

SINOTHERIUM LAGRELI RINGSTRÖM.
A NEW FOSSIL RHINOCEROTID FROM SHANSI, CHINA.

By

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In 1917 the undersigned commenced, in coöperation with the Geological Survey of China, a systematic search for fossil mammals, and already in the following year the work had met with so much success that he could, together with Dr. V. K. Ting, the Director of the Geological Survey, work out a definite plan for the continuation of the work.

We secured the able coöperation of Professor C. Wiman of the University of Uppsala, Sweden, for the scientific preparation and description of the rapidly growing material, and the necessary funds for an extensive collecting campaign were obtained partly from contributions by private Swedish donators (who have been awarded special honors by the Chinese Government) and partly by a Swedish Government grant.

It has been arranged between Dr. Ting and the Swedish authorities that the material will be divided between the Palæontological Museum of Uppsala and the Geological Museum in Peking. All the material will be described in the publications of the Geological Survey of China, small preliminary papers in the Bulletin, larger geological papers like my "Essays on the Cenozoic of Northern China" in the Memoirs and the full palæontological monographs in the *Palæontologia Sinica*.

Among the material thus collected, there are a number of new types which have considerable morphological interest.

The first of these new types, recognized as such by Professor Wiman, was a remarkable member of the *Giraffidæ* which has been named by him *Chilinotherium*, the name being derived from the Chinese allegorical animal the *Chilin*, which according to the recent researches of Mr. H. T. Chang is probably an anatomical composition with the giraffe as a model.

The *Chilinotherium* has been given the specific name *Ch. tingi* in honour of Dr. V. K. Ting, the Director of the Geological Survey, who has not only supported our fossil collecting campaign most actively, but has also planned and brought into being the *Palæontologia Sinica*, which is intended to contain, as far as possible, descriptions of all the fossils of China.

We hope soon to receive from Professor Wiman for publication a preliminary description of the *Chilinotherium tingi*.

In the meantime one of Dr. Wiman's pupils, Mr. T. J. Ringström, has sent us the following interesting note on a new member of the RHINOCEROTIDÆ, this form presenting interesting relationships to the isolated and remarkable *Elasmotherium*. This new Rhinocerotid has been named *Sinotherium* by Mr. Ringström with the specific name *S. lagrelii* in honour of Mr. A. Lagrelius of Stockholm, who with tireless enthusiasm has financially supported our collecting campaign from its inception.

Peking in May 1922.

J. G. Andersson

Among the fossil mammals, that have been collected in China during the last few years by Dr. J. G. Andersson, there has lately been found a Rhinoceros tooth of gigantic dimensions, belonging to a new form, which I propose to name *Sinotherium lagrelii* Ringström. The specimen consists of the third molar from the left maxilla, and is about half worn down. It is somewhat damaged, the roots and the upper part of the protocone being broken off. The length of the tooth, measured along the ectoloph, is 10.5 cm., the height of the crown on the outer side is about 9 cm., and the greatest width 6 cm. It must thus have belonged to an animal of unusual dimensions, closely comparable with *Elasmotherium*§; though probably larger than that animal. The most conspicuous characteristic of the tooth is the sinuous folding of the enamel, and the filling up with cement. The outsides too, are covered by a thin layer of cement. In the middle of the grinding surface the cement is less strongly developed, whereby a triangular shallow cavity arises. Otherwise the tooth is built according to the typical pattern of the *Rhinocerotides*.

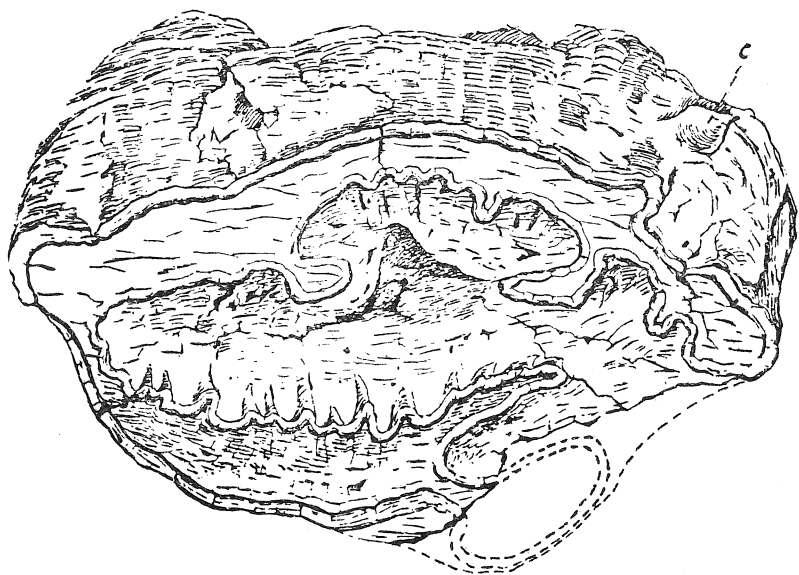


Fig. 1. *Sinotherium lagrelii*.
Third molar of left maxilla. Nat. size. c. Rest of cingulum.

The ectoloph is nearly straight, with no trace of the parastyle, 'crista', 'crochet' and 'antecrochet' are well developed; the protocone is large, and strongly

§ Brandt, J. F., "Mittheilungen über die Gattung *Elasmotherium*, besonders den Schädelbau derselben." *Mem. Ac. Imp. Sci. St. Petersbourg, Ser. VII*; Vol. XXVI 1878.

constricted off. The cingulum has completely disappeared with the exception of a small residuum (c in the figure) between the ectoloph and metaloph, which has the shape of a conic style. As already mentioned, *Elasmotherium* and *Sinotherium* occupy, with regard to size, a special position within the family RHINOCEROTIDÆ, and it seems likely that in *Sinotherium lagrelii* we may have found a less specialized form, belonging to the same phylum as *Elasmotherium*. One further resemblance to *Elasmotherium* is found in the characteristic folding of the enamel. In *Sinotherium* the folds are confined to the protoloph and the middle part of the ectoloph, while in *Elasmotherium* the enamel of the entire tooth is folded. This is however, only a difference in degree, which agrees well with the geological succession of these two animals; *Elasmotherium* lived during the Pleistocene, while the tooth in question comes from the early Pliocene or late Miocene deposits in Pao-Te-Chou, in the province of Shansi, a deposit which contains a typical *steppe fauna* e. g. hipparions, giraffes and antelopes. Further resemblances to *Elasmotherium* are seen in the facts, that the 'fossettes' are filled with cement, and that the protocone is strongly constricted and prominent. Contrary to what is seen in *Elasmotherium*, this tooth, although strongly specialized, still retains the typical appearance of a Rhinoceros molar, and has, like that, distinct roots. Supported by the above-mentioned resemblances, I do not hesitate to place *Sinotherium lagrelii* within the subfamily ELASMOTHERIINÆ, which formerly included only two species, both from the Quaternary period. I consider it premature, with the material in hand, to attempt to solve the riddle of the origin of *Elasmotherium*, or to connect the ELASMOTHERIINÆ, with any of the other six Rhinoceros phyla, arranged by Osborn¹). Still, certain details in the tooth do remind one of the 'Teleocerine' rhinoceroses and of some aceratheres. Osborn²) has shown that *Aceratherium incisivum* has a frontal horn, and suggests that *Elasmotherium* may possibly originate from that or some similar form. I do not consider that the tooth here described supports such a conclusion, for it shows that the members of the ELASMOTHERIINÆ were strongly specialized, and had already reached a huge size during the early Pliocene. It seems thus more probable that both these Rhinoceros phyla originated from some common ancestral type of the early Tertiary period, rather than that the ELASMOTHERIINÆ represent a side-branch of the ACERATHERIINÆ.

1) Osborn, H. F., Phylogeny of the Rhinoceroses of Europe. *Bull. Am. Mus. Nat. Hist.* Vol. XIII. 1900.

2) Osborn, H. F., Frontal Horn on *Aceratherium incisivum*. Relation of the Type to *Elasmotherium*. *SCIENCE*, n. s. Vol. IX. Feb. 1890.