



SIR JAMES GRAY, 1891–1975

*James Gray*

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## OBITUARY

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By the death on 14 December of Professor Sir James Gray, K.T., C.B.E., M.C., Croix de Guerre, M.A., Sc.D., LL.D., F.R.S., at the age of 84, both zoology and marine biology have lost one of their great figures. His connexion with the Marine Biological Association of the United Kingdom stretches from his first visit as a research worker to the Plymouth Laboratory in 1912, when he became a member of the Association, through his long service on the Council (first in 1920 and then continuously from 1928 to 1969), to his Presidency (1945–55) and his election as Vice-President in 1955 and Honorary Member in 1965. He was also a member of the Scottish M.B.A. since 1921 and served on its Council for six years (1960–66) and was elected a Vice-President in 1965.

James Gray, of Scottish stock, bearing the same name as his father, was born on 14 October 1891. I have it on the authority of his lifelong friend, Professor Vivian Galbraith, F.B.A., that from early childhood – they went as little boys together to the same Dame's school – he had an overwhelming curiosity about the natural world: he was a born biologist. From the Merchant Taylors' School where he was a brilliant pupil, he won a scholarship to King's College, Cambridge and in 1914, soon after graduating, he was elected to a Fellowship. So began his long and most distinguished University career in Zoology which was only interrupted, and almost immediately, by his service in the First World War; throughout it he held a commission in the Queen's Royal West Surrey Regiment and was not only awarded the Military Cross but was decorated personally with the Croix de Guerre (*avec palmes*) by Marshal Foch himself at the Front. Returning to his Fellowship at King's and to the Zoology Department he was elected almost at once to the Balfour Studentship (1919–23) after which he became Lecturer in Zoology and then Reader in Experimental Zoology. His outstanding researches on cell division, growth and ciliary mechanism won him his Fellowship of the Royal Society in 1929. In 1937 he succeeded Professor Stanley Gardiner in the Chair of Zoology. After leaving school he became a King's man for life. To the end of his days he occupied that fine college house, King's Field, with its beautiful garden which he so much loved, almost just across the Backs from King's; here he and Lady Gray had lived with their family, Tony and Sally, and entertained their friends and distinguished visitors to Cambridge for so many many years.

Others, elsewhere, have dealt, and will deal, more fully with his important contributions to zoology and to University life; here, while not forgetting these contributions, I feel it will be fitting for me to dwell more particularly on his place in the history of marine biology. Although so much of the work of the staffs of our various marine stations today is concerned with the study of different aspects of the plant and animal life, as well as the physics and chemistry, of their surrounding waters, it must not be forgotten that these laboratories largely came into existence, as did Anton Dohrn's pioneer institution, the *Stazione Zoologica* at Naples, to offer, as they still do, opportunities for visiting scientists to work on the anatomy, development or physiology of this or that particular

organism, or to use marine material for the study of fundamental biological problems. The marine laboratories continue to have these two main functions and James Gray has done so much, in different ways, to stimulate both activities. Let us look in turn at his influence on each of these sides.

We have seen that he first came to work at Plymouth in 1912, that was for 5 weeks when he had only just graduated; he came again for 6 weeks in 1913 and for 2 months in the summer of 1914. It was my good fortune in the summer of 1920 to be invited to join Julian (later Sir Julian) and Juliette Huxley – Julian had been my tutor at Oxford – to share a furnished house with them and James Gray at Cawsand while Julian, James and I were all working at the Plymouth Laboratory. Julian was concerned at that time with the growth and regeneration of the limbs of crabs, James was beginning his work on cell division and I was studying the anatomy and development of *Priapulid* which I had brought in quantity with a great deal of its native mud from the Essex coast. It was an unforgettable experience. Every morning after an early breakfast we walked up through the Mount Edgecombe estate and down to the ferry at Cremyll to cross over to Devonport and so by tram along Union Street into Plymouth; then in the evening we returned by a steamer – a paddle-steamer if I remember aright – which left a pier close below the laboratory at 6 o'clock for Cawsand. In the course of our talks together we discussed all the zoological problems of the day. Those were times of excitement in our subject: the beginnings of the powerful influence of the introduction of the experimental method into zoology. We discussed also evolution theory and the impact of the rapid development of the Morgan chromosome school of genetics – the ideas of axial gradients and physiological dominance put forward by Child of Chicago and so many other topics of the day. This experience I am recalling is, of course, typical of the important service our marine laboratories have played, and are playing, in the development of biological science; on this side they are an invaluable supplement to our universities in bringing together research workers from many different seats of learning to exchange ideas. James Gray for much of his career worked in vacations at marine laboratories, either at Plymouth or latterly at the Millport Marine Station on the Isle of Cumbrae in the Firth of Clyde where the material he required was particularly abundant; his presence always enriched the life of the community he visited.

Now let me turn to his influence on the development of marine biology in general and the research programmes conducted by the various laboratories. The supply of funds from H.M. Treasury sources for the support of the 'independent laboratories', as they were called to distinguish them from the Government Fishery Institutions, was made on the recommendation of the Development Commission until 1965 when the responsibility for such financing was transferred to the Natural Environment Research Council. It was soon after the First World War that the Development Commission set up an Advisory Committee on Fishery Research; it consisted essentially of independent academic authorities on different aspects of marine research called together to advise on the best way that money could be spent on scientific work having a bearing on the development of British fisheries. From the very beginning it took the enlightened view that whilst the Government laboratories were more concerned with *ad hoc* problems of fisheries biology, it was for the independent ones to make contributions to the funda-

mental knowledge of the basic biological and physical background upon which the fisheries must ultimately depend. James Gray joined this committee in 1932 and became its Chairman in 1949 until its dissolution in 1965; it was in this capacity that his influence was so important.

He took an immense interest in, and devoted much time to, the proposed programmes of investigation of all the independent laboratories as well as those of the Government Fisheries Departments which also came before the Committee for review. The care with which he, as Chairman, saw that his Committee – and I write now as a former member of it – fairly considered all the different lines of work seeking support from the limited funds available, has been, I am sure, an undoubted factor in the development of the great variety of original marine research undertaken in this country. I know he rated his work in this field as one of his most important activities. Periodically he and a small group from his committee would make a visit to the different laboratories to examine the work going on at first hand; again one saw his interest in the different lines of research and his sympathetic discussion of the difficulties of some of the problems involved and as often as not his making constructive suggestions. As President and Chairman of our Council he was just the same in giving encouragement during the annual visit of Council to the Plymouth Laboratory and I am sure that was equally true at Millport.

He always had the welfare of the Plymouth Laboratory very much at heart. Sir Frederick Russell writes to me that ‘when he was appointed Director after the war he could not have wished for a better President. During the difficult period of rebuilding the ravages of war Gray by his wisdom, tolerance and never failing help was a firm support. He, together with E. H. E. Havelock, Secretary of the Development Commission, and E. S. Russell, Director of Fisheries Research, gave me much friendly guidance and greatly eased my burden’.

Having purposely stressed his marine biological side I must not end without giving some brief reference to his many other sides. Zoologically, in the latter half of his life, after making his name in cytological studies – his *Experimental Cytology* was a classic – he became fascinated by the problems of the mechanics of animal locomotion. With cine-photography and a variety of experimental techniques he analysed the swimming of different kinds of fish, the progression of a snake or a slow-worm, the walking and running of quadrupeds and so on, all in terms of dynamical concepts such as the thrusts of moving inclined planes and the resultant forces of systems of levers. In addition to his numerous papers and his last big book *Animal Locomotion* (1968) he gave the Royal Institution Christmas Lectures for children which resulted in his superb book of exposition: *How Animals Move* (1953).

Whilst Sir James so often discussed the mechanical view of life – and it may be remembered that he devoted his Presidential Address to Section D of the British Association in 1933 to this subject – he was *not* a reductionist. He ended that very lecture with the following words which I have quoted in the past on more than one occasion:

Experimental zoology can be divided into two types of study: (1) the investigation of the physical and chemical properties of living organisms; (2) a study of the intrinsic potentialities of living matter, revealing as it does a co-ordination of events which is without inanimate parallel. In the first type of work we must use each new weapon which the physicist can give

us. In the second type of work, however, biology must be the mistress and not the servant of physics or of chemistry – she must make her own foundations, and build on them fearlessly, prepared to change her views, if need be, but not prepared to force the wine of life into bottles which were designed for use in the simpler and less intoxicating fields of chemical science.

He was, of course, President of the whole British Association at York in 1959. He was Professor of Physiology of the Royal Institution 1942–47, a member of the Agricultural Research Council 1942–47, a Development Commissioner 1951–59 (i.e. apart from his service on its Fishery Advisory Committee), and a Trustee of the British Museum. In addition to so much public service he bore a heavy load of administration in his large new Department of Zoology in the planning and building of which he had played a major part before he actually became Professor in 1937; he built up not only a big department but one with a great reputation. The Universities of Aberdeen and Edinburgh conferred on him the Hon. LL.D. and Durham, Manchester and Wales the Hon. D.Sc. He was awarded the Royal Medal by the Royal Society in 1948.

Sir James will be remembered by so many all over the world, by old pupils, by marine biologists, by old friends, with a deep affection and admiration; and all who know Lady Gray, Norah to many of us, will be thinking of her with all kind thoughts and the same affection.

ALISTER HARDY