

## Another Occurrence of a Fresh Water Medusa

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This medusa was found August 10, 1936, twenty miles from Carbondale, in the water supply tank of the State Hospital for the Insane, Anna, Illinois, by superintendent of the water works, Mr. Cornelius West.

During the heat and drought of the summer the State reservoir became so low that it was found necessary to secure water from other sources. A large spring nearby furnished from 6,000 to 8,000 gallons per day, the remainder was secured from the city of Anna water plant.

Some time after the water had been turned in from these two sources the medusa was found occurring in great abundance. Specimens were first brought to the authors of this article September 2 by Dr. A. G. Hamilton, psychiatrist at the hospital. Other specimens were secured in person during the months of September, October and November. There was none found after November 12.

The greatest number of medusa seen was on October 10. The time of day they were most active was between 4:00 and 5:00 p. m. The tank is exposed to the sun all day.

So far as we were able to determine, this species corresponds to that first found in the United States near Philadelphia and described by (1) Potts in 1897, and finally called *Craspedacusta ryderi* by Fernandus Payne (*Jour. of Morph.*, 1924).

*Craspedacusta ryderi* seems to be a very sporadic organism as far as its occurrence in the United States is concerned.

Since Pott's discovery the organism has been reported by various workers as occurring in at least fourteen widely separated localities.

(2) Garman ('15, '22, '25, '26) in Benson Creek, near Frankfort, Kentucky.

(3) Payne ('21, '24, '25, '26) in Boss Lake, near Elkhart, Indiana.

(4) Schmitt ('27) at Great Falls, Virginia (Lauter).

(5) Hargitt ('27) in Shaw's lily pond at Washington, D. C.

(6) Coker ('27) in an artificial pond, Augusta, Georgia.

(7) Breder ('28) reports the animal in an aquarium tank in New York City and comes to the conclusion that they have been introduced into the aquarium with water plants brought from Wilmington, North Carolina.

(8) White ('30) describes and figures a fresh water medusa found in Stallworth Lake, near Tuscaloosa, Alabama.

(9) Brooks ('32) reports the medusa as appearing in the reservoir of the Union Switch and Signal Company at Swissvale, Pennsylvania.

(10 and 11) Osborn and Kraatz ('33) record medusae from Coshocton and at Akron, Ohio.

(12) Aitken ('36) records its occurrence in Iowa.

During the past year three records of the occurrence of medusae in Illinois have been made.

(13) Van Cleave ('36) in pools at Carmi, and

(14) Also at Vandalia.

(15) Steagall and Gersbacher ('36) reported a medusa found in the State water tank at Anna, Illinois.

There has been much speculation as to the reasons for the sudden appearance of the medusa in such widely scattered localities.

1. That it may have been introduced into these various places by the introduction of fish from other localities is a theory which seems to be held by many workers, and yet neither the hydroid nor the medusa form has been found in any of the localities from which such fish are said to be imported.

2. A second theory is that they may have been transplanted along with water lilies or other plants from pool to tank, etc. The fact that the great majority of places where the medusa is found are artificial and many have water lilies and other vegetation, partially support this theory, yet there is not a recorded instance where the medusa existed at the place from which the plants were transplanted.

These theories, however, do not apply to the tank at Anna, since the water comes in from each of its three sources through a plant that chlorinates, limes, treats with aluminum sulphate, and ammonium hydroxide, then filters the water through thirty inches of sand and carries it three miles by underground pipes into the tank, which stands 16-20 feet above the surface of the earth.

No artificial planting has been done at any of these water sources. The State reservoir is a concrete one, the city of Anna supply comes from 400-600 feet beneath the rocks and the spring pool has only the vegetation of the region.

The tank itself is devoid of vegetation except for some unicellular algae, with a sprinkling of nostoc and oscillatoria. The animal life, too, is slight except for the protozoan forms found in all fresh water, water fleas, rotifers, a few larvae of diptera, and a school of very small fish identified by Dr. Thompson of the Illinois State Natural History Survey as "*Lepomis cyanellus*—Jordan". Checked by Chris Markus.

3. A third suggestion as to their origin is that eggs or the hydroid form may have been carried from one of these places to the other by some migratory bird or wandering water fowl.

The third possibility seems more probable, since all these stations confine themselves to the water courses of Eastern United States, and birds in their northern migration from Central and South America or from the Honduras and the West Indies migrate either to the northeast along the Atlantic Coast or up the Mississippi and its Ohio tributary. Such carriage would bring them directly to all these stations. We have specimens taken from Gatun Lake, Panama.

This seems to be the only explanation of the Anna display. Wandering migrants have often been seen on and in the tank. Two years ago it was visited in the spring by two ducks and one anhinga, that tarried on the water several days.

The objection to this theory is the birds' difficulty in carrying the living form and the smallness of some of the pools in which they are reported. Yet I have seen a migrant water bird or two in a private pool not more than thirty square feet in area.

The tank at Anna is twenty feet deep, with an additional sloping bottom of three feet. Its diameter is 120 feet and it has a capacity of two million gallons. It was entirely dry five years ago.

**Behavior.**—Medusa brought from the tank into the laboratory lived usually less than a month. Death was evidently due to a combination of circumstances. The water content was different, the lack of aeration was noticeable, the crowded condition of the aquarium was a poor condition for life, but most important of all seemed to be lack of the food element.

Experiments were made of leaving them wholly in tank water, then water largely tap, and then water from the campus lake. Those in the tap water lived about ten days, viability in tank water around fifteen days, but with the lake water some lived twenty-five days.

They were most abundant about the middle of October. October 11 we brought into the laboratory many, along with several of the small fish found there—one inch in length. Into each of two tanks we placed six to eight of the fish. The crowded condition of the aquaria caused the food supply to disappear, and soon we saw the larger medusae had engulfed the tail of a fish and were thus riding freely about in the water. The fish succumbed in a few days. The medusae fell with it to the sand at the bottom still feeding until all the fish disappeared except the eyes. These were never eaten. When there was nothing left of the fish except several pairs of eyes lying on the sand at the bottom, there were yet a few pulsating medusae seeking for more food. All other medusae disappeared long before the ones that ate the fish.

**Structures.**—As far as structures are concerned, we hope to be able to offer you something later. All the specimens sectioned were males. They showed all types of sperm formation, from the sperm mother cell through tetrad division, up to the sperm formation with a distinct head and tail. This development apparently goes on as the sperm cell moves outward in the gonad.

As for dehiscence there were evidences of a distinct pore or pores for the sperm exit.

The radial canals were connected directly with the interior of the gonad, but not with the stomach.

The larger otoliths were so hard that they were carried ahead of the razor blade when sectioning and fractured the paraffin ribbon.

Lack of time and living material prevented further detail study of structure.