IX.—On *Synchaeta fennica* sp. n., and Remarks on the Resting-egg of *Synchaeta pectinata*.

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(Read March 17, 1909.)

PLATE V.

SINCE the publication of my monograph of the Genus *Synchaeta* in the Journal of this Society in 1902, three new species of this genus have been described, i.e. *S. bicornis* by J. C. Smith,* *S. curvata* by O. T. Lie-Pettersen,† and *S. atlantica* by C. Zelinka.‡ The first was found in 1902, in the brackish water of Lake Pontchartrain, Louisiana, and is remarkable in possessing two dorsal horn-shaped outgrowths of the cuticula. *S. curvata* was found in the Fiords near Bergen, Norway; and *S. atlantica* was collected in mid-Atlantic, to a depth of 400 m., in immense numbers, but only within a well defined area, by the German Plankton Expedition in 1889.

Synchaeta fennica sp. n., plate V. figs. 1a, 1b.

It is now my privilege to describe a fourth new species, *S. fennica*, which I first observed in some marine material sent to me by Dr. K. M. Levander from the Baltic, near Helsingfors, in February 1900, containing *S. baltica* and *S. monopus*. I noticed a small fully-contracted and hammer-headed individual, which I suspected to be a Rotifer, but the nature of which I could not guess. I called Dr. Levander's attention to this animal, but it was a considerable time afterwards when he reported that it was a small *Synchaeta*, with two horn-like projections on the head, similar to those of *S. bicornis*, which he found not infrequently in the sea on the coast of Finland. Subsequently Dr. Levander sent a few sketches of details and a few more specimens, and from these Mr. F. R. Dixon-

* *Synchaeta bicornis*: a new Rotifer from the Brackish Waters of Lake Pontchartrain. Trans. Amer. Micr. Soc., Sept. 1904, pp. 121-126 (1 pl.).

† Bergens Museums Aarbog, 1905, No. 10, pp. 1-44 (2 pls.).

‡ Die Rotatorien der Plankton-Expedition. Kiel and Leipzig, 1907 (3 pls.).

EXPLANATION OF PLATE V.

- Fig. 1a.—*Synchaeta fennica*. Dorsal view. × 300.
 „ 1b. „ „ Front of head. × 450.
 „ 2. „ *bicornis* Smith. Dorsal view. × 345.
 „ 3. „ *pectinata*. Resting-egg. × 165.

West, Newman lith.

F.R. Dixon - Nuttall del. ad nat.

Synchaeta fennica and *Synchaeta bicornis*.

Nuttall, with his well-known skill, has made the excellent drawings which accompany this paper, plate V. figs. 1a and 1b.

The specific characters of this species may be stated as follows:—

Body cylindrical, elongate, curved, tapering posteriorly to a short tubular foot carrying two small toes. Head rounded anteriorly, with well developed auricles, carrying four frontal styles and a frontal tubular antenna, in addition to the usual dorsal antenna above the eye. Eye cervical, single, having the appearance of two appressed halves. Attached dorsally and closely below the ciliary wreath are two stout tubular appendages, directed outward and backward, containing no organs, and being prolongations of the integument and communicating with the body-cavity. The possession of these appendages is very characteristic of this species, and in this respect resembles *S. bicornis*, which has similar horn-like structures somewhat lower down, below the dorsal antenna.

In contraction, when the head is invaginated, the appendages are thrown forward and diverge, producing the hammer-shaped structure at first observed. When fully contracted the cylindrical body is much curved, convex dorsally and concave ventrally, somewhat in the form of a crescent. Two lateral antennæ were detected in the lumbar region, about two-thirds down the side of the body.

The mastax could not be investigated in the few specimens received, but is evidently of the usual *Synchæta* type. Plate V. fig. 1b, gives a frontal view of the head.

The rest of the structure appears to be quite normal and requires no further description. The male is not known.

Size: length, $238\ \mu$ ($\frac{1}{107}$ in.); width of body below auricles, $68\ \mu$ ($\frac{1}{374}$ in.).

Habitat: marine, in the Bay of Bothnia, near Helsingfors.

Synchæta bicornis Smith, plate V. fig. 2.

The figure which Mr. J. C. Smith has given of this species is so diagrammatic in character, that I take this opportunity to reproduce a drawing which Mr. Dixon-Nuttall has made from some well-preserved specimens sent to me by Mr. Smith. Plate V. fig. 2.

From this sketch it will be seen that the horn-like appendages are situated dorsally, just below the dorsal antennæ, and are curved forward. This species possesses three eyes, the two frontal eyes being connected by red granules with the cervical eye, as in *S. triophthalma* and *S. littoralis*. In size it is somewhat smaller, but in the curvature of the body it has considerable resemblance with *S. fennica*.

Size: length $210\ \mu$ ($\frac{1}{120}$ in.).

Resting-egg of Synchaeta pectinata.

In my description of this species in 1902 I mentioned that no fertilised resting-egg, indicating the presence of a male, had yet been seen by any observer.

This has since been found in 1903 by Dr. St. Hlava, of Prag, who was good enough to send me a female containing an undoubted resting-egg, and in June last year I found a similar egg within the body cavity of a female. It is spherical in shape, the surface covered with short rounded projections as figured in plate V. fig. 3, and yellowish-brown in colour.

The size is $100\ \mu$ ($\frac{1}{250}$ in.) in diameter.

Though the female is very abundant at all seasons, and has been observed for years by many, the male has so far still eluded detection.

Dr. Wesenberg-Lund has in his recent great Plankton work * expressed the opinion that *Synchaeta pectinata*, *tremula*, *oblonga*, *stylata*, and *grandis* are only seasonal variations of one species. I think I ought to take this opportunity to express my dissent from this view, as being quite opposed to my experience of these species.

S. pectinata, *tremula*, and *oblonga* are common forms, which appear, disappear, and reappear all the year round (just like *Polyarthra*, *Triarthra*, and other Rotifers), and are not uncommonly all present together at the same time. In the Grand Junction Canal, running on the north side of London, where I frequently collect, these three species were all present in great abundance, with some half-a-dozen other species of Rotifers, at the end of December, and *S. pectinata* and *oblonga* still persist at the present time (March), whilst *S. tremula* has temporarily disappeared.

S. pectinata is very rarely absent from this canal, and it is certainly there in spring, summer, autumn, and winter, without any appreciable difference in size. Further, these various species have distinctive organs, their lateral antennæ are in different positions, and, above all, they have different types of jaws. Thus it is not merely a question of size or elongation of the body; whilst the seasonal variation, which has been demonstrated in the case of *Asplanchna priodonta*, consists of a lengthening of the body only during the summer months. A further consideration is, that of all Plankton Rotifers the *Synchaeta* are the most vigorous swimmers, and quite able to counteract by their cilia any slight tendency to sink that may be due to a decrease in the density and viscosity of the water in summer.

* Plankton Investigations of the Danish Lakes, Copenhagen, 1908.

S. stylata and *grandis* are rare forms; the first I have occasionally, whilst the latter I have never, found in the canal. The periodic and often very sudden, disappearance and reappearance of various Rotifers is a well known fact, and the *Synchaeta* follow the same habits.

I am quite prepared to admit that in large lakes there may exist some seasonal variation in the direction of elongation of body or increase in length of spines in some species, not, however, in effecting such structural and organic changes which would convert a *Synchaeta oblonga* into *S. pectinata* and that species into *S. stylata* or *S. grandis*.