Unscientific Art (?)

IN NATURE, vol. xix. p. 460, Mr. Buck complains of the drawing in the *Graphic* for December 28, wherein the observer is represented as "sloping the barometer at an angle of about 30° from the vertical," in order to take a reading on a marine barometer by means of the lantern for better illumination. May not the artist be correct, and Mr. Buck have discovered a mare's nest? The barometer may be placed entirely horizontal for reading the scale, *after* the vernier has once been set when the instrument was vertical.

CHAS. COPPOCK

Grosvenor Road, Highbury New Park, N., March 21

OUR ASTRONOMICAL COLUMN

THE DISTANT HERSCHELIAN COMPANION OF γ LEONIS.—In 1861 Prof. Winnecke, writing from Pulkowa, drew attention to a star of the ninth magnitude near the double-star γ Leonis, which M. Otto Struve had found to have an annual proper motion exceeding 0″·5. The star was observed with the Dorpat transit-instrument, on April 12, 1820, and once by Bessel in zone 502, on April 12, 1831, and from these observations compared with two at Pulkowa in April, 1861, and with micrometrical measures from γ Leonis by M. Otto Struve, Prof. Winnecke concluded that the proper motion of the small star with respect to the neighbouring binary, was very nearly 0″·85 in R.A. and 0″·10 in declination, annually. Sir W. Herschel observed a distant companion of γ Leonis, the mean of two angles giving 297°·5 for about 1782·9, with a distance of 111″·4, which he thought was "pretty accurate," though as we are now aware, many of these wider measures of Sir W. Herschel require material correction.

We refer to this star from having remarked that M. Flammarion, in his recently published "Étoiles Doubles et Multiples en Mouvement relatif certain," has made it the subject of a strangely confused article, which is calculated to mislead the reader who cannot refer to original authorities. The star had been measured by Secchi in 1856, and by Powell in 1861, and M. Flammarion states that "the enormous difference between the measure of 1782 and that of 1856" had induced him to search for other observations and to reobserve it himself, which he did, in 1877. He says he had found five observations by Flamsteed in 1691, ten by T. Mayer in 1755, and fifteen by C. Mayer in 1777; these, it is added, are not very precise, for they consist only of differences of right ascension, without taking account of the declination; nevertheless he considered they had their value, and comparing his own measures of 1877 with previous observations separately, he deduces "a very surprising result," viz., that the distant star is remarkable for its motion, which, if one may judge by the totality of observations, has a mean value of 1″·08, but which appears variable, as "at present it certainly has not that value."

The main cause of M. Flammarion's difficulty is his having confounded two quite distinct objects: we have not referred to the work of C. Mayer, but the star observed by Flamsteed, which he more than once calls "Comes γ," and that observed by Tobias Mayer, is really the bright neighbour of γ, or 40 Leonis; Flamsteed did observe the declination, as will be seen in his column "Distantiæ a vertice correctæ;" and Mayer also noted the declination on one occasion, though generally recording only the right ascension. M. Flammarion says he found five observations of Flamsteed in 1691, which is a greater number than we recognise in the "Historia Cœlestis," but there are observations in 1690 and 1692. The zenith distances of γ Leonis and *Comes* on April 6, 1691, and the names of the stars on January 23, 1692, are interchanged in the "Historia Cœlestis." Tobias Mayer's observations do not apply to the year 1755, when his observatory at Göttingen was not yet erected, but to 1756 and 1757, chiefly the former year. Bessel's observation applies to 1831, not 1825, as M. Flammarion assumes.

The star in question is No. 90, in Argelander's valuable treatise, "Untersuchungen über die Eigenbewegungen von 250 Sternen, &c.," where he deduces for the annual proper motion in arc of great circle, 0″·512 in the direction 270°, or the proper motion is entirely in R.A. He observed the star upon the meridian at Bonn, once in 1857 and four times in 1862-63. It was also meridionally observed at Greenwich in 1862. It is No. 234, Hour X., in Weisse's Bessel. Thus we have three stars situate within half a degree, with large proper motions, very divergent, however, in direction:—

	Secular P.M.	Direction.	Authority.
	″	°	
40 Leonis	32·2	229·0	Mädler.
W. B. X. 234	51·2	270·0	Argelander.
γ Leonis	32·3	118·6	Mädler.

A METEOR WITH SHORT PERIOD OF REVOLUTION.—In the very interesting report of the "Luminous Meteor Committee" of the British Association for 1877-78, we find a note by Capt. G. L. Tupman, referring to a fire-ball seen on November 27, 1877, which he considers to have been moving in a nearly circular orbit, with short periodic time. Capt. Tupman observed this meteor from a position about half a mile east of the Royal Observatory, Greenwich; it began as a first or second magnitude star, but suddenly increased in brilliancy and size to a fine bluish white fire-ball ten or twelve minutes in diameter, emitting a train, coloured blue, red, and green, many degrees long. It moved very slowly, so slowly, indeed, towards the end of its course, that it appeared to come almost to a standstill. The duration was considered to be fifteen or sixteen seconds. The meteor was observed by Mr. H. Corder, at Writtle, near Chelmsford, and by Mrs. Ware, at Clifton Down, Bristol, and the positions for beginning and ending, estimated at these stations, were found to be in remarkable agreement, the true path deduced from these satisfying them all, both azimuths and altitudes, within 1°.

It appears that the meteor first became visible at a real height of fifty-six miles vertically over a point off the mouth of the Thames in long. 1° 21′ E., lat. 51° 33′, and disappeared when it had descended to a height of thirteen miles vertically over a point, about twelve miles west of St. Omer, in France, in long. 2° 0′ E., lat. 50° 45′, the length of the entire path being about eighty miles.

Capt. Tupman thinks the radiant point was pretty accurately determined in R.A. 285°, Decl. + 64°, or in longitude 340°, and latitude + 83°. The elements of the real orbit, which, with the aid of the other corresponding data depending upon the earth's position in her orbit, are thence deduced, are as follows, taking the real duration at fifteen seconds:—

Perihelion distance ... ... 0·9858	Excentricity ... 0·1568
Longitude of perihelion ... 70° 6′	Inclination ... 15° 0′
,, ,, ascending node 245° 50′	Anomaly ... −4° 16′
Semi-axis major ... ... 1·1691	Periodic time... 462 days

Motion—direct.

The precise Greenwich time of the occurrence of the meteor was 10h. 26m.

If the duration of visibility is diminished to 7½ seconds the elements are still very similar to the above; the semi-axis major becomes 1·3785 and the period 591 days. Capt. Tupman remarking that such favourable conditions for inferring the orbit of a meteor may rarely happen, adds, it is sufficient for the establishment of a short periodic time (such as 500 days) that "the meteor moved slowly from a fairly well-determined radiant distant about 90° from the point of the heavens towards which the earth's motion was directed."

We may mention that there is one singular circumstance not alluded to in Capt. Tupman's note: the elements defining the position of the orbit of the meteor