

his opinion on a two-week visit last summer to the Soviet Union as a guest of the Soviet government. Accompanied by his wife, Hughes also spent two weeks in Poland as a guest of the Polish Government.

The purpose of the visits was to lecture and consult on individual matters, not to attend a particular conference. This circumstance, Hughes says, produced an informal atmosphere favorable to learning about a wide variety of physics research as well as an opportunity to talk at length to many individuals. Among his specific comments on the state of science and on science as a way of life in the Soviet Union are the following:

Basic research. "... the Soviets certainly do not lead in basic research and in fact in most of its branches lag behind us. They do excel in certain fields, largely development of large equipment, where they have decided to devote intense effort. . . . Such things as the Soviet atomic power plant, the 10-Bev accelerator, and the earth satellite are very good examples of this type of evidence. . . . These developments, however, are not basic science and are the type of things that can be pushed to rapid success if funds are not limited."

Standard of living. "At levels above beginning PhD's the salaries seem to remain at about half those in the U.S. in terms of real purchasing power. This information may come as a surprise when compared with the stories that have been current about Soviet scientists having cars, chauffeurs, and homes in the country. These stories certainly do not apply to the scientists with whom I talked, men usually at the level of PhD's plus 5 to 20 years of experience. The only way in which these stories do apply is to the very few men who are members of the Academy . . . very few of the men we met owned cars of their own, and they all lived in rather small flats."

Effects of government control. "With the dictatorial control that is expressed by the Academy it is obviously true that certain fields can be picked to be pushed with all effort. It is difficult to say just why certain things are selected for the push, but it seems that spectacular items often are, and when success is achieved, as with the recent satellites, the propaganda value is utilized to the utmost. This kind of pressure on selected topics does not work well at all, on the other hand, in basic research and it is here that the Soviets lag behind us. . . . It is hard to see how basic science can advance in a situation in which a few fields, usually those that will produce results of propaganda value, are the only ones that are pushed."

Separation of scientific work from political opinion. "... the day we arrived

in Russia . . . there were two letters to the editor in an English-language Soviet newspaper. These letters, supposedly voluntarily submitted, were by Skobeltzyn, Director of the Nuclear Institute, and Mescheryakov, head of one large phase of research at the Dubno laboratory [Joint Institute of Nuclear Research at Dubno, about 60 miles north of Moscow]. . . . The letters expressed extreme hate for the West yet the day after reading these letters in the paper we were talking to Mescheryakov, who explained his experiments as a typical scientist, extremely friendly and vitally interested in our experiments as well as his own. The impression we gained from this and other experiences was that the scientists learned to separate their scientific work, which may be of high caliber, from propagandist political activities sponsored by the government."

Sardis Expedition

An archeological expedition to ancient Sardis in Turkey is planned next summer by Cornell University, the American Schools of Oriental Research, and the Fogg Museum of Art of Harvard University. Sardis was the city of King Croesus, who was renowned as the richest man in the world and was credited with having introduced coinage. The expedition plans were announced recently by A. Henry Detweiler, Cornell professor and president of the American Schools of Oriental Research, an organization that has research and archeological centers at Jerusalem and Baghdad that are supported by more than 100 American universities and seminaries.

AAAS Newcomb Cleveland Prize

M. Schwarzschild and J. B. Rogerson, Jr., both of Princeton University Observatory, and J. W. Evans, executive director of the Sacramento Peak Ob-

servatory, received the thirtieth AAAS Newcomb Cleveland Prize of \$1000 during the Association's recent meeting in Indianapolis. The men were honored for having developed techniques for obtaining direct solar photographs with high definition undisturbed by the blurring effects of the earth's atmosphere. In a paper entitled "Solar Photographs from 80,000 feet," Rogerson presented the results of the prize-winning project.

Three unmanned balloon flights were carried out to secure the high-quality photographs of the sun. These photographs should enable scientists to gain a better understanding of the turbulence in the solar atmosphere. Several exposures of very high definition were obtained, both of the center of the solar disk and of the limb, or edge, of the solar disk. These exposures show that the solar granulation (boiling in the solar atmosphere) has a cellular, though highly irregular, structure. The bright cells appear separated from each other by dark, and often very sharp, lines. There seems to be a continuum of granule diameters from the smallest observable with the balloon telescope (250 km) up to the sizes previously observed (700 to 1400 km).

The techniques of photographing solar granulations from a balloon-supported platform will be applicable to many other astronomical problems which are at the present time limited by the blurring of the earth's atmosphere. The solar surfaces can be seen in much more detail; turbulence around sun spots and other magnetic areas can be studied. The techniques may be applicable to the study of turbulent motion on other stars; this motion appears to have significant effects on the evolution of many stars.

The project has been sponsored by the Office of Naval Research and by the geophysics Research Directorate of the Air Force. Lyman Spitzer, head of Princeton Observatory, has been closely connected with the project in an administrative capacity.

Laurence H. Snyder, president of the AAAS, presents the Newcomb Cleveland Prize to J. B. Rogerson, Jr., one of the three winners of the association's \$1000 award.

