

the staff of the Scottish Marine Station on board the *Medusa*; the trips having been made in April, June, August, September, and November. The observations were made at all depths of the sea, from the surface to 107 fathoms. The novelty and, in not a few cases, the unexpectedness of the results render it advisable to delay a full discussion till more observations have been made and the densities worked out. In the meantime a provisional report on the results of the April and June trips, by Dr. H. R. Mill, will be read with interest. Among the unexpected results was the discovery in June in Loch Fyne of a lenticular mass of water with temperature below 43° floating between two warmer strata, the cold area being most definite at its upper surface and more diffused below. The greatest thickness of the mass of water colder than 43° was 180 feet, off Inveraray. Its lower bounding plane ran along the bottom from the head of the loch to Dunderave; then where the water deepens it dipped down again at the same angle until off Inveraray, where it bent up again and met the upper bounding surface at Furnace, 120 feet under the surface of the loch.

In a paper by the secretary on the meteorology of Ben Nevis, it is shown from the three years' observations at the low-level station and the high-level observatory that the mean decrease of temperature with height is at the rate of 1° F. for every 270 feet of ascent, the lowest monthly rate being 1° for every 284 feet in winter and the most rapid rate 247 feet in spring. A table of the barometric corrections for height for the different sea-level pressures and air temperatures that occur has also been prepared directly from the observations themselves. The importance of the results of these two inquiries rests on the fact that the Ben Nevis pair of stations alone supply, owing to their great difference in height, close proximity horizontally, and the positions of their thermometers, the physical data of observation which satisfy with sufficient closeness the requirements of these fundamental problems of meteorology. The science has now passed that stage when Great St. Bernard with Geneva, Mount Washington with Portland and Burlington, Hochobir with a station in one of the neighbouring deep valleys, or brief continued observations with balloons or at different heights on the slopes of the Faulhorn, can be accepted as affording the data required for dealing seriously with these questions.

REPORT ON THE BOTANICAL GARDEN, SAHARUNPUR

MR. DUTHIE'S "Report on the Progress and Condition of the Government Botanical Gardens at Saharunpur and Mussoorie for the Year ending March 31, 1886," which has recently reached us, contains, besides the usual routine matter, inseparable from such Reports, on the state of the Garden itself, much that has a wider range of interest. As usual, the cultivation of new plants of economic value appears to have occupied a considerable amount of attention during the year. Where so many useful plants have been introduced and reported upon, it is not an easy matter to select one or two for an example of the work in which Mr. Duthie is engaged. The character of this work is now, however, pretty well known, though the following extracts will show that plants of very varied character and uses are yearly being experimented with in our Indian and colonial botanic gardens.

Under the head of New Zealand spinach, a quantity of the seed of this vegetable is reported to have been received and planted, germinating freely and yielding a continuous crop of leaves, which, when cooked, is said to much resemble in flavour that of English spinach. The plants, Mr. Duthie says, seed freely, and he has no doubt that it will readily acclimatise; though, as he says, the introduction is not one of much importance, except for variety, as it comes into season at the same time as English kinds, and it can hardly compete with them in popular estimation. This so-called New Zealand spinach many of our readers will remember as *Tetragonia expansa*.

The Oca-quina (*Ullucus tuberosus*) is another food plant upon which experiments in cultivation have been made. It is a native of South America, and the tubers, which are about the size of a walnut, and similar in appearance to a potato, are eaten, when cooked, by the people. Its cultivation in this country as a substitute for the potato was at one time proposed and attempted. Mr. Duthie says that twenty-eight tubers were received by him from the Royal Gardens, Kew, four of which were sent to the Arnigardh Garden, and the remainder were planted at Saharunpur. Up to within a few weeks of the date of the Report,

these latter plants had made good growth, but after the commencement of the hot weather they became sickly, so that it is evident it will not suit the plains of India, but may succeed very well in the climate of Arnigardh, where it was intended that the majority of the plants should be sent.

Of the Japanese varnish-tree (*Rhus vernicifera*) the seedlings are stated to be making rapid progress. The growth for the two years after germination did not average more than a foot, which, however, has been doubled since the commencement of the hot season, and there is now no reason to doubt that this useful tree will thrive in the climate of Saharunpur. Mr. Duthie further says a small plantation will be made next rainy season, and it will then be a question of time as to when the plants will be ready for tapping.

Mr. Duthie makes the following interesting report on the subject of spider silk, which had previously attracted some attention. He says:—"I arrived from British Garwhal just in time to superintend operations at the commencement. The men employed on this work were provided with small sticks about a foot long, and they were told to collect as many clean webs as possible during the day. There was not much to show at the end of the day, as the silk takes up very little space when wound round these sticks, and the weight is inappreciable. The total weight of webs collected during the season did not exceed 10 lbs., the bulk of which was despatched to Mr. Wardle, of Leek. The cost of collecting the above, and the carriage from Bhim Teel to Saharunpur, and from Saharunpur to Bombay, amounted to Rupees 33 - 7 - 0. At this rate the export of spider silk to England would, of course, never pay, but expenses might be reduced very considerably: for instance, this first consignment included the weight of the sticks round which the silk was wound. The silk is removable after immersion in hot water. During my stay at Indalpur, in the Sháhjahánpur district, I saw some fine clean webs of the same kind in a forest about eight miles to the north of Indalpur."

Judging from the remarks of Mr. Duthie, there seems but little chance of spider silk ever becoming an article of commercial value.

The Report includes some interesting notes on some official tours made by Mr. Duthie during the year, and a valuable list of plants collected, the names of which have been verified at the Royal Gardens, Kew.

SCIENTIFIC SERIALS

Bulletin de l'Académie des Sciences de St. Pétersbourg, tome xxxi. No. 3.—Corrections and additions to the Syrian-German and Votyak-German dictionaries, published in 1880, by F. J. Wiedemann. These emendations are based on the following recent works: "The Land and Language of the Syrians," by Lytkin; the publications on the Votyak language issued by the Kazan Mission; "Votyak Tales and Proverbs," collected by Dr. Aminoff, and published in the works of the recently instituted Finnish-Ugrian Society; Dr. Max Buch's ethnographical sketch of the Votyaks in the "Actæ Societatis Scient. Fennicæ," vol. xii.; and MM. Koshurnikoff and Miropolsky's monographs on the Votyaks.—On the Ornis of the western spurs of the Pamir and Alai, by V. Bianchi—On "Claudii Galeni Pergameni Scripta minora," by L. Nauck.

Nyt Magazin for Naturvidenskaberne, vol. xxx. Nos. 3 and 4, Christiania, 1886.—This number of the Norwegian *New Journal of Sciences* contains:—Continuation of Herr Brögger's paper on the geological history of the Christiania Fjord. According to the writer, it may be assumed that the bed of the fjord has been raised by eruption to the surface of an older bed, which consists of depressed strata of the earth's crust, whose depression had been connected with active processes of dislocation, crumpling, and folding in the post-Silurian period. The evidences of erosion and eruption are considered at length, with special reference to the action of glaciers in the formation of the fjord.—Dr. Lang concludes in an exhaustive paper his contributions to the study of the eruptive rocks of the Silurian beds of Christiania, and thus completes an important chapter in the geological history of South Scandinavia.—Notice of *Regalecus glesne ascanius*, by Herr J. Grieg. This specimen, a female, with well-developed ovarium, is the fourteenth that has been taken off the Norwegian coasts since 1740.—Report of the various attempts made within the last four years to introduce new plants into Iceland, by Dr. Schierbeck. The results of these efforts to