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A Pleistocene mammal bone site near Garwolin (Mazovian Lowland, Poland)

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The remains of mammoth, woolly rhinoceros, bison, reindeer and horse were found in 2006 in a gravel pit in the Wilga River Valley near Garwolin (Central Poland), fig. 1 (Żarski et al., 2014). The most numerous remains represent mammoth bones: skull fragments, teeth, and a pelvis with predator tooth marks. Garwolin is located on the Mazovian Lowland about 60 km south of Warsaw (Fig. 1A). The area around is covered with tills and glacifluvial sands and gravels of the Middle Polish Glaciation (MIS 8-6). This area is situated outside the range of the last glaciation of the Vistulian Glaciation (MIS 2-5d; 11,700- 115,000 BP) (Fig. 1A). The ice sheet margin was about 160-200 km north of the Garwolin area. The bones were found in the fluvial sands and gravels at a depth of 5-6 m below the ground surface. Geological studies suggest that the deposits originate from the period of the Vistulian Glaciations. A 2-m-thick Holocene peat layer is located above of fluvial sands and gravels. The mammoth bones were dated twice using the 14C method between 38 and 46 ka, which is correlated with the Grudziadz Interstadial (MIS3). The climate in Poland during this interstadial was slightly warmer and the average July temperature reached 10°C. The bones of Pleistocene mammals were found in a secondary

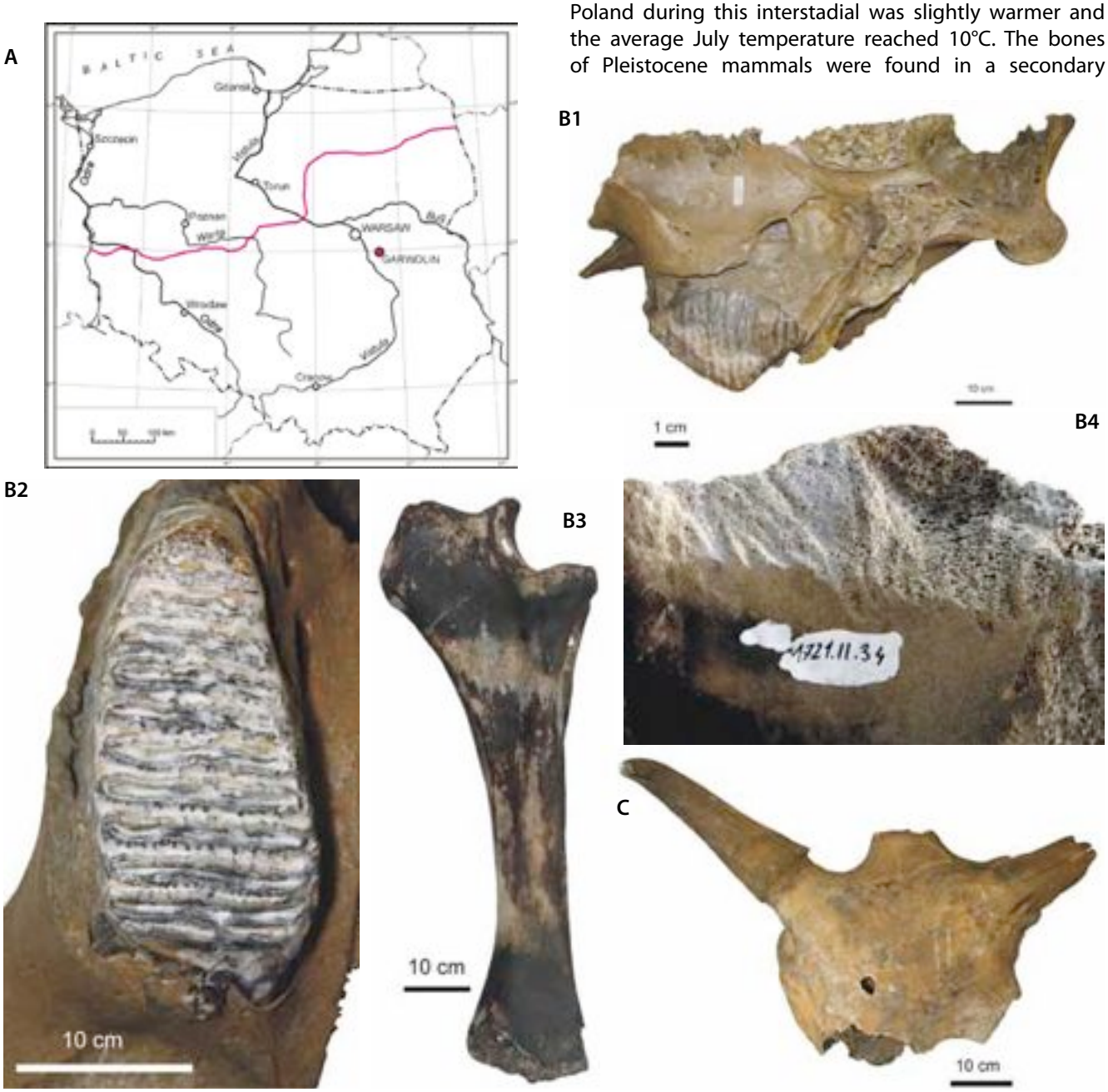

Fig. 1. **A**, Map of Poland with paleontological site in Garwolin. Red Line – maximum extent of the Vistulian Glaciations; **B**, *Mammuthus primigenius* **(1)** left part of skull together with molar M3, **(2)** left M3, **(3)** an almost complete ulna, and a **(4)** fragment of pelvis - acetabulum with predator tooth marks; **C**, *Bison priscus* skull fragment with the horn core.

deposit. Two flint artifacts were among the collection. The accumulation of bones in the fluvial sediments could have been caused by the drowning of the animals during a violent flood or by the river washing out a Neanderthal archaeological site.

The mammoth [*Mammuthus primigenius* (Blumenbach, 1799)] is represented by: an incompletely preserved fragment of the left part of a skull bearing the M3 (Fig. 1.B1), a few fragments of the skull bones, completely preserved upper third molars (Fig. 1.B2), and half of M3, a distal part of humerus and an almost completely preserved ulna (Fig. 1.B3), 6 fragments of pelvis, one of them with predator tooth marks (Fig. 1.B4), a head of a femur, 3 shafts of the femur, and shaft of the tibia, one vertebral spinosus process and a rib shaft.

The woolly rhinoceros [*Coelodonta antiquitatis* (Blumenbach, 1807)] is represented by a cervical vertebra, a scapula, a humerus shaft and an uncompletely preserved pelvis together with fragments of ilium, pubis and ischium.

The steppe bison [*Bison priscus* (Bojanus, 1827)] is represented by an incompletely preserved skull, a skull fragment with the left horn core (Fig. 1C), a skull fragment with the occipital condyles, and a femur.

The reindeer (*Rangifer tarandus* (Linnaeus, 1758) is represented by two fragments of antlers and a rib shaft.

The horse (*Equus ferus* Boddaert, 1785) is represented by a tibia.

Bone finds of Pleistocene mammals from the area of the Mazovian Lowland in Poland are quite common. The first descriptions are from the end of the nineteenth century. The bones were found during construction works and in the Vistula river. One of the most interesting paleontological finds in Warsaw took place in 1962 during earthworks in Leszno Street, where at almost 5 m depth a nearly complete skeleton of the forest elephant *Palaeoloxodon antiquus* (Falconer and Cautley, 1847) was found (Jakubowski et al., 1968). An almost complete skull of a forest rhino *Dicerorhinus kirchbergensis* (Jäger, 1839) discovered in the Vistula River valley in 1971 is also very important. It is worth noting that this is the first skull of this species unearthed in Poland and the best preserved of the four so far found and described in the world (Jakubowski, 1971; Borsuk-Białynicka and Jakubowski, 1972). The last known discovery of Pleistocene mammal bones, namely two incomplete mammoth skeletons, was during the construction of the underpass under Jerozolimskie Avenue, in Warsaw at the end of 1971 (Jakubowski, 1973).

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