lagged inside; it was also equipped with heating and refrigerating plant controlled by thermostats and by fans for stirring the atmosphere. The instruments in their turn were surrounded by a further lagged cover with again a thermostatically controlled heating circuit inside. This first serious attempt at delicate temperature control under eclipse camp conditions had worked very successfully.

Mr. E. G. Williams spoke of the results obtained with the infra-red spectrograph. A composite plate had been used of special rapid panchromatic for 5800–6700 A., Agfa 800 for the 8000 region and Agfa 950 for the region beyond 9000 A. It had been intended to use Agfa 1050 for the region beyond 10,000 A., but though the plates were specially flown over from Berlin to Moscow they were no longer sensitive when the day of eclipse arrived and could not be used. They were, therefore, unable to secure the lines at 10,746·80 A., 10,797·95 A. recently reported by Iyot. They did get a line at 7591·3 A. in the coronal spectrum for which Curtis and Babcock in 1928 gave the wave-length 7896 A. and Iyot more recently from the Pic du Midi gave 7891·9 A. No trace was found of the line about 9609 A. to be expected if the coronal spectrum came from a doubly excited helium atom. In the chromospheric spectrum lines of the Paschen series were obtained, for the first time at an eclipse, from *P*4 to *P*17, and other lines were identified as due to He, O, Mg and Ca^+.

In the subsequent discussion Mr. J. Evershed, referring to Dr. Royds' excellent spectra, pointed out that to reduce his shifts from an arc in air to an arc *in vacuo* meant an increase of 0·003 A. and meant that the displacement at the limb was twice the predicted Einstein value. Prof. A. Fowler, in sympathizing with the Cambridge party on their failure, said that it was a magnificent failure. He was very much impressed by the mechanism of Dr. Redman's camera and with the very interesting and beautiful results he had obtained. He would also like to congratulate Mr. Williams on his infra-red spectra.

Obituary Notices

Prof. A. G. Perkin, F.R.S.

PROF. A. G. PERKIN died at his Leeds residence on May 30. Born at Sudbury, Middlesex, in December 1861, he was the second son of the late Sir William Perkin, brother of the late W. H. Perkin, jun., Waynflete professor of chemistry in the University of Oxford, and half-brother of the late Dr. F. M. Perkin, who was well known as a consulting chemist.

A. G. Perkin grew up in an atmosphere of chemistry and zeal for scientific investigation. His education was varied: he followed in his father's footsteps by attending the City of London School, and from 1877 until 1879 studied under Frankland and Guthrie at the Royal College of Chemistry, South Kensington, where he carried out the investigation leading to his first paper, "The Action of Nitric Acid on Di-*p*-tolylguanidine", communicated to the Chemical Society in 1880. He next spent a year at Anderson's College, Glasgow, under E. J. Mills, and finally a year in the Dyeing Department, Yorkshire College, Leeds, where he worked with J. J. Hummel on new compounds derived from the colouring matters of brazilwood and logwood. Perkin always paid generous tribute to the abilities and personality of Prof. Hummel, to whom he owed his first, and lasting, enthusiasm for the study of the natural colouring matters.

In 1882 Perkin left the Yorkshire College to take up an appointment as chemist at the alizarin factory of Hardman and Holden, Ltd., Manchester, and was promoted to the position of manager in 1888. During this commercial period he continued scientific investigations and published papers on the action of nitric acid on anthracene, and in collaboration with W. H. Perkin, jun., on derivatives of anthraquinone, and on the colouring matter of the Indian dyestuff, kamala.

Perkin resigned his position with Hardman and Holden, Ltd., in 1892 to join the staff of the Dyeing Department, Yorkshire College, as lecturer and research chemist. Then followed a period of more than twenty years of intensive research, mainly concerned with the isolation of the colouring principles of natural products and the investigation of their constitutions. The profound knowledge of natural colouring matters that he gained by his brilliant researches established his international reputation in this field. He examined numerous natural colouring matters by degradative methods, and in certain instances deduced their constitutions, many of which, for example, those of catechin, luteolin, gossypetin, quercetagetin, etc., have since been confirmed synthetically by other workers.

In later years, Perkin devoted more of his time to the chemistry of anthraquinone derivatives. A study of the migration of the acyl group in partially acylated phenolic compounds led to the synthesis of, *inter alia*, some hydroxyanthraquinone methyl ethers, originally isolated from the Indian natural dyestuff, chay root, but not hitherto obtained synthetically. The constitutions of numerous hydroxyanthranols were

established by conversion into corresponding benzanthrones and examination of the methylation products of the latter. The formation of hydroxyanthracenes, -dianthrones, -dianthraquinones, -dianthraquinonyls and -helianthrones also was investigated and the constitutions of these compounds established.

Perkin's original papers, including those published in the *Proceedings of the Chemical Society*, all of which did not appear afterwards more comprehensively in the *Transactions*, exceeded 270. He was also author of numerous articles on natural colouring matters in "Thorpe's Dictionary of Applied Chemistry", and, in collaboration with Dr. A. E. Everest, he published the classical monograph "The Natural Organic Colouring Matters" in 1918.

Perkin was elected a fellow of the Institute of Chemistry in 1887, a fellow of the Royal Society of Edinburgh in 1893, a fellow of the Royal Society in 1903, and was awarded the Davy Medal of the Royal Society in 1924. He was also a vice-president of the Society of Dyers and Colourists, and a member of the Biochemical Society, the Chemical Society, the Pharmaceutical Society, Society of Chemical Industry, the Textile Institute, and the Livery of the Worshipful Company of Leathersellers.

In 1916, Perkin succeeded A. G. Green as professor of colour chemistry and dyeing in the University of Leeds. During the Great War he carried out investigations for the Ministry of Munitions, and also directed the work on intermediates and synthetic dyes carried out by the colony of research chemists of British Dyes Ltd. in his Department.

During his professorship, Perkin did much to widen the fundamental education of his undergraduates and to enhance the reputation of his Department as a scientific training ground for recruits for the dyestuffs, dyeing and allied industries. The very large number of students who entered for courses in colour chemistry and dyeing in the immediate post-War years were attracted at least as much by the opportunity of working under him as by the popular appeal of these subjects at that time. His students were very successful in securing appointments on completion of their courses and most of them now occupy important positions in industry.

Perkin exerted a profound, but unobtrusive, influence on his colleagues and students. He was a very gentle man with a most charming and lovable personality. He did most of his work with his own hands, and it was a privilege to observe him at work in his laboratory. He was not only a great chemist in his generation, but also he was so imbued with a passionate zeal for unravelling the secrets of Nature that all who came in contact with him were inspired by his pioneering spirit.

On his retirement in 1926, Perkin was accorded the title of emeritus professor, and in 1927 the University of Leeds conferred upon him the degree of D.Sc., *honoris causa*. In fact, he never retired, for he continued to prosecute his researches without any interruption in the professor's laboratory in the Colour Chemistry and Dyeing Department of the University of Leeds until his health began to fail in February this year. At that time he was endeavouring to determine the constitution of a green vat dye which he had obtained some years previously by heating the hydroxylated anthranol, derived from alizarin, with tetrachlorothiophen and an alkylating agent.

Perkin was well known in the Isle of Man, for many years spending all vacations at his house at Port Erin, and he was a governor of King William's College. He was very fond of animals and took the greatest interest in his dogs, his pony and his tortoise. He also inherited a great love of music, and was an accomplished performer on the flute and bassoon; he was a leading member of amateur orchestras in Yorkshire. He married Annie, daughter of the late J. E. Bedford, of Leeds, who survives him. There were no children.

E. J. CROSS
F. M. ROWE.

Prof. S. H. Langdon, F.B.A.

THE study of Assyriology must nowadays be held to embrace, in principle, the whole of the archæology, history, culture and languages of ancient western Asia. In this immense field the labourers are still few, and no country can at present boast more than a handful of them. The loss of any one is therefore serious, since replacement, much less reinforcement, is problematical. That loss is the more sensible when so active a worker as Prof. S. H. Langdon, professor of Assyriology in the University of Oxford, is withdrawn by death, on May 19, at the early age of sixty-one years.

Since the boundaries of the study have been so vastly extended by recent discovery, it has become inevitable in Assyriology, as in other sciences, that a man should specialize. Langdon's chosen branch was Sumerian, the primitive language of Babylonia, virtually extinct by the end of the third millennium B.C., but of paramount importance as belonging to a people who have been revealed, time and again, as the originators of most of the vital elements in the whole pre-Hellenic culture of western Asia. At the time when Langdon was beginning his career, knowledge of this language had scarcely passed the stage of entire dependence upon the translations furnished in bilingual texts by late Assyrian scribes, while the scepticism of Halévy still preoccupied the minds of many. Some of Langdon's early work, however, was devoted to the Sumerian religious texts without Semitic translation which have survived in large numbers, and because of their great difficulty of interpretation still remain to-day among the obscurest parts of the literature written in cuneiform.

This observation is, of course, in itself a criticism of Langdon's achievement, for throughout his working life it was upon these texts that his abundant energy was mainly concentrated; editions of the originals and translations make up a large part of his bibliography, whereas few of his contemporaries cared to venture upon so hazardous a ground. But it must be owned that, in the editions, his copies were not always of the most reliable, and that he failed to detect this