

clusions of the Warsaw Congress. Three of the satellite nations—Poland, Czechoslovakia, and Hungary—have been listed as members but have joined the Soviet Union in its charges that Unesco is an instrument of United States aggression against the “people’s democracies”; in recent years these three states have either neglected to attend Unesco conferences or have walked out over the issue of seating Chinese Communist delegates.

International Physics Labs

European Nuclear Research Council Meets

The recently established council of representatives of European states for planning an international laboratory and organizing other forms of cooperation in nuclear physics has approved a report calling for construction of a 600 Mev synchrocyclotron and a bevatron designed to operate in the 10 billion volt region. The yearly expenses during the construction of the machines and laboratory are estimated at a total of \$3,500,000 for seven years to be contributed by member governments. After the seventh year it is expected that the laboratory will require a yearly operating budget amounting to a maximum of one million dollars.

Construction of the large bevatron was proposed during a conference of more than forty physicists that was organized in Copenhagen by Niels Bohr. The conference report dealt in some detail with the problems in nuclear physics that could most fruitfully be approached through European cooperation. It declared that the central interest in atomic physics has shifted from the nucleus to the so-called elementary particles. For qualitative measurements, however, artificial acceleration of particles seems essential. The report stated that for research on elementary particles the construction of a large bevatron will be important since a comparatively large number of heavy mesons can be created only in the energy region above ten billion electron volts. Since it is desirable to start European cooperation in experimental atomic physics as quickly as possible, the report urged, a small machine with a range of about 600 Mev should be built, and other forms of joint atomic research envisaged.

The council is to be known henceforth as the European Council for Nuclear Research and will use the abbreviation CERN, derived from the French title *Council Européen pour la Recherche Nucléaire*. The member states of CERN, which has been set up with the collaboration of Unesco, are Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland, and Yugoslavia. The council, whose headquarters are in Geneva, has as its president P. Scherrer (Switzerland). Two vice presidents were elected at the Copenhagen meeting: F. Perrin (France) and W. Heisenberg (Germany). The secretary is E. Amaldi (Italy).

A preliminary study on the proposed nuclear research laboratory is to be prepared by the council’s four study groups for its next meeting, scheduled to be held

in Amsterdam in October, at which time it is expected that the location of the laboratory will be decided. So far, only the Swiss government has offered a site, but Denmark has reserved the right to make a similar proposal.

The Space Base Case

Guided Missile Launcher or Target?

Last June, U.S. Attorney Myles J. Lane, speaking at the annual communion breakfast of the 165th Infantry Regiment of the New York National Guard, was quoted by the press as having charged that classified information about studies relating to “sky platforms” had been transmitted by spies to Soviet Russia “before some of our own top people knew about the project.” Artificial satellite vehicles moving in orbits high above the earth would be of great military value, he indicated, because they could be used as launching bases for guided missiles.

For at least two decades there have been sporadic references in the technical literature and elsewhere to the practical difficulties which must be overcome in order to construct an artificial satellite and to establish it fully manned in an orbit of its own some hundreds of miles above the earth’s surface. The subject has also been discussed periodically in various parts of the world by space travel enthusiasts who are interested in the possibility of an orbital vehicle which might be used as a springboard for interplanetary flight. Still another argument that has been advanced is that an artificial satellite might be of great benefit to science if it were to be used as a high altitude laboratory equipped to attack problems in physics, biology, astronomy, and other regions of scientific interest. The cost of such an enterprise is conceded to be far larger than has been permitted for the support of any single basic research program, however, and few hopes have been expressed that a space station might be established for purely scientific purposes, even if the project seemed otherwise feasible.

The recent publication of the proceedings of the second international congress on astronautics, held in London last year, reflects a great deal of the present heightened interest in the subject. This volume (*The Artificial Satellite*, edited by L. J. Carter; 74 pp. The British Interplanetary Society, Ltd., 12 Bessborough Gardens, London, 1952; \$0.75) also explains with considerable patience why the military merits of the satellite vehicle might be considered dubious. The problem of establishing contact between orbiting vehicles is of course fundamental to any consideration of a manned station in space. Delivering supplies to a satellite traveling at a rate of several miles per second is expected to be one of the more difficult logistic problems ever to be encountered, if for no other reason than the need for avoiding damage by impact. The simpler case, it is suggested, would be where impact damage is actually desired, in which event such otherwise important considerations as the final rate and direction of

closing would become relatively trivial. From all indications, guided missiles designed to destroy hostile aircraft (see front cover) will have progressed far enough to provide an effective weapon for attacking the orbiting space station even before one is likely to be built, and with the use of proximity fuses it should not even be necessary to aim very accurately.

Dr. L. R. Shepherd, technical director for the British Interplanetary Society, made a strong plea for civilian control of any satellite vehicle project of the future in his introduction to the international conference. A military monopoly in this field, he pointed out, would be disastrous to the development of interplanetary flight. "The performance of existing rocket motors," he said, "is not far short of that required initially even by manned orbital vehicles, and ten or twenty years of vigorous development should eliminate the performance gap: there is no guarantee that military development will lead to the right sort of rockets for space flight, since the requirements are not necessarily compatible. Indeed, the quickest course in the improvement of the rocket lies in the pursuit of an interplanetary project, since the requirements for this purpose are more exacting than for any other."

Institutional Research

Education Council Forms Policy Group

The American Council on Education has announced the creation of a nine-man committee on institutional research policy, appointed by Council President Arthur S. Adams at the request of the ACE executive committee. "The amount of research sponsored annually by the Federal government in colleges and universities is increasing rapidly", the council points out, "and may exceed \$150,000,000 this year. Industries are also offering a much greater volume of research than in the past. This situation not only intensifies the problems of institutions with large sponsored research programs, but also brings into the picture many colleges which have had little or no experience with this type of operation.

"The problems with which the Committee will deal divide themselves into two major parts. The first has to do with relationships among various interested groups within individual institutions and with correlation of practices among institutions. The second has to do with principles and practices of government agencies, of industrial concerns, and of other organizations which sponsor research."

Chairman of the new committee is President Virgil M. Hancher of the State University of Iowa; other members are Robert F. Bacher of the California Institute of Technology, James H. Corley of the University of California, J. R. Killian, Jr. of the Massachusetts Institute of Technology, Larry R. Lunden of the University of Minnesota, Rev. James B. Macelwane of St. Louis University, J. C. Morris of Tulane, Franklin D. Murphy of the University of Kansas, and T. P. Wright of Cornell.

Earthquake Seismograph Station To Be Established at Rice Institute

Donation of \$25,000 by four geophysical exploration companies toward establishment of an earthquake seismograph station at The Rice Institute, Houston, Texas, was announced in June. The gift was made by General Geophysical Co., Independent Exploration Co., Robert H. Ray Co., and Seismic Explorations, Inc., all of Houston. According to information from the Society of Exploration Geophysicists, these consulting geophysical companies, although engaged primarily in the application of seismology to the search for oil, have shown great interest in the basic earth sciences and feel that the establishment of such a station at Rice will be of great value in fundamental research and will contribute to the solution of geophysical problems. The money will be used to provide the equipment for a seismological station for the continuous recording of the movement of the earth and earthquakes anywhere in the world. It will be the first such station to be established in the Houston area, and in cooperation with other stations such as those at the California Institute of Technology in Pasadena and at Saint Louis University will make possible the directional plotting of earth waves. The Rice Institute will thus become a part of the great scientific network which serves to gather information for peoples all over the world on the incidence, direction, and violence of earth tremors and quakes.

Bismanol

NOL Develops New Magnetic Material

A new magnetic material which exhibits a coercive force of 3000 oersteds, the highest recorded coercive force of any known permanent magnetic material, has been developed at the Naval Ordnance Laboratory. Named *Bismanol* from its composition of bismuth and manganese, and from NOL where it was prepared, the material exceeds any other permanent magnet, except the platinum-cobalt alloy, in available flux density in short magnets where length to diameter ratio is one or less. Since Bismanol magnets are made by the powder metallurgy technique, complicated shapes can be processed to close tolerances without requiring machining.

Bismanol was prepared as part of a search for a magnetic material not containing nickel or cobalt and which could be compacted in the form of fine particles to form permanent magnets. This particular combination of materials was chosen by the NOL researchers because of its potentially high magnetic crystal anisotropy, or, in other words, its possession of an axis along which magnetism is very easy as opposed to one or more other axes along which it is difficult. Permanent magnets are made taking this characteristic into account and aligning the crystals, as far as possible, in the direction of easy magnetism.

Both bismuth and manganese are nonmagnetic when alone. In the preparation of the magnetic alloy, powdered manganese and powdered bismuth are mixed