

LETTERS TO THE EDITOR

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[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 insure the appearance even of communications containing interesting and novel facts.]

The Enormous Loss from Ox-Warble

I HAVE read Mr. John Walker's remarks on "warbles." This is one of the many important subjects to which Miss Eleanor Ormerod has lately drawn attention. I can readily believe that there is a loss of two to three millions to the country through the ravages of this fly, but such statements, it must be remembered, should be qualified by the thought that it might cost two or three millions to protect all the cattle of this country against such attacks. The labour would be great, the vigilance would entail higher-classed stock-men, in almost all cases with higher wages, for you cannot get our labourers, dairy-men, and bailiffs even, to attend to such matters without great difficulty. The loss does not, I think, fall upon farmers, unless it is from the irritation to the cattle when they hear the buzz of the fly meditating her attack.

As to the damage to the hide, I never, in my experience, heard a butcher or dealer make warbles in the hide a pretext for offering one shilling less for a bullock. They take no notice of them at all; and, if the maggots injure the hide, this is a matter for fell-mongers and tanners, rather than for farmers. This is one of the cries emanating from the scientific friends of agriculture which it is well to listen to. It will probably gain the ear of only a select circle of agriculturists, because, to use a very homely phrase, "the game is scarcely worth the candle."

Animals pass through the market too rapidly, and the prices asked and given are so approximate only to the absolute value, that a few warbles in the skin do not in the least influence the selling price. Still, anything which can be shown to influence the comfort of live stock or the value of their products must be considered as worth attention.

JOHN WRIGHTSON

College of Agriculture, Downton, Salisbury, October 31

"Lung Sick"

MR. H. RIDER HAGGARD, in his excellent novel, "King Solomon's Mines," has the following passage. He is speaking of Zulu oxen, and says:—

"As for 'lung sick,' which is a dreadful form of pneumonia very prevalent in this country, they had all been inoculated against it. This is done by cutting a slit in the tail of an ox, and binding in a piece of the diseased lung of an animal which has died of the sickness. The result is that the ox sickens, takes the disease in a mild form, which causes its tail to drop off, as a rule about a foot from the root, and becomes proof against future attacks."

Presumably this account is *bonâ fide*. It will be gratifying to me, then, if any of your correspondents will kindly explain how it is that the virus, which has not been weakened by cultivation, produces the disease in a mild rather than in a virulent form.

E. J. DUNGATE

6, Marchmont Road, Edinburgh, November 1

The Beetle in Motion

WITH reference to Prof. Lloyd Morgan's letter in last week's NATURE (p. 7), the following passage, which occurs in an interesting chapter on "Motions of Insects" in Kirby and Spence's "Entomology," may be quoted:—

"In walking and running, the hexapods, like the larvæ that have perfect legs, move the anterior and posterior leg of one side and the intermediate of the other alternately."

This passage is in complete accord with the observations of your correspondent.

November 9

C. J. G.

Meteors

YESTERDAY (November 2), about 8.8 p.m., I chanced to see here a meteor that, I think, deserves record, especially if my

report of its position in the sky can be compared with that of some one who observed it at another place.

Returning from Oxford, I was about half a mile east of Combe Church, on the lofty plat that is the remnant of Combe Common. "Stepping westward," I was startled by a sudden splendour, flooding with light the moonlit heaven. This splendour was above me and before me; it was a little on my left. A large meteor was rapidly descending, at an angle of 60° or 70°. Not much east of it shone the half-orbed moon; but little west of it stretched the eastern branch of the Milky Way's western termination. When it had traversed about three-fourths of the distance between its apparent starting-point and the undulating ground beneath, it swelled out for a moment grandly, and, before it burst, displayed a globe at least as big as the sun, and of about the same hue, though not of dazzling lustre. After it had vanished, its track was marked for a second or two by a brilliant trail, which, in the light of the neighbouring moon, sparkled with all the tints of the rainbow, and resembled a gorgeous shower of precious stones.

JOHN HOSKYNs-ABRAHALL

Combe Vicarage, near Woodstock, November 3

I HAVE read Mr. Murphy's letter (NATURE, November 4, p. 8). At the same time as Mr. Murphy saw a large meteor (October 31, 8.25 p.m.) I also saw an immense one coming from the same portion of the sky, and travelling west. It disappeared behind a cloud. There was a loud rushing noise.

E. PARRY

Dinorwic Quarries, Llanberis, North Wales

INFLUENCE OF WIND ON BAROMETRIC READINGS

I AM glad to see (NATURE, vol. xxxiv. p. 461) that the Scottish Meteorological Society recognises the importance of the effect of wind upon the barometer. I assume that the gradient, the density, and all other sources of error had been fully corrected for before concluding the existence of the large effect attributed to the wind on Ben Nevis.

There certainly is a purely local and dynamic effect of the wind on the barometer due to the exposure, and for which there must be found some method of correction or elimination before we can proceed much farther in barometry: this effect has been independently reasoned out by G. K. Gilbert ("A New Method, &c.," 1883), and has been discussed by Prof. H. A. Hazen (*Annual Report*, C.S.O., 1882, p. 897), and by Mr. Clayton and others in recent numbers of *Science*, but its existence was long since demonstrated by Sir Henry James (*Transactions Roy. Soc. Edinburgh*, vol. xx., 1853), whose memoir seems to have been quite lost sight of by meteorologists.

The suction of wind on tubes, cows, and chimneys was investigated by Ewbank (*Journal of the Franklin Institute*, 1842), Wyman (*Proceedings of the American Academy*, Boston, 1848), Fletcher (*B.A.S. Reports*, 1867 and 1869), Magius (Copenhagen, 1875?), Holten (Copenhagen, *Overstigt Vidensk-Selskabs*, 1877), and was used by Hagemann as the basis of his anemometer; it was Hagemann's memoir (Copenhagen, 1876, translation will appear in *Van Nostrand's Magazine*, Dec. 1886) that suggested a method of determining and correcting for the amount of this important effect, whose existence had long been known to me. This method is sketched out in the *Annual Report* of the Chief Signal Officer, U.S.A., 1882, p. 99, where I state that a close determination simultaneously of both dynamic wind-pressure and static air-pressure is probably attainable by exposing above the roof, side by side, a Pitot tube facing toward the wind and a vertical tube over which the wind blows. Close the lower ends of these tubes and place within each an aneroid barometer, and the latter will record respectively the static pressure plus the effect of the wind-velocity and the static pressure minus the wind's effect. A stop-cock, cutting off at will communication between the aneroids

and the exposed mouths of the tubes, allows one to catch the influence of any gust and read the pressure at leisure.

The theoretical problem of the precise mechanical action of these tubes, especially that which Hagemann calls a Magius tube, *i.e.* one across which the wind blows at right angles, will, I hope, prove attractive to the mathematical physicists of England. Some interesting experimental work by Robinson will be found in *Van Nostrand's Magazine*, vol. xviii., 1878, p. 255, and xxxv., 1886, p. 89. A small closed room with only a chimney flue opened, such as usually obtains at the mountain stations of meteorologists, is virtually a Magius tube, and the barometer within must, under favourable conditions, show a depression depending on the so-called suction or draft up chimney. The direction of the wind combines with the structure of the building and the aspect of the various doors and windows to modify the influence of the force of the wind; the sluggishness due to the close cisterns, and the pumping due to the inertia of the liquid of ordinary mercurial barometers, further complicate the phenomena of suction during gusty winds, so that a simple general rule for correcting the observed barometric readings becomes impracticable, but the use of aneroids within closed Pitot or other tubes, with air-tight stop-cocks as above, simplifies the wind's action, and allows of its measurement at definite moments.

The distribution of pressure over the face of a large building fronting the wind, and in some part of which is the window of the room containing the barometer, is approximately known from Curtis's and Burton's measurements for a thin flat plate.

The location of each station with respect to mountains or other orographic features has also an influence on the pressure, which will still remain to be investigated; thus, on the leeward side there is a diminution, and on the windward side an increase of pressure, but this may be generally inappreciable.

It may also be mentioned in this connection that in delicate barometric measurements, such as those made by the International Bureau of Weights and Measures, it is important to prevent even the slightest currents from blowing across the open end of the siphon tube.

The suction effect of wind blowing over chimneys surmounted by cowls of different shapes was under investigation from 1878 to 1881 by a special committee of the Sanitary Institute, but, so far as I can learn, their experiments were never completed. Lord Rayleigh also read a short paper on the same subject at the meeting of the British Association in 1882, but as I do not know of its publication, I take this opportunity to express the hope that he will give meteorologists both a theoretical and experimental exposition of the action of the Pitot, the Magius, and the reversed Pitot tubes, and a suggestion as to the best method of determining, by means of stationary apparatus, the static pressure within a mass of moving air.

CLEVELAND ABBE

Washington, October 23

M. PASTEUR'S TREATMENT OF RABIES

AT the meeting of the Paris Academy of Sciences on November 2, M. Pasteur submitted a further communication on the results hitherto obtained from his method of treating hydrophobia by inoculation, which has now been in operation for a twelvemonth. The paper is divided into three parts, the first giving the statistical details brought down to the present date, the second describing certain modifications in his method as originally applied, the third giving the results of fresh experiments on animals. Up to October 31 as many as 2496 persons were inoculated at his Paris establishment, and at first the treatment was uniform for all alike, whatever their age, sex, or other varying conditions. Of the total number 1726 were from France and Algeria, 191

from Russia, 165 from Italy, 107 from Spain, 80 from England, 57 from Belgium, 52 from Austria, 22 from Roumania, 18 from the United States, 14 from Holland, the rest from various other parts of Europe, besides 3 from Brazil and 2 from British India. Of 1700 French patients, apart from 2 who arrived too late, 10 only succumbed, whereas of the small minority not treated at the laboratory as many as 17 died in the same period in the rest of France, while for the last five years the average yearly mortality from hydrophobia was 11 in the Paris hospitals alone. Last year it rose to 21, but since November 1885, when the new system was introduced, 2 only died, and these had not been inoculated, besides a third who had been imperfectly treated. Most of those who perished were children bitten in the face and subjected to the simple treatment, which experience now shows to be insufficient in such cases.

A first lesson on the necessity of stronger doses was taught by the 19 Russians bitten by a mad wolf, one of whom died while under treatment, and two others shortly after. In consequence of these deaths the 16 survivors were subjected to a second and third treatment with the strongest and freshest virus from the spine of the rabbit of 4, 3, and 2 days' standing, whereas, for the milder treatment, virus from 14 to 5 days' old had alone been used. To these repeated treatments should most probably be attributed the recovery of these Russians, who are reported to be all still in excellent health.

Encouraged by these results and by the fresh experiments described further on, M. Pasteur modified his treatment, making it at once more rapid and more active for all cases, and even still more energetic for bites on the face, or for deep and numerous lacerations of exposed parts of the body. In such cases the inoculations are now hastened, in order to arrive more promptly at the freshest virus. Thus, on the first day, virus of 12, 10, and 8 days will be used at 11, 4, and 9 o'clock; on the second day that of 6, 4, and 2 days, at the same hours; on the third, virus 1 day old. Then the treatment is repeated: the fourth day with virus 8, 6, and 4 days old; the fifth with that of 3 and 2 days; the sixth with that of 1 day; the seventh with virus of 4 days; the eighth with that of 3; the ninth that of 2; the tenth with that of 1 day.

If the bites are not healed, or the patients arrive somewhat late, the same treatment may be renewed at intervals of two or a few days for four or five weeks, which are the critical periods for children bitten in the face. This system of vaccination has been in operation for the last two months, hitherto with excellent results, as shown by comparing the case of the six children who perished under the mild treatment, with that of ten others also seriously bitten last August, and subjected to the more energetic treatment, and all of whom were doing well on the first of this month. This new system requiring an increase of the staff, M. Pasteur and his assistant, Dr. Grancher, have been aided for some time past by Dr. Terrillon, Dr. Roux, Dr. Chantemesse, and Dr. Charrin.

With regard to the fresh experiments on dogs, an objection to the inoculation of human beings after being bitten might be raised on the ground that the immunity of animals treated before being bitten had not been sufficiently demonstrated after their undoubted infection by the virus. In reply to this objection M. Pasteur points to the immunity of dogs after trepanning and intra-cranial inoculation with the virus of ordinary street rabies. Trepanning is the surest method of infection, and its effects are constant. The first experiments on this point, dating from August 1885, had but partial success. They were resumed during the last few months, with certain modifications which produced the best results. The vaccination is begun the day after inoculation, and proceeded with rapidly, the series of prophylactic virus being all administered within twenty-four hours and even in a shorter period, and then repeated