LETTERS TO THE EDITOR

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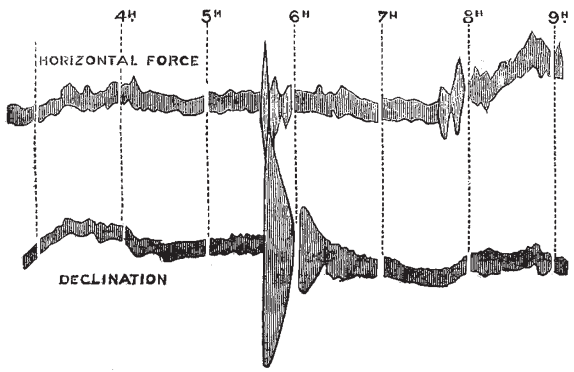
The Earthquake

WITH reference to the earthquake which occurred on the morning of February 23 last, it may be of interest to inform you that two of the magnetic registers of the Royal Observatory, Greenwich, entirely confirm the fact shown by the Kew horizontal-force register (NATURE, March 3, p. 421), of the shock having been sensible in England. The particulars are as follows :—

At 5h. 38m., Greenwich civil time, the declination and horizontal-force magnets were suddenly thrown into vibration by some cause not magnetic, the extent of vibration being in the case of declination 20′ of arc, and in the case of horizontal force ·004 of the whole horizontal force. Other smaller vibrations will be observed, on the annexed copy of the Royal Observatory photo-



Copy of the photographic registers of the declination and horizontal-force magnets, as recorded at the Royal Observatory, Greenwich, 1887, February 23.

graph, as occurring in declination at about 6h. 0m., and in horizontal force at about 5h. 45m., 7h. 40m., and 7h. 50m. respectively. No motions of this character were shown in the vertical-force magnetic register, the two earth-current registers, or in any of the meteorological registers.

It may be mentioned that the declination magnet is a bar 2 feet long, suspended by a single thread about 6 feet long, and stands in the magnetic meridian, and that the horizontal-force magnet, also 2 feet long, has a bifilar suspension, the threads, about 7½ feet long, being twisted horizontally to cause the magnet to stand at right angles to the magnetic meridian. The time of vibration of the declination magnet is 24 seconds, and that of the horizontal-force magnet 21 seconds. The magnetic declination at Greenwich at the present time is about 17° 53′ west.

W. H. M. CHRISTIE

Royal Observatory, Greenwich, March 10

The *Engineer* on the Dimensions of Physical Quantities

IN a brief book-notice (*ante*, p. 387) I commented on the grave error of measuring potential energy in terms of horse-power, comparing it with the allied absurdity of measuring distance in terms of speed. I also cited the following passage :—

"dividing 3,942,400 foot-pounds per minute by 33,000 foot-pounds, we get 119·4 horse-power" ;

and I put beside it the allied absurdity :—

"dividing 500*l.* a year by 50*l.*, we get 10*l.* a year."

I thought it superfluous to point out the nature of the mistake, but I judged rashly. For the *Engineer* (in a leader, of March 4, 1887) has made a somewhat excited attack on this and other of my statements :—remarking

"we are in doubt whether 'P. G. T.' really has any idea what (*sic*) the expression means."

To this charge I plead guilty. For if I were myself to divide 3,942,400 foot-pounds per minute by 33,000 foot-pounds, the result would contain the unit of *time* alone ; and could certainly not express horse-power. It might be angular velocity perhaps. It is true that if I were to divide 3,942,400 foot-pounds per minute by the mere *number* 33,000, I should probably obtain the result 119·4 horse power. But the *Engineer* will ascribe all this to the pedantry of the "professor," for its article goes even farther in absurdity than does the passage quoted above. It leaves out the "per minute" and says the author "is strictly correct (*sic*) when he says that 3,942,400 foot-pounds are to be divided by 33,000 foot-pounds to get the horse-power" ! Alas for Fourier, and *Dimensions* of physical quantities ! !

I wonder what the *Engineer* would assign as the result of dividing 10 eggs per minute by 2 eggs. Would it, or would it not, be 5 eggs per minute?

P. G. T.

Tabasheer

MR. W. T. THISELTON DYER'S ingenious contribution on Tabasheer in NATURE (p. 396) will doubtless be interesting in connection with the subject of the nature and mode of distribution of silica in vegetable bodies, in which it is so often contained.

Brewster, in 1819, says (*Edinburgh Philosophical Journal*, n. 1, p. 147) :—"It is found in the joints of the female (?) bamboo, sometimes in a fluid state like milk, sometimes with the consistency of honey, but generally in the form of a hard concretion. Some specimens of it are transparent, and resemble very much small fragments of the artificial pastes made in imitation of opal ; others are exactly like chalk, while a third kind is of an intermediate character, and has a slight degree of translucency.

"In the year 1804, Messrs. Humboldt and Blonpland brought with them from America some specimens of tabasheer, called *guaduas butter* by the Creoles, taken from the bamboos which grow to the west of Pinchincha in the Cordilleras of the Andes (Humboldt's 'Personal Narrative,' vol. i. Introd. p. xii. note). These specimens were analysed in 1805, by Messrs. Fourcroy and Vauquelin (*Mémoires de l'Institut*, tom. vi. p. 382), who found them to be different from the tabasheers of Asia. Instead of being wholly composed of silex, they contained only 70 per cent. of this earth, and 30 per cent. of potash, lime, and water."

Cohn speaks of two kinds of tabasheer, viz. crude and calicified. The former consists of roundly-angular pieces of unequal sizes, possessing all degrees between transparency and opaqueness, and passing from brownish, reddish, yellowish, or dark gray to black in colour ; the latter is opal-like, milky, or pale in colour, not unlike a lump of sugar. Tabasheer can be cut into pieces very easily, and shows, in polarised light, only extremely feeble double reflection.

Brewster, moreover, by studying the optical properties of tabasheer, formed one of the semi-transparent specimens, which he obtained from Nagpore and Hyderabad, into a prism, and found to his "great surprise that the refractive power of tabasheer was not only lower than water, but so much lower, as to be almost intermediate between water and gases." The results he obtained are as follows :—

		Index of refraction
Air		1·0000+
Tabasheer from Hyderabad, yellowish by reflected light		1·1115
Tabasheer from Nagpore ...	bluish by reflected light	1·1454
,, ,, ,, harder		1·1503
,, ,, ,, ...		1·1535
,, ,, ,, very hard		1·1825
Water		1·3358

As to the chemical constituents of this substance, Poleck's recent analysis (*Bot. Centralbl.* Band xxix., 1887, p. 95) shows that it contains 99·6 per cent. of pure silicic acid and only 0·4 per cent. of other mineral matters, as natrium, sulphuric acid, &c., but neither potash nor phosphoric acid has been detected. The crude specimens contain 58 per cent. of water ; the calicified specimens, on the other hand, are free from water.

We may perhaps dwell shortly upon the *habitat* of tabasheer. Mr. Dyer has fully shown its occurrence in India ; now let us consider whether it occurs further in the eastern parts of Asia, as in China and Japan, where the growth of bamboos is still in full vigour. In China, tabasheer is known as Tien-chü-hwang or Chü-hwang, that is, the "yellow (substance) of bamboo" ; or sometimes called Chü-kaou, or the "cerate of bamboo." "Pun-tsaou-kang-mûh" says : "They are produced inside the stem of bamboos, and look somewhat like yellow earth ; they may be often found attached in masses to the inside of the bamboo cane."

From the well-known old Japanese encyclopædia, "Wakan Sansai Dsuyé," the following descriptions may be quoted : "After bamboos have been cut down in March or April, and

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