

side of the body. On the expanding of the tentacle the blood instantly returns, and suffuses it; and thus the process goes on. The contraction and expansion occur at regular intervals, together occupying the space of two seconds. It is in this way that the blood is purified and the circulation controlled. The above observations were made with a seven-eighths inch objective; the subject being placed in a zoöphyte-trough.

To ascertain how long the cilia upon the tentacles would continue their motion after separation from the worm, both lophophores of an adult were cut off above their own junction. At first the tentacles remained closed; but soon they expanded, the cilia displaying active motion; and presently the two separated lophophores began to move about in the zoöphyte-trough. This motion was produced by the action of the tentacles, which bent in all directions, their tips touching the glass, and was not a result of ciliary currents. In a few minutes one lophophore had *crawled* in this manner quite across the trough, while the other remained floating in the water near its first position. Sometimes the motion was produced by ciliary currents, the tentacles remaining motionless; but this was quite distinct from the *crawling* above noted.

During this time the decapitated worm had sunk to the bottom, and, though twisting and turning a good deal, did not attempt to protrude the mutilated support of the lophophores. Its body was so much contracted that the segments were not above one-third their usual size.

At the end of five hours the worm was apparently dead; numbers of infusoria had collected to prey upon it; and the surface of its body presented a roughened appearance, as though covered with tubercles. The lophophores were still in motion. At the end of the eighth hour the lophophores had ceased to move, and were paler and more transparent; but the ciliary action, though feeble and uncertain, still continued. The body of the worm was then covered with a thick fungoid growth, consisting of transparent, rod-like filaments, three-sixteenths of an inch in length, some of the filaments having a beaded appearance. All motion of the cilia upon the tentacles had now ceased, and these latter were also the prey of infusoria.

The above experiment showed that the independent motion of the cilia continued about twice as long as the mutilated worm gave evidence of vitality. Several individuals of *Manayunkia* were observed to be preyed upon while still alive by large monads, embedded in one or more segments, which were sometimes excavated to a considerable degree.

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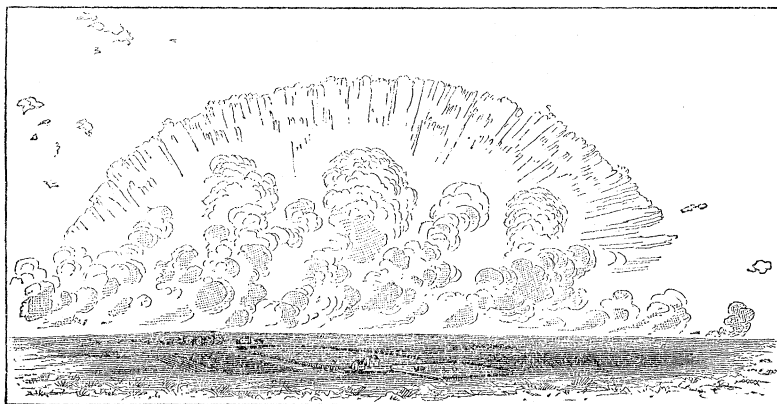
#### Appearance of the cyclone cloud at Rochester, Minn., 1883.

On Tuesday, Aug. 21, I left Minneapolis at three o'clock in the afternoon for Albert Lea, Io.

Late in the afternoon my attention was attracted

to a remarkable storm-cloud that lay along the eastern horizon. As the sun grew low in the west, this cloud assumed most extraordinary proportions and colors; so much so, that it attracted almost universal attention. A strange, fan-like sheet of yellowish cloud, with broken but decided margin, rose above the centre of the storm like a great halo. It did not seem to stand in a vertical position, but projected above, toward the west, giving the effect of a huge funnel, viewed from below, on the exterior surface of which the descending sun cast shadows, and brought out a sort of radiate ribbed structure.

Beneath this was a great cluster of swelling cumulus 'thunder-heads,' whose bases were hidden by the horizon. Three of these, higher than the others, rose vertically from the centre of the mass; their magnificent fleece-like heads entering and apparently penetrating the yellow halo. These, especially the middle and largest one, glowed brilliantly in the strong sun-



light, and cast long blue shadows down the inclined under-surface of the halo.

Encircling this brilliant mass were a number of enormous 'thunder-heads' of a most murky and forbidding appearance, that stood upright, like so many pillars of dense smoke. These upright clouds inclined a little to the east or south-east, indicating a movement in that direction.

There was a remarkable stability about the whole mass of clouds, and at sunset the effect was grand in the extreme. The sky about was clear, with the exception of isolated masses of cumulus-cloud.

I made a small pencil-sketch of the cloud-forms, with notes of color, and, since my return to Washington, have made a drawing in color.

I estimated that the cloud was from forty to fifty miles east of the railway, and, on studying the map carefully, became convinced that this was the cloud attending the great cyclone at Rochester. My attention was not called to the cloud until after five o'clock, at which time it was directly east of me, at Wilton. As the course of the cyclone was a little to the north of east, the movement was directly from me when the sketch was made.

The peculiar form of the halo, whether fan or funnel shaped, was doubtless, in a measure, the result of the movements of the storm-currents.

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