News of Science

Sputnik III

A third artificial earth satellite was launched in the Soviet Union on 15 May. Sputnik III, which weighs 2925 pounds, is a cone-shaped object that is 5 feet, 8 inches in height. The sputnik's orbit is inclined to the plane of the equator at an angle of 65 degrees. Initial reports placed the vehicle's apogee at 1167.4 miles. It takes approximately 106 minutes to circle the earth, and carries radio equipment that transmits signals on a frequency of 20.005 megacycles. The power supply includes both electrochemical and solar batteries.

At a press conference in Moscow, Yevgeni Federev, a member of the Soviet Union's International Geophysical Year Committee, reported that the variety and complexity of the instruments aboard the new satellite were its outstanding feature. Chemical fuels were used in the launching, and the launching technique was in general the same as that used for the first two Soviet satellites.

There are three major groups of instruments aboard sputnik III. The first includes apparatus designed to study cosmic phenomena such as solar radiation, cosmic rays, and the number and intensity of micrometeorites flying through space. Federev said the Soviet instruments in this category were "considerably improved" over earlier models.

The second group of instruments includes those for studying conditions in the earth's atmosphere—composition, pressure, ionization, electrical phenomena, and the strength and variations of the earth's magnetic field. Federev observed that this is "the first time in history" that it has been possible to have instruments recording all aspects of the atmosphere at all levels in the same "laboratory."

The final group of instruments aboard sputnik III are used for regulating the others—the conditions in which they operate and their sending of information to earth. In addition to the radio transmitter, these include temperature regulators and a program-control system that turns the various instruments on and off at the right times.

Federev also disclosed that the machinery for studying the satellite, its trajectory, and conditions of flight, as well as the scientific data it is collecting, has also been expanded. The number of Soviet observation stations has been increased by one-third.

Federev would not predict how long sputnik III would revolve around the earth. However, he commented that it was his "personal opinion" that sputnik III would stay up several months "and longer than the second sputnik." He also said its instruments would have a longer life than those on the second vehicle.

Chick Head Transplants

Mira Pavlovic, research associate in zoology at Yale University, has successfully transplanted the heads of chick embryos. The longest period of survival for a chick with a transplanted head was 70 days. Another lived 55 days. Other chicks stayed alive 9 days, 4 days, and 2 days, and one died right after hatching.

Miss Pavlovic, a Yugoslav scientist who has been at Yale since March 1957, has been working under John S. Nicholas, Sterling professor of biology. She has been using a transplant technique developed by Petar N. Martinovitch, another Yugoslav who held a Sterling research fellowship at Yale last year. Although Martinovitch developed the transplant technique, none of the chicks on which he performed the operation while in this country hatched. Since his return to Yugoslavia, however, he has succeeded in hatching a chick that lived about 2 days.

Miss Pavlovic has performed the operation on 100 embryos. Six of these embryos developed into hatched chicks. About 30 percent died on their last day of incubation.

The transplant is made within 33 to 40 hours after incubation, before the chick embryo's circulation system is established. The operation consists of opening a square in the shell of the egg. A pair of specially adapted watchmaker's forceps is used to cut through the mid-level of the embryonic mesencephalon. The detached tissue is then removed with a suction pipette and is placed directly on the previously prepared graft bed in the host, another chick embryo which has been decapitated. The window in the shell of the egg is then covered with a transparent material, and the egg is placed in an incubator.

The experiments were performed on Rhode Island Reds, to which the heads of a black breed were transplanted. The bodies of the mature chicks were the color of the Rhode Island Red, while the tops of their heads were black. The region of the head that is transplanted starts roughly between the upper and lower beak of the chicken, and involves the eyes and ears, the forebrain, and half of the mid-brain. Examination of the chicks that matured showed that in some cases the upper and lower levels of the beak did not match.

The two older chicks, ones that lived 70 and 55 days, both were smaller than other normal chicks that were hatched at the same time and used as controls. There has been no detectable difference between the behavior of the chicks that underwent the transplant operation and the controls.

The study was made to see if the transplant caused any discernible difference in the nervous system of the chickens. The work seems to show that early in embryonic development the tissues of differing hosts are compatible. Apparently differentiation of tissues does not take place until after the development of the circulatory system.

Churchill College at Cambridge

Sir Winston Churchill has urged the establishment of a men's college at Cambridge University to train an elite corps of scientists and technologists. On 14 May Churchill issued an appeal to his countrymen to contribute to the founding of the college, which would bear his name. He is already chairman of its board of trustees.

The new institution, according to a letter from the other trustees, is intended to produce "leaders trained at the highest level in science and technology." Seventy percent of its members would study scientific and technological subjects. There would be a higher proportion of postgraduate students than in existing colleges: one to every two undergraduates. A number of visiting fellowships would be created for specialists from abroad, and the college would try to attract postgraduate students from foreign countries and the Commonwealth.

Sir Winston's appeal emphasized the "vast significance" of technological progress to the United States and the British Commonwealth and commented: "It is a theme on which the English-speaking peoples can and must work in concert, disregarding national boundaries and

seeking unity in the benefits their joint efforts can offer to all men."

A minimum initial enrollment of 200 to 250 students and 30 to 40 fellows is planned, and it is expected that there would be an eventual total of 500 to 600 students and 50 to 60 fellows. The total endowment needed for the establishment and maintenance of the new college is £3,450,000 ($9,660,000). Churchill will donate £25,000 ($70,00). A donation of £50,000 ($140,000) has been offered by the Calouste Gulbenkian Foundation of Lisbon, Portugal, as a "willing tribute to the great living Englishman."

British industry is expected to contribute generously to the establishment of the college, and Carl J. Gilbert, president of the Gilette Company of Boston, is considering the raising of a fund among United States corporations with subsidiaries in Britain or the British Commonwealth.

Copyrights and Russian Translation

United States plans for large-scale translation into English of Soviet scientific materials may soon meet another significant obstacle—Soviet copyright of these materials. An article in the *New York Times* by Harry Schwartz reports that organizations engaged in translation of Soviet scientific journals in this country reported recently that Soviet spokesmen have said it was the intention of their government to adhere this year to the Geneva Universal Copyright Convention. The United States has ratified this convention. Such action by the Soviet Government would give it legal property rights to Soviet material reaching this country so that Soviet permission would be required for publication or translation.

One publisher commented that the threat of Soviet adherence to the Geneva Convention was being used to induce American translators of Soviet scientific material to pay royalties to the Soviet Government. The first such royalty agreement, covering 20 Soviet scientific journals, was made recently between a Soviet Government agency and Consultants Bureau, Inc., of 227 W. 17th St., New York, N.Y.

There is no legal protection for Soviet property rights in literary and related material in this country, and there is none for American property of a similar nature in the Soviet Union. If the Soviet Union joins the Geneva Convention it could radically alter the present economics of American translation of Soviet scientific materials.

The chief obstacle to Soviet adherence to the Geneva Convention would be the reciprocal Soviet obligation to honor foreign copyrights. Soviet representatives in this country who have discussed the issue with interested Americans have disclaimed all knowledge of such payment. However, some American authors of scientific books translated and published in the Soviet Union have recently received Soviet payments.

Mouth-to-Mouth Resuscitation

The mouth-to-mouth breathing technique of artificial respiration advocated for children is discussed in four articles in the 17 May issue of the *Journal of the American Medical Association*. The technique, which has been adopted for use on children by the American Red Cross, has been found to be equally effective for adults. Archer S. Gordon and his associates at the University of Illinois College of Medicine have demonstrated through comparative experiments that the mouth-to-mouth technique is "unequivocally superior" to manual techniques in all age groups. Rescuers can maintain mouth-to-mouth breathing for an hour or more without fatigue, even though the victim is twice the size of the rescuer.

Iraqi Scientific Journal

Proceedings of the Iraqi Scientific Societies, volume 1, 1957, has been released. The journal has been established to present original contributions, survey articles, and discussions in mathematics, physics, geophysics, engineering, chemistry, zoology, and botany. Contributions will be published in English, French, or German, with an Arabic résumé for each. Manuscripts should be sent to the editor-in-chief, Prof. Abdul Jabbar Abdullah, Department of Physics, Higher Teachers' College, Baghdad, Iraq.

The Iraqi societies that are supporting the *Proceedings* are the Society of Mathematical and Physical Sciences, the Chemical Society, and the Biological Socity. They were formed at Baghdad in 1956.

Grants, Fellowships, and Awards

Arthritis. The Arthritis and Rheumatism Foundation offers predoctoral, postdoctoral, and senior investigatorship awards in the fundamental sciences related to arthritis for work beginning 1 July 1959. Deadline for applications is *31 October 1958*. These awards are intended as fellowships to advance the training of young men and women planning an investigative or teaching career. They are not in the nature of a grants-in-aid in support of research projects. The three types of awards are as follows.

Predoctoral fellowships are limited to students who hold a bachelor's degree. Each applicant studying for an advanced degree must be acceptable to the individual under whom the work will be done. Stipends range from $1500 to $3000 per year, depending upon the family responsibilities of the fellow.

Postdoctoral fellowships are limited to applicants with the degree of doctor of medicine or doctor of philosophy, or the equivalent. Stipends range from $4000 to $6000 per year, also depending upon the family responsibilities of the fellow.

Senior investigator awards are made to candidates holding, or eligible for, a faculty rank such as instructor or assistant professor (or equivalent) and who are sponsored by their institution. Stipends are from $6000 to $7500 per year and are tenable for 5 years.

A sum of $500 will be paid to cover the laboratory expenses of each postdoctoral fellow and senior investigator. An equal sum will be paid to cover the tuition expenses of each predoctoral fellow. For further information and application forms, address the Medical Director, Arthritis and Rheumatism Foundation, 10 Columbus Circle, New York 19, N.Y.

Atomic energy. Sterling Cole, director-general of the International Atomic Energy Agency, announced recently that more than 200 fellowships for training in the peaceful uses of atomic energy are available through the agency. The fellowships' total value is about $1 million. Financed by the agency itself or by individual donations of member governments, the fellowships "correspond to the most urgent needs of less developed countries." Preference will be given to candidates from underdeveloped countries in awarding the fellowships.

The United States is offering 120 fellowships during the next 2 years, while the Soviet Union will accept 25 students for 5 or 6 years of study and 20 students for 3- or 6-month training courses. At present only government-sponsored candidates from member nations of the international atomic agency will be considered for study posts in foreign countries under the fellowship plan.

General. The American Academy of Arts and Sciences invites applications for grants from its Permanent Science Fund. Awards are made in support of research in any field of science whatsoever, in amounts that ordinarily do not exceed $1500. Applications for grants to be made in the early fall should be filed by *1 September* on forms that may be obtained from: The Chairman, Permanent Science Fund Committee, American Academy of Arts and Sciences, 280 Newton St., Brookline 46, Mass.