

although it was in Great Britain that the industrial revolution had its first beginnings and industrial development was most rapid". In his next report he introduced the same theme, "Industries for the most part are not yet fully alive to the importance of the human factor in production and to the still greater part this is destined to play in the future". It is partly due to the early work of Sir Duncan that these words are less true now.

In his early organization each investigator was responsible for a particular industry, and the investigators concerned themselves principally with hours of labour and the general environmental conditions likely to cause undue fatigue. As time went on investigators developed individual interests and worked along more specialized lines. As an organizer, Sir Duncan interfered as little as possible with his staff, although he was always willing to help where help was needed, either in making arrangements with a particular firm, or advising on the form of a report; and no small part of the work of the Industrial Health Research Board has been made possible by his unobtrusive but valuable help. By 1930 there had been published fifty-six reports dealing with hours of labour, lighting, heating and ventilation, vocational guidance, boredom, accidents, time and motion study.

There was an entire absence of 'red tape' in his dealings with his staff, and all, however junior, could have access to him. He had a remarkable poise of personality which made him at home with people of all ages and social class. He could without conscious effort talk equally easily to a factory worker or a duchess, to an industrial magnate or a humble apprentice, and to go round a factory with him was invariably a valuable experience. He was unusually scrupulous in giving credit to researchers and in acknowledging their work. He had many interests outside his work and was an excellent amateur musician.

Sir Duncan's official retirement was in name only, for he carried on numerous activities after the outbreak of war, serving as chairman of the National Industrial Electric Lighting Service and of the Home Office Committee on Factory Lighting, a subject that had always been of great interest to him. He will, however, always be affectionately remembered by his colleagues for his humanity.

Prof. Paul Bertrand

SON of the distinguished palaeobotanist Charles Eugène Bertrand (1851-1917), Paul Bertrand, the report of whose death has recently reached Great Britain, followed up his father's work on fossil plants, and became a leader in palaeobotanical research. He was professor of palaeobotany in Lille until 1938, when he was appointed to the chair of comparative anatomy for the study of fossil plants at Paris. He died in Paris after a short illness aggravated by privation and anxiety on February 24, 1944.

Most of Bertrand's published work falls within the period 1910-39. His most important contributions to the literature of his subject fall into two groups. His work on the Carboniferous floras of the French coal-measures has proved indispensable to students of Carboniferous stratigraphy in Europe and America. His recognition and demonstration of stages or zones in the succession of vegetation in the Carboniferous which could be recognized and defined by their floristic composition will remain, just as the corre-

sponding work by Kidston in Britain, a classic example of the application of palaeobotanical research to geology. Their work has led up to more recent work by Dr. Dix in South Wales and by many workers in North America. As an accompaniment to this work he produced monographs of outstanding quality on the Pteridosperm genera *Alethopteris*, *Mariopteris* and *Neuropteris*.

The essence of all this research is contained in Bertrand's contributions to the *Comptes rendus* of the Congresses on Carboniferous Stratigraphy held in Heerlen in Holland in 1927 and 1935. On the botanical side, his work on Algae (Botryococcaceae) found as constituents of certain coals, and on the anatomy of Devonian and Carboniferous ferns, is of outstanding quality and importance. Here he ranks with Williamson, Scott, Kidston and Lang as an outstanding contributor to our knowledge of the anatomy of Devonian and Carboniferous plants.

Bertrand kept in touch with a wide circle of friends interested in palaeobotanical work, and, with Mme. Bertrand, who survives him, regularly attended international meetings. Those who were privileged to know him will remember his quiet unassuming character, and his unfailing sympathy and interest in his friends' difficulties and problems. To know the Bertrands was to know what is best and most charming in the French character. His death causes an irreparable loss to many—especially to his younger colleagues, to whom he was unfailingly helpful.

JOHN WALTON.

Dr. Max Bergmann

DR. MAX BERGMANN, the distinguished chemist, died in New York on November 7, 1944, at the age of fifty-eight. Dr. Bergmann, who was born in Fuerth, Bavaria, studied chemistry in Munich and received his Ph.D. degree in the University of Berlin in 1911. He then entered the laboratory of Emil Fischer, where he worked until the latter's death in 1919. In 1921 Bergmann became director of the Kaiser Wilhelm Institute for Leather Research in Dresden, a position which he held until 1934. Shortly after Hitler came to power, Bergmann, being a Jew, resigned his post and accepted the position of an associate member of the Rockefeller Institute for Medical Research in New York. He was appointed a member of the Institute in 1937 and occupied this position at the time of his death.

Bergmann's work up to the time when he left Germany followed fairly closely both in subject-matter and in his way of approach that of his great master, Emil Fischer. It was concerned, almost exclusively, with the organic chemistry of amino-acids and carbohydrates. Fischer had discovered a new class of sugar derivatives, the glycals, but Bergmann proved that the structure assigned to them was not correct. He showed that these compounds were not aldehydes as Fischer had assumed, and also demonstrated the presence and position of a double bond and established the size of the ring. Another field of sugar chemistry in which Bergmann made notable contributions was that of chitin and glucosamine. His isolation of the disaccharide, chitobiose, was contemporary with that of Zechmeister.

The main interest of Bergmann was, however, in amino-acids. He extended greatly our knowledge of the azlactones, the highly reactive unsaturated anhydrides formed from amino-acids; his last paper, which appeared after his death, was devoted to this