

SEGMENTATION IN NEMATODES:

OBSERVATIONS BEARING ON THE UNSETTLED QUESTION OF THE RELATIONSHIP OF NEMATODES TO OTHER BRANCHES OF THE ANIMAL KINGDOM

I HAVE long been impressed by certain evidences of segmentation in nematodes. My first impressions arose from a study of the distribution of the setæ on aquatic forms. This distribution was in those days, and is even yet, described as irregular; the setæ are said to be "scattered" on the body. Charting all the setæ on a given specimen led to the conclusion that they were not scattered ("zerstreut"); that, rather on the contrary, they constituted a series of more or less harmonious groups. The cephalic setæ, it is well known, have an orderly arrangement. The study of a large number of cases leads me to the conclusion that those setæ, some distance behind the cephalic setæ, denominated sub-cephalic setæ, are also orderly in arrangement, and might, in some instances at least, be regarded as repetitive of the cephalic setæ.

Later I was able to show that the transverse striæ of the cuticle are retrorse on the posterior half of the body, and the reverse on the front half. (See Fig. 1.) This reversal in the cuticle at the middle of the body, or thereabouts, occurs in a very wide range of genera, is independent of age and of sex, and seems a character of fundamental significance.

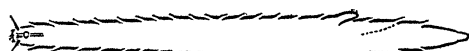


FIG. 1. DIAGRAM OF THE REVERSAL OF THE STRIÆ OF THE CUTICLE OF A NEMATODE.

Recently I have discovered that the principal cephalic organs are made up of segments which, while simple in character, bear no small resemblance to corresponding features in arthropods. The nature of these segmented appendages will be more easily understood by consulting the illustrations in Fig. 2.

The articulations in the cephalic organs of nemas are not easy to discover, owing to the small size of the organs and the transparency of the tissues. Some of these segmented

organs are under muscular control, and can be extended and inflexed after the manner of the palps of insects. This is true of some of the labial organs, which unfortunately are usually so small as to be difficult to observe. The cephalic setæ, however, are larger, being particularly well developed on some marine forms, and in this case observation on living specimens affords evidence of the articulations when they might be overlooked if they were sought by other methods; for if a seta is obstructed it takes on the attitude natural to an organ composed of flexible joints and more or less inflexible segments, as shown in the upper illustration, Fig. 2. Here again, once having established the fact and learned how to make the observations, it proves that the setæ of a wide range of genera are jointed, though the number of segments is often reduced to only one or two.

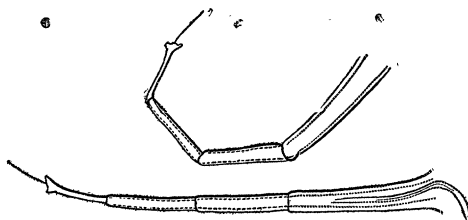


FIG. 2. CEPHALIC SETA OF A NEMATODE, SHOWING SEGMENTATION. TWO DIFFERENT ATTITUDES OF THE SAME SETA.

One recalls that a number of observers have noted the presence of longitudinal series of repetitive organs in the lateral fields of nematodes, though attention has never been called to the fact that these organs on opposite sides of the body may be symmetrical to each other. Sometimes they are exactly so.

N. A. COBB

SOCIETIES AND ACADEMIES

THE BOTANICAL SOCIETY OF WASHINGTON

THE 119th regular meeting of the Botanical Society of Washington was held at the New Ebbitt Hotel, on March 14, 1917. Seventy-four members and sixty-five guests were present. After a dinner President T. H. Kearney introduced the re-

tiring president, A. S. Hitchcock, who addressed the society on "Taxonomic Botany and the Washington Botanist."

The speaker stated that the members of the Botanical Society of Washington are nearly all specialists in the employ of the national government. They must depend upon extra-official opportunities for broadening their outlook and for keeping in touch with the development of botanical research. The speaker brought to their attention the opportunity afforded by a study of the local flora. Every scientist should have training in the two methods for establishing facts, that of experiment and that of repeated observations. The first method is used by the physiologist; the second by the taxonomist. In studying the local flora the Washington botanist can train himself in taxonomic methods and at the same time accumulate valuable botanical data. The speaker outlined the fundamental scope of taxonomic training and called attention to the ways in which the student should apply the general principles to his studies of the local flora. The investigator should free himself from the shackles of authority. He should see things as they are rather than as others say they are. He should learn to make accurate observations and to use these to determine the truth and not to establish a theory or a concept. In all his investigations he should keep his criterion of accomplishment well in advance. He whose ideal is his own best work ceases to progress. Finally the speaker advised young authors, when publishing, to prepare their manuscript with care in regard to clearness, conciseness and technique. Clear thinking leads to clear writing. Care in technique may be taken as an evidence of care in gathering the data which the writing records.

The address will be published in full in the *Journal* of the Washington Academy.

H. L. SHANTZ,
Corresponding Secretary

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 566th meeting of the society was held in the assembly hall of the Cosmos Club Saturday, February 24, 1917, called to order by President Hay at 8 P.M., with 50 persons in attendance.

Under the heading book notices, brief notes, exhibition of specimens, etc., M. W. Lyon, Jr., called attention to the latest edition of the International Rules of Zoological Nomenclature containing a summary of the opinions that have been rendered by the International Commission, compiled by Mr. John Smallwood, of Washington.

Dr. R. W. Shufeldt communicated a short paper entitled "Notes on the Trunk-fishes" and exhibited a specimen of *Lactophrys tricornis*.

Dr. L. O. Howard commented on the parent tree of an unusually fine variety of oranges and the extraordinary care taken of it by the owner during the recent cold weather in Florida.

Mr. Wm. Palmer also commented on the effects of the recent "freeze" in Florida.

The regular program consisted of three communications as follows:

T. S. Palmer: "A Pioneer Naturalist in Southern Florida—Extracts from the Diary of Titian R. Peale, 1825."

Dr. Palmer gave a detailed account of Peale's collecting trip in Florida in 1825 made for the purpose of securing birds for Prince Louis Bonaparte and mentioned and exhibited the species of birds discovered by Peale as new to science or new to the United States. He read extracts from Peale's diary and called attention to the other scientific expeditions of which Peale was a member giving many interesting facts of his long life.

Some Notes on the Aleyrodidae: A. L. QUAINANCE.

The Shad and its Relatives in the Mississippi River:

EMERSON STRINGHAM (introduced by R. E. Coker).

Mr. Stringham said that herring-like fishes found in the Mississippi River possess more economic significance than formerly recognized. The two mooneyes (*Hiodon*) have flesh of excellent quality, but they are not sufficiently abundant to be of great importance; they eat principally insects, and feed both summer and winter, day and night; they deposit their eggs as soon as the water temperature begins to rise in spring. The gizzard shad (*Dorosoma*) which serves as food for other fishes is less abundant in the Mississippi proper than in slues and lakes. The river herring (*Pomolobus chryschloris*), known as the host of a mussel of great value, feeds on insects when they are abundant, and on fishes at other times; it breeds early in summer; fears are entertained that the fish and mussel may be excluded from the upper river by a dam at Keokuk, Iowa. The Ohio shad (*Alosa ohionensis*) seems clearly distinct from the Atlantic shad, but is sufficiently similar to be equally good food, though smaller; on the Mississippi this valuable resource is not utilized; the habits of the fish are similar to those of the Atlantic species, but it has not yet been proved to be anadromous.

M. W. LYON, JR.,
Recording Secretary