

and since that time he has organized no fewer than three important expeditions, in the third of which he succeeded in reaching the top of Kilimanjaro. It is this third expedition of which an account is given in the present work. The broad results of the journey were soon made known; but of course it is only from the explorer's full narrative that an adequate idea can be formed of the interest and importance of his achievements. The mountain mass of Kilimanjaro towers up to a height of nearly 20,000 feet, and Dr. Meyer describes well the feelings with which he saw it after his arduous march across the steppes. "It was a picture," he says, "full of contrasts—here the swelling heat of the equator, the naked negro, and the palm-trees of Taveta—yonder, arctic snow and ice, and an atmosphere of god-like repose, where once was the angry turmoil of a fiery volcano." The story of the ascent is told most vividly, and there are few readers who will not sympathize with the delight with which he speaks of the moment when he set foot on the culminating peak. Although the record of his experiences at Kilimanjaro forms the centre of the book, he has much to say about what he saw both on his way to the mountain and on his way back; and in appendices various writers present classifications of his collections, and the conclusions at which they have arrived in working out his astronomical and meteorological data. The book is admirably translated, and its value is greatly increased by illustrations and maps.

Chemistry in Space. From Prof. T. H. van't Hoff's "Dix Années dans l'Histoire d'une Théorie." Translated and Edited by J. E. Marsh, B.A. (Oxford: Clarendon Press, 1891.)

WE have already reviewed the monograph of which this is a translation (NATURE, vol. xxxvii. p. 121), and need not therefore, at present, say anything of the subject with which it deals. The translator has done his work carefully, and "the invaluable assistance and advice" of the author have enabled him to make his rendering "a considerable extension of the French edition." Mr. Marsh advises those to whom the question is new to leave the first chapter till the end, as it contains a translation of the earliest memoirs on the subject, and the ideas are incompletely developed, obscure, and sometimes erroneous.

LETTERS TO THE EDITOR.

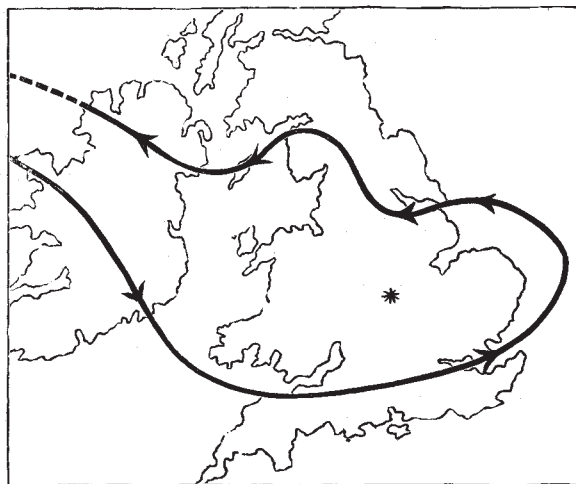
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Erratic Track of a Barometric Depression.

THE singular course of the cyclonic system which has, during the week terminating on May 29, circulated round and across the British Isles, deserves more attention than can be thus early given to it. I wish here, with your permission, first, to describe the path of its centre as correctly as can be done with the data at present in my hands, mentioning at the same time the principal modifications of the isobars and of the weather in the neighbourhood of the centre; secondly, to mention some remarkable facts in relation to the upper currents as observed by myself in its neighbourhood; and finally, to indicate the nature of those questions an examination of which will, I believe, in the instance before me, prove to be of most scientific value.

(1) The accompanying chart shows the course of the centre of depression, so far as we have yet been able to follow its track, the arrow-heads marking the position at 6 p.m. of each day. At 8 a.m. of the 23rd, the centre appears to have lain about 60 miles to the west of Erris Head, with a barometrical pressure of a little below 29.4. By 6 p.m. it had advanced south-eastwards into Connaught with a velocity of 6.5

English miles per hour, and by 8 a.m. of the 24th to a little west of St. Anne's Head. During the above period the depression was elongating itself, the position of its major axis changing from N.W.-S.E. into W.-E. The weather in the meantime was becoming rainy in the English Channel and home counties, while continuing fair in the north. At 6 p.m. of the 24th the eastward elongation of the whole system had become very marked; and at this hour the centre lay over the mouth of the Thames, after a somewhat lengthened thunder-storm over London, Woolwich, &c. The velocity of transit during the twenty-four hours had been 22 miles per hour, and the path of the centre was beginning to curve towards the left. By the morning of the 25th the centre had advanced to N.N.E., and lay about 53° 2' N. lat., 0° 24' W. long., with wet and cloudy weather over our eastern and midland districts. By 6 p.m. of that day the centre had begun to move slightly to the westward, having moved during the twenty-four hours with a velocity of 10 miles per hour. By the morning of the 26th the centre was near the mouth of the Humber, rainfall continuing over the north-east and north midland counties; at 6 p.m. of that day the centre lay over north-west Lincoln, having moved only with a velocity of about 3.8 m. per hour. The centre now moved to the neighbourhood of the Solway, with a velocity of about 10 miles per hour, and on the evening of the 27th began to recurve again a little to the left, the system at the same time becoming more circular in form, and the central pressures slightly decreasing. During this day rain and cloud prevailed on the west of the system, while in its rear there were some scattered thunder and hail



showers of the type prevalent in summer in the rear of cyclonic systems travelling to north-east. At 6 p.m. on the following day the central area had passed into Ulster, with a velocity of 5.5 miles per hour. The thunderstorms in the rear were on that day more pronounced. During the following night the centre travelled with increased velocity across Donegal to the Atlantic, and by 6 p.m. of the 29th the exterior isobars of the system had almost left our shores, finer weather setting in over Great Britain generally.

(2) The point marked with an asterisk on the chart marks the position of the writer during the progress of the depression, a position of vantage for the observation of upper currents, the value of which was much diminished by the predominant thickness of low cloud, and by the fact that there was little moonlight. Over the Midlands outlying threads of "cirro-filum" advanced with great velocity from north-north-west at noon of the 23rd, soon after which a great sheet of frozen veil-cloud rapidly overspread the sky, the exterior edge of which soon disappeared over the north-east horizon. A brilliant solar halo was completely eclipsed before 5 p.m. Meanwhile the lower cloud-current backed from south-west to south. At 7.32 p.m. there was a squall of wind from south-east with rain, and a "jump" in the barograph. About noon of the following day, when the centre was about 118 miles to the south-south-west a glimpse of the upper clouds was obtained; they were then moving from south. Further opportunities of observation were obtained in the

evening, which showed that the upper current had changed to south-east. No observations could be made during the two wet days which followed; but early in the morning of the 27th, when the centre was about 100 miles to the north, true cirri were observed moving slowly from north-east. These soon disappeared; but at 6 p.m. of the same day an important change took place, the bands of ice-cloud moving from south-south-west, from which point, or from a little west of it, the belts have continued to travel up to the time of my writing this, the lines being nearly parallel to the isobars, and to the general direction of the surface winds, and precisely resembling in character the stripes seen in most cases travelling from north-north-west when a depression, whose centre has passed a little to the north of the observer, has moved away to north-east.¹

(3) In an elaborate paper in the Quart. Journ. of the R. Met. Soc. for October 1877, the writer pointed out that in the extreme left-hand segment of an approximately circular cyclone, moving in any direction in the northern temperate latitudes, the movements of the upper currents are by no means analogous to those in the right-hand segment.² In the case of cyclones travelling eastwards, the reason of this difference is, I think, now well understood. Owing to the great relative density of the lower atmosphere, attended with low barometric pressure, near the poles, the gradients for westerly currents are far more constant in the upper than in the lower strata of the atmosphere in the regions traversed by extra-tropical cyclones. Over a large number of these cyclones, therefore, many of the isobars in the upper regions of the atmosphere do not form closed curves, but curves somewhat resembling those which, at the earth's surface, accompanying what are popularly termed V-shaped depressions. It is a question of the utmost interest whether, during the periods in which depressions travel to the west, the distribution of gradients in the upper atmosphere is really for the time reversed, and, if so, what can be the causes of so remarkable a change. There is a further question correlated with the above, which deserves more attention than has been given to it. The writer long ago pointed out (Journ. Scot. Met. Soc., vol. iv. pp. 333-335) that in cases of depressions travelling westward across our islands, temperatures at the earth's surface are in general higher over Scandinavia than over France; and a considerable number of instances have occurred since 1875 which have confirmed this conclusion. But in most of these cases an anticyclone has lain to the north-east of us, so that the "gradient force" of the lower strata may have tended to send the depression westwards, in addition to the ascensional force, associated with condensation in the western segment, due to the indraught of relatively warm air from north and north-east. In the instance described in this paper pressure was not particularly high over Scandinavia, during the westward progress of the system, but temperature seems to have been higher, over Sweden at least, than in France. W. CLEMENT LEY.

May 30.

The Crowing of the Jungle Cock.

IN NATURE (vol. xliii. p. 295) Mr. Henry O. Forbes has a letter commenting on a statement of Mr. Bartlett to the effect that the wild jungle cock does not crow, and testifying that he once heard one. In reply, in the next number of NATURE, it was suggested that the cock heard by Mr. Forbes was a hybrid.

I think that no one who has travelled in the jungles of Burma, during the dry season, can have any doubt that the jungle cock crows; for he cannot fail to have heard them many times.

It so happens that, just after reading Mr. Forbes's letter, I had occasion to travel among the hills which form the watershed between the Irrawaddy and the Sittong rivers. In one region here a large kind of bamboo was seeding, so that the jungle fowl were very numerous, and I heard them crowing in great numbers. I remember one place in particular: the Karens had prepared us a hut in which to sleep just outside of their village, which consisted, like nearly all the villages in these hills, of a single house, each family having its separate room in the common

building. "At cock crowing" in the morning we had, close to us, the crowing of the village cocks, and on every side, far and near, the answering crows of multitudes of wild birds. I do not remember ever to have been treated to such a chattering concert before.

The idea that these wild cocks were all hybrids is inadmissible, because (1) they were so very numerous, and (2) the country is very sparsely peopled, the villages all being small and far apart, and the greater part of the country still covered with primeval forest.

The crow of the jungle cock is shrill, like that of the smallest breeds of domestic fowl, and is, perhaps, a little less prolonged than that of the average domestic cock; but it can hardly be distinguished from the crow of a small breed of fowl kept by the Karens, some individuals of which so closely resemble the wild fowl that they are used as decoys.

I have several times heard wild fowl cackle, and in this journey, while in the midst of a heavy forest, miles from any human habitation, we came upon a flock of wild fowl cackling, and could tell by the tones that both cocks and hens were cackling. One of the followers being sent with a gun to try and get a shot, some of the birds saw him and flew, whereupon one of the cocks gave the peculiar call which the domestic cock gives when a bird flies over him.

I might add that, among the numerous birds shot in this region, there was one hen which had a pair of spurs about half an inch long.

B. P. CROSS.

Rangoon, May 20.

Cordylophora lacustris.

It is generally believed that this tube-dwelling Hydrozoa was originally a salt-water animal, and although now found a considerable distance from tidal water, it still dwells in rivers and canals more or less connected with tidal rivers. I have for many years found it in the Chester and Ellesmere Port Canal, growing principally on the shells of the fresh-water mussel, from two to three miles from the tidal river (the Dee). It seems to be a shade-loving animal, as I have always found it under the bridges, and from 4 to 6 feet beneath the surface of the water.

The tubes *only* remain during the winter and early spring, and the animal is fully developed in August and September. It is generally accompanied by *Fredericella sultana*.

THOMAS SHEPHEARD.

King-ley Lodge, Chester, June 12.

Philosophical Instrument Makers.

I FIND in your paper of June 11 (p. 135) that Messrs. Newton and Co. have been appointed philosophical instrument makers to the Royal Institution of Great Britain. Allow me to state that they are not the only ones, and that I also was appointed on June 1 by the managers of the Royal Institution of Great Britain to be their philosophical instrument maker. I thought that in the interest of the public you should know this fact.

A. HILGER.

204 Stanhope Street, Hampstead Road, June 12.

The Earthquake of June 7.

THE earthquake of June 7, whose centre seems to have been in the province of Verona, was also perceptible at Basle. The seismometer of the Bernoullianum Observatory registered a horizontal shock at 1h. 47m. 29s. a. Basle mean time, which corresponds to 1h. 17m. 10s. Greenwich mean time.

At Thal, a village east of St. Gall, the shock was strong enough to be felt by several persons.

Basle, June 13.

A. RIGGENBACH-BURCKHARDT.

NOTE ON EGYPTIAN IRRIGATION.

IN entering upon any account of Egyptian irrigation it is necessary, at first, to point out that it consists of two very broad subdivisions: (1) the irrigation effected by the Nile flood when there is rich muddy water in abundance for a land thrice as big as Egypt, and when everyone considers it his absolute right to have his fields

¹ These stripes or cirro-filum are so abundant in the rear of most depressions, towards the termination of the inversion disturbances accompanying squalls or thunder-showers, in Europe and the Northern States that it is singularly unfortunate that the statement of an English meteorologist, to the effect that they do not exist, should have found its way into the first edition of Ferrel's "Popular Treatise on the Winds."

² See also Ferrel, "Pop. Treat.," § 180; "Modern Meteorology," p. 111 (diagram).