Obituary Notice

WALTER RAMSDEN, 1868-1947

Walter Ramsden, whose death was announced on 27 March 1947, was an original member of the Biochemical Society. His loss will be felt keenly by his many friends, both on account of his amiable personality and of his scientific interests.

The fourth son of W. H. F. Ramsden, a physician of Saddleworth, Yorkshire, and of Catherine Kay, he was born on 4 October, 1868. At the age of 14, owing to trouble with his eyes, he left Manchester Grammar School, which he had entered when twelve years old, to study privately for four years at home. He came to Oxford with an Exhibition at Keble College, and obtained a 1st Class in the Honour School of Physiology in 1892. He was Radcliffe Travelling Fellow from 1893 to 1896, and during this time he studied at Zürich and Vienna and finally at Guy's Hospital, taking his Final M.B., B.Ch. in 1897 and his M.D. in 1902. Never married and never in medical practice, he devoted himself to teaching and research.

In 1899 he was elected at Pembroke College to the Sheppard Medical Fellowship which he held to the end of his life. It is interesting to note that under the old statutes this Fellowship is tenable for life unless forfeited by marriage. His talents were soon utilized in the Department of Physiology where he became Lecturer in Physiological Chemistry under Prof. Gotch. He held the post until 1914, and during his last year, he worked under Prof. Sherrington who had succeeded Gotch. He took part in other University activities and exercised a stimulating influence on his pupils; Edward Whitley, for instance, later became with Benjamin Moore the joint founder of the *Biochemical Journal*, and subsequently started Biochemistry in Oxford with the endowment of the Whitley Chair, Moore being the first holder.

From Oxford Ramsden went in 1914 to Liverpool to become Johnston Professor of Biochemistry in succession to Benjamin Moore. The effect made in Liverpool by his personal charm is well described in a recent obituary notice (*Nature, Lond.*, 1947, 159, 801).

In 1931 he retired to devote his remaining years to research in Oxford. For the first few years he worked in the Department of Pathology and from 1937 in the Department of Biochemistry. He pursued his researches on proteins from the silkworm until the end, so far as failing health and a troublesome gastric condition would permit. For many years he had not enjoyed good health, but nothing

interfered with the charm of his old world courtesy. His ready reception of new ideas and willingness to discuss them remained as characteristic as his fund of anecdotes. Many will retain the vivid impression of his appearance in the appropriate season with a tin containing a kindly gift of mulberries.

Those who knew him early in his career, and appreciated his brilliant skill as an experimenter in the field of surface chemistry, were disappointed that his early promise did not materialize with sufficient solidity in print. Though he was ever willing to discuss his work and ideas with friends, a certain fastidiousness and a wish to obtain more thorough completion, inhibited the published word. Nevertheless the work which appeared was important. He was among the earlier biochemists to appreciate the importance of physico-chemical surface studies in biology. His first researches set the stage for his life's devotion to the phenomena of surfaces in their especial relation to protein chemistry; in 'Die Coagulierung von Eiweisskörpern auf mech. Weg' (*Arch. Anat. Physiol., Lpz.*, 1894, pp. 517-34), he showed how denaturation of proteins occurred at the interfaces formed by mechanical shaking; this was to be followed later by work on the 'separation of solids in surface layers of solutions' (*Proc. Roy. Soc. B*, 1903, 72, 156; also *Z. phys. Chem.* 1904, 47, 336). The latter work is not as well known as it should be and has a pioneer relationship to some modern protein film work. In 1902 (*Proc. Physiol. Soc.* 5 July) he described some new properties of urea; proteins were dissolved by urea with denaturation; coagulated proteins went into solution, and even a 'dead frog placed in saturated urea solution becomes translucent and falls to pieces in a few hours'; 'thiourea appears to have precisely the same effects as urea'.

This pioneer work paved the way for more recent investigations with urea and guanidine acting on proteins. With N. G. Chavasse, in the effect on viscosities of denatured egg albumin solutions, it was followed in detail and formed a contribution to a Faraday Society Discussion in March 1913 (also *Z. Chem. Industr. Kolloide*, 1913, 12, 250), and further details were published with J. Hatton (*Chem. and Ind.* 1930, 8, 851); Ramsden showed, for instance, that urea unmasked the thiol and disulphide groups in egg albumin and added details upon the rate of denaturation. During World War I, he worked with colleagues upon the estimation of quinine (see Ramsden, *Brit. med. J.*

1920, 2, 117; papers in *Ann. trop. Med. Parasit.* 11, 12 and 13). This investigation occupied much time and the details proved troublesome. After this interlude, he soon returned to surfaces, and a more fully developed account of his theories was given in 1923 (Presidential address on Surfaces and Films to the Liverpool Biological Society; 'Demonstrations in Interfacial Phenomena at British Association Meeting', *Nature, Lond.*, 1923, 112, 671).

There followed in 1926 (*Trans. Faraday Soc.* 22, 484) a fuller account of part of his theories in a discussion ('Some Physical Properties of Composite Surfaces'), embodying work carried out with R. H. Hurst (see also *J. Soc. Chem. Ind., Lond.*, 1929, 15, 1113). In particular, it was noticed that some insoluble liquids or water-soluble colloids (saponin), would spread to enormous areas upon pure water surfaces. This led to his conception of 'disturbance haloes', and to his insistence upon the reality of surface tensions. He always argued that it was erroneous to think Langmuir's apparatus measured a 'surface pressure' of the film particles upon the movable barrier, and preferred to consider them as produced by decrements in the respective tensions. This he held very strongly and hated the thought that there should be no reality in surface tension. In 1927, Ramsden described in Clayton's 'Theory of Emulsions and their technical treatment' his theory of emulsions stabilized by solid particles, in which characteristically he stated that with J. Brooks, he had devoted two years from 1922 to 1924 to an experimental test by numerous observations of the contact angle made against a variety of solids at water-benzene or paraffin interfaces. To the writer's knowledge, these data have never been published, though some of the complicated solubility relations holding with cholesterol for mixtures of cephalin and lecithin in systems containing water and a fat solvent were briefly described (Brooks, J., Ramsden, W. & Earlam, L. (1929), *J. Soc. Chem. Ind., Lond.*, 15, 1113).

About 1930 there followed an introduction to

work which occupied him in his retirement. A deeper investigation of the reactions given by sheep's wool, treated with aqueous urea solutions, led to the finding of a pseudo thiol reaction given with an alkaline urea solution and an 'aged' nitroprusside solution, and to some qualification of a previous statement. It is possible that this work upon wool led to the prolonged researches upon fibroinogen; how the stiff water-soluble fibroinogen in the silk depots (larva of *Bombyx mori*) is transformed into the insoluble fibroin strands of silk (*Nature, Lond.*, 1938, 142, 1120).

Briefly the interesting new fact emerged that the protein fibroinogen, which is thermostable, is coagulated by shearing between two flat plates of glass, and by freezing. The presence of certain salts prevents the latter change. Interestingly enough, this coagulation by shearing was not a case of surface coagulation similar to that described by himself over 40 years earlier. Other details about this phenomenon were added later, at a Biochemical Society Meeting in Oxford (26 October) during World War II (*J. Soc. Chem. Ind., Lond.*, 1940, 59, 730). At the time of his death, he was trying to confirm an important suggestion that a catalytic factor might be concerned.

This brief account serves to illustrate a life-long interest, but cannot describe at all adequately the influence of his earnest spirit of inquiry, and his refusal to let ill-health divert him from his interests. He had many hobbies; he was a strong advocate of Esperanto and was active in spreading that gospel. In spite of his poor health, up to within four months of his decease, he would cheerfully ride 20 to 30 miles in hilly country on his bicycle, and it was remarkable how easily he negotiated the now heavily congested roads between the Parks and Pembroke College.

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