arsenic, whereas the resistant parasites contained none[29]. Advances in technique made it possible to demonstrate fixation of a drug by parasites while they were circulating in the host's blood stream. This was done, in turn, for 'Trypaflavin', antimony, gold and arsenic[31,32,33].

Ehrlich had always maintained that a drug needs two active groups, one to assist its uptake by the parasite and another to combine with a vitally active group in the parasite. Hence it follows that the mere uptake of a foreign substance need not be harmful to an organism. This was neatly demonstrated in 1935 when it was shown that malarial parasites and trypanosomes take up the three acridines, 'Atebrin', 'Trypaflavin' and 'Rivanol', but that the 'Atebrin' harms only the malarial parasites, the 'Trypaflavin' only the trypanosomes and the 'Rivanol' injured neither[34].

It is now generally agreed that the action of chemotherapeutic drugs is directly on the parasite, that their reaction with the parasite is chemical in nature and that there are two distinct reacting groups in many of the most active drugs. The co-operation of the natural defence factors of the body is also recognized. These factors, among them the reticulo-endothelial system[35,36], are believed to cope with the parasite once the drug has disorganised the latter's metabolism. The suggestion that some of Ehrlich's chemoreceptors are located in vitally important enzyme-systems[8] is one of the most stimulating suggestions made in recent years.

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OBITUARIES

Mr. John H. Reynolds

By the death of Mr. John H. Reynolds, British astronomy loses one of that long succession of amateurs who have contributed so much to the advance of the science they loved. In this case astronomical work in other countries has also been promoted by generous gifts. Early in this century, Mr. Reynolds secured a 30-in. Common mirror for his own use; but a visit to Egypt convinced him that more value could be obtained from his mirror if it were installed there than in his own garden. So an offer of a 30-in. reflecting telescope, with a mounting designed by Mr. Reynolds, was accepted for the Egyptian Government by Capt. H. G. Lyons, R.E. (later Sir Henry Lyons), of the Survey Department. A dome near Helwan was available, and the telescope began work on nebular photography in 1907. On the return of Halley's comet in 1910, the first photograph of it was secured at Helwan by Dr. Knox Shaw. Later, Mr. Reynolds installed a 28-in. reflector with the same type of mounting at his home in Harborne, where he began work in 1911. The 30-in. mirror was brought back from Helwan in 1923 to Birmingham. The second telescope was later presented to the Commonwealth Observatory on Mt. Stromlo, Canberra, where it is once more in full use in a photometric programme.

Mr. Reynolds's chief interest over many years was in nebular astronomy, particularly the extra-galactic nebulæ. He studied them in monochromatic light and in polarized light, examining their spiral forms, the distribution of condensations within them and their stellar development from type to type. He also examined them photometrically for internal light distribution. He obtained his material partly in Birmingham and partly at Helwan, for he maintained a close connexion with this Observatory from its start. He joined two eclipse expeditions, to Algiers and Egypt. He served for many years on the Council of the Royal Astronomical Society, mainly as treasurer; he was president during 1935–37. The University of Birmingham gave him the honorary degree of M.Sc. in recognition of his work for astronomy.

In addition to his normal business activities, Mr. Reynolds had other interests, being an accomplished musician. For some years he was honorary secretary of the Midland Institute, Birmingham, taking great interest in securing lecturers for it. He died on November 22, aged seventy-five, having collapsed at the close of a meeting where he had just taken part in the discussion of an astronomical lecture, showing that he maintained an active interest in astronomy right to the end of his life. F. J. M. Stratton

Mr. J. F. Marshall, C.B.E.

John Frederick Marshall, who died on December 5, at the age of seventy-five, was a leading authority on British mosquitoes. Son of the late Charles Marshall of Huntingdon, he was educated at Rugby and King's College, Cambridge, where he took a first class in the Mechanical Sciences Tripos, Part 1, in 1896, and in Part 2 (with special distinction) in 1898, and was called to the Bar, Inner Temple, in 1902.

Marshall first became actively interested in British mosquitoes about 1920 when, owing to their great prevalence in the neighbourhood of his home at

"Seacourt", Hayling Island, he organised a control scheme in 1921 after consultations with the late Dr. F. W. Edwards, of the British Museum (Natural History), and the late Colonel S. P. James, of the Ministry of Health. Marshall built, equipped and directed, at his own expense, the British Mosquito Control Institute in the grounds of his house on Hayling Island, which was officially opened by the late Sir Ronald Ross in 1925. This Institute is a centre for both pure and applied research upon mosquitoes, and has been visited by fellow-workers from all over the world.

Although some seventeen species of mosquitoes were recorded by Marshall as occurring on Hayling Island, the species which at times made life on the Island well-nigh unbearable was the brackish-water breeder *Aedes detritus* and, to a lesser extent, *Aedes caspius*. It was natural that Marshall should concentrate on a study of these two troublesome species, and his numerous publications show clearly with what meticulous care and accuracy he worked out their biology and bionomics. With his knowledge of mathematics he devoted much time, care and skill to insect photography, and invented a new apparatus for photographing insects, which he described in the *Bulletin of Entomological Research*. His greatest achievement, however, and the one which will for ever be associated with his name, is his book entitled "British Mosquitoes", which was published by the Trustees of the British Museum (Natural History) in 1938. It was the successor of Dr. W. D. Lang's "Handbook of British Mosquitoes" (1920). Marshall described nine species of mosquitoes not mentioned in Lang's book and also filled in numerous gaps in our knowledge concerning many species of which, although they were recorded as indigenous, very little was known. He added to our knowledge of their breeding-places, their bionomics and the means of classifying their larvæ, particularly the early instars. His book contains 172 text figures and twenty-five other drawings or photographs, most of which he did himself with the help of his enthusiastic assistant, Mr. J. Staley, and which bear testimony to the photographic apparatus which he invented. He was awarded the C.B.E. in 1936.

Between 1921 and 1925, I worked with Marshall while the mosquito survey of Hayling Island and the surrounding district was being made. The realization that the control measures necessary for success were both difficult and complicated stimulated Marshall and added an interest to this branch of the work which never flagged.

Marshall married in 1902 Blanche Gray, who survives him. She supported and helped him in all his scientific activities. Their daughter, Joan Grant (Mrs. Charles Beatty), is the talented author of "Winged Pharaoh" and other widely read literary works.

P. G. SHUTE

WE regret to announce the following deaths:

Dr. Clifford Dobell, F.R.S., protistologist to the Medical Research Council, on December 23, aged sixty-three.

Prof. W. H. Newton, professor of physiology in the University of Edinburgh, on December 20, aged forty-five.

NEWS and VIEWS

New Year Honours List

THE following names of men of science and others associated with scientific work appear in the New Year honours list:

Baron: Dr. L. Haden Guest, M.P., secretary of the Leverhulme Research Fellowship Committee, for political and public services.

K.B.E.: F. Brundrett, chief of the Royal Naval Scientific Service; H. C. Papworth, vice-chancellor of the University of Travancore.

D.B.E.: Prof. Olive Wheeler, professor of education and dean of the Faculty of Education in University College, Cardiff.

Knights: Prof. A. L. Bowley, during 1919–36 professor of statistics in the University of London; A. M. Bryan, chief inspector of mines, Ministry of Fuel and Power; Philip Hendy, director of the National Gallery; Dr. A. W. Pickard-Cambridge, deputy chairman of the Public Schools' Governing Bodies Association, during 1930–38 vice-chancellor of the University of Sheffield; S. J. Saint, director of agriculture, Barbados; Arthur Sims, for services to medicine and education in the British Commonwealth; Prof. A. G. Tansley, chairman of the Nature Conservancy; Dr. W. W. D. Thomson, professor of medicine, Queen's University, Belfast; Prof. R. L. Turner, director of the School of Oriental and African Studies, University of London.

C.B.: A. H. Gosling, director-general of the Forestry Commission; S. S. Hall, director-general of technical development (air), Ministry of Supply; Dr. O. H. Wansbrough-Jones, scientific adviser to the Army Council.

C.M.G.: A. B. Killick, director of agriculture, Uganda; W. H. Cocker, of Auckland, New Zealand, for outstanding services in university administration and adult education.

C.B.E.: J. Anderson, chief scientist, H.M. Underwater Detection Establishment, Portland; Mehmed Aziz, executive officer, Anopheles Eradication Scheme, Cyprus; O. G. S. Crawford, archæologist; H. W. Dawes, president of the Royal College of Veterinary Surgeons; A. N. Duckham, agricultural attaché at the British Embassy at Washington; Prof. F. Hardy, professor of chemistry and soil science, Imperial College of Tropical Agriculture, Trinidad; C. Harvey, director of agriculture, Fiji; Dr. Franklin Kidd, director of food investigation, Department of Scientific and Industrial Research; E. C. Lloyd, deputy chief veterinary officer, Ministry of Agriculture; Miss Ida C. Mann, senior surgeon, Royal London Ophthalmic (Moorfields) Hospital; Prof. J. W. Munro, professor of zoology and applied entomology in the Imperial College of Science and Technology, London; F. M. Owner, chief engineer (Engine Division), Bristol Aeroplane Co., Ltd.; Prof. F. G. Soper, professor of chemistry in the University of Otago, for public services; W. J. Spafford, lately director of agriculture, South Australia; K. T. Spencer, deputy director of aircraft research and development (technical), Ministry of Supply; Prof. A. M. Tyndall, chairman of the Executive Committee, National Physical Laboratory.