

- 1928a. Observations and banding notes on the Bank Swallow. III. *Auk*, 45: 41-45.
- 1928b. Observations and banding notes on the Bank Swallow. IV. *Auk*, 45: 310-320.
- 1941. Homing instinct in the Bank Swallow. *Bird-Banding*, 12: 104-109.
- THOMAS, E. S. 1934. A study of Starlings banded at Columbus, Ohio. *Bird-Banding*, 5: 118-128.
- THOMAS, J. F. 1933. Some results of ringing and trapping swallows in Carmarthenshire. *British Birds*, 26: 253-255.
- UCHIDA, S. 1932. Studies of swallows by the banding method. *Bird-Banding*, 3: 1-11.
- VÄLIKANGAS, I. 1933. Finnische Zugvögel aus englischen Vogeleiern. *Vogelzug*, 4: 159-166.
- VERHEYEN, R. 1939. Résultats du baguage au nid des oiseaux de Belgique pour les dix premières années (1928-1938). *Mededeelingen van het Koninklijk Natuurhistorisch Museum van België*, 15, N^o. 49. 36 pp.
- VESTERGREN, G. 1938. Återfunna ringmärkta fåglar. *Fauna och Flora*, 33: 265-270.
- VILKS, K. and VON TRANSEHE, N. 1933. Ergebnisse der Beringung von Staren (*Sturnus vulgaris*) in Lettland. *Vogelzug*, 4: 113-118.
- WHITTLE, C. L. 1926. The bearing of a knowledge of nest-spacing among birds on the work of the bird-bander. *Bull. Northeast. Bird-Band. Assoc.*, 2: 78-81.
- 1932. Are nesting territories always available for returning juvenile Song Sparrows? *Bird-Banding*, 3: 106-108.
- 4926 Cass Street, Omaha, Nebraska.

ASPERGILLOSIS AND PARASITISM IN A GULL¹

BY F. R. BEAUDETTE

A Herring Gull (*Larus argentatus*) was received Sept. 27, 1943, for examination. It had been found dead at Oyster Bay the day before.

The bird was very thin and on autopsy showed white caseous masses in the thoracic and pericardial air sacs, and a few smaller patches attached to the abdominal air sacs. Cultures taken from the air sacs on agar plates yielded a pure growth of a fungus which was identified as *Aspergillus fumigatus* by Dr. S. A. Waksman.

Although the fungus infection was undoubtedly the primary cause of death, a variety of parasites must have been a contributing factor. Thus, beneath the serous covering of the proventriculus could be seen small dark spots suggesting an infestation of Tetrameres, and careful dissection made possible the removal of six females. The female is readily distinguished by the globular shape and the red color in contrast to the elongated shape and white color of the male.

When the proventriculus was opened a small nematode seemed to be partly buried in a gland and, because of the presence of female Tetra-

¹ Journal Series paper of the New Jersey Agricultural Experiment Station, Rutgers University, Department of Poultry Husbandry.

meres, was thought to be the male of the species. Without further examination this together with a few female Tetrameres were sent to Dr. E. E. Price of the Zoological Division in Washington, D. C., for specific diagnosis. No specific diagnosis was rendered on the female Tetrameres, but what was assumed to be the male of the species was diagnosed by Dr. E. E. Wehr as *Cosmocephalus obvelatus* (Creplin, 1825) Seurat, 1919.

Finally, the intestines contained a large number of tapeworms, which were not identified, and in addition, an equally large number of two species of flukes, one of which obviously belonged to the Echinostomatidae. Specimens were sent to Dr. H. Stunkard, who identified the smaller as *Cryptocotyle lingua* and the larger, the Echinostome, as *Himasthla quissetensis*.

Mr. Bulck, who had accommodated us with the above bird, sent a second specimen which arrived April 15, 1944. Unfortunately, it was quite decomposed and infested with maggots, but a large fibrous mass was found protruding from the serous surface of the sternum. Again, the intestines contained tapeworms, two Acanthocephalids, and many *Himasthla quissetensis*.

Aspergillosis is not uncommon in birds, as it has been reported in fowls, pheasants, pigeons, turkeys, ducks, geese, swans, ostriches, flamingoes, canaries, jays, white storks, ravens, eider ducks, paraquets, hawks, bullfinches, plovers, bustards, parrots, gray parrots, wild geese, wild turkeys, gray partridges, snowy owls, and the common mallards. Other species could be added to the list if birds dying in zoological parks were included. In most of these cases *Aspergillus fumigatus* was the species of fungus involved. However, the disease in gulls has not been reported often. Robin (1) reported mycosis in a gull (*Larus griseus*), and recently Davis and McClung (2) reported cases in Herring Gulls near Boston.

It is unfortunate that a specific diagnosis was not made on the Tetrameres because Cram (3) does not list a species for this bird.

The nematode *Cosmocephalus obvelatus* has been reported from several species of gulls and other birds. In the United States it has been reported by Cram (4), who found it in the esophagus of a pelican (*Pelecanus* sp.) at the National Zoological Park, Washington, D. C., and also by Canavan (5), who found it in the proventriculus of a Herring Gull (*Larus argentatus smithsonianus*) in the Philadelphia Zoological Garden.

The life cycle of the fluke *Cryptocotyle lingua*, which appears to be common in gulls, has been worked out by Stunkard (6), who showed that the first and second intermediate hosts are the marine snail *Littorina littorea*, and the cunner, respectively.

Hoff (7) has pointed out an interesting difference in the degree of infection of snails with *Cryptocotyle lingua* with reference to the

habits of gulls. Thus in the region of docks from which gulls are continuously frightened no infected snails were found, while 501 snails from feeding areas of gulls showed 6.2 percent infection. The highest incidence of infection in snails was in those taken near roosting and nesting areas. Out of 86 snails from roosting areas, 17, or 19.8 percent, were infected, and of 134 snails from nesting sites 20.9 percent were infected. The difference is attributed to the observation of Stunkard (6) that the miracidia are not free-living and therefore do not become evenly distributed. Incidentally, Rothchild (8) has recorded an instance in which an original infection of a snail continued to result, seven years later, in the daily elimination of a thousand cercariae.

The life cycle of the echinostome *Himasthla quissetensis* was also worked out by Stunkard (9). In this the snail *Nassa obsoleta* serves as the first intermediate host and cercariae from this penetrated and encysted in the gills, mantle and foot of several mollusks (*Mya arenaria*, *Modiolus modiolus*, *Mytilus edulis*, *Cumingia tellinoides*, *Pecten irradians*, *Ensis directus*, and *Crepidula fornicata*), which serve as the second intermediate host.

Thanks are due Dr. Waksman for identification of the fungus, Dr. Wehr for identifying the nematode, and Dr. Stunkard for identifying the flukes.

LITERATURE CITED

- (1) ROBIN. Histoire des vegetaux parasites qui croissent sur l'homme et sur les animaux vivants. Paris-Braillier, 1853 (cited by R. P. Rossi). Di un' affezione micosica in alcuni canarini. *Il Nuovo Ercolini*. Anno 12, No. 20, July 20, 1907, pp. 311-313.
- (2) DAVIS, W. A., and McCLUNG, L. S. Aspergillosis in Wild Herring Gulls. *Journal of Bacteriology*, Vol. 40, No. 2, Aug., 1940, pp. 321-323.
- (3) CRAM, E. B. Bird Parasites of the Nematode Suborders Strongylata, Ascariata, and Spirurata. *Bull. U. S. National Museum*, No. 140, 1927, 465 pp.
- (4) CRAM, E. B. New Records of Nematodes of Birds. *Journal of Parasitology*, Vol. 19, No. 1, Sept., 1932, pp. 93-94.
- (5) CANAVAN, W. P. N. Nematode Parasites of Vertebrates in the Philadelphia Zoological Garden and Vicinity. II. *Parasitology*, Vol. 23, No. 2, May 11, 1931, pp. 196-229.
- (6) STUNKARD, H. W. The Life History of *Cryptocotyle Lingua* (Creplin), with Notes on the Physiology of the Metacercariae. *Journal of Morphology and Physiology*, Vol. 50, No. 1, Sept. 5, 1930, pp. 143-184.
- (7) HOFF, C. C. A case of Correlation between Infection of Snail Hosts with *Cryptocotyle lingua* and the Habits of Gulls. *The Journal of Parasitology*, Vol. 27, No. 6, Dec., 1941, p. 539.
- (8) ROTHCHILD, M. A. Seven-Year-Old Infection of *Cryptocotyle lingua* Creplin in the Winkle *Littorina littorea* L. *Journal of Parasitology*, Vol. 28, No. 4, Aug., 1942, p. 350.
- (9) STUNKARD, H. W. The Morphology and Life Cycle of the Trematode *Himasthla quissetensis* (Miller and Northrup, 1926). *Biological Bulletin*, Vol. 75, No. 1, Aug., 1938, pp. 145-164.

New Jersey Agricultural Experiment Station,
New Brunswick, New Jersey.