

ESOPHAGEAL DIVERTICULA IN THE REDPOLL,
ACANTHIS FLAMMEA

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ON 16 March 1960 the junior author banded a Redpoll that had an unusual enlargement on the right side of the neck (Figure 1). Closer examination revealed a similar enlargement on the left side. Finally it was determined that both enlargements were a single pouch filled with millet seeds. More than 600 Redpolls were subsequently banded, and each showed similar dilations.

When filled with seeds, this enlarged esophageal pouch is visible externally in the lateral cervical aperture on either side of the neck (Figures 2 and 3). In dorsal view the impression of separate lateral pouches is enhanced by the fact that the cervical portion of the dorsal spinal tract of feathers divides the enlargement superficially. In the two specimens at hand the pouch is 12 and 15 mm long on the left side, and 16 and 19 mm in length on the right side; size of course depends upon the volume of the contents. The portion on the right side occupies

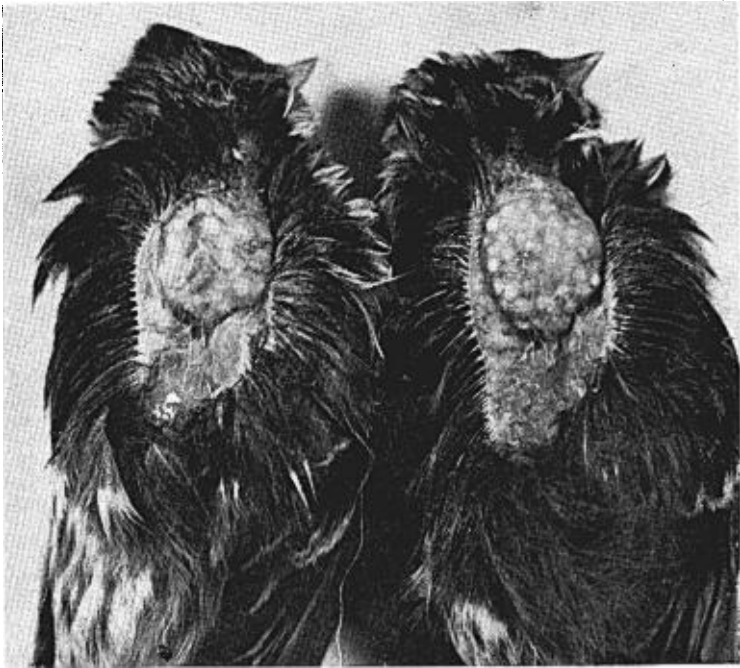


Figure 1. Superficial external view of right side of esophageal pouch in Redpoll. No dissection.

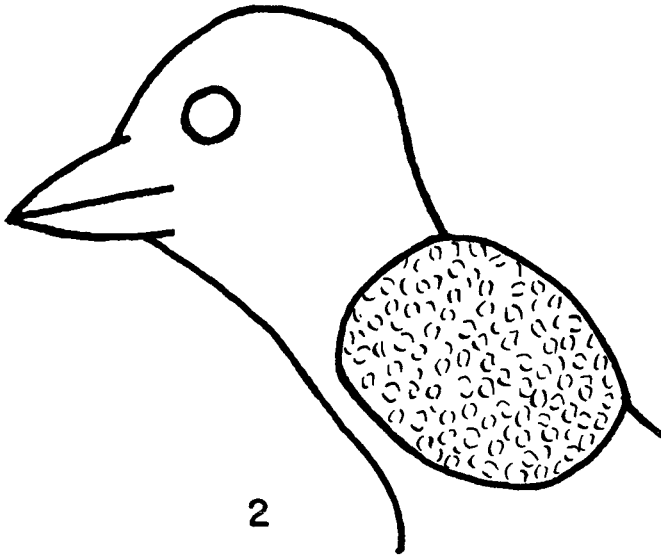


Figure 2. Diagram of left side of esophageal pouch in Redpoll.

the entire length of the neck from the posterior end of the skull to the sternum.

Dissection shows that there is actually a single enlargement of the esophagus (Figure 5), which extends laterally and dorsally around the right side of the vertebral column and forms a lesser enlargement on the left side of the column (Figure 4). The slight dorsal constriction

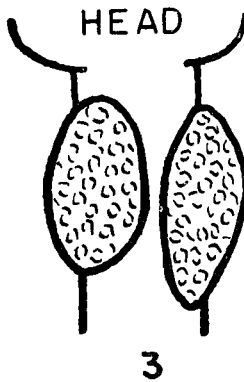


Figure 3. Dorsal view showing superficial division of esophageal pouch into right and left components.

between the right and left parts of the pouch is produced by a pair of dermal muscles lying in the midline, as well as by the feathers of the spinal tract.

The diverticulum is thus a "false crop" in the terminology of Pernkopf and Lehner (1937). There is no controllable aperture between it and the esophagus; it is simply an expansion of the esophagus.

Microscopic sections were made of the enlargement in the Redpoll, of the crop in the Domestic Pigeon (*Columba livia*), and of the esophagus in the Cardinal (*Richmondena cardinalis*), the Rufous-sided Towhee (*Pipilo erythrophthalmus*), and the English Sparrow (*Passer domesticus*). No unusual situation was found in the Redpoll. Simple tubular glands, such as apparently occur in many species, were found in the epithelium. The glands were ovoid in shape and farther apart than in the other species examined, and the cornified layer of the epithelium was thinner. All these differences may have resulted from the stretching of the esophageal wall in the Redpoll; preservation in formalin took place when the pouch was filled with seed.

Such croplike structures are not unknown in other species. The junior author has found them in the Goldfinch (*Spinus tristis*) in late November. Dr. Finn Salomonsen (pers. comm.) indicated that he had observed them "even in summer" in the Redpoll and was "astonished" by their size. Niethammer (1933) reported that filling of the fusiform crop in *Passer*, *Serinus*, and *Loxia* caused a dorsal and lateral expansion. Eber (1956) found that the full crop in *Chloris chloris* may extend dorsally over the vertebral column; Farner (1960:419) indicated the same condition in *Poephila guttata*.

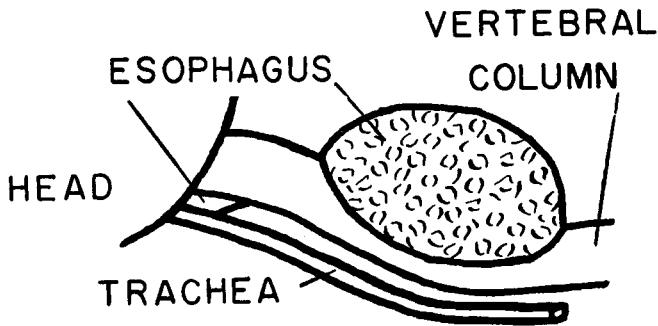


Figure 4. View of left side showing relationships between pouch, vertebral column, and trachea.

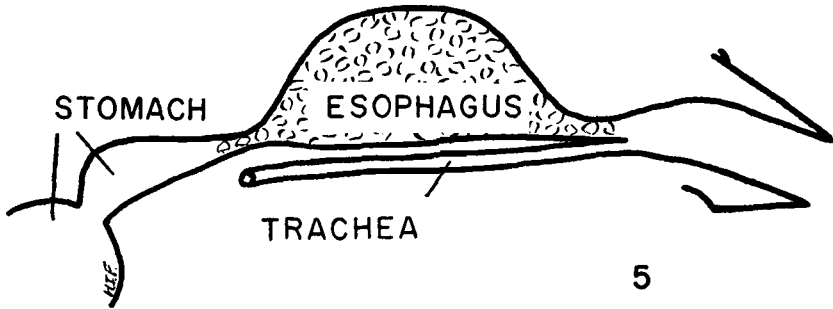


Figure 5. View of right side of esophageal pouch.

It is interesting to speculate on the function of this unique expansion of the esophagus. Its use as a storage place for food can be assumed. But why is it so extensive, and why the dorsal, subdermal extension to the opposite side of the neck? Why would not a crop in the usual position perform just as well? The amount of food contained in the expanded esophagus of these Redpolls seems relatively great—much more than is usually contained in the crop of a bird of similar body size. Is it possible that flexion of the neck in feeding would be impeded if this mass of food were contained in a ventrally located crop?

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