from the others, furnishes exceedingly interesting material for investigations upon the hypophyscal principles and their relations to the endocrine system in vertebrate animals.

What names will eventually be applied to these lobes is still unpredictable. The histological studies of Dr. Butcher and the pharmacological studies of Dr. Geiling (see abstracts) have determined the location of the pars neuralis, although, as Dr. Geiling shows, this tissue exhibits only slight hormonal content in the cartilaginous fishes. The location of a melanophore hormone in the intermediate lobe, together with the identification of the pars neuralis on its dorsal surface, would seem to indicate that the pars intermedia will continue to be regarded as such. Until something is known of the function of the pars ventralis, it will probably continue to be designated by its position.

HISTOLOGY OF THE PITUITARIES OF SEVERAL FISH

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A histological study was made of the pituitaries of several fish in order to learn: 1) the extent of the various lobes, and if they could be separated for use in experimental work; 2) if the cellular content would provide any information on the relationship of the various cells.

Very fresh material was necessary for good fixation, and Bouin's fluid gave the best results although Zenker-Formol, Regaud's, Severinghaus's, and others were used. While many stains and modifications were tried, Hasting's Romanowsky proved to be the superior. This stain was difficult to use, but, when the tissue was properly fixed, the results were gratifying. The glands were cut in sagittal and transverse planes.

There are no indications of lobes in the pituitary of *Fundulus* heteroclitus. Surrounding the radiating trabeculae of the neuralis are epithelioid cells with distinct eosinophilic granules. The more anterior portion of the gland is composed of two kinds of cells; one type takes a pale eosinophilic stain while the other has little basophilic cytoplasm and no granules. In the middle and caudal regions five distinct types of cells are recognized with the following characteristics; 1) little cytoplasm and no granules; 2) blue cytoplasm and indistinct granules; 3) large basophilic granules; 4) pale eosinophilic staining cytoplasm and indistinct granules; 5) large distinct eosnophilic granules. Type 1 is the mother cell and gives rise to a basophilic line (types 2 and 3 and gradations), and an acidophilic group (types 4 and 5 and gradations). The pituitary of the long-horned sculpin is quite similar to that of the *Fundulus*.

Indications of lobes are found in the winter flounder, but they are quite inseparable. The ramifications of the neuralis are mainly confined to the posterior portion where cells with little cytoplasm and non-granular basophilic material surround them. The mid-region, transitional or übergangsteil of some, consists of eosinophilic granular cells and non-granular elements. Fine basophilic and acidophilic granular cells and chromophobes constitute the anterior portion.

Inseparable lobes are distinguished in the pituitaries of the haddock and the cod. The neuralis is practically confined to the posterior region where it is surrounded by chromophobe cells and an occasional eosinophilic granular cell. Eosinophilic granular elements greatly predominate in the nest arrangements of the transitional part and only a few basophilic and chief cells are found. Folds of chromophobes mainly constitute the anterior lobe in the haddock and the cod.

The anterior lobe of the dogfish, as seen in sagittal and transverse histological sections, has the form of a tube, its wall being several spindle cells in thickness and its residual lumen extending entirely through it. A constricted area, with a small lumen and a relatively smooth wall, separates the anterior lobe into about equal portions, the pars medialis and the pars distalis. In the region of the latter the floor of the tube is composed of many tubules while the dorsal wall is not specialized. Throughout the distal lobe eosinophilic granular cells adjoin the peripheral vascular connective tissue trabeculae, and smaller fusiform eosinophilic cells and an occasional basophile border on the residual lumen. Cells with only a few eosinophilic granules constitute the slightly folded floor of the medialis, and the peak of its roof adjoins the numerous spreading and complicated folds of the pars intermedia. In a few instances, the roof continues directly as a fold of the intermedia, the embryonic condition thus persisting. The intermedia contains no extensions of the hypophyseal cavity and the cells, several layers in thickness, comprising its folds, contain many purplish staining granules. Purplish granules are particularly abundant in the peripheral portions of those cells bordering on the radiations of the pars neuralis. A very great difference, therefore, exists between the unusually granular intermedia of the selachians and the delicate granulation found in higher vertebrates. Radially arranged ependymal cells and their numerous interwoven processes constitute the narrow neural lobe (pars neuralis). The elongated cell bodies of the ependymal cells are on the infundibular side, and their processes, as tortuous and highly vascular trabeculae, are surrounded by the pars intermedia. A stratified epithelium, in various degenerated conditions, composes the wall of the usually tubular ventral lobe.

The cellular and granular arrangement of the pars distalis, medialis, and intermedia of the skate are quite similar to the dogfish. Only a few trabeculæ compose the pars neuralis. The lumen of the ventral lobe is directly continuous with the hypophyseal cavity of the anterior lobe, and its wall possesses distinct but poorly granular cells.

From a histological study of the pituitary in the fish, the following conclusions are reached.

1) In the bony fish, there is evidence that the chromophobe is the stem cell and that basophilic and eosinophilic lines of cells differentiate from it.

2) Of the fishes studied the dogfish and the skate possess the only pituitaries that are separable into lobes for experimental work. The small granular content of the ventral lobe in the skate and the disintegrated and inconstant occurring ventral lobe in the dogfish suggest that this division has little function. Apparently the pars neuralis undergoes little differentiation in the dogfish, as the elongated and radially arranged cells about the infundibular lumen retain much of the character of the ependymal layer of the embryo, while in the bony fish the neural component proportionally is large, well differentiated, and resembles the condition found in the higher adult vertebrates. The complicated folding and highly granular content of the pars intermedia and pars distalis of the skate and the dogfish indicate that they are quite active. There is no evidence that the staining properties of the cells change, once they are determined.

THE MELANOPHORE HORMONE OF THE HYPOPHYSIS CEREBRI OF CERTAIN SELACHIANS

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For the purpose of determining the presence and location of a melanophore expanding hormone in the hypophysis cerebri of selachians, extracts of the different hypophyseal lobes of the dogfish and the skate were tested on sun-bleached frogs.

The lobes (pars distalis, medialis, intermediate, and ventralis, as well as the saccus vasculosus) were carefully separated, placed in individual mortars, and ground together with one to two c.c. of 0.25 per cent acetic acid. The resulting suspension was then boiled for a few seconds and centrifugalized, and the clear supernatant fluid was used for the tests.

In most of the experiments the extract from one lobe of one fish was used for injection into one frog, but in a few the corresponding lobes from two or even from as many as five fish were used in the preparation of an extract. The extracts were used within a short time (5-15 minutes) after they were prepared. One fourth to one half a cubic centimeter of the extract was injected into the peritoneal cavity of a sunbleached frog. The experiments were repeated a number of times during the month of July and early part of August.

In every instance the extract of a single pars intermedia brought about a rapid (within 5 to 10 minutes) blackening of the bleached frog into which it was injected. The darkening lasted several hours. The injection of the extract of a single pars distalis (about a fifth the size of the pars intermedia) also was followed by a blackening of the bleached frog, although in a few experiments the phenomenon did not take place quite as rapidly nor last as long as in the frogs injected with extract of the pars intermedia. Extracts of the pars