

OBITUARY NOTICE.

JOHN ADDYMAN GARDNER.

1867—1946.

JOHN ADDYMAN GARDNER was born on July 3rd, 1867, and passed away on May 11th, 1946. For close on fifty years he had been associated with the University of London. From 1894 to 1942 he held the appointments of Lecturer in Chemistry to St. George's Hospital Medical School and Biochemist to the Hospital, as well as other contemporary appointments for different periods.

Gardner was educated at the Grammar School, Bradford, Magdalen College, Oxford, and Heidelberg University. In his school and college days he showed great enterprise in both his work and the social activities connected with his studies. He is remembered by Old Bradfordians as excelling on the classical side, and it was after winning an open scholarship to Magdalen that he became attracted to the study of chemistry. For some period during his undergraduate days he was President of the Oxford University Junior Scientific Club. He graduated in 1889 with First Class Honours in Chemistry in the School of Natural Science, and was awarded the Daubeny Medal.

Gardner's passion for research, which was to last unabated until his death, was developed during his undergraduate days by association with many of the eminent chemists of his day. This association was continued under Victor Meyer at Heidelberg, and secured for him a return to Oxford as Demonstrator in Chemistry. From there he published the results of researches on a variety of subjects relating to physical and organic chemistry. During this period, and for some years after his appointment to St. George's Hospital, Gardner's research work dealt largely with the chemistry of the terpenes. In collaboration with the late J. E. Marsh, Fellow of Merton, a series of communications appeared in the *Journal* (1891—97) under the title "Researches on Terpenes", relating for the most part to the camphane group. Perhaps the most important results were obtained on the oxidation products of camphene and camphoic acid and its decarboxylated derivative, camphopyric acid (carboxyapocamphoric and apocamphoric acids respectively). The authors also described a number of halogen and phosphorus derivatives of camphor, camphene, and fenchone. Gardner continued these investigations after his appointment to St. George's Hospital, but teaching and examination work now occupied the greater part of his time. He became actively engaged upon a number of examining boards, and his sympathetic and congenial personality earned for him popularity and usefulness as Inspector of Schools throughout the country. As one of his first contributions towards biochemistry he was instrumental in improving the status of organic chemistry in the Intermediate Medical Course and Examination of the University of London.

In 1905 Gardner, at the invitation of the Director, Dr. A. D. Waller, took charge of the chemistry section of the Physiological Laboratory at that time situated in the London University side of the Imperial Institute at South Kensington, an appointment that gave him wider opportunities for research. St. George's Hospital Medical School had abandoned pre-clinical teaching, and his duties there involved chiefly the superintendence of clinical analyses and investigations. Under the new surroundings at South Kensington he and Buckmaster completed an exhaustive series of investigations on chloroform anæsthesia (*Proc. Roy. Soc.*, 1906—07). At the same time he commenced those investigations on cholesterol with which his name has been so often associated. They include a series published under the title "The Origin and Destiny of Cholesterol in the Animal Organism" (*Proc. Roy. Soc.*, 1908—21), carried out in collaboration with a number of different workers. The earlier papers in this series were by Gardner and Dorée, and contained valuable results on the chemistry of the sterols. Coprosterol was isolated for the first time as a pure substance and was shown to be derived from the cholesterol of the body, apparently by intestinal reduction. It was converted into coprostanone and ψ -coprosterol, an epimer later to be of constitutional importance. A number of sterols related to cholesterol were also described and it was shown that hippocoprosterol and similar so-called sterols found in the fæces of herbivora were one and the same substance and a constituent of the grass on which the animals fed.

With other workers Gardner examined the cholesterol and ester content of the tissues of herbivora and omnivora fed on cholesterol-free and other diets, as a result of which it appeared that cholesterol was an essential substance strictly conserved by the animal. In later

communications—with Fox—some of the first evidence for the synthesis of cholesterol in the adult subject was forthcoming. In this series Gardner and Fraser described an accurate method for the gravimetric determination of cholesterol by utilising the insoluble compound formed by cholesterol with digitonin. They verified Windaus's observations on the accuracy attending the use of this compound in quantitative work. There is no doubt that some of the most accurate determinations of cholesterol and cholesteryl esters in human plasma were recorded by Gardner and Gainsborough in the Biochemical Laboratories at St. George's Hospital carried out during the years between the two wars and published in the *Biochemical Journal* and in the medical journals of that period. Sources of error and limits of accuracy were meticulously studied and recorded. Gardner's energy and enthusiasm, and his painstaking care and perseverance in all undertakings, attracted a continuous band of co-workers to his side and instilled into them a like appreciation for thorough and conscientious work.

Gardner's energy and enthusiasm were also applied to problems other than those associated with the sterols. His work on chloroform anæsthesia had involved him in a series of blood-gas estimations. Working with hermetically sealed gas pumps modified from existing types he recorded many accurate analyses. He was able, incidentally, to explain the traces of carbon monoxide wrongly claimed by French workers to be present in the blood of anæsthetised animals.

Always a keen angler, Gardner became interested in problems relating to river pollution, and, summarising his own extensive investigations, reported at length on "The Respiratory Exchange of Freshwater Fish" (*Fishery Investigations*, Vol. III, 1926). In such work the relatively large volume of water to oxygen content necessitated extreme manipulative care. It is of interest to note that with his gas pump he was able to show that trout were asphyxiated by a much smaller reduction of normal oxygen tension than were goldfish, whereas eels would thrive on a reduction to less than one-tenth of the normal oxygen tension. Gardner's insistence on accuracy in analysis may also be observed in the comprehensive account of hæmoglobin and its derivatives which he—with Buckmaster—contributed to Allen's "Commercial Organic Analysis".

Biochemistry owes much to Gardner for the part he played in forming the Biochemical Society, and for his services as Treasurer from the time of its foundation in 1911 until a few months before his death. The new Society supplied a long-felt want to men of both chemical and medical professions who were engaged in the investigations of biochemical problems, and the membership has now risen to over a thousand.

Gardner was always keenly interested in the Chemical Society. He was a Fellow for 53 years, and was Member of Council, 1919—22. He was Reader in Physiological Chemistry, London University, and in addition to appointments already mentioned was for some years Lecturer in Organic Chemistry at the London School of Medicine for Women. He was a keen freemason, and a friend of many members of lodges in London and Yorkshire. He was a Knight of the Round Table, and for many years had been a member of the Savile Club. In 1903, he married Mrs. Henrietta White. Many of Gardner's colleagues will recall the pleasant social evenings presided over by this accomplished lady of considerable literary and linguistic attainment. She died in 1926.

During the First World War, Gardner recommended the use of the lachrymatory substance chloropicrin as a war gas, and took an active advisory part in its production on a large scale. During the Second World War, although approaching his 80th year, he was an active Air Raid Warden, going on duty in Kensington High Street during the worst raids. He was continuing some researches in the sterol field when enemy action destroyed his Kensington home. With his sister, Miss Mary Gardner, who since his wife's death had been his devoted companion, he sought available accommodation in Bradford, where an attack of bronchial pneumonia followed by heart failure ended a life of unusual accomplishment. Gardner will be remembered by his many co-workers, and indeed by nearly all the present members of the Biochemical Society, with feelings of profound gratitude for the inspiration and help afforded them individually, and for the tradition established by his example.

G. W. ELLIS.
