

which is overlain by dark-green sandy clay and Gault, turned up at a high angle (and probably squeezed out) in the breadth of a few yards, before the iron-sands are reached on returning to the hill-side. The party next came to the foot of St. Martha's Hill, or Martyrs' Hill. Before mounting this hill of sand, seamed irregularly with ironstone, some of the geologists descended the Halfpenny Hatch lane, leading down towards the East Shalford bottom, and saw a section of sand and calcareous sandstone, with a fuller's earth band and pebbly beds, similar to those in the quarry on the other (western) side of Guildford. The underground structure of South-Eastern England is connected with that of the Boulonnais, of Belgium, the Ardennes, and Westphalia; and the folds and ridges of palæozoic rocks, that in those countries bear up, either at the surface or just beneath the Chalk, or the attenuated Oolites, valuable coal-beds, are continued through, in a broad sweeping line, underneath parts of Surrey, Kent, and Sussex, until visible again near Frome, in the Bristol coal-area, in North Devon, South Wales, and the South of Ireland. The old faults and fissures affecting this linear tract of old strata had long before the Coal-period raised and depressed the lands and sea-beds; and, as a great spur of the old Scandinavian lands, this tract afforded ground for the littoral growth of the jungles that formed the coal on its oscillating borders and in its lagoons, now shut up by bars, and now losing their marsh features by influx of the sea. Succeeding ages still brought oscillations and changes, until the Jurassic seas crept over this old ridge or shoal, and the Cretaceous seas quite buried it, at first in sands and ultimately by the calcareous ooze of oceanic depths. But again another contracting crush of the earth's crust operated on the old weak lines, and the buried ridge slowly uprose, and its coating of thick strata were worn off by sea and rain, making pebbles and sand for the Lower Tertiaries; and still rising, it was at length laid bare in the Franco-Belgian and the Bristol areas; whilst our Wealden valleys of elevation, and those of Kingsclere, Shalbourne, and Pewsey, show where its uneven back approaches near the soil.

## SOCIETIES AND ACADEMIES

### LONDON

Royal Society, June 20.—“On the 26-day Period of the Earth's Magnetic Force,” by Mr. J. A. Broun, F.R.S.

Referring to the Astronomer Royal's important communication on this subject, the author confesses that, projecting his results for the horizontal force, he cannot agree in his final conclusions from them. In his paper he limits himself wholly to the observations of the horizontal force, as he has found that element, when accurately corrected for temperature, best fitted to show the period in question.

As far as the existence of a period of near 26 days is concerned, he thinks there cannot be the slightest doubt; the examination of great masses of observations has confirmed his belief; but we know nothing certainly as to its cause. It appears to be most probably connected with the sun's rotation; but in what way this may act nothing is known. The single periods show great breaks, and what may be termed *accidental minima*, in opposition to the minima belonging to the period; these accidental are connected with great disturbance, probably allied to the solar eruptions, or to causes which generally produce spots and protuberances. We might suppose that the sun during its rotation produces an action on the magnetic or electric ether in motion, which, as far as it acts on our magnet, may be supposed in greater quantity or more condensed in certain parts of the earth's orbit, and in certain years; and, as has been supposed in the case of the frequency of the solar spots, this ether may also be acted on by the planet, and produce an irregularity in the length of a few successive periods. These suppositions are made merely to show that we are perhaps not in possession of all the conditions of the problem, without which perfect exactness in the calculations is impossible.

In conclusion, he refers those interested in the subject to plate xvii. in the Transactions of the Royal Society of Edinburgh, vol. xxii. where the daily means of horizontal force are projected for four stations on the earth's surface, all of which agree in showing the same movements, some of which have an amplitude of '002 of the whole horizontal force (the Astronomer Royal's result for 1870 gives a *mean* value of nearly the half of this), and with intervals of about 26 days.

### PARIS

Academy of Sciences, July 1.—M. M. Marie read a memoir on some general properties of the imaginary envelope of the conjugates of a plane place.—M. H. Reaumont communicated general equations of the movements of a solid body referred to its movable axes; and M. Montucci forwarded a note describing an experiment for the appreciation of the resistance of a sheet of brass to atmospheric pressure.—M. J. Bourget presented a memoir on the mathematical theory of the movement of a cord, one of the extremities of which possesses a given movement.—M. G. Tissandier communicated a notice of an optical phenomenon observed during a balloon ascent, describing a case in which the shadow of the balloon was thrown distinctly upon a white cloud, and surrounded by a pale elliptical halo, exhibiting the colours of the rainbow.—M. Faye communicated a letter from M. Tacchini noticing the occurrence of magnesium in the chromosphere of the sun.—M. J. A. Brown presented a note on the simultaneity of barometric variations between the tropics.—General Morin communicated an extract from a letter by M. Vinson describing a severe cyclone which followed the aurora australis of Feb. 4, 1872, at Reunion.—M. W. de Fonvielle gave an account of observations made during the ascents of the balloon “Lea,” in which he refers to the above-mentioned note by M. Tissandier, giving the credit of the first observation of the halo round the shadow of balloons to Mr. Glaisher, and especially to the oscillation and rotation of balloons.—M. L. Sollier forwarded a note on the destruction of *Phylloxera vastatrix* by means of a decoction of tobacco.—M. C. Bernard presented a fourth note by M. Paul Bert, on the influence exerted by changes of barometric pressure upon the phenomena of life; and M. Wurtz communicated a third note, by M. Oré, on the question whether strychnine is to be regarded as an antidote to chloral.—M. Decaisne communicated an interesting paper by MM. Van Tieghem and Le Monnier, “On the Polymorphism of the Reproductive Organs in the mucorine genus *Mortierella*.”—M. Leymerie presented a brief reply to a note by M. Garrigou on the constitution of the Pyrenees.

## BOOKS RECEIVED

ENGLISH.—Town Geology: Rev. C. Kingsley (Strahan and Co.).—The Life of Richard Trevithick, vol. 1: F. Trevithick (E. and F. Spon).—Health and Comfort in House Building: J. Drysdale and J. W. Hayward (E. and F. Spon).—Nautical Surveying: J. K. Laughton (Longmans).—Sewer Gas, and how to keep it out of Houses: O. Reynolds (Macmillan).

FOREIGN.—Zeitschrift für Biologie: Pettenkofer, Radlkofer, and Vogt, Band 7, Heft 3, 4, Band 8, Heft 1.—Abhandlungen des Naturwissenschaftlichen Vereins zu Bremen, Band 3, Heft 1.—Die Echinoiden der oesterreichisch-hungarischen oberen Tertiärlagerungen: Dr. Laube.—Die Erforschung des Süden-polar Gebietes: Dr. G. Neumayer.—Zur Kenntniss der Chlorophyllfarbstoffe: Dr. G. Kraus.—Jahrbuch der k. k. geologischen Reichsanstalt zu Wien, Jan.-March.—Notizblatt des Vereins für Erdkunde: L. Ewald.—Zur Morphologie des Säugthier-Schädels: Dr. J. C. G. Lucas.

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ERRATA.—Vol. v., p. 167, col. 8, l. 20, for “sufficient from” read “sufficient heat from;” p. 168, col. 1, l. 11, for “inorganic” read “organic.”