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## THE MAMMOTHS (*MAMMUTHUS PRIMIGENIUS*) OF HOFSTADE (BRABANT, BELGIUM)

by Mietje GERMONPRE (★)

The fauna of Hofstade was collected in the beginning of this century during works to extend the railway connection between Brussels and Mechelen. The fossils were deposited in the Institut Royal des Sciences Naturelles de Belgique. Although some papers on the site were published by RUTOT (1909a, 1909b, 1910), MOURLON (1909) and PASTEELS (1942), it took until 1973 before the complete fauna was studied in detail (BRAET, 1973), FRIANT (1948, 1961) worked only on the skulls of the woolly rhinoceros from this site.

The stratigraphical position of the finds is not very clear. The bones are supposed to have been collected from the top of a layer containing gravel composed of flint, sandstone and paleozoic rock (RUTOT, *ibid.*; MOURLON, *ibid.*). Today the site is no longer accessible, since the excavation became an artificial lake, but we know that the site lies within the "Flemish Valley", an assemblage of fluvial erosive forms of Pleistocene age within this geomorphological complex. PAEPE (1971) described an analogous layer at the site of Zemst (4 km to the west of Hofstade) as Coarse Basal Gravel consisting of coarse sand, flint gravel of sandstone and paleozoic rock. Further to the west, DE MOOR and HEYSE (1976) described an equivalent deposit as the formation of Dendermonde (afzetting van Dendermonde) containing coarse sand and flint, sandstone gravel, paleozoic rock gravel and mammal bones. According to PAEPE (*ibid.*) the Coarse Basal Gravel deposit belongs to the Eemian, while according to DE MOOR and HEYSE (*ibid.*), the formation of Dendermonde dates from the Eo-Würm. It seems hence that the fossiliferous deposits of Hofstade are situated near the transition from Last Interglacial to the Last Glacial. On paleoecological grounds (fauna) however we can say that they very probably belong to the Last Glacial.

The fauna itself consists mainly of remains of woolly mammoth and woolly rhinoceros. Horse, bison and reindeer are also well represented; in lesser quantities giant deer, cave bear, cave hyena, cave lion, fox and cattle (intrusive material from the upper Holocene) occur (Table I). The low frequency of small animals is striking; moreover the collection contains only limited quantities of smaller bones of larger animals. No doubt differential sampling accounts for these facts; probably the collectors picked up only the more obvious and larger bones.

In this article we want to present some new data on the Hofstade mammoths, concerning their more precise identification. A complete revision will follow in a later paper.

The identification of the proboscidean remains is based on the morphology of the third molars as reflected in the so-called shearing index (SI). This index is defined by MAGLIO (1973) as follows :

$$SI = \frac{2LF(M3^*) \cdot 2LF(M3_{\star}) \cdot W(M3_{\star})}{1000}$$

with  $LF(M3^*)$  = lamellar frequency of upper third molar i.e. the number of plates in a crown length of ten centimeters;

$LF(M3_{\star})$  = lamellar frequency of lower third molar;

$W(M3_{\star})$  = width of lower third molar.

According to the same author (*ibid.*) the shearing index can be calculated for each species by using the mean values of the parameters. This gives a rough indication of the average index for the species. We used the minima, maxima and means of the lamellar frequencies and of the width of the molars given by BRAET (*ibid.*). The diagram

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(Fig. 1) summarizes the results for several samples. Mean values of the shearing index of *Mammuthus armeniacus* (until now known as *M. trogontherii*) and *M. primigenius* were taken from MAGLIO (*ibid.*) who unfortunately does not mention the sites or the stratigraphical position of the material.

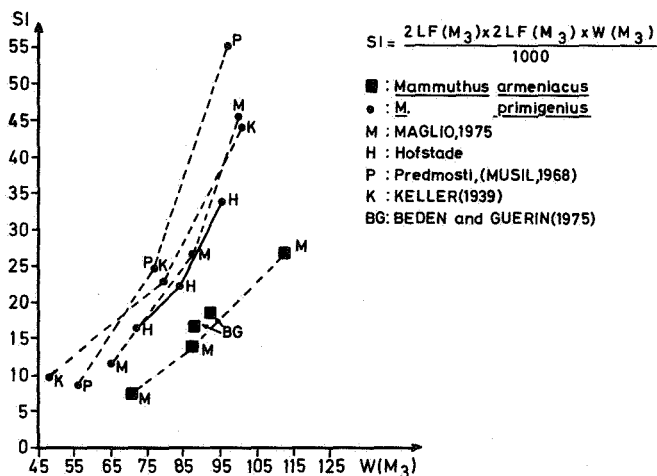


Fig. 1: Shearing index (SI) and maximal width of lower  $M_3$  (W) of *Mammuthus primigenius* and *M. armeniacus*.

The two species however are clearly distinguishable in the diagram. Other data used are those for *M. primigenius* of Predmosti (MUSIL, 1969) belonging to the late Weichselian and those for mammoths found in the Emschertal (Germany) described by KELLER (1939) as *Elephas trogontherii* and *E. primigenius*. However KURTEN (1968) says that the transition of *M. armeniacus* to *M. primigenius* coincides with the beginning of the penultimate glacial; accordingly we assigned all the proboscidean teeth of the Emschertal to *M. primigenius*. The fossiliferous deposits of the Emschertal are comparable as to taphonomic context and age with those of Hofstade (pers. comm. GAUTIER; see also GAUTIER, 1974, pp. 80-81). Other finds included in the diagram are those of Aven de la Fage probably belonging to the penultimate glaciation (GUERIN, 1973). They were ascribed to *M. aff. trogontherii* i.e. *M. aff. armeniacus*.

In the diagram (Fig. 1) the Hofstade sample falls clearly within the range of early *M. primigenius*. The assemblage of the Middle Pleistocene deposits of the Aven de la Fage contains some molars belonging to a paleopopulation, which is more primitive than the Weichselian *M. primigenius* and can indeed be attributed to *M. aff. armeniacus*, as the data for this small sample fall in the range of *M. armeniacus*. The sample studied by MAGLIO (*ibid.*) lies near the Hofstade paleopopulation, but this may reflect differences in measuring techniques. BRAET (*ibid.*) measured several teeth in jaws and could hence not give their maximal width. As a result the parameters that he obtained may be somewhat too low and the Hofstade sample should probably be situated more to the right in the diagram. As to the Emschertal sample, it may be in general somewhat younger than that from Hofstade, but again differences in measuring techniques may affect the value of the coordinates used. The foregoing illustrates the need for rigorous

standardisation of measuring techniques if we want to perform refined metrical analysis.

TABLE 1 : Inventory of the Hofstade fauna.

SPECIES	Number of bones
<i>Crocota crocota spelaea</i> (cave hyena)	2
<i>Felis leo spelaeus</i> (cave lion)	3
<i>Vulpes vulpes</i> (common fox)	3
<i>Ursus spelaeus</i> (cave bear)	3
<i>Mammuthus primigenius</i> (woolly mammoth)	777
<i>Coelodonta antiquitatis</i> (" rhinoceros)	633
<i>Equus remagensis</i> (horse)	164
<i>Rangifer tarandus</i> (reindeer)	43
<i>Megaloceros giganteus</i> (giant deer)	19
<i>Bison priscaus</i> (steppe bison)	106
<i>Bos primigenius f. taurus</i> (cattle)	6
Unidentified	14

#### ACKNOWLEDGEMENTS.

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