

glucose are outwardly secreted by the labyrinth. In contrast to the condition in the aglomerular nephron of vertebrates, cyanol, a blue anilin dye, is outwardly and rapidly secreted by the crayfish kidney even when present in low concentrations in the plasma. Evidently the labyrinth has varied secreting capacities.

The maintenance of an internal aqueous and saline steady state, in spite of a constant inward diffusion of water, is known to be due to the unvarying capacity of the crayfish nephron to eliminate urine that is markedly hypotonic to the blood. Since filtration apparently does not occur through this nephron, the hypotonicity cannot be explained by a reabsorption of salts but, like the aglomerular teleost kidney, is evidently due to a secretion of water.

The above facts permit the following conclusions with regard to the physiology of the nephron of the crayfish: 1. Inulin is secreted. 2. Filtration is evidently not an appreciable factor in urine-formation. 3. The manufacture of a hypotonic urine must be due to a secretion of water.

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Treatment of Cecal and Liver Trichomoniasis in Turkeys by Fever Therapy.

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Since 1937, experimental work has been in progress on the use of fever therapy for the cure of cecal and liver trichomoniasis in turkeys, a widespread disease of domestic fowls caused by the protozoan parasite, *Trichomonas gallinarum*. This organism invades the tissues of the lower digestive tract of birds and in chronic infection produces lesions in the ceca and liver. These lesions closely resemble, and undoubtedly have been often confused with, those produced by *Histomonas meleagridis* in the disease commonly known as black-head. Birds with chronic trichomoniasis are droopy in appearance, refuse to eat, and lose weight. The droppings become quite liquid and light yellow in color. Young birds usually die 4 to 8 days after exhibiting the first symptoms of the disease, although in mature birds the period between the first symptoms and death may be much longer.

Most of the turkeys used in this preliminary study were naturally

infected and ranged from 3 to 18 months in age. At the beginning of the work the disease was diagnosed by the external symptoms noted above, and by microscopic examination of the cecal discharges.

Recently it has been found that by making an incision into the abdominal cavity, and with the aid of a strong light, it is possible to observe the liver and ceca directly for lesions. The direct observation of lesions and identification of trichomonads in cecal droppings have made certain the elimination from treatment of birds exhibiting external symptoms similar to those of trichomoniasis but actually due to other causes.

Birds undergoing treatment were placed in a thermostatically controlled cabinet for periods ranging from 1 to 2 hours. The internal body temperature of the bird was raised from 2 to 6 degrees above the normal of 106.5°F by maintaining an air temperature within the cabinet of approximately 104°F, and a relative humidity of 60 to 70%. The duration of treatment depended upon the physical condition of each bird and its ability to withstand the increased temperature. Usually three treatments at intervals of every other day were sufficient to check the disease, although as many as 6 treatments were necessary in a few more advanced cases. After treatment the birds were placed in wire-bottomed cages at room temperature.

Heat treatment was administered to 19 turkeys in which trichomoniasis was diagnosed by external symptoms and microscopic examination and to 5 turkeys in which liver and cecal lesions were directly observed. Twenty of these 24 treated birds recovered, while 4 failed to respond to treatment. Those birds which recovered usually showed signs of improvement after the second or third treatments, began to eat voluntarily, gained in weight, and behaved like normal, active birds. Four adult turkeys were killed at different stages of recovery following treatment, and postmortem examination disclosed that many of the liver lesions had almost disappeared and all others were in process of healing. Cultures made from the necrotic areas of these livers were completely negative for trichomonads. Of the 4 birds which failed to respond to the treatment, 2 died during or shortly after being given the first treatment.

Nine turkeys with trichomoniasis were kept in cages similar to, and fed rations identical with, those of the treated birds. Seven of these died as a result of the disease, and trichomonads were cultured from their livers and ceca, while the remaining 2 birds recovered. These results indicate that turkeys having trichomoniasis of the lower digestive tract can be effectively treated with fever therapy. Work is being carried out with experimentally inoculated birds.