

a deep-water mussel of considerable size, which I propose to name *Mytilus luteus*. It inhabits the layer of mud which I have above described, and moors or fixes itself by means of a large and densely-matted byssus which is spun by the foot. This byssus is capable of being spread over a considerable extent of surface; and it not only prevents the mollusk sinking into the soft mud and being smothered or buried alive, but enables it to feed comfortably on the innumerable animalcula which swarm on the surface of the sea-bed. It is of the same use to the mollusk as the snow-shoe is to the Arctic traveller. This species of *Mytilus* I at first took to be the *Modiola incurvata* of Philippi—*M. martorelli* of Hidalgo, which lives on the south coast of Spain in rather shallow water; but on comparison I am satisfied that they differ essentially in shape, sculpture, colour, and epidermis.

I cannot conclude this account without acknowledging my most grateful thanks to the French Government for their extremely generous conduct in my case and for the excellent hospitality which I enjoyed on board the *Travailleur*, as well as to the President and Members of the Scientific Commission for their obliging and friendly companionship.

The zoological results of this French Expedition are fully equal to those made by Capt. Baudon in 1801, M. d'Urville in 1829, the *Recherche* in 1835, the *Astrolabe* in 1841, and other French expeditions; and I sincerely hope that a further expedition of the present kind may take place next year in the Mediterranean, where our good and gallant neighbours have such an important stake.

The list of Mollusca referred to in this paper includes the following new species named or recognised by the author:—*Pecten obliquatus*, *Lima Jeffreysi* (Fischer), *Mytilus luteus*, *Modiolaria cuneata*, *Axinus tortuosus*, *Mytilimeria* (?) *Fischeri*, *Thracia tenera*, *Cadulus semistriatus*, *Rimula asturiana*, *Odosstomia lineata*, and *Bullina elongata*. The species which he considers peculiarly northern are *Chiton alveolus*, G. O. Sars, *Fusus turgidulus*, Jeffreys, and *Pleurotoma nivalis*, Lovén; and the species which he considers peculiarly southern or Mediterranean is *Odosstomia fasciatus*, Forbes.

THE SHOWER OF AUGUST PERSEIDS, 1880

THE August meteors were observed under peculiarly favourable circumstances this year. Not only was the moon entirely absent during the display, but the weather, which so frequently interrupts such observations, remained fine night after night, thus allowing an unbroken series of watches to be maintained from the 6th to the 13th, and enabling the rise and fall of the display to be distinctly traced from a comparison of the results obtained each night. On the 10th, however, when the maximum was expected, the state of the sky scarcely admitted of successful observation, and the number of shooting-stars recorded that night was below the experiences of past years, but it must be remembered that, this being leap year, the chief intensity of the shower was due earlier than usual, so that it may have occurred before the evening of the 10th, when observers generally were watching for its reappearance.

At Bristol the following summary was derived from observations by the writer:—

Date, 1880.	Length of watch.	Time of watch.		No. of meteors seen.	No. of Perseids.	Hourly Nos. for one observer.		Chief radiant point.
		h.	h. h.			All meteors.	Perseids.	
August 6	1½	10	-11½	19	5	13	3	38° + 56°
7-8	4½	11	-14	112	54	25	12	41° + 55°
9	2½	11	-13½	111	71	28	44	44° + 55°
10	1½	10	-11½	50	41	34	28	45° + 57°
11	2½	10½	-13	64	43	26	17	43° + 57°
12	2½	10½	-13	45	19	18	8	—
13	1½	10½	-12	18	7	12	5	49½° + 57½°
Aug. 6-13	16½	10-14		419	240	246	144	44° + 56°

The observed maximum occurred on the 9th, when, during a watch of 2½ hours, meteors were falling at the rate of 44 per hour (for one observer), and the proportion of Perseids was nearly two-thirds of the aggregate number visible. On the 10th the hourly number of 34 was determined under less favourable conditions. A fog partially overspread the sky, rendering the

stars dim, so that many small meteors passed unrecorded, and at 11½h. it was found impracticable to continue observations. The hourly number of Perseids found on the 10th coincides with that of the preceding night, and it is obvious that, allowing for the clearer atmosphere of the 9th, the maximum of the display really occurred as usual on the 10th. It is fair to assume from the numbers actually counted in the fog-shrouded sky of the 10th that later in the night, as the radiant attained greater elevation, the meteors from Perseus were as numerous as during the few preceding apparitions of the shower. The brightest meteor observed at Bristol appeared at 13h. 37m., on August 8. The sky had become overcast except near the western horizon, where a few stars could still be distinguished. A vivid flash startled the observer, who, on looking towards the direction indicated, at once saw a brilliant meteor streak attached to the star γ Ophiuchi, and its position was such as to leave no doubt that it had been left by a magnificent Perseid. Other large meteors were registered as follows:—

	Time.	Mag.	Path		Length.
			From	To	
August 6	h. m.				
	10 52½	δ	51 + 66	60 + 70	6
7	10 49	δ	265 - 10	261½ - 19	10
7	12 0	δ	329 + 10	322½ - 0	12
7	12 25	δ	55 + 53	64 + 50	6
7	12 54	δ	52 + 48½	55 + 45	4
8	10 5	δ	61 + 72	109 + 76	13
8	11 5	δ	314½ - 2	306 - 18	17
8	11 14	δ	16 + 46	2 + 36½	14
8	12 8	δ	324 + 43	310 + 30	17
8	12 8	δ	28 + 44	24 + 39½	5
9	11 35	δ	36 + 33	35 + 27	7
9	12 5	δ	36 + 34	33½ + 28	7
9	12 23	δ	332 + 7	320 - 10	20
9	12 49	δ	122 + 73	158 + 66½	14
10	10 29	δ	316 + 81	259 + 67	19
10	11 11	δ	327 + 55	302 + 37	24
11	9 20	δ	291 + 12	292 - 3	15
11	10 40	δ	331 + 47	312 + 28	23½
11	11 10	δ	322 + 15	304 - 10	30
11	11 52	δ	343 + 20	332 + 3	19
12	11 15	δ	322 + 49	328 + 30	19½

These meteors all belonged to the shower of Perseids. Motions very swift. They all left bright streaks.

The radiant point showed a displacement on nearly every successive night of observation. It was noted at 38° + 56° on the 6th, yet on the 13th a few meteors indicated it very exactly at 49½° + 57½°. This corroborates observations made by the writer in 1877, and reported in NATURE, vol. xvi. p. 362. A large number of Perseids were seen that year, and from an exact record of their flights the radiant point was seen to advance in R.A. as follows:—

1877, August 3-7	=	α	+ δ
	=	40°	+ 56°
	=	43°	+ 58°
	=	50°	+ 56°
	=	60°	+ 59°

This is further borne out by Mr. Henry Corder's extensive observations at Writtle, near Chelmsford, during the recent display, which may be tabulated as under:—

1880.	Watch.	Time.	Meteors seen.	Perseids.	Radiant point.
August 1	h.	h.			
	2½	9½-12	25	9	35 + 56
2	2	10½-12½	21	7	{ 35 + 56
4	2	10 - 12½	35	13	{ 40 + 57
6	2	{ 10 - 10½	13	6	{ 43 + 56
		{ 14 - 14½			
8	2½	10 - 13	59	26	45 + 59
9	4½	9 - 13½	120	84	45 + 58
10	1	9 - 12	46	39	—
11	3	9 - 13	76	50	46 + 58
Aug. 1-11	17½	9 - 14½	395	234	

Mr. Corder places the average position of the radiant of the true Perseids at 45° + 58°. On the first few nights of August he found it well defined at 35° + 56°, though on the 11th it had apparently shifted to 46° + 58°. And it is to be remarked that

on July 29-30 Mr. Corder had seen a shower of twenty meteors from the point $29^{\circ} + 56^{\circ}$, which no doubt represented the first on-coming of the Perseids.

The night of August 10 at Mr. Corder's station was very hazy and generally overcast, so that though he was watching during the three hours preceding midnight, he estimated that his observation was not more than an equivalent to one hour of clear sky. He reckoned that under favourable conditions of the atmosphere the Perseids were falling at the rate of 40 per hour. Only one meteor he saw on the 10th was a fine one about = $\frac{1}{2}$. It appeared at 11h. 23m. rather low in Ursa. It was rich orange in colour, with a long narrow streak broken in the middle. On August 11 Mr. Corder found meteors scarce; the shower had evidently fallen off considerably. The horary numbers found at Bristol were 26 of all meteors and 17 of Perseids, which very closely corresponds with Mr. Corder's figures, for, observing for three hours, he saw 76 meteors, amongst which were 50 Perseids. He mentions several instances in which the Perseid streaks were broken, and the same feature was frequently observed at Bristol. In such cases the nucleus had several maxima, and the streak-producing power seemed intensified at the point of each outburst.

Mr. Corder mentions a bright aurora as visible on the 11th and 12th instant. They were seen at Bristol also, but the phenomenon of the 12th was by far the most conspicuous. At about 10h. 20m. there was a vivid arch of crimson light spanning the horizon below the stars $\beta - \gamma$ of Ursa Major, and the whole northern quadrant was aglow with streamers. But it soon lost its striking character, though there were indications of streamers at a much later period, and an auroral glow was apparent above the north-west horizon as late as 14h. It was also seen by the Rev. S. J. Johnson at Mitcheldean, Glos., who writes:—"On the 12th there was a somewhat striking display of aurora. It began at 10h. 29m., and was bounded on the east by Capella, and on the west by Arcturus. The columns were often very vivid, but the brilliant character of the phenomenon only lasted 12 minutes."

Major Tupman observing at Cookham, near Maidenhead, Berks, reports the weather very cloudy on August 8, after 11h. 34m. In one hour (10h. 34m.—11h. 34m.) 13 meteors were seen, of which all but 2 were Perseids. August 9 very clear, and the sky watched from 9h. 56m. to 12h. 5m., when 31 meteors were seen, including 28 Perseids and 3 Cygnids. August 10—watch sustained from 9h. 5m. to 10h. 43m., when 15 or 16 Perseids were noted, and a few other small meteors. Sky clouded up at 10h. 43m. August 11 cloudy. Partly clear at 10h. 55m., and 3 Perseids observed, but at 11h. 9m. it again became overcast, and prevented further observation. The radiant point derived from a number of very accurately observed paths on August 9 was at $44^{\circ} + 56^{\circ}$, with indications of a sub-radiant 4° higher in declination.

The Rev. G. T. Ryves, of Stoke-on-Trent, writes as follows:—

"August 8—10h. to 11h.—19 meteors seen, of which not more than 10 or 11 were Perseids. Soon after 11h. clouds formed, and interrupted further watching.

August 9, 9h. 45m. to 11h., 65 meteors seen.

„ 11h. to 12h. 45m., 30 meteors seen.

"From 80 to 85 were Perseids. The falling off in numbers after 11h. is only apparent, as up to that time I had been assisted by two pairs of eyes, and owing to my defective sight many of the smaller meteors would have escaped me afterwards,

"August 10, 9h. 30m. to 11h. 30m., 126 meteors seen. Nearly all of these were Perseids. During the whole of this period I was assisted by the two young observers above alluded to. Several brilliant meteors were recorded. On August 9, 12h. 25m., one was imperfectly seen in the Milky Way near horizon, in S.W., moving about S.W." This is obviously the same as one described at Bristol at 12h. 23m. the same night.

Another was seen by Mr. Ryves at 12h. 35m., August 9, moving very slightly west of, and parallel to, the stars δ and γ of Cygnus, and at 11h. 2m., August 10, a fine meteor shot towards Aquila, the end point being noted slightly below and west of Altair. These meteors were evidently Perseids, though Mr. Ryves saw only a small proportion of brilliant meteors. He remarks: "The most noticeable feature in this year's display has been the great falling off in the average brightness of the meteors as compared with former years. Of the 240 meteors seen here not more than a dozen were such as would have attracted the

attention of any one but trained observers, the great majority requiring rather exceptionally keen eyes to detect them at all."

Mr. Cornish, at Debenham, Suffolk, gives the following summary of watches between August 1 and 12:—

	Meteors.	Observers.
August 1, 10h. 15m. to 11h. 40m. ...	13	V. Cornish
9, 10h. to 11h. ...	23	H. Heather
9, 10h. 40m. to 11h. ...	13	V. Cornish
11, 9h. 48m. to 11h. 38m. ...	56	V. Cornish
12, 9h. 3m. to 9h. 33m. ...	6	H. Heather

On the 11th no less than 24 were noted during the first half-hour's observation. The sky was partly cloudy after 11h. A 1st mag. stationary meteor was seen at $348\frac{1}{2} - 23$ on August 4, at 13h. 48m. On August 9, 10h. 23m., a meteor = Sirius shot from $0^{\circ} + 37^{\circ}$ to $349^{\circ} + 28^{\circ}$, and it appears to be identical with a fine meteor registered by Mr. Ryves at Stoke-on-Trent, August 9, 10h. 25m., path from α Andromedæ to α Pegasi. Mr. Cornish remarks that "the recent display of Perseids was not equal to that of last year, even supposing the circumstances to have been as favourable." It must be remembered, however, that on the all-important night of August 10 few observations could be obtained, owing to the generally unfavourable state of the sky, and that under these conditions a comparison cannot fairly be instituted. Mr. Corder estimated the horary rate of Perseids as 40 per hour on the 10th; and at Bristol, where the stars could only be seen in dim outline through the fog-laden atmosphere, the number actually counted at an early period of the night was 28 per hour. This compares favourably with the last successful observation of this shower obtained by the writer in 1877, when, with a perfectly clear sky, 57 Perseids were noted between 9 $\frac{1}{2}$ h. to 11h., = 38 per hour. Making allowance for the difference of weather, the recent display, though it cannot be regarded as in any way exceptional, may yet be classed as a fairly active return of the shower; and it is fortunate that on the several nights immediately preceding and following the 10th, the state of the sky allowed its progress to be traced with unusual distinctness.

The Rev. S. J. Johnson, at Abbenhall Rectory, Mitcheldean, Glos., saw 20 meteors during an hour's watch (10h. 57m. to 11h. 57m.) on August 9. The following night there was much cloud about at times, especially in the eastern sky, so that only 16 meteors were seen between 10h. 3m. and 11h. 3m. On the 11th the night was very clear, and 12 meteors seen between 10h. and 11h. Mr. Johnson gives a list of the brighter meteors, which includes several nearly equal to Jupiter, and many 1st magnitude.

The night of the 9th appears to have been very favourable at all stations, and more shooting-stars were seen on that date than on the 10th, when the sky was in part overcast. On the 11th there was a very evident falling-off in the number of meteors observed at Chelmsford and Bristol, the horary rate of apparition of the Perseids being noted as 17 at both places. The following night it had fallen to 8, and on the 13th to 5, as derived from observations at Bristol, and the absolute cessation of the shower was evidently near at hand.

W. F. DENNING

INTERNATIONAL METEOROLOGY

THE International Meteorological Committee appointed by the Congress of Rome held its first meeting at the Observatory, Berne, from the 9th to the 12th ultimo. All the members of the Committee, nine in number, were present. Their names are as follows:—

Prof. H. Wild (president), Mr. R. H. Scott (secretary), Professors Buys Ballot and Cantoni, Capt. de Brito Capello, Professors Hann, Mascart, and Mohn, and Dr. Neumayer. The following is a brief notice of the most interesting results of the meeting:—

The International Comparison of Standard Instruments.—The original scheme for this undertaking was based on the supposition that thirty-six European observatories would take part in it, each paying a contribution of about 15%. The number of acceptances of the proposal up to the date of the meeting was, however, insufficient to justify the Committee in commencing the comparison, and it was therefore determined to recommend each country to carry out a careful comparison of its own standard instruments with those of neighbouring countries.

The International Simultaneous Observations.—The proposal recently made by the Chief Signal Office, Washington, to change