RECENT DEATHS

DR. OLIN H. LANDRETH, professor of engineering at Union College from 1894 to 1919, when he was appointed professor emeritus, died on November 5, aged seventy-nine years. Previous to 1894 he had been professor of engineering and dean of the engineering department at Vanderbilt University.

DR. EDWARD H. JENKINS, director emeritus of the Connecticut Agricultural Experiment Station, died at his home in New Haven on November 7 at the age of eighty-one years.

MR. LEWIS TAYLOR ROBINSON, engineer in charge of the general engineering laboratory of the General Electric Company, died suddenly from a heart attack at his home in Schenectady on November 3. He was sixty-three years old.

THE death is reported from Dresden, at the age of sixty-six years, of Professor Dr. Ing. Fritz Foerster, who had been connected with the Dresden Technical Institute for the past thirty-one years.

THE *British Medical Journal* reports the deaths of the following medical men: Dr. Louis Goudard, a former president of the Medical Society of Paris; Dr. Ducamp, professor of clinical medicine at Montpellier; Dr. A. Besson, of Paris, author of a work on microbiological and serotherapeutic technique, and Dr. Piana, for twenty-five years director of the Radiological Institute of Genoa.

SCIENTIFIC EVENTS

THE BERMUDA FRESH-WATER SYSTEM

THE first fresh-water system in the history of Bermuda, regarded for centuries as impossible of achievement, will be opened for public use on November 30, according to Professor W. D. Turner, of the department of chemical engineering at Columbia University, who planned and directed the construction. He states that drain water caught on the house tops and frequently polluted to a high degree, has served the residents of the island for generations. New York's water supply would be condemned if it contained as much as one *Bacillus coli* per cubic centimeter, while water is considered good in Bermuda if it contains not more than 100.

Professor Turner writes:

> In Bermuda most of the rock is of porous coral, filled with small cavities and fissures. After a survey of the island we selected a small hill near Hamilton, capital of the colony, believing that the fresh water filtering through the rock crevices might be collected. A trench about 250 feet long and four feet deep was dug at the base of the hill. The bottom of the excavation was approximately a foot above sea-level and sloped gradually to a pump pit.
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> A pipe line was laid in the trench with open joints so that water might find its way into the pipe and thence to the basin or pit. By concreting the basin, which, of course, was dug below sea-level, we prevented sea-water from seeping in. This was one of the points which was overlooked in previous attempts to tap a fresh-water supply.
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> From the collecting basin the water will be pumped into a new reservoir which is practically completed at Pymwood, near Hamilton. From that point the supply will be piped to the capital city and perhaps to St. George's, the old capital, twelve miles from Hamilton.

After the trench was covered over and the basin complete, Professor Turner tested his "horizontal well." For three months a two-inch stream was pumped out of the pipe line day and night. The water was allowed to gush over a nearby golf course. New Yorkers use three times as much water as the residents of Bermuda. Hotels are the largest consumers on the island because of their American guests. The capacity of the island system is 300,000 gallons. In the United States this supply would meet the demands of a community of 3,000 persons. The population of Hamilton is 6,000, but because of the conservative use of water in Bermuda the new system will more than meet the demand. Since they have been using rain water for 300 years, the people are used to very soft water. In order to meet this requirement, the new system will include a water-softening plant, which will also remove the soil bacteria. The hardness is due to carbonate and hence can be removed by lime. The average rainfall is 60 inches annually, approximately the same as that of New York and New Jersey. It is estimated that the trench will collect about 50 per cent. of the water-fall. The well may be extended to increase the supply in event of additional demands.

The new water system, which will be known as the Bermuda Water Works, was financed by Mr. H. W. Watlington, philanthropist and a member of the House of Assembly. Construction work was started in the summer of 1930.

TOPOGRAPHICAL MAPS

THE U. S. Coast and Geodetic Survey, with the aid of time signals sent from the U. S. Naval Observatory, is planning to utilize the stars at several points along the Mississippi River for scientific calculations. The expert in charge of this work, Mr. Joseph P. Lushene, will use the data from his observations to adjust an arc of triangulation from Chester, Illinois, to St. Paul, Minnesota. These arcs of triangulation

are of importance to engineers and others in private industry. Engineers can get exact geographical information of a piece of ground, as to its elevation, latitude and longitude, that would cost large sums of money if this work were to be carried out by the individual.

The survey engineers have been engaged for a number of years on a "triangulation plan" of the 3,000,000-odd square miles of the United States, setting bronze markers at various points in order to fix the basis for a system of topographical maps which will be available to any engineer or scientific man.

Mr. Lushene will call to his aid another branch of science, the radio, in helping him to simplify his observations and calculations. With the aid of a radio, complicated scientific observations, ordinarily taking two or three nights, can be completed in a single night.

Longitude determinations, which are made by comparing the time from observations on the stars as they pass the meridian at the field stations with the time signals sent from the U. S. Naval Observatory in Washington, are exceedingly accurate. This comparison gives the difference in time between the seventy-fifth meridian and the field station, and the difference in longitude thus becomes known.

A single observing party is all that is now needed in the field, while before the radio came into use, it was necessary to have two observers, one at a point whose longitude had previously been determined and the other at the new station. The stations had to be placed within a reasonable distance of a telegraph line, for otherwise great expense would be involved in connecting by wire the telegraph line and the observatory.

This meant very little freedom of choice in the location of the longitude station, and the triangulation often had to be expanded in order to make connection with the astronomical station. With the radio there is no restriction as to the location of stations except that high mountain peaks are not used for longitude determinations because of the difficulty of carrying the instruments to the top. In general, stations are used to which the automobile truck that carries the astronomical instruments can be driven.

The radio is of value not only to the geodetic engineer in the determination of longitude, but for the same purpose to the navigator of a ship. To-day the navigator can use an ordinary pocket watch, receive his time signals by radio and be able to determine his longitude with greater accuracy than previously, when he had to depend on the constancy of the rate of the chronometer.

THE AGRICULTURAL EXPERIMENT STATIONS

FUNDS for the support of the agricultural experiment stations "are being carefully safeguarded and, to an increasing extent, restricted to intensive and productive research," according to the annual report of the Office of Experiment Stations, made public on November 6 by the U. S. Department of Agriculture. The report states that 1,000, or more than 15 per cent., of the 7,000 or more distinct lines of agricultural investigations in which the stations are now engaged are carried on in cooperation with the department, thus extending the scope and increasing the efficiency and usefulness of the work.

The report shows that federal, state and other funds, amounting to about $18,000,000, of which $4,340,000 was available from federal sources, were expended by the experiment stations in the year ended June 30, 1931, in a wide range of agricultural research.

Stations in Alaska, Hawaii, Porto Rico, Guam and the Virgin Islands report progress in efforts to diversify the agriculture of these regions and to make it more profitable and self-sustaining. The appropriations for these stations for the year were: Alaska, $85,300; Hawaii, $45,200; Porto Rico, $59,200; Guam, $30,200, and the Virgin Islands, $30,300. The Virgin Islands station received in addition $16,700 from other sources for use in expanding its work to meet emergency conditions on the islands.

An important event of the year affecting the Alaska experiment stations was the transfer of the station which has been in operation at Fairbanks since 1907 to the Alaska College of Agriculture and School of Mines, thus giving the local institution greater participation in the experimental work.

Coordination of the work of the former federal experiment station in Hawaii with that of the University of Hawaii is reported to be proving satisfactory and to be resulting in a widening of the field of activity and an increase of interest in the work.

The report points out that Congress recently extended to Porto Rico in a modified form the Hatch, Adams and Purnell Acts. The acts provide that the work of the existing experiment stations and the activities of the U. S. Department of Agriculture in the island shall be coordinated by the Secretary of Agriculture and conducted jointly and in collaboration. Preliminary steps were taken to bring about this coordination.

The Guam station reports continued success in efforts to bring about diversification of the agriculture of the islands and to develop extension work. Following the establishment of a civilian government in the Virgin Islands, and in view of the serious economic and food conditions in the islands, the experiment station suspended some of its usual activities and devoted its energies to encouraging the people to plant and cultivate gardens as a relief measure.