

A glance through the pamphlet will give an idea of what kind of products different parts of the world are yet capable of supplying.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

American Weather

I INCLOSE you a cutting from the *Manitoba Weekly Free Press* of December 14, 1878, containing a record of what I cannot but think is a phenomenon unsurpassed in the annals of meteorology. For a month to exceed its average temperature by the amount of twenty-five degrees is scarcely credible even in such a continental climate as that of Manitoba. An editorial paragraph from the same paper which I also inclose will show that the fact has not been overlooked by the Manitobans, and that their attention has also been drawn to the occurrence of the reverse characteristics in the weather over here. Surely the moral of all this is universal synoptic weather charts. The whole thing at present is worked on far too small a scale. The daily papers contain a weather chart which comprises scarcely a quarter of Europe, and of what goes on outside the limits of this we are practically ignorant, unless we hunt up reports when the atmospheric conditions they refer to are long past. Even granting the impossibility of drawing the daily isobars over the North Atlantic, except hypothetically, would it not probably have thrown much light on the proximate causes of, and probable duration of, our recent cold weather here, had we been able to secure a daily synoptic chart of the isobars over America, as well as those over our own islands and the countries immediately adjacent? Surely the valuable results which would follow such an extension of our present system would quite compensate for the extra outlay incurred.

E. D. ARCHIBALD

January 11

"Weather Record for November

"The following is Mr. Stewart's monthly record of the weather:—

"The highest reading of the barometer in the month was 29.650 at 7 A.M. on the 7th; the lowest reading was 28.643 on the 26th, showing a monthly range of 1.007 inches. The mean barometrical pressure for the month was 29.1377 inches. The highest temperature in the month was 53.3 on the 17th; the lowest temperature was 10.3 on the 30th; the warmest day was the 17th, the mean temperature being 44.10; the coldest day was the 29th, the mean temperature being 18.25. The mean temperature of the month was 30.75, being 25.73 higher than the average of the month for the past seven years. The mean monthly pressure of aqueous vapour was 0.148, and the mean humidity of the month was 83. The mean amount of sky clouded was 0.45. The highest wind in the month occurred at 8 A.M., on the 14th, the force being at the rate of 24 miles per hour. The most windy day in the month was the 14th, the average daily force being 15.92 miles per hour; the least windy day was the 7th, the average daily force being 2.42 miles per hour; the mean monthly velocity was 7.89 miles per hour. The prevailing direction of the wind was south. The total amount of rain that fell during the month was 0.070 inches; total amount of snow, 1.45. Total precipitation of rain and melted snow, 0.220 inches. The Red River opened again on the 18th. On the same day the steamboat *Lady Ellen* arrived from Lake Winnipeg; on the 23rd the steamer *Cheyenne* arrived from Pembina. The Red River was finally frozen over on the 27th. Two auroras and two lunar coronas were seen in the month."

The following is the editorial comment referred to:—

"The peculiar freaks of the weather during the last year or two have defied the most ingenious efforts of the weather prophets to foreshadow its complexion with any degree of truthfulness. It is a comparatively easy task to depict the general characteristics of a season under ordinary circumstances, when

the seasons for a number of years have shown no marked deviation from their usual regularity, but the abnormal nature of the weather of late has set the prophets completely at sea. The predictions of those wise-acres who, a month or two ago, told us the present season was to be excessively severe, and cited the musk-rats, the beavers, and the cornshucks, to support the prognosis, have not been verified up to the present, and without attempting the prophecy business ourselves, we would remark that the indications are against any unusual severity this season. November has been mild to a marked degree, and indeed the whole fall, which has just passed into winter, has been exceptionally pleasant. There has been severe weather both in Europe and Asia, and heavy frosts have fallen in England, Austria and Italy—and it has been remarked that when the winters in the Old World are very cold, they are very moderate in America."

The Microphone

IN a recent letter (*NATURE*, vol. xix. p. 221) Dr. Bleekrode mentions the fact that a microphone through which a strong current is sent emits an audible sound; the electro-dynamical action of the current on its movable part is considered the origin of it.

The experiment is a very interesting one, and is nearly related to the facts I published in *NATURE*, vol. xviii. p. 642. But I cannot agree with Dr. Bleekrode in the interpretation. It is my opinion that no electro-dynamical action is in play, but only a dilatation at the points of contact.

In a circuit were placed a battery, a tangent-galvanometer, and two pieces of carbon, which supported a third one. A sound was heard and sparks were seen. The galvanometer showed that the intensity of the current increased, the deflection increasing from five to ten degrees. This proves the influence of the clouds formed at the points of contact.

The pieces of carbon were then inclosed in very flat sheets of platinum, and the experiment repeated. No sound was heard; the deflection of the galvanometer rose to 28°. When a rough sheet of platinum was taken the intensity of the current fell again, sparks were seen, and a sound was heard.

Dr. Bleekrode believes that, the coefficient of dilatation of carbon being small, the sound cannot be caused by dilatation at the points of contact. But the temperature of those points is very high, a great part of the heat generated in the circuit being produced here.

I cannot see that his experiment is a true demonstration of the repulsive action between the subsequent parts of a current. In my opinion the experiments of von Ettingshausen (*Sitzungsberichte der Wiener Akademie*, lxxvii. p. 109) are considerably more convincing. Von Ettingshausen found that, with a current which was somewhat stronger than the one I made use of, the influence of the earth-magnetism was almost as great as that of the electro-dynamical action. Moreover, this action depends upon the relative position of the movable part and the other parts of the circuit. Now I have not been able to detect the slightest variations in the sound by changing the position of the movable piece of carbon in relation to the direction of the dipping needle, or in relation to the other parts of the circuit.

I therefore hold to the explanation of the acting of the microphone as a receiver, which I believe I was the first to propose. In my opinion it depends upon the varying dilatation at the points of contact by the varying intensity of the current.

Breda, Holland, January 13

V. A. JULIUS

The Formation of Mountains

THE quotation given by Mr. Wallace from the English Cyclopædia affords a sufficient basis to prove "the more rapid [present] cooling of the interior of the globe than of the crust." I will add a passage from Sir W. Thomson's "Secular Cooling of the Earth," of a like tendency: "I think it cannot be denied that a large mass of melted rock, exposed freely to our air and sky, will, after it once becomes crusted over, present in a few hours or a few days, or at most a few weeks, a surface so cool that it can be walked over with impunity. Hence, after 10,000 years, or, indeed, I may say a single year, its condition will be sensibly the same as if the actual lowering of temperature experienced by the surface had been produced in an instant, and maintained constant ever after."¹

¹ *Trans.* R.S. Edin., 1862; also Thomson and Tait's "Nat. Phil.," App. D.