GEOGRAPHICAL WORK IN RUSSIA DURING 1876[1]

THE most important journeys by Russian geographers during 1876 were those of MM. Prshevalsky and Potanin in Central Asia, of Dr. Mikluho-Maclay in Polynesia, and the meteorological journey of M. Wojeikoff round the world. We have from time to time given notes of the progress made by M. Prshevalsky, and of the journeys of Mikluho-Maclay.

M. Potanin left Bulun Tokhoi (NATURE, vol. xv., p. 461) on August 20, and after having followed the eastern shore of the lake Ulungur, and crossed the deep and rapid Black Irtysh at Durbeldjin, he reached the river Kran, at Fulta, close by the Lamaïte convent, Shara Suma. The fertile valley of the Kran is the storehouse for the Southern Altai region; the Kirghises come here to purchase grain from the eastern slopes of the Altai and from the valley of Kobdo. The crossing of the Altai by the Djamaty pass, at the sources of the Black Irtysh, having been reported as very difficult, M. Potanin crossed the ridge by a more southern pass, Urmogaity, at the sources of the Kran river (9,000 feet above the sea), and entered on a wide hilly plateau covered with numerous lakes, and gently sloping to the east by a series of terraces, divided by border ridges. The easternmost of these ridges runs north and south, reaches 10,000 feet at the Terekty-asoo pass, and separates the high terrace of the Deloon river from the low tract on which the town Kobdo is built. This place was reached by M. Potanin on October 16. Rich collections of plants, insects, and birds were made during the journey, as well as a survey and a geological sketch of the route, together with determinations of latitudes and barometrical measurements of heights.

A most important work accomplished by the Russian Geographical Society during 1875 and 1876 is the geometrical levelling made along the Siberian highway, from Ekaterinburg to Irkutsk, on a distance of 2,236 miles. All meteorologists are well aware what a gap in our knowledge as to the distribution of pressure of the air upon the surfaces of large continents, arises from a want of geodetically-measured heights of meteorological stations. All attempts to trace isobars upon the Asiatic continent (one of which was made in the standard work of Mr. Buchan) have failed until now, the heights of the meteorological stations at Omsk, Tonesk, Krasnoyarsk, Irkutsk, and Nerchinsk having only now been directly measured. The Geographical Society has undertaken a geometrical levelling along the whole line, Ekaterinburg to Irkutsk, which levelling will afterwards be continued to Nerchinsk and Tashkend. This difficult enterprise, carried on with all possible accuracy, is now completed with full success, and the superintendent of the levelling, M. Moshkoff, is now busily engaged in computing the definitive results.

A yet more important undertaking, accomplished by the Russian geodesists, Col. Sharnhorst and Capt. Kulberg, during the years 1873–1876, is the precise determination of longitudes, by means of telegraphic signals, carried out along an arc of 103°, between Moscow and Vladivostok, on the Pacific. But this work is so important that we hope to be able to give a special report upon it.

We may also mention the work of Capt. Onatsévich on the shores of Russian Manchooria (NATURE, vol. xv. p. 417), and the important cartographical work of M. Sidensner between the Obi and Jenissei rivers.

Most valuable work was done also during 1876 by the Siberian branch of the Geographical Society. The measurements of depth of the Baikal were continued by MM. Dybovsky and Godlevsky, and showed that the greatest depth of the lake is to be found in its southern part and close to its north-western shore. M. Grebnitsky explored the region of the Southern Usuri and returned with valuable geological and botanical collections. M. Chersky explored the valley of the Irkut river and arrived at very important results, the chief of which are:—(1) that this valley is geologically a very old westerly extension of the Baikal trough; (2) that it contains immense glacial deposits; and (3) that the outflows of basaltic lava in the valley are, with one exception, pre-glacial. We notice also the entomological excursions and the exploration of the Kasbek (Devdorak) glacier, made by members of the Caucasian branch of the Society.

Besides these explorations, the Society has also issued some valuable publications. The most important of them are—(1) the fourth volume of supplements to Ritter's "Asia," being a description, by MM. Semenof and Potanin, of the Altai and Sayan highlands, according to works which appeared from 1836 to 1872; the names of the two authors sufficiently recommend the work; and (2) the second volume of M. Prshevalsky's "Travels in Mongolia," which contains—the Climatology and Ornithology, by the traveller himself; the Herpetology, by Prof. Strauch; and the Ichthyology, by Prof. Kessler. The seventh volume of the *Memoirs* of the Society contains the first part of the work of Prince Kropotkin, "On the Glacial Period in Finland and on the Bases of the Glacial Theory," with numerous maps and engravings. The *Isvestia* (Bulletin) of the Society contains, besides valuable small contributions, two very valuable maps of the Hissar and Koolab beckdoms, by M. Mayeff, and of the Lower Tunguska River, by M. Chekanofsky.

The scientific results of the expedition made to the Amu-daria in 1875 and 1876, will appear very soon. They contain the astronomical, magnetical, and meteorological observations made by M. Dorandt, and a thorough and elaborate hydrographical description of the Amu-daria, by M. Zuloff, with the collaboration of Col. Makshéeff. The first of these works is already printing, and contains abundance of most valuable meteorological data (pressure, temperature of air and of the soil, evaporation, level of water, variations of magnetical elements, &c.). The Meteorological Committee of the Society is engaged in preparing complete tables of the amount of snow and rain during 1872-1876, measured at the numerous stations organised by the Society. Finally, we can only mention some of the various works issued by the Society in the departments of Ethnography, Statistics, and Historical Geography; as, for instance, those on the trade in grain in Western Russia, by M. Rayevsky; the ethnographical description, with maps of South-Western Russia, by M. Gildebrand; the text to the ethnographical map of Russia, published by M. Rittich, being now at press; and many other valuable works of less importance.

[1] "Report of the Russian Geographical Society for 1876," by the secretary, V. I. Sreznevsky.

A POCKET HAMMOCK

IN these days, when exploring tours and extended scientific excursions are so universal, it is a great advantage to be able to take up one's bed and walk, to be in short entirely independent of sleeping accommodation. Even in our own country it is often an advantage to the working geologist, or botanist, or zoologist, to be independent in this respect, and while it is sometimes no great hardship to make one's bed on the heather or grass under the lea of a broom-bush or dyke, still it is seldom advisable to do so if it can be avoided. Many of our readers will therefore be glad to know that Seydel and Co. of Birmingham have devised a handy hammock, which bears the name of the "Ashantee Hammock," from its having been found of great service during the Ashantee campaign, Sir Garnett Wolseley testifying strongly to its manifold utility. It is made of light but strong netting, and can be so folded up as to be slung over the shoulder like a bag, or even carried in a fair-sized coat-pocket. From the arrangement of the ropes, hooks, and screws, it can be used under almost any circumstances, and, as we

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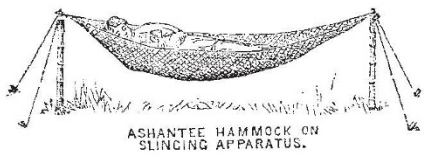
ourselves can testify, forms a thoroughly comfortable and secure bed or lounge. Mr. Stanley, we believe, was so favourably impressed with the hammock, that he has taken a supply with him in his present exploration; and for explorers in tropical countries, we should think it would prove useful in many ways, as it can not only be used as a bed, but, mounted on a pole, as a travelling litter or palanquin. For those of our readers engaged in explorations of any kind, geological, geographical, botanical, zoological, or even in doing an ordinary tour, in remote districts, we



ASHANTEE HAMMOCK ON SLINGING APPARATUS.

believe the hammock would be found of real service, as it would make them quite independent of sleeping accommodation, and would not increase the weight of their *impedimenta* by very many ounces. An idea of its construction and its adaptability to almost any circumstances may be obtained from the illustrations we give. We can honestly recommend the hammock as likely to answer all the purposes for which it has been designed.

THE SANITARY INSTITUTE

THE lecture by Dr. Richardson, published in our issue of last week, has called public attention to the Sanitary Institute of Great Britain, before which the lecture was delivered. The Institute was founded in July, 1876, at a public meeting held at St. James's Hall, and presided over by his Grace the Duke of Northumberland. The Institute has for its work a wide range of subjects. It has sprung, we may say, out of the necessities of the time, and in the first instance may be considered as a nucleus round which will cluster the many men of science who are now employed in carrying out the executive sanitary or health work of the kingdom. The various medical officers of health, the certifying surgeons under the Factory Acts, the engineers and sanitary surveyors of different localities, the mayors of municipalities, and the chairmen and presidents of local boards, all of these must needs take an interest in and in time form the body corporate of an institution framed for the purpose of becoming as it were a voluntary health parliament. In addition to these sections of the Institute there are many other sections of the community which will, we should think, earnestly join in the work. For reasons plainly stated by Dr. Richardson ladies are invited to take part in the proceedings and to help forward sanitary progress. We feel sure there will also be a large class of active men unconnected professionally with sanitary work who will be ambitious to take a part in the great practical scientific labour of the time, the only labour we may say in which science lends herself immediately to the aid and comfort of domestic life and felicity.

The detailed work of the Sanitary Institute has been in some measure projected by its founders; but it is more than probable that in the course of its natural development it will grow into something different from that which is now supposed. At the same time we are bound to say that the plan is sufficiently simple and practical to warrant the expectations of those who have mapped it out. The objects we have seen proposed are all directed to some useful and desirable end. To obtain a registration of the diseases of the kingdom; to establish communications with medical officers of health; to form local branches of the Institute throughout the kingdom; to examine and grant certificates of qualification to local surveyors and inspectors of nuisances, and to form a register of such certificated officers; to investigate the chemical aspects of the sewage question; to establish a sanitary exhibition, and to form a library of books on health subjects;—these objects, some of which must needs become a part of every sanitary organisation, are sufficiently comprehensive to cover any amount of work, and to tax any amount of industry that may be found in the best organised public body. So far the prospects of the Institute are brought beyond what is common to such undertakings in their earliest days. Members are daily being added, and an effective Council has been elected. Already one of the provincial towns, Scarborough, has invited the Institute to hold its first provincial Congress there, and in France a kindred society has been formed in sequence, and, it may be said without offence, in imitation of the one already founded in London. The visit of Dr. De Pietra Santa, of Marié Davy, and other savants from Paris to the meeting on Thursday last, is a significant sign of the good feeling with which the two rival societies have commenced their labours.

For our parts we welcome heartily both Institutes, and shall enjoy the privilege of watching their onward progress and recording their success.

ON THE SOURCE OF THE CARBON OF PLANTS

NEARLY half the dry substance of plants is carbon; and it is conclusively established that they derive, at any rate, the greater part of it, directly from the carbon-dioxide of the atmosphere, which the chlorophyll cells have the power of decomposing in sunlight, at the same time evolving oxygen. But this function of vegetation, which is so essential a complement to the processes of animal life, gives rise to many problems hitherto unsolved; and an important one is whether or not plants avail themselves of other obviously possible sources of carbon than that existing in such very small proportion, although in large actual amount, in the ambiant air.

Our knowledge bearing upon the subject as it exists in the present day, is the resultant of careful investigations by many observers. In the last century Bonnet discovered the gaseous exhalation; Priestley that the gas is oxygen; Ingenhouz that the oxygen is only evolved in sunlight; Sennebier that it is due to the decomposition of carbon-dioxide, but he believed that the carbon-dioxide is taken up in solution in water. Early in this century de Saussure carried out a long series of experiments on the relations between the carbon-dioxide decomposed, and the oxygen evolved, and on the amount of carbon-dioxide in the air compatible with the healthy development of plants. Since his time many eminent names have been added to the list of patient labourers in this field of inquiry.

Boussingault worked on the question whether the carbon-dioxide is absorbed by the leaves, or taken up by water through the roots; and by direct experiments proved that the leaves of plants do take up the carbon-dioxide, which is so sparingly, though so uniformly, diffused in the atmosphere. His researches led him to conclude that, by far the greater part, if not the whole, of the carbon which enters into the constitution of the organs of plants is derived from atmospheric carbon-dioxide; and while drawing attention to the fact that, for healthy and vigorous action, plants require large volumes of air to pass over them, and to the surprising rapidity with which they absorb the carbon-dioxide from it, he makes calculations as to the surface presented to the air by the leaves of different crops. Taking the average number of plants growing per hectare (about 2½ English acres), he estimates that:—

Artichoke gives a surface of	142,410	square metres.			
Beetroot	,,	,,	49,921	,,	,,
Potato	,,	,,	39,641	,,	,,
Wheat	,,	,,	35,490	,,	,,

Boussingault also made experiments in regard to the

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