lar to the sunlight (Fig. 1). The head was turned to the left with neck and body feathers fluffed, again maximizing incident radiation. The bird remained in this position for several minutes before resuming its foraging. While the bird was sunbathing I was able to approach it within several feet, and made a quick sketch of the posture.

This behavior may have been associated with the bird's "need" for additional heat absorption in the cool montane forest. Not surprising, in spite of hours of observation, I have not recorded the behavior in Streamertails of the warm lowlands. Other species of hummingbirds of high elevations may also engage in sunbathing and this should be watched for in the future.—CHARLES F. LECK, *Department of Zoology, Rutgers University, New Brunswick, New Jersey 08903.* *Accepted 23 July 1973.*

**Aberrations in the tongue structure of some melanerpine woodpeckers.**—In woodpeckers the tongue is a highly specialized apparatus, differing structurally, in certain respects, from that of most other families of birds. While the structure is mentioned in many ornithology texts, few detailed studies of it have appeared since Leiber's (Zoologica, 20:1–79, 1907) thorough treatise.

In the woodpeckers considered in this study, the two elongated hyoid horns, composed of the ceratobranchial and epibranchial bones, extend posteriorly from the posterior end of the basihyal, curving around the occipital region and roof of the skull and extending forward along the dorsal cranial surface toward the right nostril (Fig. 1A, B). Inserting on the distal tip, i.e. nostril end, of and completely surrounding each horn posteriorly is the branchiomandibularis muscle, which has its origin on the mandibular ramus. Upon contraction, this set of muscles pushes the tongue out of the mouth. In detail, the force of the muscles pulls on the distal tip of the hyoid horns which slide over the surface of the skull away from the nostril. The horn moves within a sheath of connective tissue which is normally attached to the rim of the right nostril. When the tongue is retracted the hyoid bones may extend within their sheaths into the right nostril in male birds. In females the horns may be somewhat shorter, terminating 6–10 mm short of the posterior margin of the right nostril.

In a recent study of the ecology and behavior of several species of melanerpine woodpeckers (Wallace, mss), I found that a surprising number of birds showed abnormal tongue development. The study involved examination of 14 males and eight females of the Red-bellied Woodpecker (*Centurus carolinus*), nine males and five females of the Golden-fronted Woodpecker (*C. aurifrons*) and four males and two females of the Red-headed Woodpecker (*Melanerpes erythrocephalus*), all from the North American mainland. Two island species were also studied: 15 males and 13 females of the Hispaniolan Woodpecker (*C. striatus*) and 15 males and 14 females of the Puerto Rican Woodpecker (*M. portoricensis*).

Examination included removal of the skin of the head to expose the hyoid horns and associated branchiomandibularis muscle. The abnormalities in every case involved the position or relative size of the epibranchial horns with their attached branchiomandibularis muscles. One of the more common aberrations involved horns of different lengths as illustrated in Fig. 1C and summarized in Table 1. Such relatively minor aberrations I have termed type I.

More pronounced aberrations included crossed horns (type II) and abnormal curvature of the horns with displaced attachment of the connective tissue sheath (type III), both shown in Fig. 2. Crossed horns were found in every species examined. In some such cases the horns were of different lengths, but neither horn predominated in being

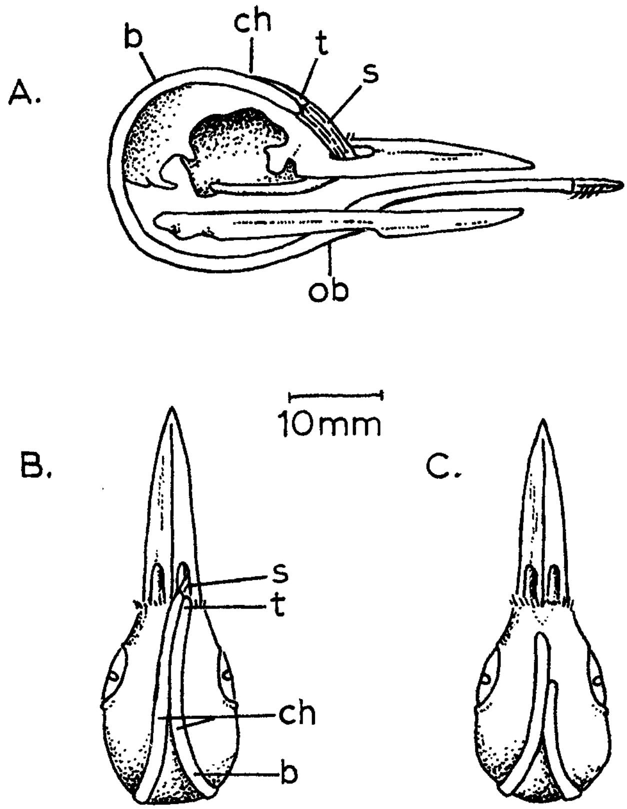


FIG. 1. A, B, normal structure of the tongue of the melanerpine woodpeckers included in this study. (Drawn from a male *Centurus striatus.*) ch, converging hyoid horns; b, M. branchiomandibularis; ob, origin of the M. branchiomandibularis; s, connective tissue sheath; t, tip of hyoid horns. The horns in some individuals may not extend into the nostril. C, type I abnormality, with horns of different lengths.

longer or above the other. I should note that if the tongue protruded at the time of collection, I pushed it back between the mandibles with the tip of the finger. On dissection, the membrane in which the hyoid moves over the skull was traced to its origin so that it was clear that the abnormal curvature was not artifactual.

Notably, type III aberrations (abnormal curvature of the horns) appeared only in the

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FIG. 2. Types II and III abnormalities in woodpecker tongues. Top row, left to right: *Centurus aurifrons* male, female; *Melanerpes erythrocephalus* male; *C. carolinus* male. Middle row: *C. carolinus* male; *C. striatus* male; *M. portoricensis* male; male. Bottom row: *M. portoricensis* male, female, female, female.

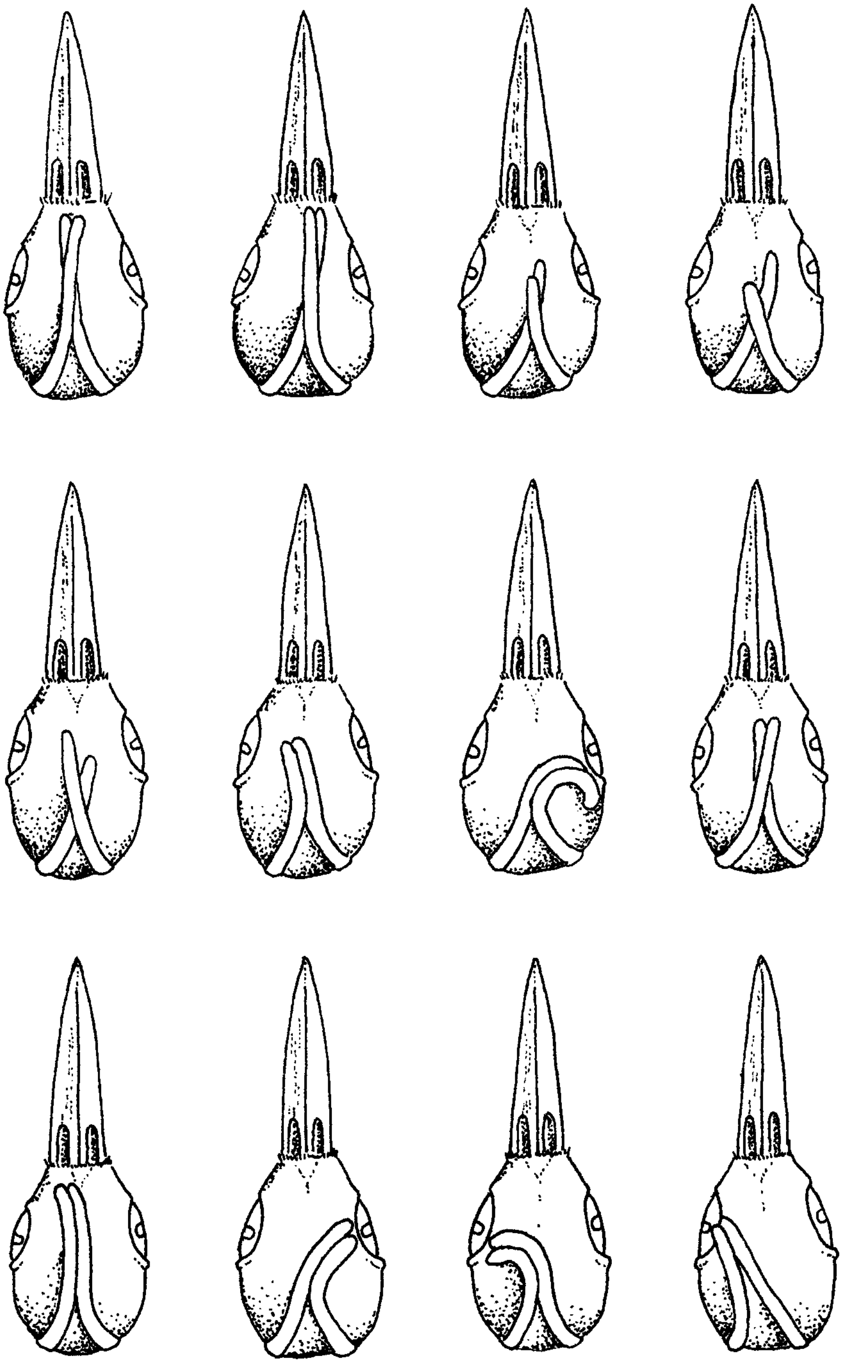

TABLE 1

SUMMARY OF TYPE I ABNORMALITIES

| Species | Sex | The longer horn | Termination[1] | Difference[2] |
|---|---|---|---|---|
| *Centurus aurifrons* | ♂ | R | 2 mm | 1.2 mm |
| *C. aurifrons* | ♂ | R | 2 | 1.3 |
| *Melanerpes erythrocephalus* | ♂ | R | 10 | 1.1 |
| *C. carolinus* | ♀ | L | 8 | 4.6 |
| *C. striatus* | ♂ | L | 9 | 6.9 |
| " " | ♀ | R | 12 | 4.1 |
| " " | ♀ | L | 8 | 6.4 |
| *M. portoricensis* | ♂ | R | 6 | 7.0 |
| " " | ♂ | R | 22 | 21.7 |

[1] Distance of origin of shorter hyoid horn from the base of the bill when the tongue is completely enclosed by the bill.
[2] Distance between points of origin of the two horns.

Puerto Rican species, which also showed a greater overall frequency (21 percent) of individuals with abnormal development than the mainland and the Hispaniolan species.

Why the Puerto Rican Woodpecker manifests an increased level of abnormality in tongue structure is unclear, but considering the incidence it seems that a certain level of variation from the norm is not strongly selected against. Increased variation in trophic structures has been demonstrated in several species of island birds, including woodpeckers (Selander, Condor, 68:113–151, 1966), and perhaps the tongue aberration in this case is associated with insularity. Definitive answers, however, await more specific data on the evolution and ecology of these species.

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**A communal Common Raven roost in Virginia.**—A nocturnal aggregation of at least 106 Common Ravens (*Corvus corax*) was observed roosting near Mountain Lake in Giles County, Virginia. This is the largest aggregation and the only communal roost known to be reported in the southern Appalachians. Wetmore (The list of birds of the Shenandoah National Park, Shenandoah Nat. Hist. Assoc. Bull., 1:12, 1950) observed a diurnal flock of more than 80 Common Ravens in Shenendoah National Park, Virginia, on 18 October 1947. Nocturnal roosts of Common Ravens have been reported in other parts of their range. Cushing (Condor, 43:103–107, 1941) reported a nocturnal roost of about 200 Common Ravens in the vicinity of Tomales Bay, California. Various authors in Great Britain have reported communal roosts, usually comprised of between 27 and 70 individuals, and on occasion up to several hundred.

The Mountain Lake roost was discovered shortly before sunset on 6 January 1973 when