

## THE ROYAL CEMETERY AT UR AND EARLY WHEELS<sup>1</sup>

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The Ur excavations led by C. Leonard Woolley revealed several types of remarkable evidence on the existence of wheeled transport in the 3<sup>rd</sup> millennium BC: an image of a two-wheeled wagon<sup>2</sup> on a stone plaque (fig. 1), representations of four-wheeled wagons on the “War” side of the mosaic “Standard” (fig. 2), and the remains of actual four-wheeled wagons in two graves (fig. 3). Besides being spectacular, these finds became one of the main sources on construction of early wheeled vehicles, and wheels in particular. While a question whether “actual wagons were of exactly the same type as that documented on representations” has been raised (Littauer, Crouwel 1979, 16), there is no doubt that the wheels of actual wagons found at Ur were constructed in the same way as depicted: tripartite, with the central plank being lentoid in shape and two flanking crescents, where all parts were held together with external bonding slats (Smolian 1964, 4; Littauer, Crouwel 1979, 18). Indeed, this type of construction is shown on the stone plaque and, with some variations, on the wheels of several wagons of the “Standard”.



Fig. 1. Fragment of a stone plaque. Ur (after Woolley 1934, plate 181b).

The misconception that actual wheels were constructed in the way they are represented on the objects arose from Woolley’s assurances that he discovered such wheels in two graves. But did he observe such a construction in the impressions in the soil? According to Woolley, the wheels in PG 789 “were of solid wood, apparently made up of three pieces” (Woolley 1934, 64); in PG 1232, the wheel “was made of three pieces of wood – distinguishable by the grain – and there were faint but unmistakable marks of the binding which had held them together, three close-set vertical marks on each side of the axle” (Woolley 1934, 108).

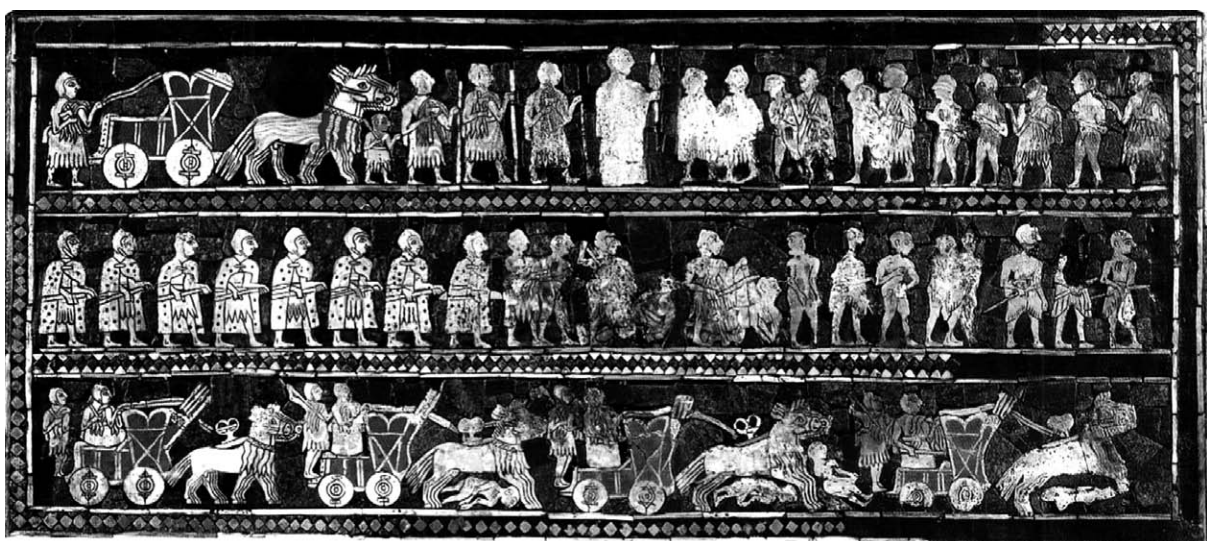


Fig. 2. The “War” panel of the “Standard”. Ur (after Woolley 1934, plate 92).

<sup>1</sup> I want to thank Igor N. Anfimov, Dr. Pascal Butterlin, Dr. Ivan I. Marchenko and Dr. Natalia Yu. Limberis for their kind permission to use their materials in this publication.

<sup>2</sup> The general term “wagon” is used here regardless of a vehicle’s function.



Fig. 3. Wheels in PG 789 (a-b) and PG 1232 (c) (after Woolley 1934, plates 33, 62a).

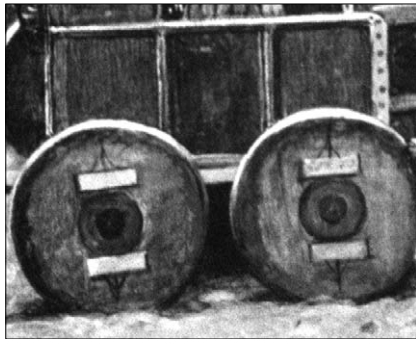


Fig. 4. Wagon in the “Reconstruction of the Scene in the Death-Pit” (after Woolley 1934, plate 30).

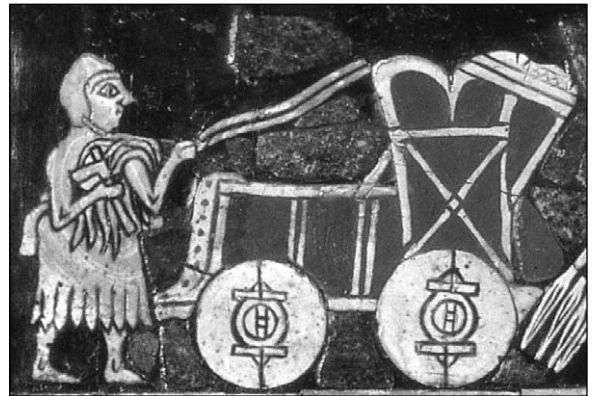


Fig. 5. Wagon in the top register of the “Standard”.



Fig. 6. Wagons in the lower register of the “Standard” (first and second from the left).

Unfortunately, Woolley did not provide a more detailed description of the construction or its scheme which would clarify the shape of these three pieces. It is not known if he saw the imprints of the three parts or, due to the fact that in PG 1232 a wooden nave (or “felloe” as he described it) during the cleaning works “fell off before the photograph was taken” (Woolley 1934, 109) regarded it as one separate part and assumed that two others would flank it. Judging by the illustration “A Reconstruction of the Scene in the Death-Pit” by A. Forestier included Woolley in his publication of the Ur excavations, Woolley believed that actual wheels had a construction

identical to the one represented in the “Standard” (Woolley 1934, plate 30) (fig. 4). But such multi-part construction is not possible in actual wheels, besides, the wagons of the “Standard” display three variants of the central part of the wheel construction. The first variant is where the wheels have a round nave, external bonding slats divided in two with a line beneath and over the nave, and triangles terminating the pattern that are also divided in two with a line. Such a construction is seen in the wagon of the top register, the utmost-left wagon of the lower register, and, possibly, the badly preserved utmost-right wagon of the lower register (fig. 5, 6/a). The second



Fig. 7. Wagon in the lower register of the "Standard" (third from the left).

variant – the wheels of the third wagon from the left where the terminating triangles do not have the dividing line (fig. 7). The third variant is visible on the wagon of the lower register, second from the left, where the figure is lacking the triangles over/beneath the bonding slats (fig. 6/b). The fact that Woolley chose one of these variants (the first one) raises doubts that the imprints in soil left by the wheels in Ur graves reflected their construction, or they were correctly interpreted. The contemporary tripartite wheels from Susa had the straight-sided central plank (fig. 8), as did the more earlier wheels from Mari (fig. 9).

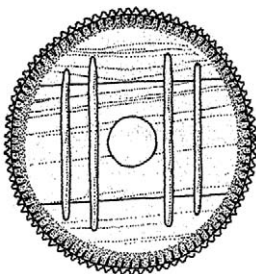


Fig. 8. Wheel, Susa (after Littauer, Crouwel 1979, fig. 5).

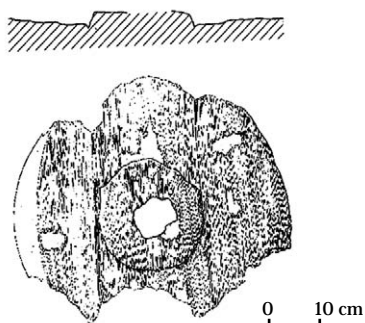


Fig. 9. Wheel, Mari (after Butterlin, Margueron 2006, fig. 3).

This gives us reason to believe that the wheels of the wagons from PG 789 and PG 1232 were of the same construction.

On the whole, the representations of the wheels on the "Standard" repeat the wheel construction shown on the stone plaque but in a misshapen way: the lentoid center clearly outlined on the plaque is changed on the "Standard"; a pair of external slats, on each side of the nave, though divided with a line, became one. Such differences could be explained by the inlay technique but the same picture also offers representations of wheels cut on shell inlays from Mari, where there are images of wheels with the lentoid figure in the centre and variants of its imitation (fig. 10/a-f).

The stone plaque from Ur is dated to the Early Dynastic II period (ca. 2650-2550) (Art 2003); the graves of the Royal Cemetery at Ur contain-

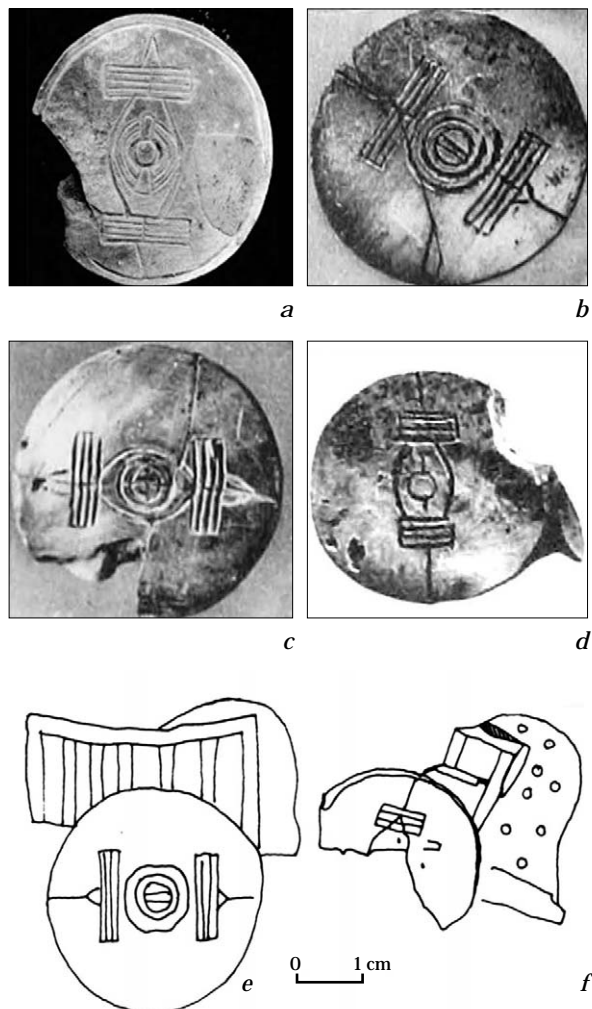


Fig. 10. Wheel images (shell inlays), Mari (a - after Parrot 1971, fig. 10), (b-f- after Parrot 1967, pl. LXV/2462-2464; fig. 262/2465, 2598; 2466).



Fig. 11. Fragment of a stone plaque. Khafajeh (after Boese 1971, Taf. VIII).

ing the “Standard” and wagons – to the Early Dynastic IIIa period (ca. 2550-2400) (Zettler 1998, 22); inlays from Mari – ca. 2550-2250 (Margueron 2003). The actual tripartite disk wheels are dated: from Mari – to the Early Dynastic I period (ca. 2900-2800 B.C.) (Butterlin, Margueron 2006, 317), and from Susa – to the Early Dynastic IIIa period (ca. 2550-2400 B.C.) (Piggott 1968, 270). The discrepancy in the representation of wheel construction with the lentoid central piece, while the contemporary and even earlier actual wheels had a straight-sided central

plank, indicates that the artisans making the mosaic panels in Ur and Mari did not see any wheels with the lentoid construction – by the time the panels were made such wheels were not being used anymore.

The lentoid shape of the central part of the wheel, however, continued to be depicted occasionally on various objects throughout the 3<sup>rd</sup> millennium B.C. They include stone plaques of the Early Dynastic II (fig.1, 11); model wheels of the Akkadian (fig. 12/a-c), the end of the Ur III (fig.12/d), and even the Isin-Larsa periods (Neufang, Pruss 1994, 169, Fund-Nr. 85Q619); and seals. According to the classification of wagon scenes in the Early Dynastic glyptic made by G. Jans and J. Bretschneider, wagons with such wheels (though not mentioned as a criterion but clearly indicated in schematic drawings) included in types (type 1a, four-wheeled; type 5, two-wheeled) that are depicted in a military context, though connected to ceremonial and mythological scenes (Jans, Bretschneider 1998, 160-162, 184, fig. 10). The images of wheels having a lentoid figure in the center seen on an Akkadian seal also belong to a wagon included alongside mythological figures (fig. 13). The representations of wagons are not rare in glyptic (Matthews 1997; Jans, Bretschneider 2011, 77-82, pl. 27) but out of a series of contemporary seals with wagon scenes from various sites, few exemplars bear the images of wheels with a lentoid central piece when craftsmen imitated them

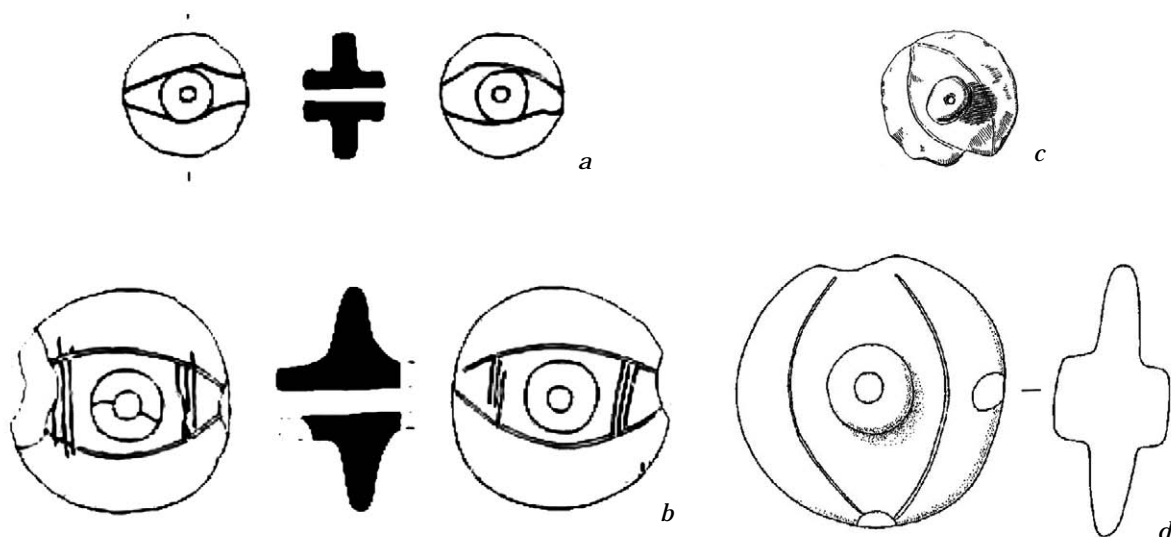


Fig. 12. Clay model wheels. *a-b* - Tell Brak (after Oates et al. 2001 488/36, 39), *c* - Chagar Bazar (after Mallowan 1936, fig. 6/8); *d* - Tell Halawa A (after Neufang, Pruß 1994, Abb. 52/114); *a* - d=4 cm; *b* - d=7,1 cm; *c* - d=3,5 cm; *d* - d=10,5 cm.

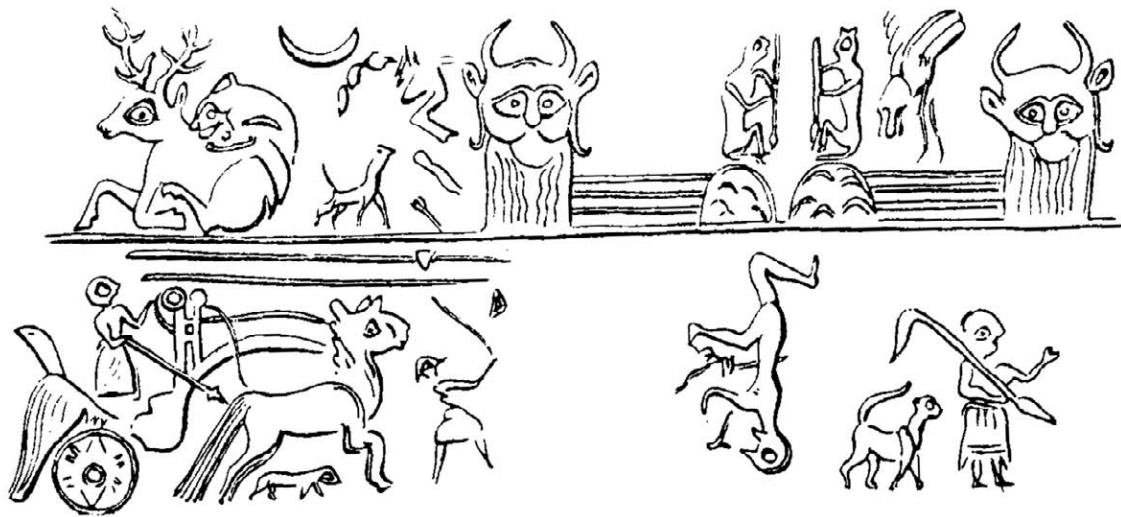


Fig. 13. Cylinder seal impression. Ur (after Amiet 1980, pl. 96/1260).

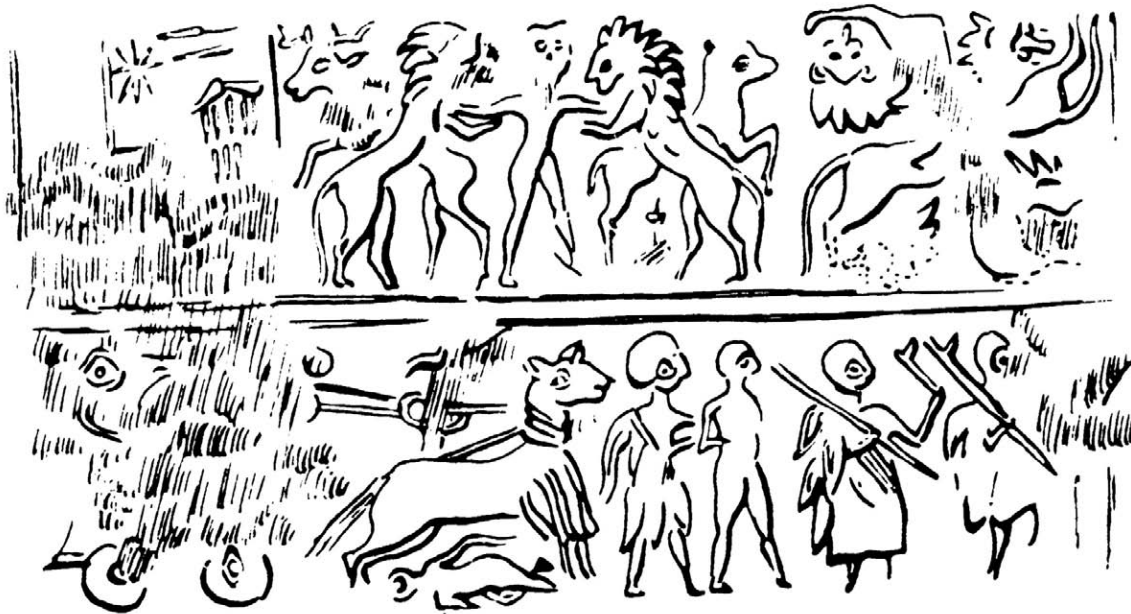


Fig. 14. Cylinder seal impression. Ur (after Amiet 1980, pl. 92/1216).

from the more ancient objects during the Jemdet Nasr (fig.16), the Early Dynastic III (fig. 14, 15), and the Akkadian periods.

The tripartite wheels with the lentoid central plank represent a more ancient construction than the archaeologically proven tripartite wheels with a straight-sided central plank<sup>3</sup>. The kurgan graves

<sup>3</sup>S. Piggott noted that all actual wheels had the straight edges and only certain representations show wheels with the lentoid central part. Referencing A. Salonen's work on terminology regarding wheeled transport, Piggott seemed to accept the lentoid-shaped central piece as a variant of construction (Piggott 1968, 270). But terms given by A. Salonen are out of context (Salonen 1954, 116-117) that is crucial for our subject.

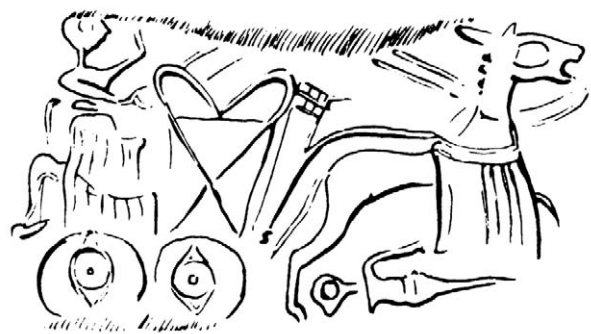


Fig. 15. Cylinder seal impression. Mesopotamia (after Amiet 1980, pl. 92/1215).



Fig. 16. Cylinder seal impression (detail). Mesopotamia (after Littauer, Crouwel 1979, fig. 13).

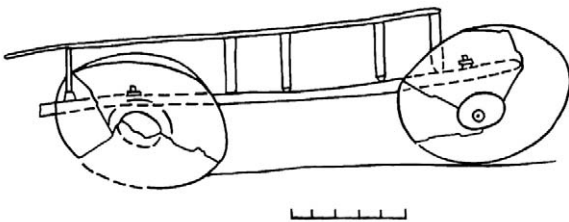


Fig. 17. Drawing of a plaster cast of a wagon. The Novotitarovskaya culture, the Kuban River region (after Анфимов 1986).



Fig. 18. Remains of a wooden wagon. The Novotitarovskaya culture, the Kuban River region (courtesy of I.I. Marchenko and N.Yu. Limberis).

accompanied by actual wagons in the North Caucasus are dated to the turn of the 4<sup>th</sup>-3<sup>rd</sup> millennium BC, and the tripartite wheels of the wagons were already made with the straight-sided central plank; their planks were now held together by internal dowelling, while external binding were continued to be applied in the Near East<sup>4</sup>. The ap-

<sup>4</sup>The data from the North Caucasus graves offers an answer to the issue whether the Ur wheels had the separate nave or it was cut from the central plank (Piggott 1968, 270; Crouwel 2004, 70). Judging on the description of wheels in the "Standard" given by Woolley, "solid wheels built up of two semi-circles of wood fastened together by cross tenons with project-

pearance of wheeled vehicles on the steppe territory is connected to the bearers of the Maikop culture, whose contacts with the Near Eastern regions have been traced from the first half of the 4<sup>th</sup> millennium BC (Trifonov 2004, 170-173). The earliest European evidence indicating the existence of wheeled vehicles there in the second half of the 4<sup>th</sup> millennium BC – the vessel from Bronovice with wagon images (Bakker et al. 1999) and groves in the Flintbek burial interpreted as traces left by a hypothetical wagon (Mischka 2011) – cannot be treated as the ones that preceded the Near Eastern evidence.

Wheel construction was one of the main arguments in the chronological scheme on the origin and diffusion of the wheeled vehicles from Mesopotamia offered by Gordon Childe in the 1950s. Though the chronology has changed for some of the evidence included in his scheme, and new data has become available, the wheel construction constitutes the bases for the solution of the old problem on time and place of the invention of the wheel. And presently, only the territory of the Near East provides evidence on its development.

The diffusion/spread of the wheel in the Old World were not probably as rapid as it might follow from the dates of the European evidence, a view that many scholars share. Taking into account that tripartite wheels with the straight-sided central piece had been already in use by the end of the 4<sup>th</sup> millennium B.C.; that a certain period of time was needed for the development of the wheel construction – the tripartite disk "is not the simplest or most obvious way of making a wheel," as Gordon Childe noted (Childe 1954, 2); and that, as M. Littauer and J. Crouwel assumed, first wheels supposedly were made out of single plank, with the successive tripartite-disk construction (Littauer, Crouwel 1979, 18), the invention of the wheel should be dated back no later than to the beginning of the 4<sup>th</sup> millennium BC.

ing hubs through which comes the axle-end" (Woolley 1934, 269), he might assume the inserted nave. The holes left at the places of naves could support this suggestion. However, the field examples from the North Caucasus, where wheels had the naves cut together with the central plank, indicate that holes equaled to the diameter of the base of the nave were a result of the millennia-long pressure from the soil and wood preservation (fig. 17, 18).



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## Necropola regală de la Ur și construcția roților antice

### Rezumat

În baza analizei construcției roților din necropola regală de la Ur – fragmentul unei plăci din piatră, „Stindardul” mozaic, roțile de la car din înmormântări –, precum și a descoperirilor atestate la alte monumente arheologice, autoarea ajunge la concluzia că, în Orientul Antic, roțile tripartite cu partea centrală în formă de lentilă nu mai erau utilizate către cumpăna mileniilor IV-III a. Chr. În perioada când erau folosite deja roțile tripartite cu centrul rectangular, cele cu nucleul în formă de lentilă continuau să fie redată pe ștampile și plăci votive, copiind, astfel, exemplarele mai vechi.

Roțile de car de la cumpăna mileniilor IV-III a. Chr., descoperite în mormintele tumulare din stepile ponto-caspice aveau centrul de formă rectangulară, deci fiind din următoarea etapă de evoluție. Având în vedere faptul că primele roți de car constau dintr-un disc masiv de lemn, iar pentru trecerea la modele mai evolute a fost necesară o perioadă îndelungată de timp, autoarea presupune că apariția roții în Orientul Antic trebuie datată cu o perioadă de timp mai timpurie, nu mai târziu de începutul mileniului IV a. Chr.

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Fig. 3. Amprente ale roților de care din înmormântările PG 789 (a-b) și PG 1232 (c). Ur (după Woolley 1934, plate 33, 62a).

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Fig. 10. Imagini ale roților (fragment de mozaic), Mari (a - după Parrot 1971, fig. 10), (b-f - după Parrot 1967, pl. LXV/2462-2464; fig. 262/2465, 2598, 2466).

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a - d=4 cm; b - d=7,1 cm; c - d=3,5 cm; d - d=10,5 cm.

Fig. 13. Amprentă de ștampilă cilindrică. Ur (după Amiet 1980, pl. 96/1260).

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Fig. 18. Vestigiile carului dintr-o înmormântare a culturii Novotitarovsk, regiunea Kuban (din arhiva personală a I.I. Marchenko și N.Yu. Limberis).

## Царский некрополь Ура и конструкция древних колес

### Резюме

На основе анализа данных о конструкции колес из Царского некрополя Ура – фрагменте каменной плитке, мозаичном «Штандарте» и колес повозок из погребений, а также привлечения находок, открытых на других памятниках, автор приходит к выводу, что на Древнем Востоке колеса трехчастной конструкции с серединой линзовидной формы вышли из употребления уже до рубежа IV-III тыс. до н.э. Когда у реальных повозок использовались уже трехчастные колеса, у которых средняя часть имела прямые параллельные стороны, колеса с линзовидной серединой продолжали изображать на печатях и посвячительных плитках, копируя их с более древних образцов.

Колеса реальных повозок рубежа IV-III тыс. до н.э., открытые в подкурганых погребениях Понто-Каспийской степи, имели среднюю часть с прямолинейными сторонами, т.е. конструкцию следующего этапа развития конструкции колеса. Поскольку, предположительно, первые колеса были сплошные одночастные и требовалось время на развитие трехчастной конструкции с серединой линзовидной, а затем и прямолинейной формы, появление колеса на Древнем Востоке должно датироваться значительно более ранним временем, чем это принято считать – не позднее начала IV тыс. до н.э.



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