other Anthozoa—which requires explanation, not expansion by night. Nevertheless Abe has broken new ground in this work which will contribute to the eventual solution of this problem.

In a series of papers on the physiology of reef corals Kawaguti confirms the observations of Yonge, Yonge and Nicholls[6] on the oxygen consumption of corals in relation to its production by the zooxanthellæ, and adds important data on the effect of light on pigmentation and growth. Upward growth of corals is all-important in the formation of reefs, and Kawaguti states that all reef-builders containing zooxanthellæ which he examined showed positive phototropism. The presence of glycogen, small amounts of a reducing sugar and copper in Fungia has been determined by Hosoi. Hayasi has entered the controversy concerning the mode of formation of the skeleton and decided that the calicoblasts are the ectodermal cells themselves, not specialized cells derived from these, which secrete the calcareous lamella, including the organic matrix, as an extracellular product. Other papers deal with animals associated with corals, and include observations by Hiro on the gall-crabs, Hapalocarcinus and Cryptochirus, and on cirripedes which grow on corals. A long paper by Matsuya is concerned with the hydrography and plankton of the waters of Iwayama Bay.

Enough has been said to reveal the range and interest of the work being carried out at the Palao Tropical Biological Station. The work of Prof. S. Hatai has long been known in connexion with his direction of the Asamushi Marine Biological Station and the numerous papers published by him and by his pupils in the Science Reports of the Tôhoku Imperial University. He is sincerely to be congratulated on the work of this new tropical marine station which he instituted and the activities of which he has since directed with such conspicuous success.

[1] "Zool. Mededeelingen", Leyden, **22** (1939).
[2] Sci. Rpt. G. Barrier Reef Exped., **3**, No. 8.
[3] Sci. Rpt. G. Barrier Reef Exped., **1**, Nos. 2 and 3.
[4] Sci. Rpt. G. Barrier Reef Exped., **1**, No. 5.
[5] *Pap. Tortugas Lab.*, **29**, 187 (1935).
[6] Sci. Rpt. G. Barrier Reef Exped., **1**, No. 8.

OBITUARIES

Prof. Ernest A. Gardner

THOUGH unable latterly to take active part in the studies to which he had contributed much, Prof. Ernest Gardner, who died on November 27, aged seventy-seven years, will be remembered in the University of London as the creator of a vigorous department of classical archæology, and as a stimulating teacher, as well as for his administrative services as Dean of the Faculty of Arts (1905–9 and 1913–15), and as Vice-chancellor in 1923–26. After a distinguished Cambridge career, he went out to Greece in 1886 with a fellowship of Gonville and Caius College, and a Craven Fellowship, as the first student of the newly founded British School of Archæology at Athens, of which he became director in the following year. He had already done a season's excavation at Naucratis with Flinders Petrie and Griffith, and took a leading part, with Montague James, Hogarth, and the present Rector of Lincoln College, in work at Paphos for the Cyprus Exploration Fund. Under his management, the British School soon took recognized place among other foreign institutes in Athens, and began to form the long series of explorers, excavators, and teachers at home, which has continued until the present time.

In 1896 the Yates professorship of archæology at University College, London, fell vacant, and gave Gardner a congenial opportunity. Here too he had to begin with the foundations, and secure for his subject a place in the curriculum. His best-known book, a "Handbook of Greek Sculpture", was published in the same year, and at once became the recognized English text-book: later it was supplemented by a more detailed study of "Six Greek Sculptors". In 1897 appeared his "Catalogue of Vases in the Fitzwilliam Museum", and in 1905 he supplemented the "Introduction to Greek Epigraphy" of E. S. Roberts, the Master of his own college, with a volume on the inscriptions of Attica. Of more general (and in the best sense popular) quality was his description of "Ancient Athens" (1902), published at a moment of pause after rapid and varied discoveries, when it was possible for one who knew the ground as Gardner did to present the results as a comprehensible whole, in the lucid style and with the fine scholarship which marked all his writing.

In the War of 1914–18, though over military age, Gardner put his intimate knowledge of Greece and the Greek people at the disposal of the Admiralty, and as a lieutenant-commander in the Royal Naval Volunteer Reserve, did valuable service at Salonica; in leisure moments bringing together at the White Tower the numerous antiquities found in the British trenches and within the lines. Of these the most conspicuous was a huge Roman milestone, whose inscription beginning *Kaisari Germanico* caused some mirth among the rank and file.

Returning to London, Gardner found many distractions in university affairs, but continued to publish useful books on ancient life and art in Greece, and to take an active part in the proceedings of the Hellenic Society, of the *Journal* of which he had been editor from 1897, while from 1929 until 1932 he was its president. A characteristic and memorable con-

tribution to classical studies was his series of cruises for students of all ages, undertaken when such facilities were rare and not easy to arrange; they brought him into personal contact with a wide variety of acquaintances, and opened what was then a new aspect of classical study.

J. L. MYRES.

Prof. V. R. Williams

WE learn with deep regret of the death of Prof. Vasili Robertovich Williams, professor of soil studies in the Timiriazev Academy of Agriculture, and well known to soil investigators for his important contributions to agricultural science.

Williams was born in Moscow in 1863, the son of an American constructional engineer who had settled in Russia in 1854 and married a Russian lady. He studied at the old Petrovsky Academy of Agriculture and Forestry, to which after a period of postgraduate work in Paris with Pasteur, he returned as lecturer. In 1894 the Institute was replaced by the Agricultural Institute of Moscow and he was appointed assistant professor of soils and agriculture. In 1906 he became director of the Institute, and after the Revolution, when it was reorganized as the Timiriazeff Academy of Great Socialist Agriculture, he was again made director though afterwards a political head was chosen in accordance with the policy then prevailing.

From the outset, Williams's soil work centred around the organic constituents: he never lost his interest in these. Only last August he showed me a colourless crystalline organic substance which he had extracted from the soil and to which he attached great importance. Like other Russian soil workers after the Revolution, he did a good deal of soil surveying and he acquired an extensive knowledge of soil utilization and crop production in Russia. On the applied side his most important activity was his keen advocacy of grass leys in the rotation. Russian agriculture was, until recently, mainly based on variants of the old three field system, fallow, winter corn, spring corn. Williams knew how greatly the agriculture of Western Europe had improved when a clover or grass and clover crop was inserted between the corn crops, and he strenuously urged that this should be done in Russia. The coming of collectivization gave an opportunity for a change of system, and the need for increasing the animal population after the devastating losses of livestock at first incurred furnished the justification for strenuous efforts to ensure ample production of fodder crops. So Williams used all his great influence in the U.S.S.R. to extend the culture of grasses and clovers and showed that, not only would more cattle food be produced, but also the soil fertility would be increased and the danger of erosion lessened.

In his later years, Williams devoted much time to the building up of his soil museum, and on each of my recent visits to the Institute he personally demonstrated its chief features: it included a large number of typical profiles with specimens or illustrations of the flora native to each type, and charts showing the most suitable kind of agriculture.

His soil work is described in his book, "Soil Science", first published in 1914 and revised in 1920.

Williams was afflicted with a paralysis which impeded his activities but never damped his enthusiasm. Like others of the older school of Russian scientific workers, he had a good knowledge of a Western language so that conversation and discussion were always easy. In his case the language was English, learned from his father and never forgotten. His work was much appreciated in Russia and he was given the highest awards open to Soviet citizens: the Order of Lenin, a seat in the Supreme Soviet, and membership of the Academy of Sciences; more important still, the deep respect, softened by affection, of many past students now engaged in agricultural organization in Russia. One of the pavilions of the great agricultural exhibition at Moscow is adorned with a very large mural painting showing him at work in his department.

E. JOHN RUSSELL.

Mr. G. Eumorfopoulos

WE regret to record the death at the age of seventy-six of Mr. George Eumorfopoulos, which took place on December 19. Eumorfopoulos had long been known as a great collector and skilled connoisseur of objects of Oriental art and more especially of the art of the Chinese.

George Eumorfopoulos was born in Liverpool in 1863. Until 1934 he was a member of the well-known firm of Ralli Bros. His career as a collector began with English and Continental porcelain, but he soon turned to Oriental art, and was one of the first collectors to give special attention to pieces of the earlier Chinese dynasties—Chou, Han, T'ang and Sung. In this field his collection for the beauty, rarity, and historic and archæological value of the specimens it contained, ranked among the greatest in the world. It was thrown open with the greatest liberality to students, fellow-collectors and connoisseurs from any and every part of the world without distinction beyond interest in that field, which Eumorfopoulos by the judicious use of his wealth in the service of his knowledge and his artistic judgment had made peculiarly his own.

Above everything Eumorfopoulos was anxious that so far as was possible others less fortunate than himself should share in the advantages for study that he enjoyed. A type collection of Chinese porcelain was formed by him and presented to the Museum at Athens, and his gifts to other museums were both numerous and valuable; but his greatest sacrifice was unquestionably the sale of his collection as a whole, which through his generosity in accepting a price far below its pecuniary value, became the property of the British nation in 1935. Now, though divided, it forms by far the most important part of the material available for the study and appreciation of the art of the Far East in the national collections.

Eumorfopoulos was also a generous supporter of all forms of archæological investigation, but more especially if it showed likelihood of advancing knowledge of the history of art. As Sir Leonard Woolley