Wellington (N.Z.) with a probable error of about ±0·05$^s$ in each case. He returned home through Europe, visiting many observatories on the way, and became a fellow of the Royal Astronomical Society in June 1904.

It seems relevant to recall that Lieut. H. N. Klotz, a nephew of Dr. Klotz, was killed in the Canadian charge north of Ypres on April 23, 1915. He was a graduate of Toronto University, and had been employed as a chemist with the Toronto Rubber Company.

H. H. TURNER.

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### PROF. J. HARKNESS.

WE regret to notice the death, in his sixtieth year, of Prof. James Harkness of McGill University, Montreal. Born at Derby, Harkness became a scholar of Trinity College, Cambridge, and graduated as eighth wrangler in 1885. After five years at Bryn Mawr College, Pennsylvania, as associate professor and professor of mathematics, he accepted, in 1903, the Peter Redpath chair of pure mathematics at McGill, and resigned it in 1913. He was formerly vice-president of the American Mathematical Society and assisted in editing the Society's Transactions. The degree of LL.D. was conferred on him by McGill in 1921.

Harkness is mainly known in England as the author, jointly with Prof. Frank Morley, of a treatise on the theory of functions of a complex variable (1893) and an introduction thereto (1898). These books, which aim at giving the fundamental ideas at the basis of the subject and avoid all intricate details, provide much the best introduction to the subject that has yet appeared in English. Harkness also collaborated in compiling the section on elliptic functions in the "Encycl. d. math. Wissenschaften." Since 1909 he was a fellow of the Royal Society of Canada and contributed papers on function theory to that Society's Transactions.

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### MR. LELAND L. DUNCAN.

WE regret to record the death of Mr. Leland Lewis Duncan, the Kentish antiquarian. The field in which he was perhaps best known to the public was that of medieval archæology and ecclesiology, subjects on which he wrote extensively. He specialised in the history of the parish of Lewisham ; but while he gave much attention to local historical problems generally, the principal subject of his investigations was the parish church, particularly in the medieval period. Apart from the work of actual investigation, he did a great service to archæology in founding the Lewisham Antiquarian Society in conjunction with Sir Edward Brabrook, Canon Legge, afterwards Bishop of Lichfield, and others. He thus continued the work which had been begun some years before by Sir Flinders Petrie, and, with other members of the Society, did much to promote the investigation of the early and medieval history of south-east London and the adjacent area of Kent on thoroughly scientific lines.

Mr. Duncan also engaged in many investigations outside the Lewisham area in Kent generally, devoting himself particularly to church records and inscriptions, and to wills, subjects upon which, it was widely recognised, his knowledge was both extensive and intimate. His researches were embodied in numerous papers, many of them appearing in *Archæologia Cantiana*, and he was engaged in the preparation of an important treatise on Kentish wills at the time of his death. In his own special sphere of work, Mr. Duncan was regarded as an authority of high standing ; but apart from that, his scholarship and accuracy set a standard in medieval research which has reacted to the advantage of archæological studies throughout the whole of south-east England. His position as an antiquarian was recognised by his admission to the Society of Antiquaries so long ago as 1890.

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## Current Topics and Events.

OUR Supplement this week is of particular interest to observers of the sun, inasmuch as it throws light not only on the somewhat restricted subject indicated by its title, but also on the general problem of the sun's constitution. From the time of Galileo onwards, sun-spots have been almost universally regarded as the most promising key to the solution of this problem, though it was not until Dr. Hale's great discovery of 1908 that this instinctive idea was shown to be justified. We are still far from the whole truth in this matter, but it is the surest sign of progress that a large field, formerly the scene of speculation only, is now thrown open to experimental investigation. Speculation in some instances came very near what is now more confidently believed to be the truth. As Dr. Hale points out, Sir John Herschel and Faye proposed theories of sun-spots almost identical with the view which he himself puts forward, so far as mechanical action is concerned, but the difficulties of reconciling such theories with observation led practically all experienced observers to reject them. It might be added that Herbert Spencer came still nearer to the modern view : not being an observer, he

was possibly less susceptible to the difficulties which his contemporaries felt so keenly. The fact which has just come to light, that there is a reversal of polarity in sun-spots (though not in the general magnetic field of the sun) on passing from one cycle to another, is perhaps the most remarkable of the many discoveries which Dr. Hale recounts. We may now, as he indicates, have to deal with a solar period of about 22 instead of 11 years ; and if so, the close coincidence between this period and that of Jupiter's revolution round the sun will no longer exist to suggest, as it has done in the past, that sun-spots may be attributable to planetary action. Of great interest also is Dr. Hale's statement that the vortices represented by the hydrogen (Hα) flocculi, which first led him to search for magnetic fields in spots, are apparently secondary phenomena, and that the vortices which give rise to the magnetism seem to lie beneath the photosphere and to have directions independent of those of the hydrogen flocculi. He is of opinion that the dominant electric charge in all *spot* vortices is of the same sign, and that opposite polarities represent opposite directions of whirl.