

*I have.* A copy was sent to Messrs. Groombridge in support of certain claims on my views about the stars. Let me hasten to assure Prof. Reynolds that, as he surmises, the views expressed in this very scarce treatise bear not the remotest resemblance to his.

I read several weeks ago Prof. Reynolds' interesting paper, the views expressed in which are, in a general way, similar to those I advocated in a paper entitled "Strange Discoveries respecting the Aurora" in *Fraser's Magazine* for February 1870. As it was quite clear to me, however, that Prof. Reynolds' views had been formed quite independently, it seemed wholly unnecessary to comment on that resemblance. I could only rejoice that so competent an authority should have been led to conclusions agreeing in general so satisfactorily with those I had deduced; and also, be it noted, with the results of the observations made on the recent eclipse.

RICHARD A. PROCTOR

#### Browning's Spectroscope

A LETTER from Mr. Browning, in the number of *NATURE* for December 15th, has just come to my notice, and seems to require a word from me. I regret exceedingly that he should have supposed that I intended to imply that he had committed any impropriety in employing in his own automatic combination an arrangement of Mr. Rutherford's from a spectroscope which was not automatic. I did not "go out of my way" in making the allusion, but only stated what I supposed to be a fact, in order to show that the proposed arrangement of radial bars was good and practicable, having already been endorsed by most eminent authority.

At the time when the article was written, Mr. Browning had but recently published the account of his instrument, and, of course, I knew nothing about its earlier history.

On the other hand, a full description of Mr. Rutherford's arrangements with an illustrative figure had appeared in *Silliman's Journal* in March 1865, more than four years earlier. This article is dated December 10, 1864, and will be found in the *Journal* referred to: vol. xxxix., p. 129.

Possibly the tone of my allusion may have been unintentionally affected by the fact that I supposed that Mr. Browning had seen this article. In common with many other Americans, who have spoken to me about it, I thought it singular that, in describing his own instrument, he made no reference to Mr. Rutherford, and am very happy to find him blameless in the matter. At the same time, I think he has no ground of complaint against me for referring to the arrangement as "first devised by Mr. Rutherford, and since adopted by Mr. Browning;" although, if I were to write the sentence again with my present knowledge of the facts, I should put it quite differently.

Let me add also that, having seen the instrument to which Mr. Lockyer refers in his note, I cheerfully concede to him the priority in respect to the use of an elastic spring, and the half prism at the beginning of the train, as well as the idea of sending the light twice through the train by a right-angled prism at its extremity. As he has never published an account of his instrument, however, I suppose I can hardly be held blameworthy for re-inventing it, and publishing it myself. Without one unkindly feeling the words of the old poet still sometimes come to mind, "*Fereant qui ante nos nostra dixerint.*"

The magnetic record at Greenwich shows a well-marked disturbance of all the elements precisely simultaneous with the eruption observed on the sun's disc September 28th. The declination was affected to the extent of five minutes of arc, and the disturbance was compounded of two waves, following each other, and partly superposed, probably corresponding to the ejection of the two masses of protuberance-matter which are shown in the figures.

C. A. YOUNG

London, Jan. 21, 1871

#### St. Mary's Hospital

I SEE in this week's *NATURE* the announcement that Dr. Wood has been appointed Lecturer on Chemistry at St. Mary's Hospital Medical School. This is an entire mistake; no appointment has yet been made, since Dr. Russell will continue to hold the post until the end of the Winter Session. The vacancy has not therefore actually occurred yet, although it will be declared shortly, and a fresh appointment made in due course.

W. B. CHEADLE,

Dean of St. Mary's Hospital Medical School

Jan. 20

[We were misled in making the announcement referred to above by our contemporary the *British Medical Journal*.—ED.]

#### IMPROVEMENT OF GEOMETRICAL TEACHING

A CONFERENCE was held at University College, London, on Tuesday, the 17th inst., to take this subject into consideration, and to form an Association for the improvement of geometrical teaching throughout the United Kingdom.

Previous to the meeting a large number of head and mathematical masters and others interested in the subject had given in their adhesion to the principles upon which it was proposed to form the Association. These included representatives of the following important schools:—Winchester, Eton, Harrow, Rugby, Charterhouse, Christ's Hospital, Marlborough, Wellington, Clifton, Uppingham, Sherborne, Birmingham, Dulwich, University College School, London, Repton, Durham, Manchester, King William's College, Isle of Man; Tiverton, Taunton, Leeds, Huddersfield, Nottingham, Yarmouth, Windermere, Mill-hill School, Middlesex, Middle Class School, Cowper Street, Middle Class School, Bedford, the majority of whom were present at the Conference. The movement was further supported by Dr. Hirst, F.R.S., of London University, Mr. W. Spottiswoode, F.R.S., president of the London Mathematical Society, Mr. C. W. Merrifield, F.R.S., Principal of the Royal School of Naval Architecture, South Kensington, and others.

Dr. Hirst, the president, took the chair, and resolutions were passed bearing upon the organisation and future working of the Association. It was proposed to invite the mathematicians of the country to prepare syllabuses of elementary geometry, embodying their views of the principles which should be adopted in any new text-book which is to supersede Euclid. Further particulars may be obtained by application to Mr. R. Levett, honorary secretary, King Edward's School, Birmingham.

#### A HINT TO ELECTRICIANS

MR. MANCÉ'S method for measuring the internal resistance of a single galvanic element or battery, communicated to the Royal Society at its meeting of last week, and the modifications of Wheatstone's bridge suggested by myself for finding the resistance of a galvanometer coil from the deflection of its own needle, supply desiderata in respect to easy and rapid measurement, which have been long *felt* by telegraph electricians and *needed* by other scientific investigators and by teachers of science. Year after year the latter, in their arrangement of batteries, electrodes, and galvanometers, have darkly and wastefully followed the method which from workmen we learn to call rule of thumb; while the former, with admirable scientific art, measure every element with which they are concerned, in absolute measure. How many physical professors are there in Europe or America who could tell (in millions of centimetres per second) the resistance of any one of the galvanometers, induction coils, or galvanic elements which they are daily using? How many of them, in ordering an electro-magnet, require of the maker that the specific resistance of the copper shall not exceed 16,000 (gramme centimetre-seconds)? How many times have eight Grove cells been set up to produce a degree of electro-magnetic effect which four would have given, had the professor exacted of the instrument-maker the fulfilment of a simple and inexpensive scientific condition, as submarine telegraph companies have done in their specifications of cables? If every possessor of an electro-magnet were to cut a metre off its coil, weigh the piece, measure its resistance, and send the result to *NATURE*, and if every maker of Ruhmkorff coils would do the like for every coil of copper wire designed for his instruments, a startling average might be shown. And what of the items? I venture to say that (provided the instruments of the great makers are not excluded) specific

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,

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

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. Cacciatore, 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.