difficulty. Every picture and colored plate of Barrow's Golden-eye in eastern books is erroneous in this respect.

Unfortunately, the tendency of modern bird-study is towards over-simplification. Since Major Brooks's article, it has become a settled tenet of faith that the adult male Barrow's Golden-eye is (1) readily identifiable and (2) that the best field character is the row of white spots on a dark wing. Proposition no. 1 is true, but proposition no. 2 is, alas, false. Most unfortunately, the male American Golden-eye occurs annually in November and December and again in April in an eclipse or transitional plumage, which has a row of white spots on a dark wing. At a distance or in poor light, the careless or inexperienced observer fails to detect that the "dark" wing is dingy grey, not jet black, and no effort is made to note the other characters, which a real adult drake Barrow's Golden-eye actually possesses. In this way an imaginary Barrow's Golden-eye is quickly materialized out of whole cloth! This has become an annual event on Fresh Pond, Cambridge. Every fall I see transitional male American Golden-eyes which, the day before, the same day or the next day, some other observer happily reports as Barrow's! I have even seen a bird with the round head spot coming in, which was only *partly in*, making it appear crescent-shaped! November, December and April sight records of Barrow's Golden-eye by inexperienced observers, in places where the species does not normally occur, should be dismissed as unworthy of scientific consideration, unless evidence is put on record to show that all the excellent characters of the beautiful drake were noted, and the species was known to arrive particularly early or remain late that year in its regular haunts. All such records from inland localities in Massachusetts are open to suspicion and require validation in my best judgement, as they are either remarkably early or remarkably late.

Cambridge
Massachusetts

AN EXAMPLE OF BUMBLEFOOT IN THE GREAT HORNED OWL

BY DAYTON STONER AND LILLIAN C. STONER

Plate 19

ON March 10, 1944, Dr. Stoner received from E. P. Hotaling, a taxidermist in Gloversville, New York, the carcass of an adult male Great Horned Owl, *Bubo v. virginianus* (Gmelin). The bird was reported to have been taken near Summit, Schoharie County, a few

days earlier. Although the owl was of about average size for this sex of the species (length, 19.75 inches; wing 15.0; tail 8.6) it was much emaciated and weighed only 2.44 pounds.

Evidently the owl had not been able to feed for some time; the usual fat areas on the body had been completely absorbed. In addition, the flesh appeared to be thoroughly dehydrated. A grayish, shell-like mixture apparently of blood, loosened feathers and possibly also nasal discharge had hardened about the external nares. Some of this material was attached in small globules to the tips of the antrorse nasal feathers. The tips of the tail-feathers were somewhat worn and broken, the vanes soiled and discolored with dried and hardened excrement. At the bend of the left wing some abrasion and slight bleeding had occurred. Evidently this was due to attempted use of the wing in terrestrial progression in an attempt to supplement the use of the incapacitated feet. The remainder of the plumage appeared to be normal and cleanly.

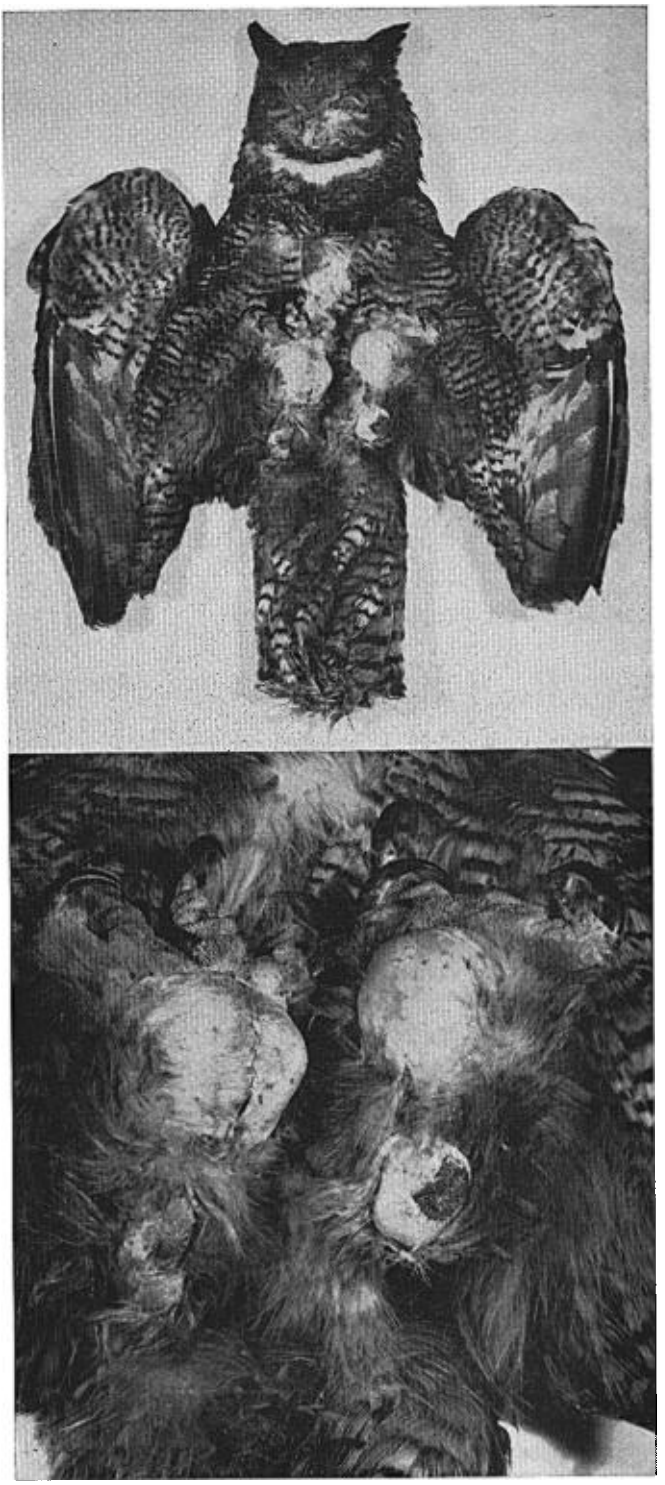
The conditions of the two enlarged and swollen feet were noted separately as their appearance was somewhat different.

The swelling on the left foot was 1.5 inches long by approximately 1.5 inches wide. While the entire foot was swollen, the largest part of the swelling was dorsal and posterior to the sole of the foot. All the claws were sound and entire except that of the third toe which consisted of a basal stub that was more or less gangrenous. Apparently this claw had been missing for some time, its tip worn from use.

The ventral side (of the left foot) of proximal end of tarso-metatarsus and tibio-tarsus had a much smaller bare, swollen area 1 inch long by 0.8 inch wide. Evidently this swollen area had previously broken open and a hard reddish brown scab had accumulated.

The right foot was somewhat less swollen but it had a tumescence dorsal and posterior to the sole of the foot slightly smaller than, but otherwise similar to, that on the left foot; extent about the same. Claw of the second toe adhering to the foot only by a shred of skin dorsally; the claw itself normal; 'gangrenous' area involving the osseous tissue at the base of toe. Dorsal side of foot less tumescent than left foot. Naked area at 'heel' less extensive and inflamed than that on the left tarsus but carrying a small brownish scab.

Mr. Hotaling, the taxidermist from whom the specimen was obtained, stated by letter that he believed the bird had been killed in the wild and from the general cleanly appearance we would assume this to be the case. He also added that the swollen condition of the feet was first noticed when he started to skin the bird and thinking that perhaps the owl had attacked a porcupine he made a cut in the enlarged part of the right foot; however, no quills were found.



BUMBLEFOOT IN THE GREAT HORNED OWL. (Photographs by Kenneth W. Ireland.)

Dr. Stoner, aided by Mr. Louis J. Koster, preparator at the New York State Museum, opened the 'tumor' on the right foot on March 11 and they recorded that "firm more or less structureless mass, surrounded by an inflamed, highly vascular capsule, is found to make up the bulk of the swelling. The skin of the foot itself is thickened, swollen and inflamed. The hardened central mass can be easily separated from the inner wall of this investing capsule."

A single owl fly, *Ornithoponus americanus* Leach, was taken from the feathers of the specimen; no other parasites were discovered.

The feet were submitted to Professor F. R. Beaudette, Poultry Pathologist of the New Jersey Agricultural Experiment Station at New Brunswick, New Jersey, for further determination as to the name of the disease and the cause of this malformation.

Excerpts from Dr. Beaudette's letter of March 17, 1944 give his diagnosis of the case which he has permitted us to quote in this article:

> "From all appearances, this condition is no different than a similar one which is quite common in chickens and which goes under the common name of bumblefoot. The cause of this has never been positively determined although opinions have been expressed to the effect that it develops in birds that roost on sharp perches or in birds that will jump on hard surfaces insufficiently protected with litter. However, field observations indicate that the disease occurs in the flock whether these factors are present or not. In fact, they are usually absent.
>
> "A bacteriological examination reveals negative or positive results depending upon whether a fistulous tract has formed or not. If the swelling has no communication with the exterior, cultures usually remain negative. Otherwise, the predominating type of organism is Staphylococcus aureus. Since this organism is widespread in nature, its presence in the abscess is easily accounted for whenever a fistulous tract develops.
>
> "I made a stain of a smear from the [right] foot and it is clearly evident that cocci predominate although there are a few rod forms. I also took a culture without any idea of obtaining a growth since the specimen was packed in formaldehide but to my surprise I find that there is quite an abundant growth on the plate, presumably the cocci and a few other colonies of the rods seen in the smear. I am quite sure that they have no primary causal relationship with the disease."

The February 20, 1944, issue of the New York Herald Tribune contained an account of the Griffon Vulture which died in the Bronx Zoo. It was reported that this bird was afflicted with bumblefoot. Dr. C. W. Leister, Curator of Mammals at the New York Zoological Park confirmed this above account in a letter to Dr. Stoner dated March 30, 1944, in which he said: "This bird was afflicted with bumblefoot for a long period of years . . . it [this disease] occurs with a fair degree of regularity in our captive birds kept indoors and with no particular relation to groups or species. Since it seldom if ever is a major cause of death it does not appear in our autopsy records."

The disease, bumblefoot, when present in poultry is frequently the result of an injury or bruise which causes pus to accumulate in the foot. If the pus is not let out the swelling often breaks of its own accord. However, in this case the pus remained and became more or less solidified into the cheesy masses which appeared as swellings. As far as we can ascertain, this is the first occurrence of bumblefoot recorded for the Great-horned Owl.

Although both legs of the owl were removed, the remainder of the specimen is preserved as a study skin and it, along with the unopened left foot which is preserved in fluid, and the fly now bear accession number 6442 in the New York State Museum collection.

REFERENCES

BUNYEA, HUBERT

1936. Acid-fast organisms found in so-called bumblefoot of chickens. Jour. Amer. Veterinary Med. Assoc., 88 (n. s.), 41 (no. 3): 386–392.

BUNYEA, HUBERT AND WEHR, E. E.

1941. Diseases and parasites of poultry. U. S. Dept. Agr., Farmers' Bull., no. 1652: 37.

KAUPP, B. F.

1921. A bacteriological study of abscess of the feet of single comb white leghorn hens. Trans. First World's Poultry Congr., 1: 268–274.

New York State Museum
Albany, New York.

A SYSTEMATIC STUDY OF THE MAIN ARTERIES IN THE REGION OF THE HEART—AVES VI

TROGONIFORMES, Part 2[1]

BY FRED H. GLENNY[2]

IN a previous paper (1), the writer presented the basic arrangement of the main arteries in the neck and thorax of the Trogoniformes—based on the study of eight species of the family Trogonidae. A single basic arrangement-pattern was found to be characteristic for the family, while only slight variations in persistence of the ligamentous vestiges of the left radix aortae and the right ductus botalli were recorded. The species of trogons which were studied were found to be "aves laevo-carotidinae," and the primary ascending-oesophageal artery arose as a branch of the left ductus shawi.

---

[1] Contributions of the Department of Zoology, University of Toronto.

[2] Formerly Assistant, Department of Zoology, University of Toronto; now on active duty with the U. S. Army Medical Department.