

a more permanent and comparative character are necessary, before a system founded on general laws can be framed. For the purpose of obtaining the absolute value of the magnetic elements, fixed magnetic Observatories, under the control of attentive observers, become indispensable, and through them the nature of all magnetic disturbances, and the causes of those perturbations of the magnetic elements which occasionally occur, may, by means of simultaneous and systematic observations, both as to time and as to instruments, be possibly discovered. On the continent of Europe, establishments for the accomplishment of these objects have been formed; but in Britain individual zeal alone was engaged in the inquiry, until 1836, when the attention of her philosophers was more specifically drawn to the subject, by a letter from Baron Humboldt to the late Duke of Sussex—an appeal which was met with every respect and consideration.

In 1837, the University of Dublin, at the instance of Dr. Lloyd, established an Observatory for all researches connected with terrestrial magnetism and meteorology; the same year the Government allotted a site for a similar establishment at Greenwich, to be placed under the control of the Astronomer Royal, and shortly afterwards a third was established at Kelso, in Scotland, at the private expense of Sir Thomas M. Brisbane, Bart.

The British Association for the Advancement of Science commenced in 1834 a magnetic survey of the British Islands, which was completed on its own responsibility in the two following years. The result was published in its annual report of 1838, and the work was followed up in other countries at the expense of their respective governments. In 1838, on consideration of a report made of the progress of the researches regarding the geographical distribution of the magnetic forces on the surface of the globe, the British Association called upon the Government to aid the prosecution of the inquiry in more remote parts of the earth, and, in consequence, a naval expedition was equipped in 1839, for a magnetic survey of the higher latitudes of the southern hemisphere. The Association, at the same time, recommended that similar magnetic, and also meteorological researches, should be accomplished by fixed Observatories at certain stations of prominent magnetic interest within the limits of the Colonies,—Canada and Van Dieman's Land, as approximate to the points of the greatest intensity of the magnetic forces in their respective hemispheres—St. Helena, as approximate to the point of least intensity on the globe, and the Cape of Good Hope, as a station where the secular changes of the magnetic elements were peculiarly interesting, were named; and it was suggested that the Observatories should be placed under the superintendence of the Board

of Ordnance, and its military corps. This recommendation, having been strengthened by the support of the Royal Society, was acceded to by the Government; and under the direction of a Committee of the Royal Society, the necessary instruments were prepared, and a code of instructions relating to their use and objects drawn up, published, and subsequently modified. The Antarctic expedition was entrusted with the charge of the Observatory at Van Dieman's Land during its first two years' operations, and the other three were each placed under the management of a lieutenant of artillery, with whom was united three (afterwards four) non-commissioned officers, and two gunners, to all of whom increased allowances were made. The sum of £100 for each Observatory was allotted for incidental expenses, making the total charge for each about £392 per annum.

The officers appointed to the charge of the Observatories were ordered to Dublin, to receive instructions in the manipulation of the instruments in the Observatory there, which were similar to those ordered for the Colonies; and in autumn, 1839, they quitted England for their respective destinations. The officer appointed to Canada was Lieutenant C. J. B. Riddell, who, being obliged to return to England in February, 1841, in consequence of ill-health, was temporarily succeeded by Lieutenant Younghusband, who acted until the arrival of Lieutenant Lefroy in September, 1842. The latter officer proceeded in April, 1843, on a magnetic survey within the Hudson's Bay territories, and was succeeded, *de novo*, by Lieutenant Younghusband, who continued in charge to nearly the end of 1844.

The observations made at the Colonial Observatories having, according to instructions, been forwarded in monthly reports to the Ordnance, were, at the request of the Royal Society, ordered by the Treasury to be reduced and published, under the superintendence of Lieutenant Colonel Sabine, assisted by Lieutenant Riddell, and four military clerks, who were non-commissioned officers of the Royal Artillery.

The results which have already been laid before the public, consequent on these arrangements, have been the publication—Firstly, of the magnetic observations made by the Antarctic expedition on its passage to Kerguelen Island, and during the first and second years of its operations at sea, within the Antarctic circle, and printed at the expense of the Royal Society, in the *Philosophical Transactions* respectively for 1842, '43, and '44; 2dly, Of observations made in 1840 and '41, at the Observatories, and by the expedition, on days of unusual magnetic disturbance, for comparison with each other, and with similar observations made simultaneously in different parts of the globe, printed by the Government in 1843;