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News of Science

Sputnik

The U.S.S.R. launched the first earth satellite, *Sputnik,* on Friday, 4 October. In the United States a group of participants in an International Geophysical Year conference was being entertained at the Russian Embassy when the news was announced. Lloyd Berkner, American IGY representative who is the reporter on earth satellites for a special IGY committee, interrupted the embassy festivities to commend the Soviet scientists for their historic achievement.

In a published statement, Joseph Kaplan, chairman of the United States National Committee for IGY, said:

"I am amazed, [given] the short time which they had to plan—obviously not any longer than we had. I think it was a remarkable achievement on their part. From the point of view of international cooperation the important thing is that a satellite has been launched. They did it and did it first."

P. H. Wyckoff, another member of the United States IGY committee, commented: "We are all elated that it is up there."

The text of the first Soviet report on the *Sputnik* included the following statements:

"According to calculations . . . the satellite will revolve at heights of up to 900 kilometers [500 miles], making one complete revolution [at 18,000 miles an hour] in one hour 35 minutes, the angle of its orbit to the equatorial plane being 65 degrees. . . .

"The satellite is in the form of a sphere with a diameter of 58 centimeters [about 22 inches] and weighs 83.6 kilograms [about 184 pounds]. It carries two radio transmitters emitting continuously signals of 20.005 and 40.002 megacycles frequency [about 15 and 7.5 meters wavelength, respectively]. The transmitters are powerful enough to insure good reception by wide numbers of amateur radio operators.

"The signals are sent in the form of telegraph messages lasting some 0.3 seconds with a pause of the same duration in between.

"The signal on one frequency is sent during the pause in the transmission on another frequency. . . .

"The Soviet Union proposes to send up several more artificial satellites during the International Geophysical Year. These will be bigger and heavier and will help to carry out an extensive program of scientific research. . . ."

Three days after the launching, Moscow radio reported that:

"The carrier rocket is just now revolving around the earth at approximately the same altitude—560 miles—as the satellite. The distance between them is about 625 miles. The distance will grow."

On the morning of 8 October, Moscow radio again issued a report, this time a warning that the satellite power supply was almost expended, that its batteries had been expected to last "only a few days." Later in the day the signals were lost for a time, but reappeared as strongly as ever after a lapse of several hours.

On Wednesday, 9 October, the Soviet Union's newspaper *Pravda* published for the first time details of the satellite and its rocket:

"The successful launching of the man-made moon, has fully confirmed the correctness of the calculations . . . in designing the carrier rocket and the satellite.

"The satellite was placed in the nose of the carrier rocket and shielded by a protective cone. The rocket was fired vertically. Moving around the world now is not only the baby moon and the carrier-rocket, but the protective cone as well. . . .

"Inasmuch as the time between the jettisoning of the cone and the detachment of the satellite was not great, the rocket and the cone were comparatively near the satellite for some time. . . .

"Then, due to the difference in rotation periods arising both from the relative speeds at the time of detachment and from the varying degrees of atmospheric resistance, the three objects moved apart and in their further rotation could be spotted over absolutely different points of the world at the one and same moment.

"The altitude of the satellite varies. It changes periodically, reaching the highest point of approximately 1000 kilometers [600 miles].

"At present the orbit's perihelion [low-

est point] is in the northern hemisphere, and its apogee [highest point] in the southern hemisphere. The moon passes over the earth areas stretching approximately between the north and the south polar circles. . . . Due to resistance encountered . . . in the atmosphere's upper layer, its [elliptical] orbit will gradually take on a circular shape.

"The satellite has the form of a sphere whose body is made of aluminum alloys. All the instruments are installed inside the sphere. Before launching, the satellite was filled with the gaseous nitrogen which is forcibly circulated during the flight. This is needed to maintain the necessary temperature.

"The satellite has light senstive elements which alter the radio frequencies of the signals and the correlation between their durations and intermissions as soon as the temperatures or other parameters of the satellite change. . . . The received radio signals are now being decoded and analyzed. . . .

"The Soviet Union will also launch a satellite having animals as passengers for the purpose of studying the behavior of living organisms during cosmic flight."

To American observers, perhaps the two most impressive facts about the *Sputnik* are its weight and the height of its orbit. The United States Project Vanguard has been hoping to launch a 21½-pound vehicle, less than one-eighth the size of the Soviet one. In addition, this country has been planning a satellite that would orbit at only about 300 miles above the earth. This altitude, roughly half that of the *Sputnik,* would touch the fringe of the atmosphere, probably limiting our satellite's life to a few days.

The Soviet accomplishment has had a significant impact on both international and domestic affairs. In the United States, there have already been demands in the press for a Congressional investigation of our missile programs. A number of high-ranking military officials in the Army, Navy, and Air Force have made public statements revealing interservice rivalry, and there has been controversy about the Federal budget allocations for scientific research (see editorial on page 723). In addition, it is predicted that long-neglected requests to the Civil Service Commission and to the White House for salary increases for Government scientists and engineers will again receive attention.

Cole to Head IAEA

W. Sterling Cole, Republican representative of Congress from upstate New York, was elected director general of the International Atomic Energy Agency by unanimous vote of its 23 governors during the recent initial general conference in Vienna of the new organization. However, the Soviet delegate stated that the U.S.S.R. would have preferred that the agency be headed by a representative of a neutral country but that in the interests of harmony there would be no opposition to the choice of Representative Cole.

The appointment, which is effective on 1 December, will be for a term of 4 years. The recommendations of the preparatory commission to the general conference were that Cole be assisted by a staff of 370 persons. Fifteen of these would have the rank of director, with salaries of $10,000 to $12,500, and Cole's salary would be $20,000.

Cole, 53 years old, has been a member of Congress since 1935 and has served on the Joint Congressional Committee on Atomic Energy since it was established in 1946; he was its chairman in 1953 and 1954. It was under his chairmanship that the basic United States law concerning atomic energy was rewritten to make it possible for peaceful uses of atomic energy to be developed more rapidly in the United States and for these applications to be made broadly available to other nations. This legislation authorized, among other things, United States activities in establishing the International Atomic Energy Agency.

Cole served as a member of the United States delegation to the conference to draft the statute of the International Atomic Energy Agency in October 1956. He also served as a member of the Congressional delegation to the Geneva atoms-for-peace conference in 1955.

News Briefs

The Metals Research Laboratory of Carnegie Institute of Technology is observing its 25th anniversary this year with a reunion program in Pittsburgh on 24 October. The laboratory is a special research institute associated with the department of metallurgical engineering in C.I.T's College of Engineering and Science.

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October has been designated Geology Month in Scouting. As part of the month, a Boy Scout Geology Kit of program aids has been prepared by the American Geological Institute, the American Association of Petroleum Geologists, and the American Petroleum Institute, and distributed to all Boy Scout Troops and Scout Explorer Unit leaders. Many geologists have volunteered to give talks on geology, minerals, and fossils, and to conduct geology field trips during the month.

* * *

San Jose State College has announced that a $2.5-million addition to its science building has been completed for use this fall term. This facility doubles the space available for the natural sciences.

Paperbound Science Library

An Inexpensive Science Library, a list of paperbound science and mathematics books, has been compiled by Hilary J. Deason, director of the AAAS High School Science Library Program [*Science* **124**, 1013 (23 Nov. 1956)]. The library program is supported by the National Science Foundation.

Deason's list includes books of varying degrees of difficulty, all of which are recommended for the nonspecialist adult reader. A majority of the titles will appeal to senior high school or junior-college students, and many can be read by junior high school students.

The list, which has been published in pamphlet form, may be obtained for 10 cents from AAAS headquarters. Copies will be sent free to teachers and librarians. The books selected are as follows:

Anatomy

Frohse, F.; Brodel, M., *et al. Atlas of Human Anatomy.* Barnes & Noble 70, 1957. 88 pp. illus. $2.25.

Sproul, E. E. *The Science Book of the Human Body.* Cardinal C174, 1955. 232 pp. illus. 35¢.

Anthropology

Alpenfels, E. J. *Sense and Nonsense about Race.* Friendship Press, 1957. 64 pp. illus. 50¢.

Benedict, R. *Patterns of Culture.* Mentor MD89, 1946. 272 pp. 50¢.

Collier, J. *Indians of the Americas.* Mentor MD171, 1948. 191 pp. 50¢.

Cotlow, L. *Amazon Head-Hunters.* Signet S1094, 1954. 239 pp. illus. 35¢.

Lips, J. E. *The Origin of Things.* Premier s33, 1956. 240 pp. illus. 35¢.

Mead, M. *Cultural Patterns and Technical Change.* Mentor MD134, 1955. 352 pp. 50¢.

Archeology

Albright, W. F. *The Archaeology of Palestine.* Pelican A199, 1956. 271 pp. illus. 85¢.

Cottrell, L. *The Anvil of Civilization.* Mentor MD197, 1957. 256 pp. illus. 50¢.

Edwards, I. E. S. *The Pyramids of Egypt.* Pelican A168, 1947. 256 pp. illus. 65¢.

Gurney, O. R. *The Hittites.* Pelican A259, 1954. 240 pp. illus. 85¢.

Pallottino, M. *The Etruscans.* Pelican A310, 1955. 295 pp. illus. 85¢.

Vaillant, G. C. *The Aztecs of Mexico.* Pelican A200, 1950. 333 pp. illus. 95¢.

von Hagen, V. W. *Realm of the Incas.* Mentor MD192, 1957. 231 pp. illus. 50¢.

Wheeler, M. *Archaeology from the Earth.* Pelican A356, 1956. 252 pp. illus. 85¢.

Woolley, L. *Digging Up the Past.* Pelican A4, 1937. 121 pp. illus. 85¢.

Woolley, L. *A Forgotten Kingdom.* Pelican A261, 1953. 191 pp. illus. 75¢.