Phosphatase Activity of Selected Tissues

W. L. Doyle and Jean Omoto
University of Chicago

1. Non-calcareous connective tissues of a variety of invertebrates were examined for phosphatase activity. The aim of the investigation was to locate sites of phosphatase of sufficiently high activity to permit characterization of the enzymes associated with differing chemical types of connective tissue. Tunicates were examined in particular. The enzymatic activities which were found in appropriate tissues were not adequate for the proposed study.

2. The view that alkaline phosphatase in the kidney is primarily related to glucose absorption has been in part supported by the reported absence of the enzyme from the aglomerular toad-fish **opsanus tau.** Accordingly the enzyme should be absent or greatly diminished in older specimens of the daddy sculpin. By histochemical staining methods there was found to be an abundance of alkaline phosphatase in specimens which were physiologically and histologically aglomerular. This confirms the recent findings of Browne, Pitts and Pitts (Biol. Bull. #99) that aglomerular forms including **opsanus** possess this enzyme in the tubules. Long-horn sculpins appeared however to have more enzyme and also to show positive reactions in the collecting tubules. Quantitative assay of relative amounts of enzyme in the two species is incomplete.

In the dogfish, tubular phosphatase was rapidly eliminated upon perfusion of the kidney with elasmobranch saline. In the rabbit, prolonged perfusion with saline has little effect on the phosphatase content.

Regeneration in Clava leptostyla Agassiz

Norman E. Kemp
University of Michigan

Preliminary experiments on regeneration in **Clava leptostyla** Agassiz revealed that two kinds of regenerative response should be distinguished: (1) primary regeneration, the differentiation of hypostome and tentacles at the distal end, usually within a week after isolating pieces of the stalk of individual hydranths; (2) secondary regeneration, the delayed differentiation of new hydranths from attached hydro-

rhizal outgrowths. Isolated portions of the stalk usually rounded up and failed to undergo even primary regeneration unless one end became attached to the glass culture dish. Accordingly, it became routine practice to secure one end of an isolated piece by pinning it with a fine glass rod thrust through the tissue and into a substratum of 2% agar. Primary regeneration was studied in a series of isolated whole stalks or in parts of stalks, which had been pinned through the distal (oral) end or through the proximal (aboral) end. Modifications of the proximo-distal gradient and tests of the morphogenetic influence of regions not normally associated were investigated by the techniques of fusing stems or the other regions of the hydranth (gonosome, tentacle-bearing region, and hypostome) in various orientations and combinations. This was accomplished by stringing the pieces to be fused on fine glass rods, then holding them tightly together by means of pieces of glass tubing slipped over the ends of the rods.

Water Diuresis in the Seal, Phoca Vitulina*

Michael Ladd, Lawrence G. Raisz,
Charles H. Crowder, and Lot B. Page
New York University

The theory that renal tubular reabsorption of water is partitioned between an obligatory (proximal) and a facultative (distal) process is based in part on the observation that a limited fraction of the water filtered at the glomerulus is available for excretion during water diuresis. In the dog, this fraction varies from 11 to 19 per cent when the filtration rate is increased or decreased by altering the protein content of the diet (Ludemann, Raisz and Wirz). In the harbor seal, **Phoca vitulina,** the filtration rate may be increased markedly by feeding (Hiatt and Hiatt) and greatly reduced by excitation of the diving reflex (Bradley and Bing). This animal therefore affords an excellent opportunity to examine the influences of wide changes in filtration rate on facultative water excretion.

Methods

Twenty weaning seals and one one-year old female were used in the study. Filtration rate was measured by the exogen-

* A complete report of this work entitled "Filtration Rate and Water Diuresis in the Seal, Phoca vitulina" appeared in J. Cell. and Comp. Physiol. 38:157, 1951.