It is less than a year since the last total eclipse, in Sweden, where British observers were among the minority who had a sufficiently clear sky to complete most of their programmes of work successfully. This year's work from the ground will consist mainly of a repetition of some of the 1954 observations, with improvements in instruments and procedure suggested by the experience gained in Sweden. Last year, Dr. H. von Klüber (Cambridge) and Dr. A. H. Jarrett (St. Andrews) succeeded in the technically difficult feat of photographing the corona through a Fabry–Perot interferometer using the light of the green 5303 A. line. Measurement of the fringes has given a distribution over the inner corona of the line width and hence of the kinetic temperature, and this year the experiment will be repeated, using a larger solar image and photographing in the light of the red 6374 A. line, as well as in 5303 A.

Prof. C. W. Allen and Dr. E. W. Foster (London University Observatory) will again be engaged in photometry and spectroscopy of the corona with the general purpose of testing theoretical models of the electron K corona and the dust F corona. The special feature of the camera to be used for photometry is an occulting disk mounted on a tower at some distance from the lens. Its purpose is to equalize the intensity of the inner and outer corona, so that both may be satisfactorily photographed in one exposure. Their second instrument, a fast spectrograph, is also designed to record the outer and inner corona simultaneously on one photograph. An absolute photometric standardization will be provided and the polarization of the corona also will be measured.

Prof. E. Finlay-Freundlich (St. Andrews) had intended to go to Ceylon to co-operate with astronomers from the Potsdam Observatory in measuring the Einstein displacement in the star field surrounding the sun. Owing to ill-health, he has been prevented from travelling; but the Potsdam observers and equipment are in Ceylon, and will be assisted by Dr. von Klüber, who worked on this problem with Prof. Freundlich at the 1929 eclipse in Siam.

Finally, Dr. D. E. Blackwell (Cambridge), who in 1954 succeeded in photographing the outer corona from an aircraft flying at 30,000 ft. and thence in obtaining good photometric measurements out to a much greater distance from the sun than ever reached before, is this year to attempt to photograph the outer corona and zodiacal light after the eclipsed sun has set. The dust which produces the F component of the corona is believed to be closely associated with that giving rise to the zodiacal light, and the problem is to bridge the existing large gap in photometric measures between the two. The ordinary zodiacal light cannot be observed with the eclipsed sun above the horizon, as the sky is then much brighter than often supposed, because of light scattered in from the sides of the moon's shadow as a kind of dawn. The device of working with the eclipsed sun below the horizon has been tried a few times by other observers, but so far without success. Dr. Blackwell will work at about 10,000 ft. over the open Pacific Ocean, in a Sunderland flying boat based on Fiji. The aircraft will be provided by courtesy of the New Zealand Air Force, by arrangement with the Defence Services Research Facilities Committee of the Royal Society.

As at other recent eclipses, all British observers are working with the support of the Joint Permanent Eclipse Committee of the Royal Society and Royal Astronomical Society.

OBITUARIES

Dr. Otto Rosenheim, F.R.S.

THE announcement of the death on May 7 of Otto Rosenheim at the age of eighty-four will recall a friendly figure often seen at meetings of scientific societies in London, to many of which he was a notable contributor of highly original observations.

Rosenheim was born in Germany, where he took his Ph.D. degree at Würzburg, working under Tafel in Emil Fischer's laboratory. For part of the course he went to Bonn, and on completion of his degree to Geneva to work with Graebe. In 1895, through the mediation of Perkin, he went to Manchester for further study, and in 1901 joined Tunnicliffe in Halliburton's department at King's College, London, as research student in pharmacological chemistry; he was made lecturer in 1904, and on Tunnicliffe's departure became assistant professor of physiology. Later he became reader in biochemistry in the University of London—an appointment he relinquished in 1920.

After retiring for a few years from official duties, he went as a voluntary worker to the National Institute for Medical Research at Hampstead in 1925, and so began a second period of research which lasted for another twenty years.

In the early period, during his association with Tunnicliffe, after some preliminary work on uric acid and the quadriurates, he investigated the toxicity of beer due to the presence of selenium, and also determined the proportion of formaldehyde in milk and food which would have no effect on healthy children. In after years, he often had resort to feeding experiments in intricate problems of sterol metabolism.

With Locke he took part in the classical investigation in which a new perfusion method was devised for the mammalian heart using dextrose in oxygenated Ringer solution; but his outstanding achievement at King's College was his arduous work on the constituents of the brain. In this he was ably assisted by Mary Christine Tebb, whom he later married. They laid the bogy of protagon, around which unseemly controversy had raged. Thudichum, of whom Rosenheim was an ardent admirer, had shown in 1874 that protagon was a mixture; but Liebreich, Gamgee, Blankenhorn and Cramer believed it to be a molecular entity. Rosenheim and Miss Tebb demonstrated how dried brain treated mildly with solvents could be separated into free cholesterol, two phosphorus-free galactosides (phrenosin and kerasin) and a phosphorus-containing residue of sphingomyelin. The structures advanced by Rosenheim for phrenosin and kerasin are close to those now accepted.

In 1909 Rosenheim examined extracts of placenta, showing that if there was no putrefaction there was no pressor effect. Dixon and Tayler had claimed the contrary. Incidentally, Rosenheim identified tyramine as a product of putrefaction.

During his period of temporary retirement, Rosenheim, who was an enthusiastic rock-gardener, interested himself in some problems posed by the pigments of edelweiss and young vine leaves.

On coming to the National Institute for Medical Research in 1925, Rosenheim brought with him the problem of spermine phosphate, the conditions for the isolation of which he and his wife had already worked out. With Dudley and later with Starling's

preparative help, they elucidated the distribution and constitution of spermine and spermidine, two bases of unknown function present in mammalian tissues and fluids.

In 1925 Drummond, Rosenheim and Coward had shown that the precursor of the antirachitic substance found in foodstuffs on ultra-violet irradiation was in the fats, and in fact in the sterol fraction. With Webster, who in Leonard Hill's department had already devised a reliable technique for the testing of antirachitic substances on rats, he concentrated on the problem of the activatable sterol and arrived at the important discovery that the so-called pro-vitamin was ergosterol. This led, in the hands of Callow, Bourdillon and their collaborators, to the actual isolation of vitamin D.

In the vitamin A field, too, Rosenheim and Drummond found that the vitamin A content of cod liver oil was approximately proportional to the colour intensity produced by addition of arsenic trichloride, an observation which facilitated further advances.

In 1932 Rosenheim and I were fortunate in resolving the impasse reached in the problem of the structure of the sterols and bile acids by suggesting a revolutionary modification of the structures hitherto proposed. Great advances have flowed from the new formulæ, not only in the sterols and bile acids but also in the heart poisons, sex-hormones and constituents of the adrenals.

Rosenheim's contributions to medical science were many. He was a born investigator, meticulous and thorough in all he attempted. The usês to which he put colour reactions and mixed solvents in purification procedures were fascinating and entrancing. He was full of encouragement for the young worker. His remarkable memory and his encyclopædic knowledge were ever available and often called upon by his many colleagues. For many years he was a valued member of the Accessory Food Factors Committee of the Medical Research Council. He was a Fellow of the Linnean Society and was elected a Fellow of the Royal Society in 1927.

HAROLD KING

Dr. R. W. Boyle

THE sudden death of Robert William Boyle in London on April 18, at the age of seventy-one, has removed one of the last of that small band of pioneers who were responsible for establishing in Canada the importance of research during the early years of the present century. Born in Carbonear, Newfoundland, on October 2, 1883, the son of Dr. Albert D. Boyle and Sophie Madelock Boyle, he received his early education there and in St. John's College, from which he graduated with the award of the Newfoundland Government Jubilee Scholarship. He then entered McGill University, where he studied electrical engineering, graduating in 1905; but, stimulated by the influence of Rutherford, then Macdonald professor at McGill, he turned to a career in physics. He was awarded in 1909 the first Ph.D. granted by McGill and in the same year was chosen an 1851 Exhibition scholar, proceeding to Manchester, where he carried out research under Rutherford on the properties of radium and thorium emanations. Returning to McGill in 1911, he taught physics and mathematics, and in 1912, on the establishment of the University of Alberta, was appointed head of the Department of Physics at the new provincial institution. With his drive and enthusiasm, he established an excellent department, both for instruction and emphasis on research.

Soon after the outbreak of the First World War, Boyle joined the staff of the Board of Invention and Research, later known as the Antisubmarine Division of the Admiralty. During this period, he developed the method of submarine detection using ultrasonics produced by oscillations of quartz crystals due to their piezoelectric properties. This was a very difficult investigation at a time when electronic amplifiers were not yet available; and when the simple triode tubes eventually were obtained, he established by his drive and vision the success of what later became known as the 'Asdic'. On returning to Alberta in 1919, he continued research on ultrasonics with a small band of enthusiastic research students, making numerous fundamental measurements in this field of physics. His appointment as dean of the Faculty of Applied Science in 1921 extended his influence on research to other fields, creating in western Canada an oasis of scientific interest in original investigation that has continued ever since. The establishment of the National Research Laboratories in Ottawa required a director with energy and vision for the Division of Physics and Electrical Engineering, and Boyle was appointed to fill this new post in 1929, which position he occupied until his retirement in 1948. During this period, his Division made notable contributions to Canadian industry and, especially during the Second World War, was responsible for the major development in radar and various other devices which the Council contributed to the war effort.

Boyle was a lovable character, an interesting and vivid conversationalist, and a kindly loyal friend to all his colleagues. Travel and fishing were his particular hobbies, which occupied his period of retirement. We looked forward to his periodic return to Canada from his travels, for we were assured of a most enjoyable evening hearing of his adventures in picturesque and lively descriptions of places and people he saw and met. He will be greatly missed by his many friends in Canada and abroad.

He received many honours. Elected to the Royal Society of Canada in 1921, he was president of Section III, 1924–25, received the Flavelle Medal in 1940, and was made LL.D. by the University of Alberta in 1933. He was a Fellow of the American Physical Society, the Acoustical Society, and a member of numerous engineering societies. He is survived by two sisters, Mrs. Mary E. Watts and Mrs. Margaret B. Horton, of Billerica, Mass., and three brothers, Dr. Hubert Boyle of New Bedford, Mass., George Boyle of Grand Falls, Newfoundland, and Albert S. Boyle of Edmonton; he never married.

D. A. KEYS

Mr. F. G. Simpson, C.B.E.

FRANK GERALD SIMPSON, who died on May 14, devoted a working life of fifty years to the study of Hadrian's Wall. By training an engineer, he was fired by the possibility of scientific study which the methodically designed Roman works seemed to offer to archæological investigation. His excavations, undertaken with a precision and clarity which surpassed and surprised all professional contemporaries, reduced the apparent confusion that often attends new discoveries to problems which seemed either simple or insoluble; for they revealed that