Smith, F.L.S. These were identified with the bodies which Mr. Berkeley had lately regarded as a species of *Protomyces*, and the cause of a new malady in the potato. The following are the principal points in this very important communication :—On receiving authentic specimens of diseased plants from Mr. Barron, Gardener-in-Chief to the Society, the brown spots on the potato-leaves at once called to mind the figures of some species of *Protomyces*, and the dimensions agreed tolerably well with some described plants of that genus, but the spots, when seen under a high power, appeared very unlike any fungus, and they were very sparingly mixed with other bodies much smaller in diameter, and with a greater external resemblance to true fungus spores. These latter spore-like bodies were of two sizes—one transparent and of exactly the same size as the cells of the leaf (and therefore very easily overlooked), and the other dark, reticulated, and much smaller. A few mycelial threads might be seen winding amongst the cellular tissue. The author's opinion, therefore, was soon formed that the "new" potato disease was no other than the old *Peronospora infestans* in an unusual and excited condition. That climatic conditions had thrown the growth of this fungus forward and out of season was probable ; but the idea that the pest would not at length attack all and every sort of potato seemed unreasonable, though the more tender sorts might be the first to suffer. From day to day the diseased leaves and stems and tubers were kept between pieces of very wet calico, in plates under glass, and it was immediately noticed that the continued moisture greatly excited the growth of the mycelial threads. So rapid was now the growth of this mycelium, that after a week had elapsed some decayed parts of the lamina of the leaf were traversed in every direction by the spawn. In about ten days the mycelium produced a tolerably abundant crop, especially in the abortive tubers, of the two-sized bodies previously seen in the fresh leaves. The larger of these bodies Mr. Smith was disposed to consider the "oospore" of the potato fungus, and the smaller bodies as the "antheridia" of the same fungus, which are often terminal in position. The filaments of the latter are commonly much articulated, and sometimes more or less moniliform or necklace-like. Both oospore and antheridium are very similar in nature and size to those described as belonging to *Peronospora alsinearum* and *P. umbelliferarum*, and this is another reason (beyond the occurrence of undoubted *P. infestans* on potato-leaves at the beginning of June) why he was disposed to look upon these bodies as the oospore and antheridium of the potato fungus. The larger bodies are at first transparent, thin, pale brown, furnished with a thick dark outer wall, and filled with granules ; at length a number (usually three) of vacuities or nuclei appear. The smaller bodies are darker in colour, and the external coat is marked with a few reticulations, possibly owing to the collapsing of the outer wall. At present he had been unable to detect any fecundating tube (described as belonging to the antheridium of other species of *Peronospora*), but he had observed the two bodies in contact in several instances. After fertilisation has taken place, the outer coat of the oospore enlarges, and appears to be cast off. Both antheridium and resting-spore are so slightly articulated to the threads on which they are borne that they are detached by the slightest touch, but with a little care it is not really difficult to see both bodies *in situ* ; and my observations lead me to think that conjugation frequently takes place after both organs are quite free. The antheridia and oospores are best seen in the wettest and most thoroughly decomposing tuber, but they occur also in both the stem and leaf. The author was also disposed to regard Montagne's *Artotrogus* as identical with the resting-spore of *Peronospora infestans*, an opinion which had long been held by Mr. Berkeley.

PARIS

Academy of Sciences, July 19.—M. Frémy in the chair.—The following papers were read :—On M. Espy's meteorological theory, by M. Faye.—On the continuation which it will be necessary to make of experimental researches on plasticodynamics, by M. de Saint-Verant. This new branch of mechanics treats of the internal motions of solid bodies in a state of plasticity. M. Tresca added some remarks on the same subject.—Experimental and clinical considerations on the nervous system with regard to its function in actions governed by the sensitive, instinctive and intellectual faculties, as well as in the so-called voluntary locomotive actions, by M. Bouillaud. The author arrives at the following conclusions :—The cerebrum and the cerebellum are both absolutely necessary for all actions which are governed by the various faculties of mind or intelligence. The cerebellum is the seat of co-ordination of the movements of walking, the cerebrum being the seat of the co-ordinating centres of the movements necessary for the execution of a great number of intellectual actions, speech in particular.—On a distinction between natural and artificial organic products. The author repeats the distinction made by him in 1860, in reply to a statement by M. Schutzenberger. This distinction is that natural bodies are always unsymmetrical.—Observations relating to M. Hirn's communication of June 23. Importance of basing the new theory of heat on the hypothesis of the vibratory state of bodies, by M. A. Ledieu.—Note on the chronology and geography of the plague in the Caucasus, in Armenia, and in Anatolie during the first half of the nineteenth century, by M. J. D. Tholozan.—On the development of the spiny rays in the scale of *Gobius Niger*, by M. L. Vaillant.—On d'Arrest's periodic comet, by M. Leveau.—Observations of Jupiter's satellites during the oppositions of 1874 and 1875. Determination of their differences of aspect and of their variation of brilliancy, by M. Flammarion. In size the decreasing order is III., IV., I., II. Intrinsic luminosity for equal surfaces I., II., III., IV. Variability in decreasing order IV., I., II., III.—Note on magnetism ; reply to an observation of M. Jamin, by M. J. M. Gaugain.—Oxy-uvitic and the cresol derived from it, by MM. A. Oppenheim and S. Pfaff. The cresol is metacresol.—On a compound of methyl oxide and hydrochloric acid, by M. C. Friedel.—On the diethylic ether of xanthoacetic acid, by MM. C. O. Cech and A. Steiner.—On the estimation of carbon disulphide in the sulphocarbonates of potassium and sodium, by MM. David and Rommier.—On the mode of action of the pillars of the diaphragm, by M. G. Carlet.—On the reproduction of eels, by M. C. Dareste.—The morphological elements of the oblong leaves of the monocotyledons, by M. D. Clos.—On a claim of priority relative to a fact of botanical geography, by M. Ch. Contejean.—During the meeting M. Mouchez was elected a member of the Astronomical section to replace the late M. Mathieu.

BOOKS AND PAMPHLETS RECEIVED

BRITISH.—Chambers' Encyclopædia. 10 vols., new and revised edition (W. and R. Chambers).—Reports of the Medical Officer of the Privy Council and Local Government Board. New Series, No. 3 (Spottiswoode).—On the Inequalities of the Earth's Surface viewed in connection with the Secular Cooling : Osmond Fisher, M.A. (Cambridge Philosophical Transactions).—Flora of Eastbourne : F. C. S. Roper, F.L.S. (Van Voorst).—Travels in Portugal : John Latouche (Ward, Lock, and Tyler).—Second Supplement to Watts's Dictionary of Chemistry (Longmans).—Transactions of the Manchester Geological Society, Vol. xiii. Part 10.—Health in the House : Catherine M. Buckton (Longmans).—Hydrology of South Africa : J. Croumbie Brown, LL.D. (H. S. King and Co.)—Rudiments of Geology : Samuel Sharp, F.S.A., F.G.S (E. Stanford).—The Skull and Brain ; their Indications of Character and Anatomical Relations : Nicholas Morgan (Longmans). North Staffordshire Naturalists' Field Club Addresses, Papers, &c.—On the Sensations of Tone as a Physiological Basis for the Theory of Music, by H. Helmholtz ; translated by A. J. Ellis, F.R.S. (Longmans).—Reports and Proceedings of the Miners' Association of Cornwall and Devon for 1874.

CONTENTS

ERRATA.—Page 232, col. 1, line 24 from bottom, for "currents" read "cumuli" ; line 22 from bottom, for "lovely" read "lowly."