

action may be expressed by "sigma," the ratio of concentration of impermeable solute to concentration of penetrating solute necessary to maintain zero volume flow. Sigma values for ethylene glycol and propylene glycol were 0.9 and 0.65 respectively. Further experiments performed with both solutes present simultaneously showed effects which are consistent with solute-solute interactions.

### **Renal Transport of Urea and Some Carbohydrates in (*Lophius Piscatorius*)**

Richard L. Malvin and Irving B. Fritz  
The University of Michigan

Previous studies by others on the goose fish with non-electrolytes have led to the following conclusions. 1. The U/P ratio for exogenous urea is greater than 1.0, and probably is indicative of urea secretion. 2. The renal tubular epithelium is impermeable to sugars. Our work this summer has shown that urea U/P ratios were 1.0 when urea was injected into muscles of the head region and were greater than 1 only when injected intramuscularly in the tail. We feel that the apparent discrepancy results from the fact that the kidney in *Lophius* is supplied almost entirely by venous blood from caudal regions. If urea is injected IM into tail muscle, blood perfusing the kidney would have a higher concentration of urea than that in mixed venous or arterial blood. Earlier investigators injected into tail muscle and used heart blood for computing plasma urea concentrations. Consequently, they calculated erroneously high U/P ratios. The present data give no basis for postulating urea secretion by goose fish.

We were also able to show that significant quantities of D-arabinose, L-arabinose and fructose are able to diffuse across the tubular epithelium. The appearance of such substances in urine might have resulted from either exchange diffusion or passive diffusion along a chemical gradient. U/P ratios for L-arabinose and D-arabinose were similar, suggesting that passive diffusion predominated, since L-arabinose is transported more readily than D-arabinose in several other systems possessing exchange diffusion mechanisms.

### **Calcium and Iron Transport in the Shorthorn Sculpin and Fundulus**

Thomas Manis and James Manis

Active transport mechanisms for calcium and iron have been demonstrated in the small intestine of the rat using everted gutsacs *in vitro*. Similar experiments were carried out at the Mount Desert Island Biological Laboratory during August of 1961 using the intestine of two teleost fishes.