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MEDIEVAL PAVEMENTS IN THE OLD TOWN OF PRAGUE. AN ARCHAEOLOGICAL CONTRIBUTION TO THE KNOWLEDGE OF THE HISTORY OF COMMUNICATIONS

INTRODUCTION

Medieval surface adjustments of outdoor communications and public spaces are often encountered in rescue excavations in the center of Prague. A wide range of materials and technologies were employed (with variations over time) in their construction¹. To begin with, it should be mentioned that the surfaces of not only some of the pedestrian walkways but also of carriageways were unconsolidated. The identification of such communications in archaeological

fieldworks is difficult but not impossible. The most common way to consolidate a road surface was by the means of a stone pavement. Besides that, hollows carved out in the subsoil are also attested in Prague's medieval towns², including the pre-municipal settlements in Prague. In what follows we present three instances of communications constituted between the 10th and the early 13th century in the Old Town (Staré Město) of Prague.

KAPROVA STREET

A portion of one of the most significant roads in the Old Town which connected the central market place with the ford across the river was unearthed during the construction of the metro station in 1975 (fig. 1; Šírová 1977; 1977a). Two main phases of the road construction can be distinguished. In the first of them, the road had the form of a holloway up to 40 cm deep and 420 cm wide. Two grooves ran parallel at a distance of 71 cm (ruts carved by carriage wheels?). The holloway was filled in with „deposits of refuse of a settlement-like nature containing numerous organic material finds” (Šírová 1977, p. 10). According to the description the strata proba-

bly accumulated in the course of the road's use (fig. 2, 5, 6). The second phase of the roads construction is represented by a very compact 30–50 cm thick

¹ During the archaeological excavations of the Prague settlement agglomeration, roads constructed of wood were discovered only in Malá Strana (Čiháková-Dobý 1999; Čiháková 2007; 2008; 2008a; Čiháková, Müller 2008; Čiháková, Havrda 2008; Cymbalak, Podliska 2010) and to a lesser extent in Prague Castle (Boháčová 1998, p. 10; 1999, p. 704).

² The Prague pre-municipal agglomeration over which two castles (Prague Castle and Vyšehrad) perched, developed in the course of the high middle ages into four individually fortified cities. The construction of the gothic city walls of the Old Town started in the 1230's and was concluded in 1253. No legal document corroborates the foundation of the city though it can be substituted with the confirmation of the Soběslav's privilege for the Prague Germans, probably from 1231. The most significant urbanistic deed was the foundation of the St Gall town sometime in the 1230's (Hrdlička 2001). This was a kind of „a town within a town” founded in an open and sparsely built-up area. It only merged with the Old Town by the end of the 13th century. The foundation of another early medieval, legally established town beneath Prague Castle (today's Malá Strana) is traditionally dated to 1257, i.e. to the beginning of the reign of Přemysl Otakar II. After 1333 Hradčany formally becomes a subject town of Prague Castle. In 1348 the Prague New Town was founded.



Fig. 1. Detail of a cadastral map of Prague's Old Town, discussed excavations and pavement finds marked



Fig. 2. Kaprova street (excavation photograph): 1 – the holloway gradually carved out by combined natural processes and wear from intense traffic and gradually filled in; 2 – a line of post-holes along the road constituting the remains of its fencing; 3 – cobbled road surface; 4 – remnants of the built-up area predating the end of the 19th century

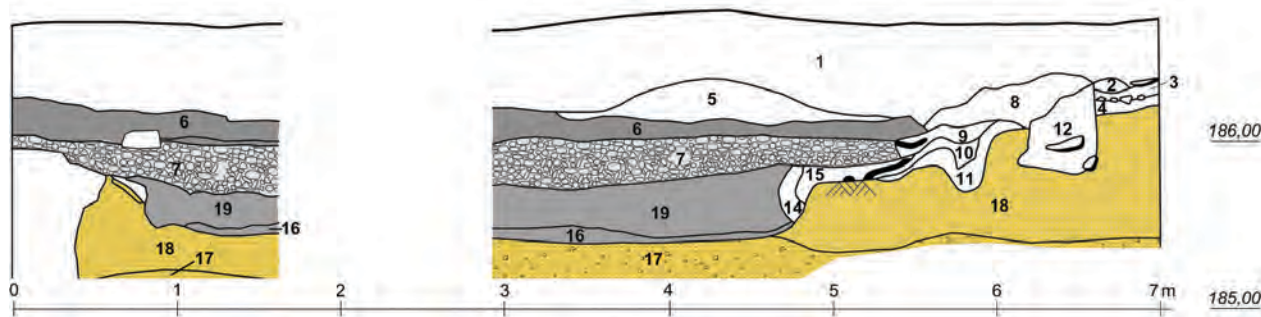


Fig. 3. Kaprova street, a section through the road (the western section of the trench): yellow – subsoil; grey – the individual phases of the road construction

cobble layer (fig. 4). The pebbles lay in a bed of compacted dark clay. Though in some parts the pebbles were interlain with thin soil layers, no actual stratification was recognised. Despite this, the author of the excavation report hypothesises a gradual rise of the pavement (Šírová 1977, p. 11). On the pavement surface rested the layer formed during the use of the path which produced among other finds also a nested weight (one lot; fig. 6). Along its northern side, the road was flanked by a fence,

attested by a line of post-holes (fig. 3). The whole situation dates to the 12th century, probably with some overlaps to both earlier and later periods. The assumed northwestern elongation of this road towards the ford which probably lay close to the St Valentine gate has not been archaeologically proven so far as the excavation in the Jan Palach square only ascertained massive high- and late-medieval refuse layers about 6 m thick (Dragoun 1993a, p. 208; 1995, p. 242).

PLATNĚŘSKÁ STREET

As a part of an underground excavation (construction of a utility trench) a connecting tunnel was driven in 1995 between the tunnels under the streets Linhartská and Platněřská (fig. 1). The archaeological investigation could only take place during the course of the tunnel driving (Havřda, Dragoun 1998, p. 274). For safety reasons, only the tunnel face could be examined and documented and even this occasionally had to be partially propped up with timbers to alleviate the threat of a cave-in. Under these conditions, it was possible to document nine sections. The sections containing medieval strata were spaced 1.5–1.8 m apart. We nevertheless succeeded in interconnecting the single stratigraphies thanks to the observations made during the tunnel driving (fig. 4).

The subsoil, composed of fluvial sandy soil with a slightly undulated surface, was detected at a depth of 4 m. Upon this rested the earliest anthropic layer: grey earth up to 15 cm thick. Its structure, however, is not that of a typical settlement layer. We are faced here rather with a horizon of only slight human impact subsequently coloured by water infiltration. This layer contained „chalice-rimmed” pottery which according to the present state of our knowledge can be chronologically placed within the 10th–11th centuries. Above this layer and at some

points directly above the subsoil was a 5–30 cm thick layer containing larger pebbles (the average diameter being 10 cm, also containing arenaceous marl in sparse quantities. This cobbled pavement is the earliest of the road surface adjustments. In the northern portion of the road, this layer was covered with prevalently grey earth, accumulated here as a result of the road’s frequentation.

The precise dating of these layers was possible thanks to pottery finds belonging to the „thickened rimmed horizon”, which can be, according to present knowledge, dated to the 12th–early 13th centuries. The only sunken feature identified in the lower part of the anthropic stratification was a pit of unclear shape at least 1.1 m in diameter. The excavation did not arrive at its bottom. This pit was sunk down to the sub-soil, cutting through the most ancient cobbled pavement. It was filled in with boulders and very lightly compacted black-grey earth without any artifact finds. Its origin probably corresponds to the period of accumulation of the dark grey argillaceous layer which separates the earlier and the later road surface adjustments. The feature sunken directly into the road raises questions concerning not only its function, but also casts doubt on the continuous use of the place as a frequented communication. It is

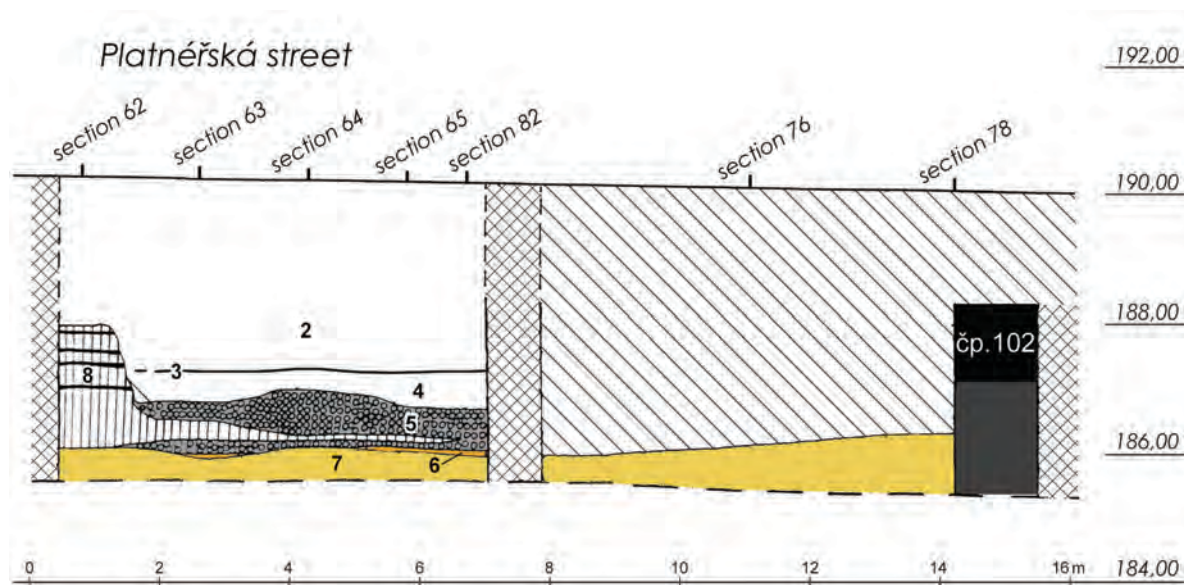


Fig. 4. Platněřská street. A generalized reconstructive section through the medieval road. The section was composed according to a series of sections documented during the driving of the tunnel. An atypical settlement layer (layer N° 6) rested on the subsoil (layer N° 7). A thick layer containing larger cobbles (layer N° 5) lay on this horizon – and occasionally also directly on the subsoil. This was in turn covered with earth sediments (layer N° 4) resulting from the street's frequentation. The road's northern margin corresponds roughly with northern facade of the pre 19th century block of houses. A complex of settlement layers (layer N° 8) interlain with flood strata was documented in this area. A romanesque house (N° 102) dated to the first half of the 13th century was located to the south of the road. Layer N° 3 – mortar, a construction horizon (1st half of the 13th century)

impossible to say if the road line shifted only slightly aside (by a few meters) in this period or if traffic was interrupted completely or if there is yet another explanation to this.

The discussed sunken feature was subsequently covered by another road surface consolidation: a massive cobble layer 0.4-0.6 m (even at points approaching 1 m!) thick, composed of large river cobbles mixed with compacted grey-black earth with some infrequent fragments of pottery or bone. Among the evidence for traffic in the area is a fragment of an iron horseshoe. After some time, the road ceased to be maintained and came to be covered with strata accumulating on both sides as a result of construction activities. The altitude of a marked mortar layer corresponds to that of the dividing line between the foundations and the ashlar masonry of house N°

102 which stood in the area of today's entrance to the Old Town's New City Hall prior to late 19th century rebuildings (Dragoun, Havrda 1997, p. 134). This construction activity can be dated to the 1st half of the 13th century.

Despite the difficult working conditions, the excavation in Platněřská street successfully identified an early medieval communication made up from boulder layers of a unique thickness (0.6-0.8 m, at points approaching 1 m). This can be taken as a proof of the significance of this road, whose width is never less than 5.5 m. Platněřská street, therefore, was an important east-west communication connecting the central market place with the bridge across the Vltava. In 2001 another portion of an early medieval stone-paved road was discovered some 60 m west of the area discussed above (Podliska 2004, p. 372–373).

KLEMENTINUM

In 1997 a excavation took place in the complex of the Klementinum in anticipation of the intended construction of a several storey deep underground facility (Havrda 2000, p. 368). The excavation was situated in service yard of the Klementinum baroque complex (fig. 1), erected by the Jesuits after their arrival in Prague. Its construction obliterated the entire pre-existing medieval urbanistic structure

whose nature can therefore only be deduced by archaeological means. From the early middle ages this area was directly adjacent to approach routes to passages over the river Vltava. The excavation brought to light some remnants of an early medieval pavement. Dated to the 10th–11th centuries it constitutes the earliest find of its kind on Prague's east bank. The discussed pavement was discovered in the east-

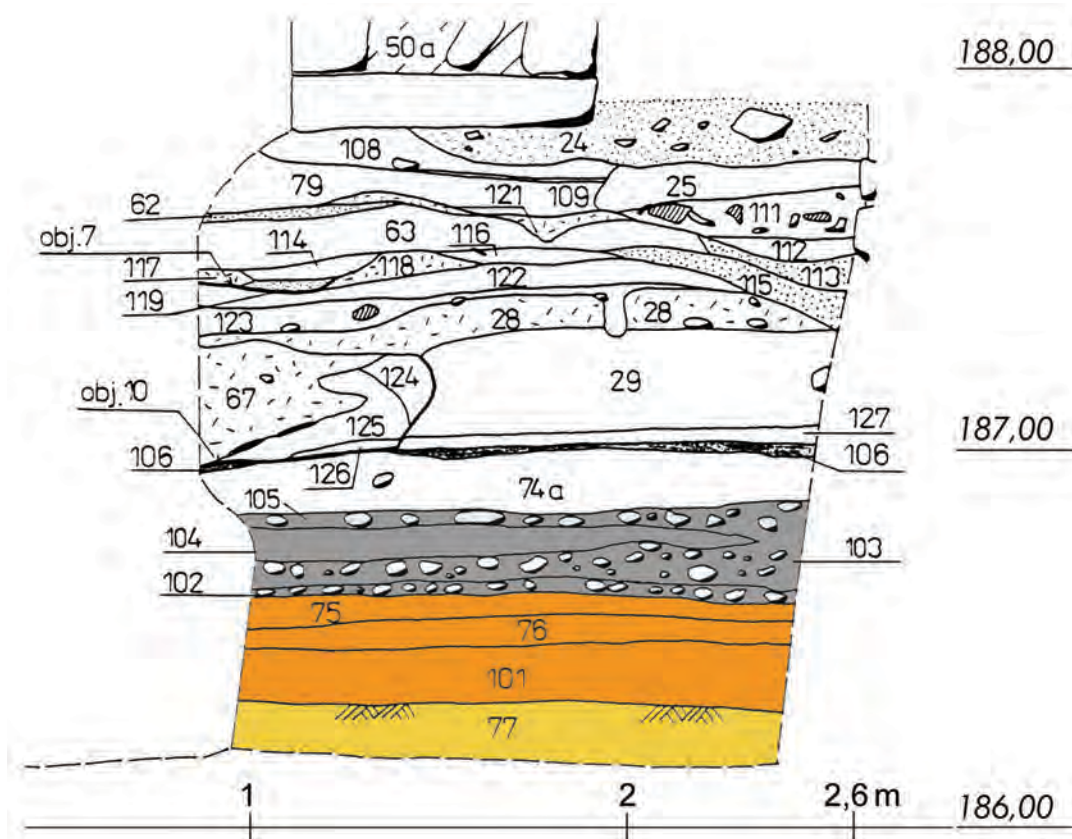


Fig. 5. Klementinum, a section through the medieval portion of the stratigraphy (pavements highlighted): the road, dated to the 10th–11th centuries (grey; layers N^os. 102–105); rests on a marked settlement horizon (orange; layers N^os. 101, 75, 76). The road grows completely silted and loses its function at the latest in the 12th century (layer N^o 74a)

ern part of the courtyard (trench A). The earliest element which can be connected with human activity in the area of this trench was a layer of a secondarily transported subsoil with some sparse charcoal (apparently this sediment was partially subject to hydraulic action). A subsequent intense settlement activity is attested by numerous small post-holes covered by the earliest settlement deposits.

The subsequent settlement horizon is marked by shallow features, probably collapsed furnaces or kilns (pyrotechnological features). Some time within the 10th century the function of this area underwent a substantial change: the remains of the pits were covered with a nearly 30 cm thick stone layer consolidating the road surface. The surface of this pavement, lying some 3.7 m below the present surface of the yard was in some areas adjusted up to three

times (fig. 5: layers 102–105). In each of these adjustments a new pebble layer was laid, while in the last of them, arenaceous marl was employed. The excavation of these pavements produced fragments of „chalice-rimmed pottery”, animal bones and a horseshoe. The communication’s use ceases due to gradual silting by no later than the mid 12th century. By the end of the early middle ages and in the high middle ages the area had reverted to settlement use.

Since neither of the road’s margins was unearthed the problem of the road’s direction remains unsolved. It is highly probable, however, that we are dealing here with a road heading from the east to the center of the Prague settlement agglomeration and crossing the river in the area where the Judith’s Bridge was later constructed.

PAVEMENT CONSTRUCTION

MATERIALS

The minerals employed in the pavements are all typical of the Prague region. The common material of the earlier pavings are river cobbles extracted from

the gravels of the Vltava which constitute the Old Town’s unconsolidated foundation. The boulders were quarried from the sub-soil directly in the town

where they are often covered with mere 0.5 m of clay-sand sediments. Though most typical for the early middle ages, this manner of road-surface consolidation is also often found in later periods. Other typical materials used in the high middle ages and early modern period are quartzites and less commonly schist (black to grey-black clayey siltstone and greywacke). The latter employed mainly in late middle ages and early modern period. These minerals belong to the Ordovician sediments of the Prague basin. Though covered by a thick gravel aggradation directly in the territory of the Old Town, their outcrops are distributed in the town's immediate vicinity (Vítkov, Letná, the New Town's upper part in the whereabouts of the former Horse Gate; Na hrádku street; Břežská Rock in the area of present-day Resslova street).

ROAD SURFACE ADJUSTMENTS: STRUCTURE AND COMPOSITION

As attested by the instances of road surface consolidation documented in the Old Town of Prague, cobbles were the most usual constituent of early medieval pavements. The consolidation consisted in a simple laying of the cobbles onto the previous road surface (this could have been either subsoil – usually sandy earth – or anthropic deposits such as sunken features or tombs). In the earlier periods there is no evidence for sandy metalling layers beneath the pavement. This technique only became common in late middle ages whereas before the stones were simply lain on the ground or in the holloway. The se-

lection of cobbles was not marked with a search for strict uniformity and their dimensions vary between 5 and 13 cm. The stones were lain flatways, only exceptionally also vertically. The construction usually consisted of a single layer of cobbles, though in some cases of particularly frequented communications there is also evidence of a series of pavement layers. The thickness of such pavements reached extraordinary values of several tens of centimeters (e.g. Platněřská street, Kaprova street, the eastern side of the Old Town square; cf. Hrdlička 1984, 151). On most of Prague's right bank, however, the road surfaces are consolidated with a single level of river cobbles, eventually with some arenaceous marl fragments in the later instances. Such pavements are archaeologically attested from several points of the Old Town³.

The most extensive excavation of a public space or a public communication in the territory of the Old



Fig. 6. Kaprova street. A nested weight (one lot), the most interesting artifact; discovered in the layer just above the paved road surface

town

³ Pavements were documented for example in the streets Benediktská, Masná, Královodvorská, Dušní (Dragoun 1981, p. 200n); Rytířská (Huml 1996, p. 247n); U Obecního dvora (Havrdá 2006, p. 356), Kozí (Havrdá 2003, p. 326), The Old Town Square (Staroměstské náměstí; Bureš, Dragoun 1991, p. 281), Malé náměstí (Dragoun 1980, p. 238) – Starec, Ovocný trh (Huml 1989, p. 177), Anenské náměstí (Podliska 2003, p. 321–322). Locally, simple pavement adjustments have been ascertained (a second or third layer, only exceptionally more): e.g. The Old Town Square (Staroměstské náměstí; Bureš, Dragoun 1991, p. 280; Dragoun 1993, p. 207); the streets Jilská (Hrdlička 1982, p. 616), Dlouhá (Bureš 1988, p. 187), Celetná (Bureš 1988a, p. 189), Uhlavý trh (Havrdá 2000a, p. 125), Husova (Hrdlička 1982, p. 599).

Town took place on the Little Square (Malé náměstí). The earlier settlement horizon from the 10th–11th centuries (an iron-working facility followed by a non-church cemetery) was covered with a cobble layer. A crossroads is attested, which soon developed into a public space (Starec 1998, p. 32). The most distinct road surface adjustments were discovered in Kaprova and Platněfská streets and in the Klementinum. Other notable cases are those documented in the southern part of the Old Town's Square (Hrdlička 1984, p. 151) and in Malá Štuparská street (Hrdlička 1983, p. 627). With the exception of Kaprova street, no road of the holloway type has been discovered in the Old Town.

In the area of the New Town (Nové Město), holloways are attested at multiple locations. A portion of a slightly sunken rubble and cobble pavement of high quality was documented along the full length of house lot N° 1234/II in Novomlýnská street and in-

terpreted as a holloway road along the river (Kašpar 2007, p. 351). A stretch of penning in front of the north-west corner of house N° 254/II in Petřská street rested on the bottom of a slightly sunken feature. Though interpreted as a moat bottom by the archaeologists responsible for the excavation (Profantová, Špaček 1991, p. 93), it is much more probable that it is a part of paved road on the bottom of a holloway. The Lesser Quarter (Malá Strana) produced several examples of early medieval holloway communications in the Lesser Quarter Square (Malostranské náměstí) and its environment (Čiháková 2007; 2008; 2008a). Later, in the high middle ages and in the early modern period other stones also came to be employed besides river cobbles (quartzites, schists, sand-stones). The stones are usually lain into a metalling layer of argillaceous or pure sand as is the case in the now-defunct street perpendicular to Bílkova street (Havřda 2003a, p. 324).

A NOTE ON THE SOURCES

Before drawing conclusions it is necessary to point out several obstacles which complicate the study of ancient communications. The elementary problem lies in the still rather small number of archaeologically documented instances of historical pavements. As a result, our knowledge of this particular type of medieval feature is still limited and not sufficiently representative (from both a quantitative and a qualitative point of view). In the right bank area of Prague's territory (whose continuous settlement dates from the 11th century) the archaeological evidence of roads and public spaces is relatively abundant (thanks mainly to the numerous excavations which have taken place here). It concentrates, however, mainly on the superior fluvial terraces⁴ where settlement is posterior to that of the lowermost terrace which is the closest to the river and was inhabited in a more consistent way since the second half of the 11th century (Hrdlička 2001, p. 207). Moreover, the evidence gained over the last few years was obtained almost exclusively in rescue excavations executed in areas endangered by planned construction activities.

The extent of these endangered surfaces is usually not sufficient for the satisfactory contextualisation of the feature⁵, which requires more extensive

excavations for a detailed study of pavement construction. There is however still a very limited number of these in the areas of modern communication lines and reaching a depth of only 4–6 m (i.e. the depth of deposits on the lowermost fluvial terrace). For these reasons it is not, for instance, always possible to determine unequivocally the function of the unearthed feature: besides roads or public spaces the consolidated surfaces may also belong to house exteriors (alleys, gateways, service areas in yards etc.) or even house interiors. Also the dating of unearthed pavements is problematic⁶ (as is also the case of other anthropic deposits). The earth between the stones (i.e. the pavement's construction itself) only rarely produces sufficient amounts of representative finds (such as coins or well datable pottery fragments) which might indicate the date of the pavement's construction and the duration of its use. Such finds are often much more numerous in deposits which stratigraphically precede the pavements. These layers, sealed by the pavement as they are, are also well protected from contamination by later finds.

This is not the case however, in situations when the pavement belongs to the earliest settlement activities in the excavated area, as is the case in some of the presented Old Town instances. The deposits formed due to the road's frequentation often produce (besides the usually high proportion of ecofacts and

⁴ See note 3.

⁵ The extension of the investigated and documented area often does not exceed several square meters. At times the pavement is only recognised as a layer in a trench section.

⁶ The first written mention of road maintainance is from the reign of John of Luxembourg (1310–1346).

artifacts made of organic materials) finds connected with traffic on the communication (horseshoe fragments, horseshoe nails). In cases when the pavement was frequented and maintained over a longer period the finds from deposits resting immediately on its surface point only to the date of its abandonment. Sedimentation on the top of a road's surface

is often connected either with a modification of the communication network (e.g. establishment of a new road, changes in the layout of plots) or with significant increase in the height of the surrounding ground. It is clear from this that a pavement can only be dated within a relatively broad period.

CONCLUSION

It is almost exclusively by archaeological means that we gain information on the character and construction details of medieval communications. The results of excavations undertaken so far inform us that the earliest roads were predominantly simple, without any consolidation, with holloways also attested, as in Kaprova street. The reason why this solution was used is possibly the fact that the settlements in this area developed on even and stable loam-sandy subsoil which in turn rests on fluvial gravel terraces. Therefore, it was not necessary to resort to further consolidation of street surfaces until (after a prolonged period of utilization) new requirements necessitated another solution⁷. Intense

traffic on the most frequented streets demanded repeated surface adjustments leading to creation of a complex of strata up to 0.5–1 m thick (cf. e.g. the excavation in the Platněřská street). The cases in which a communication is developed during a later settlement period, post-dating an earlier settlement, production or funeral horizon are relatively common. A permanent communication network was developed on a large scale in the Old Town in the 12th century⁸, in conjunction with the transfer of the central market place to its present position sometime during the first third of the 12th century (Hrdlička 2005, p. 13). The material employed in the construction of the earliest roads were almost exclusively local river cobbles⁹. As an illustration, we presented three important archaeologically documented communications related to the Old Town's earliest settlement horizon.

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⁷ On the Vltava's left bank in the area of the Malá Strana (Lesser Quarter) suburb, on the other hand, different geomorphological conditions and the clay-loamy subsoil demanded more sophisticated solutions of road construction. See note 1.

⁸ The development of the road network in the Prague basin was last outlined in a study from 1985 (Ječný et al. 1984). Other studies from the archaeological point of view have been undertaken by L. Hrdlička (Hrdlička 2000; 2001). The earliest communication network (10th–12th centuries) in the Old Town territory was determined by the two chief directions: 1) a north-south route („lower Vyšehrad road”) whose course is probably preserved in the present-day street Karolíny Světlé and which connected the bridge head (or the nearby ford) with Vyšehrad. 2) an east-west long distance route terminating at the river crossing. The latter route can only be localized very approximately. Other routes leading from the river to the southwest cannot be excluded. In the following period (the 1st third of the 12th–1st half of the

13th century) the layout of the Old Town settlement agglomeration undergoes significant changes. This new urbanistic concept is defined by a network of streets radiating from the central marketplace, present-day Staroměstské náměstí (Old Town Square). The most important among them are probably those whose course is preserved by the present-day's streets Celetná, Dlouhá and Kaprova (Čarek 1947; Hrdlička 2001, p. 207; 2005). The route between the marketplace and the bridge probably passed through the what would later be Platněřská street and turned towards the bridgehead in the area where the Klementinum was to be constructed.

⁹ See note 1.

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