

which were brilliant. One was observed in the twilight and moonlight at 8.30 falling vertically in Delphinus, and the other, at 9.57, was as bright as Venus, and gave a succession of three outbursts. Path from  $79^{\circ} + 76^{\circ}$  to  $89^{\circ} + 67^{\circ}$ . There was a vivid flash at the end point which many persons who did not see the meteor itself mistook for lightning.

W. F. DENNING

OUR ASTRONOMICAL COLUMN

BIELA'S COMET.—In the actual uncertainty with regard to the present condition of Biela's comet, the importance of an exhaustive survey of the eastern sky during the dark mornings, *i.e.*, the moonless mornings, of September and October, can hardly be exaggerated. The comet may possibly have been so disintegrated by this time that nothing further will be seen of it as such, but there must remain very great doubt as to such being the case. According to M. Otto Struve's observations of the two heads in 1852, their diameters were still considerable, that of A being upwards of 20,000 miles, and of B 37,000 miles, and the brightness of the latter was equal to that of a star of Argelander's ninth magnitude.

With respect to the most promising plan of search, not much, perhaps, can be said, but if a number of observers are available, as it is to be hoped there may be, sweeps in zones of declination between pretty wide limits of right ascension, appear likely to insure some justifiable conclusion as to the comet's present state or position. Prof. Winnecke, we believe, is in possession of a 6-inch refractor, mounted as an "Airy's orbit-sweeper," and if the comet, or what remains of it, be still moving in the old orbit, this instrument, in such hands, will be of the utmost value in the examination of the proper sweeping-lines for the particular dates. But if the orbit has been sensibly changed by further perturbation, the effect of which is wholly unknown to us, the necessary survey of the heavens will be, of course, only partially effected by this means, so that our only resource appears to be, as we have suggested, in a well-organised scrutiny of that portion of the sky wherein it is possible the comet might be situated, and there is yet time to provide for this, if arrangements have not been already made at those observatories which are occupied with cometary observations. To indicate the portion of the heavens in question, we subjoin the comet's places for the dates of new moon in September and October, according to different assumptions as to its distance from the perihelion, with similar places for five days subsequently:—

Days from perihelion.	September 15.5			September 20.5		
	R.A.	Decl.	Dist.	R.A.	Decl.	Dist.
0	144.3	+ 9.3	1.60	146.8	+ 8.3	1.56
-10	137.5	+ 12.6	1.47	140.0	+ 11.7	1.41
-20	130.1	+ 16.3	1.33	132.7	+ 15.5	1.27
-30	122.0	+ 20.1	1.20	124.5	+ 19.6	1.13
-40	112.8	+ 24.2	1.08	115.1	+ 24.0	1.00
-50	102.2	+ 28.2	0.98	103.8	+ 28.6	0.90
	October 15.5			October 20.5		
+20	170.5	- 3.2	1.65	172.9	- 4.4	1.60
+10	165.1	- 0.6	1.47	167.5	- 1.8	1.42
0	159.2	+ 2.5	1.29	161.7	+ 1.2	1.23
-10	152.8	+ 6.2	1.11	155.3	+ 4.9	1.04
-20	145.5	+ 10.7	0.92	148.1	+ 9.5	0.85
-30	136.7	+ 16.5	0.75	139.0	+ 15.8	0.67

THE CLUSTER ABOUT  $\kappa$  CRUCIS.—In a communication to the Paris Academy of Sciences on August 25, M. Cruls, Director of the Observatory at Rio Janeiro, states that on comparing the present appearance of the stellar cluster about  $\kappa$  Crucis, with the map and observations made by Sir John Herschel, he finds notable changes—confirmed by detailed micrometrical measures which he intends to publish. Three double stars are found to be certainly in orbital motion, and there is a rectilinear dis-

placement of the star near the red one. M. Cruls also mentions that he has registered a star 6.5m., which he believes has not been previously remarked, and which he suggests may be variable; it follows B.A.C. 4308 = Lacaille 5293 by 1m. 4.26s., and is south of it, 4' 14".6; according to Mr. Stone's position of this star for 1875.0, the place of M. Cruls' object for the same year is in R.A. 12h. 44m. 58.52s., N.P.D. 149° 43' 11".0. We notice that the differences given by him are almost precisely the same as the differences between Lacaille 5288 and 5293, though that in declination appears to be in the wrong direction; thus, Mr. Stone's catalogue of 1875 makes the position of 5293 with reference to 5288, in R.A. + 1m. 4.72s., in Decl. + 4' 10".4. Is it possible that there can be any confusion here? Mr. Stone has not observed a star in M. Cruls' place.

This cluster is *h.* 3435, and Sir John Herschel's micrometrical details relative to 110 of its components, will be found at p. 17 of his Cape volume; it is remarkable for the various colours of the stars, an attempt to illustrate which is made in the last edition of Chambers's "Descriptive Astronomy."

GEOGRAPHICAL NOTES

THE news of the arrival of Prof. Nordenskjöld at Yokohama on the evening of September 2, will have been received with satisfaction by the whole civilised world. The long-looked for solution of the problem of the North-East Passage has thus been practically accomplished. After being imprisoned in the ice near the Tshuctshe settlement for 264 days, *viz.*, from September 28, 1878, until July 18 last, the *Vega* was at last released, and passing the East Cape, Behring's Strait, on July 20, entered St. Lawrence Bay, which may be said to form part of the Pacific Ocean. Crossing to Port Clarence on the American coast, a short stay was made there, and then the Professor re-crossed to Komian, while all the time dredging operations were carefully made, the formation of the sea-bottom at this spot being particularly interesting on account of the meeting of currents from the Arctic and Pacific oceans. No doubt the *Vega* will bring home a rich collection of specimens. The voyage was then continued, and after touching at St. Lawrence Island, Prof. Nordenskjöld visited Behring's Island, off the east coast of Kamtchatka, where he received the first news from Europe through the resident agent of the Alaska Trading Company. It was here that the professor discovered the fossil remains of the gigantic marine animal *Rhytina stelleri*.<sup>1</sup> On August 19 he left the island and continued his journey towards Japan. On the 31st the ship encountered a severe gale, during which the maintop was struck by lightning, which also slightly injured several of the crew. Without further accident the *Vega* anchored at Yokohama at 10.30 P.M. on the 2nd inst., where she will remain for a fortnight. No deaths took place on board since the vessel left Sweden last summer, and thus the high-minded liberality of Herr Dickson, of Gothenburg, who supplied the means for the spirited enterprise of Prof. Nordenskjöld, is by the complete success of the latter deservedly rewarded.

In the August number of Petermann's *Mittheilungen* the narrative of journeys and voyages to Siberia is continued, with a map showing the most recent voyages through the Kara Sea. A special map has also been issued in which a portion of the course of Nordenskjöld in the *Vega* is laid down. The new coast-line of North-East Siberia is also laid down from the data supplied

<sup>1</sup> This animal was a species of *Sirenia*, and was exterminated by man with in a comparatively recent period. It was discovered about the middle of last century upon the island in question, which has its name from the celebrated traveller who was wrecked there in November, 1741, and who found the place inhabited by large numbers of these enormous animals. They were first described by Herr Steller, who was one of Behring's party. The discovery, however, seems to have been fatal to *Rhytina*, none having been seen later than the year 1768.