

sitization. A similar disease is known in cattle. (3) *Porphyria acuta* appears later in life. There is no bone pigmentation or photosensitivity, but much porphyrin is excreted during attacks. Other sets of symptoms may predominate and the disease is usually fatal.

Porphyrins are to be regarded as products of deranged hæmoglobin synthesis rather than as degradation products. Further knowledge of hæmoglobin synthesis will no doubt help to elucidate the problems of the abnormal production of porphyrins.

This meeting was very successful, but could have been improved by the allotment of more time for discussion of the many interesting points raised by each contributor. Sir Joseph Barcroft, in his concluding remarks, expressed the hope that the proceedings would be published *in extenso* to allow a more careful study of a valuable contribution to our knowledge of the tetrapyrrolic pigments.

## OBITUARY

Dr. W. H. Hatfield, F.R.S.

DR. WILLIAM HERBERT HATFIELD, director of the Brown-Firth Research Laboratories, Sheffield, who died on October 16 after a very short illness, had played a leading part in the development of metallurgical research in Great Britain, besides holding an important position in the steel industry. He was born in Sheffield on April 10, 1882, and worked in the laboratory of Messrs. Henry Bessemer and Co., studying at the same time at University College, Sheffield, under Prof. J. O. Arnold.

Hatfield went to the firm of J. Crowley and Co. as metallurgist, and while there published his first original research, a study with Prof. A. McWilliam of the elimination of silicon in the acid open-hearth. A second joint paper on the same subject followed in 1904. He was awarded the Mappin Medal and also a Carnegie Scholarship, which led to the publication in 1906 of a memoir on the forms of carbon in cast iron. In 1909 he developed this subject further, and showed that, contrary to the widely accepted statements of Wüst, it was not necessary that carbon should be precipitated as temper graphite before being oxidized in the production of malleable castings. The experiments, which were well designed to settle the point, were conducted in the works, the microscopical studies being made in Prof. Arnold's department, now a faculty of the University. These investigations were next expanded into a book.

In 1916 Hatfield succeeded Mr. Harry Brearley as director of the Brown-Firth Laboratories, and gathered round him a technical staff. Brearley had in 1912 invented the first 'stainless' steel, a high-chromium steel which when correctly heat-treated was highly resistant to corrosion, and found special application in cutlery. To administer the patent rights the Firth-Brearley Syndicate was formed. In the meantime, Messrs. Krupp of Essen had covered by patents a wide range of steels containing both nickel and chromium, with the primary object of using them for high temperatures, although their resistance to corrosion at atmospheric temperatures had also been noted. Hatfield made a thorough study of these steels, and selected 18 per cent chromium and 8 per cent nickel as giving the most useful results when suitably made and treated. This '18:8', to which Firths gave the name of 'Stay-

brite', became the most widely used of this series of alloys, and its success was largely due to the energetic efforts of Hatfield. He made a detailed study of the properties of the austenitic stainless steels, especially of the intercrystalline corrosion to which they were liable under certain conditions, as when welded. This difficulty was overcome partly by keeping the carbon content low and partly by adding carbide-forming elements, such as titanium. The activities of his own firm, of which he became a director, led him to give much attention to steels for guns, aircraft and marine forgings, and his later researches dealt mainly with alloy steels, especially with mechanical properties, behaviour at high temperatures, resistance to creep, and corrosion.

As a result of experiences in the War of 1914-18, certain research committees were set up by the Iron and Steel Institute, but after the first enthusiasm had passed there was a danger that their ambitious programmes might be dropped, and it was owing to Hatfield that a definite scheme was put in hand in 1924 with the object of determining the nature and causes of heterogeneity in steel ingots. This Ingots Committee, of which he was chairman, was followed by similar committees on corrosion, alloy steels, and steel castings. These and other committees and sub-committees were co-ordinated under the Iron and Steel Industrial Research Council. There is no doubt that this organization, which has been and still is responsible for co-operative research in the steel industry of Great Britain on a large scale, owes its success very largely to Hatfield, who had the art of persuading manufacturers to co-operate by pooling information, contributing money and materials, and undertaking experiments in their works, while universities and public institutions such as the National Physical Laboratory were effectively brought into the scheme.

The present War brought Hatfield new and heavy tasks. As chairman of the Technical Advisory Committee on Alloy Steels, he was instrumental in reducing to a small number the great mass of steel specifications, thus simplifying the work of the steel maker and economizing the rarer metals. In the summer of the present year he was a member of an iron and steel mission to the United States, which he had visited once before in 1928, when he gave a series of lectures afterwards published in book form. The extra strain no doubt told on him, and although his health had seemed invulnerable, the end came rapidly.

Hatfield enjoyed controversy, and in committees could be deliberately provocative, but it was possible to differ strongly from him either on scientific matters or on questions of policy without any break of personal friendship, for he was incapable of bearing malice, and differences were soon healed. Sheffield, where most of the research committees usually met, will seem a different place without him, and he will be equally missed at the meetings of many technical societies. In 1907 he married Miss Edith Marian Seagrave, and he owed much during the stress of scientific and commercial work to the companionship and support of his wife.

Dr. Hatfield was elected a fellow of the Royal Society in 1935. He received the Bessemer Medal of the Iron and Steel Institute, of which he was a devoted member, in 1933, and became a vice-president in the following year. He founded the Sheffield Metallurgical Association, of which he was the first president, and held office in many other societies.

C. H. DESCH.