of aluminoid ammonia is practically worthless on account of the organic débris.

The main difficulty in the various methods seems to rest in the manner of collecting the Plankton. The Hensen net and its method of use are open to objections, and filtration methods vary widely in their accuracy and results. Experiments carried on at the marine laboratory of the Rhode Island Agricultural Experiment Station seem to show that the collection and determination of Plankton by a centrifuge is a very rapid and accurate method, and that the results read volumetrically on the graduated glass collector are of value when taken in connection with the nature of the material collected. The total percentage of Planktonts obtained and their condition, especially of the most delicate forms, far surpasses any other method known to me. The work has been carried on with the Plantonokrit, designed and described by Dr. C. S. Dolley (Proc. Acad. Nat. Sci., Phila., May, 1896). The machine acts upon a fixed quantity of water (2 cans, each of 1 litre capacity). Nearly two years' work with the method have given results sufficient to warrant continued experiments.

Note on Ascidian Anatomy. M. M. METCALF.

Neural gland.—A neural gland is present in all groups of Tunicates, including *Appendicularia*, *Salpidæ*, *Octacnemus.*

Its position.—In *Appendicularia*, dorsal; in *Simple Ascidians*, dorso-lateral (*Molgulidæ*), dorsal (*Cynthiidæ*) or ventral; in *Compound Ascidians*, dorsal (*Botryllidæ*) or ventral; ventral in *Doliolidæ*, *Pyrosomidæ*, *Salpidæ* and *Octacnemus.*

Its size.—Insignificant in *Appendicularia;* in *Ascidians* varies from a minute and nearly functionless gland to a size fifteen times as large as the ganglion; in *Pyrosoma* and *Salpa* small; in *Doliolum* equal to the ganglion.

Many *Simple Ascidians* have the gland prolonged into the dorsal raphe, *i. e.*, into the median portion of the pharyngeo-cloacal septum. In most of these species merely the duct of the gland is so prolonged; in other forms the raphe contains much glandular tissue in connection with the duct.

In some species of *Simple* and *Compound Ascidians* the tissue of the gland is continuous with the cellular area of the ganglion, recalling the way in which they both are formed from a common structure, the visceral region of the larval neural tube. This origin of the gland from the neural tube (as described by Julin) is readily demonstrated in *Molgula Manhattensis* and in *Ecteinascidia turbinata.*

In all species studied the secretion of the gland is formed by the degeneration and disintegration of cells proliferated from the walls of the duct or its branches. It is, therefore, extremely doubtful if the gland has any renal function. No concretions were found.

The condition of the gland is very different in different species. The divergence affects its size, position and shape. Portions present in one species may be absent in another species of the same genus. The homology of the gland in *Salpa* with that of the *Ascidians* is doubtful.

Function of ciliated funnel.—It is not merely the aperture of the duct of the gland, for (1) it is often not connected with the gland, though well developed (*e. g.*, *Salpa*), and (2) it has a rich innervation in several species of *Simple Ascidians* and apparently in some *Salpas.* In some species, at least, it is probably a sense organ.

The intersiphonal organs of Tunicates show a remarkable asymmetry. Assuming the sagittal plane of the ganglion to coincide with that of the whole animal, the funnel is on the right side, and so also is often the whole or a part of the gland.

In *Molgula Manhattensis* there is a great semilunar fold of ectoderm that pushes into the cloaca parallel to the pharyngeo-cloacal septum, serving to support the latter and also to support the oviducts.

G. H. PARKER,
HARVARD UNIVERSITY. *Secretary.*

(*To be concluded.*)

CURRENT NOTES ON PHYSIOGRAPHY.

DRAINAGE OF SOUTHERN OHIO.

THE greater part of the Allegheny plateau and its westward slope is drained by streams of the simplest kind, dissecting horizontal strata in irregularly branching valleys. But for some years aberrant valley forms have been recognized in the upper Ohio region, special attention having been given to their meaning by W. G. Tight in his latest article on 'Some preglacial drainage features of southern Ohio' (Bull. Scient. Lab. Denison Univ., IX., 1897, 22–32). Confirmation is given to earlier views as to the composite origin of the modern Ohio. The preglacial drainage of the region led the Kanawha (via Teazes Valley), Big Sandy and other streams northward, across the present Ohio Valley, to a common trunk near Waverly. By some process not specified, the Ohio was given a course across the middle of this earlier system, deepening the older valleys for part of the distance, and elsewhere trenching across the divides at the lowest cols. The trenched cols, where the Ohio Valley is narrow and steep-walled, occur below Vanceburg, just above Portsmouth and above Guyandotte. Leverett appends a brief account of his contribution to this problem (l. c., 18–21).

THE COASTAL PLAIN OF MEXICO.

STUDIES by J. W. Spencer ('Great changes of level in Mexico and the inter-oceanic connections;' Bull. Geol. Soc. Amer., IX., 1897, 13–34) give, among other matters, an account of the coastal plain, or *tierra caliente*, that fronts the Mexican plateaus on the Gulf side. It has a breadth of fifty miles back of Vera Cruz, reaching an elevation of 1,560 feet at the inner margin, where the plateau ascends boldly thousands of feet above it. The inclined surface of the plain has not a uniform rise, but is made up of a number of steps or terraces, 50 to 100 feet high, with sloping plains between them. Streams descend from the plateau in valleys having a succession of reaches and falls; the same streams trench their way across the coastal plain. A brief account is given of the 'Geological Canal of Chivela,' on the divide of the Isthmus of Tehuantepec, 776 feet above the sea; its floor having lately been swept over the ocean currents during a depressed attitude of the region.

MOUNTAIN STRUCTURES OF PENNSYLVANIA.

THE prevalent belief in the frequent occurrence of synclinal ridges in denuded mountain ranges is discussed by A. P. Chittenden (Bull. Amer. Geogr. Soc., XXIX., 1897, 175–180), who cites the opinions of a number of authors on the matter. After showing that there is no logical reason to expect the more frequent occurrence of synclinal than of anticlinal ridges in ancient, deeply dissected mountains, the Appalachian ridges of Pennsylvania are classified and measured in three groups, monoclinal, anticlinal and synclinal; the total lengths for each group being 1,333, 334 and 245 miles. Synclinal ridges are, therefore, exceptional; the length of the monoclinal ridges far exceeding that of the other two classes. Synclinal ridges of Pottsville conglomerate in the anthracite coal regions are relatively more common than elsewhere, but even there the monoclinal ridge prevails. The synclinal valley between two neighboring monoclinal ridges often has a high-level floor, but it is surmounted and enclosed so distinctly by two ridges that the three forms cannot properly be described as a single synclinal mountain.

YOUNG, MATURE AND OLD LAND FORMS.

THE use of age-terms suggestive of sys-