

3. The identity of *Elephas trogontherii* Pohlig.

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The identity of *Elephas trogontherii* POHLIG is a constant source of trouble. For this reason the name rarely appears in English publications; even in Germany there has been much controversy about the correct application of the name, and in France and America the best authorities interpret the species in a manner very different from that intended by POHLIG, although their views on the identification of isolated teeth agree with his. Faced by so many glosses on the original text, it may be useful to trace the gradual development of ideas from POHLIG's preliminary diagnosis to the latest publications. Even though this does not remove all the difficulties, it will at least help to make the situation clear, and to direct attention to those points which need further investigation.

To avoid confusion, each paper is dealt with separately, beginning with the author's name and date; page references within a paragraph are to the paper indicated; fuller references will be found in the list of literature at the end. So far as possible the summaries are given in the phraseology of the authors.

POHLIG, 1887. — *Elephas (primigenius) trogontherii* approaches *E. antiquus* in its plate formula and so differs from the Mammoth; nevertheless, it shows the greatest similarity to the latter in the shape of the enamel figures on the grinding surface, and in the general broad shape of the crown. It is closely linked between *E. meridionalis* and *E. primigenius* whereas *E. antiquus*, which is far outside this lineage, belongs to quite a different group of forms (p. 799).

This statement makes it clear that *E. trogontherii* is supposed to be a variety of *E. primigenius* which comes between that species and *E. meridionalis*, and that it has nothing to do with *E. antiquus* beyond the chance that it has approximately the same plate formula.

POHLIG, 1888. — The previous interpretation is maintained, but there is an unexpected richness of nomenclature, thus — — — *E. meridionalis*

(*trogontherii*), p. 17; *E. trogontherii*, p. 17; *E. meridionalis trogontherii*, p. 20; *E. primigenius trogontherii*, p. 20; *E. (primigenius) trogontherii*, p. 169.

Elephas trogontherii approaches *E. antiquus* in its plate formula, but in the shape of the crown and of the grinding-surface it is nearer to *E. primigenius* and *E. meridionalis*. The length of one plate plus one cement interval is 15 mm and more in the upper molars, and 20 mm in the lower molars. *E. trogontherii* has little festooning of the enamel, no central angular form, and the enamel figures mostly develop from a central annulus and two lateral lamellae (pp. 190—191).

The geologically older representatives of the race, which are closer to *E. meridionalis* than to the Mammoth, may be known as *E. (meridionalis) trogontherii*, and the younger, more Mammoth-like, as *E. (primigenius) trogontherii*. The linkage between two species cannot be more clearly and intimately shown in Nature (p. 205).

In the older Pleistocene of Germany, and most probably in that of England, France, Spain, and Italy, and in the late Pliocene of those countries, there are found molars which are intermediate between those of *E. meridionalis* and *E. primigenius*, and which must be regarded as a separate form, with the rank of a natural race, because of their constant difference from either of the other species, as well as because of the significance of their geological occurrence, but which have nothing in common with *E. antiquus*, apart from the average value of the plate formula (p. 208).

POHLIG, 1891. — *E. trogontherii* has nothing to do with *E. antiquus* (p. 325). Among the quite typical specimens of this race in the British Museum may be mentioned numbers 49450, 15923, and 27908. The teeth from Ilford may also belong to *E. trogontherii* (p. 326).

VOLZ, 1896. — *Elephas trogontherii* is a variety of *E. meridionalis* (p. 359).

VOLZ, 1897. — In the main, *E. trogontherii* has the crown formed as in *E. meridionalis* and the grinding surface of *E. primigenius*. In the number and thickness of the plates, it comes between the two. Only the variety which is nearer to *E. meridionalis* seems to be well-founded. It has the following characters — — — low, broad teeth, with relatively few, thick (1.4—1.5 cm.) plates. The high variety, *E. primigenius trogontherii*, passes so gradually into *E. primigenius* that it hardly seems possible to separate them.

WÜST, 1901. — Among the Süssenborn elephants, two groups are sharply separable, I — — — the group of *E. antiquus*, and II — — — the group of transitional forms between *E. meridionalis* and *E. primigenius*, which one might also call the group of *E. trogontherii* POHLIG. If *E. meridionalis* gradually evolved towards *E. antiquus* on the one hand, and towards *E. primigenius* on the other, then individuals may, indeed must,

occur in either lineage which are extraordinarily similar to individuals in the other lineage (pp. 261—262).

POHLIG, 1909. — There are two third molars from the Cromer Forest Bed in the Geological Survey Museum in Buda-Pest; they are typical *E. trogontherii*. The upper tooth has $\times 18 \times$ plates and measures 300 mm. in length, 200 mm. in height, and 105 mm. in width; it has ten plates in 130 mm. The lower tooth has $\times 19 \times$ plates; it measures 310 mm. in length, 150 mm. in height, and 100 mm. in breadth; there are ten plates in 150 mm. (p. 243).

SCHLESINGER, 1912. — There can no longer be any doubt that *E. trogontherii* is actually a descendant of *E. meridionalis*, and an ancestor of *E. primigenius*. All the characters of the teeth, skull, and mandible show so many variations tending away from the former and towards the latter, that the genetic connexion is clear (p. 152).

SOERGEL, 1913. — *E. trogontherii* is so very variable that it is extraordinarily hard to diagnose. Very low and very broad teeth are found beside high and very narrow to relatively broad ones. Number of plates approximately as in *E. antiquus*, or a little greater. Enamel figures mostly regular, broad bands, often with a sudden median expansion, occasionally a little rhombic. Length of a plate plus cement interval varying between greater and lesser figures according to whether it is nearer to the phylogenetically older *E. meridionalis*, or to the phylogenetically younger *E. primigenius* (p. 6).

SOERGEL, following WÜST, derives *E. trogontherii* and *E. antiquus* from *E. meridionalis*, and recognises forms which are supposed to be intermediate. These he terms *E. trogontherii* var. *antiquus* and *E. antiquus* var. *trogontherii*. »*E. trogontherii* and *E. antiquus* cannot be sharply differentiated, neither from each other, nor from *E. meridionalis*» (p. 92).

DEPÉRET, MAYET, & ROMAN, 1923. — These authors divide the elephants into eight distinct lineages. That of *E. trogontherii* is said to continue, practically unchanged, from the Villafranchian of Italy to the Chelleo-Acheulian stage of England, France, and Germany. One cannot distinguish a Pliocene mutation. The species becomes extinct without leaving descendants.

They give the following characters, — — — Very wide, and very high crown, with thick, widely spaced plates (frequency 6—8 in 10 cms.), enamel wavy and strongly folded, with sharp, irregular sinuses not resembling the median loxodont sinus of *E. meridionalis* and *E. antiquus*; M_3 with $\frac{16-22}{16-22}$ plates, and $\frac{288-400}{288-400}$ mm. in length (p. 179).

ANDREWS (Unpublished). — Dr. C. W. ANDREWS identified thirty-one teeth in the British Museum collections as *E. trogontherii*; among them are ten specimens of M^3 and four specimens of M_3 . Only one of the teeth

mentioned by POHLIG, that registered 15923, is included. According to these identifications, the third molar has $\frac{13-18}{13-18}$ plates in a length of $\frac{186-302}{243-287}$ mm., and is $\frac{70-93}{80-100}$ mm. in width.

OSBORN (In press). — »Osborn does not agree with either POHLIG or SOERGEL that the species *E. trogontherii* is a connecting link between *E. meridionalis* and *E. primigenius*, but regards it as a member of a distinct phylum, *Parelephas*, which appears sparsely in the Villafranchian of Italy, and reappears in the first and second interglacial periods.»

Such differences in opinion can only be overcome by close adherence to POHLIG's original description, and careful separation of the purely objective considerations of identity from the personal, subjective, influences which govern theories of relationship and descent. To this end, all the second and third molars of fossil elephants from the English Pleistocene in the British Museum were examined, and it was found that there are certain teeth from the Cromer Forest Bed, from Clacton, and from Walton, which one cannot reasonably exclude from *E. trogontherii* as defined by POHLIG, and that these teeth do not occur in deposits younger than those named. Some details of selected specimens are given in the table on page 23.

It was also found that there is a large number of teeth which require detailed study, and which do not fit into any narrow scheme, but among which one may distinguish fairly well defined groups. These groups have a superficial appearance of intergrading, and of forming transitional stages between *E. trogontherii* and *E. antiquus* on the one hand, and between *E. trogontherii* and *E. primigenius* on the other, but there is evidence to show that they are independent of both *E. trogontherii* and *E. antiquus*, and it may be that some at least are the same thing as the *E. primigenius* mut. *astensis* of DEPÉRET and MAYET. Chief among these groups is that of the so-called Ilford Mammoth.

To sum up, *E. trogontherii* is a large elephant with broad, high molars in which the frequency of the plates varies from about 5.5—7.5, and the width of the third molars from $\frac{90-110}{80-100}$ mm. The number of plates in the upper and lower third molars varies from 15 to 21, with the talons in addition. The enamel is relatively thick (2—3 mm.), wavy, and often festooned to form irregular sinuses not resembling the loxodont sinus of *E. antiquus*.

This species, if strictly interpreted, is not common in England, where it is restricted to the Cromer Forest Bed, and succeeding stages of the Pleistocene, up to and including the Clacton-on-Sea stage of KING and OAKLEY (1936).

English specimens of *E. trogontherii*.

Locality	Tooth	Registered Number	Plate Formula	Length	Breadth	Height	Plate Frequency	Length/Plate Ratio	Enamel Thickness	Plates in Wear	Remarks
Clacton	M ²	37285	× 12-13 ×	216	86	106	5.5	16	2	11	Enamel coarsely crimped, no festoons.
Cromer (Forest Bed)	M ²	M 11986	× 2.10 ×	191	80	—	7	14.7	2.5	10	Enamel coarsely crimped and wavy.
Clacton	M ³	27907 a	× 1½ 14 ×	245	86	125	6	16.3	3	10	Width less than usual.
Pakefield (Forest Bed)	M ³	M 6864	× 19 ×	287	100	157	7	14.4	2-3	2	
Happisborough (Dredged)	M ³	33327	× 16 ×	268	92	196	5.5	15.7	2	13	Enamel coarsely crimped, with prominent festoons.
Mundesley (Forest Bed)	M ₂	M 6802	× 10 ×	216	81	—	5.5	19.7	3	10	Enamel figures festooned in the centre.
Overstrand (Forest Bed)	M ₃	M 6843	× 15 ×	256	80	140	7	16	2.5	11	Festooning irregular.
St Mary Stoke, nr. Ipswich	M ₃	27908	× 15 ×	240	84	121	7	16	3	8	POHLIG, 1891, p. 38, pl. A, fig. 8.
Walton	M ₃	49450	× 11 —	228	99	137	5	20.7	3	10	POHLIG, 1891, p. 326.

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