

It may be that our agricultural troubles of the past three years are in some measure due to its disturbance; if so, it is of national importance that we should study its variations in order to learn whether they are reducible to law, and thus capable of anticipations sufficiently reliable to induce prudential preparation for their national consequences.

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[With the extreme desirableness of an immediate and systematic observation, by European nationalities, of the temperature of the Gulf Stream, and of variations in the rate and direction of movement northwards from the tropics of the warm water and of the cold water southwards we very cordially concur. As another illustration of the practical utility of a better knowledge than we now possess of this subject, we may refer to the higher temperature and consequently larger evaporation than usual of the Atlantic in lower latitudes, along with a lower temperature, and consequently lower evaporation than usual farther north, in the beginning of the winter of 1878-79, as being in all likelihood one of the chief causes which brought us the miserable weather of the last twelve months. It is far from being beyond the reach of science to show how the larger evaporation from the more southerly regions of the Atlantic continued to spread itself over Europe further to south than usual, from which resulted the more southerly course pursued by our European storms, with the accompanying plague of east wind and rains over the British Isles, and the commercial distress thus deepened and prolonged. The importance of the inquiry is all the greater when it is considered that the past three years have impressively taught us how, not in India only, as shown by Blanford, but also in our British climate, certain types of weather, such as cold, warm, wet, or dry, when once fairly set in, tend to repeat themselves, and stamp their character on whole seasons or even a succession of seasons. It is by such lines of research that something more than a mere guess of the weather of coming seasons is to be obtained.—E.D.]

The Climate of England

WILL you permit me, as a student for twenty years of the phenomena and laws of weather, to express my surprise that in meteorological tables or records, and weather notices in general, so little attention is bestowed upon the direction of the wind? It is true that in the daily forecasts issued from the Meteorological Office, this has been made for some time past a prominent, and, to my mind, the most valuable feature. Still the point has by no means been adequately dwelt upon by writers upon meteorology, the result being the loose and utterly unscientific talk we are accustomed to hear upon the very first principles of the problem of climate.

What is more common than to hear people remark that the climate of England has changed within the last few years? Their main ground for saying so is our having had for four or five seasons winters of exceptional mildness, followed last year by one of as remarkable severity and duration, and to all appearance likely to have following it one of not very different character.

The popular idea of climate has always seemingly been that of something affixed to the soil, a feature as fixed and characteristic as the rivers or mountain chains. Now, strictly speaking, there are for us but two real sources or loci of climate, the pole and the equatorial belts; the cold heavy currents of air from the Arctic regions flowing south, to take the place of the light warm air so rarefied by the sun's heat as to form a comparative vacuum. The aerial set of flux and reflux thus tending to be set-up along meridian lines is deflected eastwards by the rotation of the earth on its axis, with the result that in our part of the earth at least the wind is found to blow from some point of west to east for much about 200 days out of the 365. So limited is our sea-girt insular area, that within a few hours, depending on the velocity of the wind, the whole breadth of Great Britain is traversed, so that instead of breathing a climate engendered by local conditions, and to be called our own, we live in an atmosphere reaching us from abroad, and modified by the conditions through which it passes to us (into which I forbear at present to enter in detail). Observation combines with theory to establish the primary fact that what may be called the ruling line or axis of prevailing wind in our island is that from south-west to north-east approximately. Along this line may be said to take place, in the main, the perennial contest of opposing air-currents, on which depends the character of our seasons, the light warm balmy breath of the equatorial current, or so-called Gulf Stream, having to battle

with the dry, heavy, chilling atmospheric masses bearing down direct from the Polar regions, or circling over the steppes of Russia, or the uplands of Scandinavia. Drawing a line at right angles to this, or from north-west to south-east, we shall find that so long as the wind keeps well within the south westerly aspect of this diagonal, frost either sharp or long is with us impossible, and as an immediate response to the vane veering or backing from one side to the other, a rise or fall of the thermometer is to be observed, which may vie with that due to the sun's place in the zodiac. The mercury may be seen to stand as high in January as in June. If we ask why the four or five winters preceding the last severe one were so exceptionally mild, the proximate answer is that during the months when the sun's power continued low, we enjoyed a succession of south-westerly winds which tempered "winter's flaw." Last year, on the contrary, the wind kept early and persistently to the northerly and easterly quarters; and were proper tables available, I believe that an abnormal prevalence of those Polar currents would be shown to have marked the later seasons of this most exceptional year.

The problem is thus shifted a step.

What we have to inquire into is the cause or causes to which is due so exceptional and persistent a flow of wind from one alternative quarter to the other.

To aim at anything like a forecast of winter or summer weather before knowing what the prevalent set of the aerial currents is to be, is to invert the essential conditions of the problem, and to put the cart before the horse. It is for meteorologists, I would urge, to concentrate their attention upon the causes or laws, which determine or disturb the periodical motions of the earth's envelope, especially as it oscillates to and fro across the limited and exceptionally situated group of the British Islands. Simple as such a suggestion may appear to men of science, the notices they have as yet given us will by no means, I believe, show it to be superfluous. It is the conviction that the primary and elementary conditions of the problem are far from having been grasped by the general public that has led me thus far to trespass upon your space.

Gray's Inn, December 2

ALEXANDER TAYLOR

A Correction

A FEW weeks ago I had some correspondence with the late Mr. J. Allan Broun on the subject of my communication to NATURE, vol. xx. p. 54, in the course of which he drew my attention to an error in my value for the barometrical oscillation corresponding to 1° F. ($q = \frac{\Delta p}{\Delta t}$) at Sibsgar. He said:—

"You had a note on the difference of results for Lucknow and Sibsgar both nearly at the same height; the values of q you made 0'017 and 0'028, the latter for Sibsgar should have been 0'018 or $\frac{\Delta p}{\Delta t} = \frac{0'477}{26'6}$ "

I acknowledge the error, and take this opportunity of mentioning it as I fear Mr. Broun's article on the subject, which he told me was shortly to appear in NATURE, and in which he would most probably have drawn attention to my error, has been cut short by his sudden and lamented decease. His last letter to me containing the above correction was dated November 15, just a week before he died.

I may add that while the above error (which was due to my taking Δt to be 16'6 instead of 26'6) disqualifies Sibsgar from demonstrating that the value of q depends on the distance from the coast independently of the altitude, the rule is nevertheless generally evident, and can be shown equally well by taking Goalpara instead of Sibsgar with Lucknow.

At Goalpara $h = 386$ feet,

$$q = \frac{\Delta p}{\Delta t} = \frac{0'448}{18'7} = 0'023.$$

E. DOUGLAS ARCHIBALD

Tunbridge Wells, November 29

Monkeys in the West Indies

IN his very interesting paper on "Tails," which appeared in NATURE, vol. xx. p. 510, Prof. Mivart says, "Monkeys are scattered over almost all the warm parts of the earth save the West Indies, Madagascar, New Guinea, and Australia." As regards the West Indies the statement is not quite correct, and I am sure Prof. Mivart will be glad to receive the following