demonstrated in grass from that region collected in July 1937 (3). On consulting the hydrographic records it was found that the mean % chlorinity had been increasing steadily since 1934-an increase from June through December 1934 to January through May 1937 of 13.90 to 15.70. Over the same period the temperature change was negligible.

These figures as reported do not attempt to account for the suddenness of onset and the universality of the disease, but they do indicate a possible explanation for the seemingly haphazard local variations so far observed throughout the diseased areas. Unfortunately the possible significance of this line of investigation was not realized in time to make more than a beginning. But the need for a more careful study of this relationship between chlorinity and the virulence of the disease is indicated.

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## THE EXCRETION OF URIC ACID BY THE CHICKEN

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In view of the metabolic importance of uric acid in the birds, considerable interest attaches to the mechanism of its excretion. The available evidence shows that this is effected in part by glomerular filtration and in part by tubular excretion, but no observations have been made on normal, unanesthetized birds, or at plasma concentrations above the normal level. The present investigation is intended to examine the process of tubular excretion in greater detail. Methods will be described in a full report to be presented elsewhere.

The uric acid/inulin clearance ratio in the chicken at normal plasma uric acid concentrations is 7.5 to 15.8. As the plasma level is raised this ratio is depressed (due to a reduction in the uric acid clearance) until at plasma levels of 100 mgm. per cent it has a value of 1.8 to 3.2. These facts are confirmatory evidence of the tubular excretion of uric acid in the chicken and show that this process accounts for 87 to 93 per cent of the total uric acid excreted at normal plasma levels. The rate of tubular excretion of uric acid increases with increasing plasma level until it reaches a maximum value at 20 to 40 mgm. per cent plasma uric acid. At normal plasma uric acid levels the rate of tubular excretion of uric acid is more than 50 per cent of the maximum rate.

The development of a highly efficient tubular mechanism for the

excretion of uric acid in the bird serves to maintain a low plasma level of this substance in spite of, or in association with, relatively poor glomerular development and a limited capacity to elaborate an osmotically concentrated urine.

## THE EXCRETION OF INORGANIC PHOSPHATE IN SQUALUS ACANTHIAS

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Phosphate excretion in *Squalus acanthias* was studied in an effort to discover the method of acidification of the urine and to determine whether or not endogenous inorganic prosphate is excreted by the renal tubules in this species.

The urine of the dogfish may normally contain large quantities of acid soluble (inorganic) phosphate which, apart from chloride, is usually the most important anion and the only significant inorganic buffer in the urine. The average pH of the urine (42 samples from 18 fish) is  $5.72 \pm 0.11$ . The reaction is not significantly altered by the injection of 4 cc. per kgm. of saturated NaHCO<sub>3</sub> or the same dose of a 20 per cent solution of Na<sub>2</sub>HPO<sub>4</sub>/NaH<sub>2</sub>PO<sub>4</sub> at pH 7.5.

From the simultaneous renal clearances of inulin and  $PO_4$  and the pH of the blood urine it is possible to determine whether either the basic or acid phosphate ion is excreted or reabsorbed by the tubules. Such calculations show that there is a copious tubular excretion of  $NaH_2PO_4$  both at normal plasma  $PO_4$  levels and when the plasma  $PO_4$  has been elevated by the injection of inorganic phosphate. The total excretion of  $Na_2HPO_4$  appears to be slightly greater than the quantity filtered through the glomeruli; but the accuracy of this calculation depends upon precise knowledge of the ionic activity of  $PO_4$  in both plasma and urine, and final decision in this question is reserved.

It is concluded that exogenous phosphate is excreted by the tubules in *Squalus acanthias*, chiefly as  $NaH_2PO_4$ , and that the maximum rate of excretion may be reached at a plasma level of PO<sub>4</sub> of 6 to 7 millimols per liter. Phlorizin in doses sufficient to produce complete glycuresis had no effect upon the tubular excretion of phosphate.