

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN NOVEMBER:—

- November 1. 5h. 17m. to 6h. om. Occultation of 103 Tauri (mag. 5.5) by the moon.
5. 4h. Mars 3° 41' N. of the moon.
12. Mars rises at 9h. and visible afterwards throughout the night in Cancer. Diameter of the planet 9".6.
15. Mars. Illuminated portion of disc = 0.900.
15. Jupiter becomes visible as a morning star. Polar diameter 28".8.
15. Meteoric shower from Leo in the early morning hours. (Radiant 149° + 23°.)
16. 7h. Vesta 10' N. of the moon.
17. 10h. 11m. Minimum of Algol (β Persei).
20. 7h. Minimum of Algol (β Persei).
22. 7h. 9m. to 8h. 13m. Occultation of 19 Piscium (mag. 5.2) by the moon.
- 23-24. Meteoric shower from Biela's comet. (Radiant 25° + 43°.)
25. 12h. Uranus in conjunction with the sun.
28. 14h. 7m. to 15h. 6m. Occultation of 103 Tauri (mag. 5.5) by the moon.
29. 11h. 19m. to 11h. 49m. Occultation of the star DM + 24°, 1033 (mag. 6.0) by the moon.

COMET BROOKS.—A telegram from Kiel, dated October 21, informs us that at 7h. Geneva time, on October 20, Brooks found a comet in position R.A. 14h. 32m. 8s. and Decl. + 60° 26'. It was moving in a south-easterly direction, and was described as "bright." A later telegram, dated October 22, gives the position of the comet from an observation made at Pola on October 21, at 16h. 48.5m. Pola mean time; this was R.A. 15h. 4m. 12s. and Decl. + 57° 50'.

The comet was thus situated in the constellation of Draco, and moving to the south of the star β Draconis.

THE LARGE SUN-SPOT.—In this column for September 8 we drew attention to the large spot that had a few days previously made its appearance on the eastern limb of the sun, and remarked that "the spot will be well worth watching during the remaining period of its visibility, especially as many years may perhaps elapse before observers are favoured with another spot of similar size."

At the present time there is another great spot, larger, perhaps, than the one referred to above, which is now beautifully visible near the centre of the solar disc. This very compact group, which is not situated very far from the solar equator, is composed of two large umbrae surrounded by rather irregular shaped penumbrae, with several small spots scattered around them. Another smaller spot is also following the large one.

It will be well for observers to look out for an aurora and magnetic storm when the spot passes the central meridian, as was the case when the spot, previously referred to, was in the same position on September 9 last.

THE HARVARD ASTROPHYSICAL CONFERENCE.—It was on the occasion of the dedication of the Yerkes Observatory that the Americans held their first astrophysical conference. So great was the success of this, their first trial, that it was expected that more would be held in after years. For this we had not long to wait, and we have now before us a full account of the conference recently held at Harvard, the oldest observatory devoted to astrophysical research, contributed to *Science* (October 7) from the pen of Prof. M. B. Snyder. There could have been no more appropriate place of meeting in America for the second conference than that of the Harvard College Observatory, for Prof. E. C. Pickering's vast organisation of work in all modern branches of astronomy is second to none.

The conference was presided over alternately by Prof. J. R. Eastman, of the United States Naval Observatory, and Prof. Hale, of the Yerkes Observatory, and the meetings were not only held on August 18, 19 and 20, but were carried over to a series of adjourned meetings held during the course of the subsequent week.

The papers read were very numerous, and dealt with all kinds of astrophysical work. The work carried on at Harvard formed, perhaps, the chief item in the programme. Some of the papers dealt with were as follows:—

Prof. George Comstock, on "Some investigations relating to zenith telescope latitudes"; Dr. Harold Jacoby, on "Photo-

graphic researches near the pole of the Heavens"; Mrs. Fleming, on "Stars of the fifth type in the Magellanic clouds," which establishes another connection between these objects and the Milky Way.

Prof. Solon Bailey presented a paper on "Variable stars in clusters," which is a subject most interesting in the light of recent investigations.

We notice that general plans for observing the total eclipse of the sun on May 28, 1900, were briefly discussed, and a committee appointed to consider the work of organisation.

Another important question brought up at the conference was the creation of a permanent astronomical and astrophysical society. This proposal was formally accepted, and a committee, consisting of Profs. Hale, Comstock, Pickering, Newcomb and Morley, was appointed to consider the organisation.

THE KNIGHT-DARWIN LAW.¹

THE law under the above title is known to botanists through H. Müller ("Befruchtung der Blumen," Eng. trans., p. 4), who says that Andrew Knight "laid down the law that in no plant does self-fertilisation occur for an unlimited number of generations." This he calls the Knight's Law, and later, in substantially the same form, it becomes the Knight-Darwin Law. For the statement of Knight's Law the reader is referred to that author's celebrated paper: "An account of some experiments on the fecundation of vegetables" (Phil. Trans., 1799). The words, however, do not occur in Knight's paper, and I imagine that Müller got them from Charles Darwin's paper on the fertilisation of papilionaceous flowers, where occurs the passage (*Gardener's Chronicle*, 1858): "Andrew Knight many years ago propounded the doctrine that no plant self-fertilises itself for a perpetuity of generations."² The words are not given in inverted commas, and I strongly suspect that, with a singular lapse of his usual accuracy, my father was merely giving his own interpretation of the conclusion which seemed to flow from Knight's expressions when taken with the whole of the context. For in the "Effects of Cross- and Self-fertilisation," 1876, p. 7, he quotes Knight's actual words. After referring to Sprengel, he goes on: "Andrew Knight saw the truth much more clearly, for he remarks: 'Nature intended that a sexual intercourse should take place between neighbouring plants of the same species' . . ." and again: "'Nature has something more in view than that its own proper males should fecundate each blossom.'" Here we have simply the general statement that hermaphrodite flowers are not necessarily self-fertilised; a statement of fundamental importance in floral biology. If the positive statement that "no plant self-fertilises itself for a perpetuity of generations" is to be found elsewhere in Knight's writings, I think Darwin would have quoted it.

In the "Origin of Species" (edition i., p. 96) he refers to Knight in the following words: "Nevertheless I am strongly inclined to believe that with all hermaphrodites two individuals, either occasionally or habitually, concur for the reproduction of their kind. This view, I may add, was first suggested by Andrew Knight."

Lastly, in 1868 ("Variation of Animals and Plants," ii. p. 175), after speaking of his own hypothesis, "that it is a law of nature that organic beings shall not fertilise themselves for perpetuity," he adds: "This law was first plainly hinted at in 1799, with respect to plants, by Andrew Knight." If he had known any positive expressions—going beyond the nature of a hint—in Knight's writings, would he not have quoted them? It seems, therefore, that, as far as Knight is concerned, the law should be a general statement of the tendency to cross-fertilisation of hermaphrodites, and not the positive statement quoted by Müller.

When we pass from Knight's share in the law to Charles Darwin's—there are difficulties in fixing on the most authentic wording of the law. The earliest form is that occurring in the "Origin of Species" (ed. i. p. 97).

"These facts alone incline me to believe that it is a general law of nature (utterly ignorant though we be of the meaning of the law) that no organic being self-fertilises itself for an eternity of generations; but that a cross with another individual is occasionally—perhaps at very long intervals—indispensable."

In the sixth edition of the "Origin" 1872, he retains the above passage with the omission of the words "utterly

¹ A paper read before Section K (Botany) at the British Association, 1898.

² This sentence is quoted by Müller, "Historical Introduction," p. 29.