BALLOONERS will rejoice at hearing that Messrs. Hachette and Co. have issued a magnificent work on the Aërial Voyages of Glaisher, Camille Flammarion, W. de Fonvielle, and Gaston Tissandier. The illustrations are excellent.

TWO handsome volumes devoted to the "Life and Letters of Faraday" have been issued by Messrs. Longmans, and received by us just as we were going to press. The author is the Secretary of the Royal Institution, Dr. Bence Jones, whose delightful memoir of Faraday communicated to the Royal Society last year has been perused with pleasure by all scientific men.

THE committee of the Council on Education have placed at the disposal of the University of Oxford two of the thirty exhibitions, value 25*l.* each, given by Sir Joseph Whitworth, to assist deserving students in competing for his scholarships in mechanical science.

BOTANY

Spontaneous Movements in Plants

M. LECOCQ, of Clermont Ferrand, records in the *Belgique Horticole* some singular spasmodic movements in the leaves of *Colocasia esculenta*. These motions bear no resemblance to those produced in the Sensitive plant by the warmth of the hand, but occur spontaneously independently of the action of the wind or of any external cause, at irregular intervals, and at different periods of the day and night. M. Lecocq describes the movement as a kind of trembling or quivering affecting the whole plant, sufficiently powerful to tinkle little bells attached to the branches, and on one occasion even to shake the pot in which the plant was contained, and to resist a pressure of the hand, the number of the pulsations varying from 100 to 120 per minute. He states that the *Colocasia* is destitute of the stomata with which the leaves of plants are generally provided, especially on their under-surface, and attributes the phenomenon to the incessant pulsations of the imprisoned sap.

Decomposition of Carbonic Acid by Leaves

M. P. P. DEHERAIN has been continuing his researches on the evaporation of water from the leaves of plants, and the decomposition by them of carbonic acid. His previous investigation had established the fact that these two functions of the leaves proceed *pari passu*, the same conditions favouring the one as the other; and that both are determined by the degree and nature of the light to which the leaves are exposed, and not by the temperature. He now attempts to show that it is not the intensity only of the light which determines the rapidity of the evaporation of the water, and of the decomposition of carbonic acid; but that certain rays of light are far more efficacious than others. A careful series of experiments on the submerged leaves of *Potamogeton crispus*, accurately weighing the quantity of gases emitted, showed that under the influence of yellow light 26·2 c.c. of gas were exhaled, while under the influence of blue rays of the same intensity the plant disengaged only 5·8 c.c. of gas in the same time. A repetition of the experiment established the following laws,—1st. That all the rays of light are not equally efficacious in determining the decomposition of carbonic acid. 2d. That even with the same intensity yellow and red rays act more powerfully than blue or violet. 3d. That the relation which has been established between decomposition and evaporation is maintained also with respect to the relative influence of different rays of light. [Comptes Rendus.]

New Coffee Fungus

THE Rev. M. J. Berkeley forwards to the *Gardener's Chronicle* a letter from the well-known botanist, Mr. Thwaites, of Ceylon, in which he speaks of the consternation caused among the coffee-planters of that island in consequence of the rapid increase of a parasitic Fungus in the coffee-plantations, causing the leaves to fall off before their proper time, and endangering the safety of the crop. It is a singular fact that among more than one thousand species of Fungus which have been received in this country from Ceylon this particular one does not occur; not only is it an entirely new species, but it is with difficulty referable to any recognised section, being intermediate between the true moulds and the *Uredos*. Mr. Berkeley establishes from it a new genus *Hermileia*. A. W. B.

CHEMISTRY

Thallium Salts.—II.

MM. LAMY AND DES CLOISEAUX have again examined the thallous salts named below. The *ferro-cyanide*—

$$Tl_4FeCy_6 + 2Aq.$$

has a beautiful yellow colour, a density of 4·641, and is readily dehydrated by heat. Exposed to dry air, the crystals gradually lose their transparency. Water dissolves more of this than of potassic ferro-cyanide; the actual solubility is shown by the following numbers—

100 grm. water dissolve at 18° . . . 0·37 grm. ferro-cyanide
" " " at 101° . . . 3·93 " "

The crystalline type to which this salt belongs is a doubly oblique prism. It exhibits a high degree of double refraction; fine plates of it, cut parallel to the plane of cleavage, show a well-defined system of rings under the polariser. The crystals are very fragile.

Thallous tartrates and paratartrates are remarkable for the readiness with which they yield large and brilliant crystals. *Hydro-thallous tartrate*, $C_4H_5TlO_6$, generally crystallises in beautiful white prisms, which have a silky lustre, due to the presence of a number of longitudinal striæ; it is soluble in 122 parts of water at 15°, and in 6 parts of water at 101°. The density of the crystals is 3·496, and they are, as already found by Lang, optically and geometrically isomorphous with hydro-potassic tartrate. The *neutral tartrate* is prepared by adding thallous carbonate to boiling aqueous hydric tartrate, until alkalinity ensues. On cooling, large, transparent, lustrous crystals make their appearance; their specific gravity is 4·658; they are unalterable in air at the ordinary temperature; at 100°, however, they become opaque and anhydrous. They dissolve in five times their weight of water at 15°, and in a tenth of their weight of boiling water. The formula of this salt is—

$$2[C_4H_4Tl_2O_6] . Aq.$$

It crystallises in forms belonging to the clino-rhombic system—

Plane angle of the base . . . . . 106°59′26″
Plane angle of the lateral faces . . . 101°57′41″
Obliquity of the primitive prism . . . 110°23′00″

The double refraction is very energetic. The plane of the optic axes is normal to that of symmetry. The acute bisectrix is negative and perpendicular to the horizontal diagonal of the base. The horizontal dispersion is pretty decided, as is also the proper dispersion of the optic axes, ρ being $< \nu$. *Sodio-thallous tartrate*— $C_4H_4NaTlO_6 + 4Aq.$

is prepared in the same manner as common Seignette salt, with which it agrees not only in composition, but also in figure; but it differs from that body in the orientation of its optic axes. The crystals are soluble in half their weight of water at 20°, and effloresce when handled. The acute bisectrix of the optic axes is negative and normal to the base; the dispersion, though considerable (with $\rho > \nu$), is much smaller than in the common Seignette salt. When redissolved in water, and allowed to evaporate spontaneously, the above compound yields a more complex tartrate, having the formula—

$$C_4H_4TlNaO_6 + C_4H_4Tl_2O_6,$$

and crystallising in the rhombic system. As regards form, it may be referred to a right rhomboidal prism of 98°40′, differing chiefly in height from the tartrate just described. The acute bisectrix is positive. *Thallio-stibiosylic tartrate*—

$$C_4H_4Tl(SbO)O_6 + Aq.$$

is less soluble in water than the corresponding potassic salt. The crystals are quite permanent, and have the specific gravity 3·99. Although geometrically isomorphous with the potassic salt, the two tartrates differ completely in optical properties. At 15° to 20° the optic axes are perfectly united for all the colours of the spectrum; but at 70° they separate to the extent of 20°—25°, in the plane passing through the principal diagonals of the bases of the primitive prism. Their acute bisectrix is negative; dispersion inappreciable. *Dithallous paratartrate* is anhydrous, has a density of 4·659, and is capable of crystallising in two distinct forms. The two forms, which both belong to the clino-rhombic system, are distinguished by the following numbers—

	Normal.	Irregular.
Plane angle of the base	68°55′56″	80°16′22″
Plane angle of the lateral faces . . .	90°16′24″	95° 9′36″
Obliquity of the primitive prism . . .	90°20′00″	96°45′00″

In both, however, the dispersion is weak, with $\rho > \nu$; the acute bisectrix is positive and the separation of the optic axes