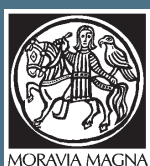
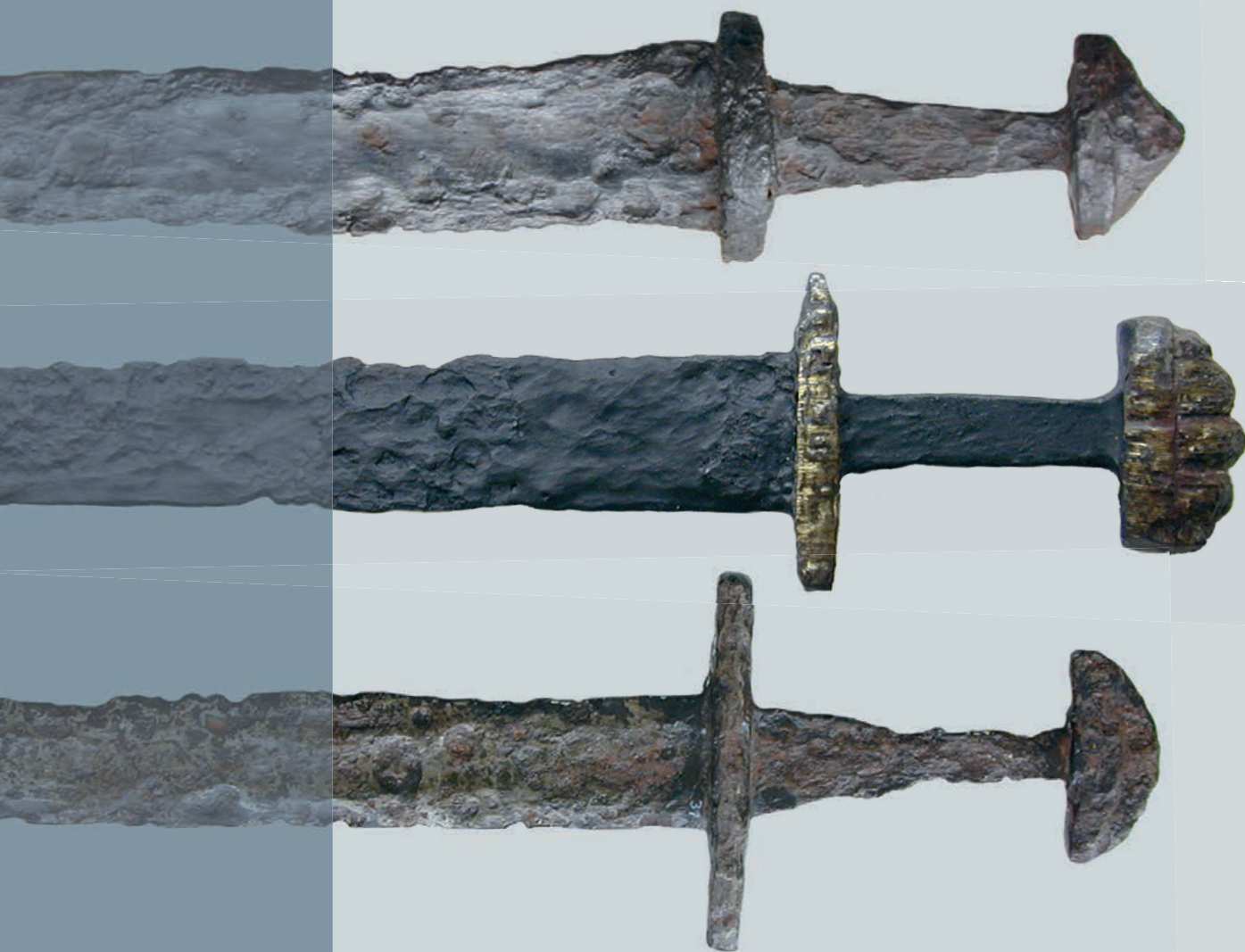


IX

INTERNATIONALE TAGUNGEN IN MIKULČICE



ARCHÄOLOGISCHES
INSTITUT AV ČR
BRNO 2019

BEWAFFNUNG UND REITERAUSRÜSTUNG
DES 8. BIS 10. JAHRHUNDERTS
IN MITTELEUROPA

Waffenform und Waffenbeigaben bei den
mährischen Slawen und in den Nachbarländern

Lumír Poláček – Pavel Kouřil (Hrsg.)

Bewaffnung und Reiterausrüstung des 8. bis 10. Jahrhunderts in Mitteleuropa
Waffenform und Waffenbeigaben bei den mährischen Slawen und in den Nachbarländern

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Lumír Poláček

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Band IX

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VORWORT

Der vorliegende Band enthält Beiträge, die während der gleichnamigen Internationalen Tagung in Mikulčice im Mai 2011 vorgetragen wurden. Wie schon die vorausgegangenen ITM-Kolloquien so war auch diese Tagung einem ausgewählten aktuellen Aspekt der mitteleuropäischen Frühgeschichtsforschung gewidmet, und zwar dem Thema der Bewaffnung und Reiterausrüstung. Damit wurde ein breites Spektrum von Fragen behandelt, beginnend mit Typologie, Chronologie und Technologie einzelner Sorten von Artefakten über allgemeine Probleme der frühmittelalterlichen Bewaffnung und Reiterausrüstung bis hin zum archäologischen Experiment. Der gegebene Themenkreis wird im Buch nicht nur aus Sicht der Archäologie, sondern auch der historischen Wissenschaft erörtert, und zwar mit einer beträchtlichen Gelehrsamkeit und dem Streben nach einer komplexen oder analytischen Darstellung. Die vorliegenden 25 auf ganz unterschiedlichen Quellenbeständen fußenden, oft innovativen Beiträge von Forschern aus Polen, der Slowakei, Tschechien, Ungarn, Kroatien, Österreich und Deutschland bieten ein kompaktes Bild der Bewaffnung und Reiterausstattung der Westslawen und Teilen der Südslawen, aber auch der Awaren und Ungarn vor dem Hintergrund der gesellschaftlichen, kulturellen und politischen Entwicklung Ostmitteleuropas in den letzten drei Jahrhunderten des ersten Jahrtausends.

Leider erscheint die Sammelchrift mit beträchtlicher Verspätung, wofür wir die Autoren und Leser gleichermaßen um Entschuldigung bitten. Hauptursache der Verzögerung waren die nach dem tragischen Brand der Arbeitsstätte in Mikulčice 2007 zu bewältigenden Aufgaben: die Errichtung und Inbetriebnahme der neuen archäologischen Basis Mikulčice-Trapíkovo und die parallel hierzu gebotenen Sicherungsarbeiten

an dem umfangreichen, durch den Brand beschädigten Fundmaterial von der Fundstelle Mikulčice-Valy, das nach und nach konservatorisch behandelt und identifiziert werden musste.

Trotz der Verspätung erlauben wir uns, der wissenschaftlichen Fachwelt diesen Konferenzband zu unterbreiten, in der Überzeugung, dass alle Beiträge ihre Relevanz und Aktualität behalten haben. Mögen sie als nützliches Hilfsmittel und Studienmaterial für weitere Forschungen auf dem betreffenden Fachgebiet dienen! Ergänzt sei, dass die letzten Autorenkorrekturen der meisten Beiträge im Jahre 2016 erfolgten und der Inhalt seither nicht mehr aktualisiert wurde.

Es ist uns eine angenehme Pflicht, uns bei allen Autoren der in der Sammelchrift präsentierten Beiträge sowie bei dem Kollektiv der Mitarbeiter, die sich an der Vorbereitung dieses Bandes beteiligten, recht herzlich zu bedanken. Für Übersetzungen und sprachliche Korrekturen sind wir Frau Pavla Seitlová und Frau Tereza Bartošková und sowie den Herren Torsten Kempke und Paul Maddocks verbunden. Für Redaktionsarbeiten gebührt unser Dank Herrn Petr Luňák und Frau Zdeňka Pavková, die auch den Satz des Buches übernahm.

Das Buch erscheint in einem Jahr, in dem das Archäologische Institut der Akademie der Wissenschaften der Tschechischen Republik des 100. Gründungstags seines Vorgängers, des Staatlichen Archäologischen Instituts, gedenkt, der ersten professionellen archäologisch-wissenschaftlichen Arbeitsstätte in der damals eben erst gegründeten Tschechoslowakei.

Erscheinen konnte die Publikation dank der finanziellen Förderung seitens des Editionsrats der Akademie der Wissenschaften der Tschechischen Republik, dem dafür unser Dank gilt.

Lumír Poláček – Pavel Kouřil

Reconstruction of the Riding Saddle Used in Great Moravia in the 8th–9th Centuries

VÁCLAV GŘEŠÁK – MARTINA HŘIBOVÁ – † PETR HLAVÁČEK – LUDĚK GALUŠKA – ONDŘEJ BÍLEK

Reconstruction of the Riding Saddle Used in Great Moravia in the 8th–9th Centuries. *The aim of our report is to describe an experiment based on archaeological finds, resulting in a functional model of the saddle used in Great Moravia in the 8th- to 9th centuries, including verification of its riding properties. The saddle was reconstructed on the basis of discoveries of Avar and Hun saddles which were adopted by Slavs.*

Keywords: Slavic saddle – reconstruction – archaeological experiment

1. Introduction

The interest in Slavic saddles used during the Great Moravian period was motivated by an exhibition planned as part of The Great Moravian Empire Memorial Monument. One exhibit is a horse figurine with a period saddle and horse-trappings. Thus far early medieval saddles have not yet been the subject of intensive archaeological studies.

2. The saddle in the 8th–9th centuries

2.1. Slavic saddles

Information concerning Slavic saddles from the available literature can be summarised as follows:

1. Contemporaneous literary sources mention the saddles of Moravians but no information is provided about their appearance (MMFH 1966). Ibrāhīm ibn Yaʿqūb (al-Tartushi) (RICHTER-BERNBURG, 2007, 402b–403b.) also speaks about saddles crafted in Prague.
2. In archaeological literature, saddles of the Early Middle Ages were studied mostly by Russian authors.¹ Gyula LÁSZLÓ (1943) studied the saddles in detail.

Attila Kiss undertook literary research on the subject of saddles from the Early Middle Ages (KISS 1984, 189–207). The above authors mentioned Slavic saddles only marginally, and consistently state that the Slavs used saddles adopted from neighbouring nomadic peoples (KISS 1984, 189–207, SEDOV 1982, 238). Gyula László summarised the matter thus: “Early and later Slavic saddles were developed from adopted wooden steppe saddles” (LÁSZLÓ 1943).

3. European archaeological finds from 0–1000 AD do not contain any complete saddles, only the remnants of metal parts or adornments. The reconstruction of a saddle on such a basis is uncertain, although a number of authors have tried it. Attila Kiss discusses such reconstructions (KISS 1984, 189–207). In most cases the reconstruction involves merely a drawn reconstruction of the saddle base (saddle tree) or a non-functional wooden maquette. The saddles of the Slavs are not dealt with.

4. The only information regarding the appearance of Great Moravian saddles is provided by finds of clay model saddles from Mikulčice (NOVOTNÝ 1966, 649–688) and of the silver plaque from Staré Město representing a rider on horseback with a bird of prey on his arm (GALUŠKA 2004, 35–36).

It is likely that the Slavs did not have saddles that were structurally different from other tribes. The Slavs

¹ VAJNŠTEJN 1966a; 1966b; AMBROZ 1973; DMITRIEV 1979; KISS 1984; KYZLASOV 1973.

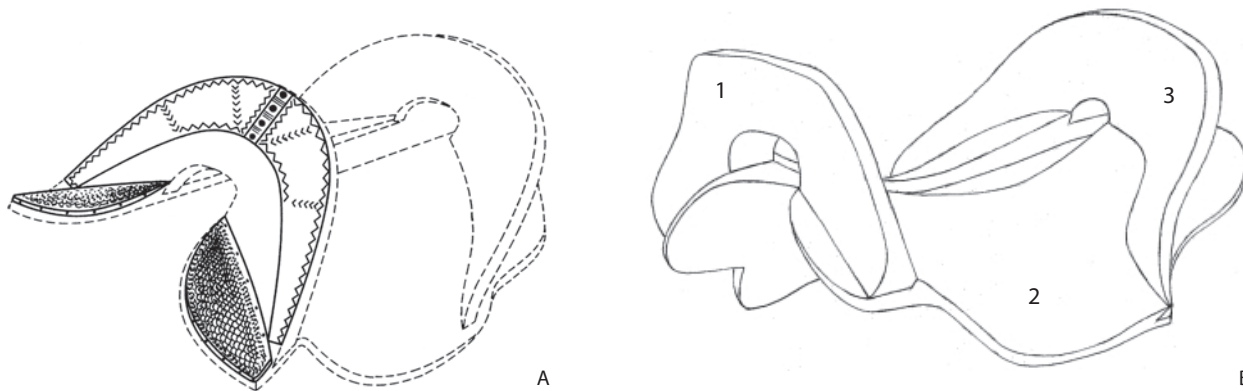


Fig. 1. A – Hun saddle tree (DMITRIEV 1979); B – Avar saddle reconstructed by the authors: 1– fork, 2 – bar, 3 – cantle. Drawing: by V. Gřešák.

were never an “equestrian nation” as were the Scythians, Huns or Avars. They adopted saddles from nomads who developed new types of saddles in areas of eastern China, expanding to the west during times of conquest (AMBROZ 1973, 81–98).

To obtain information about the Slavic saddle’s appearance, we have to analyse the saddle that was spread throughout Europe by the Avars (particularly in the 8th century) (KISS 1984). Theoretically, it is also possible to recognise the influence of Byzantine and Frankish saddles (GIESLER 1996, 808–811), which the Slavs certainly knew considering their frequent contacts. It is probable that there is a similarity between the saddle’s shape depicted in Great Moravian finds and Avar saddles.

Relatively well-preserved finds from the Kudyrge burial site (GAVRILOVA 1965, 85, Fig. 17), Kokel (VAJNŠTEJN 1966a, 60–80) and Dyurso (DMITRIEV 1979, 212–229) made possible A. V. Dmitriev to reconstruct the shape of the Hun saddle tree (Fig. 1), used, with small changes, in Eurasia until the 9th century (AMBROZ 1973, 81–98). The saddle of ancient Turkic tribes was also structurally identical (CHUDJAKOV 2008, 23–38) as well as the Avar saddles depicted in an article by A. K. AMBROZ (1973, 81–98).

The characteristic shape of a riding saddle is determined by the wooden saddle tree that forms its base. Projecting the Dmitriev saddle tree drawing (DMITRIEV 1979, 212–229) onto diagrams of the clay saddle models found in Mikulčice makes it possible to compare the similarities (Fig. 2). Agreement is apparent in the lines of the saddle’s cantle, which is tilted sideways and is lower than the fork. In the lower part, it expands deep into the expanded bar, where it forms a support shape beneath the upper parts of the rider’s thighs. This cantle shape is typical of Avar saddles and is different from the historically and structurally newer type brought to Europe by the Magyars.

The high fork, vertically positioned and relatively high, proves that the clay models display an Avar-type

saddle. The resemblance, however, may be found only on five of the seven discovered saddle models, or their remnants. The remaining two models are different in shape, but it is necessary to consider the creator’s imagination and craftsmanship.

The discovery of clay saddle models is not restricted to Slavic settlements. During excavations in Chanska (Turkmenistan) a clay model was discovered which depicted a saddle with a higher vertically-positioned fork and a lower circular cantle. Sedov describes the discovery: “This type of saddle spread across Eastern Europe during the expansion of the Huns” (SEDOV 1982, 238).

The second preserved saddle representation on the territory of Great Moravia from the 9th century is a silver plaque, the so-called “falconer”, of a rider found in the church “Na Špitálkách” in Staré Město (GALUŠKA 2004, 35–36). The horse is shown in side view and has a complete riding harness. Unfortunately, the saddle is partially covered by the rider’s clothing. Projecting an Avar saddle tree onto a photograph of the silver plaque makes it possible to see that the cantle and fork are in an identical position (Fig. 3).

The fork of the “falconer’s” saddle is vertically positioned and higher than the cantle. The angle tilt of the cantle toward the horizon is approximately 50°, which precisely corresponds to an Avar saddle.

Analysis of the saddle shape shown in the Great Moravian finds demonstrated agreement in structural components characteristic of an Avar saddle, which confirms the hypothesis concerning the use of Avar saddles by the Great Moravian Slavs.

2.2. The development of riding saddles

For saddle reconstruction, an understanding of the saddle tree shape is fundamental. Subsequently, it is necessary to determine the saddle tree structure, the type of material used, and the method of joining individual saddle parts. Further it is necessary to estimate

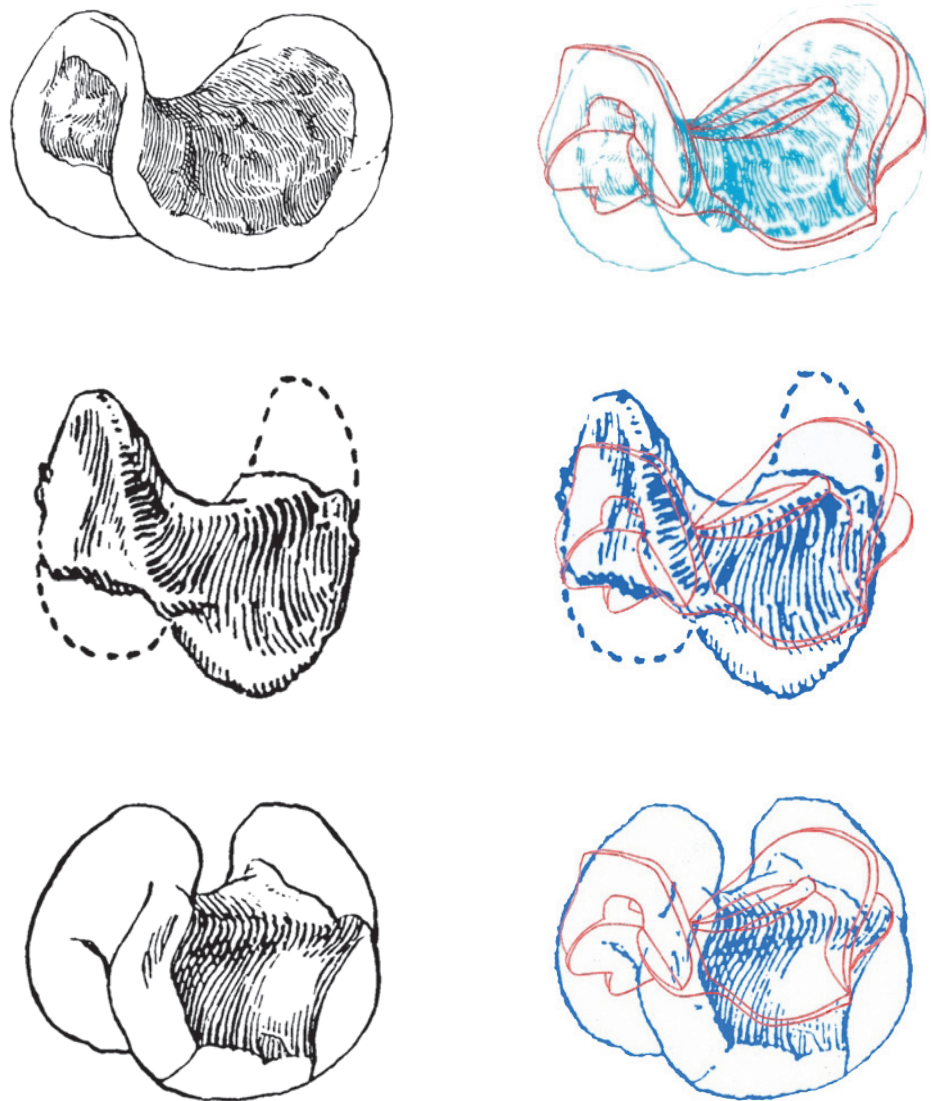


Fig. 2. Projection of Avar saddle tree onto clay saddle models found in Mikulčice (left column after Novotny 1966, right column after M. Hřib).

whether the saddle tree was covered with hide or leather parts and the construction of the individual parts.

To answer those questions, it is necessary briefly to introduce the origin and development of riding saddles.

The first saddle was a “soft” saddle, actually a kind of covering or padding fixed to the horse’s back, to lessen the impact of the aggravating horse sweat on the rider. The soft saddle in different variations – either simple (Latin, “*ephippium*”) or more complex (Scythian saddle, the saddles of the “Terracotta Army” in China) – was used by nomads until the Migration Period (AMBROZ 1973, 81–98).

Approximately 100–200 years BC (GORONČAROVSKIJ 2008, 9–14) there appear saddles with fixed wooden saddle trees. Why did the soft saddle, which had been in use for at least 2,000 years, suddenly cease to be sufficient? The prevailing idea among archaeologists is that the saddle with a fixed saddle tree originated with the introduction of armoured riders in eastern Asian armies. This solution was used to enable a firm platform

for heavily armoured riders during an attack with long spears (GORONČAROVSKIJ 2008, 9–14). An explanation for the development of the saddle with a fixed saddle tree was revealed after the application of veterinary medicine research concerning the horse’s movement biomechanics together with computer-processed data acquired during hippological measurements.

On the basis of de Cocq’s study (DE COCQ 2004, 758–763) it was demonstrated that the basic factor forcing men to develop saddles with a fixed tree was the load on the horse’s back or the rider’s weight. Biomechanical measurements established the limits of the relationship between the weight of the rider and the “bearing capacity” of the horse’s back. The spine of a trained horse loaded with an adequate weight manages to adapt even if the rider does not use a saddle and his weight acts on the relatively small space of the seat. If the weight of the rider exceeds a certain limit, this leads to extreme curvature of the horse’s spine and to the vertebrae jamming. During long-term load,



Fig. 3. Projection of Avar saddle tree onto the “Falconer” plaque. Author M. Hřib.

vertebral adhesions are created. The total weight of a lightly armoured rider does not exceed the critical boundary and it is sufficient to equip the horse with a soft saddle. Full armour increases the rider's weight to above the bearable limit, which leads to fatal consequences for the horse's spine.

The only way to decrease the pressure originating from a large force concentrated on a small area is to enlarge the contact size of the surface. It is necessary to distribute the impact of an armoured rider's weight over a larger area than the area of the rider's seat. A soft saddle did not make it possible to enlarge the seat surface. Furthermore, local pressures were concentrated close to the horse's spine (Fig. 4A).

Two shaped surfaces resting on the horse's back enabled enlargement of the supported surface of a rider's seat. The weight of an armoured soldier sitting on this saddle is distributed over a surface that is equal to the area of the section supporting the saddle tree.

Figure 4 shows a comparison of the pressures affecting a horse spine caused by a rider sitting on a soft saddle and in a saddle with a fixed saddle tree. The

loaded surface in the case of a saddle tree-type is two times greater than in a soft seat-type. The size of the load force is not distributed evenly across the surface. The dynamic load strength changes during the horse and rider's movement.

Ancient saddlers created a series of developmental variants of the riding saddle. Initially, these included a relatively narrow tabular bar connecting two bearing curves, as is documented in the discoveries of saddles from Noin-Ula (RUDENKO 1962, 49–50) or early Chinese saddles (AMBROZ 1973, 81–98). Other enlargements of the saddle tree support surface resulted in the broad bar “shovel” shape of Hun and ancient Turkic saddles (Fig 6.) (CHUDJAKOV 2008, 23–38). One extreme is the so-called “Bosphorus” saddle (GORONČAROVSKIJ 2008, 9–14), where the supporting surface of the saddle tree is not divided into two parts but is created by a single monolithic wooden block.

The saddle with broadened shovel-shaped saddle tree bars was imported into ancient and early medieval Europe by the Huns and Avars. The transition to narrower bars occurred in Europe at the end of the 9th century with the arrival of nomadic Magyars (CHUDJAKOV 2008, 23–38).

Along with a better distribution of the rider's weight, saddle construction with a fixed tree had another indisputable advantage. The side bars of the saddle tree represent an ideal place for suspending stirrups. These facilitated sitting on the horse and also improved the rider's stability.

2.3. Avar saddles

A. K. AMBROZ's (1973, 81–98) study demonstrates that the Avars used saddles of so-called ancient Hunno-Turkic construction that spread across Eurasia between the 5th and 9th centuries. Contributing to an understanding of the tree shape and construction were the finds of well-preserved wooden parts of saddle trees in ancient Turkic graves (VAJNŠTEJN 1966b, 294). Reconstructions made from finds allowed the tracing of the shape of individual saddle tree parts, production technology and also the method of connecting parts into a single unit (Fig. 5).

European finds, primarily from modern Hungary, are mainly limited to metal saddle parts. Drawn reconstructions of Avar saddle trees based on discovered cantle and fork metalwork were published by G. LÁSZLO (1943). However, the author did not have available the finds from ancient Turkic graves published much later. Therefore the reconstruction of the bar shape was inspired by Magyar saddles (Fig. 6). A steeper and higher fork, tilted aslant, the cantle with a lower edge jutting out deep under the rider's legs, are all displayed on

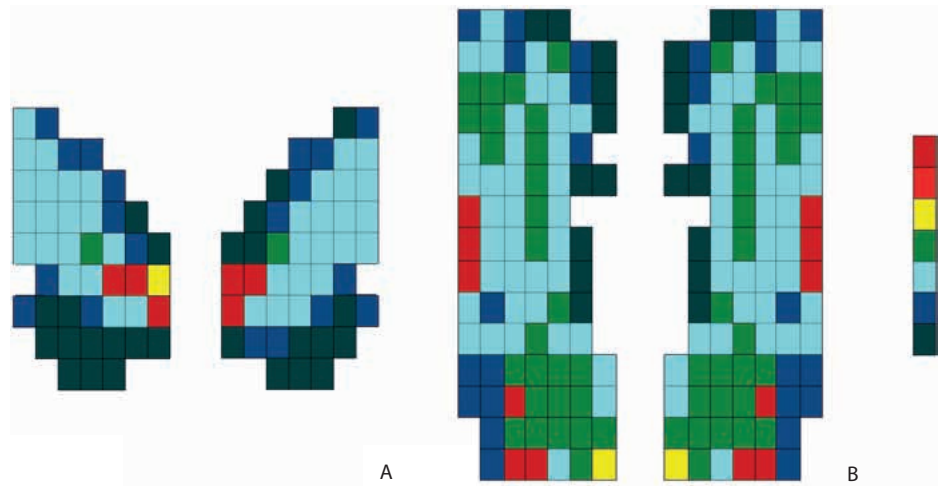


Fig. 4. Comparison of pressure diagrams of rider A – without and B – with saddle. Source: Novel, Munich.

the saddle of ancient Turkic constructions containing broadened bars.

Asian finds of the wooden parts of preserved saddle trees allow the reconstruction of only the wooden tree and the saddle's basic shape. It is impossible to determine whether the saddle tree was covered by rawhide or leather.

In Táng Tàizōng's (Chinese monarch, 7th century AD) tomb, a bas-relief was discovered showing a nomad and a horse with a typical ancient Turkic saddle (Fig. 7: VAJNŠTEJN 1966a, 60–80). The precise depiction it affords allows the shape of the covering leather parts and the construction and connection method to be studied. It is possible to assume that the Chinese and Avars (in respect to their Asian origin) used the same or a very similar shape and construction of leather saddle coverings.

Evidence for the widespread use of a similar saddle type through Asia is also supported by the discovery of clay figurines from the Tan period (618–907 AD) in eastern Turkestan (Fig. 8: VAJNŠTEJN 1966a, 60–80). The saddle seat shows the same construction as that from the bas-relief. It is a highly interesting solution, which preceded the creation of the seat foundation, as we know it from modern Kazakh and Magyar folk saddles. The strap tensioned between the cantle and fork of these saddles provides a firm, flexible and adjustable base for the seat (Fig. 9).

On the saddle shown in the bas-relief and clay figurines, the seat alone assumes the function of the bearing strap. Its front and rear sections have been adapted to a “pocket”. By those pockets, the seat is fixed to the cantle and fork and its middle section remains tightly fixed beneath the tree side. For the rider, this creates a flexible pad that cushions hard impacts when riding. This is schematically illustrated in Fig. 10.

In Avar graves, metal clasps from the upper edge of the fork and cantle are often found (LÁSZLÓ 1943). This

sheathing served to reinforce the edge of both fork and cantle and also held the edge of the stuffed padded seat in the required position, as in modern Mongolian and Tibetan saddles. Early medieval saddlers applied two variants of the seat according to by whom and for what purpose the saddle was to be used.

A “suspended” seat, created from a single leather piece and equipped with pockets for hanging on the

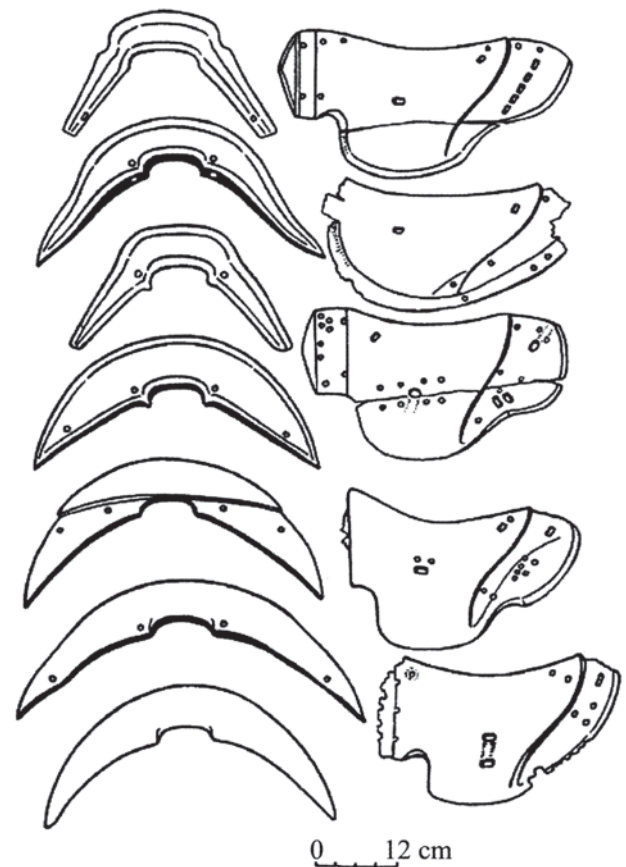


Fig. 5. Shape of bar saddle tree found in ancient Turkish graves. After CHUDJAKOV 2008.

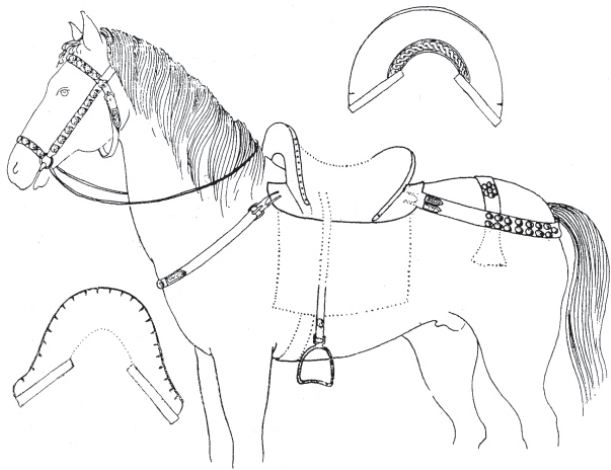


Fig. 6. Drawing reconstructing Avar saddle tree. After LÁSZLÓ 1943.



Fig. 7. Bas-relief on the grave of “Táng Tàizōng” (Zhàolǐng, Shànxi, China, 7th century). After VAJNŠTEJN 1966a.



Fig. 8. Clay figure from Tan period (618–907), Eastern Turkestan. After VAJNŠTEJN 1966a.

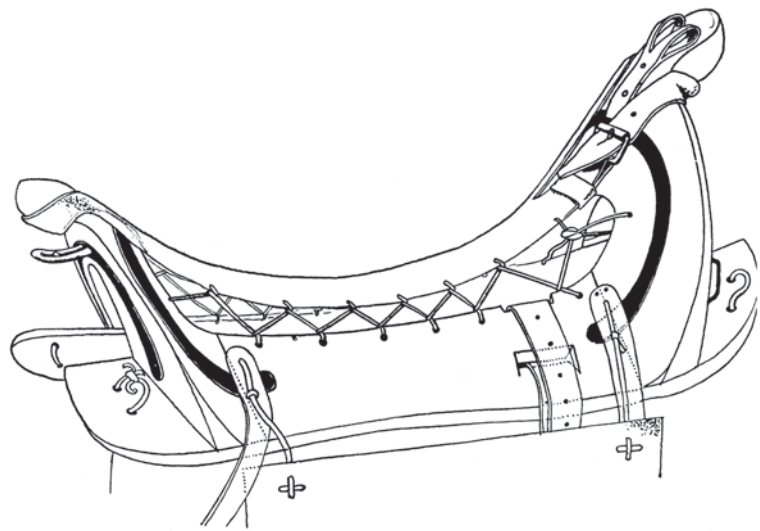


Fig. 9. Kazakh saddle tree with supporting belt (so-called lenchik). After G. LÁSZLÓ 1943.

fork and cantle, was attached to the saddle tree only by straps. Its simple construction and easy interchangeability (without the use of specialised tools) directly predetermined it as the saddle for nomads and pastoralists.

The front and rear edges of a padded seat are fixed to the fork and cantle by metal parts and this requires skilled processing by a saddler and blacksmith. The level of production and metal ornamentation then corresponds to the wealth of the owner.

A suspended saddle could also be reinforced and decorated with metal or ivory ornamentation, which was sewn on or attached to the leather.

Distributing the rider's weight along the spine of the horse and on its ribs has been proven as a functional

solution to the problems related to the extreme weight of armour. For the needs of light riders and the daily life of nomads, however, shovel-type expanded saddle tree bars were unnecessary and, furthermore, more demanding to manufacture. The changes made to the riding saddle at the beginning of the High Middle Ages for Asian nomads is described e.g. by Y. S. CHUDJAKOV (2008, 23–38). At the end of the 9th century in Central Europe, the Magyars introduced a more modern type of saddle with narrower bars, a tilted fork and cantle and with bearing straps connected between them. The construction of ancient Magyar saddles gradually became the basis for military and working saddles used not only in Europe, but also around the world.

3. Creating the saddle reconstruction

Based on analyses of archaeological finds, we are going to describe the appearance and construction of saddles used in Central Europe during the Great Moravian period. The material and technology used for the archaeological experiment needs to correspond as closely as possible with historical reality. The only exception was the wood processing technology of saddle trees, where machine tooling was used.

The saddle tree is made of poplar wood, but originally birch and primarily ash were also used (SOKOLSKIJ 1971, 226–227, Tab. XXXIV). In shape and dimension, the saddle tree corresponds to finds from Turkic graves (Fig. 11). The bottom saddle tree bars must conform to the anatomy of the horse's back. A projection of the shape of the working part of the horse's back was performed using a 3D measurement method developed at our biomechanical laboratory (GŘEŠÁK et al. 2008, 5). A Hucul pony's back was used for the computation. The Hucul pony is a direct descendant of the original horse breed (Tarpan) which was probably the most widespread horse in the Early Middle Ages (EDWARDS 1995, 192–193).

According to the measurements, a virtual 3D model of the saddle tree was drawn consisting of two bars (left and right) and the fork and cantle (Fig. 12). The model parts were cut out of wood on a computer-equipped tooling machine.

The hand-made procedure of creating the saddle tree remained in the cutting of individual parts out of wooden blocks, using simple production and special measuring tools (LÁSZLÓ 1943). Avar saddlers had an advantage over their European colleagues. They made saddles for only one breed of the small and hardy “Mongolian” horse, spread across Asia. Therefore their saddle trees always had the same shape and dimensions for the bottom surface that supported the bars (GŘEŠÁK et al. 2008, 5). This fact led to a standardisation and simplification of the demanding manual production.

The saddle tree parts are connected by rawhide (cattle) straps. The method is suggested by openings in the bars and saddle tree fork and cantle from Turkic graves (Fig. 5). The fork was furthermore anchored “on a stringer” on a perpendicular groove created in the front part of the bar. The cantle has a sideways groove, as shown by the cuts in Fig. 11.

The binding of forks, cantles and bars by straps creates a strong, but also to a certain degree variable and adaptable structure, the connection within which is easy to repair. The entire procedure is amply described by G. LÁSZLÓ (1943).

From finds of saddle tree remains, it cannot usually be determined if their surface was modified.

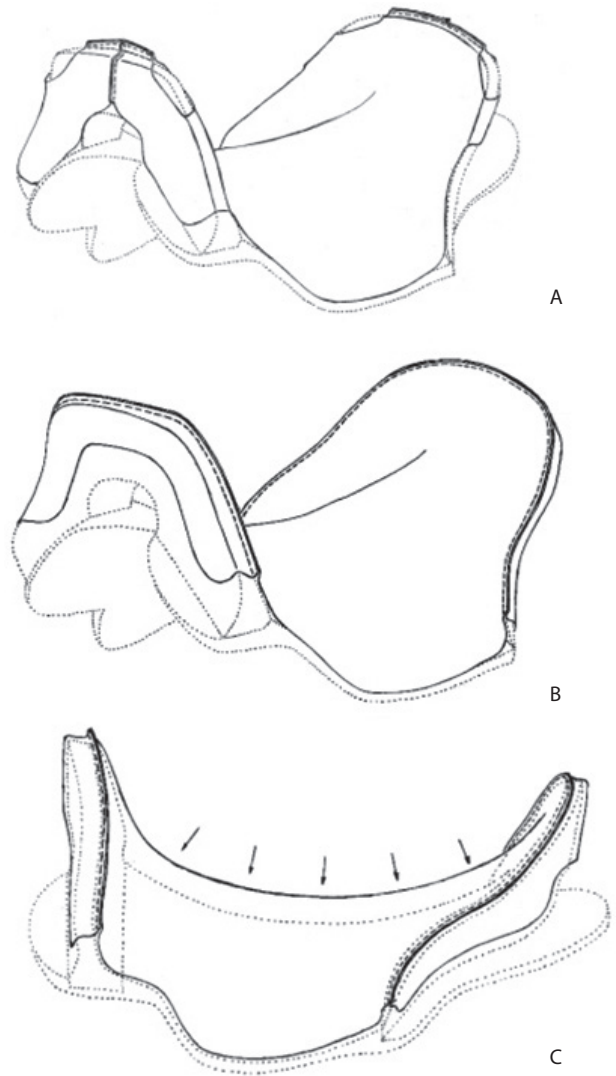


Fig. 10. Versions of seat constructions: A – one-piece seat, B – three-piece seat, C – seat tension over saddle tree. Drawing by V. Gřešák.

Modification was used to increase the strength and resistance to climatic influences in the Middle Ages. e.g. the Mongolian saddle of the 12th century had a tree covered by rawhide (BOISSELIÈRE 2005, 113). The saddle tree of the grave saddle of Henry V († 1422) is covered with linen (HICKLING 2002, 40). Medieval saddlers in Bohemia covered trees in birch bark (JANOTKA/LINHART 1987, 67). Birch bark was a frequently-used material by the Slavs for its availability, lightness, strength and resistance to rot. We used birch bark for the saddle tree covering surface as the most historically accurate material. The birch bark was stuck to the tree surface using bone glue (Fig. 13).

The bottom leather parts (i.e. skirt), shown on the bas-relief and on the clay figurines (VAJNŠTEJN 1966a, 60–80), create a malleable base under the saddle tree bars and at the same time protect the rider's legs from horse sweat. Each saddle bar is equipped with an

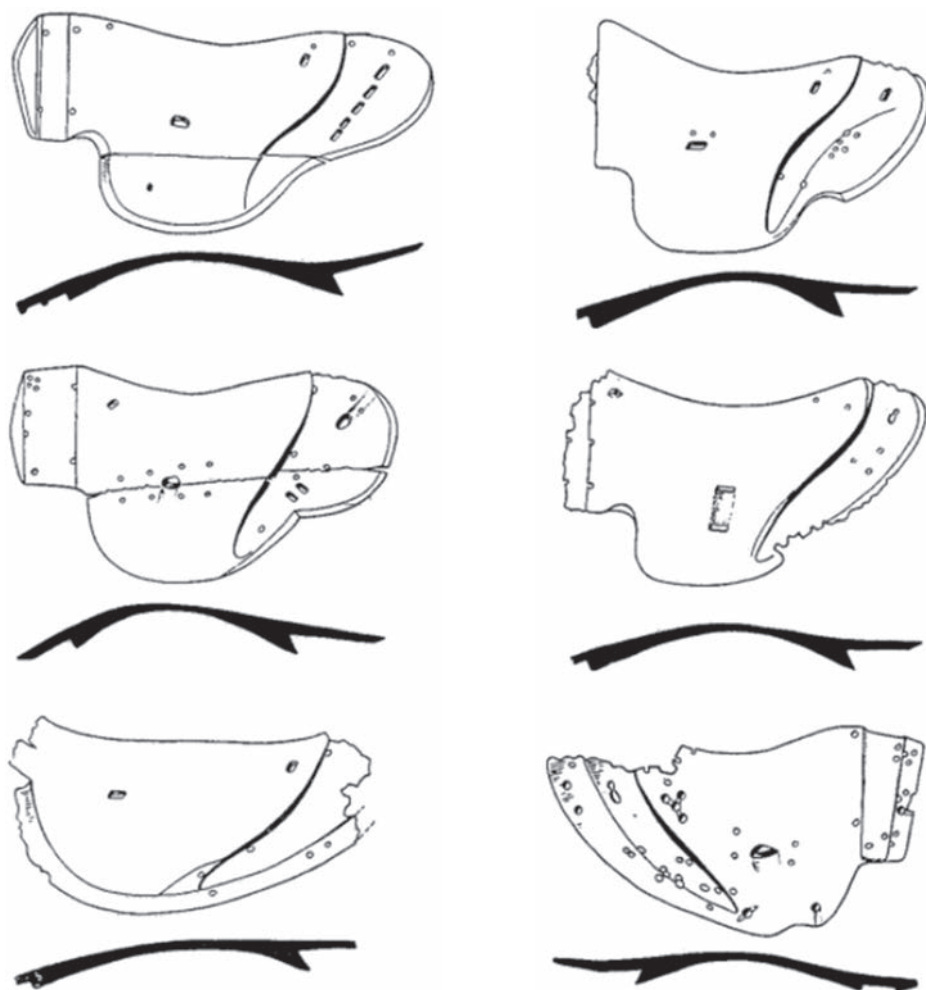


Fig 11. Bars of ancient Turkish saddles from Kokel burial ground (After VAJNŠTEJN 1966b, Tab. X.).

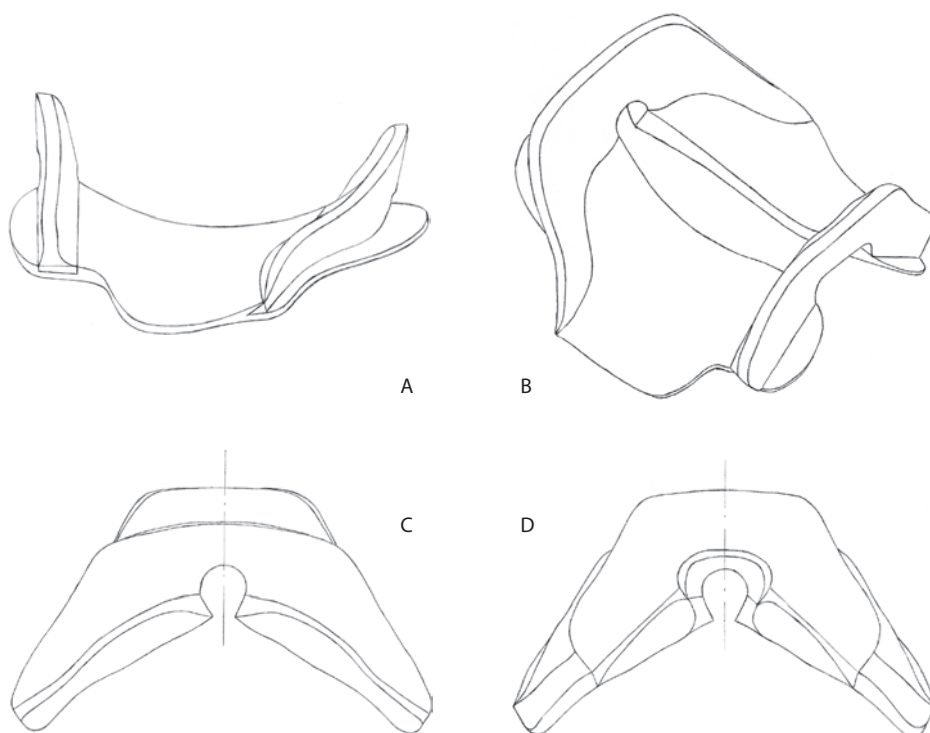


Fig. 12. Saddle tree: A – side-view, B – bird's eye view, C – front-view, D – back-view. Author O. Bilek.

independent leather part, so the gaps between bars create the so-called saddle chamber (GŘEŠÁK 1990, 272) and the horse's spine remained clear. The leather parts fulfil the same function on modern working saddles of Asian pastoralists (Fig. 14). In the next developmental phase in the skirt's leather parts, these became part of the medieval knight's saddle and, through the saddles of the Spanish conquistadors, they were introduced to Western saddles (the so-called skirt). In our reconstruction, both parts are made from tanned cow hide and fixed to the tree by straps (Fig. 15).

An independent supplement to each saddle is the so-called blanket inserted beneath the skirt parts. This is designed to protect the horse's back from blisters and to capture the horse's sweat. Traditionally, it was made of felt, textile or, as in our case, sheep's wool.

The saddle reconstruction is furnished with a sewn padded seat, which covers the entire upper surface of the saddle tree between the cantle and fork and extends across the bottom shovel-shaped protrusion of the bars. The seat is made of tanned deer hide and the fur of large animals was used as stuffing material. On the cantle, the edge of the seat is attached to the tree using a copper rivet. The fork is laced by a strap to the decorative metalwork. The bottom seat edges under the cantle are attached by a strap to openings in the tree and skirt.

The saddle is supplemented by a figure-eight type stirrup (KIRPIČNIKOV 1973, Tab. XII), suspended across the saddle tree bars. The entire saddle is fixed to the horse by a cinch of white "styptic" cow hide and held by straps, i.e. by an apron and crupper.

Verification of the saddle's riding properties was performed at Modrá Open Air Museum (CZ) and at the Museum of Liptov Village in Pribylina (SK) on Hucul ponies belonging to the breeder Mr. Jindřich Goliáš. The riders consistently stated excellent shape correspondence between the horses and saddle (the so-called saddle fitting). Despite the extreme width of the wooden saddle tree bars, the saddle provides sufficient rider comfort.

4. Conclusion

The reconstruction of an early medieval riding saddle was successfully performed. Based on the 3D projection of the saddle tree onto the Great Moravian finds, it was proved, with high probability, that a similar shape of saddle could have been used by the Slavs. The riding properties were tested for practicality and the saddle fulfils its function very well.²

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Fig. 13. Back part of saddle tree covered with birch bark. Author V. Gřešák. Photo by R. Štefková.

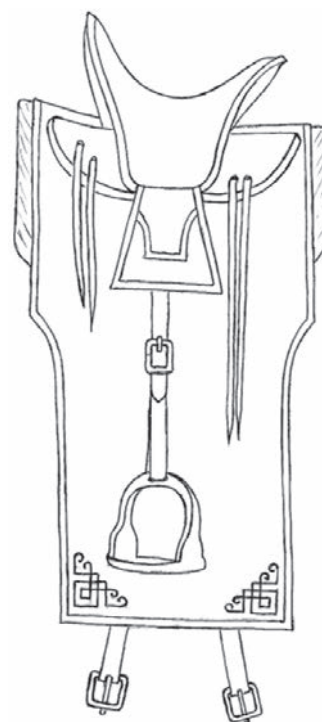


Fig. 14. Drawing of modern Mongolian working saddle. Drawing by V. Gřešák.



Fig. 15. Saddle reconstruction. Author V. Gřešák. Photo by R. Štefková.

Souhrn

Rekonstrukce jezdeckého sedla používaného na Velké Moravě v 8.–9. století. Prezentovaná práce se zabývá rekonstrukcí jezdeckého sedla z období raného středověku používaného na území Velké Moravy. Jsou zde analyzovány archeologické reálie jak z asijských oblastí, kde probíhal vývoje sedel, tak i z Evropy, které

specifikují tvar a konstrukci sedla používaného v 8. až 9. století. Na základě poznatků z oblasti biomechaniky je zdůvodněn vznik sedel s pevnou kostrou. Problematika konstrukce kostry sedla, jejího pokrytí usňovými díly a samotná technologie výroby, jsou řešeny metodou archeologického experimentu.

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Ing. Václav Gřešák
 Ústav fyziky a materiálového inženýrství
 Univerzita Tomáše Bati ve Zlíně
 Nám. TGM 275
 CZ-760 05 Zlín
 E-mail: gresak@utb.cz

Doc. Ing. Martina Hřibová, Ph.D.
 Ústav inženýrství polymerů
 Univerzita Tomáše Bati ve Zlíně
 CZ-760 05 Zlín
 E-mail: mhribova@utb.cz

Doc. PhDr. Luděk Galuška, CSc.
 Moravské zemské museum
 Kapucínské náměstí 8
 CZ-659 37 Brno
 E-mail: lgaluska@mzm.cz

Doc. Ing. Ondřej Bílek, Ph.D.
 Ústav výrobního inženýrství
 Univerzita Tomáše Bati ve Zlíně
 CZ-760 05 Zlín
 E-mail: bilek@utb.cz

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