M. Poincaré's works in mathematical analysis, analytical and celestial mechanics, mathematical physics, and scientific philosophy; his obituary notices of numerous men of science, including the late Lord Kelvin; and his more various writings. Each of the sections dealing with M. Poincaré's scientific work is prefaced by an appreciation by some great authority; thus, that on celestial mechanics is preceded by a translation of Sir George Darwin's address in presenting the gold medal of our Royal Astronomical Society last February. The price of this interesting volume is 7 francs.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN DECEMBER:—

Dec. 2. 6h. Venus at greatest elongation, 47° 18′ E.
,, 18h. Mercury in superior conjunction with the Sun.
6. 10h. 35m. Jupiter in conjunction with the Moon (Jupiter 3° 35′ S.).
12. 7h. 45m. Sun eclipsed, invisible at Greenwich.
,, 19h. 27m. Mercury in conjunction with the Moon (Mercury 0° 3′ S.).
14. 13h. 51m. Uranus in conjunction with the Moon (Uranus 3° 5′ N.).
16. 3h. 10m. Venus in conjunction with the Moon (Venus 2° 50′ N.).
18. 9h. Mercury in conjunction with λ Sagittarii (Mercury 0° 3′ N.).
20. 10h. Saturn stationary.
,, 11h. 56m. Mars in conjunction with the Moon (Mars 5° 0′ N.).
,, 21h. 2m. Saturn in conjunction with the Moon (Saturn 1° 40′ N.).
27. 8h. 30m. Neptune in conjunction with the Moon (Neptune 4° 9′ S.).
,, 20h. 1m. Mercury in conjunction with Uranus (Mercury 1° 43′ S.).

HALLEY'S COMET, 1909c.—The following is a further extract from Mr. Crommelin's revised ephemeris for Halley's comet as given in No. 4359 of the *Astronomische Nachrichten*:—

Ephemeris.

1909 (Berlin M.T.)	R.A. (1910·0) h. m.	Decl. (1910·0) ° ′	log r	log Δ	Magnitude
Dec. 1·4	4 26·9	+15 52			
6·4	4 6·2	+15 23	0·3775	0·1505	12·4
11·4	3 44·4	+14 45			
16·4	3 22·3	+14 4	0·3527	0·1340	12·0
21·4	3 0·6	+13 18			
26·4	2 40·2	+12 28	0·3259	0·1381	11·8

From this we see that the comet is now a little to the west, and south of, Aldebaran, and on December 4 will pass very near to γ Tauri.

According to a note by Mrs. Maunder in the *Daily Chronicle*, Mr. Hollis found the comet a conspicuous object in a 10-inch telescope on November 22, and the Rev. T. E. R. Phillips observed it the same evening, and was still able to see it when the aperture was reduced to 3 inches. Photographs taken at Greenwich on that date showed the comet to be somewhat brighter than the tenth magnitude, *i.e.* about eight times as bright as computed.

OBSERVATIONS OF MARS.—Seven new canals, bringing the total found at the Hem Observatory up to twenty-three, are announced by Mr. Jonckheere in No. 4371 of the *Astronomische Nachrichten*. For two of them, leaving the Cyclopum Lucus and going to Hephæstus and Amenthes respectively, Mr. Jonckheere proposes the names Cepheus and Cassiopeia.

The *Comptes rendus* for November 15 (No. 20) contains three notes dealing with the planet. In the first M. Idrac describes the visual and photographic observations made by him at Meudon during the recent opposition. The photographs were taken in the focus of the 24-inch photographic equatorial, and show a fair number of details, some of which were not visible, or very faint, to the naked eye; the plates used were sensitive to the blue and ultra-violet radiations. On September 20 the edge of the north polar cap was shown clearly on the photograph, and on September 25 extended down to about latitude 55°.

In the second note M. Antoniadi describes the results of thirteen nights' observations made between September 20 and November 9. The most remarkable changes, since the opposition of 1907, appear to be the return of Syrtis Major to the form it had in 1864 and 1877, the re-apparition of Lac Mœris, and the formation of a multiple "island" in the eastern part of the Mare Cimmerium. About fifty "canals" were seen, but M. Antoniadi discusses the meaning of this term before applying it definitely to the features seen. He defines eight types of markings which may be called "canals," and finds that there is no geometrical *réseau* of straight lines intercrossing on the surface of Mars; but across the continental areas there is a structure like a grey marbling, which is too evanescent and intricate to be drawn. A useful chart (Mercator) accompanying the note embodies the features seen at Meudon.

MM. de la Baume Pluvinel and F. Baldet contribute the third note, which describes the photographic researches carried out on the Pic du Midi during September and October. Ordinary plates were used at first, with exposures of 0·1s., but these showed only the polar caps. Later exposures, with Lumière colour filters and various bathed plates, took 6s. to 12s., and show nearly all the details observed visually; the geometrical *réseaux* of fine canals are not, however, to be found on the photographs.

During the recent opposition, M. Kostinsky, using the Pulkowa astrographic telescope, succeeded in obtaining photographs of the two satellites Phobos and Deimos, and now publishes the measures in No. 4369 of the *Astronomische Nachrichten*. The accordance with the ephemeris (based on Struve's elements) is satisfactory, and the photographic magnitudes of the satellites are 11·6 and 12·3 respectively.

PERRINE'S COMET, 1909*b*.—An observation of Perrine's comet, made at Heidelberg on November 20, gave the position at 13h. 0·2m. (Königstuhl M.T.) as 7h. 6m. 20·33s., +15° 31′ 28″ (1909·0), and the magnitude as 14·0 (*Astronomische Nachrichten*, No. 4371).

In No. 4369 of the *Astronomische Nachrichten* Prof. Wolf directs attention to an abnormal decline of the brightness of this object about November 9. On October 11 it was seen with difficulty in the reflector, and on November 6 could not be found visually, although since September 5 it has been observed visually with a 6-inch telescope. A photograph taken with the Bruce telescope on November 9 failed to show any trace of the comet, which must therefore have become enormously fainter.

THE DESIGN OF SPECTROGRAPHS.—All those who are interested in the design and performance of spectrographs, more especially such as are used for radial-velocity determinations, will welcome a paper by Mr. J. Plaskett which appears in No. 4, vol. iii., of the Journal of the Royal Astronomical Society of Canada. As is now generally known, Mr. Plaskett has, since 1905, devoted a great deal of labour to the design of a generally effective instrument, and he has now succeeded in producing a single-prism spectrograph which has proved beautifully effective. Rigidity, temperature control, and optical efficiency have all been provided for, and the instrument can be changed from a one- to a three-prism spectrograph in two minutes without affecting the temperature conditions. Mr. Plaskett gives illustrations and full details of the numerous minor devices and accessories, which it is impossible to reproduce here.

THE ASTRONOMICAL SOCIETY OF WALES.—No. 3, vol. xi., of the *Cambrian Natural Observer*, the quarterly record of the Astronomical Society of Wales, contains several useful notes for amateur observers. Miss Hagerty contributes an interesting article on solar energy, and Mr. Mee asks all Welsh observers to forward to him accounts of any astronomical phenomena they may observe; he gives some useful hints as to what the naked-eye observer may see and should record.

BRITISH ASTRONOMICAL ASSOCIATION.—Messrs. Neill and Co., Edinburgh, have just published, for the British Astronomical Association, a general index of the Journal from vol. i. to vol. xviii. The index has been compiled by Mr. F. W. Levander.