space are the high-energy streams of charged particles called cosmic rays. Under quiet sun conditions, cosmic ray instruments will be invaluable in exploring the zones of charged particles trapped in the earth's magnetic field. These trapped particles were discovered during the IGY, and their relation to solar disturbances as well as how they entered the atmosphere in the first place are still largely unknown. Cosmic rays are also valuable in studying the basic nature of the interplanetary medium of our solar system, which can best be done during solar minimum. The lowest energy cosmic rays reach the earth only during times of solar quiet.

The last general area of research in the IQSY is that of aeronomy, the science of the physical, chemical and electrical properties of the atmosphere. The nature of the true "undisturbed" atmosphere can only be studied during solar quiet.

Geophysicists hope to enlarge their knowledge of solar radiation—and consequent ionization—electron density, interplanetary dust, ionospheric winds and the temperature and density structure of the atmosphere.

The experiments and programs mentioned in this story are only a fraction of the research planned for these two years. The information accumulated by the individual countries will be exchanged through the world data centers, located in the United States, the Soviet Union, several countries in Western Europe and Japan.

A special calendar for the two years has been established. It will operate on universal time (0000 UT to 2400 UT), and includes designated special days of the week and special seasonal intervals for concentrated study. Regional warning centers, established during the IGY, will alert the scientific community to any unusual geophysical events such as magnetic storms, cosmic ray events or solar flares.

The National Science Foundation is the official Government agency for supporting special IQSY projects and collating the efforts of various Government agencies under its coordinator, Dr. Robert Fleischer. NSF operates in conjunction with the National Academy of Sciences IQSY Committee, responsible for the overall U.S. program and representation in international programs.

• Science News Letter, 84:362 Dec. 7, 1963

INVENTION

Patents of the Week

➤ A CHEMICAL METHOD for protecting the world from radioactive waste materials earned patent 3,110,557 from the U.S. Patent Office.

The process was invented by Marshall L. Spector, head of exploratory research in the Research and Development Laboratory of the M. W. Kellogg Company, Jersey City, N. J.

"Radioactive wastes are chemically bound in a stable solid or rock form through a chemical reaction in this process," Mr. Spector told SCIENCE SERVICE.

These artificial rocks then can be stored to allow the radioactivity to decay without great danger to the public.

The process is being seriously considered as a solution to the crucial problem of what to do with the "hot" by-products of nuclear reactors. Mr. Spector's method would treat the wastes with silicon.

Metal oxides, which may either be found in the radioactive wastes or added separately, react with the silicon to form an insoluble silicate rock, thus trapping and binding the radioactive material permanently. Rights to the patent were assigned to Mr. Spector's firm.

Blood Gas Analyzer

A newly-patented instrument measures gases and anesthetics in blood and can also help determine the quality of such liquids as water, orange juice and hydrocarbons.

The U.S. Patent Office issued patent 3,111,390 for this apparatus, 150 of which already are in laboratory use all over the United States.

Made by the Fisher Scientific Company of Pittsburgh, Pa., the device is known commercially as the Fisher Clinical Gas Partitioner. It was invented by Billy W. Taylor, a Fisher employee in charge of the clinical instrumentation section of the research and development laboratory.

The amount of oxygen, nitrogen, carbon dioxide and carbon monoxide present in blood is analyzed automatically by gas chromatography instead of gas analysis by the traditional Van Slyke technique. The older method requires a highly-skilled operator and eight to ten time-consuming operations.

In the patented apparatus, the operator introduces a small sample of blood into a reaction chamber where the gases are extracted automatically. An inert gas, such as helium, carries the blood gases into two columns where they rise at different speeds. A detector tells the different gas concentrations in the blood.

Other Significant Patents

Other patents include:

A tiny plunger to unclog openings in salt and pepper shakers and other similar containers for which radio and television entertainer Paul Winchell earned patent 3,110,424. At the same time he received patent 3,110,501 for laminated disc pad phonograph records. Rights to both patents were assigned to his corporation, Chelwin Productions, Inc., of New York.

A means for spreading insecticide by storing it around a bomb which is then set off for which Michael D. Barber of Brunswick, Ga., was awarded patent 3,110,256.

A human body heater for hunters and other persons exposed to cold for a long period which earned patent 3,110,301 for Lewis J. Bricker of Waynesboro, Pa.

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