

GEOGRAPHICAL NOTES

AT the meeting of the Royal Geographical Society on Monday night Sir Henry Rawlinson read the following telegram, forwarded by the Eastern Telegraph Company from Zanzibar, with regard to the movements of Mr. Joseph Thomson:—"Thomson reached Dgare na Erobi, in Masai country, long. 37°, lat. 3°5', on May 5. Was compelled to flee during night to evade what could only have been a disastrous fight, through troubles raised by Fischer's caravan in front. Got safely back to Taveta, where he camped his men, and has come down to Mombasa with small party in seven marches to replenish his goods, which has become necessary in consequence of his retreat from Masai and prolonged detention at Taveta. Returns in a few days to Taveta to proceed by Arusha, probably in company of another caravan. Is in good health. Details by post."

THE Russian Geographical Society has awarded its great gold medal to H. W. Abich, Member of the Academy of Sciences, for his researches into the Geology of the Caucasus. The gold medal of Count Lütke has been awarded to W. K. Döllén, astronomer of the Pulkova Observatory, for his new improved instrument for the determination of latitudes and longitudes. Two other gold medals, for ethnographical and statistical works, have been awarded to M. Barsoff, for collections of songs of Northern Russia, and to M. Krasnoperoff for a statistical description of the Government of Perm. Small gold medals have been awarded to MM. Eklon and Roborovsk, who both accompanied M. Prshevsky in his travels; to M. Oshanin, zoologist, for travels in Karategin, Darvaz, and Turkestan; and to M. Vitkovsky, for exploring graves of the Stone period about Irkutsk. Silver medals have been awarded to M. Lessar for levelling operations between Askabad and Seraks; to M. Schultz for the same between Orenburg and Lake Aral; to M. Brounoff, for researches on cyclones and anticyclones in Europe; to M. Gladysheff, for determinations of latitudes and longitudes in the Akhal-tekke oasis; to M. Kiseleff, for a journey to the Bi-shan; to M. Rodionoff, for surveys in Karategin; to M. Slovtsoff, for a description of the district of Kokchetan; also four other medals for smaller ethnographical and statistical works.

M. LESSAR, who made so interesting a journey from Askabad to Mash-had, continues to make a series of excursions in the same region. He went a second time to Mash-had *visâ* Khelat, and thence to Zurabad, Saraks, Merv, Charjui, and Khiva; then he made a barometric levelling from Askabad to Tejent, visited Merv a second time, and in December last journeyed in the mountain region of Khelat, Daraghez, and Attek, thus covering about 3300 miles from April to December.

THE proprietors of the *Melbourne Age* have despatched an exploring expedition to New Guinea.

WE mentioned in a preceding volume the late Barbot de Marny's theory as to the formation of the dunes (*barkhans*) in the steppe of Kyzyl-kum and the influence of the wind as a powerful agency in modifying the earth's surface in the steppes. We find now, in the *Zapiski* of the Kieff Society of Naturalists, several objections to this theory by M. Borschoff. Without denying the partial influence of the wind, he reduces it to a quite secondary agency, and decidedly opposes the wind-theory of the formation of *barkhans*. Wind may increase the *barkhans* to a certain amount, but their primary origin must be sought for elsewhere, and the rôle of the wind is far below what has been assumed. So hard a rock as the sandstone, permeated with iron and lime, of the Kara-kum and Kyzyl-kum steppes cannot be disintegrated by wind, unless it has been disintegrated beforehand by rains and rapid changes of temperature—both which conditions are missing in the steppes. Therefore on the Emba, the Ilik, the Irghiz, where the same sandstones occur—as devoid of vegetation as in the Kyzyl-kum, there are no such surfaces covered with *barkhans* as in the neighbourhood of Lake Aral. As a rule the dunes appear only where there are remains of former lakes, and in such cases they assume the directions of the shores of these former basins. Far from being dependent on the direction of the prevailing winds, the direction of the *barkhans* varies, even within short distances, and it follows the windings of the coast of Lake Aral. Thus, they incline the Sary Cheganak bay, like the parallel steps of an amphitheatre, the same directions being also taken by the rocky ledges of the terraces of sandstone, even beneath the water of the bay. The close connection of these ridges with the former action of the interior sea is the more obvious, as these dunes—sometimes

stratified in their interior—often contain remains of Aral mollusks, such as *Cardium rusticum*, *Dreissena polymorpha*, as also *Adacna vitrea*. Whole banks, from a quarter to half a foot thick, of these shells are found in the *barkhans*, and they are met with at distances of 27 miles from Lake Aral, and 70 feet above its level (at Sopak), or even 80 miles north of it, and 100 to 120 feet above its level (at the Toulagaj hill), whilst the depressions between the *barkhans* contain deposits of salt, with the same shells, or with an alga similar to the Aralian *Zostera*. The primary origin of the *barkhans*, M. Borschoff says, can be discovered even now in the low coast ridges. These ridges once formed slowly increase afterwards by the accumulation of vegetation on their summits, and vegetation plays a most important part in their growth. Several Solanææ, such as *Caroxylon*, or *Halostachys*, and Gramineæ, such as *Arulops levis*, grow on their summit, which is covered subsequently with various species of *Tamarix* and *Calligonum*. When deeply covered with vegetation, their further increase is due to the sand brought by the wind, the organic life still remaining a powerful agency of increase. But their original appearance must be sought for, it is contended, in the agency of water. M. Severtsoff's remarks on the influence of vegetation on the growth of the dunes, and those of the Turkestan railway expedition on the immobility of the dunes (already analysed in NATURE), go far to sustain M. Borschoff's conclusions.

AN expedition, under the direction of Col. Prshevsky, is being organised for the purpose of scientific researches in Central Asia and Thibet. The expedition is expected to start in August next.

A SERIES of valuable papers on the island of Yezo now appearing in the *Japan Gazette* deserve the attention of geographers. They are from the pen of Capt. Blakiston, who received the gold medal of the Royal Geographical Society in 1861 for exploration on the Yang-tsze, and who has for many years resided at Hakodate, the principal port of Yezo. The papers, which have reached their fifteenth part, are so varied and complete that they may fairly be called an encyclopædia of the island. The geography, geology, fauna and flora, the progress made during the past twenty years by the Japanese administrators, the Ainos, the mineral productions are all treated, and in addition the records of numerous journeys over all parts of the island are given. It is to be hoped that these valuable papers will be published in a collected form, for no future account of Yezo will be complete in which copious reference is not made to them. The numerous reports of the *employés* of the Japanese Government to the Colonisation Department in Tokio, which are now so difficult to obtain, are largely quoted in notes.

ACCORDING to a new survey of the rapids of the Dnieper, the total fall of the river, on a stretch of forty-six miles, from Ekaterinoslav to the Khortitsa Island at Alexandrovsk, is 106½ feet. The aggregate fall of the nine rapids is 60¾ feet, and their aggregate length is 5335 yards, the greatest rapid being that of Nenasytetsky (the Insatiable) which has a fall of 19½ feet and a length of 1867 yards. The discharge of water at the head of the rapids has been found, at a level 2½ feet below the average, to be 27,934 cubic feet per second.

THE CAUSE OF EVIDENT MAGNETISM IN IRON, STEEL, AND OTHER MAGNETIC METALS¹

THE extreme sensitiveness of the induction balance to all molecular changes in the structure of metals was remarked in my first paper on this subject to the Royal Society;² and in the case of iron and steel it is most remarkable, as the addition or subtraction of 1/500,000th part, or the addition of the smallest iron filing to an already large balanced mass of iron, is at once rendered evident and measurable.

Possessing such an invaluable instrument of research, I was desirous of investigating the molecular construction of iron and steel, but at once I met with a difficulty, viz. that magnetism itself completely changed the character of any piece of iron under investigation; consequently, finding no help or explanation of the effects produced from any accepted theories of magnetism, I was forced to investigate, by means of the induction balance, the

¹ Paper read before the Society of Telegraph Engineers and of Electricians, on May 24, 1883, by Prof. D. E. Hughes, F.R.S., Vice-President.

² "On an Induction Current Balance, and Experimental Researches made therewith."—*Proceedings Royal Society*, March 29, 1879, p. 56.