of the isotope of element 102.

In their experiments, the Berkeley scientists deposited curium over an area of less than a square centimeter on a thin nickel foil. This target foil was placed in front of the highly concentrated beam of the heavy ion linear accelerator. The target was enclosed in a container filled with helium gas.

When a curium atom captured a carbon nucleus, a new nucleus was instantaneously formed, four neutrons came off, and the resulting nucleus flew out of the target. This nucleus was slowed down by colliding with the helium atoms, and attracted to a metallic conveyor belt having a negative charge and moving just under the target. The belt passed next to a thin foil plate which had a strong negative charge. As the 102 atoms decayed by emitting an alpha particle, the resulting fermium atoms were kicked off the conveyor belt and attracted to the foil.

The length of foil was cut into five strips, and each was simultaneously analyzed in counters. The distribution of fermium atoms on the foil strips determined the half-life (the fast decay of the atoms of element 102 insured that most of the daughter fermium atoms were deposited on the closest sections of foil to the target, and fewer of them with greater distance). When the speed of the belt was changed, the distribution of fermium atoms varied in conformance with a 3-second half-life for the 102 isotope.

Identification of the atomic number of the element was made by chemically identifying the daughter atoms as fermium in chemical separation experiments with the dissolved foil.

The scientists searched repeatedly for evidence of an isotope of element 102 reported found last year by scientists of the Argonne National Laboratory in Chicago, the Harwell Laboratory in England, and the Nobel Institute in Stockholm, Sweden. These scientists re-

ported observing directly an isotope of element 102 with a half-life of 10 minutes and emitting alpha particles of 8.5 Mev. They bombarded curium 244 with carbon 13 nuclei in the Stockholm cyclotron. The energy range of the carbon nuclei was from 80 to 100 Mev and averaged 90 Mev. Working under very difficult conditions, the international group said they observed small amounts of element 102 activity in 12 out of 50 bombardments.

Ghiorso said the Berkeley group had attempted to duplicate this reaction, with a curium target of the same composition. Their beam of bombarding carbon nuclei was about 10 times as intense. They made many attempts to produce the reported activity, using beams of particles of 90 Mev and also particles varying over a wide energy range (60 to 100 Mev). All of the efforts were unsuccessful.

Academy Oceanography Committee

The National Academy of Sciences–National Research Council has formed a Committee on Oceanography whose primary purpose is to promote the future development of oceanography in the United States. The committee is sponsored by the Office of Naval Research, the Atomic Energy Commission, and the U.S. Fish and Wildlife Service. Harrison Brown of California Institute of Technology is chairman.

The committee has organized six panels to examine particular areas: the Panel on New Research Ships, Columbus Iselin, chairman; the Panel on New Devices for Exploring the Ocean, Allyn Vine, chairman; the Panel on Radioactive Waste Disposal at Sea, Roger Revelle, chairman; the Panel on International Cooperation in the Marine Sciences, Athelstan Spilhaus, chairman; the Panel on Ocean Resources, Robert Snider, chairman; and the Panel on Basic Research in the Marine Sciences, Alfred Redfield, chairman.

The committee is attempting, with the assistance of the panels (i) to formulate recommendations concerning a long-range national policy with respect to oceanography; (ii) to assist in all possible ways in increasing both the quantity and quality of basic research in the marine sciences; and (iii) to advise specific government agencies concerning those problems which involve the marine sciences. It is attempting to produce a preliminary report sometime during the summer.

The committee would welcome comments and critical examination of its activities. Interested persons should write to the chairman; the executive secretary, Richard C. Vetter; or to any one of the panel chairmen. The committee intends to keep marine scientists informed of its progress.

Pastore-Durham Bill Opposed

The national council of the Federation of American Scientists has released a statement opposing the Pastore-Durham Bill (S 3474 and HR 11926), which was introduced in Congress to facilitate the cooperation of the United States with certain of its allies in the field of atomic weapons. The FAS Council questions whether the proposed bill will contribute to the security of the United States, saying:

"It is generally recognized that an atomic stalemate now exists in the sense that total war would, in all likelihood, result in the destruction of all major powers engaged in such a war. . . . It would appear to be obvious that the greater number of nations coming into possession of atomic weapons, the more precarious becomes the stalemate. . . .

"We believe that the Congress and therefore the people should not delegate their responsibility in such matters to the administration. We feel that the U.S. should negotiate with other nations individual agreements concerning the transfer of nuclear weapons material and the exchange of restricted data; this can be done under the existing regulations of Section 121 of the Atomic Energy Act of 1954. These regulations require positive action of Congress as well as action of the Administration. We are strongly opposed to the Pastore-Durham bill which would, in effect, permit the Administration to make such arrangements without debate. It seems to use that the passage of this bill would be an irrevocable step which is likely to jeopardize our long-range goal of true security through worldwide, enforced disarmament.

Soviet Education Survey

The U.S. Department of Health, Education, and Welfare has announced that a survey of education inside the Soviet Union, the first Government-sponsored study of this kind, is being made by a team of 10 United States educators. The study team, headed by U.S. Commissioner of Education Lawrence G. Derthick, left for the U.S.S.R. on 6 May and will return around 10 June.

The survey has been made possible by the agreement of 27 January 1958 between the governments of the United States and the U.S.S.R. on exchange of missions in cultural, technical, and educational fields. Several technical and cultural missions have been exchanged, but this is the first time that an official group from America representing a cross-section of education will have visited the Soviet Union to observe various aspects of Soviet education. A group of Soviet educators will make a similar study of education in the United States at a later date.

In addition to Derthick, the team includes: Herold C. Hunt, Eliot professor of education, Harvard University, and former Under Secretary of Health, Education, and Welfare; Harry C. Kelly, assistant director for scientific personnel and education, National Science Foundation; A. John Holden, Jr., State Commissioner of Education, Vermont; Henry Chauncey, president, Educational Testing Service; George Z. F. Bereday, associate professor of education, Columbia University; and four members of the U.S. Office of Education staff, John R. Ludington of the Secondary Schools Section, Lane C. Ash, of the Division of Vocational Education, John B. Whitelaw of the Teacher Education Section, and Helen K. Mackintosh of the Elementary Schools Section.

BCG Vaccination

After weighing the advantages and disadvantages of BCG (*bacille Calmette-Guérin*) vaccination, an ad hoc committee of the Surgeon General of the United States reported recently that: "It is believed that the advantages of vaccination outweigh the disadvantages for tuberculin negative persons who are exposed to a definite risk of infection, especially if they cannot be retested frequently with tuberculin." The committee recommended BCG vaccination for those groups named by the American Trudeau Society, the American College of Chest Physicians, the American Medical Association, and the Medical Advisory Committee of Research Foundation.

The American Trudeau Society list of groups includes: (i) doctors, medical students, and nurses who are exposed to tuberculosis; (ii) all hospital and laboratory personnel whose work exposes them to contact with the bacillus of tuberculosis; (iii) individuals who are unavoidably exposed to infectious tuberculosis in the home; (iv) patients and employees in mental hospitals, prisons, and other custodial institutions in which the incidence of tuberculosis is known to be high; and (v) children and certain adults considered to have inferior resistance and living in communities in which the tuberculosis mortality rate is unusually high.

The vaccine may be obtained by any licensed physician in the United States and its territories by writing to the Research Foundation, 70 W. Hubbard St.,