

| M. T. at Rio. | R. A. | Decl. |
|------------------------------|------------------------|------------------------|
| | h. m. s. | ° ' " |
| May 29 ²⁷ 980 ... | 5 2 3 ⁸ ... | -31 15 24 ⁹ |

The comet was nearest to the earth about midnight on June 19, when its distance was 0²83.

The ephemeris subjoined is for Greenwich midnight :—

| | R. A. | N. P. D. | Log. distance from the Earth. | Sun. |
|--------------|------------------------|------------------------|-------------------------------|--------------------|
| | h. m. | ° ' " | | |
| July 22 ... | 11 44 ² ... | 8 5 ⁰ ... | 9 ⁹ 290 ... | 0 ⁰ 065 |
| 23 ... | 11 55 ⁵ ... | 8 13 ⁵ ... | | |
| 24 ... | 12 5 ⁹ ... | 8 22 ⁷ ... | 9 ⁹ 479 ... | 0 ⁰ 173 |
| 25 ... | 12 15 ⁵ ... | 8 32 ⁴ ... | | |
| 26 ... | 12 24 ⁵ ... | 8 42 ⁵ ... | 9 ⁹ 657 ... | 0 ⁰ 281 |
| 27 ... | 12 32 ⁹ ... | 8 52 ⁹ ... | | |
| 28 ... | 12 40 ⁷ ... | 9 3 ⁴ ... | 9 ⁹ 825 ... | 0 ⁰ 388 |
| 29 ... | 12 48 ⁰ ... | 9 13 ⁹ ... | | |
| 30 ... | 12 54 ⁹ ... | 9 24 ⁵ ... | 9 ⁹ 982 ... | 0 ⁰ 493 |
| 31 ... | 13 1 ³ ... | 9 35 ² ... | | |
| August 1 ... | 13 7 ⁴ ... | 9 45 ⁹ ... | 0 ⁰ 131 ... | 0 ⁰ 597 |
| 2 ... | 13 13 ² ... | 9 56 ⁴ ... | | |
| 3 ... | 13 18 ⁷ ... | 10 7 ⁸ ... | 0 ⁰ 271 ... | 0 ⁰ 700 |
| 4 ... | 13 24 ⁰ ... | 10 17 ² ... | | |
| 5 ... | 13 29 ² ... | 10 27 ⁴ ... | 0 ⁰ 404 ... | 0 ⁰ 800 |
| 6 ... | 13 34 ³ ... | 10 37 ⁴ ... | | |

COMET 1881 c.—Telegrams from the Smithsonian Institution at Washington notify the discovery of a comet at the Observatory of Ann Arbor, by Mr. Schäberle, apparently on July 16; it was situated, according to the telegrams, nearly in the right ascension of Capella in 48° declination (or ? 38°).

NEAR APPROACH OF VENUS TO 107 TAURI.—Prof. Winnecke has circulated a note in which he suggests a method of determining the solar parallax from observations of this planet, when it approaches or occults a fixed star. We refer to the note at this time, only to draw attention to a close approach of the planet to 107 Tauri, a star of 6⁵m. on the morning of July 24. According to a calculation by one of Prof. Winnecke's pupils the star will be occulted, but there appears to be some mistake here. Taking the star's place from the Greenwich Catalogue of 1864 and the Radcliffe Observations 1870-75, its apparent position will be R.A. 5h. 1m. 51³³s., Decl. +19° 42' 15¹.", and at conjunction in R.A. July 23 at 20h. 26m. 2 G.M.T., the geocentric difference of declination (Venus-star) is 28⁷"; this difference is reduced by the effect of parallax at Greenwich to 22⁹", and Wichmann's value of the semi-diameter of the planet being 10⁸", it appears neglecting tabular error of place, that at conjunction in right ascension, the south limb of Venus will be 12" north of the star.

[Since the above was in type Dr. Gould's observations of the great comet at Cordoba have been received; they show that at the end of May the elements upon which our ephemeris is founded may give the comet's position with errors of + 1⁰ in R.A., and + 3⁸ in declination.]

SCIENTIFIC SERIALS

Bulletin de l'Académie Royale des Sciences de Belgique, No. 3.—On the intensity of scintillation during auroræ boreales, by M. Montigny.—Observations on the anatomy of the adult African elephant, by MM. Plateau and Liénard.—On a general property of liquid sheets in motion, by M. Vander Mensburge.—On the triangulation of the kingdom, by M. Adan.—On the magnetism of bodies in relation to their atomic weight, by M. Enerà.—On the broadening of the lines of hydrogen (third communication), by M. Fiévez.

No. 4.—Liberty, and its mechanical effects, by M. Delboëuf.—Note on *Pretsvichia rotundata*, J. Prestwich, discovered in the coal shist of Hornu, near Mons, by M. de Koninck.—On the transformation of methylchloracetol into acetone and thi-acetone, by M. Spring.—On the blood of insects, by M. Fredericq.—Note on certain co-variants, by M. le Paige.—Researches on the reproductive apparatus of osseous fishes, by Mr. MacLeod.—On the stratigraphic position of remains of terrestrial mammalia discovered in Eocene strata of Belgium, by M. Rutot.

Archives des Sciences Physiques et Naturelles, June 15.—International Geological Congress at Bologna (1881); report of Swiss Committee on unification of nomenclature, by Renevier.—On an artificial reproduction of Gaylussite, by MM. Favre and Soret.—Study on palæontological and embryological develop-

ment, by M. Agassiz.—Researches on alternating generations of Cynipides of oak, by M. Adler.—Observations on luminous plates, by M. Dufour.—Apparatus for Lissajous' curves, by the same.—The telephone and return currents of telegraph lines, by M. Caudey.

Atti della R. Accademia dei Lincei, vol. v. fasc. 13.—Astronomical and physical observations on the axis of rotation and the topography of Mars, at the Royal Observatory of Brera, in Milan, with the Merz equatorial, by S. Schiaparelli.—Preliminary note on the volcanic ejection of tufa of Nocera and Samo, by S. Scacchi.—Researches on the variations of tone in the human blood-vessels, by Signori Rajardi and Mosso.—On observations of solar spots, faculæ and protuberances, at the Royal Observatory of the Roman College, during the first quarter of 1881, by V. Tacchini.—On the mean monthly and annual temperatures and the daily thermometric excursions deduced from observations at the observatory of the Roman College, by the same.—A supposed new red star, by the same.—Observations on small planets, by the same.—On the depolarising property of saline solutions, by S. Macaluso.—On the constitution of derivatives of santonine, by S. Cannizano.—On the action of bromine on naphthaline, by S. Magatti.—Attempt at synthesis of pyragallic acid, by the same.—On a new (3rd) homologue of pyrol contained in oil of Dippel, by Signori Ciamician and Demstedt.—On cadaveric poisons, by S. Moriggia.—On the saccharifying ferment of wine, by S. Selmi.—Some theorems on geometry of *n* dimensions, by S. Veronese.—On the skeleton of Scelidoterian exhibited in the geological museum at Bologna, by S. Capellini.—Primordial fauna in Sardinia, by S. Meneghini.—On botanical taxonomy, by S. Carnel.—Ephemerides and statistics of the Tiber in 1880, by S. Betocchi.—Determination of the difference of longitude between Rome and Milan, by Signori Respighi and Celoria.—Absolute value of gravity at Rome, by S. Respighi.—On corrections in elliptical co-ordinates in the calculation of planetary perturbations, by S. de Gasparis.—Some artistic, literary, and geographical fragments of Leonardo da Vinci, by S. Govi.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, June 22.—R. Etheridge, F.R.S., president, in the chair.—Thomas Hart and David William Jones, Colonel, Chili, South America, were elected Fellows of the Society.—The following communications were read:—Description of a new species of coral from the Middle Lias of Oxfordshire, by R. F. Tomes, F.G.S. The species of coral described in this paper was referred by the author to the genus *Thamnastræa* and the sub-genus *Synastræa*, under the name of *Thamnastræa Walfordi*, in honour of its discoverer, Mr. E. A. Walford. The specimen was from the *Spinatus*-beds of the Marlstone, at Aston-le-Walls, Oxfordshire. Like *Thamnastræa Etheridgei*, previously described by the author (*Q. J. G. S.* xxxiv. p. 190) from the Middle Lias of Oxfordshire, this species presents the same sub-generic characters as *T. arachnoides* of the coral rag of Steeple Ashton; and the author remarks upon the fact that the only species known from the English Lias resemble corallian rather than Inferior-Oolite forms.—Note on the occurrence of the remains of a Cetacean in the Lower Oligocene strata of the Hampshire basin, by Prof. J. W. Judd, F.R.S., Sec.G.S. With a note by Prof. H. G. Seeley, F.R.S., F.G.S. The author referred to the rarity of remains of marine mammalia in the Lower Tertiaries of Britain, the only recorded species being *Zeuglodon Wanklynii*, Seeley, from the Barton clay. The single specimen in his possession was obtained at Roydon, about a mile and a half north of Brockenhurst, where the beds exposed in the brickyard consist of sandy clays crowded with marine fossils, and resting upon green freshwater clays, with abundance of *Uno Solandri* belonging to the Headon series. The author briefly referred to the question of the horizon of these deposits, which he regards as belonging to the same great marine series as the beds of Brockenhurst and Lyndhurst, which he holds to be Tongrian or Lower Oligocene. The Cetacean vertebra obtained by Prof. Judd was stated by Prof. Seeley to be a caudal vertebra, probably the eighth, but not later than the twelfth, of a species belonging, or closely related to the genus *Balenoptera*, and especially approaching *Balenoptera laticeps*, a species of the North Sea which appears to range to Japan. Prof. Seeley regarded it as representing a new species, which he named *Balenoptera Juddii*.—Descrip-

tion of a peat-bed interstratified with the boulder-drift at Oldham, by G. H. Hollingworth, F.G.S. The author described a deposit of peat interstratified with boulder-drift, exposed in a railway-cutting at Rhodes Bank, Oldham. The depth of the section was only 14 feet, and it showed:—

- | | |
|---|--|
| 1. Soil | 8 to 10 inches. |
| 2. Boulder-clay, with beds and strings of peat | 2 to 6 feet. |
| 3. Main bed of peat, containing mosses, exogenous stems, and beetles | 2 in. to 1 ft. 9 in. (average 15 in.). |
| 4. Fine blue clay (floor) | 2 inches to 1 foot. |
| 5. Current-bedded coarse sand and fine gravel | 4 inches to 2 feet. |
| 6. Boulder-clay. | |

The mosses in the peat are of northern type.

Silurian uniseriate *Stomatopora* and *Ascodictya*, by G. R. Vine, communicated by Prof. P. Martin Duncan, F.R.S. For the genus *Stomatopora* the name *Alecto* has priority; but as that had previously been applied to a member of the class Echinodermata, the author preferred the later name. Species of the genus have also been described under the generic name *Aulopora*. The author has received from Mr. Maw more than two hundred-weight of washed *débris* of Wenlock shale, about thirty pounds of which, from twelve localities, he has examined. It contains a moderate amount of Polyzoan remains, generally water-worn. The author described the following species:—*Stomatopora inflata* and *dissimilis*, *Ascodictyon stellatum* and *radians* (with a variety *siluriense*), and discussed the characters of the genera.—Note on the diamond-fields of South Africa, by E. J. Dunn, communicated by Prof. Ramsay, F.R.S. The passes or necks of decomposed gabbro, &c., at the Kimberley, Bultfontein, and other diamond-mines have now been excavated to a considerable depth, and have allowed excellent sections of the sedimentary beds through which they have broken to be examined. These are generally but little disturbed, and may be traced over an area of many square miles. Immediately beneath the surface are, generally, yellowish shales, with remains of small Saurians: and beneath these a mass, certainly more than a hundred feet thick, of black carbonaceous shales, with occasional thin bands of coal. It is found that the diamonds are more abundant and of better quality when the level of the black shales is reached. It seems, therefore, not improbable that the carbon requisite for the formation of diamonds was obtained from these shales. Some other points of minor interest were also noted in this paper.—On a new *Comatula* from the Kelloway Rock, by P. H. Carpenter, M.A., Assistant Master at Eton College, communicated by the President. The specimen, to which the author's attention was called by R. Etheridge, jun., is in the national collection; he proposes for it the name *Actinometra calloviensis*. The specimen is from the Kelloway rock, of Sutton Benger; the whole diameter is 15 mm.; diameter of centrodorsal 6 mm. Three species of this genus are already known from the British Jurassic rocks; two are only known from their centrodorsals, which are each different from that of *A. calloviensis*. The third is *A. cheltonensis*, from the Inferior Oolite, known only by its radials and basals, which are different from those of the present specimen. To this *Antedon Picteti*, from the Valangian of the Continent, has some resemblance. It is, however, a true *Actinometra*, differing chiefly from existing forms in retaining its primary basals without their having undergone transformation into a rosette.—Descriptive catalogue of Ammonites from the Sherborne district, by Sydney S. Buckman. Communicated by Prof. J. Buckman, F.G.S., F.L.S., &c. In this paper the author gave a list of the Ammonites from the Inferior Oolite of the neighbourhood of Sherborne, in which he enumerated about forty-seven species, and stated that he had about fifty more which appear to be undescribed; fully one half have the mouth-termination perfectly preserved. The author indicated the zones into which the rocks furnishing these Ammonites could be divided, as shown at Osborne, near Sherborne, at Wyke Quarry, and at Bradford Abbas, and indicated the characteristic fossils of each; he also gave the principal synonyms of the species referred to, and discussed some of their characteristic peculiarities.—The next meeting of the Society will be held on November 2, 1881.

Entomological Society, July 6.—Mr. H. T. Stainton, F.R.S., president, in the chair.—One new Member and one Subscriber were elected.—Mr. W. L. Distant exhibited the

sexes of *Morpho Adonis*.—Miss E. A. Ormerod exhibited some elm-leaves bleached by the attacks of a Coleopterous larva; and larvæ of a species of *Dolerus* and of *Charæus graminis*, feeding on grass.—Rev. E. A. Eaton exhibited drawings by Mr. A. T. Halleck of the nymphs of various *Ephemeride*.—The Secretary read the report of the Committee appointed at the last meeting to inquire into the history of an insect found feeding on the eggs of locusts in the Troad. It proved to be a dipterous insect apparently belonging to the *Bombyliidæ*; and specimens were exhibited by Sir S. S. Saunders.—The following papers were then read:—Mr. F. Moore, descriptions of new Asiatic diurnal *Lepidoptera*.—Mr. D. Sharp, on the species of the genus *Euchroma*.—Mr. J. W. Douglas, observations on the species of the homopterous genus *Orthezia*.—Mr. A. G. Butler, on the *Lepidoptera* of the Amazons collected by Dr. Trail during the years 1873–1875. Part iv. Geometrites.—Baron Osten-Sacken, note on the larva of *Nycteribia*.—Mr. W. F. Kirby, notes on new or interesting species of *Papilionidæ* and *Pieridæ* collected by Mr. Buckley in Ecuador.

EDINBURGH

Royal Society, June 6.—Sir Wyville Thomson, vice-president, in the chair.—Prof. H. Alleyne Nicolson, in a paper on the structure of the skeleton in *Tubipora*, and on the relations of the genus to *Syringopora*, argued that the similarity between the skeletons of these genera was only apparent, and that careful and minute microscopic study proved them to be built up in very different ways. In the former genus the skeleton is porous and made up of fused spicules. There are no tabulæ, and the axial tube, when present, seems to be simply the calcified wall of the body cavity, coming into contact with the external walls only at the nodes which mark the stages of growth. In the *Syringopora* again the skeleton is not porous, while there are true septa and funnel-shaped tabulæ which give rise to an axial tube.—Prof. Tait communicated a note by Mr. A. P. Laurie on an iodine battery, whose great merit is that it combines the simplicity of a single fluid cell with an electromotive force practically constant. Carbon and zinc plates dip into a solution of iodine in iodide of zinc, the iodine preventing polarisation. The zinc should not be amalgamated, and should be removed from the solution when the cell is not working. As tested by a quadrant electrometer, the electromotive force was very approximately one volt, and was hardly diminished, even after half an hour's short-circuiting.—In a note on chemical affinity and atomicity Mr. W. Durham brought forward certain objections to the generally-accepted theory of atomicity, arguing that there was no sufficient ground for assuming that one atomicity of a given element was saturated by one atomicity of another element in the compound, that this assumption led to the necessity of giving to certain elements different atomicities, and that it was more rational to suppose a given atomicity distributed among several of the like constituents of the compound.—Sir Wyville Thomson communicated a paper on the physical and biological conditions of the channel between Scotland and the Farø Islands. A series of soundings taken last summer had proved the existence of a narrow ridge running across this channel and flanked on both sides by deep water. Down to a depth of 260 fathoms (the depth of the ridge) the ocean water on both sides of this ridge was at much the same temperature, while at lower depths the water to the north-east was markedly colder than that to the south-west; thus at 450 fathoms the temperatures of these regions were respectively 30°·5 F. and 47°·2 F. The characteristic fauna of these regions showed a corresponding diversity, that of the north-east basin being similar to the Scandinavian fauna, and Arctic in character, that of the south-west being similar to the fauna found in the warmer waters all over the ocean bed. Many new forms were discovered in both of these regions.

June 20.—Prof. MacLagan, vice-president, in the chair.—Prof. Chrystal, in a note on Sturmian functions, gave a simple demonstration of a theorem of Joachimsthal, expressing a class of these functions as the successive minors of a symmetrical determinant.—Dr. Herdman communicated Part iv. of the Preliminary Report on the *Tunicata* of the *Challenger* Expedition.—Mr. D. B. Dott gave a short account of a series of experiments which he had made on comenic acid and its salts, which he regarded as establishing its dibasic character.—Dr. Macfarlane read a paper on Morgan's systems of consanguinity and affinity, which he had examined with the help of his analysis of relationships. The paper consisted of two parts, the first being a criticism of the tables of data, the second of an explana-

tion of the so-called classificatory methods. The classification proceeds according to difference of generation, and is merely one mode in which the relationship ideas may be expressed in words. Mr. Morgan's hypothesis of a consanguine and of a Panaluan family are contradicted by the data which they are introduced to explain.—Prof. Tait communicated a note on a proposition in the theory of numbers.

PARIS

Academy of Sciences, July 11.—M. Wurtz in the chair.—The following papers were read:—On the formation of the tails of comets, by M. Faye. A reply to M. Flammarion. The tail is not rigidly connected with the nucleus. The repellent force is proportional to the surfaces, is weakened by interposition of a screen, is not propagated instantaneously, and varies in inverse ratio of the square of the distance.—Theory of plane flexion of solids and consequences relating to construction of astronomical telescopes, and to their regulation, getting rid of deviations of the optic axis due to flexion, by M. Villard.—On the velocity of propagation of explosive phenomena in gases, by M. Berthelot. The experiments were with mixtures of hydrogen and oxygen and of carbonic oxide and oxygen (2 vols. to 1). These were placed in a long iron tube (open or close, fixed in various positions, &c.), and were inflamed with an electric spark; the passage of the wave was measured by an electric method. The velocity was in general about 2500 m. per second. Explosive phenomena are more complex than a simple motion of translation or even than the propagation of a sound wave.—Reply to M. de Lesseps on M. Roudaire's project, by M. Cosson.—On the borings made in strata to be traversed by the Panama Canal, by M. de Lesseps. The strata of large section will offer sufficient consistency for formation of talus, while not presenting the resistance of hard rock.—Study in experimental thermodynamics of steam-engines, by M. Ledieu.—Photography of the spectrum of comet *b* 1881, by Dr. Huggins. M. Berthelot thought the spectra rendered probable the electric origin of the proper light of comets.—Influence of phosphoric acid on phenomena of vegetation, by M. de Gasparin.—Remarks on the accidents caused by use of sulphide of carbon in treatment of vines in the South of France, by M. Cornu.—Shocks of an earthquake at Gabes on June 13 were reported.—On the comet of 1881 observed at the Imperial Observatory of Rio de Janeiro, by M. Cruls.—Observations on the same comet at Algiers Observatory, by M. Trépied.—Further observations by M. Wolf and by M. Thollon (See page 261).—Attempt at explanation of the tails of comets, by M. Picart. A comet, consisting of gaseous matter and luminous ether, appears, at a distance from the sun, in spheroidal form (the luminous ether being then invisible). But on nearing the sun the luminous ether of that star repels the luminous ether of the comet; hence the tail.—On the polarisation of the light of comets, by M. Prazmowski. The comet is shown to reflect solar light abundantly.—New method of determining certain constants of the sextant, by M. Gruy.—On Kleinian groups, by M. Poincaré.—On a general means of determining the relations between constants contained in a particular solution, &c. (continued), by M. Dillner.—On the three centrifugal axes, by M. Brassine.—On the absolute measurement of currents by electrolysis, by M. Mascart. By careful experiment he finds the intensity of the current capable of producing in one second the electrolysis of 1 equiv. of a substance expressed in milligrammes is equal to 96'01 w., or say 96 webers.—On the reality of kinematic equivalence in undulatory optics, by M. Crouillebois. M. Cornu made some remarks.—On the chlorides of iron, by M. Sabatier.—On the oxychlorides of strontium and of barium, by M. André.—Experimental researches on decomposition of picrate of potash; analysis of products, by MM. Sarrau and Vieille.—On decipium and samarium, by M. Delafontaine. He reserves the name *decipium* for the radical of the earth having an equivalent of about 130; *samarium* for the other metal (in samarskite) whose absorption spectrum was described by M. Lecoq. (The equivalent of samarine is probably under 117.)—Action of peroxide of lead on alkaline iodides, by M. Ditte.—On ethers of morphine considered as phenol, by M. Grimaux.—Researches on tertiary monamines; III. Action of triethylamine on ethers with hydracids of secondary and tertiary alcohols, by M. Reboul.—On cyanised camphor, by M. Haller.—On the composition of hydrosulphite of soda and of hydrosulphuric acid, by M. Bernthsen.—Two facts relating to decylene (oil of turpentine), by M. Maumené.—On *viscase*, or the gummy substance of viscous fermentation, by M. Béchamp.—

Determination of urea with the aid of titrated hypobromite of soda, by M. Quinquaud.—Researches on animal heat, by M. d'Arsonval. By direct calorimetry he proves the great absorption of heat by the egg in incubation during the first day (a fact otherwise proved by M. Moitessier). Oxygen is abundantly absorbed and carbonic acid emitted. During sleep or complete rest, animals absorb much oxygen and make little heat, the emission of carbonic acid varying slightly. The author hardly ever found agreement between the heat measured directly and the heat calculated from respiratory combustions; this is because organic combustion is of the order of fermentation. The chemical method gives the sum; direct calorimetry the difference. The two methods should be combined.—Action of maté on gases of the blood, by MM. d'Arsonval and Couty.—Absorbed by the stomach or the veins, maté diminishes the carbonic acid and the oxygen of arterial and venous blood enormously (sometimes a third or a half of the normal quantity)—On the seat of cortical epilepsy and of hallucinations, by M. Pasternatzky. Cortical epilepsy is really what the name implies. The hallucinations he produced in a dog with absinthe he attributes to excitation of the sensitive sub-cortical centres by that substance.—On the alterations of the cutaneous nerves in pellagra, by M. Dejerine.—On venous circulation by influence, by M. Ozanam. Among the various causes of progression of blood in the veins is an important influence exercised on each vein by the artery associated with it. The vein-walls experience a rebound from the arterial movements.—On the structure of the oothecæ of Mantes, and on the hatching and first moulting of the larvæ, by M. Brongnart.—Chemical researches on the product of secretion of the ink-bag of Cephalopoda, by M. Girod.—On the synchronism of the marine carboniferous fauna of Ardoisière (Allier), and the anthraciferous fauna of Roannais and Beaujolais, by M. Julien.—M. Laurey noted, about the comet, that the sunlight illuminated only the left part, leaving the right dark—a true cometary phase.

VIENNA

Imperial Academy of Sciences, June 23.—L. T. Fitzinger in the chair.—L. T. Fitzinger, examination of some species which were till now incorporated with the species *Ursus arctos*.—F. Steindachner, contributions to the knowledge of African fishes (contains a description of a new species of *Sargus* from the Galapagos Islands).—Job. Mayer, on the trajectory of the 1880 *b* comet.—Max. Margules, on the motions of viscous liquids and on the figures of motion.—F. Ströhmer, on the occurrence of ellagic acid in pine-bark.—Ernst Schneider, a sealed packet (experiment on the construction of high-power telescopes).—MM. Neumayr and Emil Holub, on the fossils at the Uitenhage formation in South Africa.—M. Neumayr, studies on fossil Echinodermata.—V. v. Lang, on the coefficient of refraction of concentrated solutions of cyanine.—L. Haitinger, on the occurrence of malic and citric acid in *Chelidonium majus*.—Dr. T. Puluj, a sealed packet (without inscription).

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