OUR ASTRONOMICAL COLUMN.

OBJECTS FOR THE SPECTROSCOPE.

Sidereal Time at Greenwich at 10 p.m. on September 25 = 22h. 18m. 40s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ′
(1) G.C. 4815	—	—	22 32 1	+33 49
(2) 615 Birm.	6	Yellowish-red.	22 34 18	+56 13
(3) B.A.C. 7954	4	Yellowish-red.	22 43 46	−14 4
(4) ζ Aquarii...	3	White.	22 23 12	− 0 35
(5) η Aquarii	4	White.	22 29 42	− 0 41
(6) 251 Schj.	8	Very red.	21 38 43	+37 31
(7) T Herculis	Var.	Reddish.	18 4 56	+31 0

Remarks.

(1) According to the observations of Huggin and D'Arrest, this nebula has a continuous spectrum, but further observations for "irregularities" or bright flutings should be made. The nebula is described as "Bright; pretty large; pretty much elongated in the direction 160°; suddenly much brighter in the middle."

(2) Dunér compares the spectrum of this star of Group II. with that of α Herculis, and states that "it is one of the finest in the northern sky." The bands 2–9, including 6, are very wide and dark, and the spectrum is one which may be advantageously studied. Light-curves of spectra of this type are valuable, as they show the relative extent of carbon radiation, and therefore serve as a cross check in the classification which is made on other grounds.

(3) The spectrum of this star is one of Group II., in which bands 2, 3, and 7 are dark but not very wide, and bands 4, 5, and 8 are feeble and narrow. Dunér thinks it almost intermediate between Group II. and Group III., but in this he is probably mistaken, as the description agrees almost exactly with that of 75 Cygni (see p. 511), which turns out to belong to an early and not a late species of the group. In that case the bright carbon flutings are predominant, and it will probably be found that this applies also to the star in question. Here, again, a light-curve of the spectrum compared with that of a star like (2) should emphasize this point.

(4) This star has a spectrum which is almost Group IV., the hydrogen lines being considerably broad, but, at the same time, *b* and D are seen without much difficulty. Its proper place on the temperature curve is therefore the last stage of Group III. It may be remarked that with the same thickness of F in a star of Group V., the metallic lines would not be so prominent. One need only compare Aldebaran and Capella to see this difference in the intensities of the metallic lines in Groups III. and V.

(5) A star of Group IV.

(6) In the spectrum of this star of Group VI. no secondary bands were seen with certainty by Dunér, and although the green and yellow zones are very bright, the blue light is very feeble. It seems as if in some of these stars there is more continuous absorption than in others, and comparative light-curves of the spectra of stars of the group might throw light upon this point. This again would probably enable us to determine the relative temperatures of the different stars. The intensity of the blue zone certainly does not depend altogether upon magnitude.

(7) The approaching maximum of this variable (October 4), will offer another opportunity of determining the character of its spectrum. It is much to be regretted that so many variables have as yet unknown spectra, and the sooner they are observed the better. T Herculis has a period of about 165 days, and ranges from 6·9–8·3 at maximum to 11·4–12·7 at minimum (Gore).

A. FOWLER.

SOLAR ACTIVITY FROM JANUARY TO JUNE 1890.—Prof. Tacchini has just presented to the Paris Academy of Sciences a note on the distribution in latitude of solar phenomena observed by him during the first half of this year (*Comptes rendus*, September 15). Hydrogen prominences have been more frequent in the southern hemisphere than in the northern, and reached a maximum of frequency in the zone included between the latitudes 40°–50°. This was also the case in 1889 (*Comptes rendus*, May 5, 1890). During the second quarter of this year prominences have been observed very near to the poles, which indicates that solar activity is on the increase. Faculæ show maxima of occurrence at the same distance from the equator in both hemispheres, viz. 20°–30°. The maximum frequency in the northern hemisphere is more marked, however, than in the southern. The distribution of groups of spots is the same as that of faculæ, hence Prof. Tacchini concludes that we have reached a period of change in the distribution in latitude of solar phenomena; for whilst prominences have maintained a predominance in the southern hemisphere, faculæ and spots have been more frequent in the northern. The absolute number of groups of spots during the second quarter of this year was greater than that of the first quarter, thus indicating that the minimum period has definitely passed.

THE TELLURIC SPECTRUM.—In the current number of *L'Astronomie* M. Janssen gives a short account of his work in Algeria on the telluric spectrum. The object of the expedition was to photograph the solar spectrum on isochromatic plates when the sun was respectively on the meridian and horizon. By the use of such plates, having maxima of sensibility at the less refrangible end of the spectrum, the increase in intensity of the most important telluric lines, which accompanied a decrease in the sun's altitude, may be strikingly demonstrated. The observations were made from a small fort near Biskra, situated on the edge of the Sahara, and having an uninterrupted view towards the south. The solar spectrum was obtained by means of a Rowland's grating, and many photographs were taken during the three months of observation. Their discussion is not yet completed, but M. Janssen notes that without the purity of the sky at the place of observation and the continuance of fine weather it would have been impossible to obtain any useful results. An excursion was made to Tuggurt in order to study the solar spectrum from one of the driest places on our globe. Some photographic observations of mirages were also made at the same time, and are said to throw much light on the nature of the conditions necessary for the production of these singular phenomena.

THE PERSEID METEORS.—In *Comptes rendus* for September 15, Prof. Denza gives an account of the observations made in Italy from August 9 to 11 under the direction of the Italian Association for the Observation of Meteors. From the results obtained at the thirty stations it is concluded:—

(1) The number of luminous meteors, especially on August 11 and 12, was greater than in preceding years, and has relatively attained a maximum. This appears to prove that the earth has cut through a condensation in the meteoritic ring.

(2) The meteoritic shower, which formerly began on August 10, appears to have suffered a retardation, and now begins on August 11.

(3) The following are the numbers of meteors observed at some of the stations: Vatican Observatory, 1971; Florence, 1749; Aprica, 1740; Gaeta, 1305; San Martino in Pensili, 1276; Moncalieri, 1036.

(4) The radiant of the principal shower was found to have the same position between Perseus and Cassiopeia as has previously been noted.

(5) Other radiants were also observed, and notably in Ursa Major and Ursa Minor, Cygnus and Andromeda.

(6) Most of the meteors seen had the yellow colour characteristic of this swarm.

(7) The shower was a remarkable one this year, not only because of the great number of meteors, but also because of their large size.

NATAL OBSERVATORY.—From the annual report of the Government Astronomer of this Observatory for 1889 it appears that the principal work in progress is a comparison of the declinations deduced from observations made at Observatories in the northern and southern hemispheres by a comparison by Talco's method of the zenith distances of northern stars and circumpolars both above and below the pole. Some important results have also been obtained from an investigation into the present theory of lunar motion. The meteorological observations made during 1889 have been tabulated, and will be found useful.

THE NARRABURRA METEOR.

THE Narraburra meteor was found in the year 1854, by Mr. O'Brien, in lat. 34° 10′ S., long. 147° 43′ E., which is a point on the Narraburra Creek about 12 miles east of Temora. When found, it was on a hard and stony surface, but I have been unable to obtain any other particulars, as the finder has long since passed away to the majority.

Mr. O'Brien gave the meteor to Mr. Patrick Harrold, of Mount Hope, near Cootamundra, and it has been in his keeping ever since; until, on March 30, 1890, he was induced by Mr. William R. Eury, Inspector under the State Children's Relief Branch, to send it to me. Mr. Eury, as soon as he saw the meteor, pointed out to Mr. Harrold the great scientific interest attaching to it, and that undoubtedly the proper place for it was in the Observatory, where a collection of these so-called shooting-stars is being made, and upon this, Mr. Harrold sent it to me. I am very much indebted to both of these gentlemen for enriching the Observatory collection by this most interesting specimen of a metallic meteor. Our museum for meteors now contains six.

In appearance this meteor is like rusty iron, and it has a very irregular outline, which seems to have resulted from the oxidation or solution of rounded masses, which had solidified with the iron, and upon removal formed cavities. In size it measures 11 inches × 7½ inches. Two of these are so placed that they look like the orbits in an ox's skull, a suggestion borne out by

the general outline, which is not unlike the bone in question. In one place a hole nearly 1 inch in diameter and 1½ inch deep, has been made straight into the solid iron, and there seems to be little doubt that, when the iron originally cooled down from its gaseous state, it did so in the presence of these rounded and symmetrical masses, which impressed their form on the plastic iron as it solidified. These, as I have already suggested, have no doubt been removed since they reached the earth's atmosphere.

A meteor which fell in New England in November last was seen to have a spiral motion, emitting steam or smoke in jets. Looking at the holes in this meteor, one can see at once that if, when it reached the atmosphere, they were charged with some substance that would burn freely in the oxygen of the air, this solid mass of iron would have twisted about under the influence of the many gas-jets from the burning masses in its sides.

I find its specific gravity is 7·57 and its weight is 71 pounds (70 pounds 14 ounces). Meteoric iron is, I think, never quite pure, and masses of it vary very considerably in specific gravity. Taking five at random which fell in different parts of the earth, it varies in them from 7·38 to 7·82, and the mean happens to be 7·62, almost exactly the same as the one before us.

This meteor has not been analyzed yet.

July 26 H. C. RUSSELL.