We have to thank Mr. R. P. Sinclair for considerable assistance. Our thanks are also due to Dr. Philpot for many discussions, to the Sharples Centrifuge Co., the Royal Society and Imperial Chemical Industries, Ltd., for financial and technical assistance.

Owing to the present international situation, it has not proved possible to obtain the collaboration of my co-worker, Dr. F. R. Eirich, in writing this brief survey of work on the air-driven ultracentrifuge. Whilst he might not agree in detail

with some of the observations made therein, he expressed an earnest desire for these results to be communicated as soon as was conveniently possible.—E. K. R.

¹ Pickels, E. G., *Rev. Sci. Inst.*, **9**, 358 (1938).

² Svedberg, T., and Pederson, K. O., "The Ultracentrifuge" (Oxford, 1940), pp. 9, 124 and 152.

³ Bjornstahl, Y., *Rev. Sci. Inst.*, **10**, 258 (1939).

⁴ Philpot, J. St. L., *NATURE*, **141**, 283 (1938).

⁵ Svedberg, T., and Pederson, K. O., "The Ultracentrifuge" (Oxford, 1940), pp. 9 and 297.

⁶ Weiner, O., *Ann. Phys. und Chem.*, N.F. **49**, 105 (1893).

⁷ Svedberg, T., and Pederson, K. O., "The Ultracentrifuge" (Oxford, 1940), pp. 9 and 382.

⁸ Svedberg, T., and Pederson, K. O., "The Ultracentrifuge" (Oxford, 1940), p. 390.

OBITUARIES

Prof. R. T. Hewlett

RICHARD TANNER HEWLETT, a well-known and highly respected figure in British bacteriology for some forty-five years, died on September 10 at the age of seventy-five. Educated at King's College School and trained for his professional career at the King's College School of Medicine, Hewlett graduated M.B. Lond. in 1890 and for three years acted as demonstrator in bacteriology, eventually in 1901 succeeding to the chair of bacteriology vacated by his chief, Prof. Edgar Crookshank. In the interval he had served (1894–1901) on the bacteriological staff of the British Institute of Preventive Medicine under its then director, Dr. Allan Macfadyen. During his career he also acted as director of pathology and later as consulting pathologist at the Seamen's Hospital, and for many years he lectured on bacteriology at the London School of Tropical Medicine.

Hewlett's interests lay almost entirely in the application of bacteriology to hygiene and public health, and numerous articles from his pen on a diversity of subjects—water pollution, shell-fish and sewage contamination, pure milk supplies, cellular contents of milk, insect carriers of disease, etc.—will be found in the appropriate journals from 1897 onwards. He was particularly interested in the disinfection process and in methods of testing disinfectants, to which subject he devoted his Milroy Lectures before the Royal College of Physicians in 1909. In these lectures he expressed the view that the similarity of certain disinfection curves to that of a monomolecular reaction was only apparent, and that the course of disinfection processes generally was most probably to be accounted for by the assumption of a variation of resistance existing among the individuals in the bacillary population exposed—a view which has since been widely ventilated and experimentally tested.

At the British Institute of Preventive Medicine, Hewlett had been greatly intrigued by the experiments of Macfadyen and Rowland on the extraction of cell juices from yeasts and bacteria by grinding at the temperature of liquid air. Later, with the

help of his former colleague Mr. J. E. Barnard, an improved grinding apparatus was devised, and the results obtained by immunization of animals with such juices (endotoxins) were communicated to the Royal Society in 1909 and 1911. Assay of this work, which unfortunately was not carried far enough or conducted on a sufficiently large scale, is difficult even now; but it still has its interest for workers occupied with the more detailed analysis of bacterial antigens on modern chemical and serological lines.

Hewlett was widely read in his subject and wrote with ease. His student text-books on "General and Special Pathology" and on "Applied Bacteriology" have had a large vogue for many years. To the "System of Bacteriology" he contributed important articles, and the columns of *NATURE* contain many contributions from his pen. In recent years he took a great interest in the work of the Royal Microscopical Society, of which he was honorary secretary at his death. Unassuming and ever helpful and friendly in his human relations, Hewlett leaves a pleasant memory, and the undersigned records with gratitude the interest he maintained in the work and affairs of the Lister Institute, where he served an apprenticeship in the 'nineties. To his widow and family our sincere sympathy is extended.

J. C. G. LEDINGHAM.

Prof. H. Stroud

HENRY STROUD was born at Bristol on August 7, 1861. He began his education at Bristol Grammar School and proceeded with an entrance scholarship in 1879 to the University College in that city, where he came under the influence of Silvanus Thompson. In 1880 he was awarded the Gilchrist Scholarship tenable at Owens College, Manchester, where he studied under Balfour Stewart and Henry Roscoe for two years, at the end of which period he apparently scooped up all the mathematical and physical scholarships in his immediate neighbourhood and went with them to St. John's College, Cambridge. In the

Mathematical Tripos list for 1885 he was eighth Wrangler. In 1886 he obtained a first class in physics in Part II of the Natural Sciences Tripos, and in the same year graduated as doctor of science in the University of London.

Stroud was appointed lecturer in physics at the College of Physical Science (which later became Armstrong College and is now King's College), Newcastle-upon-Tyne, in 1886 and was elected professor a year later. In the following years he became a strong believer in the value of popular scientific lectures, and many will remember his numerous experimentally illustrated lectures given in towns and villages throughout the northern counties of England on X-rays, radium and wireless telegraphy at a time when these subjects were in their infancy. He played an important part in the development of the institution as a self-contained university college and as a unit of the University of Durham.

For several years Stroud was associated with the late Lord Armstrong in his researches on "Electric Movements in Air and Water". Although he published little himself, he was always keenly interested in research and he endowed various college prizes with a view to its encouragement. On his retirement in 1926, after forty strenuous sessions in harness, he was elected professor emeritus by a college grateful for his valuable services. Stroud died in peaceful seclusion at Gerrard's Cross on September 3.

GEORGE W. TODD.

Colonel H. L. Crosthwait, C.I.E.

HERBERT LELAND CROSTHWAIT, who died on September 11, aged seventy-two, was the eldest son of the late Mr. Samuel Crosthwait, of The Lodge, Bagenalstown, County Carlow, Ireland, and educated at Rossall and at Trinity College, Dublin. He entered the Royal Engineers in 1890. Two years later he went to India and in 1897 he joined the Survey of India, in which he remained for the rest of his service. Here he soon became well known for his very extended knowledge of a variety of scientific subjects; in fact, if he had concentrated on any one subject he would easily have been one of the authorities on that subject. His wide knowledge and experience, however, made him a most delightful companion. He could talk well and easily and with full knowledge on many topics.

As a surveyor, Crosthwait was mostly employed on the scientific side, but quite easily switched on to the topographical branch when required, as, for example, when employed on the Chile-Argentine Boundary Commission, or during the War of 1914-18 in East Persia, and during the Waziristan Expedition and Third Afghan War of 1919-20. For these services he was awarded a C.I.E.

On his retirement Crosthwait began to specialize on the subject of air surveys and became a director of the Aircraft Operating Company, Ltd., where his knowledge of topography and his very quickly acquired knowledge of the application of air photography to map-making made him a much valued colleague. He was on the council of the Royal Geographical

Society for many years, where his appreciation of the value of air photography to map-making made him a most useful member; it might, in fact, be fairly said that no one rendered better service to cartography of late years than Crosthwait did in leading air survey on the right lines; that is, to a full but not excessive appreciation of its value.

Added to his wide knowledge over an extensive range of subjects, Crosthwait had a great charm of manner, and a very human kindness which made him a valued companion, whether in the wilds of the jungle or at a civilized meeting of the members of a scientific society. His death will leave a wide gap among his large circle of friends.

C. H. D. RYDER.

Lieut. J. H. Martin, R.N.V.R.

LIEUT. JAMES MARTIN, who has been reported lost at sea, had an unusual career compared with other polar explorers of the last twenty years. His whole interest was the sea, and his contributions to Antarctic discovery depended on his intimate knowledge of seamanship and his devotion to shipwork. He broke away from office work in the City to serve before the mast in the sailing ship *Garthpool*, and some years later he signed on as a seaman in the *Discovery* on a summer voyage to the Antarctic in 1929-30 under Sir Douglas Mawson. Martin shipped on her again in the following season and was ranked as boatswain. In order to improve his knowledge of ice navigation he then went to Norway for spring sealing in the White Sea and served as a seaman in the *Quest*. Soon afterwards he was chosen as leader of the 1933 Oxford University Expedition to Spitsbergen, but was prevented in the end from actually taking part owing to having been severely frost-bitten whilst sledging in Northern Canada.

Martin made plans for an Antarctic expedition, but set them aside in favour of John Rymill's British Graham Land Expedition. He accordingly volunteered as one of Rymill's crew and was appointed mate in the *Penola* commanded by Lieut. R. E. D. Ryder, R.N. Much of the ship work was done under sail, in which Martin was an expert. Great size and strength, fearlessness and gentleness went to the make up of this remarkable man. Ryder has made clear how much he depended on his mate during the three years voyage, and the success of the expedition was in part due to the way these two understood each other, and worked the ship in narrow waters. When war broke out, Martin transferred to the Navy from the Grenadier Guards, in which he had held a commission in 1918, and from then for most of the time was shipmate once again with Ryder.

J. M. WORDIE.

WE regret to announce the death of Mr. J. B. Beresford, C.B.E., formerly secretary of the University Grants Committee, and of the Standing Committee on Museums and Galleries, as a result of enemy action, aged sixty-two.