physical sciences notes

DOCUMENTATION

Euratom center opened to public

Euratom's Center of Information and Documentation, which manages a retrieval system for nuclear physics literature, is now to begin offering its services to anyone interested in the subject. Previously the center, located in Brussels, was largely restricted to serving Euratom member countries (Belgium, France, West Germany, Italy, Luxembourg and the Netherlands).

By the beginning of 1969 the center's staff of 40 people from six countries will acquire an IBM 360/55S —at present an IBM 360/40 is used for coding and indexing the 643,000 documents in the collection. The basis for the bibliography is the American journal NUCLEAR SCIENCE ABSTRACTS.

One branch of the center's operation—called Eastatom —seeks to acquire nuclear documents from Eastern Europe. But the Eastern Countries are reluctant to provide full information. They would like to see the center taken over by the International Atomic Energy Agency in Vienna, of which they are members.

RADIO ASTRONOMY

Joint Harvard-Smithsonian program

The Smithsonian Astrophysical Observatory and the Harvard College Observatory, both in Cambridge, Mass., have united their radio astronomy programs. The joint effort was begun with the erection of a new radiotelescope, an 84-foot dish provided by the Smithsonian, on the pedestal that had carried Harvard's old 60-foot dish. The old Harvard telescope was taken down last July.

More than a month of use indicates that the new telescope meets all performance requirements. With improved instrumentation and a more accurate surface in addition to its larger size, the new dish is more than twice as sensitive as the old one. Studies of the atomic and molecular gases in interstellar space are underway.

Dr. Edward Lilley of Harvard and the Smithsonian is scientist-in-charge of the joint operation. Dr. Dale F. Dickenson of the Smithsonian is chief astronomer.

TECTONOPHYSICS

Laboratory to simulate deep-earth conditions

Texas A&M University is completing a laboratory in which rocks will be subjected to conditions simulating those deep in the earth's interior; pressures will be developed 10,000 times that of the atmosphere along with temperatures up to 900 degrees F.

Under these conditions rock often becomes ductile—rather like taffy. Sometimes, however, it remains brittle. Why it does one or the other is something scientists at the new Center for Tectonophysics want to find out.

One theory is that brittleness may be caused by release of water from certain kinds of rock, according to Dr. J. W. Handin, director of the laboratory. There are certain water bearing minerals, such as serpentine, which dehydrate at some critical temperature, he says. This may be important, Dr. Handin says, in understanding earthquakes born some 30 to 60 miles deep.

The center will also study such things as strain and fracture in rocks and will develop instruments to simulate the effects on rock of underground nuclear explosions.

The center has a budget of about $115,000 a year provided by the Defense Department's Advanced Research Projects Agency.

SOLAR PHYSICS

Heavy elements found in solar wind

Instruments on Vela satellites have detected ions of heavy elements in the solar wind. Previously the only known ions in the solar wind were from light elements: singly charged hydrogen and doubly charged helium 4.

Now singly charged helium 4, doubly charged helium 3, and oxygen with positive charges of five, six and seven have been found. Other heavy ions are present but have not been precisely identified.

The Vela measurements show that the ratio of helium to oxygen is more variable in the solar wind than in solar cosmic rays. This would indicate that the solar wind and solar cosmic rays originate in different parts of the sun's atmosphere. The ratio of the different oxygen ions to each other is about what would be expected if they came from a coronal region with a million-degree temperature.

When the ratio of helium 3 to helium 4 is determined precisely, it should provide information on how helium 3 production varies with the age of the sun, an important consideration in devising models of the sun's history.

The results were published in the Feb. 19 PHYSICAL REVIEW LETTERS by Drs. S. J. Bame Jr., A. J. Hundhausen, J. R. Asbridge and I. B. Strong of Los Alamos Scientific Laboratory.

PLANETOLOGY

Ice caps on Venus

All recent observations of the planet Venus show surface temperatures in the hundreds of degrees. Dr. Willard F. Libby suggests nevertheless that there might be polar ice caps and even certain forms of life on the planet.

Dr. Libby's reasoning starts with a search for missing water. There is evidence to show that the chemical composition of Venus is very similar to that of earth. If this is true, then there should be a good deal more water on Venus than has so far shown up in data on the planet's atmosphere. Polar ice caps, perhaps five kilometers thick, might contain the missing water if temperatures permitted them to exist.

Dr. Libby argues that such temperatures might exist. He sees Venus with polar ice caps melting at the edges and sending streams of water down to the hot equatorial desert where the water evaporates. In the transition region forms of life that can survive a carbon dioxide atmosphere could live. SCIENCE prints Dr. Libby's suggestion in its issue of March 8.