the addition of predetermined amounts of ammonia salts (such as ammonium sulphate) to straw. The commercial value of this development may be considerable. With the advent of the motor the supply of town dung has fallen off. Many market-gardeners are, consequently, in straits, for the so-called artificial manures are lacking in organic matter (humus), without which many garden and glasshouse crops cannot be grown satisfactorily. It may be that the ordinary farmer, too, will find a use for the artificial product. It is difficult under modern conditions to maintain sufficient animals to make all the straw produced into dung. Again, where animal excrements exist in abundance (as in milk production), lack of knowledge of the principles of the interaction between

urine and straw leads to much waste of valuable fertilising material.

Another direction in which these discoveries may have a practical outcome is in removing the soluble compounds of nitrogen present in sewage. Under the existing sludge processes very little of this soluble matter is recovered. It has been shown that if liquid sewage is used to ferment straw, the effluent is practically free from nitrogen; it has all been retained by the straw.

Enough has, perhaps, been said to indicate the great practical importance of the discovery made by the Rothamsted workers. The scientific advance is not less notable, and marks another stage in the capture by the biologists of the agricultural field of research.

West Indian Zoology.¹

By PROF. J. STANLEY GARDINER, F.R.S.

IN 1895 the State University of Iowa, acting through Prof. C. C. Nutting, who was already well known as a member of several marine expeditions, organised a zoological exploration of the Bahamas. Its object was twofold: to give their people experience of marine life in tropical seas, and to secure material for morphological and systematic research and for ordinary laboratory purposes. So satisfactory were the results that Prof. Nutting's staff themselves suggested a further expedition, this time to the Lesser Antilles. Preparations were commenced in 1916, so little was the entry of the United States into the war anticipated. Prof. Nutting himself went down to prospect in 1917, and finally the expedition sailed in April, 1918, the party consisting of nineteen persons, including six ladies.

Barbados was first visited, the party camping for six weeks in the quarantine station on Pelican Island, which was placed at its disposal by the Barbados Government. Groups were formed for shore collecting, row-boat work, launch dredging to 200 fathoms, land work, and laboratory observations.

Barbados Island itself is the most eastern of the Antilles, and, although now consisting largely of elevated coral and limestone rocks, contains the remains of land connecting it in early Tertiary times to South America. It was then sunk to great depths and overlaid by beds of ooze, "Barbados earth," noted for their richness in radiolaria and foraminifera. The uplift raised the sea bottom high enough for corals to thrive, and subsequent elevations are responsible for the terraced effects so apparent in the topography of the present land. The island is about 21 by 14 miles, and has now a population of nearly 200,000. All is cultivated, and land collecting was hence little likely to yield results of much value. The expedition, indeed, mainly concentrated on marine work, and the more striking animals of different

groups are described; the whole forms a guide which will be of value to future workers. The general variety of life is interesting, but the uniformity of all tropical marine life in the coral-reef regions of the world is still more striking; indeed, Prof. Nutting's descriptions would apply almost equally well to faunas from similar grounds off Ceylon, Seychelles, or Fiji.

The second camping place was in the British dockyard in English Harbour, Antigua. Here, on account of the heavy swell, work had to be concentrated in the harbour and in the neighbouring Falmouth and Willoughby Bays. There were compensations in a neighbouring mangrove swamp with its peculiar fauna, in fairly smooth bottom, and in the land being little altered and still largely wild, covered with close tropical jungle. There are volcanic rocks of some age on this side, limestone rocks occurring principally in the north of the island, off which are the chief living coral reefs. The marine crustacean, holothurian, and worm faunas proved particularly interesting, and there are many observations on the modes of life of different forms. Clearly, while the whole surroundings were not so exciting to the party as those of the coral reefs of Barbados, the expedition must have obtained a large number of animals of great interest. Geographically, the mollusca in the clearly capable hands of Mr. Henderson, and the fossil geology in those of Prof. Thomas, may be expected to yield valuable information.

The immediate scientific results of this expedition are not likely to be great, but the whole idea underlying it, and its scope, are of great interest, for it might well be copied by British universities. Here was a party of nineteen charming people, half of whom were interested professionally, while the rest were students. They went off for a term, and came back to their university with a glimpse of what tropical life really is, an abiding picture which will make those who teach interesting to their students, for they will be describing what they have seen, living forms in their natural environments.

¹ University of Iowa Studies in Natural History. Vol. viii., No. 3. "Barbados-Antigua Expedition." By C. C. Nutting. Pp. 274. (Iowa City: University of Iowa, n.d.)

Thomas Wharton Jones, F.R.S.

SIR RICKMAN GODLEE'S memoir of Wharton Jones, reprinted from the *British Journal of Ophthalmology*, March and April, 1921 (London: Geo. Pulman and Sons, Ltd.), is a most admirable short study. It gives us in close compass not only the man's work, but also the man, from 1808 to 1891—a long life in the service of physiology and ophthalmology. Wharton Jones's

work on the capillary circulation and on the processes of inflammation is memorable, and was recognised and honoured by all men of science: but the advance of the medical sciences carried the younger men far ahead of him. From Edinburgh, where Wharton Jones was one of Knox's assistants, and suffered a share of the public hatred which flared up over the Burke and Hare murders, he came to London in 1838