PHYSICS

Studying Cosmic Rays From Laboratory Three Miles High

Scientists From Seven Institutions Can Live Near Their Instruments at New Hostel at Top of Mountain

SCIENTISTS from seven institutions will gather this summer on top of Mt. Evans, near Denver, 14,259 feet above sea level, to study the mysterious cosmic rays from space. Scene of their convocation will be the Cosmic Ray Laboratory of the University of Denver, Massachusetts Institute of Technology and the University of Chicago, now in its fourth season.

Already at work, or soon to arrive, are parties from Washington University, St. Louis; Kenyon College, Ohio; the University of Chicago; the Bartol Research Foundation of the Franklin Institute, Philadelphia; Cornell University, Colorado State College and New York University. Each group is bringing a special type of equipment.

That of Kenyon College, a portable laboratory in a bus, using cloud chamber equipment to trace the course of the rays through air filled with water vapor, is already at the top of the peak. It is directed by Dr. Wilson Powell, working under a Guggenheim fellowship.

Dr. E. J. Shremp and M. L. Yeater, of Washington University, St. Louis, also are operating their device there. It is a "Ferris wheel" six feet in diameter, with 72 Geiger counters mounted on the rim. It is turned slowly, and as it turns it records the arrival of cosmic rays from 18 directions at once. An automatic camera photographs the counting panel at regular intervals.

It was built last fall, operated in St. Louis. Now it is at the University of Denver, 5,200 feet above sea-level, and next season will be taken to the top of Mt. Evans, if there is a sufficient electrical supply there—it draws a heavy current.

Dr. Joy C. Stearns, head of the physics department of Denver University, says it is planned to have a Diesel engine at the Mt. Evans laboratory next season. Cornell has indicated it will share expenses of the laboratory with the other institutions, he said. Its interest is due to Dr. Bruno Rossi of Cornell, who has been conducting experiments on Mt. Evans for two seasons, and is returning this summer. His problem this season is to determine the "life period" of mesotrons. He is also making observations from Denver and from Echo Lake, 10,800 feet high.

Dr. Arthur H. Compton, Nobel prize winner of the University of Chicago, one of the founders of the laboratory, will come in August from the Andes, where he and a party are now conducting cosmic-ray research.

Scientists can live right by their instruments this summer, in the new turtlebacked hostel being completed on top of the mountain, about 100 yards from the laboratory. In previous years they had to drive back and forth 11 miles from Echo Lake Lodge, 5,000 feet below. The road is also being oiled clear to the top—highest oiled road in the United States.

Science News Letter, August 2, 1941

OCEANOGRAPHY

Miniature Ocean Used In Research on Shore Erosion

TWO miniature oceans built in University of California laboratories are beginning to tell researchers not only what the wild waves are saying, but what they are doing.

There has been much unverified conjecture on the effect of waves and ocean floor topography on shorelines and harbors. Some of these theories are being scientifically settled by Prof. Morrough P. O'Brien, chairman of the department of mechanical engineering, and his associates.

Two water tanks have been constructed, one a long, narrow channel 60 feet in length and only one foot wide; the other 58 feet long and 38 feet wide. The floor of the larger tank is formed into mountains and valleys, resembling the bottom of the ocean. A mechanical wave machine moves plank-like steel plates back and forth through the water producing six-inch-high breakers that crash on an imitation beach of real sand.

One of the first results of experiments with the small ocean was a definite decision between two theories of wave motion. One group of scientists maintained that while waves advanced toward shore the water moves in elliptical orbits. This is called the trochoidal theory. Others have subscribed to the irrotational theory which proposed that the wave motion produced a slow motion of the water in the direction of wave travel. The pigmy waves in the laboratory "sea" proved the irrotational theory correct.

Frank Milner, graduate engineering student, made another discovery by studies of the model ocean. Many harbors have submarine valleys just offshore, and Mr. Milner found that these valleys influence the action of waves against the shore. A small valley, duplicating one at Moss Landing in Monterey Bay, Calif., was built into the floor of the tank. Breakers set in motion by the mechanical wave machine were weakened in force and height by sides of the valley which sloped up to the shoreline, so that waves finally broke on shore with much less force.

A rip tide, the engineers noted, formed in the center of this valley. By placing a dye solution in this current, they could follow the direction of the rip tide and found that it ran oceanward instead of toward shore.

The object of these laboratory ocean studies is to set up duplicate coastline conditions and to analyze the movement and force of waves and currents, and the modifying effect of undersea floor formations. A better understanding of these conditions will make it possible to plan better protective means for beaches and to build more effective breakwaters for harbors. These studies should be of practical aid in the designing of large ships, also; particularly large naval vessels.

Science News Letter, August 2, 1941

Fossilized pollen will be studied by University of Oklahoma archaeologists in hope of dating more definitely burial grounds and other traces of an Indian civilization believed to have flourished in the State about 450 A.D.