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National Museum has two specimens of *Myosciurus* from French Congo (Gabon). These specimens (males) were collected by Aschemeier at Ntyonga in 1918.

On 28 March 1968, an adult female *M. pumilio* was captured at Engong (10°19' E, 1°37' N), Rio Muni. The animal was caught by hand on the trunk of a fallen tree, and the site of capture was near the edge of a field of *Coffea* and *Musa* bordered by regenerating vegetation, mostly *Aframomum* and *Musanga*. Notes on the labels of four specimens of *M. pumilio* in the British Museum (Natural History) indicated that the animals were observed and captured on trunks of trees.

Comparisons of external and cranial measurements revealed some sexual dimorphism in specimens of *Myosciurus* (Table 1). External measurements of females, taken from specimen labels, were slightly smaller than similar measurements of male pygmy squirrels. Cranial measurements, taken with dial calipers, of females averaged greater than cranial measurements of males.

Little is known of reproduction in *Myosciurus*. The specimen from Rio Muni reported herein was lactating and possessed one pair of pelvic mammae. One pair of pelvic mammae was noted on a female specimen from Cameroon. After his survey of numbers of pairs of mammae in the genera of diurnal squirrels, Moore (1961) reported no observations on *Myosciurus* or on other genera in the tribe Funambulini with only a single pair of functional mammae.

Specimens in the British Museum (Natural History) were examined through the courtesy of Gordon Corbet. The specimen from Rio Muni was obtained during field work supported by the National Geographic Society and a grant (FR00164) from the National Institutes of Health.

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THE ROUTE OF INGESTED BLOOD IN THE VAMPIRE BAT (*DESMODUS ROTUNDUS*)

The gross morphology of the gastrointestinal tract of the vampire bat (*Desmodus rotundus*) has been described by several investigators (Grasse, Libr. Acad. Med., 17:1758–1804, 1955; Park and Hall, Trans. Kansas Acad. Sci., 54:64–72, 1951). In contrast to the simple mammalian tract, in which the stomach separates the gastroesophageal junction from the gastro-

FIG. 1.—Radiogram of a vampire bat that ate 2 milliliters of a blood-barium mixture. "A" shows the position of the gastroesophageal-duodenal junction.

duodenal junction, the vampire has a T-shaped gastroesophageal-duodenal junction with a tubular, caecal-type stomach. A gross morphological description of the gastrointestinal tract, however, does not clearly indicate the pathway of ingested blood.

To determine this, we used the technique of fluoroscopy. Five vampire bats that had been deprived of food for 48 hours were allowed to feed on 2-milliliter increments of blood containing a suspension of barium sulfate and were x-rayed immediately afterward.

The radiogram in Fig. 1 shows a bat that ate only 2 milliliters of the blood-barium mixture; all the barium can be seen in the intestine. The bat in Fig. 2 ate 4 milliliters of the mixture and barium began appearing in the stomach. Fig. 3 shows a bat that ate about 10 milliliters of the mixture in one feeding. All the barium appears to be in the distended stomach, which completely fills the peritoneal cavity and masks a view of the intestines.

FIG. 2.—Radiogram of a vampire bat that ate 4 milliliters of a blood-barium mixture. "A" shows position of gastroesophageal-duodenal junction. Barium is appearing in the stomach (B).

Additional x-rays of this bat taken at 15-minute intervals showed that the stomach began to empty after 30 minutes, and the barium in the intestines then became visible.

Since the blood enters the intestine first and then overflows into the stomach, the stomach of the vampire bat appears to have a function different from that of digestion of protein of the simple mammalian stomach. Wimsatt and Guerriere (J. Mamm., 43:17–27, 1962) found that water was rapidly removed from the ingested blood in the stomach of vampires. Rouk (M. S. thesis, Oklahoma State Univ., 1968), in a comparative study of the gastric histology of Chiroptera, found a much richer gastric vascular network in vampires than in other bats, supporting the hypothesis that a main function of the stomach is water absorption. However, he also determined that chief and parietal cells, responsible for pepsinogen and HCl production, occur in the stomach. Because blood bypasses the stomach or remains in

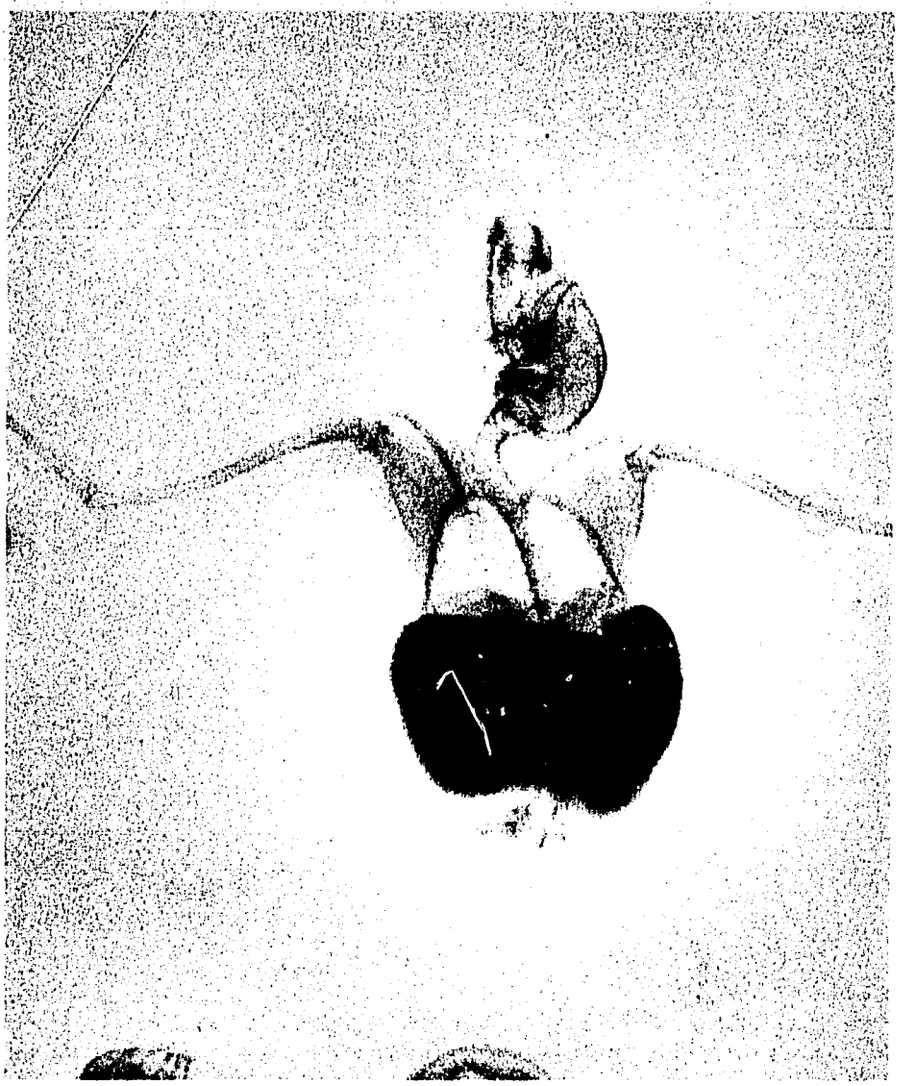

FIG. 3.—Radiogram of a vampire bat that ate about 10 milliliters of a blood-barium mixture in one feeding. The barium in the distended stomach obscures the view of the intestine.

it only a short time, it is questionable how much protein digestion occurs there. Perhaps the primary gastric functions are storage of a large volume of blood and water absorption.

We wish to thank Mr. Charles Ahrens, University of Colorado Medical School, who did the radiography work for this study. This research was conducted with funds provided to the Bureau of Sport Fisheries and Wildlife by the Agency for International Development PASA RA(ID) 1-67.—G. CLAY MITCHELL AND JAMES R. TIGNER, *Denver Wildlife Research Center, Denver, Colorado 80225 (Mitchell is stationed at Instituto Nacional de Investigaciones Pecuarias, Km. 15½ México-Toluca, Apartado Postal 41-652, México, D. F., México).* *Accepted 5 June 1970.*