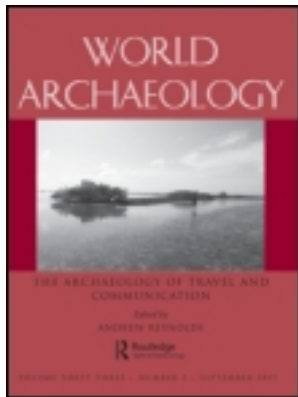


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A new Early Bronze Age wagon model from the Carpathian Basin

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A new Early Bronze Age wagon model from the Carpathian Basin

Mária Bondár and György V. Székely

Abstract

This study offers a brief overview of the main directions in the research into prehistoric wagon models and the appearance of wheeled vehicles. A new Early Bronze Age clay model found recently in Hungary is presented as part of the study. A discussion of the analogies to the model and the interpretation of its design are followed by a review of new European finds proving the early use of wagons. The dates strongly suggest that wheeled vehicles appeared more or less simultaneously in several places.

Keywords

Clay wagon model; Bronze Age; prehistoric symbolism; wheel; secondary products; problems of origin and dating.

The wagon model from Nemesnádudvar

In 2009, a new wagon model made in an entirely different style from other, currently known, similar finds came to light at Nemesnádudvar (County Bács-Kiskun, Hungary) during an excavation conducted by György V. Székely (Székely 2010: 36).

Find circumstances

The archaeological investigation of the M9 motorway section between Dusnok and Nemesnádudvar began in 2008. The excavation of Site M9/3 (Nemesnádudvar–Karasica-csatorna, Berek) in 2009 was part of the salvage work preceding construction. The site is located on a flat ridge running north–west to south–east on the eastern bank of the Sárköz II (Karasica) Canal in the northern outskirts of Nemesnádudvar (Fig. 1).

Various Early Bronze Age, Sarmatian and Late Medieval features, as well as a prehistoric burial were uncovered in the 8215m² area investigated between April and July

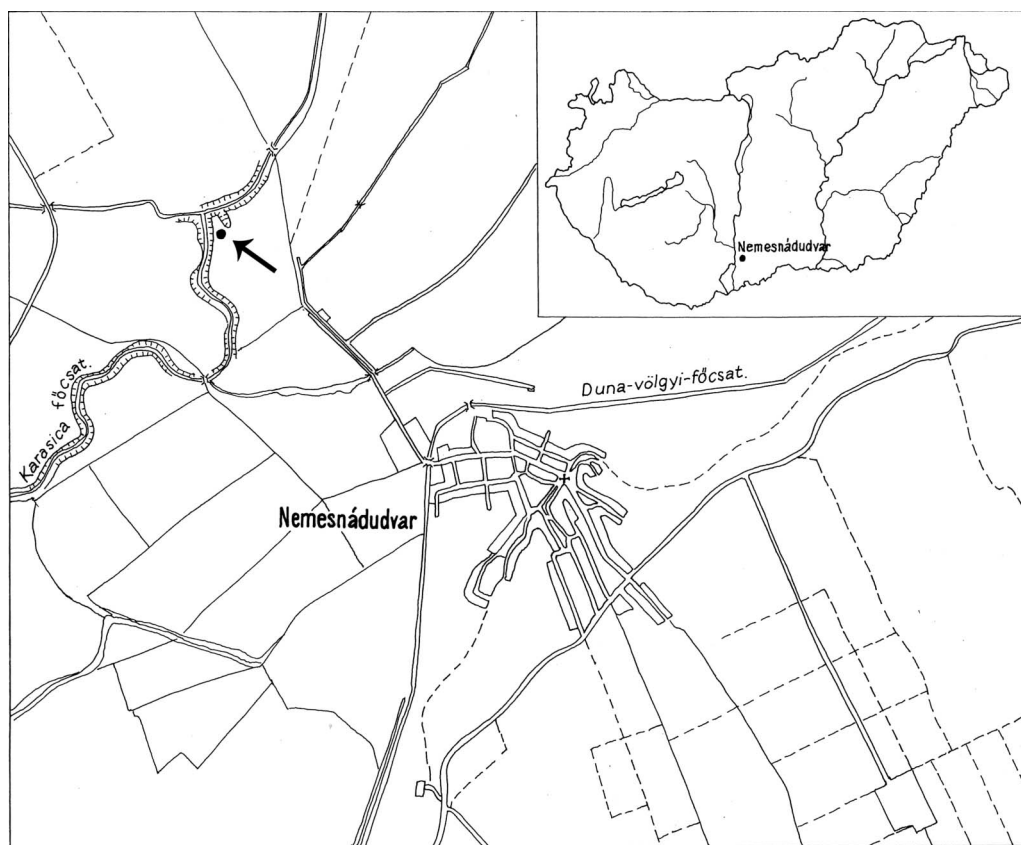


Figure 1 Nemesnádudvar: site location.

2009. The pits of the Early Bronze Age settlement lay scattered among the Sarmatian pits in the northern part of the excavated area (Plate 1).

The small oval pit containing the wagon model lay in the northern part of the investigated area. The clayey brown fill of the pit yielded various pottery fragments and animal bones, as well as the joining fragments of a clay wagon model. The downwardly narrowing pit measured 94cm by 72cm; its greatest depth was 40cm from the shovel-scraped surface. Broken into several pieces, the wagon model lay near the floor of the pit, tilted against its south-western wall (Plate 2 and Fig. 2).

There was nothing to indicate that the pit once had a special function or that it had been a sacrificial pit. Smaller pits, containing no more than a handful of finds or no finds at all, and a few post-holes were found in its immediate vicinity.

Description of the wagon model

The wagon model (Fig. 3 and Plate 3) is made from clay tempered with crushed ceramics and fired to a brownish-grey colour. The short sides are straight; the long sides terminate in two handle-like, rounded projections. The top of the long sides is curved; both have a neck-like raised projection in the centre and an onion-head-shaped knob at each end.



Plate 1 Nemesnáadudvar: view of the excavations.

Plate 2 The pit containing the wagon model and associated finds during excavation.

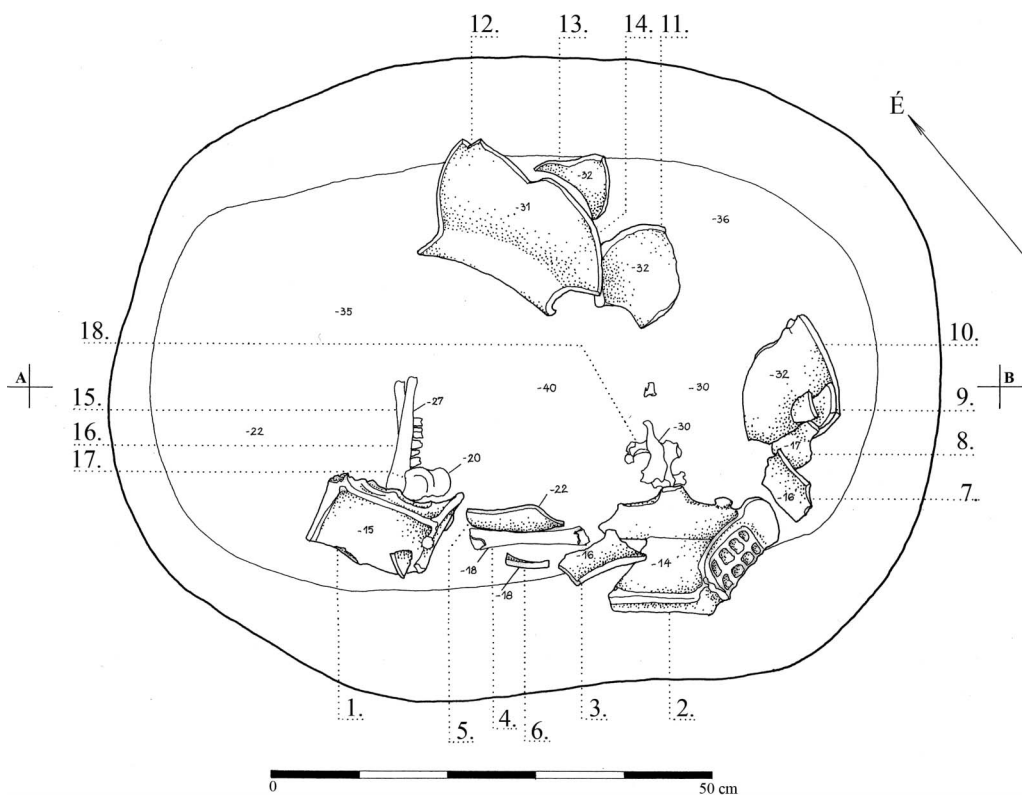


Figure 2 Plan of the pit containing the wagon model.

The model is set on four small cylindrical feet. The decoration of the two long sides is similar: a pattern of incised parallel chevrons under the neck-like projection in the middle and a design of parallel incised oblique lines on the curved end. Three dotted circles adorn the triangular field between these two main patterns. One of the short sides has a vertical

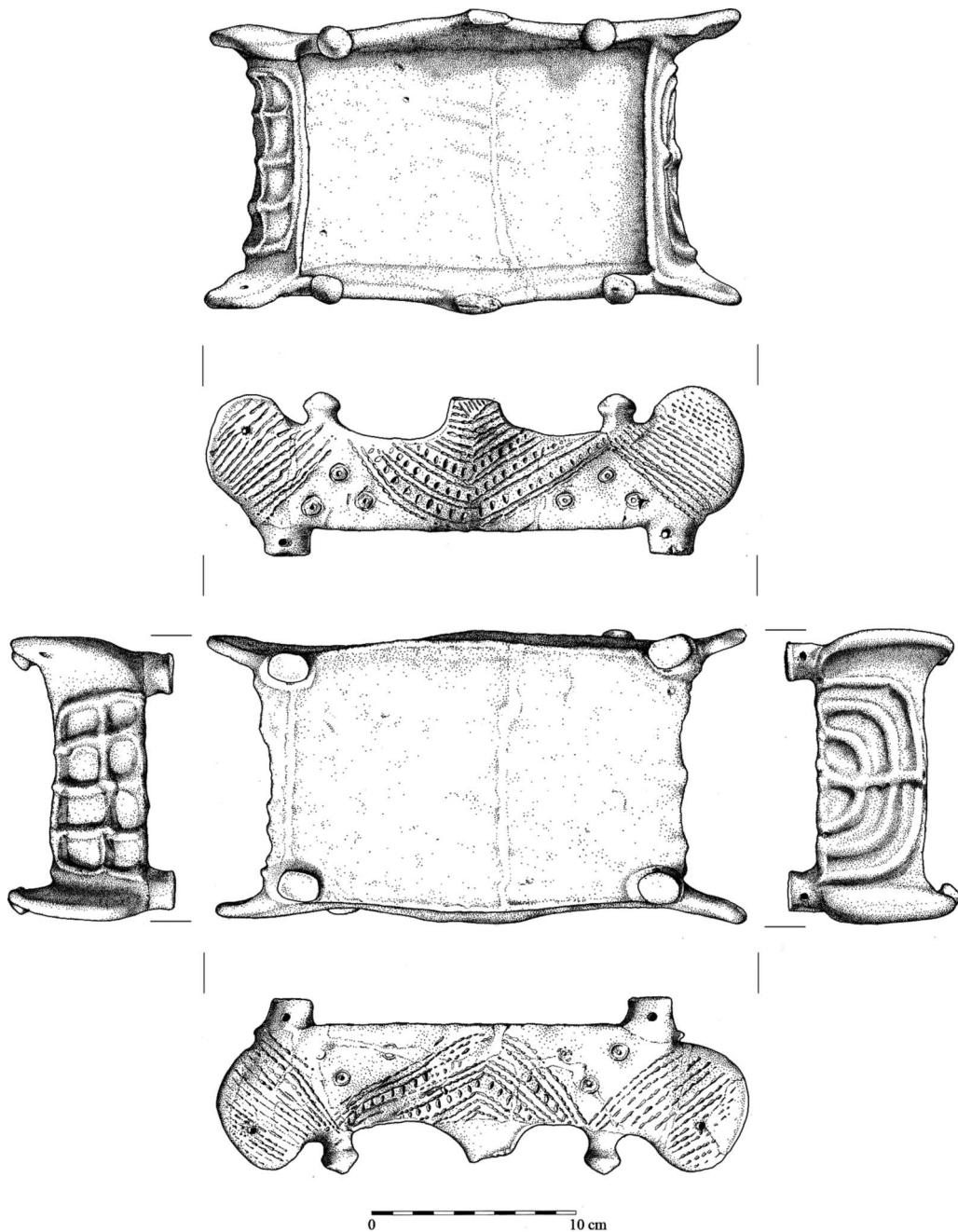


Figure 3 Drawing of the wagon model from Nemesnádudvar.

rib flanked by two pairs of three curved ribs; the other short side is divided into eight panels by vertical and horizontal ribs arranged in a lattice pattern. The ends of the long sides and the feet had originally been perforated. The wheels, the axles and the top of the neck-like projections did not come to light during the excavation. The model



Plate 3 Photo of the wagon model from Nemesnádudvar.

is 26.3cm long, its greatest width is 14.9cm and its height is 8.8cm with feet and 6.6cm without feet.

The finds illustrated in Fig. 4 (where the numbering of the finds corresponds to that in the plan of the pit shown in Fig. 2) came to light together with the wagon model. They are:

1. Neck and rim fragment of a large, medium thick-walled vessel with slightly incurving neck. Light brown exterior, grey interior. H. 5.7cm, dR (diameter of rim) 26cm (Fig. 4.3).
2. Rim fragment of a large, medium-thick-walled vessel with curved neck and slightly out-turned, thickened rim. Light brown exterior, grey interior. H. 4.2cm, dR. 36cm (Fig. 4.5).
3. Rim fragment resembling the previously described piece, probably from the same vessel. H. 4.1cm, W. 4.3cm (Fig. 4.6).
4. Rim fragment resembling the previously described piece, probably from the same vessel. H. 4.6cm, W. 9.5cm (Fig. 4.7).
5. Rim and body fragment of a large, globular, medium-thick-walled vessel (cooking pot). The neck is slightly curved, the shoulder more prominently. The out-turned rim bears a row of finger impressions. A finger-impressed, oblique rib is set on the shoulder under the neck. H. 14.7cm, dR 34cm (Fig. 4.8–12).
6. Body fragment of a large, medium-thick-walled vessel with a loop handle. Light brown exterior with grey mottling, grey interior. H. 7.4cm, W. 5.6cm (Fig. 4. 9).
7. Rim fragment of a medium-thick-walled conical bowl with low, curved neck, decorated with a small oval knob on the shoulder under the rim. Light brown exterior with grey mottling, yellowish-grey interior. H. 12.2cm, dR. 35cm (Fig. 7.10).
8. Body fragment of a large, medium-thick-walled vessel with coarsened body. Light brown exterior, grey interior. H. 8cm, W. 10.5cm (Fig. 2.11).
9. Rim fragment of a medium-thick-walled conical bowl with low, curved neck and out-turned rim. Light brown exterior with grey mottling, grey interior. H. 8cm, dR. 18cm (Fig. 4.13).
10. Body fragment of a large, medium-thick-walled vessel. Grey exterior, light brown interior. H. 8.1cm, W. 8.2cm (Fig. 4.14).

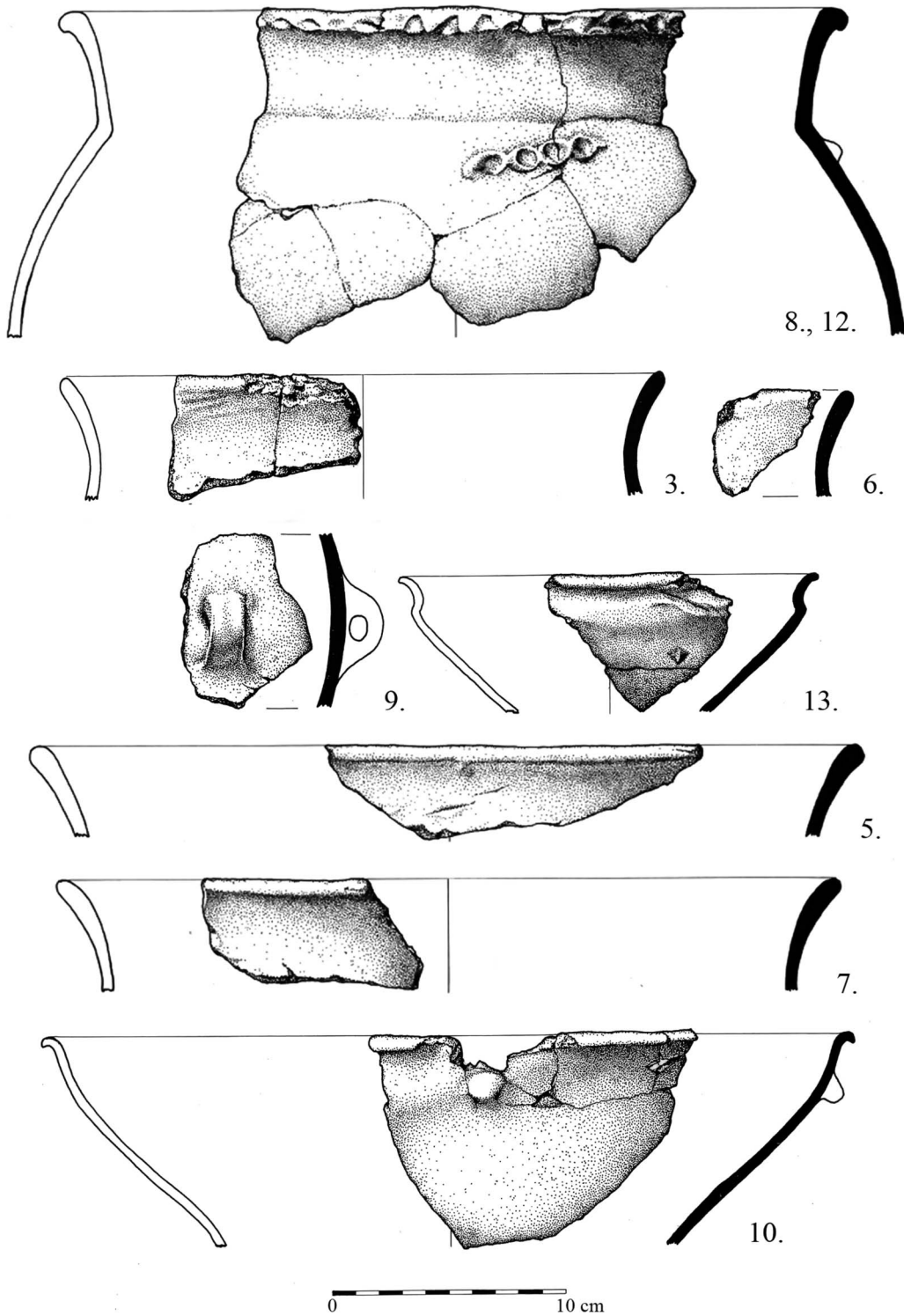


Figure 4 The finds from the pit.

11. Tibia of a small ruminant (sheep or goat) (Fig. 2.4).
12. Rib of a large-bodied ungulate (Fig. 2.15).
13. Cattle mandible (Fig. 2.16).
14. Cattle astragalus (Fig. 2.17).
15. Fragment of a cattle skull (Fig. 2.18).

Anna Zsófia Biller, who analysed the animal bones, noted that the pit contained relatively few bones (216 fragments), among them articulating skeletal parts of cattle (metatarsals, phalanges, teeth, etc.). The preliminary species identification indicates a high consumption of sheep meat. Cattle and dog bones were also represented in the sample.

Analogous finds

The design and the symbolism of the wagon model from Nemesnádudvar represent an entirely new type among currently known miniature vehicles.

Similarly to other hand-modelled ritual artefacts, the wagon model from Nemesnádudvar is a unique creation. While lacking exactly identical parallels, some of its elements have counterparts. Unfortunately, the published wagon models, whether intact or restored, are rarely shown from all sides in publications and thus there are few published examples of pieces whose decoration is known to vary on different sides. At present, the number of wagon models (both intact and fragmentary) from the Carpathian Basin totals eighty-nine (Bondár 2012). Certain decorative elements of the Nemesnádudvar wagon box are paralleled by the models of the Wietenberg culture from Derşida and Lechința. Analogies to the onion-head shaped projections on the rim can be found in Derşida (Chidioșan 1980: pl. 25.7), while another wagon model from the same site has a peaked rim terminating in a bird's head (Chidioșan 1980: pl. 25.9). It is unclear from the published drawing of the latter whether the bird head was set on the corner or on top of the side. The original position of the animal head on the fragment from Lechința is clear: the short front side was peaked and topped by two cattle heads (Bichir 1964: fig. 4.3). The rounded 'handles' of the Nemesnádudvar model have their counterparts among the fragments from Derşida (Chidioșan 1980: pl. 25.2, 4), one of which has similar perforated knobs for the axles (Chidioșan 1980: pl. 25.4). The side of the virtually intact piece from Otomani (Ottomány) also has handle-like projections (Ordentlich and Chidioșan 1975: pl. 6.5). The differing ornamentation of the short sides can be noted on the wagon model from Pocsaj, assigned to the Gyulavarsánd culture, and on a piece from the culture's eponymous site (Fettich 1969: pl. 3.2b, 3.2c).

Interpretation of the wagon's ornamental design

Drapery

Each side of the wagon model bears a different design (Plate 3). Although the patterns on the two long sides appear to be identical at first glance, a closer look reveals subtle differences in the minor details of the two compositions. The four corners of the rectangular

wagon body end in flat, perforated ‘handles’ whose ornamentation is part of the wagon’s overall design. The pattern of incised parallel chevrons resembling a necklace and its continuation on the handles can perhaps be interpreted as the depiction of textile drapery swathed over the wagon which was fastened at the four spots marked by the onion-head shaped knobs. We may assume that the wagon model covered with the ornate drapery was an important ritual accessory of ceremonies performed on special occasions.

Combination of human imagery and wagons

The tops of the neck-like projections in the middle of the long sides have broken off and it can no longer be determined whether they ended in human or animal heads, or were perhaps just simply rounded. The necklace-like pattern recalls the decoration of Middle Bronze Age figurines, such as the ones from Dalj (Kovács 1972: 49, fig. 4), Cîrna (Kovács 1972: 48, fig. 2; Kalogeropoulos 2007: pl. 67a, 67b), Vattina (PraistJugZem IV, pl 82.1), Vinča (Kovács 1972: 48, fig. 1), Vrsac (PraistJugZem IV, pl 84.2, 2a) and on an unprovenanced piece from the Lower Danube region (Kovács 1972: 49, fig. 3). A lavishly ornamented collar-like garment appears slightly earlier on figurines. The human figurines of the Early Bronze Age Hatvan culture have rounded shoulders and a bent back or slightly peaked head. These figurines are portrayed wearing a necklace-like adornment and their body is covered with some sort of clothing, usually depicted in a highly stylized manner, as on the piece from Szurdokpüspöki (Kovács 1977: figs 8–9). The figurine of the Nir (Nyírség) culture from Berea in Romania carries a similar decoration (Bader 1978: pl. 8.7).

There is a striking difference between the decorations of the two short sides. These sides are adorned with impressed patterns whose style contrasts noticeably with the delicate, lime-encrusted design on the two long sides. The decorative motifs adorning the wagon model had most likely been vested with some obvious meaning for the community which had made and used the model. The axles passed through the small perforated knobs on the underside of the wagon box. The ‘handles’ at the four corners are likewise perforated, suggesting that the wagon had perhaps been suspended (in which case the emphasis was not on the artefact’s function as a wagon); another possible interpretation is that the perforations indicated how the draught animals were harnessed to the wagon.

It seems to us that the wagon model from Nemesnádudvar blends the symbolism of wagons and figurines. The possible meaning of this symbolism is all the more difficult to understand because the tops of the neck-like projections have broken off and we do not know whether they had been surmounted by human or an animal heads, or whether they had a plain rounded tip. An anthropomorphic top seems more likely in view of the necklace-like design underneath. In our view, the depiction of a human figure on the wagon can be likened to the human or divine passengers riding chariots or wagons of later ages.

Dating

The analogies to certain elements of the wagon model from Nemesnádudvar would suggest a date in the Middle Bronze Age. However, the pottery fragments found together

with the wagon model (Fig. 4) and the interiorly decorated bowl brought to light from another pit assign the pit and its finds to the Early Bronze Age. The thermoluminescence (TL) dating of the wagon model gave a calendar date of 2420 ± 620 BC, while the dates for two vessel fragments found in the same pit were 2010 ± 560 and 1670 ± 520 BC respectively (Table 1). Figure 5 shows that a date between 2190 and 1450 BC is consistent with all the TL measurements in the pit. This date would correspond to the Ada or Nagyrév Culture in this region during the Early Bronze Age II–III. However, no wagon models have yet been found in an Ada context. A new corner fragment of a miniature wagon was found in 2005 at Cegléd during the investigation of a Nagyrév settlement (unpublished, RKM 2005: 219).

Discussion

The analogies to certain elements of the Nemesnádudvar wagon model suggest that these elements carried a meaning intelligible to various communities living across a larger area.

The ornamentation of wagon models usually corresponds to the decorative motifs adorning the pottery of the cultures they are assigned to, one implication being that some of the designs adorning pottery carried a symbolic meaning which also appeared on other artefacts such as figurines and wagon models. The currently known corpus of wagon models suggests that some cultures used both decorated and plain pieces, and that there was considerable variation in type even within a single culture. Surprisingly enough, the rich diversity of wagon models is not a reflection of many different cultures, but rather an indication that wagon models were vested with different meanings within the same archaeological culture, recalling the similar diversity of Late Copper Age figurines (Bondár 2008: 174).

At present, we cannot decipher either the ritual meaning of wagon models or their role at the time. The wagon models in question may have been simple toys, but they may equally well have been the embodiments of prestige items symbolizing wealth and social standing, or symbols of the sun in early beliefs transmitted from one generation to the next, or the rudimentary forms of iconographic signs associated with later deities. Where their meaning and function are concerned we can only make educated guesses. The currently known wagon models are restricted to a far smaller area than the one in which wheeled vehicles were actually known and used. The many pieces known from Mesopotamia, Greece, Italy, the Carpathian Basin, the Pontic, India and China indicate that miniature models had a specific meaning and significance in certain regions, and it can hardly be a mere coincidence that the distribution of the known models correlates with the flourishing cultures and civilizations of prehistoric ages. In contrast, several regions where models are lacking, such as Holland, Germany and Switzerland, have yielded the remains of genuine wooden vehicles.

The invention of the wheel and of wagons was an important innovation. Heavy wagons with solid wheels probably evolved from similar Y- and A-framed carts, the boxes placed on them being a later development.

The earliest representations of wheels and rudimentary vehicles in Europe appear in the rock art of Switzerland, Germany and Italy. The archaeological finds include miniature

Table 1 Estimated, corrected and calendar ages obtained from all luminescence D_e and dose rate data of ceramic samples (György Sípós, unpublished report)

Sample	D_e (IRSL) (Gy)	D^* (4–11 μm) (Gy/ka)	Age (IRSL) (ka)	g value (%)	Corrected age (ka)	Age (BSL) (ka)	Calendar age
Wagon model	13.34 ± 0.64	3.61 ± 0.42	3.70 ± 0.43	2.16 ± 0.16	4.43 ± 0.62		2420 ± 620 BC
0222/0247	12.60 ± 0.44	3.54 ± 0.44	3.56 ± 0.44	1.72 ± 0.08	4.02 ± 0.56		2010 ± 560 BC
0222/0262	11.69 ± 1.12	3.49 ± 0.31	3.35 ± 0.44	1.55 ± 0.12	3.68 ± 0.52	4.06 ± 0.49	1670 ± 520 BC

Notes

D_e equivalent dose (Gray)

D^* dose rate (Gy/ka)

Age: equivalent dose/dose rate (ka)

g value: % fading/decade

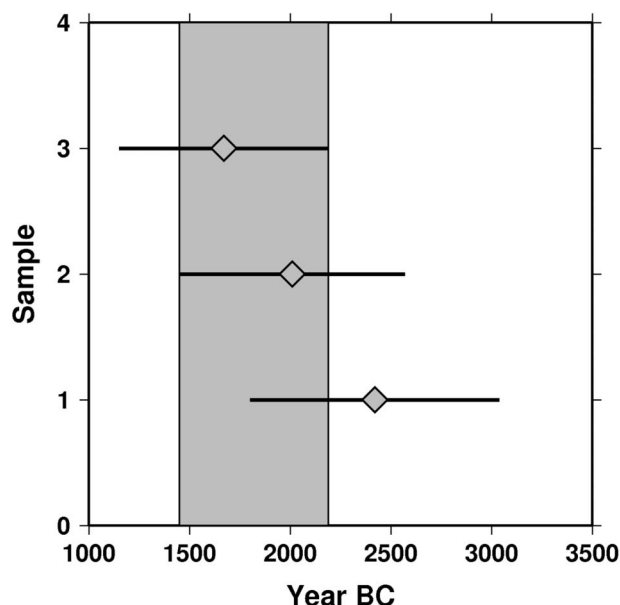


Figure 5 Age of TL samples and date estimated for the pit.

figurines in clay or metal of the harnessed oxen, clay wheels and wagon depictions appearing on clay vessels. ‘Reduced’ (miniature) wagon models fashioned from clay make their appearance in the Late Copper Age in the Carpathian Basin. They are found both on settlements and in burials, and their ritual dimension is undeniable. In Early and Middle Bronze Age cultures, the appearance of the bird-human-vehicle metaphor is a new element but not all wagon models were vested with a ritual meaning and some may have been simple everyday artefacts (toys). At this time, wheeled vehicles had become widely used utilitarian, commercial and military crafts, and both ritual symbols (miniature wheels and wagon models, the draught animals harnessed to wagons) and the genuine, real-life wagons on which they were modelled existed simultaneously.

The different wagon depictions, the discovery of genuine wagon remains and the radiocarbon dating of finds have significantly modified earlier chronologies. There is increasing evidence that the use of wagons is earlier than previously assumed as new radiocarbon dates pushed back the date of the appearance of wheels and wagons. Reliably dated finds have provided evidence that two- and four-wheeled vehicles were known from the mid-fourth millennium BC across the greater part of the European continent. Iconographic evidence is provided by the rock art of Switzerland, Germany and Italy, while finds of wooden wheels from Denmark, Germany (Fedele 2006; Louwe Kooijmans 2006; figs 4–5; Pétrequin et al. 2006: figs 3, 7.1; Ruoff 2006: figs 1, 4; Schlichtherle 2006: fig. 1; Woytowitsch 1995) and the Ljubljana marshland in Slovenia (Čufar et al. 2010; Velušček 2002, 2006), wheel-ruts recently discovered at Flintbek in Germany (Mischka 2010), a road paved with tree trunks excavated in Holland (Louwe Kooijmans 2006: figs 7–8; Pétrequin et al. 2006: fig. 6), clay wheels (Bakker et al. 1999; Dinu 1981; Schlichtherle 2010), wagon models and the small figurines portraying animals yoked to the wagon conclusively prove the early use and diffusion of this major innovation across Europe.

The radiocarbon dates also suggest that wheeled vehicles came into use simultaneously in several regions, challenging earlier views according to which the wagon was invented in the early urban cultures of southern Mesopotamia. Many scholars now suggest that wheeled vehicles were invented independently in multiple centres (for a good summary of various opinions, see Burmeister 2004). Rare items at first, wagons were probably prestige items or part of ritual paraphernalia in the fourth millennium BC, becoming an indispensable means of transportation in the trade stimulated by urbanization in the Ancient Near East from the mid-third millennium.

Late twentieth-century studies have focused mostly on the ritual dimensions and the distribution of wheeled vehicles; more recently, the emphasis has shifted to the role of vehicles in trade, animal husbandry and subsistence. According to Andrew Sherratt's model of the Secondary Products Revolution (SPR) (Sherratt 1981, 1983, 1997a), the primary exploitation of animals for their meat was eventually followed by the discovery that domestic animals could also be exploited for their milk, wool and traction power. This discovery had a profound effect on human economy and society. In Sherratt's view, the SPR emanated from the civilization of the Ancient Near East (Old World) to Europe (the New World) and Asia during the fourth millennium BC. He argued that the SPR was a process at least as important as Childe's Neolithic Revolution in that it involved the adoption of various innovations such as the plough and transport based on animal traction, and the spread of new domestic species such as the horse, the ass and wool sheep. In the wake of the SPR, population growth would have led to the expansion of settlements and major changes in animal-breeding strategies, and long-distance travel would also have been made possible. Sherratt later added two new elements to his model, the drinking revolution and the importance of the domesticated horse for riding and as a pack animal (Sherratt 1997b). The secondary products scenario was conveniently summed up as the 'driving and drinking' revolution. Sherratt envisioned prehistoric communities as resembling industrial societies in many respects.

Sherratt's main argument was that the use of animal-drawn wagons was conceivable only in regions with a concentration of various resources such as livestock, goods and manpower, and thus vehicles were essentially used by the elite. He noted that such a concentration of resources could be observed only in the early urban centres of southern Mesopotamia and thus the spread of the technology, including the package of animal-drawn ploughs and wheeled vehicles, proceeded from south to north on the elite level (Sherratt 2004).

In contrast, Joseph Maran claimed that wheeled vehicles were invented on the northern Pontic coast and were subsequently diffused from that region (Maran 2004: 436–8). In his view, the technology of wheeled vehicles was mediated southward by the Maikop culture of the Caucasus, known to be contemporaneous with the Middle and Late Uruk period. Maran shared Sherratt's view that this technology transfer occurred on an elite level. Lorenz Rahmstorf (2006: 76) came to a similar conclusion after examining the distribution of various trade commodities and innovations of the Early Bronze Age (debas amphikypellon, Syrian flasks, decorated bone cylinders, cylinder seals, sinkers, spools, weights, etc.). Various Anatolian and Mesopotamian products and innovations rapidly spread to the Eastern Mediterranean at the time of the so-called second urban revolution. Rahmstorf suggested that this rapid diffusion could be explained by the fact that Aegean communities had reached a similar level of civilization and were receptive to new cultural

goods. It would appear that the social transformations at the time of the first and second urban revolutions stimulated the mosaic-like diffusion of various commodities, among them wheeled vehicles.

We may agree that major innovations appeared or were adopted in regions where there was a social demand for them. It has recently been suggested that the wagon was an innovation inspired by economic necessity and that its extensive use can be observed only in regions where there was a socio-economic need for wheeled vehicles (Maran 2004; Rahmstorf 2006; Ruoff 2006; Sherratt 2004). On the other hand, Sherratt's SPR model has been heavily criticized. It was challenged on the grounds, among others, that milk consumption can be observed well before the fourth millennium BC (Craig et al. 2003; Duerr 2007; Evershed et al. 2008; Greenfield 2010; Greenfield et al. 1988; Vigne and Helmer 2007) and his claim that the horse was domesticated in the Ancient Near East has also been refuted (Anthony and Brown 2007). His views on the place where the invention of wheeled vehicles occurred are similarly contested.

In summary, we may say that the wheel and wheeled vehicles most likely did not arrive to Europe from Mesopotamia. It is possible that these two innovations originated from the Pontic, as Maran believes. However, the new Northern and Western European finds dating from the Late Neolithic raise the possibility that the wheel and wheeled vehicles were invented simultaneously in several places. This would explain the differences in form and style between them, and why they were accorded different roles in various societies and belief systems.

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