

## METEOROLOGY

# Storms Cause Explosions

► THE BELIEF long held by coal miners that disastrous mine explosions are often associated with stormy weather has some basis in fact.

Dr. C. B. McIntosh, geography professor at the Eastern Illinois State College, Charleston, has studied the relationship between weather and 428 major coal mine explosions in the period from 1839 to 1953.

Although several compounds found in coal mines can be burned, the two occurring in sufficiently high concentrations to cause disastrous explosions are methane and coal dust.

Dr. McIntosh finds the methane content in air in the mines was increasing either on the day before or the day of the explosion. As a gas, he reports, methane expands and contracts with changes in atmospheric pressure and temperature. Pressure is the important factor in mines.

The principal methane storage places in coal mines are worked-out rooms. When these are closed off with only temporary

barricades, there is danger of an explosion. A fall in atmospheric pressure disturbs the balance between ventilated passages and unventilated rooms, forcing the methane-contaminated air past the barriers. This can also happen, Dr. McIntosh says, even from rooms permanently sealed.

Concerning the part weather plays in affecting coal dust explosions, Dr. McIntosh found the moisture accumulated by the coal particles is dried out by the passage of a cold front. Since the coal's surface moisture evaporates first, just as it does in soil, the dried-out top layers would be easily stirred up and dispersed into the air.

"Conditions favorable to coal mine explosions—increase in methane and drying of coal dust—are therefore closely associated with frontal passages and with the ensuing influence of cold, dry air," Dr. McIntosh reports.

The periods of highest methane content and dry coal dust do not coincide, so there should be two peaks of explosion frequency. He found evidence for the two peaks—explosions occurring near a frontal passage being due primarily to methane and those occurring about three days later being due mainly to coal dust.

Although his studies are not "proof," Dr. McIntosh suggests an understanding of the weather-explosion relationships he found could help industry improve its safety record of the past eight years.

Science News Letter, May 18, 1957

## SEISMOLOGY

## Discover New Kind Of Earthquake Wave

► A NEW KIND of earthquake wave that will provide additional information on the structure of the earth's crust was reported at the 1957 annual meeting of the Seismological Society of America in Los Angeles.

Drs. Maurice Ewing, director of the Lamont Geological Observatory, Palisades, N. Y., and Jack Oliver, also of the Observatory, said the waves were discovered by studying records of the Arctic earthquake on June 3, 1956. They are called "higher modes of continental Rayleigh waves."

Although the existence of such waves was predicted theoretically many years ago by the Japanese seismologist Sezawa, they were not previously clearly identified in the earth's crust.

The waves might be likened to the overtones, or higher modes, of an organ pipe, but differ in that they are traveling rather than stationary waves.

Besides providing additional information on the strength and thickness of the earth's crust, the waves may provide "the key" to a wave propagation system that will unify previously observed earthquake phenomena, Drs. Ewing and Oliver reported.

Elevated areas are being further elevated and depressed areas further depressed in the Western Rift Valley of Africa, said two other scientists. Dr. George H. Sutton, also of the Lamont Observatory, and Dr. Eduard Berg of the Institute for Scientific Research in Central Africa, Belgian Congo, said their studies of earthquake records for the three years prior to April, 1956, showed the elevation and depression effects.

Science News Letter, May 18, 1957

## ● RADIO

Saturday, May 25, 1957, 1:45-2:00 p.m. EDT  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. John W. Mitchell, principal plant physiologist, and Dr. Paul C. Marth, senior plant physiologist, U. S. Department of Agriculture, Beltsville, Md., will discuss "New Wonder Chemical—Gibberellin."

## MEDICINE

## Filming Heart Sounds Helps Diagnose Disease

► THE HAZARDOUS and elaborate tests used to diagnose diseased heart valves may be unnecessary if an instrument called the phonocardiograph is used, Drs. Thomas F. Leo and Herbert N. Hultgren, Cardiovascular Research Laboratory, Stanford University, Stanford, Calif., have found.

The phonocardiograph, used to make a record of the heart's sounds on photographic film, offers a valuable diagnostic tool for the physician, they reported at a meeting of the western section of the American Federation for Clinical Research in Carmel, Calif.

With heart surgery becoming more common today, there is an increasing need for more accuracy in diagnostic equipment, they said, recommending the phonocardiograph for both accuracy and easy use in the doctor's office.

For timing purposes, the phonocardiograph is generally used in connection with an electrocardiogram, the instrument that measures the heart's electrical impulses. Working together, the two machines are of particular value in detecting types of heart disease that can be cured by surgery, the doctors said.

The physicians reported their phonocardiograph findings in a group of patients suspected of having mitral valve disease. The technique improved the accuracy of diagnosis, they said.

Science News Letter, May 18, 1957

## METEOROLOGY

## Propose Attaching Telescope to Balloon

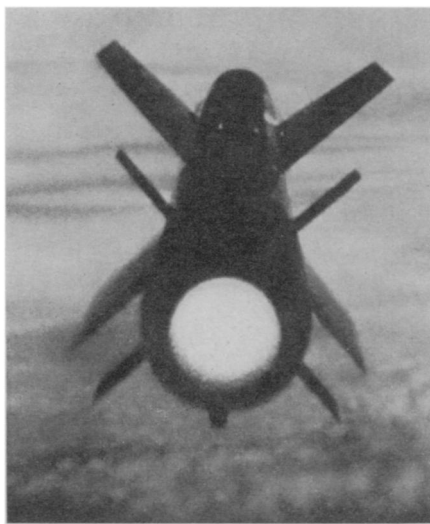
► A TELESCOPE hung under a high-flying manned balloon to take a closer look at the atmospheres of earth's neighboring planets is being considered by the Navy Department.

At an altitude of 100,000 feet, the telescope would be above 99% of the earth's atmosphere, Malcolm D. Ross of the Office of Naval Research told the American Meteorological Society meeting in Washington.

He also reported the manned balloons could be used for aeromedical research and for tests on military equipment.

The instrument suggested for the trip to the fringes of the earth's atmosphere is an 18-inch wide-angled Schmidt telescope to which a spectrograph is attached.

Science News Letter, May 18, 1957



**FIRESTREAK**—Great Britain's new fighter-borne guided rocket is shown here accelerating rapidly after launching. The rocket is carried by a supersonic fighter and a detector eye sensitive to infrared rays makes it follow a moving target until it strikes.