

### On Keeping Marine Organisms Alive in Small Aquaria.

IN NATURE of November 10 (p. 44), a contrivance is mentioned by the use of which the sea-water in a small aquarium can be kept in motion. The same kind of apparatus has been employed during the winter 1897-98 in Kiel, for keeping Peridinea and Diatoms of the Plankton in a healthy condition. Prof. Geo. Karsten has described the apparatus used in the *Wissenschaft. Meeresuntersuch. der Kommiss. z. wissenschaft. Untersuch. d. deutsch. Meere in Kiel und der Biolog. Anstalt a. Helgoland*, vol. iii. part 2, March 1898, p. 8. In this case a clinostat-clockwork was used, and the plunger rose five times in three minutes. The bell-jar, serving as an aquarium, was very small, holding about 1.5 litre. Ceratium and Skeletonema got on very well, the same plants dying off rapidly on being kept in water at rest. OTTO V. DARBISHIRE.

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### THE NOVEMBER LEONIDS OF 1898.

VERY unfavourable weather was experienced all over the country at the middle of November, and the return of the Leonid meteors was very scantily observed. At many stations no observations whatever were possible between November 13 and 16, while at other places only one of these nights was partially clear. As a result of the bad atmospheric conditions, very few meteors have been recorded. But it seems certain, from a comparison of the fragmentary observations obtained at various places, that, apart from the unfavourable influence of the weather, the meteoric shower did not nearly answer expectation. In fact, the number of meteors visible appears to have scarcely exceeded the average number that may be counted on an ordinary mid-November night. It is true that the observations did not cover the whole of the three nights of November 14, 15 and 16, and were, moreover, effected in most cases under circumstances little calculated to ensure successful results. But making every allowance for the difficulties encountered, the feeble character of the shower is still significant, and proves that the earth in recently crossing the node of Tempel's comet of 1866, did not encounter the denser part of the meteoric stream, but a very attenuated region far in advance of the associated comet. Indeed, the recent display appears to have been scarcely richer than those of 1879 and 1888, when the comet was not a great distance from its aphelion. Of course, the real shower may have occurred in the daytime, but it would scarcely escape recognition in America or some other distant part, for observers all over the world are keenly alive to the attractions and the importance of the Leonid display, and have been on the alert to witness it.

Descriptions of the recent shower from the United States are not dissimilar to those from our own country. Of course, we cannot rely upon the exaggerated statements published in some of the American newspapers, or sent home by the New York correspondents of certain English journals. One of the latter, writing on November 15, says: "Astronomers throughout the United States watched the shower of Leonid meteors, which appeared between midnight and five o'clock this morning. Many of the meteors made brilliant flashes across the sky, and left fiery trains. One meteor in Orion lit up the entire city of New York at about one o'clock in the morning, and fell hissing, the sound indicating its close proximity." More trustworthy accounts from astronomical observers at the Lick Observatory, Mount Hamilton, the Princeton Observatory, and others at Richmond, Virginia, agree that the late display was a disappointing one, the meteors seen being neither numerous nor brilliant.

With regard to observations made in this country, the writer has received reports from London, Oxford, Bridport, Yeovil, Cardiff, Chester, Loughton (Essex), Ciren-

chester, Stone (Staffs.), Leeds, Southport, Belfast, Dumfries, and several other places. A few quotations from these may perhaps be interesting:—

*Belfast*.—A watch was maintained on November 12 to 15h. 30m., but no Leonids observed. On the following night (13th), to the same time, six meteors were recorded, and of these three may have been Leonids. On November 14, the sky was overcast to 16h. 40m.; then it partly cleared; but there was a good deal of mist, and the stars shone very dimly. Between 16h. 40m. and 17h. 15m. the observer saw ten fine Leonids; but the sky became cloudy again, and observations were discontinued. The shower was regarded as a fairly strong one under the conditions, and the maximum appeared to be at about 17h.—W. H. Milligan.

*Southport*.—Observations were made at the Meteorological Observatory on November 14, 13h. 30m. to 17h. 30m., and the following were the hourly number of meteors (nearly all Leonids) noticed by one observer:—

h. m.	h. m.	
13 30 to 14 30		= 15 meteors.
14 30 to 15 30		= 10 "
15 30 to 16 30		= 3 "
16 30 to 17 30		= 2 "

The meteors were small, not one being brighter than a 1st mag. star. The scarcity of meteors, only five being seen between 15h. 30m. and 17h. 30m., is remarkable.—J. Baxendale.

*Yeovil*.—On November 14 the sky was clear, but only two or three meteors were remarked in the two hours between 13h. and 15h.—Rev. T. E. R. Phillips.

*Cirencester*.—Weather clear during the whole night of November 14, and only a little fog at low altitudes. Observations were made from a window facing E., between 11h. 45m. and 12h. 50m., but no meteors were seen. The sky seemed unaccountably light.—Miss E. Brown.

*Gateshead*.—On November 13, between 10h. and 15h., the atmosphere was favourable, and observations were made at short intervals, but no meteors were seen.—Dr. A. W. Blacklock (*English Mechanic*).

*Northants*.—On November 14, from midnight to 15h., a watch was kept with results almost *nil*. The sky was, however, partially veiled with clouds through which only a few stars could be seen. There was a very brilliant meteoric flash at 13h. 55m.—F. H. Wright (*English Mechanic*).

*Bristol*.—On November 12 the clouds passed off at 15h., and the sky was watched intermittently until 17h. Only seven meteors were seen. There was no sign of radiation from Leo. At 16h. 4m. the sky was illuminated, probably by the outburst of a large meteor in a region of the heavens hidden to the observer. The nights of November 13 to 19 were all overcast, and no observations could be obtained.—W. F. D.

*Chester*.—On November 16, between 10h. and 13h., six plates were exposed for 30m. each, but no meteor trails were secured. The meteors appeared to be scarcer than on any ordinary night. At 12h. 8m. a Leonid of the apparent brightness of Mars was seen, and with the exception of a small, swift Perseid nothing else was recorded.—F. W. Longbottom.

The remainder of the reports are stories of failure in consequence of the weather. At many places a series of dense fogs occurred just at the important time. In spite of these drawbacks, however, the fact remains that at certain stations on November 15 a clear sky invited observation, but presented very few meteors. It is true that Mr. Milligan saw some brilliant ones in the hazy sky of November 14, 16h. 30m. to 17h. 15m., and that the observed maximum of the "shower" seems to have occurred at nearly the same time as last year. But the phenomenon, so far as it was observed, was quite of minor character, and observers who saw nothing what-