

HISTOPHYSIOLOGY AND FINE STRUCTURE OF REGULATORY EPITHELIA

W. L. Doyle, University of Chicago, Chicago, Ill.

A physiological, histochemical and electron microscopic approach to comparative studies on epithelia of marine organisms which play a significant role in regulatory processes. Principal attention has been devoted to saline secretions and this work has provided the first descriptions of the fine structure of the nasal salt glands of marine birds and the rectal salt gland of elasmobranchs. Initial studies were on the so-called chloride cells of the gills of marine fish and later studies have been concerned with the structure of the respiratory tree in holothuria, the haemal rete in holothuria and with the alkaline gland of the male skate. The glands studied are all noted for the production of highly concentrated solutions of sodium salts. In the other epithelia principal emphasis has been devoted to the cytology of specialized cells and the mucoid elements of the basement membranes. The following papers have been published on the work done on these materials.

W. L. Doyle. 1960. Principal Cells of the Salt Gland of Marine Birds. *Exp. Cell Res.*, 21, 386.

_____. and Donna Gorecki. 1961. The so-called chloride cell of the fish gill. *Physiol. Zool.*, 34, 81.

_____. 1962. Tubule cells of the rectal gland of *Urolophus*. *Am. J. Anat.*, 111, 223.

_____. 1964. Fine structure of the respiratory tree in *Cucumaria*. *Quart. J. Micr. Sci.*, 105, 7.

It is proposed to extend these primarily morphological studies in order to provide experimental physiological and histochemical evidence for the significance of the cytological aspects which relate to the special function of these epithelia. Work in progress is concerned with epithelia forming physiologically significant barriers in a variety of marine organisms and includes further work on gills of elasmobranchs and on the formation of the basement membranes in primitive vascular systems.

THE ROLE OF URICOLYSIS IN THE PRODUCTION OF UREA BY FISHES AND OTHER AQUATIC VERTEBRATES

L. Goldstein and R. P. Forster, Harvard University, Boston, Mass., and Dartmouth College, Hanover, N. H.

The activity of the uricolytic pathway (uric acid \rightarrow urea) was assayed in slices prepared from livers of teleost fishes. The rate of conversion of uric acid to urea ranged from 5 μ moles urea/g hr in the goosefish (*Lophius americanus*) to 23 μ moles urea/g hr in the winter flounder (*Pseudopleuronectes americanus*). Allantoin and allantoinic acid were also converted to urea at approximately the same rate as uric acid.

Allantoicase was found to be present in the livers of eighteen species of teleosts indicating