

which easily crumbles into dust. The cock bird perched himself on the tree over my head, and began pecking with wonderful rapidity at this lichen and moss, so that, the moment I looked up, a shower of fine dust fell on my face. As I followed the young bird, the old one followed me, got on a branch as close to my head as he could, and sent a shower of dust down upon me. I can scarcely doubt that the dust, like the previous swoops, was intended rather to blind me than to distract my attention. Have instances of like sagacity—*i.e.* the apparent knowledge of the organ of vision and the means of injuring it—been noticed in jays before? KARL PEARSON

Saig, Schwarzwald, July 14

Munro and Jamieson's Electrical Pocket-Book

As Mr. A. Gray's criticism of our "Pocket-Book" is chiefly confined to literal errors practically unavoidable in a work of the kind, we take the opportunity of stating that we have lately been correcting these for the second edition, which, we are happy to say, has already been called for.

J. MUNRO AND A. JAMIESON

I OBSERVE that in my article in the last number of NATURE the third sentence of the third paragraph of p. 263, beginning "In the particular case, &c.," should have the words "corrected for the heat of combination of copper oxide and sulphuric acid" inserted after the word "this." A. GRAY

Glasgow, July 21

THE GREELY EXPEDITION

SUCCESS has at last attended the efforts to rescue the expedition to Lady Franklin Bay under Lieut. Greely; but, alas, out of the twenty-five men who started three years ago nineteen have perished. The party had left their station, Fort Conger, in August last, but did not succeed in getting further south than Cape Sabine, in Ellesmere Land, at the entrance to Smith Sound, about 150 miles from Lady Franklin Bay, and some 300 or 400 miles from Upernivik, the nearest Danish station. It is easy now to say that it would have been much better for the expedition to have stayed on in their comparatively comfortable quarters at Discovery Bay; the chances are that they would all have survived, and probably all have been rescued this summer by the relief party in the *Bear* and the *Thetis*.

We may remind our readers that the Greely expedition was sent out by the Government of the United States as one of the series of International Arctic expeditions, the main purpose of which was to take regular observations, according to a preconcerted plan, on the meteorological and other physical conditions of the Polar area. As the Greely expedition had to go much further north than any of the others, it started a year earlier in order to be sure to reach its post in time and be able to begin observations not later than August 1882. It was thoroughly equipped, both with scientific apparatus and with the material for a comfortable life under unusually trying conditions. The provisions supplied could have easily been made to last until the present summer, and we know from letters from Lieut. Greely, written shortly after his arrival, that the region around Lady Franklin Bay, 81° 44' N. lat., abounded in musk oxen. In the summer of 1882 strenuous efforts were made to reach the station, but with no success. Last year two vessels were sent out, but the state of the ice was such that one was completely crushed and the other was glad to escape southwards almost as soon as it had entered the threshold of the intricate channel that led to Fort Conger.

The expedition which has been so fortunate as to rescue the six survivors consisted of the United States ships *Bear* and *Thetis* and Her Majesty's ship *Alert*, which was presented to the United States Government for the purpose. The condition in which the few survivors were found is almost too harrowing to record; how very nearly too late the rescue party were is impressively shown by the fact

that Lieut. Greely, surrounded by his prostrate companions, was reading the service for the dying. "The red syenite rock forming Cape Sabine," Sir George Nares tells us, "and the islands in the neighbourhood of Payer Harbour is sterile and barren to the last degree. During the three days we were detained there, although parties from the ships explored the whole of the immediate neighbourhood, very little animal life was seen." The end of the cape or peninsula is cut into by a bay in which are several islands—Brevoort, Payer, Stalknecht, &c. Here Sir George Nares in 1875 left 250 rations, which do not seem to have been discovered by the Greely party; and of the 50,000 lbs. of food buried for them by the rescuing parties Lieut. Greely succeeded in finding only 250 lbs.

For full details as to the work accomplished by the unfortunate expedition during its almost three years' stay in so high a latitude we must await the publication of the records. Happily all the records have been saved, and thus the gain to science is likely to be of unusual value. What are the hardships to be met with, and the aspects of nature to be witnessed in this remote latitude, we know something of already from the records of our own expedition ten years ago under Sir George Nares. But the present expedition, profiting by the experience of its predecessors, and working on a carefully prearranged plan, is likely enough to tell us much that we never dreamt of. While the main work of the party was to make regular observations in physical science, it is evident that they have taken advantage of their exceptional position to push back the limits of our ignorance of Arctic geography. The lowest temperature experienced is stated to have been 61° below zero F. We all remember the exciting narrative of the painful scramble of Commander Markham and his brave men over the "palæocrystic ice" in order to make the attempt at least to reach the Pole. After about sixty miles they had to return baffled, glad to escape with their lives. Markham and Parr and their men had, however, the satisfaction of having attained the highest latitude ever reached—83° 20' 26". Lieut. Lockwood, however, succeeded in getting some four or five miles (83° 24') beyond Markham's farthest, and 19° to the east of the English route.

Lieut. Lockwood, unhappily among the dead, seems to have been one of the most active and enterprising members of the expedition. He followed Lady Franklin Bay in its continuation, Archer Fjord, ninety miles beyond Beatrix Bay, Nares's furthest, quite to the other side of Grinnell Land, which he found to be an island, separated by Archer Fjord from the land to the south, now named Arthur Land. This was confirmed by the view obtained from Mount Arthur, 5000 feet high, west of the Conger Mountains, which may possibly be the range named after the United States by Sir George Nares. This Grinnell Land seems in many ways to be an interesting region; there are evidently several peaks or mountain ranges reaching a height of 5000 feet. A considerable area both on the north and south shores is covered by an ice-cap 150 feet thick, while, so far as we can judge from the report, there is a belt of comparatively open country in the interior some sixty miles wide. Even so late as March last, when the members of the expedition were dying one by one on Cape Sabine, exploration was not neglected. From Mount Carey to the north-west of the cape Sergeant Long obtained an extensive observation in the direction of Hayes Sound, which showed him that the Sound extends twenty miles further to the west than is shown on Sir George Nares's chart.

On his journey northwards Lieut. Lockwood succeeded in reaching 7° further east than Lieut. Beaumont's furthest in 1875. From a height of 2000 feet he saw no land to the north or north-west of Greenland, but away to the north-east, in lat. 83° 35', and long. 38° 82',

he saw a cape which he named Robert Lincoln. These observations are interesting. They seem to show that to the north of the American coast the sea is comparatively landless; while to the north-east the archipelago which borders the north coast of Greenland probably extends for a long distance, perhaps to meet the north-west extension of Franz-Josef Land. Lieut. Greely himself passed the summer of 1882 in the interior of Grinnell Land, in the east of which his station was located. Here he discovered a lake, sixty miles by ten, which he named after General Hazen, the Chief of the Signal Service of the United States.

From all this it is evident that, besides carrying out their strictly scientific work, the geographical explorations of the Greely expedition have been very extensive. From Fort Conger they extended east and west over some 40° of longitude and northward over 3° of latitude. They have enabled us to give more precision on our maps to the north coast of Greenland, and to extend it to the east and north-east. Grinnell Land they have found is an island largely covered by a thick ice-cap with a great lake in the interior, and separated by a narrow channel or fjord from the newly-named Arthur Land to the south. The "palæocrystic ice" of the Nares expedition is a myth, and it is evident that the ice of any part of the Arctic area is for no two successive seasons the same. It must necessarily be continually on the move, piled up in some parts to "palæocrystic" dimensions, while in other parts the sea may be comparatively open. One point seems to us conclusively settled. It is evident from what we know of the present expedition, and of the attempts to rescue it, added to the experience of previous expeditions, that there is no way to the Pole by the Smith Sound route for either ships or sledges. What Lieut. Lockwood saw from his vantage-ground to the north-eastwards seems to us to show that the route by Franz-Josef Land is more hopeful than ever, and that, if another attempt is made to reach the Pole, the choice of a starting-point will probably lie between that land and the New Siberian Islands.

L'ABBÉ MOIGNO

FRANÇOIS NAPOLÉON MARIE MOIGNO, mathematician, physicist, linguist, and ecclesiastic, was born at Guéméné (Morbihan) on April 20, 1804; as he died on Sunday, the 13th instant, he is worthy of a place among the English mathematicians whose names figure in Prof. Sylvester's British Association Address (Exeter, 1869). He was descended from a good old Breton family. Moigno first studied at the Collège de Pontivy, then proceeded to the Jesuit seminary of St. Anne d'Auray. In 1822 he went to another house of the fathers at Mont-rouge, where he passed his novitiate. In addition to theology he studied with great enthusiasm both the physical and mathematical sciences; in these he made rapid progress, and in 1828 arrived at a new mode of getting the equation to the tangent plane to a surface. Leaving Paris in 1830 on account of the Revolution, he spent some time in Switzerland, and here turned his wonderful powers of memory to the acquisition of some eight new languages, at the same time perfecting his knowledge of Latin and Greek. In 1836 the Jesuits appointed him to the Mathematical Chair in their house in the rue des Postes, Paris. Here he published the first volume of his great work, "Leçons de Calcul différentiel et intégral," following the methods used by, and utilising published and unpublished papers of, Cauchy. As his Superior was opposed to his scientific work, Moigno broke with the order, and gave himself up to his favourite pursuits. Having in 1845 become scientific editor of *L'Époque*, he was sent on account of that journal on a visit to England, Germany, Belgium, and Holland, and furnished to its

columns his observations on these countries. About 1850 he filled a similar post on the staffs of *La Presse* and *Le Pays*. In 1852 he became editor-in-chief of *Cosmos*, a weekly scientific review. His connection with this journal closed in 1862, and in 1863 he founded a new journal called *Les Mondes*.

From the above hasty sketch it will be seen how active Moigno was as a journalist. In 1864 he was made a Chevalier of the Legion of Honour. Moigno wrote a number of works bearing on the relation of science and religion. Of his other works we give a few titles:—The continuation of the "Leçons," noted above, the fourth volume containing a part on the Calculus of Variations (written in conjunction with M. Lindelöf, 1861). "Leçons de Mécanique analytique, rédigées principalement d'après les Méthodes d'A. Cauchy et étendues aux Travaux les plus récents—Statique." To Liouville he contributed a "Note sur la Détermination du Nombre des Racines réelles ou imaginaires d'une Équation numérique comprises entre des Limites données: Théorèmes de Rolle, de Budan, ou de Fourier, de Descartes, de Sturm, et de Cauchy" (v. 1840), and on a like subject ("Caractère analytique simple et sûr auquel on reconnaît que la Méthode de Newton est applicable") to the *Nouvelles Annales de Mathématiques* (x. 1851). But the great part of his writings, by which he is generally known, is physical. The Royal Society's Scientific Catalogue gives the titles of some twenty-five papers, which are concerned mostly with light, electricity, heat, and the solar spectrum; one title only we copy, "Navigation aérienne avec ou sans Ballon," from *Les Mondes*. The "Répertoire d'Optique moderne ou Analyse complète des Travaux modernes relatifs aux Phénomènes de la Lumière" (1847-1850) took him some years to write; and is a work of considerable importance. Another useful summary of results is the "Physique moléculaire, ses Conquêtes, ses Phénomènes, et ses Applications, résumés des travaux accomplis dans les vingt dernières années" (1868).

From his *actualités scientifiques* we single out here "Science Anglaise, son Bilan au mois d'Août, 1868;" this gives from the Norwich meeting of the British Association (Moigno was a Foreign Associate, but was not able to be present at the gathering) the Presidential and seven Vice-Presidential Addresses, and the evening discourses by Huxley and Odling. Dr. Hooker's address was not at all acceptable to Moigno, and he prefaces his translation ("pour effacer quelque peu le fâcheux vernis du positivisme de M. Hooker") with an article of his own, contravening the address of a Positivist Professor, Signor Govi, delivered at Turin.

It is in this last character of a translator of English scientific works (he translated also Père Secchi's work on the Sun) that Moigno did us Englishmen a great service: the following titles will prove this:—"Sur la Radiation" (Tyndall's Rede Lecture); "La Calorescence—Influence des Couleurs et de la Condition mécanique sur la Chaleur rayonnante" (Tyndall); "La Force et la Matière," and "La Force" (Tyndall), avec une Appendice sur la Nature et la Constitution intime de la Matière" (by Moigno); "Analyse spectrale des Corps célestes" (Huggins); "Sur la Force de Combinaison des Atomes (Hoffmann), avec addition d'un Aperçu rapide de Philosophie chimique" (by Moigno); "Le Son" (Tyndall); "Six Leçons sur le Chaud et le Froid" (Tyndall). In 1852 appeared a second edition of the "Traité de Télégraphie électrique . . . précédée d'un Exposé de la Télégraphie ancienne de Jour et de Nuit," with an atlas; in 1850 he had published his "Proclamation patriotique. Belle Invention française." This is a pamphlet on the invention of tubular bridges by M. J. Guyot. In 1861 he wrote another pamphlet entitled "Cotonisation du Lin," which treats of a practical substitute for cotton. From the titles of these last pamphlets, as well as from those of many of the preceding works,