the concentration in the urine might decrease. Creatine excretion decreased, increased, or remained constant in different experiments though the urinary concentration invariably decreased with increasing urine flow.

It seems probable, since six species of marine teleosts falling in three phyogenetically widely separated groups were found to have at some time in their normal life urinary chloride concentrations of zero to trace, that such a condition may be the normal condition of marine teleosts, and therefore that the analyses of marine teleost urine previously presented in the literature are analyses of diuretic urine produced under the unnatural conditions of experimental manipulation. That this latter conclusion is correct is evidenced by the fact that the urine composition obtained after taking repeated urine samples more closely approximated results of analyses already present in the literature.

THE EXCRETION OF PHOSPHATE BY THE KIDNEY

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The urine of the winter toadfish (aglomerular kidney) contains only the faintest trace of inorganic phosphate. The injection of large amounts of inorganic phosphate intramuscularly or intravenously raises the plasma phosphate to high levels, but does not cause the excretion of any inorganic phosphate in the urine. An excretion of inorganic phosphate has not been found as the result of various procedures (feeding, injection of glucose, parathyroid extract, insulin). The injection of sodium glycerophosphate results in a marked rise in the inorganic phosphate of the plasma, but in no excretion of morganic phosphate by the kidney.

The urine of the goosefish (also with aglomerular kidney) contains varying amounts of inorganic phosphate (from traces up to 45 mM. per liter). The injection of inorganic phosphate or of sodium glycerophosphate raises the plasma phosphate level but does not increase the urinary excretion of inorganic phosphate.

The above results suggests that inorganic phosphate is not secreted by the aglomerular kidney, and that the inorganic phosphate in the urine of the aglomerular fish is formed in the kidney from some organic precursor (which is not sodium glycerophosphate).

An attempt to test this hypothesis that inorganic phosphate is only filtered by the glomerulus and that secreted phosphate comes from some precursor has been made for the frog and the sculpin (glomerular kidneys). The injection of inorganic phosphate and xylose into the frog gives urine/plasma ratios which are identical within experimental error. Thus in the frog inorganic phosphate is only excreted by glomerular filtration. In the sculpin, the secretion of phosphate appears to be very variable and easily influenced by experimental procedures. A large number of experiments were carried out on

phosphate excretion in this fish but no definite conclusions can be drawn at present.

THE SIZE AND HEMOGLOBIN CONTENT OF THE RED CORPUSCLES OF TELEOSTS, ELASMOBRANCHS, AND CYCLOSTOMES

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As part of an investigation of the size and hemoglobin content of vertebrate red corpuscles, the blood of 18 species of teleosts, 5 species of elasmobranchs, and 1 cyclostome was examined. In each instance erythrocyte counts, hemoglobin, hematocrit and icterus index determinations, diameter measurements of the red cells and calculation of the mean volume, thickness, hemoglobin and hemoglobin concentration of the red corpuscles were carried out. A total of 41 specimens was thus studied.

These observations revealed a great difference in the volume of the erythrocytes of elasmobranchs and cyclostomes as compared with that of teleostean red corpuscles, the former being much larger. The hemoglobin content of these erythrocytes tended, on the whole, to vary directly with their size so that the mean corpuscular hemoglobin concentration was essentially constant. The greatest difference in the volume of the red cells was 15:1. The maximum variation in mean corpuscular hemoglobin concentration was 1.5:1.0. These findings correspond with observations in amphibia, reptiles, birds and mammals and suggest, as studies in human beings have already indicated, that there is an optimum concentration of hemoglobin in the red corpuscle.

On the whole, variations in red cell size occurred in inverse ratio to variations in erythrocyte count, so that the red cell mass tended to vary much less than the wide differences in the erythrocyte counts of various fish would indicate. Nevertheless red cell mass was much less constant than mean corpuscular hemoglobin concentration.

THE REACTION OF THE OVIDUCT OF SKATES TO CERTAIN AUTONOMIC POISONS

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Studies of the effects of well known autonomic poisons on the heart and gastro-intestinal tract of skates have already been reported by a number of investigators. However, a rather careful search of the literature has led to the conclusion that the oviduct of the skate has never been made the subject of an investigation of this kind. The desirability of extending such studies to the oviduct of the skate became apparent.

The herein described study was carried out on three species of