

# 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 ma-

chinery 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 middle 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