

action and by the permanent occupation of temporary observatories. The present poverty of the country is such that no well-found expedition is likely to be launched in the near future, but the time will come when further information will be urgently required, and this will be the time for insisting on the im-

portance of such conditions as will obtain the fullest scientific value for money expended. It is hoped that the Scott Polar Research Institute, the formal inauguration of which has recently taken place at Cambridge, will have some influence in determining questions of this nature. C. S. W.

### Obituary.

PROF. F. W. GAMBLE, F.R.S.

A DISTINGUISHED English zoologist, a remarkably fine teacher and a man of a singular charm of character, has been lost to science by the death, on September 14, of Prof. Frederick William Gamble, Mason professor of zoology and comparative anatomy in the University of Birmingham. He was born in Manchester on July 13, 1869, and was educated at the Manchester Grammar School and at the Owens College. At the College he came under the influence of the late Prof. A. Milnes Marshall, and catching his enthusiasm for the study of animal morphology, devoted himself to zoological studies. After taking his degree with first-class honours in the newly established Victoria University and gaining the Bishop Berkeley research fellowship, he went abroad and studied for a time in the University of Leipzig. The first two papers from his pen, one on our rare British Nudibranchs, published in 1892, and the other on the British marine Turbellaria, published in 1893, were descriptive and systematic in character, but already they showed evidence of the tendency of his mind towards the experimental side of the subject.

After a short period as a junior demonstrator, Gamble was made lecturer and senior demonstrator in zoology in the University of Manchester, and in 1896 he completed his account of the flatworms and Mesozoa for the "Cambridge Natural History," a most interesting and valuable contribution to that excellent text-book. It was about this time that the lug-worm (*Arenicola*) was introduced as a type in the schedule for the first M.B. examination of the Victoria University; and finding from laboratory experience that the current accounts of the structure of this worm were inadequate and in many respects inaccurate, Gamble and his colleague J. H. Ashworth prepared and published in the *Quarterly Journal of Microscopical Science* a very careful and elaborate description of its anatomy. This study led to the important discoveries by Ashworth, at a later date, of the structure and function of the giant nerve cells and nerve fibres of the Polychæta.

While the work on *Arenicola* was still in progress, Gamble's interest was attracted to the colour changes in the 'Phantom' shrimp *Hippolyte varians*, and, working now in partnership with a colleague in the botanical department, Mr. (now Sir Frederick) Keeble, a series of experiments were made at the fisheries' station at Piel which led to very interesting and remarkable results. The discovery of a blue nocturnal phase in all the colour varieties of this shrimp was in itself a novel and startling fact, but when the researches were extended to the higher forms of Crustacea, many other very important systematic and physiological results were obtained. In 1903 another paper by the same authors, working on the coast of France, appeared in the *Quarterly Journal of Microscopical Science*, on

the bionomics and physiology of the remarkable turbellarian worm *Convoluta roscoffensis*, in which it was proved that the green corpuscles of the *Convoluta* represent a phase in the life-history of a flagellate organism allied to the genus *Carteria*, and that this organism infects the eggs after they are laid. It is not an exaggeration to say that this study in symbiosis has become one of the important classics of the subject. It is frequently referred to by later writers as the chief authoritative statement on the physiological relationship of host and guest.

It is not possible in this place to refer in detail to other scientific work Gamble did when this partnership was dissolved. It was characterised by the same love of the experimental method, accurate observation, and cautious deduction that was shown in his earlier writings.

With all his love for scientific research Gamble combined all the great qualities of a conscientious and explicit teacher. He spared no pains to make his lectures and demonstrations effective, with the result that he earned the respect and gratitude of a large number of his pupils and colleagues. In the two admirable little books which he published, "Animal Life" and "The Animal World," he has left some indication of the way in which he presented the problems of biology to an unscientific audience; and his account of the Radiolaria in Lankester's "Treatise on Zoology" shows his power of mastering the literature of a large subject and presenting the substance of it in an intelligible way to the more advanced student.

By the death of Gamble many of us have lost a most sincere and devoted friend. His quiet, modest manner, his constant readiness to help his colleagues and his pupils, and his unblemished character, endeared him to a wide circle of friends and acquaintances. He was elected a fellow of the Royal Society in 1907 and appointed professor of zoology in the University of Birmingham in 1909. He was president of Section D of the British Association at the Toronto meeting in 1924, where he delivered a very interesting address dealing principally with the question of the metabolic gradients.

Gamble married, in 1904, Ellen, daughter of the late Rev. J. M. Bamford, of Arnside, who survives him. He left no children.

WE regret to announce the following deaths:

Prof. Rudolf Eucken, from 1874 until 1920 professor of philosophy in the University of Jena, and author of many works on philosophy, on September 14, at eighty years of age.

Dr. Paul Kammerer, of the Biologische Versuchsanstalt, Vienna, known for his experimental work on the inheritance of acquired characters in amphibia, on September 23, aged forty-five years.