## Obituary.

### PROF. MILTON WHITNEY.

BY the death on Nov. 11, at the age of sixty-seven years, of Milton Whitney, soil science loses one of its most striking and original personalities. His work extended over nearly forty years, and throughout the whole period he was noted for the freshness of his outlook and the novelty of his deas. He first came into prominence in 1892, when, as professor of geology and soil physics at the Maryland Agricultural College and physicist to the Experiment Station, he published an interesting paper, "Some Physical Properties of Soils in Relation to Moisture and Crop Distribution," in which he examined a number of soils of known productiveness and showed that their agricultural properties are closely related to the texture of the soil as revealed by mechanical analysis. The physical properties of the soil, especially the texture, regulate its temperature, moisture content, and air supply, or, as he called it, with the love of analogy which characterised all his writings, the 'climate' of the soil, and he argued that the significance of these physical properties in determining the distribution and yield of crops must therefore be of the same order as that of climate in the ordinary sense of the word. In short, these physical factors are the predominant factors in soil fertility. He thus broke completely away from the idea currently accepted at that time that fertility is mainly a matter of chemical composition of the soil. The American workers were prepared for this insistence on the physical properties, as W. H. King had already at Madison been carrying on important physical studies, and there were no active soil investigators in Great Britain to controvert the position even if they had wished to do so.

This and other papers marked out Whitney as a man of ideas, and when the United States Department of Agriculture set up its Soil Bureau in 1894, Whitney was put in charge. Among his early studies here was one on the tobacco soils of the United States, showing the close connexion between the quality of the crop and the texture of the soil. High quality or 'wrapper' tobacco was produced on soil containing much sand and little clay, while low quality or 'filler' tobacco was grown on heavier soils containing more clay and silt. Other crops showed similar relationships with soil composition, and Whitney regarded his thesis as so well established that, in the great soil survey of the United States then being organised, he used mechanical analysis as the basis of classification. The scheme has, in point of fact, been altered, but it served a very useful purpose.

Before long it appeared that mechanical analysis alone would not suffice to explain all the phenomena of fertility. For example, in the survey of Florida, two widely different soils, the good 'pinelands' and the barren 'hammock soils,' had the same mechanical analysis, yet obviously could not be classed together. Whitney tried electrical methods of soil moisture determination in the soil *in situ*, but without much result: he was led, however, to recognise the importance of the soil solution in the nutrition of the plant and, in conjunction with Cameron, brought out a paper in 1903 on the chemistry of the soil in relation to crop production, in which the principles of physical chemistry were for the first time applied to the soil.

The subject was so novel that most investigators were not prepared for it, and some of the deductions were so startling that they gave rise to a vigorous controversy—the first there had been in soil science for many years. The centre of it was Whitney and Cameron's statement that the soil solution, which is the proper food of plants, is of the same order of composition and concentration in all soils, and therefore all soils, fertile and infertile, are equally well supplied with plant food: fertilisers do not feed the plant, but act in some other way. The controlling factor in soil fertility was in some cases physical, but in some at least it was the presence of toxic substances in the soil. This led to the study of the organic substances in the soil by Schreiner and Shorey, and the isolation of dihydroxystearic acid and other poisonous substances from certain infertile soils.

The controversy is now over, and it is known that the soil solution does vary in composition and in concentration in different soils and in different seasons in the same soil. But the great value of Whitney's work remains unchallenged: he widened the range of the subject and enriched it with ideas and analogies which, if not themselves entirely sound, nevertheless make the investigator stop and think.

E. J. RUSSELL.

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### MR. W. C. F. NEWTON.

THE death of Mr. W. C. F. Newton, on Dec. 22, at the age of thirty-two years, takes away a young worker of rare quality in a field that has been but sparsely cultivated in Great Britain—cytology and its bearing upon genetics. Newton was a student at the Birkbeck College, but his course was interrupted by war service (he received the Mons medal) and he did not take his degree until 1921. With a scholarship from the Department of Scientific and Industrial Research, he continued to work at the Birkbeck under Dame Helen Gwynne-Vaughan, and began to investigate the chromosomes of Galtonia, a paper on which appeared in the *Annals of Botany* for 1924.

In 1922, Bateson, who had long been on the look-out for a cytologist, invited Newton to join the staff of the John Innes Horticultural Institution, and there he continued to work. Much time was not given to him, for he had to undergo a severe operation in the summer of 1926, and was in hospital while he corrected the proofs of his paper (*Jour. Linn. Soc.*, 1927) on the chromosomes of Tulipa and allied genera. This paper contains some incidental mention of the improvements in technique he had introduced, methods of fixing and staining which are now in general use, though, as