MISSISSIPPI FLOODS A LAWN

Here is the turbulent Father of Waters at flood stage, in miniature, from below Greenville, Miss., to the mouth of Old river. This reproduction of the Mississippi in reduced size at the U. S. Waterways Experiment Station, Vicksburg, Miss., has been called the largest river model ever built. It is used under the direction of Lieut. Herbert D. Vogel, of the Corps of Engineers of the U. S. Army to study the effect of structures designed to improve the river channel. The model is approximately 400 feet wide at the lower end and 120 feet wide at the upper end in the foreground. Twenty-four hundred feet of horizontal distance have been reduced to one foot and 120 feet of vertical distance to one foot. Notice the men in the background.

tion of one or the other. None of the recent work here or abroad shows a considerable effect of this character. Dr. Millikan has a great deal of data on this point. There are small and irregular variations but not of the sort which would result if the sun were the origin of the rays. Since they are, moreover, not produced on the earth they must come from the space outside.

The situation is in a very desirable state, Dr. Millikan pointed out. The leading experimenters everywhere are practically in complete accord as to the direct facts of observation. There are differences of opinion with regard to the interpretations to be applied to these facts. But in this matter of interpretation all physicists can join in the discussion. It will not be long before a generally acceptable conclusion will be reached as to the fundamental nature of the cosmic rays. The result will have consequences of most intense significance to theoretical physicists as well as to our notions of the structure of the universe.

Science News Letter, December 17, 1932

GEOGRAPHY

Heat Wave Aids Small Boat to Sail "Impossible" Arctic Seas

THE "IMPOSSIBLE" feat of sailing around Franz Josef Land, in the North Polar regions, has been achieved by Russian explorers. They were aided by a heat wave from Florida which started in the Gulf Stream four years ago and moving slowly northward warmed the Polar Sea this year.

Experienced navigators have thought it impossible to sail a ship safely through the fickle seas north of Franz Josef Land, which lies far up toward the Pole. The leader of the Russian expedition, Prof. N. N. Subov, believed this uncharted polar region should be visited, and oceanographic data gathered.

The voyage was made in a small motor sailing craft of only 100 tons displacement and 125 horsepower.

"It was not luck but careful planning that made our success possible," said Prof. Subov, telling of the difficulties and how they were met.

So closely was the trip planned, that the little boat was loaded with only 30 days' fuel and 40 days' provisions, and no winter equipment. Prof. Subov had prepared maps, and had surveyed the temperature conditions of the region for past years. He predicted that the seas northeast of Franz Josef Land and towards Novaya Zemlya would be found free of ice, owing to the fact that a large volume of warm water from the Gulf Stream has been moving for four years slowly northward, and has had a marked effect on icebergs and sea temperatures along its route.

So strong was Prof. Subov's confidence that he could travel around Franz Josef Land on the crest of this warm wave this year, that he refused to turn back when confronted by a great ice-pack blockade east of Graham Bell Island. Warmer water must be present farther to the northeast, he was convinced. And moving in that direction, 25 miles, a passage to the south was found. The boat had a narrow escape on one occasion, being caught in an ice pack which nearly closed upon it.

September 20, thirty-four days after the little boat sailed from its starting point, Murmansk, it was back there again. Its fuel supply was down to a mere two-hour reserve. The food stores had been eked out by two white bears, shot toward the latter part of the voyage.

One discovery announced by Prof. Subov is that the islands which Nansen named Eva and Liv after his wife and his daughter are in reality a single piece of land. The two ends are joined by a low stretch of land, the Russian explorers found.

"We charted it," said Prof. Subov, "and changed the name to Evaliv."

Describing the scientific observations made, Prof. Subov said:

"During our expedition we made 400 wire soundings at five-mile intervals. We made 38 full oceanographic stations at which temperature, salinity, oxygen, hydrogen ion concentration, phosphates, and nitrates were determined. We also investigated the distribution of plankton and benthos—forms of animal life at the sea bottom—and made the usual meteorological observations."

One practical application of the Arctic oceanographic studies is in the fishing industry of northern countries, which is directly affected by temperatures and other conditions of the Polar seas.

The most important results of the expedition, however, in Prof. Subov's opinion, is that it proved his ideas of forecasting Polar climatic conditions to be workable. The expedition also showed, he pointed out, that small boats can be very useful for oceanographic work in the high latitudes if climatic conditions are known beforehand.

Science News Letter, December 17, 1932

PHYSICS

Conservation of Energy Law Declared Unnecessary

THE LAW of conservation of energy which has been the cornerstone of physical theories for several generations may have to be discarded when dealing with certain atomic transformations. The conservation of energy is now doubted because identical radioactive atoms give off electrons of different energy and apparently continue to be identical so far as their energy is concerned.

Dr. Niels Bohr, the (*Turn Page*)