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Duck Disease Caused by the Toxin of *Cl. Botulinum* Type C.

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Study of the clinical manifestations and the absence of characteristic anatomical findings suggested that the so-called duck disease is the same sickness as Limber neck of chickens. The unknown different symptoms caused by *Botulinus* in wild and domesticated ducks may be due to the natural habits of these birds. To keep themselves from drowning the water birds stretch their heads backwards. This is of course not necessary in the case of chickens and tame ducks. Furthermore the experiments of Mr. Kalmbach refuted the theory of a salt intoxication and forcibly indicated the existence of an animated virus.

The theory of *Botulinus* intoxication was confirmed in a series of experiments to be detailed elsewhere. Cultures prepared from the liver and other organs of sick wild ducks contained a toxic anaerobe. 0.3 to 0.5 cc. from these cultures, administered by mouth or when injected, induced in healthy wild ducks the paralysis of legs, wings and *membrana nictitans*, respiratory distress and aphonia, strikingly similar to that in naturally diseased birds. In general the autopsy findings are negative with the exception of a dilated rectum filled with accumulated urine. Inoculation of mice revealed the typical symptoms of *Botulinus*. These experiments proved the identity of the duck disease and the Limber neck of chickens, chiefly produced by *Clostr. botulinum* Type C, sometimes also by *Parabotulinum* Type A. *Botulinus* Type C toxin formed by strains obtained from Limber neck in chickens, *Parabotulinum* toxin A, and even Type B in larger doses, are experimentally capable of producing the duck disease.

Pure cultures could be prepared without difficulty. The first culture made from a sick wild duck (Williams Lake) contained a coccus and anaerobes. The isolation of the anaerobe was obtained by heating the culture at 80°C. for 3 minutes. Morphological and biological investigations showed the presence of *Cl. botulinum* Type C. A culture from a killed experimental duck was given to Dr. K. F. Meyer and Dr. H. H. Heller. They also succeeded in isolating the *Cl. botulinum* Type C and identified it by toxin-antitoxin absorption test according to standard methods.

The same anaerobe has been found in the liver of 4 acutely fatal cases of duck disease, and in 5 birds, which had suffered from the same malady 3 weeks before they had died of an intercurrent disease. So far, in one duck recovered from duck disease 6 weeks previously the cultural demonstration failed. These observations are of great epidemiological interest in connection with the fact that generally the young birds are subject to the disease.