Dye	Molecular Weight	Uptake 30-60 min.		Uptake in presence of DNP 10 ⁻⁴ M	
		Lumen	Cell	Lumen	Cell
Phenol red	354	+	-	-	-
Chlorphenol red	424	+		0-0	-
Bromcresol purple	540	+	-		-
Bromphenol blue	670	+	+	+	+
Bromcresol green	698	+	+	+	+
Indigo carmine (sulfonic acid)	466	+		-	-
Neutral red (basic dye)	289	+	-	+	-

Preliminary observations also suggest that only isolated fragments of the choroid plexus could concentrate dyes. Thus choroid plexus attached to the brain failed to concentrate chlor-phenol red. More definitive work needs to be done with regard to this problem.

1964 #3

REPORT ON RESEARCH

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Investigations pursued intermittently concern the biology of the ciliates which are variously associated with the sea urchin <u>Strongylocentrotus droebachiensis</u>. Of the numerous observations that have been reported, the following are worthy of special mention.

In the first study of the series (Beers 1948 <u>Biol. Bull.</u> 94: 99-112), it was shown that division in several of the common endozoic ciliates, which are holotrichs, is a cyclical phenomenon, and it was suggested that an inherent rhythm is involved. More recent studies of an experimental nature have shown, however, that the outbreaks of division are usually correlated with the feeding habits of the host and thus are not inherent.

One of the ciliates, identified provisionally as <u>Euplotes balteatus</u> (Beers 1954 <u>Jour. Proto-</u><u>zool</u>. 1: 86-92), is of special interest for two reasons: first, it is a hypotrich rather than a holotrich and secondly, it seems to be adapting to endozoic life in the urchin. A recent revision of the genus <u>Euplotes</u> by the French protozoologist Michel Tuffrau directs attention to the importance of the dorsal kinetics and argyrophilic network as stable specific characters. A study of these structures is in progress in an effort to identify correctly the species from the urchin and to establish its relationship to free-living species.

The studies have provided the first record of the occurrence on echinoids of a ciliate which is obligately epizoic rather than endozoic. This ciliate, a peritrich described as <u>Urceolaria</u> <u>spinicola</u>, is found on the spines and pedicellariae. A study of its autecology is in progress, with special reference to its distribution on individual hosts, on hosts of different ages and on hosts from different localities.

Recent publications follow, excluding preliminary and progress reports.

Beers, C. D. 1961 The obligate commensal ciliates of <u>Strongylocentrotus droebachiensis</u>: occurrence and division in urchins of diverse ages; survival in sea water in relation to infectivity. <u>Biological Bulletin</u>, <u>121</u>: 69-81.

. 1961 Is the ciliate <u>Euplotes balteatus</u> adapting to commensal life in the sea urchin <u>Strongylocentrotus droebachiensis</u>? <u>Journal of Parasitology</u>, 47: 478.

. 1963 Relation of feeding in the sea urchin <u>Strongylocentrotus droebachiensis</u> to division in some of its endocommensal ciliates. <u>Biological Bulletin</u>, <u>124</u>: 1-8.

. 1964 <u>Urceolaria spinicola</u> n. sp., an epizoic ciliate (Peritrichica, Mobilina) of seaurchin spines and pedicellariae. <u>Journal of Protozoology</u>, <u>11</u>: 430-35.

1964 #4

THE INTRAVENTRICULAR AND VASCULAR PRESSURES AND THEIR RELATIONSHIP IN THE ELASMOBRANCH

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A study has been made of the cerebral ventricular and vascular pressures and their relationships in the elasmobranch <u>S. acanthias</u> as part of a larger study of the comparative physiology of the CSF. Pressure measurements were made in the conus arteriosus, the dorsal aorta, the orbital sinus, anterior cardinal vein, the lateral and cerebellar cerebral ventricles, and the space between the brain and the skull.

The passage of the arterial blood through the gills before going to the brain caused a reduction in blood pressure from about 50/35 mm Hg to about 30/25 mm Hg or 40% reduction in systolic pressure and 29% reduction in diastolic pressure. The pulse pressure dropped from 14 mm of mercury to 5 or about 64%. In nine experiments, the mean arterial pressure distal to the gills was 25/20 mm Hg. In 11 experiments, the mean intraventricular pressure was 48/45 mm H₂O with a pulse which ranged from 1.1 to 5 mm H₂O with a mean of about 3 mm of water. The pressure seemed to be about the same in the two lateral ventricles and in the cerebellar ventricles, but communication sometimes did not seem to be very good. The initial measurements always showed equal. The orbital venous sinus was usually lower than the intraventricular pressure with a mean of 19 mm H₂O and never showed any pulsation. The anterior cardinal vein pressure seems unrelated to the CSF intraventricular pressures, sometimes being somewhat higher and sometimes lower than the intraventricular pressure. The mean was 55/51. The anterior cardinal vein always showed a pulse of about 3 to 5 mm of water but this pulse was related to the auricular contraction of the heart. The cardinal vein pulse was completely out of phase with the CSF pulse which was exactly in phase with the arterial pulse. The extradural fluid pressure was usually about 7 mm H₂O below that of the CSF but never showed any pulsation.

The intraventricular pulsations found in the elasmobranch were considerably smaller than those found in the mammalian species with choroid plexuses of similar size. The reason for this was the damping of the arterial pulse pressure by its passage through the gills before re-entering the dorsal aorta.

These observations are consistent with the hypothesis that the pulsatile pressure caused by the choroid plexus as each heart beat fills it with blood is a major factor in the enlargement of the cerebral ventricles.