

growth-valuable sunlight in the lower strata of the forest is well demonstrated when the trees are thinned out either by cutting or accident, letting more light

through. The humbler plants of the forest floor then fairly leap forward in their growth.

Science News Letter, July 20, 1935

GEOGRAPHY

Air Survey Of New Mexico Aided By 275-Pound Camera

THE WORLD'S largest aerial camera, which can photograph a ground area of 760 square miles, or over twice that of New York City at a single "shot," has been built by Fairchild Aerial Surveys and Aerial Camera Companies for use by the Department of Agriculture in a mapping survey of central New Mexico.

Weighing 275 pounds without films, the camera has ten lenses mounted in two sets of five. When the ten lens shutters are snapped at exactly the same instant by a master electric trigger, ten negatives making a composite print which measures 32x32 inches are exposed.

A single load of films for this photographic colossus weighs 70 pounds; includes 1,200 feet of film; takes 2,000 unit exposures, which will make up 200 composite pictures.

Soil Conservation Service workers,

starting a survey from the air of the rugged and almost inaccessible terrain of central New Mexico about mid-July, will make first use of the new camera. It will primarily aid in the selection of control points, so indispensable in the detailed mapping work to be undertaken. Previously these control points were necessarily established as the result of ground surveys, because smaller cameras did not photograph a large enough stretch of territory.

Surveyors will fly the camera back and forth over the Rio Grande area, along courses 30 miles apart, with lanes 11 miles wide being "shot." From these surveys, control points which could not have been established by ground surveys because of the lack of roads and general inaccessibility of the territory, will be set up, and from them every square inch

of territory photographed with smaller cameras.

As there are wide stretches in Siberia and China which have never been surveyed, and since only about one-third of the United States has been adequately mapped, the camera may prove invaluable in bringing the last unknown wilderness under the study of scientists and explorers.

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GEOGRAPHY

Soviet Ice-Breaker Will Seek "Lost" Arctic Island

THE SOVIET ice-breaker Sadko recently sailed from Archangel on a 6,000-mile journey into the melancholy wastes of the Arctic, to determine the existence of Gillis or Giles Land, a phantom "lost" island of the North, which has been reported seen by only a half-dozen persons since its alleged discovery by Capt. Cornelis Gillis in 1707.

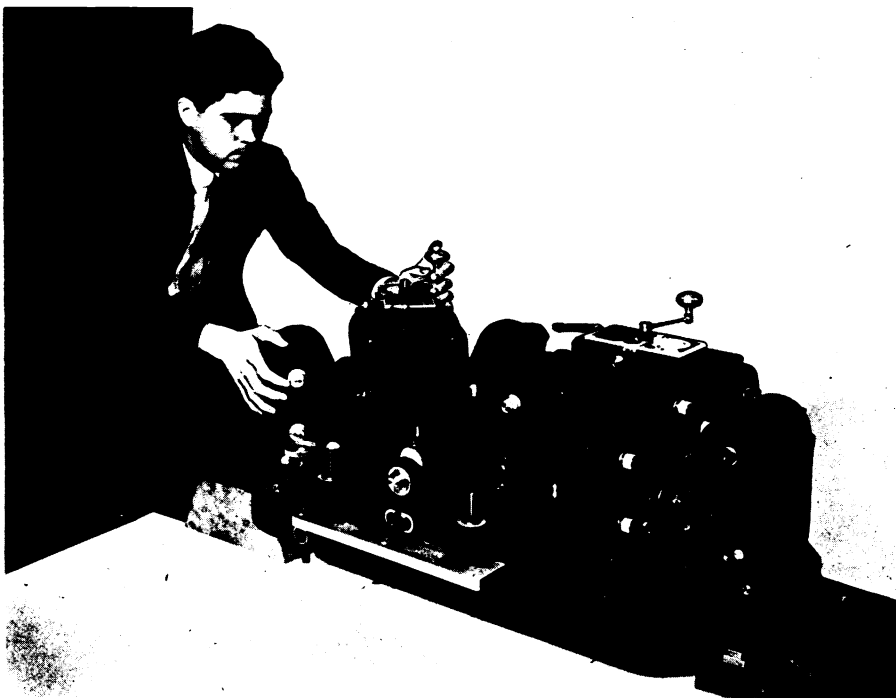
The expedition will also make a hydrological study of the lower depths of the polar basin, down to 3.1 miles, and explore the course of the Gulfstream as it finally "dies" in the frigid waters of the Arctic.

Leaving Archangel, the expedition will touch at North Cape, the southern part of Spitzbergen, go into Greenland Sea and then round Spitzbergen and Franz Joseph Land from the north, finally reaching the barren Siberian coast at Novaya Zembla, where the coal supply will be renewed. Turning north, the Sadko will again pass Franz Joseph Land, cruising about in little known waters, and finally go into the Lepatev Sea, the Vilkitsky Strait, and the Kara Sea.

Mindful of previous disasters, provisions and clothing enough to last for two and a half years are being taken, although the expedition plans to stay but four months. Headed by the explorer G. A. U. Ushakov, the 72 members of the party count among their number many leading Soviet geologists, hydro-chemists and physicists.

Equipment aboard the Sadko includes two airplanes, five research laboratories, and four dog teams, besides the over-supply of food and clothing.

Gillis Land or Giles Land was first reported by Captain Cornelis Gillis in 1707. It was reported seen from the eastern part of Northeast Land in 1864, after being forgotten for nearly a century and a half. In 1896 Arnold Pike claimed to have landed on the island on a hunting



LARGEST AERIAL CAMERA

The world's largest aerial camera, capable of photographing an area of 760 square miles at one shot, is finished, with all its 10 lenses ready for the mid-July survey of central New Mexico by Soil Conservation Service workers. It is built by the Fairchild Aerial Surveys and Aerial Camera Companies, and weighs 275 pounds plus an extra 70 pounds for films.

expedition. The only accurate description on record is that of Dr. A. G. Nathorst, Swedish explorer, who is alleged to have visited the island in 1898. He described it as a "glittering white mass

from its peaks down to the sea." The peaks are supposedly 600 to 700 feet in height, and the entire land a sheet of snow and ice.

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MEDICINE

Change Of Cracker Size Affects Diabetic Patients

AN UNLOOKED for effect of industrial standardization appears in the recent announcement from the Johns Hopkins Hospital in Baltimore that the change in size of a popular soda cracker is going to make trouble—temporarily at least—for patients suffering from diabetes.

From automobiles to crackers, industrial efficiency depends on having machines which reproduce the product quickly, cheaply and with as much uniformity as possible.

Crackers may not have to meet the "interchangeable parts" requirements of the automobile industry, but they have considerable standardization of size and weight. And in this characteristic lies the approaching trouble for diabetics.

The soda cracker whose size has now been changed had been adopted by the Johns Hopkins and other diabetic clinics as a unit of carbohydrate (starch food) against which the insulin needs of diabetic patients are balanced, explains Dr. Eugene J. Leopold, physician in charge of the Hopkins' diabetic clinic. The pa-

tient who takes a certain number of insulin units daily is told to eat a certain number of these crackers. The crackers were considered better for this purpose than bread because of their uniform size. Slices of bread and even the composition of the loaf vary considerably so that the physician could not be sure how much carbohydrate his patient would get from two slices of bread but he could be certain of the amount in two of these crackers.

Now the crackers are made in a much smaller size. As a result, the diabetic who eats the former prescribed number is not getting the required amount of carbohydrate for the amount of insulin he is taking and may consequently suffer from insulin shock—the result of too much insulin for his requirements.

Dr. Leopold hopes that patients and their physicians all over the country have noticed the change in size of the cracker and are making an appropriate change in the number included in the day's diet. Three of the old style large crackers correspond to about four of the new smaller ones.

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ASTRONOMY

Stars And Nebulae Only Minute Part Of Universe

THE distant nebulae are closer together than the ones in our part of the universe, according to the latest measures of Dr. Edwin Hubble of the Carnegie Institution's Mt. Wilson Observatory, who uses the world's largest telescope for his observations.

However, Dr. Hubble is not ready to accept the most obvious interpretation of his results. The measurements involve nebulae so far away that it takes several hundred million years for their light to reach us, and various things have to be taken into consideration.

Dr. Hubble took the temperatures of the nebulae to be 6,000 degrees Centigrade (10,800 degrees Fahrenheit) and assumed that the farther a nebula is from us the redder its light appears. This so-called red shift has been observed for the nearer nebulae but the more distant ones are so faint that they cannot be examined even with the 100-inch telescope he used.

According to recent theories, the universe is best regarded as a uniform space constantly expanding, and Dr. Hubble's results raise a difficulty with the concept of uniform space. This difficulty has been

examined theoretically by Profs. R. C. Tolman and P. S. Epstein of the California Institute of Technology. Working independently, they showed that even a homogeneous expanding universe could behave in accordance with the measurements of Dr. Hubble.

This is possible only if the matter in the universe is many times more dense than has been regarded as possible in the past. On the average there would have to be one atom in every quart of space. This would mean that 99.9 per cent. of the matter in the universe is nonluminous and that the stars and nebulae we can see are only a minute fraction of the whole.

Astronomers raise the question as to how it is possible to hide such vast quantities of matter in space from all of their observations.

When the 200-inch telescope is finished, the question will most likely be decided. Until then there are too many uncertainties involved to take any single theory too seriously. If the theory of Prof. Tolman is correct, it would mean that we can see one-quarter of all the nebulae in space with the 100-inch telescope, and probably the 200-inch telescope will see as far as there is space.

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PHYSICS

Century of Weather in Few Months, Record for Testing

MORE than a century of the ravages of time and weather have been simulated in the thousand cycles of freezing and thawing of concrete specimens recently completed in the research laboratory of the Portland Cement Association.

The reaction to severe winters is one of the measures of the durability of a structural material exposed to the weather. In the laboratory tests specimens of concrete of various shapes and sizes go from tropical warmth to the middle of a hard winter and back again in 24 hours.

The specimens to be tested are immersed in water containers and placed in a freezing room where it is always 20 degrees below zero. Then they get a thawing in a tank where the water is kept at 80 degrees.

After twenty or thirty cycles, the specimens are dried and weighed to determine whether there has been any deterioration or spalling of the surface. The original weight of each specimen is carefully recorded, and periodical weights are determined as long as the tests continue, which is sometimes for years.

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