

A Hornless Rhinoceros from the Mio-Pliocene Deposits of East Africa

By

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(With one plate)

The claim of hominoid affinity made on behalf of the extinct apes of Africa has evoked so much interest that closer study of the larger vertebrates likely to prove useful index fossils to such deposits, is essential. One of these, a very imperfectly known hornless rhinoceros, is here described.

For many years fossils of such a rhinoceros, or rhinoceroses, were known from six areas yielding hominoid material; these remains although common, were too fragmentary for precise determination and were regarded as belonging to either *Aceratherium* Kaup or *Teleoceras* Hatcher, typically Miocene genera and both with horns (Osborn 1923).

An almost complete skull devoid of mandible secured in 1947, by the northern branch of the University of California African Expedition to which the writer was attached, has now revealed that it belongs to a new subfamily, genus and species of completely hornless rhinoceros.

Its description is as follows:—

Subfamily *Turkanatheriinae* subfam. nov.

An African subfamily of hornless, tree-browsing, slenderly built rhinoceroses intermediate between the *Paraceratheriinae* Osborn, of Asia and the *Teleocerotinae* Hay, of Europe and North America. For characters see type genus.

Type Genus Turkanatherium Deraniyagala, from the Pliocene of East Africa.

Genus *Turkanatherium* Deraniyagala

(Plate I)

Turkanatherium Deraniyagala, 1951 (November) Proc. 7th Annual Session Ceylon Association of Science, Vol. II, p. 24 (Genus nov.).

Skull dolicocephalic, acuminate, hornless; profile saddle shaped, nasals elongate but weak and acute anteriorly, premaxillaries weak, edentulous, separated anteriorly and acute, nasoturbinals feely developed and not recurved, occiput vertical, sagittal crest compressed, double and feeble; distance from narial cleft to orbit long and contained 5 $\frac{2}{3}$ times in skull length. orbit open posteriorly and closer to nasal tip than to condyle, narial notch ends at vertical plane between first and second premolars, nasofrontal suture, front margins of orbits, fronts of second molars and posterior margin of palate on same vertical plane, upper teeth brachydont, molariform, no incisors or canines, premolars four, molars three, no crista, premolars with tetartocone united to protoloph, postglenoid and post-tympanic processes separate and with infra-otic channel open; occipital condyle enlarged.

Genotype *Turkanatherium acutirostratus* Deraniyagala

Horizon.—The "type" skull was discovered by Dr. H. B. S. Cooke in March, 1948, in the bed of grey tuff conglomerate which lies above the red tuff at Moruaret Hill, West Turkana, 20 miles north-east of Lodwar and 26 miles west of Lake Rudolf, East Africa. The bed is about 90 feet above the present lake level. The specimen is not water-worn although the tuff contained various minerals worn into pebbles. These facts prove that the fossil was not "derived", and since the pebbles are not depressed they are not lacustrine.

The fauna of this grey tuff conglomerate comprises such mammals as *Trilophodon*, *Pliohyrax*, *Brachyodus*, *Listriodon*, *Dorcatherium*, the fish *Lates*, and fossils of existing mollusca. This assemblage suggests that the bed is of Pliocene rather than Miocene age, while the absence of *Hippopotamus* remains further suggests that it is pre-Pliocene.

Fossils of the hominoid *Proconsul* Hopwood, were collected for the first time from similar deposits at the Losodok hills about seven miles east of Moruaret Hill, by Loy Champa, a Turkana policeman attached to the party. Other fossil assemblages more or less similar to that of the Turkana area, and also containing both rhinocerotids and hominoids, occur upon Rusinga and Maboko islands in Lake Victoria, and at Songhor and Koru.

Turkanatherium acutirostratus Deraniyagala

Turkanatherium acutirostratus Deraniyagala, 1951. (November) Proc. of 7th Session of Ceylon Association of Science, Vol. II, p. 24, and "Sri Lanka" Vol. 3, No. 12, pl. I.

Skull very acuminate anteriorly and strongly expanded at zygomatic arches which are widely angular posteriorly, parietal crests vestigial supra-orbitally and forming a weak double sagittal crest, three uniserial pits upon each parietal, premaxillae slender, edentulous, acute and not in contact with one another anteriorly, palate with a median projection posteriorly and ending at vertical plane between first and second molars, vomer fused to floor of mesopterygoid fossa which is as wide as a molar, each pterygoid forms a flat knobless wing laterally, length of preorbital part of skull contained $2\frac{1}{2}$ times in total skull length and $1\frac{1}{2}$ times in distance from front of orbit to occiput, condyle large, height of occiput equals 1.96 times its width at mid height. Nasals do not reach as far anteriorly as premaxillaries, lacrymal prominence small, it lies in the mid region of anterior margin of orbit, no rugose supraorbital swelling. The two teeth rows are nearly parallel to one another, molars longer than wide and also longer than high, ectoloph compressed, no crista. Premolars with tetartocone united to protoleph, parastyle well developed, crochet present but no antecrochet or crista, first molar subquadrangular and possessing a well developed antecrochet and moderate crochet, second molar has a compressed and elongate parastyle and paracone overlapping the back of the first molar; it possesses a feeble antecrochet and strong crochet. The third molar possesses a strong crochet. Cingulum present anteriorly and lingually at base of protocone, and also forms a vestigial prominence at the base of the hypocone at the entrance to the median fossa; there is no cingulum along base of the ectoloph. The enamel on the labial aspect of the ectoloph tends to recurve over its occlusal surface.

Holotype.—The skull of a young adult with the last molars slightly worn; mandible missing. Specimen in the Colombo Museum collection (Pl. I).

Dimensions of "type" skull: Total length 586 mm., mesial nasal suture 164 mm., back of narial notch to orbit (laterally) 109 mm., front of orbit to occiput 329 mm., diastema in front of first premolar 84 mm., free part of nasals 96 mm. long, depth of skull and teeth at front of orbit 207 mm., trans-zygomatic width 320 mm., height of occiput 157 mm., width of occiput at mid height 80 mm. and 90 mm. at vertex, skull height at vertex 204 mm., premaxillary tip to posterior of palate 252 mm., greatest interorbital width 156 mm., tips of nasals to front of orbit 230 mm., front of orbit to condyle end 355 mm., back of narial notch to vertex 460 mm., length of palate 187 mm., width of mesopterygoid fossa at free ends of pterygoids 75 mm., width of condyle 126 mm., length of tooth row 260 mm., distance

between first premolars of opposite sides 50 mm., distance between third molars of opposite sides 65 mm., length of palate 187 mm., length \times width of first molar 48 \times 44 mm., of second molar 62 \times 57 mm., labial height of first molar 28 mm., of second 40 mm.

Discussion

This rhinoceros displays an unusual combination of both unspecialized as well as highly specialized characters which are as follows:—

(A) *Unspecialized*—(1) Hornless, (2) Dolicocephalic—nearly all Miocene and Pliocene aceratheres are brachycephalic (Osborn 1898), (3) Central position of orbit, (4) Vertical occiput, (5) Great distance from narial cleft to orbit, (6) Absence of rugose prominence above orbit, (7) Separate post-glenoid and post-tympanic processes, and open infra-otic canal, (8) Brachydont dentition, (9) Presence of four premolars, (10) Union of tetartocone with protoloph in premolars as in Miocene forms such as *Aceratherium mite*, (11) Lack of a crista in teeth, (12) Poor development of cingulum, (13) Labial margin of ectoloph curling over it.

(B) *Specialized*.—(1) Strongly acuminate shape of skull, (2) Elongate, weak nasals, (3) Expanded zygomatic area, (4) Saddle shaped rhinoceros-like profile, (5) Weak temporal ridges, (6) Large calvarium, (7) Large occipital condyle, (8) High occiput, (9) Loss of incisors and canines, (10) Compression and extension of parastyle and paracone in molars to overlap the back of the tooth in front, as in such Pleistocene forms as *R. antiquitatis*.

Conclusion

The acuminate front of the skull shows that the animal was a tree-browsing species with elongate, pointed upper lip, and of more slender build than the living rhinoceroses. It is too specialized to be as early as the Miocene, and is more probably of Pliocene age, a view supported by some of the animals occurring in association with it while the absence of hippopotamus fossils suggests a pre-Pleistocene age. The hominoid *Proconsul* Hopwood, which occurs in association with *Turkanatherium* should be of similar age.

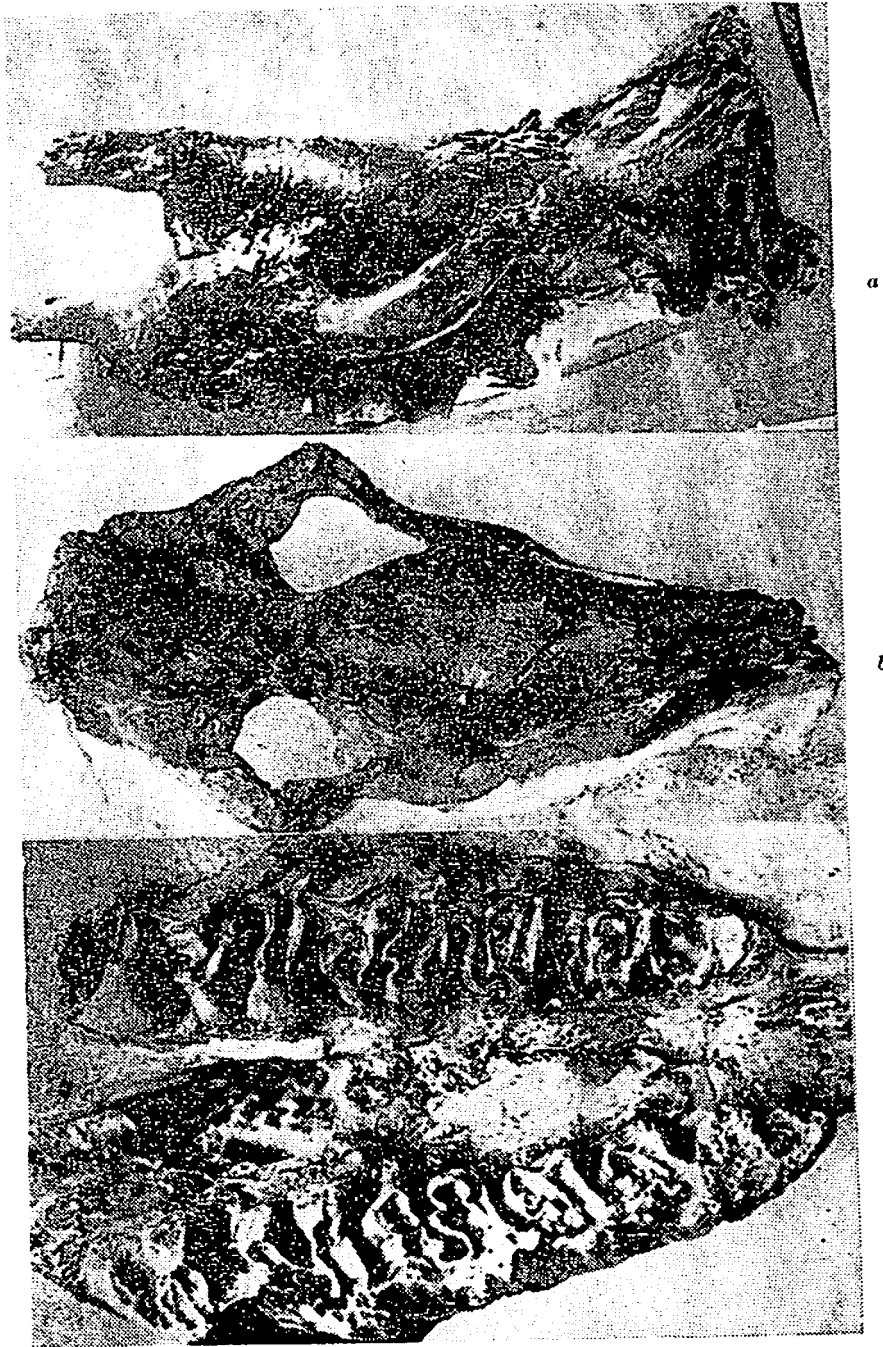
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Explanation of Plate

The type skull of the hornless rhinocerotid *Turkanatherium acutirostratus* Deraniyagala, from the Turkana District, West of Lake Rudolf, East Africa.

- Fig. 1. Skull in "norma lateralis" $\times \frac{1}{4}$, viewed from left side.
Fig. 2. Skull in "norma dorsalis" $\times \frac{1}{4}$.
Fig. 3. Palate and dentition $\times \frac{1}{4}$.



Holotype of *Turkanatherium acutirostratus* Deraniyagala
(a) Skull in norma lateralis, left view. (b) Skull in norma dorsalis.
(c) Palate and dentition. Note absence of crista.