

matter assumes the hierarchical forms that evolution shows us. Without it and we see in life something inchoate but, in a way, fetid and malignant: something suggested to us by the cancerous tumour or the luxuriantly living and rotting tropical jungle. Here, and in the backwaters of organic evolution—the “living fossils” that are poised between extinction and stability, or the primitive and unprogressive human societies—we see the life of the future: the inextinguishable vital impulse that waits on the ordering control that will lead to its deployment in new organic forms.

PROBLEMS OF CROP PRODUCTION.

IN his address as president of Section M (Agriculture), Sir John Russell reviews the present position of agricultural research as compared with that occupied when the British Association visited Toronto in 1884. Up to that time the man of science had been occupied with the problem of how to feed the plant. Agricultural science was regarded as simply a branch of chemistry; but, during the last forty years, many new problems involving the biological sciences had presented themselves for solution. These problems are related to the growth of the plant as affected by inherent and environmental variations. Sir John Russell points out that, whereas the great discovery during the early period was that the plant could be fed by “artificial” substances, the most pregnant discovery of the second period was that the plant is plastic; by methods which are under scientific control it can be modified in desired directions, and thus be induced to give results that mere feeding cannot accomplish. Following the

pioneer labours of Bateson, astonishing practical results have been reached by such workers as Biffen in England, Nielsen Ehle in Sweden, and the Howards in India. But the science of genetics is only on the threshold of what it may yet accomplish.

Sir John Russell then goes on to review, in detail, recent advances that have been made in the sciences with which he is particularly concerned at Rothamsted. He emphasises the pressing need for subjecting the great mass of material that has now accumulated to statistical analysis. In regard to the numerous empirical data from “field” experiments, Sir John Russell is of opinion that no advance can be expected until some fresh opening is discovered by scientific workers. With regard to the more rigid data accumulated by laboratory workers, the view is expressed that the greatest field for discovery lies in the direction of linking up plant nutrition studies with those of the soil solution, the latter being explored in the light of the physico-chemical interactions between soil and soil water. On the more general issues Sir John Russell is insistent on the need for fuller co-operation between all classes of scientific workers—for team work which shall include workers of all nations. But when all is said and done, the great expenditure of time and money now being incurred in agricultural research can only be justified by abandoning the view that the economic end alone is worthy of the effort. The address closes with an eloquent appeal for a wider vision, for an effort to upraise country life by revealing to the countryman “something of the wonder and mystery of the open spaces in which he dwells.”

Obituary.

PROF. J. WERTHEIMER.

THE death, on August 9, of Prof. Julius Wertheimer, at sixty-four years of age, deprives both science and technical education of a most active and stimulating worker. Since 1890, when he was appointed principal of the Merchant Venturers' Technical College, Bristol, he took a leading part in promoting scientific and technological instruction in the city, with the result that, when the University of Bristol was established in 1909, the faculty of engineering was instituted at the Collège, with Prof. Wertheimer as dean of the faculty and also professor of applied chemistry.

Prof. Wertheimer was educated at University College, Liverpool, and Owens College, Manchester, and was headmaster of the Leeds School of Science and Technology from 1887 to 1890. He was a fellow of the Institute of Chemistry, the Chemical Societies of London and Berlin, and the Physical Society of London. He was for ten years hon. secretary of the Association of Technical Institutions, and was the author of textbooks of practical chemistry and of scientific and educational articles in various journals, including NATURE. His long experience and wide knowledge of all matters relating to technological education at home and abroad made him a very valuable member of many committees. He served on the Council and Senate of the University of Bristol, the Teachers Registration Council, the Education Committees of the Gloucestershire County Council, the Bristol City

Council, the British Science Guild, and other bodies. In recognition of his services to science and education the degree of doctor of science, *honoris causa*, was conferred upon Prof. Wertheimer by the University of Bristol in 1911. He also received the honour of Officier d'Académie de France in 1906.

MISS KATHERINE A. BURKE.

BY the death of Miss Katherine A. Burke, University College, London, has lost an excellent teacher who was untiring in her devotion to the academic, social, and athletic life of the college. Graduating at Birkbeck College, Miss Burke began her career at University College, in 1898, as a research assistant of the late Sir William Ramsay, and she took a share in the research emanating from the chemical laboratory at about this time. Later, she was appointed to the chemical staff, and was the first woman teacher directly concerned with the teaching of the undergraduates of the college. Miss Burke's original work included research on thorianite, the oxides of chlorine, the Joule-Thomson effect, the chemical dynamics of the alkyl iodides, and the absorption spectra of alcoholic solutions of nitrates. The paper on chemical dynamics, with Prof. F. G. Donnan (*Journ. Chem. Soc.*, 1904, 555), showed that the order of reactivity of the alkyl iodides varied with the type of chemical reaction investigated, and hence it was not possible to ascribe their reactivity