MANAGEMENT

Federal Organization Under Attack

The Government is spending nearly $4 billion a year on research and development in laboratories it established and supports, but it has no accurate record of how many laboratories it operates, where they are located, what kind of work is being done in them, how many people work in them and what the employees do.

These were among the facts uncovered by the Library of Congress Legislative Reference Service in a study made for a subcommittee of the House Committee on Government Operations. The report explores the use of Federal laboratory resources—an aspect of Federal administration of research previously given little attention.

Besides bringing together and analyzing the scattered information on Federal laboratories in the public record, current research and development aimed at environmental pollution control and abatement was investigated thoroughly as a case study. A survey showed that such work is conducted by 192 laboratories operated by nine different Federal agencies or departments.

The President's Science Advisory Committee has a panel that for two years has been studying the same problem, but no conclusions have yet been reported. The Department of Defense is now reorganizing and consolidating its many laboratories in an effort to attain more efficient use of personnel and facilities.

ASTRONOMY

Comet Reactions Simulated

How comets react when they are hit by the solar wind is being tested in a laboratory model by Dr. L. Danielsson of Advanced Kinetics, Inc., Costa Mesa, Calif. He has devised an experiment to simulate conditions in the solar system on a much reduced scale, using the interaction of an accelerated proton stream with a cloud of carbon dioxide gas sublimated from a piece of dry ice.

Photographs reproduced in the November 1 Applied Physics Letters show a well defined, comet-like structure around the dry ice, with an extended tail carried downstream by the simulated solar protons.

HIGH ENERGY PHYSICS

'Onion-Skin' Theory Revived

Renewed life for the "onion-skin" picture of the nucleus is seen in the report by a team of Midwestern scientists who studied the scattering of protons smashing into protons at various energies in the 12.5 billion electron volt accelerator at Argonne National Laboratory. The physicists found evidence that the proton has several layers, as has long been thought from less conclusive studies, not just the outer one detected in previous experiments.

Although the interpretation of their experiment is tentative, the scientists suggest in the November 21 Physical Review Letters that there are most likely three regions—nine-tenths, one-half and one-third of a fermi in radius. A fermi is one-tenth of a millionth of a millionth of a centimeter.

RADIO ASTRONOMY

Structure Mapped

The radio source called Cygnus A has now been mapped in high detail by Dr. C. M. Wade using the interferometer at the National Radio Astronomy Observatory in Charlottesville, Va. Dr. Wade found that the Cygnus A source, already known to consist of two distinct sections, has two "hot spots," when scanned at a wavelength of 11 centimeters. One has a temperature of at least 530,000 degrees Kelvin and the other nearly a million degrees Kelvin, Dr. Wade reports in the November 14 Physical Review Letters.

He also found that the distribution of temperature differences within both sections of Cygnus A indicates the presence of very strong magnetic fields, although only the relative strength, not the absolute magnitude, has been measured.

Cygnus A was one of the first of two discreet radio sources discovered in the mid-1940's to be broadcasting radio waves that would be detected by earthbound antennas. The other was in Cassiopeia. Their exact locations were not pinpointed until the early 1950's, after several other but much fainter radio sources had been discovered.

SPACE TECHNOLOGY

ATS: A Satellite's Satellite

The U.S. has launched at least 210 satellites, and is getting to be a pretty old hand at the game. Yet early in December, the National Aeronautics and Space Administration will launch the first of a five-satellite series specially designed to make life easier for other satellites to come.

Called Applications Technology Sattellite B (it is coming before "A" because its stabilization system was perfected first), the 1,550-pound cannister will be placed in a synchronous (stationary) orbit. There it will take careful measurements of all the things that can plague synchronous satellites during their lifetimes—solar radiation damage, high energy particles, low energy particles, and the earth's magnetic field.

In addition, ATS-B will be loaded down with a wide variety of experiments. It will be equipped, for example, as a communications satellite that can handle 600 two-way voice channels and even color television.

It will also be a weather-watcher, equipped with a high-resolution cloud camera capable of photographing two-mile wide objects on hte ground. Ion engine and stabilization experiments will be included; NASA is already planning a second ATS series.