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403. A FOSSIL *RHINOCEROS* FROM KUZUÛ, TOCHIGI PREFECTURE, JAPAN*

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葛生産化石犀の一種：本化石は栃木県葛生の大叶石灰岩のさけめから 1947 年に発見されたもので第二前臼歯は武蔵野郷土館所蔵他は野間達郎氏所有品である。標本は右側上顎前臼歯および大臼歯をそなえているが，歯冠部は第二前臼歯と第四前臼歯を除いては一部分欠損したり又は全部欠損している。歯の形態からみると，中国の周口店によく出る *Rhinoceros mercki* JÄGER によく似ているので同一種かあるいはこれに近い種と考えられるが，今後なを多くの資料の追加提供されるのを待って種名を決定したい。 さしあたり *R.* sp. として報告する。

永 沢 譲 次

The specimen dealt here was given to the present writer for studying through the kindness of Mr. Tatuo NOMA and the writer had reported it as *Rhinoceros* referable to *R. mercki* of Choukoutien in China at the 60th annual meeting of the Japanese Geological Society, spring, 1953, in Tokyo.

This paper is the first description about the above mentioned specimen. My cordial thanks are due to Prof. SAKAZUME of Dôshisha University, to Mr. KUSAKA and Dr. OZAKI of the National Science Museum (Tokyo) as regards literature.

Description of species

Order Ungulata

Sub-order Perissodactyla

Family Rhinocerotidae

Genus *Rhinoceros*

Rhinoceros sp.

Text-figs. 1, 2, 3.

* Received Nov. 15, 1960; read at 78th meeting of the society at Akita, May 13, 1961.

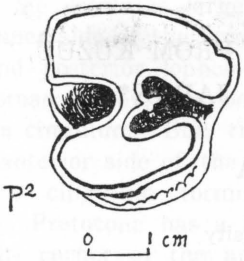
Material:—A fragment of right upper jaw with P^3-M^2 in situ, the rests of broken P^2, M^3, and a detached right P^2 belonging to the Musashino Kyodo-Kan at Koganei, Tokyo.

Locality:—A limestone fissure of Yosizawa quarry, Ôgano at Kuzuû, Tochigi Prefecture, Japan. The specimen was collected in December 1947.

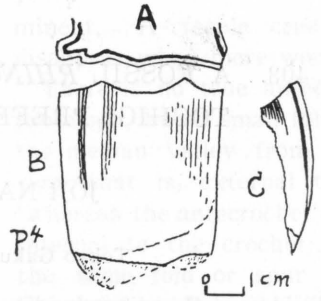
Horizon:—Precise horizon unknown (Pleistocene).

Description:—P^2 much worn. The external wall of the crown with a distinctive parastyle almost smooth and gently convex. Deep-seated crochet crenated or doubled on P^2. Protocone and hypocone fused at the base, and the inner side of inner cones rounded. The anterior fossette has a narrow open inlet at the anterior side of the crown. The crown is bordered lingually and anteriorly by a low basal cingulum. Length of the outer side of the crown is larger than that of the inner side of the crown.

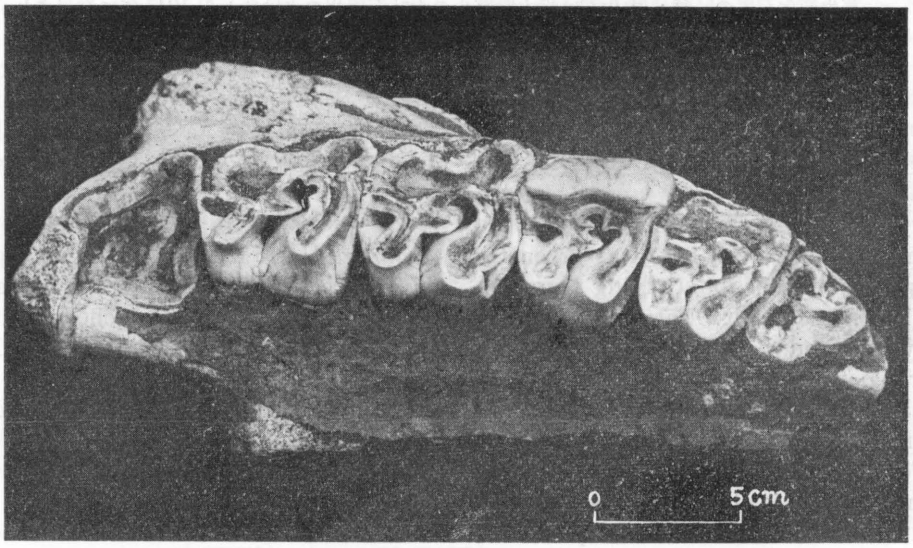
P^3: Crown moderately worn. The inner half part of the crown preserved. Length of the outer side of the crown is larger than that of the inner side of



Text-fig. 2



Text-fig. 3



Text-fig. 1

Text-fig. 1. *Rhinoceros* sp. Right upper premolars and molars, crown-view.
Text-fig. 2. *R.* sp. Right upper second premolar, crown-view.
Text-fig. 3. *R.* sp. Right upper fourth premolar : A, upper view ; B, external view ; C, anterior view.

the crown. Postfossette present. Crochet prominent, with a small spur at its inner portion. Crista rudimentary. No antecrochet. The half part of the anterior side of the crown is bordered by a low basal cingulum. Protocone and hypocone fused at the base, presenting somewhat convex wall.

P^4 : A complete crown moderately worn. Length of the outer side of the crown is larger than that of the inner side of the crown. Posterior fossette present. Crochet prominent, with a spur at its outer portion and another smaller spur at its inner portion. Crista more or less distinct. No antecrochet. Protocone and hypocone fused at the base. The surface of the external wall of the crown comparatively smooth and gently convex, with a single fold (paracone-fold) set much forward, very close to the parastyle. Paracone-fold attains not to the crown base. No posterior fold on the external wall of the crown.

M^1 : The inner half part of the crown is preserved. Length of the

outer side of the crown is larger than that of the inner side of the crown.

Anterior and posterior lophes separated by a broad valley, not bordered lingually by a cingulum. But, the half part of the anterior side of the crown bordered by a cingulum forming an oblique ridge. Protocone has a enamel sinus near the corner of the anterior-inner side of the crown. Posterior fossette present. Crochet prominent. No crista. No antecrochet. A feeble cusp presents at a posterior part of the protocone.

M^2: The inner half of the crown is preserved. Length of the outer side of the crown is larger than that of the inner side of the crown. Crochet prominent. A feeble crista which will disappear when more worn, presents.

There is no true antecrochet on the protoloph, but a small fold projects into the median valley from its outer portion, that is, external to the crochet (whereas the antecrochet always appears internal to the crochet). We can see the same fold or spur on M^1 of the Choukoutien *R. mercki* (Teilhard, 1936, fig. 11) and M^1, M^2 of *R. mercki* Kaup from Les Grottes de Grimaldi (Boule and others, 1906-1919, figs. 2, 5).

The half part of the anterior side of the crown is bordered by a cingulum forming an oblique ridge. Two small cusps present at posterior part of the protocone.

The teeth measure as follows:

	Maximum length	Maximum breadth	Height of crown at outer side	Height of crown at inner side
P^2	33 mm	35 mm	—	—
P^3	39 mm	50 mm	—	22 mm
P^4	45 mm	50 mm	47 mm	25 mm
M^1	50 mm	59 mm	—	20 mm
M^2	51 mm	62 mm	—	25 mm
M^3	46 mm (at base of crown)	54 mm (at base of crown)	—	—

Thickness of enamel layers: 1~2.5 mm
Length of a root of M^3....30 mm (measured directly)
Length of a root of P^3....30 mm (approximately)

From the above mentioned measurements, it is known that crowns are moderately hypsodont (perhaps a little shorter than in *R. mercki* of Choukoutien).

Comparisons:—The character of the teeth above mentioned bears a striking resemblance to that of the Choukoutien *R. mercki*, but the size of teeth is somewhat smaller than in *mercki*. We have known three species of *Rhinoceros* in Pleistocene deposits of China: *R. mercki* Jäger, *R. sinensis* Owen, and *R. tichorhinus* Cuv. (*Coelodonta antiquitatis* Blum.). The specimen described here is easily distinguished from *R. tichorhinus* Cuv. by its smooth outer wall of crown with lophes sub-transvers.

The Chinese form of *R. mercki* was first described as *R.* sp. by Zdansky (1928) and next by Wang (1931) as a new species: *R. choukoutiensis*, but in 1936 Teilhard de Chardin, refered it to *R. mercki* of Europe. This form is two-horned, with a complete nasal septum and hypsodont upper and lower teeth,

and presents no vestigial upper and lower incisors, occurring widely in Pleistocene deposits (from Villafranchian to Loessic times) of China.

NAORA (1954, p. 16) distinguished the present specimen from *R. mercki* owing to the unaccordance of the shape of P^2. But, as compared P^2, a detached tooth belonging to the Musashino Kyodo-Kan at Koganei, Tokyo, with MERCK's P^2 figured by ZDANSKY (1928, pl. 5, fig. 82, pl. 6, fig. 2), the writer could not recognize any morphological or specific differences between both P^2. *Dicerorhinus* (?) sp. which is represented by an isolated tooth, probably M_1 or M_2 reported by SHIKAMA (1949, p. 74) from a fissure deposits of Ôgano limestone at Kuzuû, Tochigi Prefect. is brachyodont (short crowned tooth), so it cannot belong to the same species (*R. mercki*).

According to the descriptions of PEI (1958, p. 32) and TEILHARD de CHARDIN (1936, p. 28), the distinction between *R. mercki* and *R. sinensis* OWEN from Szechuan in China is uneasy as long as the molars only are known in either species. In *R. sinensis*, however, external wall of the upper molariform teeth (especially the two last premolars) is not so even as in *mercki*, but presenting two distinct folds corresponding to the two internal lophes (MATH. and GRANGER, 1923).

As external wall of P^4 of the present specimen is almost smooth, so in this point, the difference is noticeable between this form and *R. sinensis* OWEN.

R. sinensis OWEN reported by MATSUMOTO (1915) is distinguished from this form by distinct folds on the protoloph and the hypocone. M^1 of *R. mercki* illustrated by TEILHARD (1936, fig. 11), M^1 and M^2 of the same species by ZDANSKY (1928, pl. 6, fig. 4, pl. 8, fig. 2) and one isolated specimen, M^2 refered to *R. mercki* by CHIA and CHAI (1957, pl. 2, fig. 1) present a weak enamel sinus or groove at the posterior wall of the protocone, making a feeble antecrochet. But, it is not recognized on M^1 and M^2 of the present specimen, M^1 and M^2 of *R. mercki* illustrated by YOUNG (1933, fig. 18) and M^1 and M^2 of *R. mercki* KAUP from Les Grottes de Grimaldi (BOULE and others, 1906-1919, figs. 3, 5). About the upper teeth of the Choukoutien *R. mercki*, TEILHARD (1936, p. 24) wrote: "Antecrochet and crista small, deep-seated, sometimes vestigial, but rarely entirely absent."

From the above description, it seems, the presence of such a enamel sinus or feeble antecrochet cannot be a constant character in *R. mercki* JÄGER.

But, it is safe to say that if the Chinese forms have constantly more or less recognizable antecrochet in the molars, the present specimen will be distinguished from the Chinese forms by the lacking of antecrochet and small dimensions of teeth.

The present teeth are smaller than those of *R. sinensis* OWEN from Szechuan (MATH. and GRANGER, 1923).

As above mentioned descriptions, the present form seems to belong to MERCK's *Rhinoceros* or species closely allied to it. But, the writer wishes to preserve the precise specific name of this specimen till farther evidences are provided.

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