

obituary

John Richardson Marrack, DSO, MC, Emeritus Professor of Chemical Pathology in the University of London, died in the USA on June 13, 1976. He was born on November 26, 1886 at Clevedon, Somerset, but soon moved to Tiverton, where he attended Blundell's School, to which he remained greatly attached, and of whose Old Boy's association he later became Vice-President. He went to St John's College, Cambridge and then to the London Hospital Medical College, graduating in 1908.

His first research was on rheumatoid arthritis as a John Lucas Walker student, and later Beit Memorial Fellow at the laboratories of the Cambridge Research Hospital (which has become the Strangeways Laboratory). After the First World War, when he served in the RAMC, he went to the London Hospital as lecturer in Chemical Pathology. He became interested in the properties of colloids, initially from studying the binding of calcium by serum proteins, and came to the conclusion that colloid interactions were caused by definable and verifiable physical and chemical forces, acting between distinct protein entities. As an example he chose antibodies, whose nature was quite unknown and whose very existence as separate entities was doubted. In 1930 he showed that diphtheria antitoxin behaved as a distinct protein whose interaction with diphtheria toxin could be measured quantitatively. In a monograph published in 1934 (*The Chemistry of Antigens and Antibodies*) he proposed that the specific affinity of antibodies for antigens is determined by the same factors which determine the specific binding of molecules to form crystals, that is, the shape of the molecules and the spatial distribution and strength of

polar forces. The monograph contains a clear diagram elaborating the theoretical studies of Heidelberger and Kendall to illustrate what has now become accepted as the 'lattice hypothesis' of antigen-antibody interactions.

Revised in 1938 this work has had a lasting influence, and convinced many chemists and biochemists that immunology was a fit subject for scientific study by themselves as well as by bacteriologists and serologists. Marrack was also the first to use methods which are now commonplace: equilibrium dialysis, whereby he indicated that anti-hapten antibodies were probably bivalent, and the attachment of coloured dyes to antibacterial antibodies, which inspired Albert Coons later to develop the technique of immunofluorescence. Marrack wrote few papers, by present day standards, and his encyclopaedic knowledge of immunochemistry appeared mostly in review articles.

John Marrack was a colourful character. Behind a shyness and apparent abruptness lay kindness and intellectual integrity. He always wanted to be an athlete and was by temperament a fighter—for seven years he was welterweight champion in the London University boxing tournaments. Throughout the whole of his adult life he was a keen walker (he knew Dartmoor intimately) and he never drove where he could go by bicycle. On more than one occasion when roused to righteous anger he took the law into his own hands and used his fists: once to apprehend a thief in the laboratory and again to despatch a gang of hoodlums who misguidedly attacked him on Whitechapel Station. His war record in the RAMC—DSO as a line medical officer and MC for investigations on the poison gas used

against the British Army in 1917—illustrates this aspect of his character. So also does his consistent championship of the underdog.

During the Civil War in Spain, he was an active member of the Spanish Medical Aid Committee, and visited the International Brigade and the Spanish Republican army. About this time he became deeply concerned about the nutrition of children in Britain, influenced by L. J. Harris and Jack Drummond, and spent much time and effort campaigning for the Children's Nutrition Council—to such good effect that he was adviser to the Ministry of Food during the Second World War and wrote in 1942 a book (*Food and Planning*) which influenced the post-war planning of nutrition.

These activities were regarded by many of his contemporaries as indicating that he was finished with research, but were entirely consistent with his character. When he returned to the laboratory in the Department of Pathology at Cambridge in 1952, his main work had, in fact, been completed, but he began to exploit the growing knowledge of the structure of antibodies while devoting most of his energy to editing, for its first ten years, virtually single handed, the new journal *Immunology*. By now the importance of his earlier work had become widely understood and recognised and at the age of 76 he was made Visiting Professor at the University of Texas. At the First International Congress of Immunology in 1971 he was one of five to receive the Distinguished Service Award "For revolutionary ideas that have become commonplace in his lifetime, and for pioneering work in the physicochemical interpretation of antigen-antibody interactions".

J. H. Humphrey

Marie Laura Violet Gayler, March 1891–August 1976, was the youngest of five daughters of Mr William Gayler, Director of Stamps and Excise at Somerset House. Her mother was an artist, a Gold Medallist of the Slade School, whose paintings were often exhibited at the Royal Academy. Marie graduated from London University in 1912, and after teaching botany at the Colstan Girls' School, Bristol, in 1915 she joined Walter Rosenhain's scientific staff in the Metallurgy Department of the National Physical Laboratory, and later married Dr J. L.

Haughton, a member of the same Department. She retired in 1947.

Marie Gayler and a physical chemist, Miss I. H. Hadfield, were the first women to be appointed to the scientific staff of the Department. She became a distinguished member of Rosenhain's team, which in the 1920s and 30s at the NPL, helped to lay the scientific foundations of physical metallurgy and to give this country the leading position which it enjoyed in the subject for a couple of decades or more.

Marie Gayler's outstanding contribution, with Hanson and Haughton,

was the elucidation of the mechanism of age-hardening in the duralumin family of aluminium alloys, which had been developed empirically by Wilm in Germany. A very important outcome of the NPL work was Y-alloy, an aluminium alloy which contained nickel as well as copper, magnesium and silicon, the normal alloying elements in duralumin. The presence of nickel greatly improves the strength and hardness of age-hardened duralumin at temperatures of 150–200 °C. This makes Y-alloy eminently suitable as a material for the pistons of internal

combustion engines. Many derivatives of Y-alloy have been developed, among which are the RR series of alloys, one of which is used in the skin of the Concorde which is heated by passage through the air at supersonic speeds.

In the 1930s and 40s Marie Gayler took over the work at the NPL on dental amalgams. To understand the mechanism of the setting and hardening of amalgams she followed the traditional NPL procedure, which was to establish the metallurgical constitution of the alloys, consisting essentially of silver, tin and mercury. The setting proceeds by diffusion at room temperature of the mercury into the powdered silver-tin alloy. Novel metallographic techniques had to be worked out for the

study of the complex processes of diffusion and reaction. To ensure the satisfactory prosthetic performance of the amalgam filling, close control of the volume changes occurring during and after setting must be assured. In recognition of this side of her work Marie Gayler was made an Honorary Member of the British Dental Association in 1947.

Although her principal researches were concerned with aluminium alloys and dental amalgams, Marie Gayler also carried out important investigations on iron-manganese alloys, and on the melting points of pure silicon and iron. In 1947 the Institute of Metals, in whose Journal many of Marie Gayler's papers were published, awarded its

Platinum Medal jointly to her and her husband, Dr J. L. Haughton.

After her retirement she was able to devote more time to her interest in sculpture; she sculpted the head of the late Professor Hume-Rothery; which now stands in the library of the Department of Metallurgy in Oxford University.

Marie Gayler readily absorbed and whole-heartedly transmitted Rosenhain's enthusiasm and scientific resourcefulness. She worthily maintained and enhanced the traditions of the Metallurgy Department of the NPL, and her surviving colleagues remember her as a warm and helpful colleague of striking and attractive appearance.

A. J. Murphy

announcements

Meetings

November 11, **Ecdysone Workshop**, London (Dr. D. L. Whitehead, Tsetse Research Laboratory, Department of Veterinary Medicine, Langford House, Langford, Bristol BS18 7DU, UK).

January 29–30, 1977, **Human Skin Banking**, Milwaukee, Wisconsin (Ralph M. Guttman, MS, Director, St Mary's Skin Bank, PO Box 503, Milwaukee, Wisconsin 53201).

March 2–4, 1977, **Cell Differentiation and Neoplasia**, Houston (Stephen C. Stuyck, MD, Anderson Hospital and Tumor Institute, Houston, Texas 77030).

March 28–April 1, 1977, **Scanning Electron Microscopy**, Chicago (Deadline for abstracts: October 25) (Om Johari, Annual SEM Symposia, IIT Research Institute, 10 W 35th Street, Chicago, Illinois 60616).

May 3, 1977, **Crop Protection**, Ghent (Prof. Ir. R. H. Kips, Chairman of the Organising Committee, International Symposium on Crop Protection, Faculteit van de Landbouwwetenschappen, Coupure Links 533, B-9000 Ghent, Belgium).

May 17–21, 1977, **Study of Macromolecules by NMR**, Grasmere, UK (Dr D. H. Richards, Explosives Research and Development Est., Non-metallic Materials Branch, Powdermill Lane, Waltham Abbey, Essex).

July 11–14, 1977, **Gas Kinetics**, Manchester (Fifth International Symposium on Gas Kinetics, UMIST, PO Box 88, Manchester M60 1QD).

July 11–15, 1977, **Organometallic and Co-ordination Compounds of Ger-**

Person to Person

A limited number of copies of the *Genetic Hazards to Man from Environmental Agents*, the proceedings of a symposium held in Ottawa in May, 1975, and published in *Mutat. Res.*, **33**, (1), (1975) are available to scientists who would not have access to it otherwise. Please write to Dr John A. Heedle, Department of Biology, York University, 4700 Keele Street, Downsview, Ontario M3J 1P3, Canada.

I am conducting experiments on the variations of fungal pathogens of rice induced by pesticides. Those who are working on similar topics may please contact me if interested in exchanging views on this subject (Dr S. Balakrishnan, Dept of Pathology, College of Agriculture, Vellayani PO, Trivandrum, Kerala, India).

There will be no charge for this service. Send items (not more than 60 words) to Martin Goldman at the London office. The section will include exchanges of accommodation, personal announcements and scientific queries. We reserve the right to decline material submitted. No commercial transactions.

manium, Tin and Lead, Nottingham (Dr P. G. Harrison, Secretary, 2nd Ge, Sn and Pb Conference, Department of Chemistry, University of Nottingham, University Park, Nottingham NG7 2RD, UK).

August 8–19, 1977, **Physics of Quantum Electronics**, Telluride, Colorado (Professor S. F. Jacobs, Rt. 2, Box 732D, Tucson, Arizona 85715).

August 21–26, 1977, **Singlet Oxygen and Related Species in Chemistry and Biology**, Pinawa (D. Fundytus, Conference Secretary, Technical Information Services, Whiteshell Nuclear Research Establishment, Atomic Energy of Canada Ltd, Pinawa, Manitoba, Canada, ROE 1LO).

August 30–September 3, 1977, **Fourth European Crystallographic Meeting**, Oxford (Dr C. K. Prout, Chemical Crystallography Laboratory, 9 Parks Road, Oxford OX1 3PD, UK).

September 5–10, 1977, **Biology of Connective Tissue**, Uppsala (Professor T. Laurent, Biomedical Centre, University of Uppsala, Box 575, S-751 23 Uppsala, Sweden).

September 12–16, 1977, **Bioindicators Deteriorationis Regionis**, Liblice, nr Prague (Ústav krajinné ekologie CSAV honice, Czechoslovakia).

September 25–October 11, 1977, **Kimberlite**, Santa Fé, New Mexico (2nd (Ing. J. Spálény CSc.), 252 43 Prů-International Kimberlite Conference, Sylvia-K Inc., 5671 Blue Saga Drive, Littleton, Colorado 80123).

October 11–13, 1977, **Oceanic Fronts**, New Orleans, Louisiana (Deadline for abstracts: November 1) (American Geophysical Union, 1909 K Street, N.W., Washington, D.C. 20006).

November 14–18, 1977, **Pan American Conference on Forensic Applications of Medicine, Dentistry, Pathology and Palaeopathology**, Mexico City (Dr William G. Eckert, Laboratory, St Francis Hospital, Wichita, Kansas 67214).