Karren en wagens : constructie en gebruik van voertuigen in Gallia en de Romeinse Rijn-Donauprovincies
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SUMMARY

Research objective, set of research questions and research method
The aim of this study is to gain insight into the construction, typology and use of two- and four-wheeled vehicles (carts and wagons respectively; two-wheeled ‘chariots’ have not been considered in this research) from the province of Gallia and the Rhine-Danube provinces in Roman times. As most of the information is found here, the research area is limited to these provinces. Three types of sources are used: pictures of vehicles, remains of vehicles primarily found in funerary contexts, and ancient written sources referring to vehicles or to other subjects concerning land transport. The emphasis is on the information from contemporary pictorial representations, and of these a catalogue has been drawn up. On the basis of the gathered material, the research area can be divided into a western part (the provinces of Gallia, Germania, and Raetia), and an eastern part (the provinces of Dacia, Moesia, Noricum, Pannonia, and Thracia).

To get an idea of the possible construction of the vehicles, and of the different types of vehicles that were used, answers to the following questions were sought:
- What are the various parts that made up carts and wagons?
  - Which of these parts (possibly) define a type of cart or wagon?
- What are the similarities and differences in the construction of vehicles from the research area on the one hand, and those from the European Late Iron Age and Italy during the time of the Roman Empire on the other?
  - Can a development be discerned in the construction of vehicles?
- Which parts of the construction of vehicles determine their use?
  - What can be said about the use of vehicles on the basis of the pictures?
- What is known about the construction and the use of vehicles from the written sources?
  - Who made the vehicles?
  - How were vehicles made?
  - Who used and owned vehicles?
  - How were the draught-animals harnessed?
  - What was the role of vehicles in funerary contexts?
  - Was this role the same everywhere?

The following text outlines the subjects discussed in chapters 2 through 5. This summary concludes with an evaluation of the answers to the research questions.

Two-wheeled vehicles
In chapter 2 the different parts of the construction of carts are discussed. A cart has one axle, two wheels, a traction element, a loading platform and/or bottom frame, an optional superstructure, and in some cases strap holders as part of a suspension system. On the basis of these elements of construction, as found on pictures from the Roman provinces, four types of carts can be distinguished. Carts of Type 1 have a revolving axle, no raised loading platform, and a single draught pole. They are used for the transport of goods. Type 2 consists of carts with a fixed axle, no raised loading platform,
and a variable superstructure. Within this type, carts with a single draught pole can be discerned as well as ones with shafts. The carts of Type 2 are used for the transport of goods. Type 3 consists of carts with a fixed axle, a raised loading platform, and a variable superstructure. This type consists of both carts with a single draught pole and of ones with shafts. The carts of Type 3 are used for the transport of goods as well as persons. Finally, the carts of Type 4 have a fixed axle, a raised loading platform, a superstructure in the form of a seat, and either a single draught pole or shafts. They are used for the transport of persons.

**Four-wheeled vehicles**

Chapter 3 discusses the construction and typology of wagons. Their constituent parts are treated in the same sequence as those of carts, in order to facilitate a comparison between two- and four-wheeled vehicles. Wagons have two axles, four wheels, a traction element, a bottom frame, an optional superstructure, and in some cases strap holders. Although this is not shown in the pictures, many wagons probably had a pivoting front axle. On the basis of the pictures, two types of wagon can be distinguished. Type 1 consists of wagons with fixed axles, a variable superstructure, and either a single draught pole or shafts. They are used for the transport of goods, as well as persons. The wagons of Type 2 have fixed axles, a single draught pole, and strap holders. Little can be said about the superstructure, because it is not preserved in most of the pictures. The Type 2 wagons are used for the transport of persons.

**Harnessing and control of the draught animals**

Also in chapters 2 and 3, attention is paid to the draught animals, and the way in which they were harnessed to the vehicles. In the provinces mainly equids (mules and horses) are depicted, but bovids are shown as well. In contrast to modern harnessing, the Roman traction element (a single draught pole for two draught animals or shafts for one draught animal) was used for pulling as well as for steering. Experimental research has made it clear that in the Classical World two kinds of harnessing were used for equids: breast traction with a dorsal yoke, and shoulder traction with a neck yoke. Breast traction is not represented in pictures from the Roman provinces. In shoulder traction, the pulling power of the animals is transmitted to the vehicle by the draught animal pushing it’s shoulder-muscles against oval wooden discs that are connected to the yoke ends. Recent research seems to point to either a third way of harnessing, or to an adaptation of shoulder traction: neck muscle-traction with a yoke placed fairly high on the neck. In this case the draught animal’s neck-muscles push against the discs.

In several pictures, besides the draught animal or animals, an additional animal can be seen that does not seem to play a role in pulling the vehicle. This is the so-called outrigger. It probably enabled the driver to change draught animals during travel between two changing places.

The driver of equine draught animals usually sits or stands on the vehicle. He is mostly depicted holding the reins in the left hand and a whip in the right. In bovine draught an attendant usually walks along with the animals, holding a goad or stick.

**Comparison with the European Late Iron Age and Italy during the Roman Empire**

In chapter 4 a comparison is made between the findings from chapters 2 and 3, and pictures and remains of vehicles from the previous pre-Roman period in the provinces, as well as those from Italy.
during the Roman Empire. To facilitate such a comparison, the sequence in which the constituent parts of vehicles are discussed, is the same as in chapters 2 and 3.

Comparisons with the European Late Iron Age should be made with caution, because neither the nature of the finds from that period, nor their geographical distribution, correspond to those from the Roman provinces. We have no pictures of vehicles from the Late Iron Age in Europe, while in tombs mainly ‘chariots’ are found, and no wagons or ‘ordinary’ carts. From the European Middle Iron Age some pictures, as well as some graves with wagons, are known. But in these cases, too, the areas where the finds were made do not correspond geographically to either of those from the Late Iron Age and the Roman provinces. From Italy during the Roman Empire, no tombs with vehicles are known, but vehicles are frequently depicted. These pictures can be compared with those found in the provinces. Moreover, around Mt. Vesuvius, some carts and wagons have been found that were covered by ash when the volcano erupted. These finds, too, present useful comparative material.

The main difference between the finds from the Iron Age and those from the Roman period (from the provinces as well as Italy) is, that there are no Iron Age vehicles known with shafts (for the use of one draught animal). The pictures with shafts from the Roman period are mostly found in Northern Italy and Gallia, which suggests that this type of traction element originated in these areas. Strap holders, as part of a suspension system for vehicles, seem to have had precursors in the European Iron Age and were apparently not much used in Italy during the Roman Empire. Outriggers are mostly seen in pictures from the provinces in the western part of the research area. They are not depicted in the Iron Age, and are rarely found in pictures from Italy during the Empire. Finally, it is noteworthy that in most pictures from all areas and all periods, the driver holds the reins in his left hand, and a whip in his right hand.

**Vehicles in daily life and in funerary contexts**
In chapter 5 the use of vehicles in daily life and in funerary settings is examined. From ancient written sources (especially from the *Codex Theodosianus*) we know of legislation that mainly concerns the use of vehicles, the regulation of traffic, the transport of goods, and the treatment of draught animals. These sources indicate that there was a lot of traffic, and that many things could go wrong. Little is known about the makers of vehicles, except that they are occasionally mentioned in some texts. There also is hardly any contemporary information about the techniques used in making vehicles. Much knowledge has been gained through practical experiments, and it is also possible to gain insights from research into shipbuilding. Recovered ships give information about the wood-joining techniques used, and about the origin of the wood. It is plausible that, as in the case of shipbuilding, local knowledge as well as knowledge from the areas around the Mediterranean was used in the construction of vehicles. Often, it is hard to distinguish the owners from the users of vehicles, but we may assume that vehicles were used by private persons, by merchants, as well as by the army, the emperor and government officials. In addition, some attention is paid to the relations between transport over land and over water, because several pictures indicate that these two forms of transport were not strictly separated. Although transport over land was more expensive than that over water, the costs seem to lie less far apart than was thought for a long time. The two forms of transport were complementary to each other.

Most of the information about vehicles from Roman times derives from pictures on funerary monuments and from vehicle burials. It is unclear what the exact meaning of vehicles in funerary
contexts was, but it seems clear that their role was not the same in all provinces. In pictures from the western part of the research area, vehicles are mostly shown in representations from daily, more specifically, professional life. There are a few tombs containing vehicles in these provinces, and most of these graves follow the *pars pro toto* principle. It appears that in the eastern part of the research area, vehicles are depicted in a more ‘ceremonial’ setting, in which the vehicles are often accompanied by a rider on horseback. In these provinces, many tombs containing vehicles have been found. The vehicles found in these graves, mainly wagons, are on the whole richly decorated, and the graves probably belong to local elites.

Several funerary monuments from the research area on which a vehicle is depicted, also bear inscriptions. From the names of the individuals mentioned we can sometimes deduce the origin of the deceased or the person(s) responsible for erecting the monument. It is notable that most of these inscriptions were commissioned by and for male persons. Only in the province of *Pannonia* the number of men and women for whom a monument with the depiction of a vehicle and an inscription was erected, is about equal. In most cases the number of persons mentioned in an inscription does not correspond to the number of persons depicted on or with the vehicle. It seems, therefore, that there is no direct connection between the inscription and the picture. Possibly, the people who commissioned a text had it inscribed on a stone that was already decorated.

At the end of chapter 5 a list is given of terms used in ancient written sources to denote vehicles. In my opinion, it is not possible to connect pictures of vehicles with these terms. At best, it can be established what a certain vehicle was used for, but not what it looked like.

**Conclusion**

On the basis of pictures and actual remains of vehicles, a typology for carts as well as for wagons that were used in the Roman provinces can be established. However, it is not possible to fully answer the questions concerning continuity and change of the construction of vehicles in the Roman provinces in pre-Roman and in Roman times. Also, it is not clear whether, and if so, to what extent one part of the Empire influenced another, as regards both the construction of vehicles and the harnessing of the draught animals. There are, however, some cases in which there seems to have been continuity and influence, for example in the use of strap holders, shafts, and the way in which the driver holds the reins and whip.

Most depicted vehicles could be used for the transport of goods, as well as persons. The superstructure was probably adaptable in many cases. Only vehicles with strap holders can be said to have been exclusively meant for the transport of people.

Experimental archaeology, knowledge gained from research into shipbuilding, and the study of ancient written sources yield additional information about the construction and the use of vehicles, and about the harnessing of the draught animals. However, it is not possible to connect the names of vehicles used in written sources with actual depictions of vehicles.

There is no unambiguous answer to the question which role vehicles played in funerary contexts. What can be said is, that their role was not the same in all provinces. In the western part of the research area, most pictures show scenes from professional life, while in the eastern part the pictures seem to have a more ‘ceremonial’ character. Tombs containing vehicles are mostly found in *Pannonia* and *Thracia*. In the western provinces of the research area such graves occur only sporadically.