

## Disease of Potatoes

THE *Sclerotia* referred to by Mr. Worthington G. Smith (in NATURE, vol. xxviii, p. 299) as having destroyed the potatoes in Norway have been sent to me from two different places on our western coast. As I usually travel every summer, I had no opportunity of cultivating them myself; so I sent them to Prof. De Bary of Strasburg, who kindly informs me that he has cultivated them with success. They belong to *Peziza sclerotiorum* (Lib.). The spores of our Norwegian *Peziza* will produce *Sclerotia*, as he has proved by experiment, also in *Daucus carota*, and very likely in *Phaseolus* and some other plants.

Christiania, August 6

A. BLYTT

## Determination of "H"

SINCE the publication of a method for the determination of the value of the horizontal component of the earth's magnetism by Mr. A. Gray in NATURE, vol. xxvii, p. 32, I have worked out the value of "H" for my laboratory here, and from six sets of experiments carried out during the month of March in a small building constructed free from iron near the laboratory, I find "H" to equal 0.18365. The method proposed by Mr. Gray was closely adhered to throughout the experiments.

Taunton, August 8

FREDERIC JOHN SMITH

## Fireball

ABOUT 8.25 p.m. on the 11th inst. my attention was suddenly attracted in the direction of the window of my dining-room, which looks south, by a brilliant ball of fire of a deep amethyst colour. It was travelling across the clear blue sky at the rate of about twenty miles an hour in an easterly direction and at an angle of 45°. Before disappearing behind a cloud it seemed to throw a few particles of itself forwards at a greater speed than that at which it was travelling. I trust others saw it under more favourable circumstances, and that they will communicate their experience of its course to you.

CHARLES F. CASSELLA

The Lawns, Highgate, August 14

## Palæolithic Implements at Stratford

ALLOW me to say that a few weeks ago I found an abraded ochreous oval Palæolithic implement at Stratford (*in situ* two feet from surface). I have shown it to Mr. W. G. Smith, who says it is very interesting, as implements are rare in that locality, and especially oval ones, and he thought it as well for me to communicate with you, as it may interest some of your readers.

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G. F. LAWRENCE

## EARTH PULSATIOMS

FOR many years philosophers have speculated as to whether the surface of the earth is really so stable as it usually appears. With the sudden and violent motions of our soil which we call earthquakes man has been familiar since the earliest times, and the origin of these disturbances has always formed a fruitful source of speculation. With the help of properly constructed instruments, our knowledge of the nature of these movements has during the last few years been greatly extended, and we are brought to the conclusion that these natural vibrations are propagated through the surface of our earth in a manner very different to that which we should have anticipated from our knowledge of elastic solids. Another order of earth movements which, in the hands of Timoteo Bertelli of Florence, M. S. di Rossi of Rome, and other Italian investigators, have recently received considerable attention, are *Earth Tremors*. From observations carried on during the past ten years it would appear that the soil of Italy is practically in a perpetual state of vibration, even in districts far removed from volcanic centres. On account of the smallness in the amplitude of these motions they are only to be observed with the aid of specially constructed instruments. Messrs. George and Horace Darwin, in connection with their experiments on the disturbance of gravity caused by lunar attraction, have shown that these movements are common to the soil of Britain. Like observa-

tions have been made in Japan, and it does not seem improbable that after further experiments have been carried out we shall be brought to the conclusion that the surface of the whole globe is affected with similar microseismic disturbances.

In addition to these minute movements, which escape the attention of the ordinary observer on account of the smallness of their amplitude, theoretical investigation has shown that there may be existing in the soil on which we live movements which have escaped our attention on account of the slowness of their period. These motions for want of a better term I call *Earth Pulsations*. Mr. George Darwin in his last report to the British Association has shown that movements of that nature may be produced by barometrical variation. A rise of the barometer over an area is equivalent to loading that area with a weight, in consequence of which it is depressed. When the barometer falls, the load is removed from the area, which in virtue of its elasticity rises to its original position. This fall and rise of the ground completes a single pulsation.

On the assumption that the earth is extremely rigid, Mr. Darwin calculates that if the barometer rises an inch over an area like Australia, the load is sufficient to sink that continent two or three inches.

The tides which twice a day load our shores cause the land to rise and fall in a similar manner. On the shores of the Atlantic, Mr. Darwin has calculated that this rise and fall of the land may be as much as five inches. By these risings and fallings of the land the inclination of the surface is so altered that the stile of a plummet suspended from a rigid support ought not always to hang over the same spot. There would be a deflection of the vertical.

In short, calculation respecting the effects of loads of various descriptions which we know are by natural operations continually being placed upon and removed from the surface of various areas of the earth's surface, indicate that slow pulsatory movements of the earth's surface must be taking place, causing variations in inclination of one portion of the earth's crust relatively to another. That pulsatory motions of this description have repeatedly been observed it may be shown that there is but little doubt. The magnitude of these disturbances however is so great that we can hardly attribute their origin solely to the causes which have just been indicated. Rather than seeking an explanation from agencies exogenous to our earth we might perhaps with advantage appeal to the endogenous phenomena of our planet. When the barometer falls, which we have shown corresponds to an upward motion of the earth's crust, we know from the results of experiment that microseismic motions are particularly noticeable.

As a pictorial illustration of what this really means, we may imagine ourselves to be residing on the loosely fitting lid of a large cauldron, the relief of the external pressure over which increases the activity of its internal ebullition; the jars attendant on this ebullition are gradually propagated from their endogenous source to the exterior of our planet. This travelling outwards would take place much in the same way that the vibrations consequent to the rattle and jar of a large factory slowly spread themselves farther and farther from the point where they were produced.

Admitting an action of this description to take place, it would then follow that this extra liberation of gaseous material beneath the earth's crust would result in an increased upward pressure from within, and a tendency on the part of the earth's crust to elevation. If we accept this as an explanation of the increased activity of a tremor indicator, then such an instrument may be regarded as a barometer, measuring by its motions the variations in the internal pressure of our planet.

The relief of external pressure and the increase of the