

the conception of applied science was understood in a comparatively narrow sense, as investigation and instruction in the craft side of industry and in the scientific subjects which seemed relevant thereto. The craft side is certainly an essential aspect of applied science, and must always be so if science is to be applied at all. It was only later and rather slowly that it was realised that this aspect merely sets the problem of applied science and that the understanding of the craft does not provide a solution of the questions which industrial processes raise. Still, even this humble beginning gave the start to what has provided a vast scientific undertaking.

The establishment of the Universities of Leeds and Sheffield, which represents the culminating point in the institutional development of applied science in Yorkshire, created new standards and a new outlook in the conception of applied science and its value for industry. Hitherto, applied science in the widest sense had been restricted to the communication of information on and the study of the technique of industrial processes carried on in the area, with some instruction of a rather elementary kind in certain of the pure sciences. The aim was to train or provide craftsmen with an intelligent appreciation of the rules and operations of their respective crafts, so that there might be in industry more competent and efficient workmen. With the advent of the universities and the spirit of detached scientific inquiry which inspires university work, applied science was able to become the critic and investigator of traditional industrial processes and methods, and to place the resources of a wider scientific outlook and

knowledge at the service of craftsmanship. This raised instruction in applied science to a higher intellectual level. It could not be merely the communication of traditional knowledge acquired by experience in industry; its aim was not simply to confirm but to transform existing practice in industry by training whole-time students in scientific principles and by promoting scientific investigation of industrial processes. This could not but be to the ultimate advantage of industry though the effects might not be seen for some time and the results might be slow in appearing.

The prosecution of applied science at this higher level had a further important consequence; it suggested and indeed created a graded system of technical training and education with craft instruction in its various forms at one end of the scale and specialised scientific investigation into industrial processes at the other. The first could be appropriately taken over by the technical colleges, the second by the universities. There is at points a certain overlap, perhaps inevitable, between the work of the technical colleges and the universities. But the main distinction is clear between the purpose of the two types of institutions occupied with applied science. The primary business of the technical college is to provide craft teaching at a lower or a higher level, with higher scientific instruction and research occupying relatively a second place in the work of the college; the main purpose of the university is to provide higher teaching in science and to carry on scientific investigations in applied science, with technical instruction occupying relatively a secondary place in its work.

Obituary

SIR BERNARD MALLET, K.C.B.

SIR BERNARD MALLET, whose death on October 28, at seventy-three years of age, we regret to record, was the son of Sir Louis Mallet, a distinguished civil servant. He first entered the Foreign Office, from which he was transferred to the Treasury. He became a commissioner of Inland Revenue in 1897 and Registrar General in 1909, from which post he retired in 1920. His chief assistant for many years was Dr. Stevenson, who did such admirable statistical work in connexion with *inter alia* the differential birth rate, labour which never received adequate reward from the Government in spite of the loyal advocacy of his chief. Sir Bernard was president of the Royal Statistical Society in 1916-18, where, as everywhere, his personal influence was most valuable. He was for long an official of the Political Economy Club, and at its dinners must have met every living economist of note. He wrote several books, including a continuing series on the British budgets.

During the last years of his life, eugenics and the cognate subject of population occupied much of Sir Bernard's time. As to the latter, he was

president of the World Population Conference held at Geneva in 1927, as a result of which was inaugurated the International Union for the Scientific Investigation of Population Problems, a now flourishing organisation in which he has continued to play an active part. He was a member of the International Federation of Eugenic Organisations, and attended meetings at Paris, Munich and in Dorsetshire. This last was somewhat of a novelty, the head-quarters being at the house of his cousin, Capt. Pitt-Rivers. A paper by him was read at the International Congress at New York this year.

Sir Bernard joined the Council of the Eugenics Society in 1918 and became its president in 1928. About that time the Society received a large bequest from an Australian pastoralist, the exaggerated hopes thus aroused in truth causing no small trouble. The Society prospered greatly under his guidance, the progress made in regard to sterilisation being especially noticeable, whilst several new schemes were set on foot, of which the most noteworthy was the attempt to give practical definition and expression to the concept of negative eugenics both in the sphere of hereditary

diseases and in that of the so-called 'Social Problem Group'.

That characteristic of Sir Bernard Mallet which will have stamped itself most strongly on the minds of all his friends is the charm of his personality. He was a gentleman in the very highest sense of the word. He was always courteous and most helpful to his colleagues. Eugenics as an applied science demands not only theoretical knowledge but also the power to judge between conflicting human motives, needs and prejudices, with the result that the task of its leaders is at times one of extreme difficulty. The Eugenics Society was fortunate in securing the services of a president with such varied experiences, all of which helped him to fill with success the place which he only consented to occupy out of a sense of duty.

PROF. K. K. GEDROIZ

SOIL investigators all over the world will learn with deep regret of the death on October 5 of Prof. K. K. Gedroiz of the Dokuchaiev Soil Institute, Leningrad, and until lately president of the International Society of Soil Science. He was born in 1872 in Bessarabia, was educated in Kief and graduated in 1897 as a forest engineer at the School of Forestry in Leningrad. He then became assistant to Kossovitch at the Agro-chemical Laboratory of the Ministry of Agriculture. In 1915 he was appointed editor of the Russian *Journal of Experimental Agriculture*, and in 1919 was made professor of soils at the School of Forestry: later on, in 1922, he became lecturer in agricultural chemistry at Nossov, and after Glinka's death in 1928 he was elected a member of the Russian Academy of Science and director of the Dokuchaiev Soil Institute, where he was specially concerned with the laboratory investigations of the soil and also with the soils of the podsol zone.

Prof. Gedroiz for many years carried out important investigations on the process of absorption by soil, attributing it, as van Bemmelen had previously done, to complex reactive substances produced by weathering. Both in their composition and their interaction with dissolved salts these substances were generally so similar in type that he felt justified in speaking of a reactive 'soil complex' modelled on the same lines as a salt, in which the cations could be replaced by other bases or by hydrogen. In the 'complex' of a normal fertile soil the predominant cation is calcium; in other soils it might be sodium, magnesium or hydrogen. In developing these ideas he was able to give a rational explanation of many of the phenomena associated with acid and alkaline soils, and to clear up many obscurities in what had previously been a very difficult subject.

Prof. Gedroiz's work was long unknown to British and American investigators owing to its publication in Russian. A summary issued in an abstract journal attracted the attention of one or two

United States soil workers and they arranged for a translation of all of his papers into English. The volume was widely circulated among other soil investigators and at once ensured the recognition of the high merits of his work.

Gedroiz did much to make Russian soil science famous throughout the civilised world. His investigations into the soil complex and the phenomena of absorption fell easily into line with the studies on soil formation and classification initiated by Dokuchaiev and continued by a group of brilliant successors, Glinka, Neustruev and other workers still surviving: it gave a new and permanent direction to soil science. Gedroiz was of a modest and retiring disposition, rarely appearing at scientific gatherings: many soil investigators who visited Russia in 1930 were disappointed that they were unable to meet him and pay their respects to him. His work had sterling qualities which will ensure its place among the classics of modern science.

E. J. RUSSELL.

DR. WILLIAM GARNETT

THE death of Dr. William Garnett on November 1, at the ripe age of eighty-one years, will cause a feeling of the very deepest regret to those of his contemporaries and coadjutors who knew and appreciated the man and his genius.

Dr. Garnett was born at Portsea on December 30, 1850, and was the son of William Garnett of that town. He received his early education at the City of London School, and continued it at the Royal School of Mines, having taken the first place among the Whitworth scholars in 1869. He afterwards proceeded to St. John's College, Cambridge, of which he was later elected a fellow, having been bracketed fifth wrangler in 1873. He was the first demonstrator of physics in the Cavendish Laboratory under James Clerk Maxwell, whose biographer he became.

Fortunately for the cause of technical education, Dr. Garnett left Cambridge and associated himself with the developments of education which were then taking place. He was exceptionally well qualified to take up the position of a leader in the movement which was then developing throughout the length and breadth of the country for the advancement of what was termed 'technical education'. He held the position of professor of mathematics, physics and mechanics at University College, Nottingham, and later became principal and professor of mathematics in the Durham College of Science, Newcastle-upon-Tyne. Here he did splendid work. Realising that it was most important to associate the educational authorities with the development of technical education, he to some extent laid on one side his teaching duties at Newcastle-upon-Tyne with the view of obtaining an association between his college and the education authorities. He likewise found time during this period to write on behalf of technical education in the *Technical World* and other journals.

It was only natural, therefore, that Dr. Garnett