sion will be greatest at the posterior end and null at the anterior end of the body, with a complete gradation between the two extremes.

The chains of *Stenostoma* always taper posteriorly, as would be expected if this tension is effective in modifying form.

The elongation and decrease in transverse diameter of pieces are exactly what might be expected if the tension is effective.

And, furthermore, it is possible to prevent the change of form (morphallaxis) by preventing the animals from attaching themselves. The form change occurs very rapidly in *Stenostoma,* being complete in twenty-four hours or less. Pieces were prevented from attaching themselves during twelve hours after operation and then were compared with pieces, originally of the same size, which had been allowed to attach themselves. The pieces which had not been allowed to attach themselves were little changed, while the controls had elongated in some cases nearly half of the original length and tapered strongly to the posterior end.

It was found also that the chains attach themselves more readily to rough than to smooth glass. A little very fine sand on the bottom of a glass vessel is sufficient to cause the animal to attach itself more readily and therefore to change its form more rapidly than a specimen kept in a clean glass jar.

In all these experiments the specimens were kept without food.

The experiments show that form-regulation (morphallaxis) in *Stenostoma* is, at least in large part, purely a mechanical phenomenon, not the effect of stimuli.

Cord and Brain: J. B. Johnston.

Recent studies upon the brain and cranial nerves of lower vertebrates show that the nervous system, exclusive of the sympathetic and higher brain centers, falls into four chief *functional divisions.* These are as follows:

A. Somatic sensory division: Consisting of the free nerve endings and sense organs (neuromasts) in the integument, exclusive of end buds; nerve components innervating these organs (dorsal roots, exclusive of sympathetic fibers, V., VIII. and lateral line roots); and the nerve centers in which these components end (dorsal horn, tuberculum acusticum and cerebellum). Its stimuli give rise to reflexes which affect the animal's relations to its environment, and in higher forms commonly give rise to sensations and conscious reactions.

B. Splanchnic sensory division: Free nerve endings in the lining of the alimentary canal, sense buds in the branchial and mouth cavities, and on the surface of the head and body (end buds); components innervating these (sympathetic fibers in the dorsal roots, X., IX. and VII. roots), and centers in which these components end (Clarke's column and lobus vagi or fasciculus communis with its nuclei). Its stimuli give rise to reflexes which serve the functions of nutrition, respiration, circulation, etc.

C. Somatic motor division: The ventral horn of the cord, the nuclei of the XII., VI., IV. and III. nerves, the somatic motor fasciculus and its 'tween brain nucleus, and the motor components innervating somatic musculature.

D. Splanchnic motor division: The region of the lateral horn in the cord, the nuclei of the X., IX., VII. and V. cranial nerves; and the motor components innervating splanchnic musculature.

In the parts of the brain rostral to the medulla the splanchnic sensory and motor divisions are wholly lacking, while the somatic motor extends forward nearly to the rostral end of the brain axis and the somatic sensory division includes the cerebellum and probably the tectum opticum.

Important parts of the mid, 'tween and fore brain (inferior lobes, central gray, striatum [?], etc.) belong to the same category as the tract and commissural cells of the medulla and cord. The nucleus of the posterior commissure and the olfactory apparatus cannot be compared with any structures in the cord or hind brain. There is no essential resemblance between the olfactory nerve and its central apparatus and the typical cranial nerves and their centers. The olfactory nerve has no segmental value.

The Development of the Postcaval Vein in Didelphys Virginiana: C. F. W. McCLURE.

The variations in the mode of origin of the postcaval vein of the common opossum are so extreme as to preclude our formulating a typical arrangement for the species as a whole. The different modes of origin which characterize the postcaval vein in the adult are briefly as follows:

1. The postcaval vein may be formed through a union of the iliac veins which takes place *ventral* of the common iliac arteries (type I.);

2. Through a union of the iliac veins which takes place *dorsal* of the common iliac arteries (type II.); or,

3. Through a union of the iliac veins which takes place both *dorsal* and *ventral* of the arteries in question (type III.).

A study of the embryonic development of the posterior tributaries of the postcava shows, I think, how these variations have been derived. Embryos of 8.5, 12, 15 and 22 millimeters in length were examined.

In an embryo 8.5 millimeters in length the umbilical artery, on each side, *passed through a complete foramen* in the postcardinal vein, so that one portion of the circumarterial venous ring lay *ventral* and another *dorsal* of the artery. This foramen was situated near the point of union of the external and internal iliac veins. In a subsequent stage the internal iliac veins approached each other in the median line and fused ventral of the caudal artery to form a common internal iliac vein.

The writer believes that the type of postcaval vein to be assumed by the adult depends upon the loss or persistence of those portions of the circumarterial venous rings which lie dorsal and ventral of the umbilical arteries.

If the atrophy affects the dorsal branches of the circumarterial venous rings, a postcava will result as in type I. If it is the ventral branches of the rings that atrophy, a postcava will result as in type II., but, if dorsal and ventral branches of the rings both persist, a postcava of type III. will be formed.

The Development of Pigmental Color in Insects: W. L. TOWER. (Read by title only.)

Progressive Variation in a Given Generation of some Plants and Animals: W. L. TOWER. (Read by title only.)

Observations on the Habits of Hyalella dentata Smith: SAMUEL J. HOLMES.

The observations on *Hyalella* that were made related to food habits, thigmotaxis, phototaxis, reactions to pressure and sexual habits. Experiments were performed with the end of determining the mode of sex recognition in *Hyalella.* That sight plays no important part in the process was proved by the fact that males whose eyes were blackened over with asphalt varnish succeeded as well as others in obtaining females. Neither did removal of the first and second pairs of antennæ in the males prevent their obtaining mates. It is therefore improbable that the males are guided to the females by the sense of smell. Several females, some of which were recently torn from males, were placed within a