

ARTERIES IN THE HEART REGION OF THE KIWI

BY FRED H. GLENNY

INTRODUCTION

THROUGH the cooperation of the Curator of Birds of the United States National Museum, the writer was able to study the arrangement of the main arteries in the region of the heart of the Kiwi (*Apteryx australis mantelli*). The findings are set forth in the following observations with the hope that they may be of interest to students of bird anatomy, and to give a better understanding of the structure of the bird.

OBSERVATIONS

The left and right innominate arteries arise from the aortic root of the right ventricle. The systemic arch on the right side remains as the functional arch and joins the right radix aorta which passes posteriorly to join the definitive dorsal aorta. The left and right ligamentum botalli are present along with the distal portion of the left radix aorta now fused with the left ligamentum aortae (Glenny, 1941).

Unlike most other birds (Glenny, 1940, 1940a, 1941a), the innominate arteries give rise to two thyroid arteries (dorsal and ventral) before giving rise to the internal carotid and subclavian arteries. The subclavian arteries give rise to the 1) coracoid, 2) internal mammary or intercostal, 3) cutaneous, and 4) two pectoral-axillary arteries.

With the reduction of wings from flight, there is considerable modification in the areas supplied by the pectoral and axillary arteries as compared with those areas supplied by the same vessels in other birds. Thus the arteries which normally supply the pectoral muscles of other birds, supply the wings, skin, and pectoral muscles in the Kiwi. The latter or pectoral muscles are supplied by small branches of the larger arteries which supply the wings. The cutaneous artery supplies the skin and is lateral in position.

The left carotid arch gives rise to the 1) brachio-scapular, 2) internal carotid, and 3) superficial cervical arteries. The left superficial cervical artery gives off a branch which passes laterally along the neck and supplies the muscles and other tissues in that region, while the other branch supplies the trachea and lymphatic glands on the left side of the neck. The internal carotid enters the hypapophysial canal and passes anteriorly toward the head alone.

The right carotid arch gives rise to the 1) cervico-brachio-scapular and 2) ascending-oesophageal arteries. The former sends off small branches to the syrinx, brachio-plexus, shoulder and scapula, and anteriorly along the dorsal region to the cervical musculature. The ascending-oesophageal gives rise to one important branch which supplies the lymphatic glands on the right side of the neck; otherwise it supplies the oesophagus and to a lesser extent other tissues in this area.

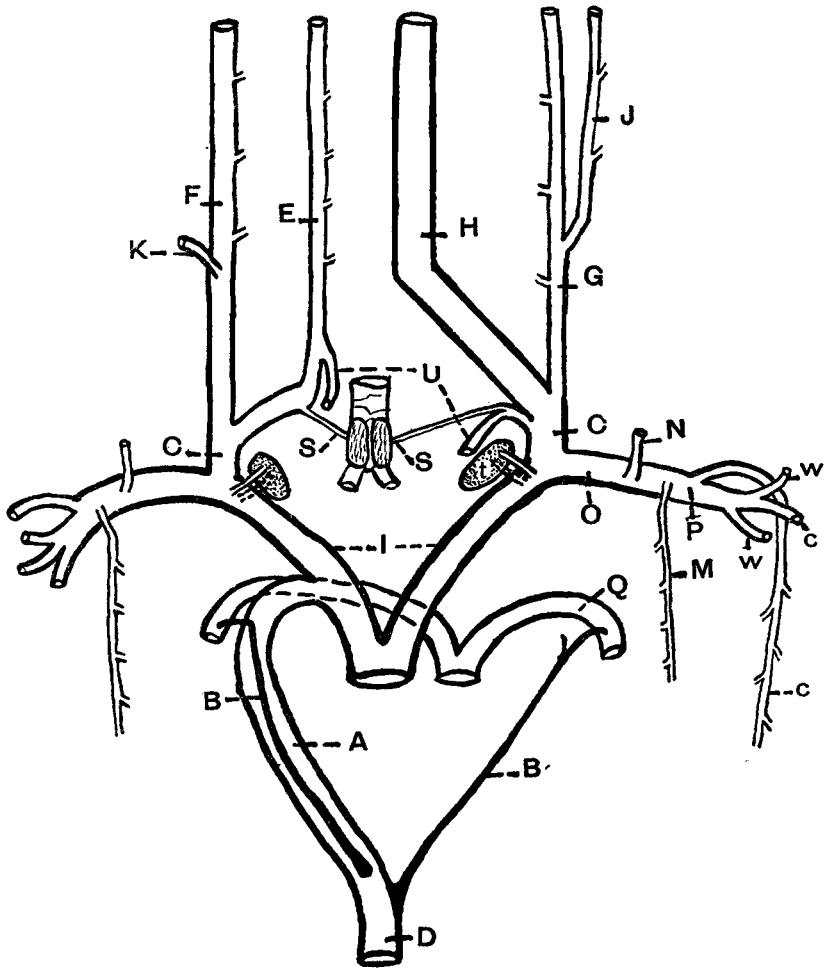
DISCUSSION

Although only one specimen of this species of Kiwi was available, based upon the former experiences of the writer it is safe to assume that the above picture is a reasonable representation of the condition of the anterior part of the arterial system in *Apteryx*.

The writer is of the opinion that this condition is to be considered as an example of modification rather than of extreme primitiveness. This conclusion is based upon the evidences presented in the penguins, a late rhea embryo, and other presumably primitive birds. The fact that a branch of the right carotid arch is superficial is an indication that this arrangement is one of modification and perhaps to a lesser degree of primitiveness. However, the greatest modification of

TEXT-FIG. 1.—Diagrammatic representation of the main arteries in the region of the heart of the Kiwi (*Apteryx australis mantelli*).

- A, right radix aorta.
- B, ligamentum aortae.
- C, internal carotid artery.
- D, dorsal aorta.
- E, right cervico-brachio-scapular artery.
- F, right ascending oesophageal artery.
- G, left ascending tracheo-lymphatic artery.
- H, left vertebral artery.
- I, innominate arteries.
- J, superficial cervical artery.
- K, right lymphatic artery.
- M, internal mammary (intercostal) artery.
- N, coracoid artery.
- O, subclavian artery.
- P, pectoral arteries.
- Q, pulmonary artery.
- S, ductus shawii.
- U, scapular arteries.
- c, cutaneous branches of pectoral artery.
- w, axillary branches of pectoral artery.
- t, thyroid gland and arteries.



Diagrammatic representation of the main arteries in the region of the heart of the Kiwi (*Apteryx australis mantelli*).

arterial supply is found in the arteries which are derived from the subclavian artery. In the rhea and penguins, these arteries follow much the same general pattern as those in other species of the more primitive orders of birds.

ACKNOWLEDGMENTS

The writer wishes to thank Dr. Alexander Wetmore and Dr. Herbert Friedmann, of the U. S. National Museum, for their kindness in making available material and facilities for this study.

REFERENCES

GLENNY, FRED H.

1939. An anomalous artery in the kingfisher (*Ceryle alcyon*). Ohio Acad. Sci., 39: 94-96.
1940. A systematic study of the main arteries in the region of the heart. Aves I. Anat. Record, 76: 371-380.
- 1940a. The main arteries in the region of the heart of three species of doves. Bull. Fan Mem. Inst. Biol., Peiping, China, zool. ser., 10: no. 4, Dec. 25.
1941. Presence of the ligamentum botalli in the Golden Eagle, the Red-tailed Hawk, and the Common Pigeon. Ohio Journ. Sci., 41: 46-49.
- 1941a. A systematic study of the main arteries in the region of the heart. Aves II. Ohio Journ. Sci., 41: 99-100.

*Bird Research Laboratory,
Summit County Wildlife Research Station,
Akron, Ohio*