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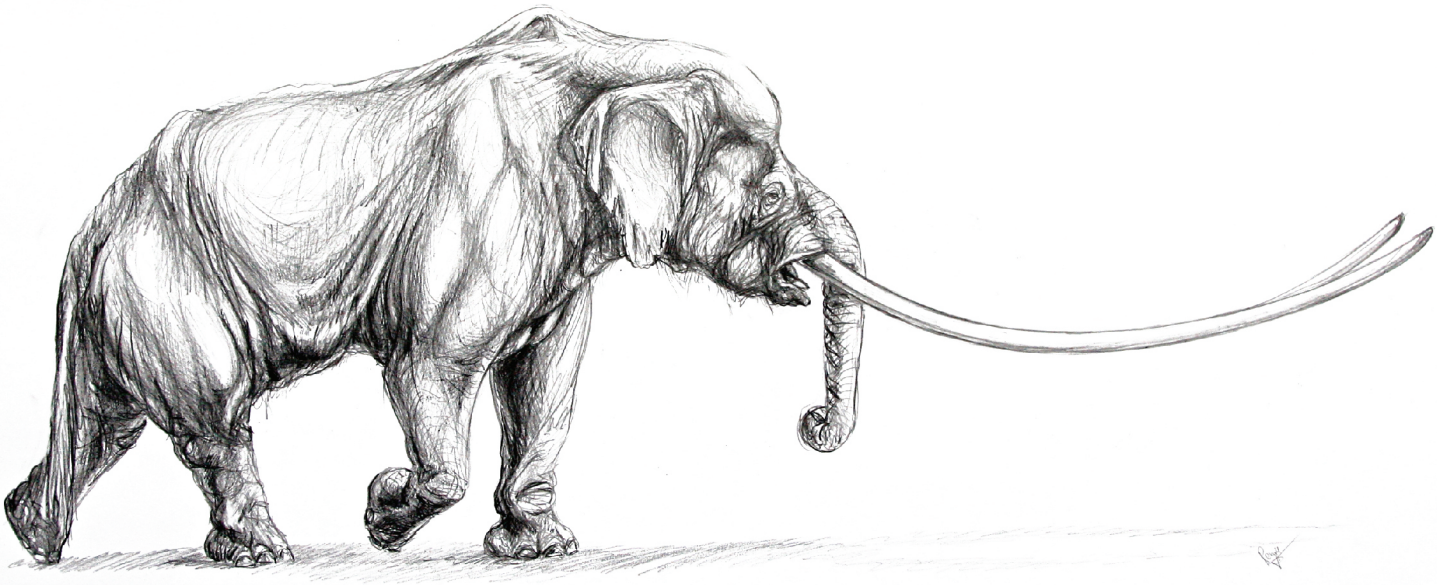

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ABSTRACT BOOK

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New material of *Mammuthus primigenius* (Proboscidea, Elephantidae) from the Late Pleistocene of Niederweningen, Canton Zurich, Switzerland

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Since the 19th century, Niederweningen, 20 km northwest of Zurich, has been known as the most important woolly mammoth (*Mammuthus primigenius*) site of Switzerland. Over 100 fossil specimens comprising bones, teeth and tusks of at least seven mammoth individuals, including a very young calf, were excavated there in 1890-91 (Lang, 1892). In 2003, another partial *M. primigenius* skeleton was unearthed at a construction site close to the original locality of 1890/91 (Furrer et al., 2007). Previous studies of the mammoth site have revealed an age of about 45 ka for the layers containing the mammoth material (Hajdas et al., 2007; Preusser & Degering, 2007) and enabled the reconstruction of the environment and the climatic conditions during the middle part of the last glacial cycle (Middle Würmian) (Coope, 2007; Drescher-Schneider et al., 2007; Tütken et al., 2007).

The newly discovered, largely articulated material belongs to an adult and includes the mandible, molars, tusk fragments, hyoid bones, some vertebrae and ribs, a humerus, an ulna, one radius, an almost complete manus, a small portion of the pelvis, a rather fragmentary femur, one tibia and fibula, a patella, tarsal bones, metatarsals, phalanges and sesamoids.

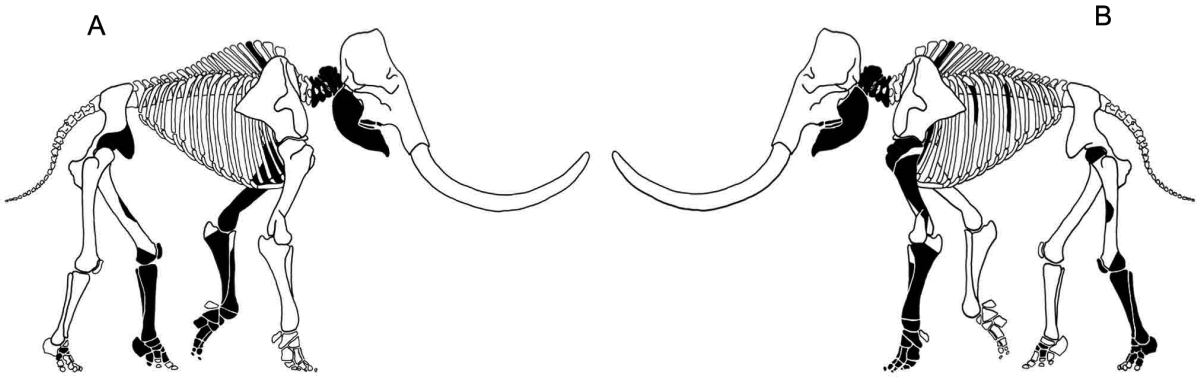

Fig. 1. Schematic drawing of a mammoth skeleton indicating the available skeletal elements of the specimen found at Niederweningen in 2003; **A**, right side; **B**, left side. Modified drawing of *Mammuthus* by S. Hartmann (available at www.skeletaldrawing.com). Based on our study the mammoth was thumbless. Thus, in contrast to the original drawing the phalanges of the first digit were removed.

Most of the collected limb remains are derived from the left side of the animal's body. We confirm that it was a large male individual (Furrer et al., 2007) and suggest a shoulder height of approximately 3.0-3.3 m. Based on the wear pattern of the molars, the mammoth died at an age of about 35-38 years.

For work on this new specimen, special emphasis was placed on the extraordinarily well-preserved carpals, metacarpals, phalanges and sesamoids of the almost complete left manus. Besides the missing pisiform and a third phalanx, all bones are preserved. Properly documented feet are extremely rare in the fossil record of *M. primigenius*, therefore this left manus reveals new insights into the morphology of the anterior autopodium of the species. Up to now the study clearly demonstrates, among other results, that our specimen was thumbless. No contact facet is observable at the lower side of the first metacarpal of its first digit. Moreover, two well-developed large sesamoids can be rearticulated laterodistally to its first metacarpal. Comparing the correspondent sesamoids of extant elephants, which are relatively small (Hutchinson et al., 2011), to the ones of the Niederwenigen mammoth, these elements clearly differ in their proportions. Regarding our mammoth individual we assume that the lack of the first digit in its manus is related to the increased size of the distal sesamoids of its first metacarpal. However, further investigations and more fossils are needed to support this hypothesis. Additional important observations obtained with our material are the identification of small bones of the left manus as third phalanges of the digits II to V. Finally, the aserial order of the carpal bones is also clearly visible in the left manus of the new partial skeleton whereby the magnum and trapezoid are overlapped by the lunar.

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