tered in this study. It was characterized by the formation of many (3 to 12) hypha-like tubes, each of which achieved a length about equal to the diameter of the parent cyst and then rounded up to form conidia-like bodies. They believed the organism to be a Phycomycete resembling the Chytridiales. We also believe that the organism in the herring is a Phycomycete, subdivision Archimycetes, and probably very close to the Chytridiales. It is interesting to note that in these lower fungi conidia may or may not be formed depending upon environmental conditions. No zoospores have been observed in culture or in tissue, but it is entirely possible that the conditions under which this parasite has been studied are not favorable to the formation of this stage in the life cycle. Inasmuch as many of the known species of the Archimycetes are parasites that attack freshwater and marine algae, it is not unlikely that this gap in our knowledge of the life history of the parasite may be filled by more information concerning possible parasitic organisms encountered in the food of the herring.

This type of systemic parasitic fungus has been repeatedly described in European marine and freshwater fish (for review see Fish, 1934). Widespread epidemics of this sort in the herring have been reported in Western Atlantic waters in 1898, 1914 and 1930. These spacings of 16 year intervals indicate that, if the disease is really of a cyclical nature, one would expect the next occurrence of a widespread epidemic in the middle nineteen-forties.

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THE GLUCOSE REABSORPTIVE PROCESS IN THE FROG RENAL TUBULE; EVIDENCE FOR GLOMERULAR FUNCTIONAL INTERMITTENCY IN THE NORMAL INTACT ANIMALS*

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One hundred and fifty simultaneous inulin and glucose renal clearance determinations were made in this series of experiments on 15 bullfrogs with the glucose plasma concentrations ranging from 41 to 1650 mg. per cent, and the urine flows from 1 to 35 ml./kg./hr. The inulin clearance (occasionally creatinine clearance) was used to measure the rate of glomerular filtration, and the physiological and biochemical procedures were the same as those employed in an earlier study (Forster, 1938).

The amount of glucose reabsorbed by the renal tubule cells (T_G) was found to be influenced both by the simultaneous glucose plasma

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concentration and the rate of urine flow. This value was calculated from the formula,

$$T_G = P_G C_{IN} - U_G V,$$

where P_G and U_G are the concentrations of glucose per ml. of plasma and urine, respectively, C_{IN} is the inulin clearance and V is the urine flow in ml./kg./hr.

As the glucose concentration is raised in the plasma the amount of glucose reabsorbed by the tubule cells increases until a maximum is reached at a plasma concentration of 300 mg. per cent. This average reabsorption maximum (glucose T_m) is 1.16 mg. per ml. of glomerular filtrate formed, and is a constant value for all glucose plasma concentrations over 300 mg. per cent. This indicates that there is a maximal limit imposed upon the tubular mechanism responsible for the reabsorption of glucose.

However, despite the average constant glucose T_m at plasma concentrations over 300 mg. per cent, the amount of glucose reabsorbed during any individual clearance period varies directly with the simultaneous rate of urine flow or the rate of glomerular filtration. It was demonstrated earlier that in the frog, unlike mammals, variations in urine flow are produced primarily by alterations in the rate of glomerular filtration rather than by differential rates of tubular water reabsorption (Forster, 1938). An average of 8 mg. of glucose are reabsorbed per kg. body weight per hour at a rate of glomerular filtration of 5 ml. /kg./hr., and this rises to 32 mg. at 20 ml., and 64 mg. at 40 ml. This direct correlation between the rate of glomerular filtration and the rate of glucose reabsorption, when the glucose plasma level is higher than 300 mg. per cent, is interpreted as indicating that variations in glomerular filtration rate are caused by the opening and closing of the individual glomeruli, which in turn determines whether or not their associated renal tubules will have available glucose for reabsorption.

Glomerular functional intermittency has not been indicated in mammals by these variations in the rate of glucose reabsorption (Goldring, Chasis, Ranges and Smith, 1940). These current results on the frog by the renal clearance technique substantiate the earlier findings of Richards and Schmidt (1924-25), who directly observed the intermittent opening and closing of glomeruli in the exposed frog's kidney.

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