PROCEEDINGS

OF

THE ROYAL SOCIETY.

May 1, 1879.

THE TREASURER in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

In pursuance of the Statutes, the names of the Candidates recommended for election into the Society were read from the Chair, as follows:—

Prof. John Anderson, M.D.
Rev. Miles Joseph Berkeley, F.L.S.
Henry Bessemer.
Prof. Alexander Crum Brown, M.D.
Walter Lawry Buller, Sc.D., F.L.S.
George Howard Darwin, M.A.
Prof. Joseph D. Everett, M.A., D.C.L.
Prof. Francis Stephen Bennet François de Chaumont, M.D.
Prof. George Downing Liveing, M.A.
George Matthey, F.C.S.
George John Romanes, M.A., F.L.S.
Arthur Schuster, Ph.D., F.R.A.S.
Prof. Harry Govier Seeley, F.L.S.
Benjamin Williamson, M.A.
Thomas Wright, M.D., F.G.S.

The following Papers were read:—

I. "A Magnetic Survey of the Fortieth Parallel in North America between the Atlantic Ocean and the Great Salt Lake, Utah." By T. E. THORPE, Ph.D., F.R.S., Professor of Chemistry, Yorkshire College, Leeds. Received March 25, 1879.

(Abstract.)

This communication contains the results of a series of observations of the three magnetic elements—dip, intensity, and declination—made

along the 40th parallel in North America between the Atlantic Ocean and Salt Lake City. Magnetic observations have been made, with more or less assiduity, at different places in the eastern States for many years past; but of the immense tract of country lying between the Mississippi and the Pacific Ocean there is only a single determination of one of the three elements indicated on Sir Edward Sabine's maps, viz., a determination of declination at Salt Lake City. A series of observations was made some years since by United States' officers along the Mexican frontier, and a similar series was carried out by the English and American officers employed on the North American Boundary Commission. The present set of observations was made, therefore, along the district which lies midway between the line of observations already run along the northern and southern boundaries of the United States' territory.

The instruments employed formed part of the admirable magnetic equipment belonging to Owens College, Manchester, and were kindly placed at the disposal of the author by the Council of the College. At the commencement and end of the survey a complete series of observations was made at Kew, which was adopted as a base station; and a similar set was made at Washington in the magnetic observatory belonging to Mr. Charles A. Schott, of the United States' Coast Survey Department, with a view of obtaining an independent check on the indications of the instruments. The author learned from Mr. Schott that the Coast Survey Department is gradually accumulating data for a discussion of the magnetic history of the American continent. It has already published a map of declination for 1870, from which it is evident that much has been done in the determination of this particular element since the date of Sir E. Sabine's memoirs, more especially along the Pacific slope, and in the regions to the west and south-west of the Great Salt Lake. As yet, however, no observations have been published relating to any of the districts west of the Mississippi visited by the author.

II. "On certain Definite Integrals occurring in Spherical Harmonic Analysis, and on the Expansion in Series of the Potentials of the Ellipsoid and of the Ellipse." By W. D. Niven, M.A., Fellow of Trinity College, Cambridge. Communicated by J. W. L. Glaisher, M.A., F.R.S. Received April 3, 1879.

(Abstract.)

1. The object of this paper is to explain a general method of calculating a class of integrals connected with the expansion of functions in spherical harmonic series.