

PATHOLOGICAL INVESTIGATIONS**By J. A. J. Venn, M.R.C.V.S., D.V.S.M.****Ministry of Agriculture Veterinary Investigation Centre, Langford**

In previous years, attention was given, in the main, to the adult birds in the collection. During the period under review, which includes two breeding seasons, the investigations were directed towards an endeavour to determine whether or not there was any single factor that could be regarded as primarily responsible for the high rate of loss in the young stock.

Before discussing this investigation in detail, the position with regard to the losses in the collection as a whole can be considered briefly.

Aspergillosis

In the previous report, mention was made of the proposed investigation into Aspergillosis. It is regretted that this work is in abeyance, due to the departure from Bristol University of the worker concerned.

The possibility of a test being found that will enable Aspergillosis to be detected in birds during life has been under consideration, but one cannot, as yet, state whether this will be effective.

Nutritional Disorders

These, except in the case of newly hatched Ruddy Ducklings, appear to have been overcome. This fact is very encouraging.

Parasitism

The existence of parasitism in the adult birds continues to decrease. A few deaths in geese, from gizzard worm infestation, were encountered, but these must be regarded as inevitable in view of the concentration of the birds and the ubiquity of the parasite. There is no doubt that losses would be much higher if medication were not employed.

Losses in Young Stock

For the first time since the author has been undertaking the pathological investigations, it was decided to make a determined effort to discover the reason for the high mortality, as is indicated in the Hatching and Rearing Table.

In 1952, casualties examined early in the breeding season suggested that tape worm infestation might account for the losses encountered. Weakly birds were accordingly treated. Some recovery took place, but towards the latter end of the season the mortality rate rose alarmingly and it was found that *Acuaria uncinata* was present. This parasite was detected in the great majority of subsequent post mortems during the remainder of the season.

Here we might interpolate a short note about this parasitic Nematode worm. It is one that invades the proventriculus or stomach, damaging its wall and causing serious interference with the function of the organ. As a result of activity by the tissues of the bird, the worms may become encysted, but the damage to the stomach appears to be permanent. The intermediate host of the parasite is generally accepted as *Daphnia*, the water flea.

For the 1953 season it was hoped that small changes in management, such as having the youngest batches upstream of the older birds and also rearing broods in small units supplied with tap water, would control the infestation.

The results, in brief, were that at the commencement of the season, it appeared that the condition was under control and the rearing was satisfactory. As

the season continued, losses mounted until the end. This implied that there had been a build-up in infected *Daphnia* during the season, since it was unlikely that the intermediate stage could survive through the winter.

For the next season, more heroic measures are planned, which include alterations in the design of the pens and, at the same time, a drug that may prove effective in the control of the parasite is being used, so it is with hopes of a considerable improvement in rearing percentages that the 1954 season is awaited.

The author wishes to record his appreciation of the great help given him in these investigations by Mr S. T. Johnstone and his staff. Also he would mention his gratitude to Dr E. J. L. Soulsby, Lecturer in Parasitology at the University of Bristol Veterinary School, for his advice and active participation in the examinations undertaken during the time under consideration.

There can be no definite guarantee that 1954 will be a more successful rearing season than the previous two, but it appears likely, now we have determined what appears to be the main cause of loss, that the measures envisaged will reduce losses from this parasite to negligible amounts.

TABLE XIII
CAUSES OF DEATHS IN THE COLLECTION, 1952-53

| Cause of Death | Species | Young | Adult | Total |
|---|------------------------------|---------------------|-------|-------|
| Infectious Diseases | | | | |
| Aspergillosis | Greater Snow Goose | 1 | — | 1 |
| | Ruddy-headed Goose | 1 | — | 1 |
| | Falkland Goose | — | 1 | 1 |
| | Andean Goose | — | 1 | 1 |
| | Abyssinian Blue-winged Goose | — | 1 | 1 |
| | New Zealand Shelduck | — | 1 | 1 |
| | Maned Goose | — | 1 | 1 |
| | Scaup | — | 3 | 3 |
| | Avian Tuberculosis | African Yellow Bill | — | 1 |
| | New Zealand Scaup | — | 1 | 1 |
| Parasitic Diseases | | | | |
| Cestode Infestation (<i>Hymenolepis</i> spp.) | Mandarin | 1 | — | 1 |
| | Red-breasted Merganser | 1 | — | 1 |
| | Wandering Tree Duck | — | — | — |
| | Rosy-bill | 2 | — | 2 |
| | Carolina | 9 | — | 9 |
| | Abyssinian Black Duck | — | 1 | 1 |
| | Brazilian Teal | 1 | — | 1 |
| | Redhead | 1 | — | 1 |
| Nematode Infestation | | | | |
| Gizzard Worms (<i>Amidostomum</i> spp.) | Upland Goose | — | 2 | 2 |
| | Barnacle Goose | — | 1 | 1 |
| | Black Brant | — | 1 | 1 |
| Gape Worms (<i>Cyathostoma</i> spp.) | Grey-breasted Whistling Duck | 1 | — | 1 |
| <i>Acuaria uncinata</i> | Carolina | 20 | — | 20 |
| | Bahama Pintail | 7 | — | 7 |
| | Eider Duck | 5 | — | 5 |
| | Orinoco Goose | 3 | — | 3 |
| | Hartlaub's Duck | — | 2 | 2 |
| | Mandarin Duck | 2 | — | 2 |

TABLE XIII—continued

| Cause of Death | Species | Young | Adult | Total |
|--|------------------------------|-------|-------|------------|
| | White-faced Whistling Duck | 1 | — | 1 |
| | Chiloe Wigeon | 1 | — | 1 |
| | Crested Duck | 1 | — | 1 |
| | Gadwall | 6 | — | 6 |
| | African Black Duck | 1 | — | 1 |
| | Abyssinian Black Duck | 1 | — | 1 |
| | Red-crested Pochard | 5 | — | 5 |
| | Garganey Teal | 1 | — | 1 |
| | Cape Teal | 1 | — | 1 |
| | Chestnut-breasted Teal | 3 | — | 3 |
| | Cinnamon Teal | 1 | — | 1 |
| | Shelduck | 2 | — | 2 |
| | Ruddy Duck | 1 | — | 1 |
| | Yellow-bill | 1 | — | 1 |
| Renal Coccidiosis | Greater Snow Goose | 1 | — | 1 |
| | Bar-headed Goose | 2 | — | 2 |
| Nutritional | | | | |
| Gizzard Erosion | Ruddy Duck | 10 | — | 10 |
| Indefinite Etiology | | | | |
| Visceral Gout | Carolina | 1 | — | 1 |
| | Barrow's Goldeneye | 1 | — | 1 |
| | White-faced Whistling Duck | 9 | — | 9 |
| Nephritis | Ruddy-headed Goose | 1 | — | 1 |
| | Ross's Goose | 1 | — | 1 |
| | Philippine Duck | 1 | — | 1 |
| | Gadwall | 5 | — | 5 |
| | Indian Pigmy Goose | 2 | — | 2 |
| | Grey-breasted Whistling Duck | 1 | — | 1 |
| | Scaup | 4 | — | 4 |
| Hepatitis | Cereopsis | — | 1 | 1 |
| | Barnacle Goose | — | 1 | 1 |
| Various Causes | | | | |
| Heart Failure | Brazilian Teal | — | 1 | 1 |
| Pleurisy | Ruddy Shelduck | — | 1 | 1 |
| Impaction of Portions of Digestive Tract | Goosander | 1 | — | 1 |
| | Cinnamon Teal | 1 | — | 1 |
| | Scaup | 1 | — | 1 |
| Sinusitis | Emperor Goose | 1 | — | 1 |
| Congestion of Lungs | Ruddy Duck | 4 | — | 4 |
| | Emperor Goose | 1 | — | 1 |
| Chilling | Chiloe Wigeon | 2 | — | 2 |
| | Rosy-bill | 2 | — | 2 |
| | African Black Duck | — | — | — |
| Decomposed on Receipt .. | Various Species | — | — | 27 |
| Total | | | | 181 |

In many instances, where young birds are under consideration, only sufficient specimens to establish a diagnosis were examined. In the case of goslings and ducklings, therefore, the total death rate was much higher than the post mortem figures imply.