

GEOGRAPHY

Alaska Defense Discussed

Problems of this northern territory, close to Russia, engage the attention of scientists. "Permafrost" presents one of the toughest problems.

► RESEARCH for the defense of Alaska, vital strategic area only 50 miles from Russian territory, was discussed in Washington by more than 300 scientists attending the first Alaskan Science Conference, sponsored by the National Academy of Sciences.

Thousand-foot Frozen Layer

"Permafrost," the underlying earth layer of the Alaskan Arctic which never thaws, is one of the toughest problems facing scientists and engineers, the conference was told.

In certain localities the permanently frozen layer extends downward to at least 1,020 feet below the surface, Dr. Gerald R. MacCarthy, of the U. S. Geological Survey reported. This discovery was made in studies of oil wells drilled for the Navy in World War II. Thermal cables were lowered as far as 2,400 feet. Scientists are now ready, Dr. MacCarthy said, to sink their instruments even deeper, down to 6,000 feet into the earth.

From these studies, Dr. Louis L. Ray of the Geological Survey said, will come better understanding of Alaskan vegetation and farming problems, soil, drainage, water supplies, and construction work done over permafrost—a problem vital to military defense of Alaska.

Caribou Almost Extinct

Thanks to a combination of wolves and game-hungry natives armed with high-powered rifles, Alaska's "millions" of caribou no longer exist, Dorr D. Green, chief of predator control in the U. S. Fish and Wildlife Service, told the conference.

Game herds have been reduced far below any possibility of spontaneous recovery, he said, and can be maintained only by careful wildlife management methods. One of the most promising of these is wolf poisoning with baits soaked in fetid seal oil.

Wildlife Service scientists have found that valuable fur animals, such as mink, otter, marten and weasel, turn up their noses at such fare, but wolves are strongly attracted by the evil smelling bait.

Dogs Carry Worms

An embargo against any shipment of Arctic dogs to the United States was recommended by Dr. Everett L. Schiller of the U. S. Public Health Service in Anchorage. Tapeworm infections carried by dogs as well as wolves, Alaskan foxes, voles and other mammals are a serious health problem in the territory, he said.

Huskies and other sledge dogs are an apparent reservoir of tapeworms which can

cause internal tumors when transmitted to human beings.

Archaeological Sites Rifled

Serious damage to Alaskan archaeological sites is being done by Eskimos digging for ivory and U. S. soldiers and sailors hunting for curios, Prof. Frederica de Laguna, Bryn Mawr, Pa., College anthropologist, told the conference. Records of fast-vanishing native cultures are being endangered, she warned, despite a 44-year-old law providing legal protection to such sites against vandalism.

Forecast Volcanic Eruptions

The possibility that volcanic eruptions can be forecast with accuracy is being studied in Alaska, Dr. Joel H. Swartz of the U. S. Geological Survey reported. Particularly in the Aleutians, volcanos are a risk to military and civilian installations. Experiments in predicting approaching eruptions by instruments which pick up earthquake tremors are being made. Three seismic stations have already been set up on Adak and Great Sitkin Islands in the Aleutians, where measurements of "ground tilt" and magnetism are also being tested as possible eruption indicators.

Salt Varies in Ice

You cannot tell the thickness of Arctic ice by use of electrical equipment like that employed in prospecting operations. Resistivity of ice to direct current varies with the temperature of the ice and with how much salt is in the ice, William J. Dichtel and George A. Lundquist, of the U. S. Naval Ordnance Laboratory, told the scientists.

A quick method of finding ice thickness is important to many of the Armed Forces' naval and aerial operations. The two scientists said also that temperature varies with the thickness of the ice and that there is a great variation in the amount of salt in different parts of the ice.

Cortisone for Eye Ill

Cortisone, famous arthritis remedy, promises to control the major eye disease in the native populations of the Arctic circle and to prevent the blindness it causes.

Cases in which this hormone drug brought dramatic recoveries in 24 to 48 hours, instead of 10 days to three weeks or longer, were reported by Drs. Milo H. Fritz of Anchorage, Alaska, and Phillips Thygeson of San Jose, Calif., to the Alaskan Science Conference in Washington.

The eye disease is called phlyctenular keratoconjunctivitis. Little blister-like bumps

that come in crops attack the lining of the eyeball and lids and scar the cornea. Eyesight is impaired by the scars and in some cases is lost entirely.

The cause of the disease is not known. The best theory at present is that it comes from an allergy to the products of the TB germ.

While cortisone can be used to stop the acute attack of the disease and prevent scarring of the eye cornea and blindness, full control of the disease will not come until tuberculosis is eliminated.

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PHYSICS

Physics Nobel Prize For Meson Research

► PROBING the inner secrets of atoms to find out more about how they are made brought Dr. Cecil F. Powell of Bristol University the 1950 Nobel Prize in physics.

Mesons are the tiny elusive particles formed when cosmic rays smash an atom to bits and in cyclotrons. Their life is short, measured in millionths of a second. They are considered key particles of the atom, perhaps holding the secret of its binding force.

For his method of photographing these nuclear processes and his discoveries about mesons, Dr. Powell received the prize.

One of the photographic emulsions that Dr. Powell developed in his laboratories contains eight times as much silver bromide as older emulsions. This aids in magnifying the path of a particle on the photographic plate. The emulsion is also loaded with boron, which prevents the tracks left by the particle from fading.

By studying meson tracks on plates exposed on mountain tops or suspended from balloons soaring miles above the earth, scientists are learning about the different types of mesons, their masses and other facts ex-



DR. CECIL F. POWELL

pected to throw much light on the nature of the atom's nucleus.

Dr. Powell was once charged by Russian scientists of ignoring their claims of discovery of new mesons. Two Russian scientists stated in a letter to *NATURE*, British scientific journal, that they had detected

16 kinds of mesons. Dr. Powell recommended that the Russians do further experiments to reduce statistical variations of the Russian observations and to give a decisive answer as to whether the many kinds of new particles they claimed really existed.

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MEDICINE

Two Feet of Guts Enough

Body adapts to loss of most of small intestine by enlarging diameter of remnant and by colon's assuming some absorptive functions.

► YOU can get along pretty well nowadays with only about a foot or two of your small intestine—if disease or obstruction dictate its removal.

For one thing, improved surgery, antibiotics and blood plasma give you an excellent chance to survive an operation to remove nearly all your small intestine. As much as 15 feet of this organ now can be removed.

But how can patients continue living, after surviving surgery? After all, the small intestine is the organ which is responsible for absorbing the nourishment for the body. Its walls are designed to allow digested food components to pass through and into the blood stream, which distributes this nourishment to the whole body.

If only a foot or two of this important organ remains to handle the traffic of digested food, how can the body possibly get enough nourishment?

This problem and the remarkable manner in which the body adapts itself to the new conditions is a subject of a report in *GASTROENTEROLOGY* by scientists in the University of California School of Medicine, San Francisco, and the Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.

The report is part of a study which Dr. T. L. Althausen, professor of medicine in the California institution, has been conducting for several years. Dr. Althausen's colleagues were Dr. Kahn Uyeyama, of California, and Dr. R. K. Doig and Miss S. Weiden, of Australia.

The scientists report two cases. One is an Australian man of 50 who developed an

obstruction and extensive gangrene of the small intestine. The other is an American woman who had intestinal ulcers and inflammation with many ulcers. Each retained about two feet of small intestine.

There were three principal ways the body compensated for the loss of the greater part of the intestine.

At first it was impossible for the body to get enough nourishment by ordinary routes; so artificial feeding was employed. But in time the remaining fragment of small intestine expanded in diameter, increasing the absorption surface and the capacity of the abbreviated organ to pass nourishment.

Second, the colon assumed some of the absorptive functions of the small intestine.

Third, there was a weight loss. This loss was great immediately after operation. As the body became adapted to the situation, however, there was some increase, the weight leveling off somewhat below normal pre-operative figures. With this lighter weight, the nourishment requirements were reduced to a scale compatible with the capacity of the abbreviated small intestine.

The physicians feel that many individuals, who would have died in earlier years, will now not only survive operation, but be able to live comparatively normal lives. They point out that the Australian male now is continuing his normal occupation as a sailor on a coastal steamer, and he eats the regular food of the ship's mess. The American housewife cares for a family of three, gardens, and considers a slight intestinal instability her only problem.

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tempted to do this.

The feat will have been accomplished by Dr. Eleanor Alexander Jackson, Rosenwald research fellow at Cornell Medical College for the past three and a half years. Dr. Jackson thinks other researchers may have grown the leprosy germ successfully but not recognized it in the different form in which she finds it grows outside the body. Work with the pleomorphic form of TB germs, which are distant cousins of leprosy germs, led Dr. Jackson to study leprosy from this angle.

Material, called lepromin, prepared from Dr. Jackson's pure growths of leprosy germs has been injected into the skin of leprosy patients. It gave the same reactions as the lepromin ordinarily used for leprosy skin tests. This seems to confirm Dr. Jackson's belief that she has actually grown the leprosy germs outside the body. The lepromin ordinarily used is obtained from leprosy nodules of patients and is crude material, containing other things besides lepromin.

Dr. Jackson has injected her cultivated germs into mice. After eight months, equivalent to 20 years in man's life, the mice developed sores on their skin very like the sores in human leprosy. Skin tests of these animals with lepromin obtained from the U. S. Leprosarium at Carville, La., gave reactions indicating that the mice had leprosy.

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CHEMISTRY

Diels-Alder Reaction Gains Nobel Prize

► AN IMPORTANT chemical reaction, originated by two German chemists Drs. Otto Diels and Kurt Alder over 20 years ago, has won for them the 1950 Nobel prize for chemistry. Acknowledged as a great help in synthetic rubber and other chemical manufacture that was successfully used by the Germans in World War II, the Diels-Alder reaction is nevertheless not widely known and is referred to only in technical chemical books.

The Diels-Alder reaction is a general method for making organic chemicals. By means of it chemicals of the class of synthetic rubber material can be converted into compounds of quite different type.

Butadiene, chloroprene and similar rubber ingredients are compounds whose carbon atoms are joined by double bonds but arranged in a straight line. In the Diels-Alder reaction such materials are made to combine with the chemical maleic anhydride. The result is an aromatic material whose carbon atoms are joined in ring-shaped structures.

These ring compounds, which are very useful to the organic chemist, occur in coal tar, but can be made in the laboratory by only a few methods. Of the possible processes of making wanted ring compounds to order, the Diels-Alder process is one of the simplest.

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MEDICINE

Leprosy Germ Cultivated

Organism from blood of leprosy patients, believed to be the cause of the disease, now reported grown outside the human body.

► A GERM from the blood of leprosy patients, believed to be the cause of this dreaded disease, has now been grown outside the human body.

If confirmed by other scientists, this will be the first time that the leprosy germ has been cultivated outside the human body, though scientists for many years have at-