Přehled výzkumů 67/1, 2026 ● 93–102

Sledges and harnesses in the Upper Palaeolithic: On an unfound type of artefacts

Saně a spřežení v mladém paleolitu: příspěvek k nenalézanému typu artefaktů

– *Zdeňka Nerudová** –

'During the greater part of the year the only passable road is that afforded by the ice and snow; therefore sledges (qamuting) of different constructions are used in traveling (Boas 1888, 529).'

KEYWORDS

Gravettian – Magdalenian – transport – sledge – harness components

ABSTRACT

On a theoretical level, the presented article analyses the possible existence and hypothetical methods of cargo transportation in the Upper Palaeolithic (Gravettian, Magdalenian). Using ethnological observations and further studies concerning Late Pleistocene and Early Holocene finds originating from Arctic regions, the author describes the character of potential finds and the possibilities of their differentiation. In this context, she draws attention to three specific finds from the Moravian Gravettian of unclear function, which theoretically could be parts of a sleigh harness, and compares them with similar objects stored in some foreign ethnological collections. The aspect of harnesses used in the Upper Palaeolithic could also be interesting in discussions regarding the first domesticated wolves (dogs) in the Gravettian, or the question of the existence of tamed reindeer. From an archaeological point of view, interesting finds in this context are depictions of horse heads with some kind of halters.

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https://doi.org/10.47382/pv0671-01

Received 24 October 2025; received in revised form 25 February 2026.
Available online 28 April 2026.

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Competing interests: The authors have declared that no competing interests exist.

1. Introduction

While specific human activities are challenging to detect in archaeological collections, it is evident that the prehistoric population was engaged them. One such topic is the identification of artefacts related to the transport of cargo and humans. Emma Vitale and her colleagues revived the discussion by publishing an article focused on the identification of a dog sledge in an archaeological context (Vitale et al. 2023). Based on this article, we can ask whether it is possible to find an object in the Palaeolithic material that could – purely hypothetically – be considered part of a harness. Since the possibilities of identifying a sledge are, as far as materials are concerned, highly limited, we can focus on 'small Palaeolithic mobile art'. The purpose of this study was not a comprehensive search of all known finds, analogies and ethnological sources, but only a random identification of suitable objects.

2. Hunter-gatherer mobility

Represented by hunter-gatherers, the Palaeolithic way of life is directly linked to movement (Lee, DeVore eds. 1968; Sahlins 1972; Kelly 1992; Hitchcock 2004). One of the many questions that we can ask in this context is how people moved from place to place. The repeated and persistent movement of people and/or commodities in the Palaeolithic certainly occurred, as is evident not only in the context of the migration of our ancestors from Africa, which eventually resulted in the settlement of practically the entire world and the rapid transfer of technologies (archaeological cultures) and genetic information between populations. Human mobility was very high, and, especially in the Upper Palaeolithic period, contacts were made over considerable distances, as can be observed, for example, in imports of raw materials in the Aurignacian or Gravettian, carried out over a distance of several hundred kilometres (Féblot-Augustins 1997; Oliva 2001; 2002; Moník et al. 2025). Some of the hunting groups could move up to 17 times during the calendar year as part of their hunting strategies (for example, the Yukaghirs living in the Lena River area near the East Siberian Sea; Kirby et al. 2016; D-PLACE_online). Therefore, based on ethnological analogies, we can assume that movements in the Palaeolithic were also carried out somewhat regularly, in connection with changing seasons, hunting strategies or social needs (Kelly 1992; Burch 1998; Abe 2005; Binford 2012).

Practically every work on the mobility of Palaeolithic populations mentions walking as a means of moving from place to place (Kelly 1992). Walking is one of the oldest and most widespread means of movement (Murdock 1967), and it is not a problem to cover considerable distances in a few days.

Nevertheless, this method of transport somewhat limits the weight and volume of transported commodities, especially if there are no containers available in which to place the objects intended for transport (Gould 1978). Long-distance journeys (for example, in the bush) are usually carried out with the least (lightest) equipment possible, since their purpose is typically social contact or informational round-trips rather than the transport of heavier loads over longer distances (Lee, DeVore eds. 1968). In some indigenous societies, a factor called transport efficiency has even been observed, which decreases significantly with the increasing weight of the transported catch. For example, the Hadza people weigh the advantages and disadvantages (efficiency versus nutritional value) of transporting their catch with respect to distance and weight (O'Connell et al. 1988). A second limitation, especially in the Palaeolithic, could be the reduced mobility of a walker carrying an excessive load. Although contemporary high-altitude porters are capable of carrying extremely heavy loads per person,[1] the weight of the load (and possibly their equipment) limits their mobility and ability to quickly respond to unexpected situations, such as an attack by a dangerous animal, sudden illness, or accident.

3. Transport options

Not only the aforementioned example of transporting raw materials, but also the transport of, for example, catches or immobile people (children, seniors, etc.) forces us to think about how the transport of various commodities could have been carried out in the Palaeolithic. We are looking for a reliable and functional[2] method of transporting people and goods that could be applied during the Upper Palaeolithic period. As considerations of using the water network for transport would form the subject of a whole separate article,[3] we therefore set them aside here; then, in addition to the aforementioned walking,[4] one of the assumed means of movement and transport in the Upper Palaeolithic could be sledges (Fig. 1), so typical for the original inhabitants of the Arctic regions (Nordenskiöld 1882; Boas 1888; Nansen 1894; Bogoras 1904; Czapliczka 1914, etc.) up to the present day (Svoboda 2015; 2020). Their knowledge and use are even one of the arguments in the discussion of the rapid settlement of the North American Arctic (Ameen et al. 2019). Although sledges have undergone some development, from sledges without skids to those with skids, their construction was straightforward and their production and shape have practically not differed from their modern variants for decades and centuries (Nordenskiöld 1882; Bogoras 1904; Jochelson 1905; Svoboda 2015; 2020).

Nevertheless, sledges are probably not the oldest means of transport; that was the travois, a simple A-frame structure used to drag loads over land, most notably by the Plains Indians of North America (see References in Bennett et al. 2025). The load was then attached between the poles in the middle (Lips 1960), or the load could simply be dragged (Rasmussen 1922). Both the sledge and the travois had to be propelled in some way: in addition to human power, animals were used, i.e. dogs, reindeer, horses, and other animals suitable for pulling.

4. Possibilities for identifying a team

When searching for evidence of the existence of a team/sledge in the Palaeolithic, we can rely on several sources: archaeological finds of the sledges and teams themselves and ethnological analogies. Somewhere on the border between both types of information are images and three-dimensional objects from the Palaeolithic age, which are interpreted as a representation (rendering) of the team's harness.

4.1 Archaeological finds with a clear function: sledges and dog teams

Since we cannot be satisfied with only (relatively late) analogies, we are looking for the oldest possible direct evidence of sledge use in climatically suitable areas (especially the Arctic

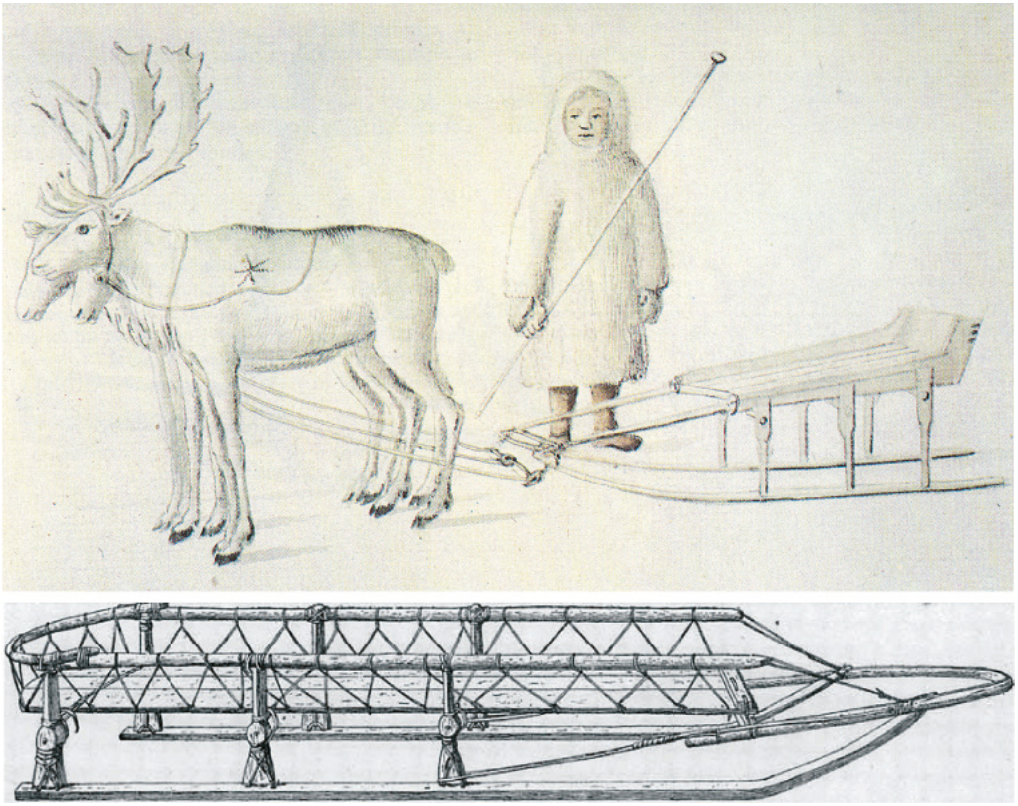

Fig. 1. Two examples of high 'built-up sledges'. Top: variant documented among the Nentsi, visiting Riga in 1786, in an illustration by Johann Christopher Brotze. Source: Wikimedia Commons. Bottom: Tungus sledge depicted by Bogoras (1904). High sleds have sideboards on each side and are usually intended for transporting smaller (lighter) items, such as clothing; they were used with dog teams in Alaska and Siberia. Various sources consistently state that one family could own up to 15 different sledges depending on their purpose: female, hunting, sacred, cargo, travel, etc. (Boukal 2003, 52; Golovnev et al. 2018, 82, 198).

Obr. 1. *Dva příklady tzv. vysokých (built-up sledge) saní. Nahoře varianta zdokumentovaná u Něnce, pobývajícího roku 1786 na návštěvě v Rize na obrázku Johanna Christophera Brotze. Zdroj: Wikimedia commons. Dole tunguzské saně, vyobrazené Bogorasem (1904). Vysoké saně mají na každé straně bočnici a jsou obvykle určeny pro přepravu menších (lehčích) předmětů, například oblečení; se psím spřežením se používaly na Aljašce a na Sibiři. Různé zdroje shodně uvádějí, že jedna rodina mohla vlastnit i 15 různých saní podle jejich účelu: ženské, k lovu, posvátné, nákladní, cestovní, aj. (Boukal 2003, 52; Golovnev et al. 2018, 82, 198).*

regions). These are much more common Early Holocene finds, less common Late Pleistocene finds and relate exclusively to dog teams, as only their remains have been found in archaeological contexts thus far. However, these finds are considered by researchers to be more indirect evidence that could indicate the use of sledges in a particular context and region. Therefore, some basic research criteria have been established, which, depending on the degree of fulfilment, indicate the degree of probability (from zero to very likely) of the use of sledge teams. The following three features are considered reliable criteria for identification, which should ideally occur together in the archaeological material (Vitale et al. 2023): 1. the presence of sledges or their parts, 2. the presence of dog equipment (objects used directly with the attachment and control of dogs during sledding), and 3. parts of dog bodies (including excrement, parts of fur or their bones). It is clear from the description that, unfortunately, these are mostly types of materials (parts) that can be preserved only in some regions (Pitulko, Kasparov 2017; Vitale et al. 2023), or rather, in many areas, it will probably be possible to find only a fragment (only one) of the required features.

From an archaeological point of view, a unique find is two Late Pleistocene sledges from eastern North America, which were probably used for funerary purposes (Gramly, Harrod 2023). The second oldest evidence of the sleds includes the discovery of a part of a sled (fragments of a sledge) from the Zhokhov site (Novosibirsk Islands area), dated to the Holocene (7900 BP); other wooden objects from the same site, unfortunately not directly related to sleds, also show older dates (Pitulko, Kasparov 1996; Vitale et al. 2023). The analysis of the morphology and morphometry of preserved sledge runners and composite platform supports presumes two types of sledge construction – small light sledges and relatively large 'cargo' sledges (Pitulko, Pavlova 2024). As for sledges themselves, their oldest known depictions are considered to be those from the pyramid builders in ancient Egypt, dating from around 3000 BC. Some of the petroglyphs in northern Bohuslän in Sweden likely depict men with sledges; another depiction comes from the Kalnes site in Norway. The scenes are dated to the Scandinavian Bronze Age, i.e. between 1700 and 500 BC (BF online). Decorated examples of three sledges were found during the discovery of a richly furnished Viking grave and ship at Oseberg in Norway; the boat was built around 820 AD (OMCH_online). The lists given are random, but they illustrate well the various forms of finds and at the same time demonstrate the knowledge of the production and use of sledges over a relatively long period.

Fig. 2. Gravettian objects from Předmostí I (1) and Pavlov I (2, 3). A bone object 35 cm long from Greenland, described as a harness part. Currently housed in the ethnographic collections of the Anthropos Institute, Moravian Museum (4). The original inventory number from 1926 belongs to the Umlauff Museum in Hamburg. Identical objects, found for example in the National Museum of the American Indian (Smithsonian) database, are interpreted as bag handles, originating from Alaska from the Iñupiaq Eskimos (NMAI_online). Photo sources: 1 – After Oliva 2015; 2, 3 – after Valoch, Lázničková-Galetová eds. 2009; 4 – photo and overall graphics by Z. Nerudová.

Obr. 2. *Gravettienské předměty z Předmostí I (1) a Pavlova I (2, 3). Kostěný předmět o délce 35 cm, původem z Grónska, byl popsán jako součást postroje. V současnosti se nachází v etnografických sbírkách Ústavu Anthropos, Moravské zemské muzeum (4). Původní inventární číslo z roku 1926 patří Museum Umlauff Hamburg. Identické předměty, které lze nalézt například v databázi National Museum of the American Indians (Smithsonian), jsou interpretovány jako rukojeti (madla) tašek, původem z Aljašky od Iñupiaq Eskymáků (NMAI_online). Zdroje fotografií: 1 – podle Oliva 2015; 2, 3 – podle Valoch, Lázničková-Galetová eds. 2009; 4 – foto a celková grafika Z. Nerudová.*

4.2 Archaeological finds/representations of unclear function

The Moravian Gravettian (Pavlovian) is characterised not only by the uniqueness of the finds or the complexity of the uncovered settlements, but also by the many innovations or technological procedures that the bearers of this culture mastered (Oliva 2007; Oliva et al. 2009; Svoboda 2016; 2020). In addition to the industry of hard animal tissues, which is rich in numbers and types, serving in many cases practical purposes, the Gravettians also made objects whose purpose is unknown to us, or which we classify as artistic or decorative due to their representation. The following three specific artefacts also belong to this group.

A pendant or clasp in the shape of spectacles (probably not entirely complete – Fig. 2: 1) comes from the Předmostí I site; made of mammoth bone, it measures 165 × 29 × 9 mm. The central hole was not completed; traces of a dent are visible on one side, and the other side is damaged by exfoliation. The object was probably first published in 1918 (Absolon 1918). The shape of the object itself evoked its name and function, which was to have been a clothing clasp (Klíma 1990). Two decorated rings called 'owls' were found at the Pavlov I site during excavations by Bohuslav Klíma. Both are made of mammoth ivory. The first object (Fig. 2: 2) was found by Klíma during the excavation seasons of 1952 and 1953 (Klíma 1954), the second in 1956 (Fig. 2: 3).

The maximum length of the first object is 40 mm, while the dimensions of the second object are 42.7 × 36.6 × 7.3 mm and the weight is 6 g. The surfaces of the second 'owl' show traces of blows and polishing, and a series of parallel lines is visible on one of the edges (Fig. 2: 3; García Diez 2005). The striking shape, in the case of the object in Fig. 2: 2, perhaps with hints of some protrusions (according to Klíma representing feathers, with a large beak in the middle), gave the name to both objects, which could perhaps have served, according to some interpretations, as decorative ornaments on clothing (Klíma 1954, 728).

Some Upper Palaeolithic (Magdalenian) representations, for example, in the French caves of Niaux, La Marche, Erberua or Oxocelhaya, depict horses with a kind of simple halter tied around the nostrils and behind the animal's head (summarised by Clifford, Bahn 2022, 123). Among the artistic finds, it is necessary to mention an object carved from reindeer antler depicting a horse's head, probably with a halter, from Mas d'Azil, or a carving of a horse's head with geometric decoration evoking a halter from the Saint-Michel Cave (France; Fig. 3).[5]

Some of the so-called batons ('bâtons-percés') are considered as a part of the harness in some discussions, probably based on their similarity to horse harnesses, as we know them mainly from ceremonial masks. One of them is depicted on the frontispiece of the 2nd edition of R. F. Spencer's publication from 1976 (Spencer 1976), or from the recent period from Sardinia (Clifford, Bahn 2022, 125, Fig. 4).

We can probably attribute the rare finds of fragments of twisted ropes to purely utilitarian objects. Five fragments of braided rope, two of which were impressions of a cord in cave sinter, come from Lascaux Cave. Among them was a triple-braided cord, 30 cm long, 7–8 mm in diameter, probably braided from plant fibres (Breuil 1955; Glory 1959).

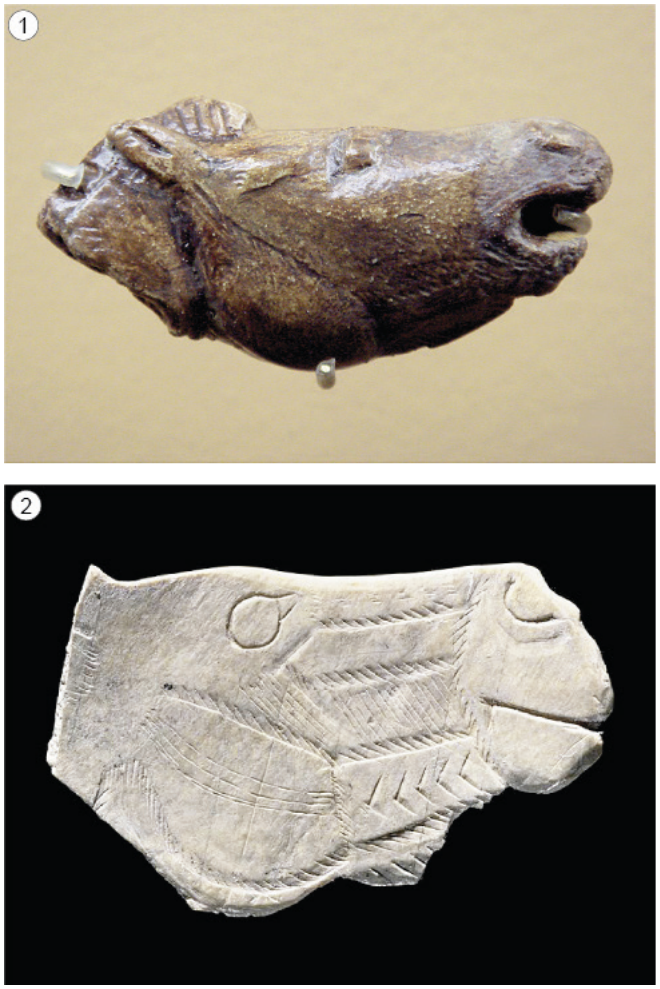

Fig. 3. Horse head from Mas D'Azil site (1) and horse head carving from Aruda, Saint-Germain Cave (2). Photo sources: 1 – Wikimedia Commons; 2 – Musée d'Archéologie nationale – Domaine national du château de Saint-Germain-en-Laye (MAN_online).

Obr. 3. *Hlava koně z lokality Mas D'Azil (1) a řezba hlavy koně z Arudy, jeskyně Saint-Germain (2). Zdroje fotografií: 1 – Wikimedia Commons; 2 – Musée d'Archéologie nationale – Domaine national du château de Saint-Germain-en-Laye (MAN_online).*

What is particularly interesting about the cited finds is the fact that they come from the same time period, the same area, and that they depict horses or objects that are, or can be, associated with horses.

4.3 Ethnological analogies

Any mention, depiction or evidence of the existence of sledges and the way they were used is of a relatively recent dating and generally connected with the modern exploration of the polar regions (Nordenskiöld 1882; Boas 1888; Bogoras 1904; Czapliczka 1914; Rasmussen 1922). The preserved finds and photographs show that the actual harnesses (of dogs, reindeer) were made of leather (as were the shoes of the dogs) and equipped with bone, wooden or antler (possibly ivory) eyelets (Fig. 4), which secured the harness straps and harness. They were essentially identical for both dogs and reindeer (cf. Fig. 4C, 5). The differences were in the way the draft animals were tied. The reindeer had a simple halter around their heads, sometimes also around their muzzles, while the harness for the dogs depended on the type of area: the Palaeo-Inuit (Eskimo) land is characterised by its lack of vegetation. The dog team is therefore tied in a fan shape, and the dogs can have a very heavy load; it is said that they can carry up to 1,500 kg. On the contrary, thickets and forests are typical for Indigenous people (First Nations in Canada) who lived south of the tree line. The dog team must therefore be narrow; the dogs (6–7 dogs) are tied in a line behind each other. They pull light, flexible sledges, and their load can be a maximum of 300–400 kg, including the hunter (Frison-Roche 1972; Irimoto 1980).

The oldest information about the existence and use of sledges is probably a copy of a fragment of the Kungur Chronicle (late 16th century), which states that during the Siberian campaign led by the Cossack Yermak Timofeevich (which was supposed to have begun around 1581), people living near Siberian rivers used reindeer sledges for transportation in the winter (Nordenskiöld 1882, 521). From about the 17th century, sledges pulled by reindeer or horses began to appear more frequently in various artistic depictions in Russia or Finland, usually as a means of social pastime; for example, an engraving of a dog sled on the handle of a knife found at the Ust'-Poluy site in the Ob River region is dated to 1700–1900 (Pitulko, Kasparov 1996).

5. Zooarchaeological evidence – Use of animals for pulling: dogs, reindeer and horses

Parts of dog (in the case of the Palaeolithic period, more likely wolf) skeletons, as well as remains of reindeer and horses, are relatively common in our Upper Palaeolithic material; however, these finds alone are not sufficient evidence for identifying sledges in the Palaeolithic. Furthermore, the preference for a concrete type of animal can differ according to the period, region, or, for example, preferences.

In animals that have been used for pulling heavy loads for a long time, changes in the postcranial skeleton or pathological changes in the bones may be noticeable. However, these arise only with a particular type of harness and in the case of systematic (not just occasional) use for pulling. In this context, unfortunately, changes in the skeleton of dogs (domesticated wolves) have not been recorded for Palaeolithic finds, probably due to the incompleteness and taphonomy of animal skeletons.

The oldest dogs used for pulling sledges, whose remains were found in the Arctic regions, were dated to around 9000 years BP (Pitulko, Kasparov 2017); numerous other finds are significantly younger (Vitale et al. 2023). The dog (*Canis lupus familiaris*) was the most common and also probably the earliest animal used for pulling in subarctic regions. Dogs were primarily used in

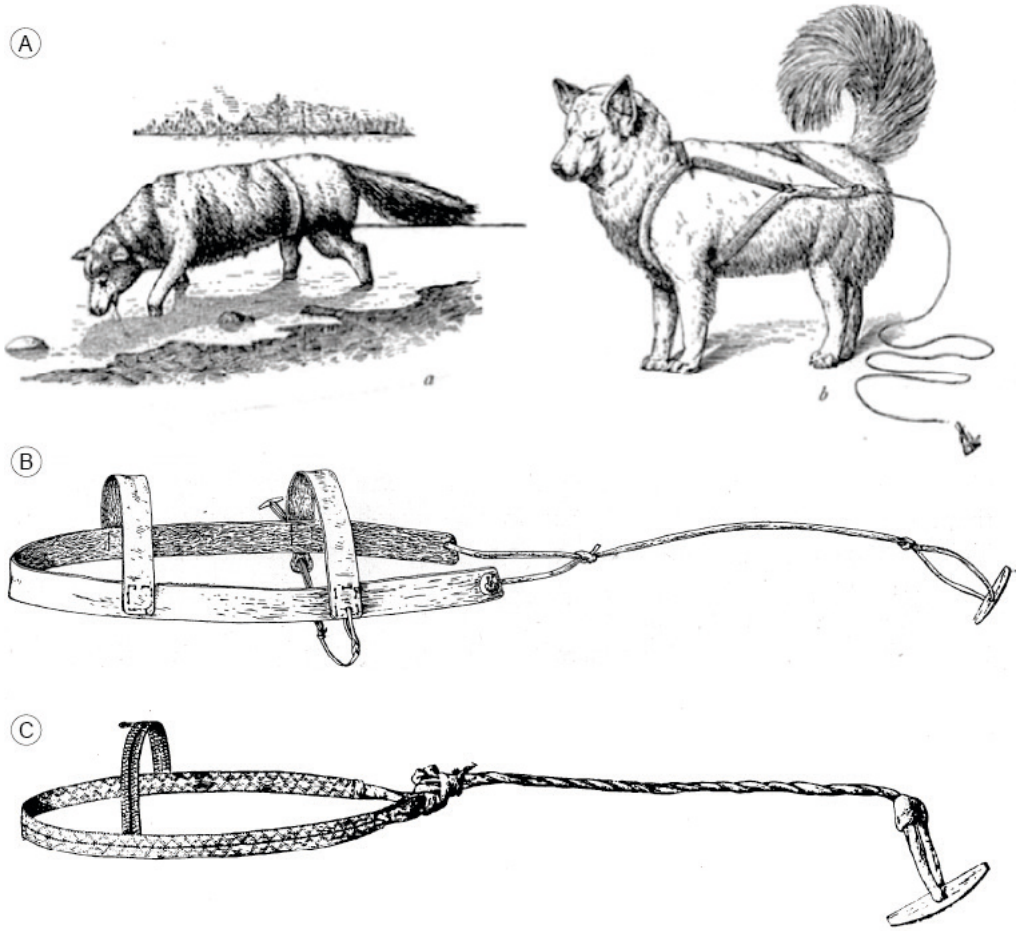

Fig. 4. Three different types of dog harnesses after Bogoras 1904 and Boas 1888 (A), the middle and bottom according to Jochelson 1905. A – West Siberian type. A less functional harness where the dog can only pull with its hind part; B – a more common harness where the dog's front legs are placed in loops connected by crossing straps between the shoulders and across the chest; C – East Siberian (arch, oblique), which has only one short strap over the shoulders. This type of harness is mainly used in Kamchatka and the Amur basin. Due to the construction, where one of the arches is fixed around the dog's neck used for pulling, the animal can easily be strangled. The last type of harness is the ancient Kamchadal type, consisting of a single loop without cross straps, placed over the head and the left front leg, leading to the dog pulling with its right shoulder (Nordenskiöld 1882; Boas 1888; Jochelson 1905).

Obr. 4. *Tři různé typy psího úvazu podle Bogoras 1904 a Boas 1888 (A); prostřední a spodní podle Jochelson 1905. A – tzv. západosibiřský typ. Méně funkční úvaz, při kterém pes může táhnout pouze zadní částí těla; B – častější způsob úvazu, při němž jsou přední nohy psa umístěny ve smyčkách, které jsou spojeny křížícími se pásy mezi lopatkami a napříč hrudníku; C – východosibiřský (obloukový, šikmý) typ, který má pouze jeden krátký pásek přes lopatky. Tento typ úvazu používají hlavně na Kamčatce a v Amurské pánvi. Vzhledem ke konstrukci, kdy je jeden z oblouků upevněný okolo krku psa, který je takto používán k tahání, může velmi snadno dojít k uškrcení zvířete. Posledním typem postroje je starověký typ Kamchadal, který se skládá z jediné smyčky bez příčných popruhů, umístěné přes hlavu a levou přední nohu, což vede k tahu psa za pravé rameno (Nordenskiöld 1882; Boas 1888; Jochelson 1905).*

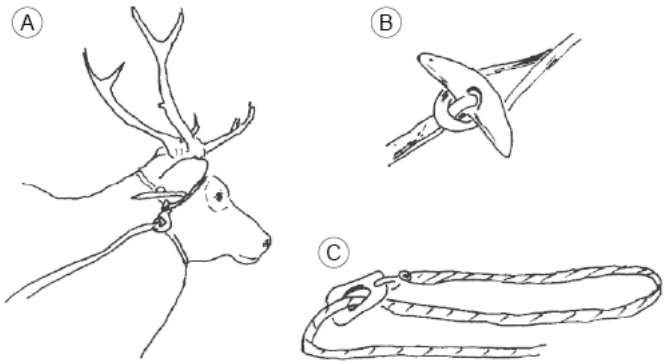

Fig. 5. Details of harness attachment. A – an ethnological document from Greenland; B – detail of the dog harness; C – reindeer harness. Drawing by Z. Nerudová according to Bogoras 1904; Pitulko, Kasparov 2017.

Obr. 5. *Detaily upnutí postroje. A – etnologický doklad z Grónska; B – detail průvleku lana psího postroje; C – detail sobího postroje. Překresba Z. Nerudová podle Bogoras 1904; Pitulko, Kasparov 2017.*

North America, especially since the breeding of domesticated reindeer began there only after 1890 with the import of the first live animals from Siberia (Jackson 1894; Olson 1969). It is of some interest that genetic analyses indicate that dogs, or rather the predecessors of modern draft dogs, were used for pulling much earlier than their Late Pleistocene – Early Holocene finds indicate (Sinding et al. 2020).

The second animal historically used for pulling was the reindeer (*Rangifer tarandus*; Fig. 1). Reindeer, as a draft and riding animal, was and still is, to a lesser extent, used primarily in Siberia (Abe 2005). For the Sami and other indigenous peoples of Siberia, reindeer-drawn sledges are a traditional means of transport, and the Nenets rode them on the swampy tundra even in the summer (Svoboda 2020; Svoboda, Nerudová 2023). Other people, such as the Evenks, Yakuts, and Tuvinians, use reindeer to carry loads, strong castrated males for riding. Numerous skeletal remains of reindeer have been preserved at many Upper and Late Upper Palaeolithic sites.

Here, it is again necessary to recall the method of tying a draft animal, which under certain circumstances does not affect the skeletal system (Fig. 4, 5) and in this context has probably

never been analysed on palaeontological material. Foreign studies on this topic are relatively numerous and supplemented, among other things, by genetic analyses, while the intensive use of reindeer for draft purposes is usually simultaneously associated with their domestication (Nomokonova et al. 2021; Salmi 2023; Salmi et al. 2021, with other references).

A separate chapter is the possible use of horses, as indicated by their depictions from the French Magdalenian. Horses were commonly hunted, especially in the Magdalenian, but it is not thought that humans could have tamed them in the Palaeolithic (Librado et al. 2021).

We have mentioned that the halter was tied around the nostrils from the outside of them, similar to what we know of reindeer (no bit was used), which will not leave marks on the skull/teeth. What may interest us is the question of why horses were depicted and not, for example, dogs (wolves) or reindeer. Were people at that time already able to capture and tame the selected animal, which therefore became significant for the depiction? Or is the explanation more pragmatic, reflecting the different seasonality of horse and reindeer hunting, with horses being hunted in the summer months and reindeer in the winter? Are the depictions of horses with halters evidence that they were used in the summer months? In terms of nutritional advantages, reindeer far surpass horses in terms of usable energy and fat (Pryor 2008).

Unlike the Arctic regions, we still lack reliable evidence for this type of transport in our lands during the Gravettian and the end of the Upper Palaeolithic. The remaining possible alternative that could theoretically have been preserved is some parts of the traction harness: buckles and pins, which served to secure the harness straps (Fig. 5). Their existence has been documented in some Late Palaeolithic and Early Holocene finds, especially from the Arctic regions of Siberia, Alaska, Canada and Greenland (Pitulko, Kasparov 2017; Vitale et al. 2023), and these finds are identical to those known from ethnological publications or preserved period photographs.

6. Discussion

If we want to respect the methodological procedure defined by Vitale et al. (2023), we should ideally have all three types of finds (sledge, harness and dogs) in one find context at the same location. Unfortunately, this is not the case. The Palaeolithic evidence is both widely scattered and at the same time somewhat heterogeneous in time and geography (Gravettian, Magdalenian, Moravia, France).

The depicted Moravian Gravettian art objects were not chosen by chance from the plethora of Upper Palaeolithic small mobile art: they were selected for their shape, size and the existence of a hole.

The two objects referred to as 'owls' stand out because they are almost identical; it can be said that they were found at the same site as a pair. What we consider essential is that analogies can be found for them in foreign collections, based on which it would be possible to connect them with a part of a dog harness, specifically with the toggle part of a dog harness. In terms of dimensions and shape, both objects from Pavlov fall entirely within the variational range of the mentioned objects. Analogies originating from various regions of North America and Siberia can be found in the on-line database of objects of the National Museum of the American Indians (Smithsonian; Collection search, dog harness; NMAI_online), as well as in the on-line database of the British Museum (The British Museum, Collection, dog harness; TBM_online), among the Digital collections of the American Museum of Natural History (AMNH_online),

Fig. 6. Two examples of the toggle part of a dog harness. A – musk ox horn; B – bone. Both pieces Netsilingmiut Inuit (Netsilik), collected between 1913 and 1916; King William Island and Boothia Peninsula; Kitkmeot Region (Qitirmiut); Nunavut; Canada. Source: National Museum of the American Indian (NMAI_online), Copyright: CC0.

Obr. 6. *Dva příklady přehazovaček psího postroje. A – rohovina pižmoně; B – kost. Obojí Netsilingmiut Inuit (Netsilik), získané v letech 1913 až 1916, oblast Ostrov Krále Viléma a poloostrov Bothia, oblast Kitmeot (Qitirmiut), Nunavut, Kanada. Zdroj: National Museum of the American Indian (NMAI_online), Copyright: CC0.*

and also on the website of the National Museum of Denmark (NMD_online, and here cf. Fig. 6).

The first described object from Předmostí (Fig. 2: 1) is somewhat atypical, and, unfortunately, due to surface damage, it is not possible to perform a more detailed observation, especially the determination of possible use-wear traces or polishes. Nevertheless, the idea that it could not be used as a part of a harness cannot be rejected outright. In this context, I would like to refer to the variability of these objects, or the personal invention of the creator of such a component, and point out a very atypical object of rectangular shape with four longitudinal holes (see NMAI_online_143458), which also served as the toggle part of a dog harness.

If we summarise the available facts, we can evaluate what objective arguments we have for the use of sledges in the Palaeolithic:

- High mobility of people over long distances, transport of various commodities (raw materials, hunted game).
- The presence of animals usable for pulling without the need for their domestication,[6] with genetic analyses of some of them indicating their much earlier draft use than we would assume from the archaeological finds themselves.
- The existence of depictions demonstrating knowledge/use of halters.

- Supporting positive arguments may be:
- Long-term modern knowledge of sledge use (throughout the Holocene), and also that the oldest known evidence of sledges dates back to the end of the Pleistocene.
- The similarity of some small Palaeolithic art objects with ethnological finds of harness components.

Given the postulate that 'absence of evidence is not evidence of absence (non-existence)', arguments against the use of sledges in the Palaeolithic are limited to stating that:

- Finds of sledge parts or harnesses are not older than the end of the Pleistocene / beginning of the Holocene.
- We do not yet know skeletal finds of animals with skeletal pathologies caused by harnessing.

7. Conclusion

The presented study draws attention to the possible existence of a difficult-to-prove method of transport in the Upper Palaeolithic, which would be the use of sledges.

Although there are rich archival and ethnological sources (photographic, travelogue, diaries) on this topic, archaeological finds are either non-existent or mostly scarce, regionally limited to Arctic territories and temporally limited from the Late Pleistocene / Early Holocene to the present. Although sporadic objects appear in our Gravettian material that could theoretically be considered parts of harnesses (Fig. 2: 1–3), their functionality in this respect has not been studied in any detail. Palaeontological research could focus on examining possible deformities of dog (wolf) and reindeer or horse skeletons from Upper and Late Palaeolithic contexts, to see if any evidence of the use of these animals for draft purposes could be found. Any positive findings would be particularly valuable to the debate over the domestication of the first dogs in the Gravettian, as they would, in addition to genetic and isotopic analyses (different dietary requirements of dogs versus wolves), more strongly support the argument for domestication.

Acknowledgements

This article was created based on institutional support for the long-term conceptual development of a research organisation provided by the Ministry of Culture (DKRVO, MK000094862). I would like to thank P. Neruda for the discussion and interesting suggestions during the creation of this article, and to the reviewers for their valuable comments.

Notes

1 The record holder was Ladislav (Laco) Kulanga, who repeatedly carried above-limit loads in the High Tatras (Slovakia), his maximum being 207 kg (LK_online).

2 Travelers who used sledges for transportation usually did not write about them as a fast method of transportation. Documented observation records indicate that while the average speed of a hunter on foot in the field was 4 km/h, a reindeer sledge travelled at an average speed of 8 km/h (Abe 2005, Tab. 5.48), a dog sledge about 9 km/h (Irimoto 1980), depending on the terrain, weather, amount of snow and weight of the load.

3 The control of waterways, even over long distances, undoubtedly existed in the Palaeolithic, as evidenced by human fossils, e.g. from Australia, dated to 70,000 years ago (Thorne et al. 1999), cave paintings from Borneo, which are said to be up to 50,000 years old (Aubert et al. 2018), and cave paintings from Sulawesi, which are perhaps up to 40,000 years old (Aubert et al. 2014).

4 Extreme running, for which some groups of ultrarunners are known (e.g. Tarahumara), is much more demanding in terms of energy, fitness, and logistics than regular walking, not to mention the infeasability of transporting more material things (in general, on current endurance running: McDougall 2022; on the endurance running of our predecessors, Bramble, Lieberman 2004; Lieberman et al. 2007; Hora et al. 2022; on energy, e.g. Loskot 2022).

5 For the sake of completeness, it must be stated that not everyone agrees with the interpretation that the images show horse halters. This idea was particularly supported by G. P. Bahn (1982), and E. Clifford and P. Bahn (2022) also argue in this sense in their work. Some researchers point out that the images document only a different morphological type of horse (e.g. Corchón, Rivero 2013).

6 It is necessary to distinguish between domestication and taming, which are two different processes.

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Resumé

Předkládaný příspěvek v teoretické rovině rozebírá eventuální možnosti způsobů přepravy nákladu v mladém paleolitu (gravettienu, magdalénienu) a s nimi spojenou případnou existenci (znalost používání) saní. Tématem se v nedávné době zabývala Emma Vitale s kolegy (2023), která postulovala kritéria týkající se kladné identifikace používání zápřahu saní v paleolitu. Tento příspěvek na citovanou práci tematicky navazuje.

Paleolitický způsob života lovců-sběračů je přímo svázán s pohybem (Lee, DeVore eds. 1968; Sahlins 1972; Kelly 1992; Hitchcock 2004). Jednou z mnoha otázek, kterou si můžeme v této souvislosti položit, je, jakým způsobem se lidé přesouvali z místa na místo. K opakovanému a vytrvalému pohybu lidí a/nebo komodit v paleolitu bezpečně docházelo, jak je zjevné nejen v kontextu migrace našich předchůdců z Afriky. Mobilita lidí, zejména v mladém paleolitu, byla velmi vysoká; etnologické zdroje uvádějí, že některé skupiny lidí se mohly v průběhu jednoho kalendářního roku přesunout až 17krát (Kirby et al. 2016; DPLC online). Téměř každá práce cituje chůzi jako jeden z nejběžnějších, nejstarších a nejspolehlivějších způsobů přesunů i na dlouhé vzdálenosti (Murdock 1967; Kelly 1992), dalším tématem je však transport objemných nebo těžkých komodit, který není při dlouhých pochůzkách prioritou (Lee, DeVore eds. 1968; O'Connell et al. 1988).

Jedním ze způsobů přepravy nákladu a/nebo osob mohl být smyk (Bennett et al. 2025 s další literaturou). Další spolehlivé a funkční řešení pohybu a přepravy ve vrcholném mladém paleolitu mohly představovat saně (obr. 1), tak typické pro původní obyvatele arktických oblastí (Nordenskiöld 1882; Boas 1888; Nansen 1894; Bogoras 1904; Czapliczka 1914, aj.) až do současnosti (Svoboda 2015; 2020).

Při hledání důkazů existence zápřahu/saní v paleolitu se můžeme opírat o několik zdrojů: archeologické nálezy samotných saní a zápřahů (k metodologii viz Vitale et al. 2023) a etnologické analogie. Někde na pomezí mezi oběma typy informací se nacházejí vyobrazení a trojrozměrné objekty paleolitického stáří, které jsou interpretovány jako ztvárnění úvazu zápřahu.

Mezi archeologické nálezy s jasnou funkcí musíme počítat sáně (či spíše jejich fragmenty), úvazy nebo součásti spřežení a postrojů včetně pozůstatků tažných zvířat. Takovéto doklady byly nalezeny v klimaticky vhodných (polárních) oblastech. Jejich datování spadá do časného holocénu, případně do závěru pleistocénu (Pitulko, Kasparov 2017; Vitale et al. 2023; Gramly, Harrod 2023). K dalším archeologickým nálezům patří vyobrazení saní stavitelů pyramid ze starého Egypta nebo petroglyfy znázorňující lovce a saně z oblasti Bohuslän ve Švédsku nebo Norsku. Petroglyfy jsou datovány do doby bronzové (BF_online; OMCH_online).

Z moravského gravettienu známe několik drobných předmětů nejasné funkce (obr. 2). Z některých francouzských jeskyní pocházejí vyobrazení koňských hlav s ozdobou okolo nozder evokující ohlávku (Clifford, Bahn 2022), unikátním je trojrozměrný předmět znázorňující hlavu koně s naznačenou ohlávkou (obr. 3). Také magdalénienské, tzv. velitelské hole (bâton-percé) jsou někdy spojovány se zápřahem, podobně jako fragmenty krouceného provazu nalezené v jeskyni Lascaux (Breuil 1955; Glory 1959).

Absence dochování předmětů sloužících jako součásti spřežení a/nebo úvazu je dána materiály, z nichž byly vyráběny (obr. 4), které se v našich podmínkách, na rozdíl od polárních oblastí nedochovávají. Výjimku mohou představovat součástky postroje/zápřahu vyrobené z odolnějších materiálů, jako je kost, mamutovina nebo třeba sobí paroží (obr. 5). Z etnologických dokladů víme, že způsoby úvazu byly shodné pro psí i sobí spřežení a obdobné byly také používané komponenty.

Přestože zooarcheologická evidence psích (respektive vlčích), stejně jako sobích nebo koňských koster je v paleolitu poměrně početná, prozatím na těchto nálezech nebyly studovány patologie, které by mohly souviset s využitím těchto zvířat k tahu. Nelze také vyloučit, že způsob zápřahu nezanechával na kostech rozpoznatelné stopy (obr. 4, 5) nebo že zvířata byla k tahu používána jen příležitostně.

Srovnáme-li zmíněné drobné paleolitické předměty moravského gravettienu (obr. 2) s etnologickými příklady – drobnými součástkami psího postroje nazývanými přehazovačky (obr. 6), je patrná jejich morfologická podobnost. Současně je v dostupných on-line kolekcích zřejmá vysoká variabilita tohoto předmětu (Smithsonian; Collection search, dog harness; NMAI_online; The British Museum, Collection, dog harness; TBM_online; AMNH_online; NMD_online).

Pokud shrneme dostupná fakta, mezi objektivními argumenty pro využití saní v paleolitu musíme jmenovat:

- vysokou mobilitu lidí na velké vzdálenosti, transport různých komodit (kamenné suroviny, ulovená zvěř)
- přítomnost zvířat využitelných k tahu (kůň, sob, vlk) bez nutnosti jejich domestikace, přičemž u některých z nich genetické analýzy naznačují jejich časnější využití k tahu, než bychom předpokládali ze samotných archeologických nálezů (pleistocenní předchůdci dnešních tažných psů)
- existence vyobrazení dokládajících znalost/použití ohlávky.

Podpůrnými kladnými argumenty mohou být:

- dlouhodobá novodobá znalost v používání saní (po celý holocén) a také to, že nejstarší doklady saní jsou známy již ze závěru pleistocénu
- podobnost některých drobných uměleckých předmětů paleolitického stáří s etnologickými nálezy součástek postrojů.

Vzhledem k postulátu, že „absence důkazů není dokladem nepřítomnosti (neexistence)", jsou argumenty proti používání saní v paleolitu omezeny na konstatování, že:

- nálezy součástí saní a/nebo úvazu spřežení nejsou starší než konec pleistocénu či počátek holocénu
- zatím neznáme kosterní nálezy zvířat s patologiemi skeletu způsobenými zápřahem.

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