

magnetic survey of Egypt and the Sudan. It was intended also, should time permit, to make observations in German South-west Africa.

These proposals met with the approval of the trustees of the Carnegie Institution, and they allocated a sum of 2000*l.* for the work. In the first instance the proposals contemplated only one field-party with one observer; later, however, the writer modified his plan so as to include a second observer, in the hope of being able to have two field-parties. At his suggestion the Department of Terrestrial Magnetism in Washington appointed Prof. Morrison as second observer. The additional money necessary was provided by the Government Grant Committee of the Royal Society (250*l.*), and by Dr. L. S. Jameson and Sir Lewis Michell (100*l.*)

The work began at the end of November, 1908, when the writer left Ceres Road, in the Cape Colony, for Windhuk, in German South-west Africa. This journey lasted four months. During February and March of 1909 Prof. Morrison made observations along the railways in the northern part of the same region.

In April, 1909, repeat observations were made in Cape Colony and in Rhodesia, and Prof. Morrison also made observations between the Victoria Falls and Broken Hill, the then terminus of the Beira and Mashonaland Railways.

The two observers left Broken Hill in the beginning of May, and marched to Abercorn *via* Fort Rosebery. After Broken Hill the only means of transport was by porters; one set of instruments was carried from there more than 2000 miles, the other more than 1400, the whole distance being accomplished without mishap to any of the instruments.

At Abercorn the observers separated: Prof. Morrison proceeded to the northern end of Lake Nyasa, then down the Nyasaland plateau and the Shiré and Zambezi valleys to Chinde; from there he went by sea to Dar-es-Salaam, and made observations between it and the terminus of the railway which goes from that place inland. He was able to secure a number of observations which will be of great value for determining the secular variations of the magnetic elements in that part of the world. Finally, he made a number of observations along the Uganda Railway from Mombasa to Port Florence.

The writer went overland from Abercorn to Bismarckburg, a German station on the south shore of Lake Tanganyika. From there he marched to Tabora, an important town in German East Africa; observations could not be made along the shores of Tanganyika, as he had originally intended, because the steamer had temporarily ceased to run—the two white men on it, the captain and the engineer, having contracted sleeping sickness. From Tabora he journeyed overland to Bukoba, a German port originally founded by Emin Pasha, on the west shore of Victoria Nyanza; the march was continued along the west coast of that lake to Entebbe. At the latter place he found it was impossible to take the usual overland route to Gondokoro, on account of sleeping sickness; his caravan had to go *via* Albert Nyanza, and there he conveyed forty-five miles from Butiaba to Koba. The end of the porter transport was reached at Gondokoro, just a little more than 2000 miles from Broken Hill by the route followed. The work was brought to a close by the two observers once more meeting at Cairo, and comparing their instruments with those at Helwan and, finally, with those at Kew.

In addition to the observations taken along the routes mentioned above, a number of stations previously worked at in Cape Colony, the Transvaal, Natal and Zululand were again occupied in 1908; the cost of this was defrayed by a grant from the Royal Society (25*l.*) In all about 360 new stations were

occupied, mainly in regions which formerly were known magnetically only slightly or not at all.

The instruments used for the above observations were the same as in the earlier work in South Africa (1898-1906), and were lent to the writer by the Royal Society, the Royal Observatory of the Cape of Good Hope, and the South African College. By means of the repeat observations, the results obtained in 1909 and in previous years can be reduced to the same standard; and, further, through the comparisons at Helwan and at Kew, can be compared with much that has been done in recent years in other parts of the world.

While making the preliminary arrangements for the journey, the writer received great assistance from the Governor of the Colony of the Cape of Good Hope, Sir Walter Hely-Hutchinson, who communicated with the authorities of the various territories it was proposed to survey, and obtained permission for the observers to enter them, and to enjoy while there special privileges.

In German South-west Africa the authorities allowed the observers to travel free of charge over the Government railways; the same facilities were given by the Cape, the Central South African, the Natal, the Rhodesian, and the Uganda railways; the writer had valuable concessions while travelling in the Sudan and on the Egyptian Government steamers and railways.

In addition to these facilities, the courtesy and hospitality of the English and the German officials did much to relieve the tedium and strain incident to work of this nature in such circumstances. The writer feels that a formal recognition such as this is but a poor return for the help so willingly and generously accorded.

In conclusion, it gives the writer great pleasure to have the opportunity of thanking Mr. R. S. Woodward, the president of the Carnegie Institution, and Dr. L. A. Bauer, director of the Department of Terrestrial Magnetism of that institution, for their advice and encouragement during the progress of the work, and in particular to thank the latter for the great interest he has taken in the reduction of the results, a work which is being carried out at Washington under his direction.

J. C. BEATTIE.

#### SIR ROBERT GIFFEN, K.C.B., F.R.S.

THE sudden death of Sir Robert Giffen on the morning of April 12, while on a tour in Scotland accompanied by Lady Giffen, is a great loss to economic and statistical science. He joined the Statistical Society in 1867, at the age of thirty, having then already acquired reputation as a writer on financial subjects in the *Globe*, the *Fortnightly Review*, the *Economist*, and the *Spectator*. He was elected a member of the council and one of the secretaries of the society in 1876, in which year he joined the Civil Service, and was appointed chief of the Statistical Department of the Board of Trade, and one of the delegates of the Government of England to the International Statistical Congress at Buda-Pest. He submitted to that congress "Considérations sous Forme de Tableaux pour la Préparation d'une Statistique internationale des Chemins de Fer," and was appointed a member of the permanent committee. To the Social Science Congress at Liverpool, in the same year, he contributed a paper on the causes and effects of the depreciation of silver, how far is it an evil, and what are the means of remedying the evil? In his official capacity, he devoted himself with zeal to rectifying and harmonising governmental statistics, and to diminishing the overlapping and cost of parliamentary returns. For example, he pointed out that the statis-

tics of emigration were vitiated by the omission of any deduction in respect of the return of persons temporarily leaving the country; and he induced the Government to appoint a committee to consider the whole question of official statistics.

In 1878 he read before the Statistical Society an important paper on recent accumulations of capital in the United Kingdom, which is an excellent example of the comprehensiveness and accuracy of his statistical methods, and of his faculty of drawing trustworthy inferences from materials that at first sight appear insufficient. Great as was the increase of wealth which he had to record, he was sanguine enough to hold that it would be the fault of the English people if their progress were not in future even more rapid than in the past, and his forecast has been verified. In the same year he took part in the foundation of the *Statist* newspaper, and was the delegate of the Government to the International Statistical Congress at Paris.

In 1879 he contributed to the Statistical Society a treatise on the fall of prices of commodities in recent years, and undertook the duty of editor of the society's journal. The Treasury committee on statistics made its report, to which was appended an important memorandum by Sir Robert Giffen on the compilation and printing of the statistics of the United Kingdom. In 1882 he read a paper to the Statistical Society on the use of import and export statistics, and was elected president of the society. His inaugural address was on the utility of common statistics. In the following year the University of Glasgow, of which he had been a student, conferred upon him the degree of Doctor of Laws. His inaugural address to the Statistical Society for that year was on the progress of the working classes in the last half-century. It is characteristic of his thorough devotion to any duty which he undertook that he was present at every meeting of the society held during his presidency. In the year 1884 he was elected a member of the Athenæum club under the rule which enables the committee of the club to confer that honour on persons distinguished in literature or the arts or for public service. In 1885 he contributed to the Statistical Society's jubilee volume a paper on some general uses of statistical knowledge; and, in the following year, read to the society further notes on the progress of the working classes. In 1887 he was nominated by the International Statistical Congress at Rome as the English member of a committee on standards of value; and in the same year he was appointed by the British Association president of the section of economic science and statistics (section F) for the meeting at Manchester, and delivered an address on the recent rate of material progress in England. He also took part in the proceedings of a committee of the association appointed to investigate variations in the value of the monetary standard, and in the following year drew up the report of that committee. He afterwards became its chairman.

In 1890 Sir Robert Giffen took part in the formation of the British Economic Association, now the Royal Economic Society, and became a vice-president of it. In 1891 he was created a Companion of the Bath, and in 1892 elected a Fellow of the Royal Society. In 1894 the Royal Statistical Society (as it had then become) paid him the well-earned compliment of awarding him their Guy medal in gold as a recognition of his great services. In 1895 he took the second step in the ladder of the Order of the Bath, being promoted to the dignity of Knight Commander, and in 1897 he retired from the public service after a career of great usefulness and distinction, having taken a large share in the creation and development of the labour, commercial and statistical depart-

ments, of which he was the first controller-general. In 1900 he was elected president of the Manchester Statistical Society, and delivered an address; and in 1901 the British Association appointed him, for the second time, president of section F, and he delivered an address at Glasgow on the importance of general statistical ideas.

His separate published works were:—"American Railways as Investments" (1872), "Stock Exchange Securities" (1877), "Essays in Finance" (3 editions), "The Case against Bimetallism" (2 editions), "Economic Inquiries and Studies" (2 vols., 1904).

This formal record of a life spent in the study of subjects usually thought to be dry and uninteresting would not be complete if it were not supplemented by the statement that in personal character and private life he was one of the most genial of men.

#### NOTES.

THE eighteenth "James Forrest" lecture of the Institution of Civil Engineers will be delivered at the institution on Wednesday, June 22, at 8 p.m., by Sir John Gavey, C.B., his subject being "Recent Developments of Telegraphy and Telephony."

A REUTER message from Washington states that the proposed American Antarctic expedition under the joint auspices of the Peary Arctic Club and the National Geographic Society has been abandoned for this year on account of lack of funds.

WE learn from *Science* that Prof. R. P. Whitfield, curator in the American Museum of Natural History since 1877, and the author of important contributions to palæontology and geology, died on April 6, at the age of eighty-two years.

THE death is announced, at sixty-one years of age, of Dr. C. B. Plowright, formerly professor of comparative anatomy and physiology at the Royal College of Surgeons, and the author of a standard work on fungi.

M. DE MONTEFIORE, we learn from the *Revue scientifique*, has given 150,000 francs to the Paris Academy of Sciences to create a new triennial prize of 12,500 francs to assist the progress of electrical science.

IT is announced in the *Times* that a National College of Agriculture is soon to be established in Pretoria. General Botha has promised to set aside 100,000*l.* as a first instalment for the execution of the project, and the Town Council has unanimously decided to give the Government the whole of the town lands of Groenkloof as a site. The area comprises 3681 acres, and contains arable and pasture lands as well as a large plantation.

THE Geological Society of France has this year awarded its Danton prize to M. Gosselet. The prize is given to the geologist whose discoveries are likely to benefit industry most, and was awarded to M. Gosselet for the part he has taken in the development of coal-mining in the north of France. The Viquesnel prize, intended to encourage geological research, has been awarded to M. Robert Douvillé for his stratigraphical work on the geology of Spain and his palæontological researches on the foraminifera and ammonites.

THE Geologists' Association has arranged a Whitsuntide excursion to Swanage, Lulworth Cove, and Bournemouth from May 14-18. The party will leave Waterloo on Friday, May 13, at 4.10 p.m. The excursion to Lulworth Cove will be carried out only if the sea is calm, and