

## THE BROWN JAY'S FURCULAR POUCH

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Travelers along northeastern Mexico's modern highway are apt to remark upon the scarcity of bird life. Those who motor at reasonable speed from Monterrey to Victoria, and thence to Mante, Valles, and Tamazunchale, are sure to see, and almost sure to hear, however, a crow-sized, dark gray-brown bird, with longish tail, that inhabits the brush of the low country. This bird is in no way handsome, but its boldness, simple coloration, and obvious predilection for the roadside insure its being noticed and talked about. It belongs to that tribe of mischief makers, the Corvidae. It is the Brown Jay, *Psilorhinus morio*.



Fig. 58. Brown Jay (*Psilorhinus morio*), about one-fifth life size. Drawing by George Miksch Sutton.

The Brown Jay almost never goes about alone. Family groups of five or six are the rule, although sometimes when an owl, lynx, human being, or other enemy species is being mobbed, a party of twenty or more may congregate. Excitement then runs high. Each jay must approach "the enemy" as closely as it can, so as personally to confirm the "rumors" it has heard. Each jay must scream. If "the enemy" moves, the outcry momentarily stops short; the jays eye each other as if pondering the next move; and the hubbub of screaming starts afresh.

When the senior author first encountered the Brown Jay in the vicinity of Monterrey, Nuevo León, in February of 1938, he was greatly struck with what he called the bird's "hiccup." This sound, which usually was heard just at the close of the customary scream, but often quite independently of it, was not unlike the syllable *puck* or *huck*. Although not loud, it was distinctly audible at a distance of several yards, particularly when the jays, hopping from branch to branch overhead and peering curiously downward, ceased from their outcry. It had a snapping or popping quality, and careful observation disclosed the fact that the bill was usually, if not always, slightly open when the sound was produced.

The hiccup was caused not by some oesophageal spasm, but by the sudden inflation (or perhaps deflation) of a curious little pouch on the jay's chest. Although hidden by the throat and breast feathers and therefore usually not visible in the living bird, this pouch was readily perceptible the instant a freshly killed specimen was squeezed. Now filling to capacity with air, it sprang up, lifting and pushing the feathers aside, only to collapse slowly. A sudden squeezing might even cause it to "pop" faintly.

*Description of the pouch.*—Cursory examination of the pouch disclosed the fact that, when fully expanded, it was spherical and about three-quarters of an inch in diameter; it was tough, faintly powdery in appearance, and sparsely covered with small down-feathers, and when deflated, it occupied the interclavicular space just in front of the sternum. During the course of preparation of study skins it was found to be virtually unskinnable, for the dermis adhered closely to the subcutaneous tissues. The whole structure was, therefore, liberally treated with borax and allowed to dry as a pouch.

All specimens of Brown Jay collected by the senior author and his co-workers in 1938, 1939, and 1941 were found to possess this pouch. Birds of both sexes and those in full juvenal feather possessed it. In May of 1941 an adult male collected by Robert B. Lea in southwestern Tamaulipas was preserved in formalin and brought back for detailed laboratory study.

Dissection of this specimen clearly shows the pouch, which has been called the "cervical sac" (Crandall, *Zoologica*, 1, 1914: 336-337), to be directly connected with the interclavicular air sac. Since the term "cervical air sac" is in current use for two of the nine major air sacs of most birds (the Brown Jay included), the authors propose that Crandall's term "cervical sac" be replaced by "furcular pouch."

At this point a brief statement concerning a bird's air sac system is in order. The system usually consists of nine sacs—all of them connected with, or accessory to, the lungs—two cervical, two anterior intermediate, two posterior intermediate, two abdominal, and the single, unpaired interclavicular. The last-named sac is adherent to the syrinx and lies ventrad, laterad, and cranial to this organ. From it rise four pairs of diverticula—the subscapular, axillar, suprahumeral, and sternal. In the Brown Jay there is still another—a prominent, unpaired, median diverticulum which lines the furcular pouch described above.

The pouch in the specimen at hand measures five-eighths of an inch in diameter, is wrinkled, and, except for a few small down feathers, is quite naked. Its orifice meas-

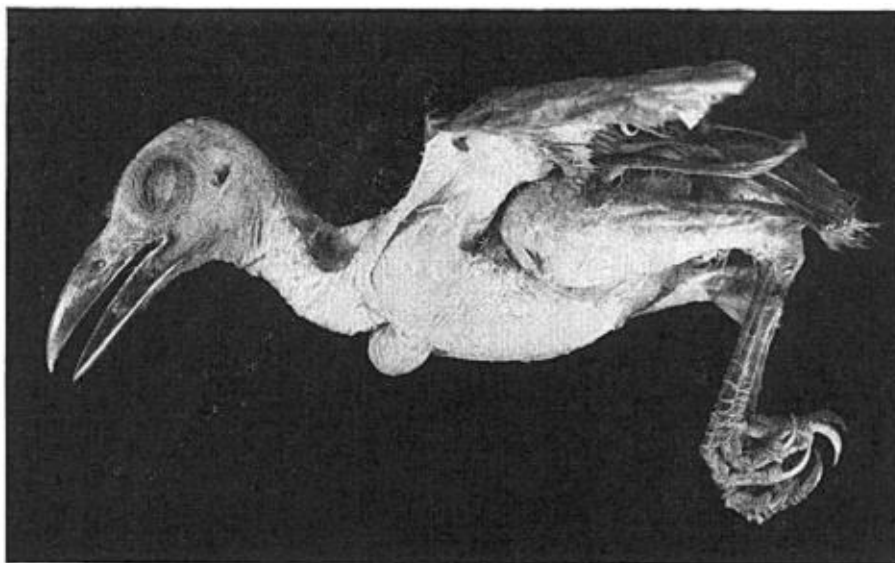
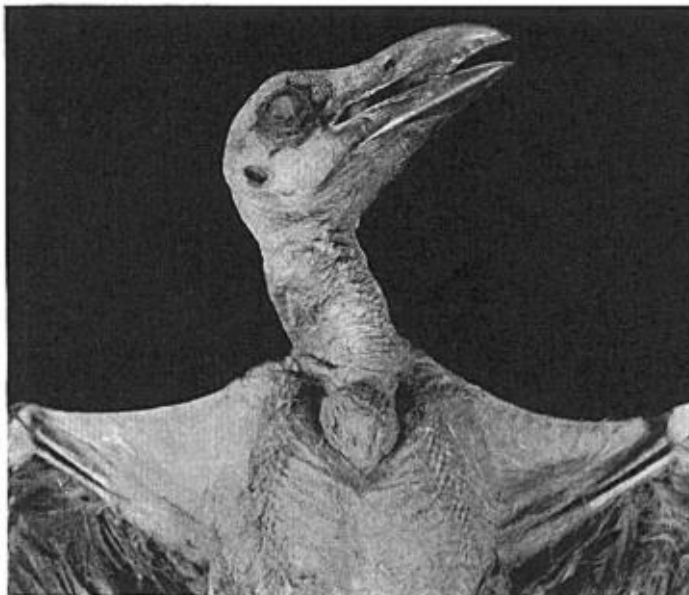


Fig. 59. Ventral and lateral aspects of plucked specimen of *Psilorhinus morio* showing furcular pouch. Photographs by Art Smith.

ures slightly more than one-fourth of an inch in diameter and may be enlarged or reduced respectively through the relaxation or the contraction of the two cleido-trachealis (=cleido-thyreoideus) muscles. These muscles (see fig. 60) originate on the cranial face of the wishbone for a distance of five-sixteenths of an inch on either side of the

interclavicle, pass laterad and craniad around the base of the furcular pouch, and about one-third of the way up the neck become intimately associated with the integumentary muscles. Beyond this point they again free themselves from the skin, pass along the ventral side of the trachea and ultimately insert on the superior lateral border of the larynx, the basal part of the ceratobranchials, and the lateral borders of the basihyal.

By way of comparison, two other corvids (courteously furnished by William E. Bostwick and Stephen W. Eaton) were dissected—a Crow (*Corvus brachyrhynchos*) and a Blue Jay (*Cyanocitta cristata*). In these species the cleido-trachealis muscles were found to be not nearly so well developed as in *Psilorhinus morio*. In the Crow, a larger bird than the Brown Jay, they were much thinner and narrower, not only relatively, but actually. The fact that neither the Crow nor the Blue Jay possesses anything comparable to a furcular pouch suggests the possibility that in the Brown Jay the cleido-trachealis muscles have hypertrophied in correlation with the development of this remarkable structure.

*Histological study.*—Although the available material was not ideal for histological study (it had been fixed in weak formalin), sections from both the ventral and lateral walls of the pouch were stained with various reagents. Sections treated with Mallory's

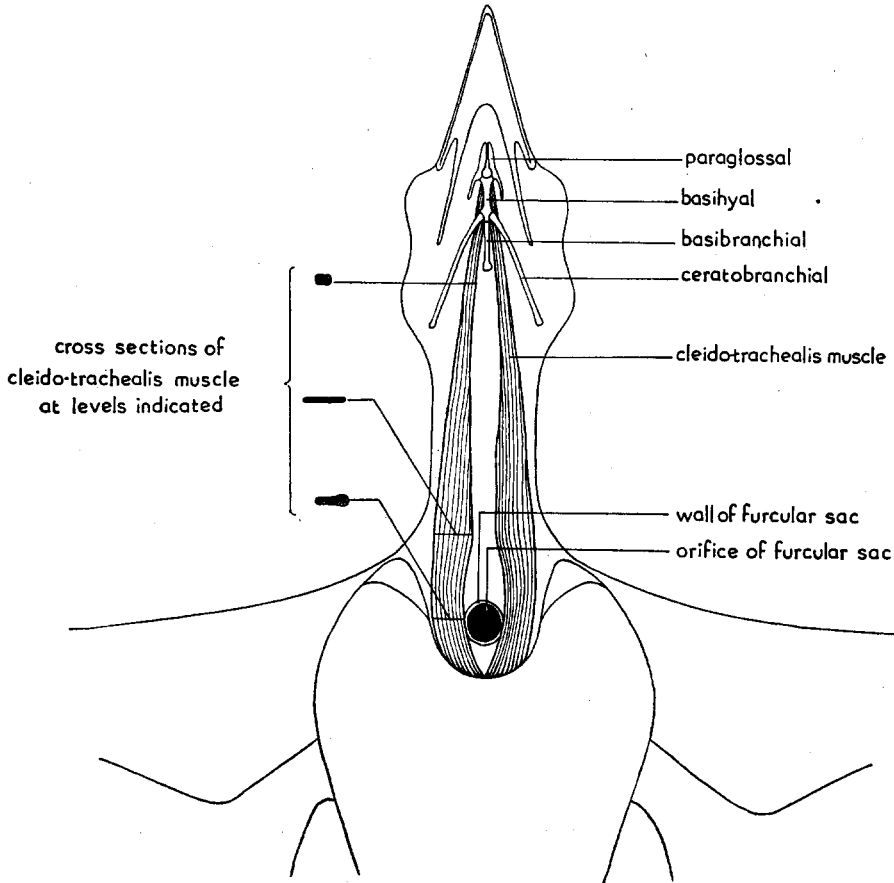


Fig. 60. Ventral aspect of *Psilorhinus morio* showing relationships of cleido-trachealis muscles to orifice between furcular pouch and interclavicular air sac. Drawing by Perry W. Gilbert.

connective tissue stain revealed that the wall consists (from outside to inside) of a layer of integument, an adipose layer, a layer of connective tissue, and a thin, non-ciliated, cuboidal epithelial lining. The ventral wall, because of its relatively heavy layer of adipose tissue, is considerably thicker than the lateral walls. Neither smooth nor striated muscle was detected. Weigert's resorcin-fuchsin stain revealed the fact that elastic fibers, though present, were no more abundant than might be expected in ordinary white fibrous connective tissue. These facts lead the authors to think that the pouch does not contract through action of any intrinsic muscular elements, but that it simply collapses, the air passing from it into the interclavicular air sac during expiration. The speed with which air leaves possibly is regulated to some extent by the cleido-trachealis muscles, but it is doubtful if these muscles ever completely shut the orifice.

*The hiccup as part of the Brown Jay's vocabulary.*—The senior author is well acquainted with the Brown Jay's habits. At the Rancho Rinconada, near Gomez Farias, Tamaulipas (headquarters of the 1941 Cornell University-Carleton College Expedition), the species was abundant. The four members of the expedition were awakened almost daily by the jays, who learned that if they came early to a certain bedroom window and screamed incessantly they could rouse the human beings within.

During these early morning visits the hiccup was used as part of the bird's vocabulary just as definitely as were the scream and other purely vocal sounds. The hiccup was a signal for quiet, for stealthy approach, for close attention to some not quite solved problem. Whether the birds could scream without hiccupping was questionable; but hiccupping without screaming was a common practice. The jay's colloquial nickname, *Papán*, more than likely arose as an imitation of this sound.

The bird student or hunter in southern Tamaulipas is almost certain to be accompanied by a troop of Brown Jays wherever he goes. This is sometimes very annoying, for the birds are apt to be most obstreperous when quiet is most desired. Shooting a jay will sometimes cause the posse to disband. The hunter may now proceed unattended for a time; but he is sure to be rediscovered and the loud-voiced birds gather from all directions as if, completely oblivious to huntsman and gun alike, they were compelled by instinct to rally at a given signal.

If the hunter keeps carefully under cover, he may move about without the jay cortège. Perhaps he sits down to wait for quarry. A jay may approach him, hiccup plainly, hop closer. Other jays may come, each of them hiccupping. If the hunter remains motionless and partly shuts his eyes, the whole flock may examine him, hiccup over him at some length, and pass on without a scream. It takes a certain poise and determination to undergo these inspections. There is a great temptation to turn the head a bit so as to watch the flock. But let the hand move or the eye wink and *pee-ah! pee-ah!* the alarm sounds—and bedlam breaks loose.

So the hiccup is a Brown Jay word. It is produced not by the syrinx but by a pouch that looks like a crop and that connects directly with the bird's interclavicular air sac. Did the pouch come into being because the Brown Jay needed it, or did it evolve quite by chance, persisting because it in no way adversely affected the bird's welfare? The only answer to questions such as these is that the Brown Jay is obviously a successful species; that its anatomy and habits must therefore have been conducive to, or at least not detrimental to, species survival.

*Taxonomic significance of the pouch.*—Early ornithologists apparently failed to notice the Brown Jay's pouch. This was probably because they had no opportunity to study the living or unskinned bird. Rüppell (*Mus. Senckenbergianum*, 2, 1837: 188-189), who named and described the genus *Psilorhinus*, as well as the species *Psilorhinus*

*mexicanus*, made no mention of it. Wagler (Isis von Oken, 7, 1829: column 751), in his description of "*Pica morio*," gave an account of a yellow-footed individual, but said nothing of the pouch. Lichtenstein's brief description of "*Corvus morio*" included nothing pertaining to the species' anatomy (Preis-Verzeichniss, 1831: 1; Jour. für Ornith., 11, 1863:56). George Robert Gray, in his "Genera of Birds" (1849: 307-308), presented a good drawing of the head in profile, the bill (from above), the primaries, and an outline of the foot, but there was no description nor drawing of the pouch. Neither R. Bowdler Sharpe (Cat. Birds Brit. Mus., 3, 1877:4-8) nor Robert Ridgway (Birds N. and M. Amer., 3, 1904:255) made any mention of the pouch in keys to the genera of the Corvidae.

As Crandall (*loc. cit.*) has clearly pointed out, the pouch is present both in *Psilorhinus mexicanus* and in *P. morio*. No one appears to have called attention to the fact, however, that no other corvid possesses such a structure, and that it therefore is probably the most valid single character whereby the genus *Psilorhinus* may be recognized. Many another corvid in the Old World as well as the New has wholly or partly uncovered nostrils, average bill and feet, long or longish and more or less graduated tail, and a color pattern wherein the head and upper parts are dark and the belly and under tail coverts are white. But among corvids the Brown Jay's pouch appears to be unique; the air sac diverticulum contained therein apparently is unique; and the whole structure cannot be dismissed as superficial.

Should the Brown Jays constitute a genus by themselves? In answering this question the authors would like to express their general disapproval of weakly characterized genera, and their particular disapproval of monotypic genera in families of more than one genus. Why maintain such a category as the genus at all unless it be to show, through grouping, that certain forms are related? The answer to the original question, then, is this: The furcular pouch of the Brown Jay is not necessarily a generic character. But if the genus *Psilorhinus* be maintained, the pouch is the most valid character the group possesses.

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