

Eugene Warming was born on November 3, 1841, at Manö, near the Schleswig-Holstein frontier in Jutland, and passed his earlier life in Denmark. As with so many other northern botanists, inspiration came during a sojourn in tropical lands. Three years at Lagoa Santa, Brazil, gave many opportunities for observations on plant distribution, and one of his earlier papers (1869) was a semi-popular account of excursions over the rolling "campos" into the mountains of Brazil. "Lagoa Santa" (1892) is a classic monograph on biological plant geography, and his account of the mangrove swamps was one of the early descriptions of this type of vegetation.

Quite in another direction was the moulding influence of Warming's voyage to Greenland in 1884. His results were published in that year, and in 1887 he laid the foundation of a geographical botany of the Arctic by grouping and describing the types of vegetation. Many of the more recent papers in the "Meddelelser" (Communications on Greenland) are the work of Warming or his pupils, and include monographs on the structure, pollination, and hibernation of Arctic Heaths (1908), Saxifragæ (1909), Primulaceæ (1916), and Caryophyllaceæ (1920). He also directed the publishing, in English, of "The Botany of the Færöes," a monograph of more than a thousand pages. The contributions of C. H. Ostenfeld on the land vegetation, and of F. Børgesen on the marine algæ, are the more illustrative of Warming's methods.

Much of Warming's work is comprehensive and geographical, but it is not superficial. One of his earlier contributions—"On the Structure, Hibernation, and Renewal of Shoots" (1884 and 1891)—is pioneer work. The underground structure of herbaceous perennials would appear to have received little attention until systematised by Warming. Yet the mode of over-wintering is fundamental in the existence of a plant, besides being an important factor in distribution and survival. The groups of life-forms of plants, formulated then, have been adjusted in the later editions of his text-book. In another direction his activity included taxonomy, and his "Systematic Botany" (English edition, 1895) is still a text-book. One of his earlier papers (1892) dealt with the primordia of stamens and ovules, and his maturer views, "Sur la valeur systématique de l'ovule," came in 1913. The need for research on vegetative organs appealed most to him. His "Psammophile Vegetation" (1891) and "Halophytstudier" (1897) are classics on coastal vegetation. The work of his later years was a series of monographs—"Dansk Plantevækst"—descriptive accounts of Danish plants and plant communities, including "Strand vegetation" (1906), "Klitterne" or dunes (1909), and "Skovene" completed in 1919. This last is a book of 635 pages, a unique account of plant life in forests and woodlands.

It is well for botany that all this detailed work has become the foundation of a more generalised text-book. In 1895 there was issued in Copenhagen a modest work, "Plantefund," Warming's lectures to his students. In 1896 it appeared in German as the "Lehrbuch der ökologischen Pflanzengeographie: eine Einführung in die Kenntnis der Pflanzenvereine." An edition, fully revised by Warming, is the English text-book, "Oecology of Plants" (1909). The latest,

a book of 760 pages, with 64 pages of bibliography, appeared in Berlin in 1918. The key-note of the work is the grouping of plants into life-forms or growth-forms, determined partly by hereditary factors, partly by what Warming calls epharmony with the habitat and environment. The groups hydrophytes, mesophytes, xerophytes, and others are too familiar to need explanation. To attain a true perspective amongst the world's plant communities, Warming's outlook is absolutely necessary. If one adds the cartographical methods of Flahault of Montpellier, of Clements in America, and of the more recent Swedish school, then the whole field of plant ecology is covered.

The drift of European botany in the latter part of the nineteenth century was not too favourable to works dealing with vegetation and environment. Why this apathetic condition existed need not concern us here, but it is the case that the efforts of pioneers like Warming appealed strongly to the younger botanists with out-of-doors instincts. This has been the case in Britain, where a smaller group, the British Vegetation Committee, became in 1913 the British Ecological Society with its *Journal of Ecology*. So also in America, Warming's influence contributed to the rise of strong schools of ecology, a society, and a periodical. Contemporary schools have grown up at Montpellier and at Zurich.

Many honours were conferred on Eugene Warming. As one of the five trustees of the Carlsberg Foundation for more than twenty-five years, he exerted a great influence on Danish science through grants in aid of research and publication. He retired from his professorship in 1911 when seventy years old, after serving for just over twenty-six years (November 1885-December 1911), being followed by another great botanist, C. Raunkiaer, who was succeeded last year by C. H. Ostenfeld. In 1908 he was a delegate at the Darwin-Wallace jubilee celebration of the Linnean Society of London, of which he was elected a foreign member in 1888.

It was our good fortune to spend a fortnight in 1913 in Denmark under Warming's leadership. His enthusiasm for his native flora and vegetation was that of youth, his kindness excelled even the well-known hospitality of the Danes as a nation, and he conveyed it all with fluency in any one of four languages. Others who knew Eugene Warming personally will agree that he was a true source of inspiration, and they can understand the secret of the power of his pen.

WILLIAM G. SMITH.

MR. R. STRACHAN.

At the ripe age of ninety, Richard Strachan passed away on Easter day, April 20. He was educated at the Nautical School, Royal Hospital, Greenwich, and afterwards entered the Board of Trade. In 1855, when the Meteorological Department of the Board of Trade was initiated under the superintendence of Admiral FitzRoy, he was given charge of the Instruments Division for supplying vessels in the Navy and mercantile marine for purposes of observation in the different oceans.

Mr. Strachan contributed many useful memoirs on the meteorology of the Arctic and Antarctic, compiled

from the records of the various expeditions that were sent to those regions. He also contributed numerous and varied articles on meteorological instruments to the *Horological Journal*, while many of the leading opticians were helped in their constructive work by his keen knowledge of instruments and their requirements. He joined the Royal Meteorological Society in 1865, being a fellow for practically sixty years. He served on the Council of the Society and contributed many discussions to the Society's Proceedings and Quarterly Journal.

Mr. Strachan edited a monthly *Meteorological Magazine* in 1864, but it was only current for four months, April-July; it was the precursor of *Symons' Monthly Meteorological Magazine*, which commenced in 1866 and is now continued by the Air Ministry. In 1868 he issued a pamphlet on principles of weather forecasts and storm prevision, and in 1910, ten years after retirement, a treatise on the basis of evaporation, dealing with the temperature of the sea around the British Islands.

The writer was a colleague with Mr. Strachan under the directorship of Admiral FitzRoy, and for many years later, and can testify to the ungrudging assistance given to aid in the solution of meteorological problems.

C. H.

PROF. CHARLES GODFREY, M.V.O.

As was announced in NATURE of April 12, Prof. Charles Godfrey died on April 4 at the early age of fifty years. All who are interested in the education of boys and girls realise something of his influence on the modern teaching of mathematics, even if their knowledge of him extends only to the admirable text-books of which he was one of the authors. But they do not all know that he did much more than write able books to meet an existing demand; that has been done before; it was largely his preliminary work in the cause of better teaching that created the demand for new text-books.

The revolution in school mathematics which has been in progress during the past twenty years needed a man not only with vision and driving force, but also able to bridge the gap between the actual teachers in schools and the mathematical experts who impose on them the general lines of their teaching and test its results.

Prof. Godfrey was such a man, and he devoted himself to the work. He could meet the experts on their own ground, and could speak with authority on the needs and difficulties of the dull and average learner as well as those of the brilliant exception in whom the expert takes most interest. He possessed a rare combination, the enthusiasm of a reformer with a critic's detachment of mind, partly natural, no doubt, but partly acquired during a school life spent under the influence of Rawdon Levett, an eminent example of both qualities.

So equipped, Godfrey was a most valuable member of those countless committees where revolutions are planned and directed until they have gathered strength to spread of themselves. Perhaps his greatest asset for this work was his readiness to efface himself if he could thereby induce his distinguished colleagues to think that they were the initiators of his proposals. Thus the results of the experiments he carried out, first at Winchester and then at Osborne, were made available for the benefit of all schools in the British Empire and even beyond it. Only those who are able to contrast the present with former systems can fully realise the debt which mathematical education owes to Prof. Godfrey.

C. E. ASHFORD.

WE regret to announce the following deaths:

M. C. A. Angot, lately Director of the Central Meteorological Bureau, Paris, and a member of the International Meteorological Committee, on March 16, aged seventy-five.

Prof. F. H. Bigelow, formerly professor of meteorology in the United States Weather Bureau and director of the Solar and Magnetic Observatory at Pilar, Argentina, aged seventy-three.

Sir A. J. Leppoc Cappel, K.C.I.E., Director-General of Indian Telegraphs from 1883 until 1889, on April 20, aged eighty-seven.

Major F. W. Cragg, of the Indian Medical Service, and assistant director of the Central Research Institute at Kasauli, on April 23.

Dr. G. Stanley Hall, emeritus president and formerly professor of psychology of Clark University, Worcester, Massachusetts, and editor of the *American Journal of Psychology*, on April 24, aged seventy-eight.

Prof. T. C. Mendenhall, emeritus professor of physics in the Ohio State University, president of the American Association for the Advancement of Science in 1889, aged eighty-two.

Current Topics and Events.

At the meeting of the Berlin Mikrobiological Society in the Hygienic Institute of the Veterinary School, Berlin, on April 7, the important announcement was made by Profs. Frosch and Dahmen that they had succeeded in isolating, cultivating, and photographing the long sought-for virus of foot-and-mouth disease. From the short account in the *Berliner tierärztliche Wochenschrift* (1924, xl. p. 185), just published, their success was primarily due to the fact that, regarding the fluid in the disease blisters as a reaction on the part of the infected animal, they separated the fluid from the virus which it contained by some means which they do not yet publish. In some way, also, Dahmen succeeded in getting the virus to grow on

solid media and was able to propagate it in sub-culture through as many as twenty-five generations. With the 13th and 23rd generations of culture, they successfully produced the disease in guinea-pigs. With the sixth sub-culture of another strain a cow was inoculated on the muzzle and after eight days showed salivation. From this animal another cow was inoculated and developed typical foot-and-mouth disease. Frosch, continuing the account of Dahmen, describes the colonies of the virus as extraordinarily minute with a diameter not greater than that of a human red blood corpuscle (*i.e.* 7-8 μ). Naturally they can only be seen with the microscope, when they appear as rounded or oval masses with a slightly