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## THE BACULUM OF THE GORILLA

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The bacula of both the lowland gorilla and the mountain gorilla were recently described by Hill and Matthews (1949), illustrated with X-ray photographs. Bacula of both these species in the collections of Chicago Natural History Museum, from individuals that are unquestionably adult, differ widely from those described by Hill and Matthews. They are also strikingly different from the corresponding bones of the chimpanzee and orang.

### **Gorilla gorilla.** LOWLAND GORILLA.

The baculum of "Bushman," the lowland gorilla that died recently in the Lincoln Park Zoo in Chicago at 22 years of age, is shown in figure 138.

The bone is a small plate-like structure measuring 5 mm. in length by 3 mm. in greatest width. It is thus considerably shorter than the subadult bone described by Hill and Matthews (7.9 mm.), which appeared "incompletely ossified at its extremities." The anterior tip is attenuated, almost cylindrical in cross section, and curved sharply downward almost at a right angle. The bone widens posteriorly. Slightly behind the middle there is a small wing-like lateral expansion on each side. These processes are curved a little ventrad. They are asymmetrically situated, the one on the right side being farther forward than the one on the left. The posterior border of the bone is rounded. The dorsal surface is convex from side to side, the ventral surface slightly concave.

In side view the baculum is thin, less than a millimeter in dorso-ventral diameter. The profile is straight except for the sharp downward curvature of the anterior tip.

The entire surface of the bone is rugose. This may be pathological, as the texture of all other anthropoid bacula examined is smooth. There is a nutrient foramen on the ventral surface about 1.5 mm. behind the tip.

**Gorilla beringei.** MOUNTAIN GORILLA.

The baculum of an old male mountain gorilla collected by Edmund Heller on the Volcano Sabinio, Uganda, is shown in figure 138.

The bone is a lanceolate plate, 11.7 mm. long by 3.5 mm. in greatest width. It is shorter than the bone described by Hill and Matthews (12.7 mm.). There is no way of determining positively which end is anterior and which posterior, but the orientation shown

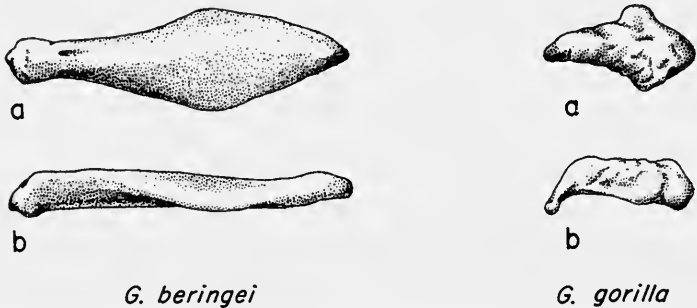


FIG. 138. Camera lucida drawings of bacula of mountain gorilla (*Gorilla beringei*) and lowland gorilla (*Gorilla gorilla*): a, dorsal view; b, lateral view.  $\times 4$ .

in the figure is probably correct and will be used in describing the bone.

The baculum is symmetrical. The anterior end is somewhat truncated and is circular in cross section. From the anterior tip the bone expands gradually to a point behind the middle, where the margin forms an obtuse angle. The margins of the posterior part of the bone converge to an acuminate posterior tip. The dorsal surface of the expanded part is convex from side to side, the ventral surface slightly concave. A nutrient foramen, directed anteriorly, is situated on the dorsal surface just behind the anterior tip.

In side view the baculum is thin, about a millimeter in dorso-ventral thickness. The anterior end is bent slightly ventrad, and the lateral wing-like expansions curve very slightly ventrad. The long axis of the bone forms a slight S-curve.

Both of these bones differ considerably from the corresponding bones described and figured by Hill and Matthews, indicating either that their material was not fully mature or that there is considerable



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individual variation. Hill and Matthews refer to their most mature *Gorilla gorilla* as "subadult," but regarded their *G. beringei* as fully adult.

The most conspicuous difference in the present specimens, aside from their smaller size, is the wing-like lateral expansions seen in both species. These were not present in the specimens examined by Hill and Matthews, and are wanting in the chimpanzee and orang-utan. Hill and Matthews, in fact, describe their *G. beringei* bone as laterally compressed, whereas our specimen of this species would have to be described as dorso-ventrally depressed.

"Bushman" was in captivity from babyhood and the possibility of pathological changes in the baculum cannot be ruled out. The specimen of *Gorilla beringei* was wild-killed, however, and there is no reason for assuming that the bone is not normal.

## REFERENCES

HILL, W. C. O. and HARRISON-MATTHEWS, L.

1949. The male external genitalia of the gorilla, with remarks on the os penis of other Hominoidea. Proc. Zool. Soc. Lond., 119: 363-378, 6 figs., 4 pls.



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