communicated to the Royal Society a description of his re-flecting octant ; and, after some hesitation, Halley declared himself satisfied that Hadley's idea was quite different from that of Newton, who had invented an instrument founded on the same principle. It is no doubt true that Thomas Godfrey, a glazier of Philadelphia, had in-vented an instrument of this kind about the year 1730 ; but the first intelligence of his invention did not reach Eng-land before the month of May 1732, in a letter from James Logan to Halley. Godfrey's instrument was made of wood by Edmund Woolley, a carpenter, about November 1730, and had been tried on board the ship *Truman*, of which John Cox was master. The first model of Hadley's octant had, however, been constructed by his brother George about the middle of the summer of 1730. The thanks of those interested in the history of astronomy are due to Dr. Dreyer for the effort which he has made to correct the errors on this point which are found in Poggendorff's " Biographisch literarisches Handwörterbuch," in Wolf's " Geschichte der Astronomie," and elsewhere.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 SEPTEMBER 19-25

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on September 19

Sun rises, 5h. 43m. ; souths, 11h. 53m. 42·7s. ; sets, 18h. 5m. ; decl. on meridian, 1° 25′ N. : Sidereal Time at Sunset, 17h. 59m.

Moon (at Last Quarter September 21) rises, 20h. 39m.* ; souths, 4h. 7m. ; sets, 11h. 44m. ; decl. on meridian, 15° 12′ N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	4 55	11 29	18 3	6 0 N.
Venus	3 50	10 45	17 40	9 56 N.
Mars	10 44	15 11	19 38	18 12 S.
Jupiter... ...	7 7	12 52	18 37	3 43 S.
Saturn... ...	23 34*	7 37	15 40	21 32 N.

* Indicates that the rising is that of the preceding evening.

Occultations of Stars by the Moon (visible at Greenwich)

Sept.	Star	Mag.	Disap. h. m.	Reap. h. m.	Corresponding angles 'ro n ver-tex to right for inverted image
20 ...	130 Tauri... ...	6	23 34	0 30†	68 229
21 ...	26 Geminorum...	5½	22 46	23 26	23 273
25 ...	B.A.C. 3345 ...	6	1 53	2 41	61 206

† Occurs on the following morning.

Sept.	h.		
22 ...	12 ...	Saturn in conjunction with and 3° 29′ north of the Moon.
23 ...	— ...	Sun in equator.

Variable Stars

Star	R.A. h. m.	Decl. °			h. m.
U Cephei	0 52·2	81 16 N.	... Sept. 21, 19 4 *m*
ζ Geminorum ...	6 57·4	20 44 N.	... ,, 24, 0 57 *M*
U Monocerotis ...	7 25·4	9 32 S.	... ,, 21, *M*
U Cancri	8 29·3	19 17 N.	... ,, 25, *M*
δ Libræ	14 54·9	8 4 S.	... ,, 21, 2 11 *m*
U Coronæ	15 13·6	32 4 N.	... ,, 22, 1 45 *m*
U Ophiuchi... ...	17 10·8	1 20 N.	... ,, 22, 4 27 *m*
			and at intervals of 20 8
β Lyræ...	18 45·9	33 14 N.	... Sept. 18, 21 30 *M*
			,, 22, 2 0 *m*
η Aquilæ	19 46·7	0 43 N.	... ,, 25, 5 0 *m*
S Cygni	20 3·1	57 40 N.	... ,, 24, *M*
U Cygni	20 16·1	47 32 N.	... ,, 20, *M*
T Cephei	21 8·0	68 2 N.	... ,, 20, *m*
δ Cephei	22 24·9	57 50 N.	... ,, 22, 22 0 *M*

M signifies maximum ; *m* minimum.

Meteor Showers

The following are amongst the showers of the period :—Near θ Cassiopeiæ, R.A. 14°, Decl. 50° N. ; near α Arietis, R.A. 31°, Decl. 18° ; and near Polaris, R.A. 68°, Decl. 87° N.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

UNIVERSITY COLLEGE, LONDON.—We notice from the prospectus of the Engineering Department that the examination for the Gilchrist (Entrance) Engineering Scholarship of 35*l*. per annum is to be held on the 28th and 29th inst. Candidates must be under nineteen, and the subjects of examination are : —(1) Mathematics ; (2) any two or more of the following—(*a*) mechanics, (*b*) mechanical drawing, (*c*) examination on some subject connected with engineering, (*d*) French or German, (*e*) the use of tools. The examination is intended to be of such a standard as can be passed by lads from school who have begun to acquire some knowledge of mechanical pursuits. The appli-ances of the engineering laboratory (under Prof. Alexander B. W. Kennedy) have been very much extended during the past year, mainly through a grant from the Gilchrist Trustees, and are now very complete in the direction both of experiments in elasticity and the strength of materials, and in the economic work of engines and boilers. Laboratory work is so arranged that students go through a systematic course of experimental instruc-tion in these and other connected subjects during the session.

SOCIETIES AND ACADEMIES
PARIS

Academy of Sciences, September 6.—M. Émile Blanchard in the chair.—On presenting to the Academy a copy of a volume issued on the occasion of M. Chevreul's centenary, August 31, 1886, M. Berthelot remarked that this seemed a suitable occasion for reviving the old custom of celebrating Academic solemnities by the publication of special scientific and literary essays. The present work, in the preparation of which MM. Ch. Richet, G. Pouchet, E. Grimaux, E. Gautier, Dujardin-Beaumetz, E. Demarçay, and Berthelot had co-oper-ated, has been executed with rare taste and care by the editor, M. Alcan, and by him dedicated to M. Chevreul on behalf of himself and his fellow-contributors.—Fluorescence of the com-pounds of manganese subjected to electric effluvium in vacuum, by M. Lecoq de Boisbaudran. In the experiments here de-scribed the author has aimed especially at determining the effects due to the presence of manganese. The fluorescence of some of its compounds is an extremely sensitive reaction, by means of which imponderable traces of this metal may be de-tected in natural or artificial substances that might otherwise be supposed free from its presence.—Paralytic ataxy of the heart, by M. Mariano Semmola. In this communication the author resumes the results of his further observations on cardiac dis-orders, already reported in the *Transactions* of the International Medical Congress, seventh session, London, August 1881.—Remarks in connection with three Italian essays submitted to the Academy, by M. Govi. The first of these papers deals with an episode in the life of Galileo, showing that the hostility of the Jesuits to the Florentine philosopher was not due to the letter ad-dressed by him to his brother in 1606, announcing the expulsion of the Order from Venice. The second describes a curious plano-convex lens executed by Torricelli some time between 1644 and 1647, and recently discovered in the Cabinet of Physics attached to the University of Naples. The third refers to an unpublished letter written by Volta in 1785 on Lavoisier's pneu-matic theory, which, although not accepted without reservations, is defended against the assumptions of an Englishman named Lubbock, who had essayed to transform oxygen into a new principle called by him the "sorbile principle."—On certain differential equations of the first order, by M. Roger Liouville. It is shown that the differential equation—

$$y' + a_1 y^3 + 3a_2 y^2 + 3a_3 y + a_4 = 0,$$

is reducible to the quadratures if its coefficients $a_1, \ldots a_4$ and their derivatives $a'_1, \ldots$ satisfy the equation—

$$a_1 L' + K L^{\frac{5}{3}} - 3 [a'_1 + 3(a_2{}^2 - a_1 a_3)] L = 0,$$

where L represents the combination

$$L = a_2 a'_1 - a_1 a'_2 + a_1 (a_1 a_4 - a_2 a_3) + 2a_2 (a_2{}^2 - a_1 a_3),$$

and K an arbitrary constant which may vanish.—Note on the