stage of the visible, stainable, cultivable organism, the streptococcus.

It is, of course, possible that these unstained, invisible forms revealed by ordinary methods of examination are not the inciting agents or "viruses" of these diseases and that they represent merely the filterable or other state of the streptococcus. A consideration of the great difficulty one has in isolating the streptococcus and demonstrating diplococci in lesions in these diseases and the ease with which the bodies are found in the filtrate indicate clearly that the "invisible" forms of the streptococcus, if such they be, are present in large numbers in the host, as in positive cultures of the streptococcus. Their form, size and color are too characteristic and true to type to permit considering them as artifacts or as being expressive of etiologically unrelated, contaminating streptococci. Non-infectivity of the filter-passing forms, except in the cases of virus diseases, their presence in large numbers in filtrates, both of cultures and of infected tissues, and the great difficulty in obtaining the visible forms in cultures of filtrates indicate that "invisible," filter-passing forms represent a certain stage in the development of microorganisms.

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## ON THE TAXONOMIC POSITION OF ECHINORHYNCHUS SAGITTIFER LINTON

WHILE working over a collection of acanthocephala from fishes of the Woods Hole region I have found it necessary to pay attention to changes in nomenclature which have been made since my earlier papers were published, at which time it was still customary to refer all species of the group to the genus Echinorhynchus.

Van Cleave in 1923[1] created the name Serrasentis for the genus in which *E. sagittifer,* in the following year, was included as a distinctive species. In 1924[2] he gives the synonymy of the genus Serrasentis, and *E. sagittifer* Lt., 1889, is placed as synonym under *Serrasentis socialis* (Leidy, 1881).

Leidy's description of *E. socialis*[3] is:

> Body white, cylindrical, with a dilation of the anterior fifth: narrowed posteriorly, with a white spiral band passing around the whole length and giving the appearance of transverse annulations.
>
> Proboscis moderately long, cylindrical, with twenty-six transverse rows of simple re-curved hooklets, sixteen in each row.
>
> Male furnished with a posterior vesicular appendage.
>
> Length from ½ an inch to 2 inches 4 lines: breadth of larger individuals anteriorly ⅝ of a line; posteriorly ⅜ of a line.
>
> *Habitation.*—Found frequently in considerable numbers in the intestine of *Platessa plana.*

An error has been made by some one in copying the first paragraph of Leidy's description of *E. socialis,* which in Van Cleave's paper (*l.c.,* p. 327) reads:

> Body white, cylindrical, with a dilatation of the anterior fifth; narrowed posteriorly, with spiral (white) band passing around the whole length, and giving the appearance of transverse rows of simple recurved hooklets, sixteen in each row.

With the exception of the "white spiral band," which may be accounted for without attributing to it specific value, the above description fits the species which has been recorded under the name *E. acus,* now known as *E. gadi,* found in many species of fish in the Woods Hole region, and frequently occurring in considerable numbers in *Pseudopleuronectes americanus,* a synonym of *Platessa plana.*

The proboscis of *E. sagittifer* in the original description of the species[4] is thus characterized:

> The proboscis is clavate, bluntly rounded in front, increasing slightly for a short distance back, and then narrowing gradually to the base, thickly beset with recurved hooks, of which there are about twenty series, counting from base to apex, and about fifteen visible in the longest spiral.

Leidy makes no mention of spines on the body of *E. socialis,* while they are a conspicuous characteristic of *E. sagittifer.*

Furthermore, *E. sagittifer* in the Woods Hole region has been found but sparingly, and then only in immature forms, encysted on the viscera and peritoneum of its hosts. It has been found in the adult stage only in the southern host *Rachycentron canadus*[5].

In 1884 when I was beginning work on the helminth parasites of fishes I wrote to Joseph Leidy enclosing a sketch of an acanthocephalan, which I later described under the name *E. sagittifer.* He replied that he was unacquainted with this form.

I conclude, therefore, that *E. socialis* Leidy should be regarded as a synonym of *E. gadi* and that *E. sagittifer* Linton belongs properly in Van Cleave's genus Serrasentis and should be written *Serrasentis sagittifer* (Linton).

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[1] Trans. Am. Mic. Soc., 42: 186.
[2] Proc. Acad. Nat. Sci. of Phila., 76: 325–328.
[3] Proc. Acad. Nat. Sci. of Phila., 5: 156, and Smithsonian Mis. Col., 46: 46.
[4] Report U. S. Fish Com. for 1886, p. 494.
[5] Bull. U. S. Bureau of Fish., 24: 371.