

## THE NEW STAR IN AQUILA.

THE unremitting character of the watch kept on the sky by the amateur astronomers in this country is well shown by the number of independent discoveries of the new star. Apparently, the first observation was made by Miss Grace Cook at Stowmarket when on the watch for meteors at 9 h. 30 m. G.M.T. on June 8. Other independent discoveries were made by Mr. W. F. Denning, at Bristol, and Mr. David Packer, at Birmingham, at 10.0 G.M.T.; Mr. C. L. Brook, at Meltham, at 10.15 G.M.T.; Mr. W. H. Steavenson, at West Norwood, at 10.30 G.M.T.; Mr. H. Thomson, at Newcastle, at 10.44 G. M. T., and Mr. Felix de Roy, at Thornton Heath, at 10.45 G. M. T. It was also noticed at 9.40 G. M. T. by Mr. Witchell, of the Royal Observatory, Greenwich, but not identified as a Nova. On the following day it was also detected independently in Scotland by Dr. Anderson, the discoverer of Nova Persei and Nova Aurigæ. Mr. Denning says that the increase in the light of the star must have occurred during daytime in England on June 8, for he was observing meteors nearly the whole of the preceding night and saw nothing unusual in the sky. Presumably, therefore, the object must have been faint at the time and, in any case, of such small magnitude as to enable it to escape detection. As yet little information has been received with regard to observations in other countries; the star was seen at the Hector Observatory in New Zealand, but apparently 12 h. after its discovery in England.

At discovery the star was very nearly of the same brightness as Altair (0.9m.). The testimony of all the discoverers agrees on this point. It was confirmed by photometric observations at Greenwich by Mr. Jonckheere, who determined the magnitude with a wedge photometer by comparison with Vega, Arcturus, and Altair. The change of brightness in the short night of June 8 was very slight, if indeed perceptible. In colour the star was like  $\alpha$  Aquilæ. With the highest power the star showed a sharply-defined stellar nucleus in the 28-inch telescope at Greenwich. So far as could be seen with an eye-piece prism, the spectrum appeared to be perfectly continuous, no night lines being detected. At the Cape Observatory the important observation has been made that the Nova contains hydrogen and calcium absorption lines similar to Nova Persei, February 22, 1901. It is not stated in the cablegram whether the observation was made on June 8 or June 9.

A great increase of brightness occurred in the next twenty-four hours. On Sunday night the star certainly equalled Vega (0.1m.) in brightness, though Vega was at a much greater altitude. Observation at Greenwich was somewhat difficult owing to some faint, low-lying haze. To some observers the star appeared to be considerably brighter than Vega. As on the previous night no bright lines were seen in the star's spectrum.

The position of the star relative to B.D. +0.4023° (8.5m.) was determined by M. Jonckheere. Using the position of this star given in

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the Abbadia Catalogue (1900) the position of the Nova is found to be

R.A. 18h. 44m. 43.48s., Dec. 0° 29' 28.2" for 1918.0

Direct observation at the Transit-Circle by Mr. Witchell gave

R.A. 18h. 44m. 43.47s., Dec. 0° 29' 31.5" for 1918.0

It was noticed by M. Jonckheere that a star on the Algiers Chart Zone +1°, No. 141, having the co-ordinates -3' and -32' and of the ninth magnitude seemed to be in the position of the Nova. Reference to the measures of the Algiers Astrographic Catalogue shows that this star is No. 108 on plate 1003. Its magnitude is given as 8.8m. Its co-ordinates on this plate (centre: 18h. 40m. and 0°) are +57.0074' and +27.8588'. With the data given in the catalogue the position of the star is found to be

R.A. 18h. 44m. 43.52s., Dec. 0° 29' 31.0" for 1918.0

It thus seems very probable that the Nova is identical with this star of the Algiers Astrographic Chart and Catalogue, photographed on the dates Aug. 20, 1909 and June 26, 1895. This star is also shown on a Franklin Adams plate taken at Johannesburg in 1910. It cannot be said with certainty that these three photographs show no evidence of variability, though on the photographs of 1909 and 1910 the star is perceptibly fainter than the neighbouring star (No. 105 in the Algiers Catalogue) while in the catalogue (date of photograph, 1895) it is given as of the same magnitude (8.8m.). If the identity of the Nova with this star is confirmed the point is one of great interest.

It is fortunate that the Nova will be well placed for observation for some months, so that ample records of its varying luminosity and spectrum will probably be secured. At the present time the star rises practically due East at about 7.20 p.m., and is on the meridian, 39° above the horizon at London, at about 1.20 a.m., G.M.T.

F. W. DYSON.

The spectrum of the Nova was observed by me on June 10 with a McClean star spectroscope on a 3-inch refractor, and on June 11 with a Zöllner spectroscope on the 6-inch refractor at the Imperial College. It was not notably different on the two evenings, except that the continuous background was possibly more intense on June 10. In each case the spectrum strongly recalled those of Nova Aurigæ and Nova Persei in their early stages, shortly after maximum brightness. The most striking feature of the spectrum was the red line of hydrogen, which was of extraordinary brilliancy. In the green there was a group of four bright lines, of which the most refrangible and brightest was doubtless H $\beta$ , while the others may well have been the enhanced lines of iron about wave-lengths 517, 502, and 492, which were observed in previous novæ. Another conspicuous line in the blue was probably H $\gamma$ . There was also a broad nebulous line about  $\lambda$  532, and another of the same character which was roughly estimated to be about  $\lambda$  560. On the red side of the latter was a dark shading, and there

was a strong absorption line or band which was estimated to be in the position of sodium D. There was possibly a bright fringe on the red side of this absorption line. Between D and C there were two fairly conspicuous bright lines, which were estimated to be in the neighbourhood of  $\lambda$  615 and  $\lambda$  630. The star was brighter than Altair, and was of a reddish-yellow colour.

A. FOWLER.

#### INSECT BEHAVIOUR.<sup>1</sup>

IT was on a *Harmas* (an untilled, pebbly bit of land) in Provence that Fabre, after heroic struggles, opened his "laboratory of living entomology," where, undisturbed, he might "pry into life." "Never, in my insect-hunting memories have I seen so large a population at a single

back of the butterfly's neck; the beautifully finished cupolas made by *Eumenes* wasps out of minute pebbles and mortar, and stored with half-paralysed caterpillars, the food for the grub which hatches out of the egg cleverly suspended from the roof; the way the glow-worm deals with snails, first chloroforming them and then drinking them, for the flesh has to be liquefied into a broth before it can be used. Fabre's words suggest that the liquid passes up the hollow mandibles to the mouth, but there seems some doubt on this point, as may be seen by comparing the recent observations of Miss Kathleen Haddon with those of Prof. Bugnion.

Apart from the sheer delight afforded by Fabre's intimate descriptions, the chief value of the essays before us lies in their evidence of the limitations of instinct, which gives a basis for the conviction,

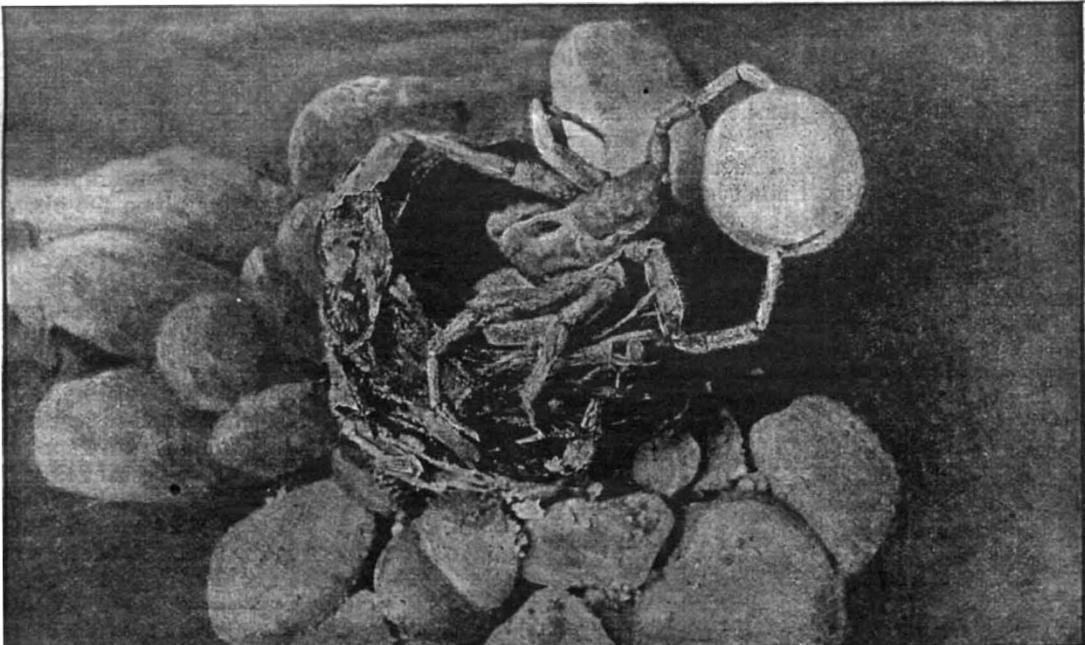


FIG. 1.—The *Lycosa* lying head downwards on the edge of her pit, holding in her hind legs her white bag of eggs, and lifting them toward the sun, to assist the hatching. From "The Wonders of Instinct."

spot; all the occupations have made it their rallying-point. Here come hunters of every kind of game, builders in clay, weavers of cotton goods, collectors of pieces cut from a leaf or the petals of a flower, architects in pasteboard, plasterers mixing mortar, carpenters boring wood, miners digging underground galleries, artificers handling goldbeaters' skin, and many more." What a place for studying those inborn capacities for effective behaviour which we label instinctive! What disclosures this inimitable observer gives us—the sounds of the midsummer night from the tinkling of toads to the death-wail of the surprised cicada, the green grasshopper's strange banquet off her fertilising capsule, the quick and fatal bite which the "devilkin" or *Empusa* gives on the

from which the author never departed, that instinctive behaviour is not in the same category as intelligent behaviour. On one hand we see extraordinarily perfect instinctive behaviour like that of the Capricorn grub boring in the depths of the oak-tree for three years on end, yet coming at the appropriate time to the surface and preparing down to minute details an exit for the future beetle. It behaves as if it had perfect prescience. On the other hand, the burying beetles, though persisting in trying all their bag of tricks when their undertaking is difficult, will allow themselves to be baffled by a hitch which the least spice of intelligence would remove, and will submit to incarceration in a prison which to expert tunnellers like *Necrophori* has practically an open door. Similarly, Fabre's procession caterpillars persisted for a week in a futile circumambulation of the margin of a vase in the garden. Instinctive

<sup>1</sup> "The Wonders of Instinct. Chapters in the Psychology of Insects." By J. H. Fabre. Translated by A. T. de Mattos and Bernard Miall. Pp. 320. (London: T. Fisher Unwin, Ltd., 1918.) Price 10s. 6d. net.