

GEOPHYSICS

To Study Whistlers

In connection with International Geophysical Year, network of observing stations will observe these radio waves of audio frequency, born of lightning flashes.

► WHISTLERS will receive special attention during the International Geophysical Year, 1957-58, when 40 nations join in attacking the earth's mysteries.

These whistlers are radio waves of audio-frequency that are born of individual lightning impulses. Dr. Millett G. Morgan of Dartmouth College told the American Association for the Advancement of Science meeting in Atlanta how a network of observing stations will observe them as convenient natural probes of space just outside the earth's atmosphere. Whistlers are not the same as cosmic noise due to radio waves from outer space.

The radio commotion of the lightning is spread into various low frequencies which travel between the two hemispheres along the lines of the magnetic field. These paths rise in the middle latitudes of the earth to heights as great as the earth's diameter.

Already through their use there are hints that the amount of matter in the extreme outer atmosphere is a hundred times as great as previously thought.

The scientists will also listen in on what they call the dawn chorus, a radio effect connected with the aurora and magnetic disturbances and caused by the bombardment of the earth by material shot from the sun. They hope to settle what comes from the sun to disturb radio, TV, and wire communication here on earth, particularly at the time of the greatest prevalence of sunspots.

Extremely accurate aiming of the earth satellites or artificial moons will be necessary when they are launched from rockets 200 to 300 miles above the earth. Dr. Homer E. Newell, Jr., of the Naval Research Laboratory, Washington, explained that if the angle of shooting of the little object from the top point of rocket flight varies more than a degree and a half from the horizontal it will be plunged into the denser atmosphere and burn itself out.

The first earth satellites may not be able to send messages back to earth by radio because of the weight of the apparatus within them needed to do this. Even an uncommunicative or uninstrumented artificial moon can give scientists much information, just as measurements upon the moon have helped understand the shape of the earth. The earth may get a new determination of its waistline or the actual amount of bulging at the equator. The man-made moon will give higher accuracy than hitherto possible to some of these fundamental measurements.

High-speed computers or electronic brains will be used to plot the paths of the satel-

lites in the sky. The inaccuracies of our knowledge of the shape of the earth will cause some of the first man-moon flights to be lost to view, but as more are launched and followed the predictions of the orbits will improve as the new information of the earth's shape is acquired.

Antarctica will be one of the most observed regions of the earth two years hence. Ten other nations will join the United States in setting up over 40 stations on or around the south polar continent.

The South Pole itself will be occupied for a continuous period with scientists delivered there by parachute from airplanes. Our expedition now in Antarctica is a preliminary bout with the earth's most empty quarter, a continental ice-covered area 6,000,000 square miles in extent. An antarctic veteran, President Laurence M. Gould of Carleton College, Northfield, Minn., predicted to the scientists in Atlanta that important new knowledge will result from this concerted attack on the last known earth areas.

Science News Letter, January 7, 1956

VETERINARY MEDICINE

Dogs Fare Better When They Regulate Own Food

► MOST DOGS stay in good flesh and condition, make better use of their food, and have better manners when they are allowed to feed themselves as often and as much as they like, Dr. J. W. Bernotavicz, director of the Gaines Research Kennels, New York, reported.

During a five-year experiment on the results of self-feeding on kennel dogs, using unlimited amounts of homogenized dry meal, Dr. Bernotavicz found only a few out of several hundred dogs that did not learn to regulate the amount of food they ate to their needs.

He noted that when a dog is put on a dry self-feeding program, he will gorge himself with food for about a week or two. The dog soon learns, however, there is no competition and the food is always there when he wants it. He then adjusts his food intake to his caloric requirements, the scientist said.

Results of tests indicate dogs make better use of the food they eat by taking it frequently in small portions rather than in one or two large portions a day, Dr. Bernotavicz said. In this way, the level of nutrient materials in the blood stream is held more nearly constant and over a much greater period of time.

Science News Letter, January 7, 1956



MATCH-SCRATCHER—This unusual fish was recently received by Fort Worth's James R. Record Aquarium. It is variously known as "unicorn fish" because of its retractable spine; as "helicopter fish" because of its underwater hovering, up and down, forward, backward or sideways motion; and as "file fish" because of its rough skin. Its skin is frequently tacked up in a ship's galley for striking matches.

ASTROPHYSICS

To Send Small Rocket Up About 60 Miles

► EXPLORATION of the upper atmosphere and the fringe of outer space is being planned at Woomera rocket range as part of the joint British and Australian geophysical year program in 1957-58.

It will be different from the United States space satellite program, it was reported in Sydney, Australia, by H. J. Brown, controller of the Weapons Research Organization.

"We are thinking of getting a small rocket to a height of 300,000 feet, or about 60 miles, in a much less expensive way than the big three-stage rockets," he said.

A small instrument-crammed rocket powered by solid instead of liquid fuel may be sent to about 70,000 feet, attached to a large balloon and then fired by radio. It should reach a height of 300,000 feet, Mr. Brown explained.

This rather inexpensive way of getting recording instruments into the last layers of the atmosphere has been discussed by other countries but has not yet been tried.

The chairman of the Royal Society's Upper Atmosphere Committee, Prof. H. S. Massey who was in Australia to discuss the plan, said recently that the high-altitude rockets from Woomera could help solve the problems of space travel.

He stated that rockets, probing 120 miles into the upper atmosphere, could be launched from Woomera in two years.

Prof. Massey spent two months in Australia discussing Australia's part in space travel experiments with the Upper Atmosphere Research Committee of the Australian Academy of Science.

He said that Britain and Australia have a combined program to investigate the upper atmosphere with rockets.

"We want to insure there will be no overlapping."

America had a nine-year lead over Britain on space-rocket experiments. But Britain planned to send up its first space rockets in two years, which showed how Britain was advancing with space experiments, he pointed out.

Prof. Massey said that ground work had

begun in Australia on rockets to investigate space. He did not know how far the work had gone.

Biggest problem in future space travel, he indicated, would be space medicine. Space medicine could make it possible for humans to get into space despite tremendous acceleration.

Navigation in space travel would have to be extremely accurate and was another major problem, he said.

Practical work for the rocket research program is being conducted in a top secret atmosphere at the Long Range Weapons Establishment at Woomera, South Australia.

Science News Letter, January 7, 1956

MEDICINE

Ammoniated Cigarettes

Next thing that may be tried by smokers who want to go on smoking without fear of lung cancer. Ammonia fumes reduce the tar in cigarette paper.

➤ AMMONIATED cigarettes may be the next thing tried by smokers who want to go on smoking without fear of getting lung cancer.

This is suggested by reports from S. Z. Cardon and E. T. Alvord, research chemists with the Rand Development Corporation, Cleveland, to the American Association for the Advancement of Science meeting in Atlanta.

Treating cigarette paper with chemicals which give off ammonia when heated reduces the benzpyrene found in the tar from the paper, they reported. Benzpyrene causes cancer in laboratory animals. The ammonia treatment also reduced the amount of the chemical in the tar of the whole cigarette.

Whether this chemical exists in large enough amounts in cigarette paper to be responsible for the statistical association between cigarette smoking and lung cancer is a question scientists have not yet agreed on.

Discovery of the chemical in cigarette paper tar was announced by Mr. Cardon, Mr. Alvord and Donald V. Lefemine of the Cancer Institute, Miami, Fla., a year ago, (*SNL* Oct. 30, 1954).

Now Mr. Cardon and Mr. Alvord report repeating the original experiments in a way to determine the amount of benzpyrene in cigarette paper as it is burned when wrapped around a cigarette and the whole thing "smoked" in a machine designed by the research laboratory of the American Tobacco Company.

They found an average quantity of 2.5 micrograms of benzpyrene per package of cigarettes. No significant difference was found among several popular brands.

Seeking a way to check the formation of benzpyrene in burning cigarettes and their paper, the scientists tested several hun-

dred compounds. Best seems to be ammonium sulfamate.

Cigarette paper treated with as little as five percent of this ammonia compound by weight reduced the amount of benzpyrene in the tar from the burning cigarette paper by 95%. A 60% reduction in benzpyrene was obtained in tar from cigarettes made with this treated paper. Apparently the ammonia reduced benzpyrene formation from the tobacco as well as from the paper.

Science News Letter, January 7, 1956

MEDICINE

See Aspirin Effect Due To Dual Action on Glands

➤ THE RELIEF ASPIRIN gives to arthritis patients seems to come from a dual effect of the drug on two glands of the human body.

Studies suggesting this were reported by Dr. Alan K. Done of Salt Lake City, Utah, to the American Rheumatism Association meeting held at the National Institutes of Health, Bethesda, Md.

The two glands are the pituitary gland in the head and the adrenal glands, producers of anti-arthritis cortisone. The pituitary influence these glands through one of its hormones, ACTH.

Aspirin, Dr. Done reported, stimulates the pituitary and, as a result, there is an increase in production of adrenal gland hormones known collectively as steroids.

Second effect of aspirin is to increase the rate at which these steroids are removed from the circulating blood by means other than excretion through the kidneys. This implies that aspirin also influences hydrocortisone after its release from the adrenal glands.

Science News Letter, January 7, 1956

● RADIO

Saturday, Jan. 14, 1956, 2:05-2:15 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Francis O'Neill, director of the Central Islip State Mental Hospital, on Long Island, N. Y., will discuss "Drugs Against Mental Illness."

The availability of many kinds of human cancer growing routinely outside the human body is widely regarded as a development that may accelerate cancer research throughout the world.

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