

On a Species of Siphonophore observed at Plymouth.

By

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LAST autumn the occurrence of a small Siphonophore in the produce of the surface tow-nets attracted my attention. I first noticed it in the contents of a small net, worked five miles south of the Eddystone, on September 12th, and afterwards it was obtained in great abundance close to the Plymouth Breakwater, and even inside the Sound. It was brought in numbers to the Laboratory almost every day up to about the middle of October, but after the end of that month it was not seen again.

This Siphonophore was a Monophyid, and its single nectocalyx was from 3 to 6 or 7 mm. in length. Its appearance as a whole when slightly magnified is represented in Figs. 1 and 2, p. 213.

An elaborate description of the organism would be impossible without a detailed explanation of the structural features which are common to the family Monophyidæ, and which distinguish that family from other divisions of the Siphonophora. Such a detailed explanation would be quite superfluous, since a reference to Haeckel's Report on the Challenger Siphonophora, p. 125, and elsewhere, will at once afford a lucid and definite analysis of the whole class, and enable anyone to follow the discussion of the identity and position of the species here considered. I shall therefore confine myself to the question of identification, using the terms adopted by Haeckel for the various organs.

It will be seen at once, then, that the form belongs to the genus *Muggiæa*, the definition of which is "Monophyidæ with an angular pyramidal nectophore, and a complete infundibular hydroecium in its ventral side. Bracts spathiform or conical, with a deep ventral groove, a bevelled basal face, and a simple ovate phyllocyst." I have not figured the bracts, nor have I been able to make a thorough

examination of them, but have seen enough of them to know that they do not invalidate the identification of the genus.

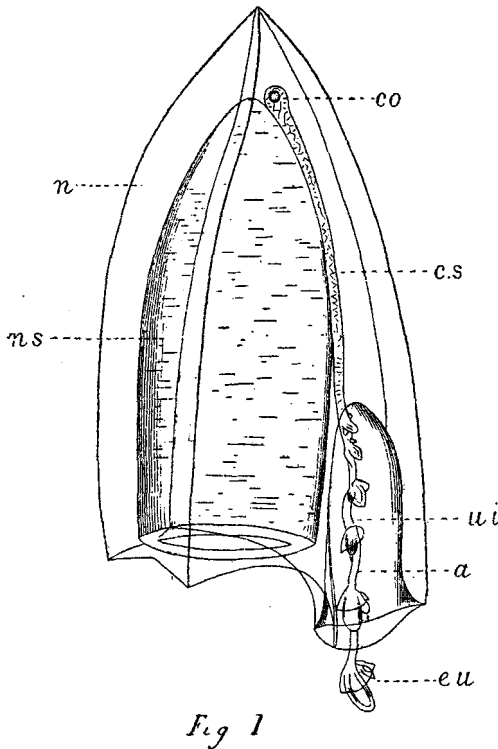


Fig 1

FIG. 1.—*Muggiæa atlantica*, seen from the right side.

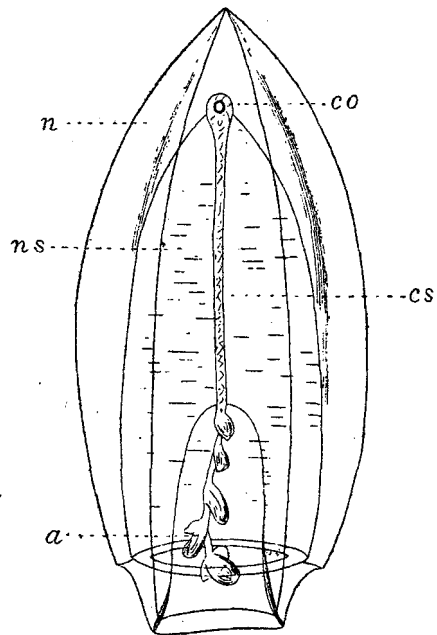


Fig 2

FIG. 2.—The same from the ventral side.

a, siphosome or common tubular stem, bearing *eu*, cormidia or groups of zooids at intervals; *co*, oleocyst; *cs*, somatocyst; *n*, nectocalyx; *ns*, nectosac or cavity of the nectocalyx; *ui*, hydrœcium, cavity from the apex of which the siphosome depends.

Only one species of *Muggiæa* has been adequately investigated; two others are mentioned by Haeckel, but they have not been sufficiently described. The first species is described by Dr. Carl Chun in a paper in the *Sitzungsberichte der k. preuss. Akad. der Wissenschaften*, translated in *Ann. and Mag. Nat. Hist.*, 5th series, vol. xi, p. 153. It was originally described as *Diphyes Kochii*, and afterwards as *Muggiæa*. Chun adopts the name *Muggiæa Kochii*. This species was obtained at Trieste in the Adriatic, and by Chun at Malaga on the coast of Spain. It is obviously different from the Plymouth species, for although its shape is similar, its size about the same, and the ridges of the nectocalyx are smooth, the hydrœcium is much shorter, and the somatocyst only extends to half the height

of the nectosac; whereas in the Plymouth species the hydræcium extends to one third the height of the nectosac, and the upper end of the somatocyst is above the apex of the latter.

The third species recognised by Haeckel is one described by Huxley in his Ray Society monograph on the Oceanic Hydrozoa as *Diphyes Chamissonis*. This form was obtained in the Pacific Ocean, and is distinguished by the broader, shorter form of nectocalyx, and by the denticulation of its ridges.

Haeckel's second species is one observed by himself in the Canary Island, Lanzerote, which he says differs from *M. Kochii* mainly in the size of the conical hydræcium, the top of which attains to half the height of the nectosac. Haeckel has nowhere given a figure nor any more detailed description of this species. As for its name, he says it may retain the name *Muggiæa pyramidalis*, but the choice of this name seems to have been due to a mistake. In the translation of Chun's paper in the Ann. and Mag. Nat. Hist., he points out that the young *Muggiæa Kochii* when first developed from the egg has not the characters of *Muggiæa*, but of the genus *Monophyes*; the nectocalyx is rounded, not pyramidal, and the hydræcium is an open groove, not a closed cavity. Chun calls this stage *Monophyes primordialis*, which Haeckel quotes as *Monophyes pyramidalis*. On the other hand, the Eudoxia stage of *Muggiæa Kochii* was described by Will under the name *Ersæa pyramidalis*.

Now, although it seems to me extremely probable that the form observed by Haeckel at the Canary Islands was of the same species as that obtained at Plymouth, it is not certain. The most characteristic feature about the Plymouth form seems to me to be the great length of the somatocyst and the position of the oleocyst above the apex of the nectosac. I wrote to Professor Haeckel on the subject, and he replied that he was unable after so many years to ascertain whether his species and mine were the same, as he had neither specimens nor drawings which sufficiently exhibited the test structures. At the same time I think it is inconvenient to use for another species either of the names *pyramidalis* or *primordialis*, which have been applied to stages of *Muggiæa Kochii*. I have therefore to find a new name for the species occurring at Plymouth, which may or may not have a range extending to the Canary Islands, and will call it *M. atlantica*. There is one point to be noted which makes it very probable that the Canary Island form and the English form are the same, namely, that in the former according to Haeckel the hydræcium extends to half the height of the nectosac, and in the latter its relative height is nearly as great, so that in the Canary Island form the somatocyst may extend as in the English to the apex of the nectosac.

The form I have described was also noticed at Plymouth by Mr. G. C. Bourne, who states in his report of his cruise in H.M.S. "Research," this Journal, vol. i, No. 3, that he also obtained it off the south-west coast of Ireland, and that it seems to be the *Muggiæa Kochii* of Chun and Haeckel. I have indicated above the points by which it is definitely distinguished from *Muggiæa Kochii*.

In the paper already cited, Chun gives a detailed account of the interesting and complicated changes which he discovered to take place in the life-history of *Muggiæa Kochii*. The egg first develops into a stage resembling Monophyes, in which the nectocalyx is smooth and without ridges. The characteristic pyramidal nectocalyx then develops and separates, carrying the siphosome with it. The cormidia or eudoxomes, when fully developed on the tubular stem or siphosome, become free, and continue to live as independent organisms or colonies, which were originally described under the name *Eudoxia Eschscholtzii*. The Eudoxia bears a genital calyx resembling a nectocalyx in shape, and this produces ova or spermatozoa. Each Eudoxia is unisexual, but produces several genital calyces in succession, all of the same sex. From the egg of the Eudoxia develops the Monophyes-like larva and the series of stages recommences. Probably the *Muggiæa atlantica* has a similar life-history, but I was unable to make a more complete study of it, partly because I had other work to attend to, partly because I could only obtain pelagic material when the total results of the day's collecting were brought in somewhat late in the afternoon. The specimens as brought to me were always in the condition shown in my figures, only a short basal portion of the siphosome remaining attached to the nectocalyx. Detached eudoxomes were present in the bottles, but in a somewhat damaged condition.