among the aboriginal tribes of Canada. Professor Cunningham, Dr. Beddoe and Professor A. F. Dixon send papers dealing with questions of anthropometry.

Professor Sydney H. Vines will preside over the Botanical Section (J). His address will deal with Botany in the 19th century, and will be a review of the more important advances made in the different departments of the science. As has already been stated, this Section will have a joint discussion with the Geological Section on the Coal Period Vegetation. A museum is being arranged to illustrate the Yorkshire Coal Measure Flora, etc., in connection with the discussion. Mr. Percy Groom, of Coopers Hill Engineering College, is to deliver a semi-popular lecture before the Section entitled 'Plant-form in Relation to Nutrition.' There will also be papers on Fossil Plants, Plant Anatomy, Plant Physiology, etc.

The Friday evening discourse will be delivered by Professor Gotch, the subject being Animal Electricity, while that on Monday evening will be by Professor W. Stroud, whose subject will be 'Range Finders.' Professor Sylvanus P. Thompson will give the lecture to the operative classes on Saturday, and will take as his subject 'Electricity in the Industries.'

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*VARIATION AMONG HYDROMEDUSÆ.**

THE announcement of Bateson in his 'Materials for the Study of Variation' that medusæ best illustrated the principle which he designated as 'Discontinuity of Meristic Variation' led me, in connection with researches which have been under way for several years, to note more specially any indications which might either confirm or discredit this statement. Accordingly I have from time to time made such collections of the Hydromedusæ as might afford a means of testing the matter. While as yet these have not been extensive, except in a few genera, they seem to be sufficient to warrant a brief summary of facts bearing upon the general problem of variation. The collections have been chiefly of the following genera: *Eucope*, *Obelia*, *Margelis*, *Pennaria* and *Gonionemus*.

The facts exhibited by *Eucope* have recently been published by Agassiz and Woodworth, and while I have made observations upon those which I had collected in larger numbers than any other, they are yet so similar to those made by these observers that I shall make no particular reference to them at this time. Of the species of *Obelia* and *Margelis* I have as yet had no opportunity for extended study. Facts presented here will have reference only to the species of *Pennaria* and *Gonionemus*.

Of *Pennaria* the medusæ are very small and of a shape which renders rather difficult an examination of the radial canals, a feature which, in my observations, has been among the most variable of structural characters. From the examination of only about a hundred specimens I have found no marked variation of this feature except in the direction of atrophy. The medusa of *Pennaria* seems to be in a somewhat degenerate condition. In many specimens the marginal canal is wholly atrophied and in some cases also the radials, to a greater or less extent. I have elsewhere* pointed out that in many cases the medusæ of this species never become free, but discharge the generative products while remaining connected with the polyp. Another feature which may prove to be a variation is the appearance of small wart-like or vesicular protuberances at various points of the extumbrella. Agassiz, in the North American *Acalephæ*, refers to a similar feature but explains it as probably due to the distortion caused by ova in the subumbrellar cavity. This, however, I am strongly convinced is

* Abstract of a paper presented before the Section of Zoology of the American Association.

**Am. Nat.*, May, 1900.

a mistaken view, for the vesicles remain after the eggs have been discharged, and are quite as prominent in preserved specimens as in those alive and bearing eggs. As to variation in tentacles there seems to have been little. These organs are so rudimentary that detection of variations in them would be extremely difficult.

Upon the whole this species seems to be fairly constant in general structural features and only in the deeper and microscopic aspects are signs of degenerative variation specially apparent. The variation in physiological habits to which reference has been made are, however, very marked and of quite as much significance as are those more conspicuous morphological features usually cited. I would offer this suggestion that in those cases in which the medusæ perish early after discharging the ova, and specially those which do not become free at all, there may be some correlation between the atrophy of the chymiferous canals and this shortlived condition.

It is among the species of *Gonionemus* that I have discovered the most notable and numerous variations. Of these more than five hundred specimens were examined, all of which were taken at Woods Holl during the summers of 1897-99. Attention was directed chiefly to a study of the gonads, radial canals and tentacles. Of the specimens examined only fifteen showed abnormal or unusual genital features. In five specimens the gonads were atrophied upon one of the radial canals and equally developed upon the others. One specimen showed the gonads developed only upon one of the canals. Six specimens showed no trace whatever of gonads though they were of full size and normal in every other respect. Another specimen showed only traces of gonads as two small knobs near the bases of two approximate canals.

There was considerable variation in both the number and arrangement of tentacles. In reference to variation with age it was found that on the smallest specimen examined measuring two mm. in diameter the tentacles were twenty-nine, while on the largest 19 mm. in diameter there were 68 tentacles. The number, however, was not always proportional to the size. For example, one specimen of 4 mm. diameter had 39 tentacles, while another of 6 mm. had but 30; the largest referred to above had 68, while a specimen but 14 mm. in diameter had 71, and two others of 15 and 16 mm. had 72 each. In only 11 of the 500 specimens were the number of tentacles between each radical canal equal and symmetrical. In the order of appearance of new tentacles there did not seem to be any definite regularity. For example the following from many observations may reveal this more clearly:

(1) 2–1, 2–1, 2–1, etc. (2) 7–1, 3–1, 7–1, 3–1, etc. (3) 11–1, 11–1, 11–1, etc. In each case the 1 indicating the new tentacle.

In only a single specimen was there found any bifurcation of the tentacles which was so conspicuous a feature in *Eucope*. In this specimen there were two tentacles arising from a single sensory bulb and two others showed bifurcation, one near the tip, the other near the base.

In the number and character of the radial canals there was the most marked exhibition of variation. In number the variation was from two to six. Of the minimal number, two, only a single specimen was found, but it was in every way normal other than this, and the correlated fact that there were but two gonads. These canals were continuous and divided the body into halves.

Of specimens with six canals several were found, some of which clearly showed the canals converging symmetrically to the gastric pouch, but in a few cases the extra two canals were found to result from an

apparent bifurcation of two of the primary canals at distances varying from a fourth to three-fourths of the distance toward the margins.

Several specimens were likewise found with five canals. Indeed, this was a not uncommon feature and the medusa was divided into a regular pentamerous form, quite similar to reports made by several observers of pentamerous Aurelias.

Of those with three canals several varieties were found, those with three symmetrical canals dividing the bell into thirds, or making a trimerous form, the canals being at angles of 120 degrees. In other cases the one-half of the bell was equally divided by the third canal into quadrants while the other half remained undivided, showing that in this case there had been the total suppression of one of the canals.

In a few cases a sort of aboral circular canal was present, the radials instead of entering directly into the gastric pouch entered a circular canal which surrounded it. Of these there were several forms which only diagrams can make clear.

In conclusion it may be suggested that there was an apparent absence of any correlation of variation and also of any 'meristic' feature.

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LATERAL LINE ORGANS IN EUNICE AURICULATA n. sp.

In a hitherto undescribed species of *Eunice*, to which I have given the above specific name, occurs a lateral line organ which, so far as I can learn, has not previously been discovered in this family. The specimens were collected in Porto Rico by the U. S. Fish Commission Steamer *Fish Hawk* during the winter of 1898–99.

The parapodium, as is characteristic of this genus, is uniramous, only the notopodium remaining, *not*, Fig. 1. Dorsally this carries a long cirrus *d. c.*, and a gill *gill* attached to this cirrus. These gills are absent from the most anterior segments and appear first on the parapodia of the 19th segment. The parapodium carries a single

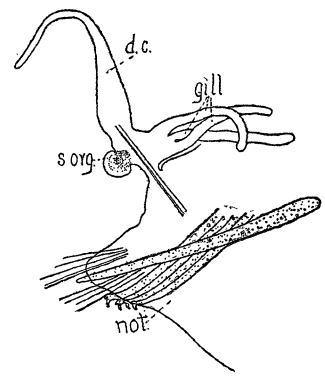

Fig. 1.

stout, straight, aciculum, with several smaller ones, toothed at the ends, and crossing the first at an angle. A dorsal and a ventral bundle of fine setæ are present. Anteriorly there is a thick ventral cirrus, which is much smaller toward the posterior end of the body (not shown in the figure.) A bundle of fine setæ extends into the dorsal cirrus.

The organ in question is situated on the outer side of the base of the dorsal cirrus, *s. org.*, Fig. 1. It appears on the first segment as a slight swelling, which becomes more

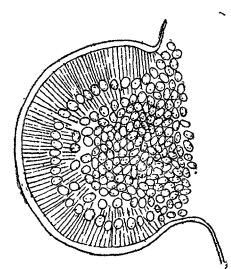

Fig. 2.

and more prominent posteriorly, until it reaches the condition shown in fig. 1. It is a rounded, smooth projection, slightly