But this thickness is that of a sheet having the same gradient as the Greenland sheet, or 1:459; and the front of the Greenland sheet is stationary. For maximum vigor of both Greenland and Labrador sheets, the supposition may be made that the mean thickness was 50 per cent. greater than that which corresponds to a gradient of 1:459. On this assumption the Labrador sheet at its maximum would have had a mean thickness of $2.35 \times 1.5 = 3.52$ km. If now, for the maximum vigor of the Labrador sheet, x be the thickness of ice at the center of dispersion and .3 km be taken as the thickness at the front, out in the Atlantic, then the mean thickness is $\frac{x+.3}{2}$. Thus, $\frac{x+.3}{2} = 3.52$, whence $x = 6.74$ km. For this load the isostatic depression was $\frac{6.74 \times .917}{3.3} = 1.87$ km; and the altitude of the ice surface at the center of dispersion was $6.74 + .5 - 2.04 = 5.2$ km. The gradient of the Labrador sheet at this maximum stage depends on how far the front had advanced beyond the line of the present shore.

If the mean thickness of the Labrador sheet at its maximum be assumed to have been 3.52 km, we may, to extend the discussion, adopt this figure for the mean thickness of all continental ice sheets at the height of pleistocene glaciation. Coleman[6] gives the area covered by continental ice in Pleistocene time as 12,000,000 square miles or 31,000,000 square kilometers. The volume of this ice is $31,000,000 \times 3.52 = 109,120,000$ cubic kilometers. To supply this ice a layer of water $\frac{109.12 \times .917}{368} = .27$ km thick was removed from the ocean, the extent of the ocean being 368,000,000 sq. km and the expansion of water on freezing $\frac{1}{12}$. The removal of this load of water would have necessitated the addition in depth of a layer of heavy rock, of specific gravity, say 3.3, for isostatic compensation. This layer of rock added to the oceanic column would have had a thickness of $\frac{.27}{3.3} = .08$ km, and would have raised the sea bottom that much. The net fall of sea level, relatively to the center of the earth, or to the pre-glacial sea level, was $.27 - .08 = .19$ km. The layer of rock added to the oceanic column had the same mass and the same volume as that forced out of the continental columns to compensate the load of ice.

Of the total area (31,000,000 sq. km) covered by ice sheets in the Pleistocene one half has been completely deglaciated, and the ice still remaining on the other half, comprising Antarctica and Greenland, has been reduced in thickness. The reduction may be again taken, for the purposes of this discussion, at about one third of the maximum. That is, the mean thickness of existing ice sheets, covering an area of 15,500,000 sq. km, is supposed to be 2.35 km instead of the 3.52 km at maximum glaciation. The total volume of ice thus restored to the ocean since the maximum Pleistocene glaciation is about 72,740,000 cu. km. As water spread over the ocean it is a layer $\frac{72.74 \times .917}{368} = .18$ km thick; and if no other movement occurred the sea level would be raised that much. But this load of .18 km of water has been, or is in process of being, compensated by the removal from the oceanic column in depth of a layer of heavy rock. The thickness of this layer, at the assumed density of 3.3, is $\frac{.18}{3.3} = .05$ km; and the sea bottom would subside that much. Thus the net rise of sea level due to the waning and partial melting of the Pleistocene ice sheets, up to the present, is $.18 - .05 = .13$ km. For the total rise of sea level in this time we must of course add the effect due to the delivery to the ocean of the products of ordinary stream erosion.

[6] *Op. cit.*, p. 9.

OBITUARY

LEE CLEVELAND CORBETT

THE death of Dr. Lee Cleveland Corbett, which occurred on July 13, 1940, at his home in Takoma Park, D. C., came as a surprise to most of his friends. Though it was known following his return on the first of April from Florida that he was not well, few realized that his condition was critical.

The principal steps of Dr. Corbett's professional career after graduating from Cornell University, College of Agriculture, in 1890, constitute a continuous progression. From 1891–3 he was assistant horticulturist at the Cornell University Experiment Station under Dr. L. H. Bailey. In 1893 he went to South Dakota in the pioneer period of agricultural education there, as professor of horticulture and forestry in the State Agricultural College and Experiment Station, where he remained two years, going in 1895 to the University of West Virginia as horticulturist, where he continued until April, 1901, when he was appointed as horticulturist in the U. S. Department of Agriculture.

By a then recent Act of Congress, the tract of land across the Potomac River from Washington to become known later as Arlington Farm, had been turned over to the Department of Agriculture. Dr. Corbett's chief assignment, and his principal activity for several years, was the development of this land for experimental

purposes and the construction of the necessary buildings.

It was on July 1, 1901, that the Bureau of Plant Industry came into official being and under it there were combined into a single major administrative organization the several independent plant divisions, the heads of which had previously reported directly to the secretary. Shortly after Dr. Corbett came to the department, the Office of Horticulture was organized under his direction as one of the coordinate units in the Bureau of Plant Industry and in which the vegetable work of the Department was placed. Later, investigations in floriculture and landscape gardening were added. As the pioneer work at Arlington Farm was gradually accomplished, thus requiring less of Dr. Corbett's attention, the vegetable and floricultural work was given an increasingly large proportion of his time. In 1913, he was appointed assistant chief of the Bureau of Plant Industry. At the same time the Office of Horticulture and the Office of Pomology were combined into a single administrative unit in charge of the late A. V. Stubenrauch. When the latter, in July, 1914, resigned to return as professor of pomology to the University of California with which he had previously been connected, Dr. Corbett rather gladly transferred back to division work, succeeding Mr. Stubenrauch as the administrative head of the Office of Horticulture and Pomology.

In the fall of 1920, he made a trip to England and the Continent, particularly France and Holland, visiting the nursery growing centers of these countries in the interests of the root-stock investigations which were being inaugurated here.

Dr. Corbett served as head of the Office of Horticulture and Pomology until November, 1928, when he welcomed a transfer from administrative work to a field of research in which he had long been greatly interested, namely, a study of the causes leading to the development of horticultural industries in particular areas and their subsequent history, including both advancement and decline in different instances. This involved the appraisal of many factors as the suitability of the varieties grown, time of ripening, competing crops, regional costs of production, distribution facilities and other factors which might influence trends in the industries under investigation. The most of his time until his retirement, January 31, 1938, was devoted to this line of research, but during the last year of his service, he made a three months' plant exploration trip to South America on a special assignment in the Bureau of Plant Industry.

In the earlier years of his professional work he was a prolific writer, being the author of a considerable number of bulletins from the South Dakota and West Virginia Experiment Stations, and of a much larger number relating principally to vegetable growing and ornamental horticulture after he came to the Department of Agriculture. He also contributed to several yearbooks of the department and to numerous publications outside the department; he was the author of two books—"Garden Farming," a rather comprehensive work on vegetable culture, and "Intensive Farming."

Dr. Corbett was born at Watkins, N. Y., on October 21, 1867. In addition to the degree of B.S. conferred on graduation from Cornell University, he received the degree of M.S. in 1896 from the same institution, and the honorary degree of doctor of agriculture in 1921 from the University of Maryland. He held membership in numerous scientific and other organizations, including the American Association for the Advancement of Science of which he was a fellow, Vegetable Growers' Association of America, American Society for Horticultural Science of which he was president in 1914, National Potato Association of America, National Geographic Society, Washington Academy of Sciences, Botanical Society of Washington, Cosmos Club, and others.

Surviving Dr. Corbett are his widow, Mrs. Louise Phillips Corbett, and five children by his deceased wife, Mrs. Evelyn Northrup Corbett—Ruth, Frances (Mrs. Colston E. Warne, Amherst, Mass.); Dr. Roger B., director, Extension Service, University of Connecticut, Storrs; Laurence W., with Northrup, King and Co., seedsmen, Minneapolis, Minn.; Lee Thurston, lawyer, Rochester, N. Y., and a number of grandchildren.

H. P. GOULD

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RECENT DEATHS

THE body of Dr. John Eliot Wolff, professor emeritus of geology at Harvard University, was found after a twenty-seven-hour search on August 12 in the Mojave Desert, where he had gone on a one-day camping trip. He was eighty-two years old.

DR. FREDERICK EHRENFELD, head of the department of geology and mineralogy at the University of Pennsylvania, a member of the faculty for forty-three years, died on August 16. He was sixty-eight years old.

DR. MILICENT WASHBURN SHINN, specialist in child psychology, editor of the *Overland Monthly* from 1883 to 1894, died on August 14 at the age of eighty-two years.

FRANKLIN HENRY HOOPER, editor-in-chief of the Encyclopaedia Britannica from 1932 until 1938, who was associated with the publication for thirty-nine years, died on August 14 from injuries received when struck by a truck. He was seventy-eight years old.