resistance above 30,000 would not be a singular case. I could tell something of galvanometers of 1869, comparable only to submarine cables of 1857. I refrain:—but let makers of galvanometers, Ruhmkorff coils, and electromagnets beware; surely NATURE will find them out if they do not reform before 1872. W. THOMSON

THE GAUSSIAN CONSTANTS OF TERRESTRIAL MAGNETISM

I THINK you will be doing good service to the cause of Natural Science by giving insertion in your valuable pages to the following translation of a notice which appeared in No. 1,825 of the *Astronomische Nachrichten* (Vol. 77, p. xi), on the subject of Prof. Petersen's recomputation of the Gaussian Constants of Terrestrial Magnetism, in aid of which the British Association at their last meeting voted a grant of money. It has been communicated to me by Prof. Erman of Berlin, who, in reference to the grant in question, writes as follows:—"This new act of British generosity would in other times have scarcely needed a special mention, being equalled by so many former ones of the same kind; but in the present moment, when the raging war makes petty jealousies spring up between our two befriended [friendly] nations, it is a most sacred duty to publish the fact of two Prussians having found in England a most generous and most wanted help for their scientific endeavours."

Mr. Petersen's calculations are progressing in a very desirable manner, and he hopes fully to bring them to their end (D.V.). J. F. W. HERSCHEL

Collingwood, Jan. 21

TRANSLATION

"We learn by a communication from Prof. Erman that M. Petersen, of Kiel, has undertaken to extend his great work on Terrestrial Magnetism, so as to afford for the whole earth, and for the epoch 1829, a *Fundamental Determination of the Potential Constants*, which, according to laws yet unknown, are subject to secular variation. From the knowledge of these fundamental values so obtained by the researches of Erman and Petersen, will then come to be securely connected, as a second step in advance, the determination of the laws of secular change. Since, however, the material obstacles to so laborious a work, with whatever personal devotion, would have proved insurmountable without public aid, it becomes our duty most gratefully to announce that such aid has been granted from the same quarter which afforded it to the earliest portion of this undertaking. The British Association for the Advancement of Science, at its last annual meeting, has appointed a committee, consisting of Sir J. Herschel and Prof. A. Erman, for the purpose of engaging M. H. T. R. Petersen to prosecute the continuation of his computations of the constants in question for 1829, so as to embrace all observations not included in the previous calculations, and to this end has placed a sum of 50*l.* at their disposal.

"In pursuance of this object Prof. Erman addresses to the readers of this notice his request for the communication of citations of, or references to, works and treatises or essays in which may be found recorded measured values for any station of the globe, of the magnetic *declination*, *inclination*, and *intensity* during any portion of the last ten years, as also any researches on the annual variations of these elements at determinate stations. Of course it is not meant to call for even an approximately complete catalogue of works of this kind, to furnish which would of itself require no small amount of labour. But many astronomers [and others] must have access to a variety of journals, accounts of travels, records of measures and observations, &c., which may not have come under the notice of Messrs. Erman and Petersen,

notices of which, communicated to the Editor of the *Astronomische Nachrichten* * in the form of a letter, with a postscriptum or memorandum such as:—Magnetic Observations for 18 . . . are to be found in . . . Volume . . . page . . . are requested."

ACCOUNT OF THE AUGUSTA ECLIPSE EXPEDITION

IN consequence of the unfortunate wreck of the *Psyche* on a sunken rock on the coast of Sicily, about nine miles north of Catania, the arrangements of the Sicilian Expedition were considerably modified. Catania was made the headquarters of the expedition, and the garden of the Benedictine Monastery was given up by the authorities of the city to the English and American observers. It was finally arranged that Prof. Roscoe should take charge of the Etna Expedition, and I was asked by Mr. Lockyer to take charge of the Expedition to Augusta. Mr. Brett, Mr. Burton, Mr. Clifford, Mr. Ranyard, Mr. Samuelson, and myself formed the party.

It was also arranged with Mr. Ranyard at Catania, that on the morning of the 22nd, he and another of our party should drive some miles up from Augusta in the direction of the hills of Carlentini, to observe the Eclipse. At Augusta we were to live in camp, and Colonel Porter, with a body of sappers, had been landed there by the *Psyche* on her way to Naples.

Mr. Brett and Mr. Ranyard went first to Augusta to make arrangements with Colonel Porter for our encampment and observatory, and they met with every assistance from the Syndic of the City of Augusta, and were very kindly received by the Italian astronomers, among whom were Prof. Cacciatores, Prof. Donati, Father Secchi, and Father Denza, who were stationed inside the fort. Our encampment, and a wooden observatory sixty feet long, were pitched on the southern slopes of the glacis of the fort, with a full view of the sea to the east.

I cannot speak too highly of the way in which Colonel Porter exerted himself to make all arrangements satisfactory and complete, and even to introduce elements of comfort into our camp life; and the energetic way in which his men carried out his instructions is beyond all praise. Up to Monday the 19th, the terraces of the Monastery at Catania were made the general practising ground, and those who were to observe for polarisation, except Mr. Ranyard, who was at Augusta, tested and compared their instruments for rapidity of correct observation, and for delicacy.

For my own telescope I had two eye-pieces, one with plates of double-rotating quartz, and the other with a Savart polarimeter. When the polarisation was not very strong, I found the polarimeter more delicate than the bi-quartz for detecting the plane of polarisation, and with it I was able to measure the amount of polarisation readily. On observing the same points with Mr. Griffiths, who also used a Savart polarimeter, we found that in from ten to fifteen seconds we could determine the plane and amount of polarisation, and in some cases we found that our readings for both were absolutely identical.

At about 6.30 on Monday evening, and again soon after 7 o'clock, when Mr. Clifford and I were on the sea on our way to Augusta, we saw a brilliant display of the zodiacal light, consisting of brilliant pink streamers, stretching up perpendicularly to the horizon, the planet Jupiter being just on the most brilliant streamers. Towards the north and round the horizon there were also streamers and a faint hazy light, and the sky became covered with a pinkish mauve colour. One of these displays was also seen by the rest of our party at Augusta.

As the evening grew darker, there was strong phosphorescence on the sea. The drops scattered by the oar as it struck the water glowed with phosphorescent light, and the forms of the eddies, caused by the bending of the oar, were distinct and brilliantly illuminated.

* Prof. Dr. C. A. F. Peters, Direktor der Sternwarte in Altona.