

the sun give results comparable with each other, wall-screens give results which are not comparable, *inter se*, it being perhaps impossible to find two wall-screens in positions tolerably comparable. But it is in investigating the daily range and sudden changes of temperature, the humidity of the air, and others of the prime factors of climate that wall-screens as instruments of observation totally break down.

A PAPER of researches on the rainfall of Austria-Hungary has been recently presented to the Vienna Academy by Dr. Hann. His object is, while showing the main features of distribution of rain in the country, to establish a rational method of deduction of results from measurements of rainfall during short intervals of time. In the greater part of Austria-Hungary, he shows that June is the most rainy month; it is so in the whole of Bohemia and Hungary, with Siebenbürgen, in the eastern part of Galicia, and in Bukowina. In Moravia and Silesia nearly the same rain falls in June and August, with an intermediate decrease in July. West Galicia and the Tatra-region show a preponderance of July rain. Southwards from the Upper Dranthal a maximum in October becomes predominant. From about 45° lat. southwards more rain falls in the three winter than in the three summer months. The further south the more pronounced is the distinction of a dry from a wet period. The driest months in the whole of Austria-Hungary down to 45° (where July is the driest month) are January and February; and especially notable is the little rainfall of February at the southern base of the central chain of the Alps.

PHYSICAL NOTES

MEASUREMENTS of the heat conductivity of iron hitherto have given rather discordant results. This must be due, according to Herr G. Kirchhoff and Herr Hansemann, to the fact that in most of them the quantities of heat given out or received from without by the body examined have not been sufficiently taken into account. These physicists have recently described to the Berlin Academy experiments by a method in which a cubical iron mass, after being left to itself a long time, had a strong water-spray directed against one of its side surfaces, the water being some degrees hotter (or colder) than the place of observation. At several points back from the heated surface vertical passages were made, each to receive one junction of a thermopile of thin German silver and copper wire, the other junction being at constant temperature. An observer, with the aid of a chronograph, marked the point of time at which certain divisions of the scale of the (mirror) galvanometer passed the vertical wire of the telescope, at the same time dictating their number to an assistant. Referring to the memoir for further details, we note the conclusion arrived at, *viz.*, that the heat-conductivity of iron divided by the product of its specific heat and its density, at the temperature $\theta = 16.94 - 0.034(\theta - 15)$, when the temperature is measured in centigrade degrees, and the units of time and length are seconds and millimetres. With this result, that of H. Weber agrees best; he obtained the number 16.97 for 39°C. The results of F. Neumann, Ångström, and Forbes, on the other hand, are more divergent. (The substance used in the experiments here described was Dortmund puddled steel, containing 0.129 per cent. carbon and 0.080 silicium.)

HERR E. WIEDEMANN has recently made further experiments on the phosphorescent or fluorescent light produced by electric discharges (*Wied. Ann.*, No. 1). Nearly all platino-cyanide double salts show fluorescence under the discharge; but, so long as they were undecomposed, no double fluorescence was observed. When platino-barium cyanide had been traversed by a single discharge, the strong green fluorescent light showed no dichroism, but, after a series of discharges, dichroism appeared. It also occurred when the crystals of that or other platino-cyanide double salts were left a long time *in vacuo* (without electric discharge), whereby they lost water; and the more rapid appearance of dichroism under the electric discharges is attributed to heating of the crystals. Herr Wiedemann opposes Mr. Crookes's view, offering the following proof of its incorrectness:—If the positive current of a Holtz machine be sent through a very thick-walled discharge-tube, and the discharges be made to follow one another in such a rhythm that they are deflected from their course in the tube by the finger, only a weak phosphorescent light appears on the inner side of the tube, but a very bright green light appears on the *outer* side. The non-observation of this before is probably due to the thinness of the tubes commonly used. In

narrow, and especially capillary tubes, too, only the inner wall becomes luminous.

WE take the following from the *New York Nation*:—"It is impossible for the unaided ear to determine with certainty the direction of a distant sound, especially when the atmosphere is foggy; hence the great utility to navigators of the instrument which its inventor, Prof. Alfred M. Mayer, of the Stevens Institute, has felicitously named the 'topophone,' or sound-placer. It consists of 'a vertical rod passing through the roof of the deck-cabin,' and bearing on the upper end 'a horizontal bar carrying two adjustable resonators,' below which a pointer is set at right angles with the bar. Rubber tubes from the resonators pass through the roof of the cabin and unite in a single pipe connected with a pair of ear-tubes. The vertical rod is turned by means of a handle in any direction. The first step is to tune the resonators accurately to the pitch of the sound under observation, and fix them 'at a distance from each other somewhat less than the length of the wave of that sound;' the next, by turning the handle, to bring them simultaneously on the wave-surface, when, as 'they both receive, at the same instant, the same phase of vibration on the planes of their mouths,' it will result that if the connecting tubes be of the same length, the sound-pulses, acting together, will be reinforced to the ear, but if the tubes differ in length by one-half the wave-length of the sound, the pulses will oppose and neutralise each other, and thus tend to produce silence. At this moment the horizontal bar is a chord in the spherical wave-surface of which say the fog-horn is the centre; and the pointer represents a radius, 'or, in other words, coincides in alignment with a line drawn from the place where the sound is produced through the plane of observation.' By sailing the ship a measured distance 'at an observed angle from the radius line thus found, a second radius line may in like manner be found,' and 'the distance between the two points of observation is the base-line of a triangle, of which the two convergent radii are the sides.' From these data the distance of the fog-horn is readily computed."

GEOGRAPHICAL NOTES

THE *Vega* reached Naples at 1.30 P.M. on Saturday, the 14th. Prof. Nordenskjöld and his staff received a warm reception from representatives of the Italian and Swedish Governments. Prof. Nordenskjöld has been made Grand Officer, and Lieut. Palander Commander of the Order of the Crown of Italy. On Monday the explorers were entertained at a grand banquet. The French Institute will hold its annual meeting on March 1, under the presidency of M. Daubrée, who will deliver an inaugural address, the subject being Prof. Nordenskjöld's expedition. It is expected that the professor will land in France on that day. He will stop at Marseilles and Lyons, where he will be received by the local geographical societies and authorities. The Paris Geographical Society will send a delegation to Marseilles. Prof. Nordenskjöld will receive the gold medal of the Society at Paris, in the large hall of the Sorbonne. The several learned societies of Paris will send delegations to witness this ceremony, which will be followed by a grand banquet on the succeeding day. It is expected that Prof. Nordenskjöld will reach London in about a month's time, but his present intention is not to give a public address. He does not feel himself sufficiently master of English for this purpose, and, moreover, as might be surmised, he has an aversion to "starring." The botanists and zoologists of the expedition will go overland, visiting all the museums with Arctic collections, and will rejoin the *Vega* at Copenhagen.

AT the last promotion of the Legion of Honour M. Levasseur, vice-president of the Paris Geographical Society, was appointed to the grade of officer for his geographical and statistical works. M. Levasseur is the editor of the statistical department of the *Annuaire* of the Bureau des Longitudes, which has been so much enlarged recently.

THE French Chambers, at the instigation of M. de Freycinet, have voted a sum of 600,000 fr. for the cost of sending exploring missions into the remoter parts of Algiers and Senegal, and penetrating into the Sahara of the Western Soudan. Their immediate object is to trace the lines of future railways, but the indirect influence on the extension of our geographical knowledge is most important. Three scientific expeditions are being organised in Algiers; one is to operate in the Algerian Sahara, and will not pass El Golea; a second, comprising a corps of

engineers and an escort of natives, will advance southward from the Wargla, and, after passing the summer at the Jebel Ahaggar, will proceed by the Houssa to Sokoto, and ascending the Niger to Timbuctu, will return by way of Senegal. The Anthropological Society of Paris has availed itself of the permission granted it of sending out observers competent to undertake the ethnological study of the races with which the expeditions will come in contact, and has entrusted to Dr. Guyard the superintendence of the scientific staff which will accompany the Government explorers.

PROF. WALDHAUER, of Dorpat, has visited the northern boundaries of Courland, near the Riff of Domesnæs, in the Gulf of Riga, with a view of studying the condition of the small remnant of people living there, who are the sole representatives of the ancient races of Courland and Livonia. These persons, about 2,400 in number, occupy a limited area of about a verst in width between Mellesilla and Lyserort, and are separated from the Letts in the interior by a tract of morasses. They exhibit great national pride, deny their affinity with the Estonians, are ignorant of the term Livonian, and call themselves "randalist," inhabitants of coast-lands, or "kalamied," fishermen. They are hardy sailors and skilful pilots. Several families occupy one long hut in common, and their villages resemble those of the Estonians. They are usually fair-skinned, with chestnut or dark-brown hair; the beard, which is generally very abundant in middle life is seldom seen in young men before the age of twenty-five. Prof. Waldhauer has seen no instance of a red beard among them.

THE Chilean Government has just published in English, Spanish, and French, a "Synopsis Statistical and Geographical of Chili," treating of the condition of the country from January, 1878, to September, 1879. Among other useful matter it contains a short historical sketch, besides notes on its geographical position and physical aspect, its industrial zones, geological constitution, ethnography, and medical geography.

IN the new number of the Belgian Geographical Society's *Bulletin*, M. A. J. Wauters opportunely furnishes an article on Karema, on the eastern shore of Lake Tanganyika, where M. Cambier has just commenced the establishment of the first Belgian "Station hospitalière et scientifique" in East Central Africa.

THE *Cape Argus* publishes the results of the recent attempt to relieve the Trek Boers from the West Coast. After Mr. Palgrave returned to Capetown with the information that they had temporarily settled in what is called the Kaoko Veldt, Mr. Haybittle, by dint of hard travelling and the assistance of traders whom he met, succeeded in reaching the Boers in twenty-one days from Walfisch Bay. He describes the spot where he found them as a long limestone ridge about a day's journey from end to end, and about two days' journey south of the River Cunene, the nearest point on the coast being Point Rock, a distance of thirteen days' journey. In this ridge there are a number of depressions, in some of which springs are found, whence arises the name of Six Fountains. The country is almost devoid of population.

THE original paper in last Heft of the fourteenth volume of the Berlin Geographical Society's *Zeitschrift* is on the region around Koseor on the Red Sea, by Dr. Klunzinger. This number contains the usual annual bibliographical list of publications in all departments of geography, the most exhaustive and carefully arranged list of the kind to be found anywhere. In the *Verhandlungen* for November and January are important papers on the Marquesas Islands, by Baron von Schleinitz; on the Cordillera Passes, by Baron von Theilmann; on a journey on the Ural in the summer of 1879, by Dr. Arzuni; on agriculture in Japan, and on the geological survey of that country, by Dr. E. Naumann; and on the question whether the Andes are sinking, by Herr W. Reiss. Herr Reiss, after a careful review of what we know as to the condition of the coasts of Central and South America, where, while in one or two places a sinking seems apparent, a general rising is mostly proved, comes to the conclusion that the South American Continent, including the Andes, is increasing and not diminishing in elevation.

THE well-known traveller, Herr Ernst von Hesse-Wartegg, who has been staying in London for some time, delivered an interesting lecture on Thursday last, to the members of the German Athenæum, in Mortimer Street. The subject of the lecture was the social life of the Prairie Indians of North America,

and was illustrated by numerous photographs and ethnological objects.

THE German Palestine Society has recently published part 3 of the second volume of its *Proceedings*. It contains a treatise on the Sulphur of the Jordan Valley, by Dr. Fraas (Stuttgart); a communication respecting the discovery of some valuable coins near Jerusalem, by Dr. Erman (Berlin); Notes on a Journey to Moab in 1872, by Rev. Klein (Kaiserslautern); an alphabetical list of all the localities in the Pachalik of Jerusalem, by Dr. Socin (Tübingen); an article on the ruins of Askalon, by Lic. Guthe (Leipzig), and various financial and administrative reports. The Society's last general meeting was held at Treves in September last. The efforts of the Society are now directed towards establishing a fund for scientific exploring expeditions to Palestine.

AT the last meeting of the Berlin Anthropological Society the latest news received from Prof. Bastian and Dr. Finsch were communicated by the president. Dr. Bastian stayed at Batavia until October last, and then left that place; he does not mention where he intended to proceed to next, but seems to have started on a prolonged tour, as he has sent all his collections and the scientific results of his investigations to Berlin. Dr. Finsch writes from the Marshall Islands, and says that intercourse with the natives of that group of islands is very difficult and expensive. He has collected over 300 ethnological objects, most of which, however, date from the places he visited before arriving in the Marshall group.

THE German Admiralty intends to publish a work on the scientific voyage round the world, made by the German corvette *Gazelle* during the years 1874 to 1876. The work will be divided into three parts. Part I. will contain a short description of the origin of the expedition, its objects and a general account of the voyage. The second part will be devoted to the deep-sea measurements, the meteorological and magnetical observations. Part III. will treat of the marine fauna and flora. The total cost of the work is estimated at 60,000 marks (3,000*l.*), for which the Admiralty will apply to the Federal Council.

NO. III. for 1879, of the *Journal* of the Asiatic Society of Bengal, contains a valuable *résumé* of the survey work accomplished during the Afghan campaign by the surveying officers attached to the various columns.

AT the meeting of the Geographical Society on Monday next an account by Mr. Hore, of the London Missionary Society's station at Ujiji, of his recent exploration of the Lukuga outlet of Lake Tanganyika, will be read, as well as a paper by Dr. Emil Holub, on the Marutse-Mabunda Empire in South Central Africa.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The Rev. J. C. Saunders, of Downing College, is announced to lecture this term on "Chemistry, Physiology, and Botany," and Messrs. Saunders and Hicks are the examiners in the coming "Special" B.A. examinations in natural science for an ordinary degree, taking in geology and the other subjects mentioned.

NATURAL science scholarships are offered this year at Clare College (60*l.*), Caius (40*l.* or 60*l.*), King's (the Vintner of 90*l.*), Christ's, Emmanuel, and Sidney Sussex, St. John's (50*l.* for three years), Trinity and Downing (40*l.* to 70*l.*). In most colleges preference will be given to students under twenty by calling them Minor Scholars; exhibitors, in general, may be of any age.

AT present botany and vegetable physiology appear to be getting more and more at a discount in Cambridge, notwithstanding the able teaching of Dr. Vines. He has had to close his laboratory, the room being otherwise required; and Dr. Hicks, (Sidney), sustains the burden of teaching botany during the term in both elementary and advanced lectures, in addition to the joint demonstratorship in chemistry. Several lectureships in botany are vacant in London.

AN amended series of regulations has been issued and will probably be carried, in regard to the Cambridge Natural Sciences Tripos. Twelve months' notice is to be given of the branches of science in which the practical examination is to be held. The class list in the first part of the examination is to be quite distinct from that issued after the second part. In the