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## THE STREETS OF MEDIEVAL WROCŁAW – METHODS OF CONSTRUCTION AND FUNCTIONS

The complex central theme of medieval streets is linked with a broader question of the relationship between man and his natural environment, the development of technology, the spatial organisation of a town, its social topography and public interaction in the commonly used zones of the town. It is a reflection of the way municipal projects were organised, of the constant care and of the emergence of measures taken by the town authorities and property owners. The division of space into private and public, the latter used by all, is one of the features which describe the concept of the communal town.

In the case of Wrocław the natural environment was an important factor which helped shape its traffic and transport system, the methods of road surface construction and conservation, and the daily care about its condition. The laying out during the 13<sup>th</sup> century of the communal town in the valley of the Odra River was the result of a decision taken three centuries earlier when choosing the site for a stronghold (fig. 1). It appears that the criterion of natural defensibility was of key importance when setting up the stronghold on an island later known as Ostrów Tumski (*Dominsel*, Cathedral Island). Found in the neighbourhood of the fortified settlement were other islands and low river terraces. The emergence in the 11<sup>th</sup>–13<sup>th</sup> centuries in the vicinity of the stronghold of proto-urban districts and, with time, of an urban agglomeration, was greatly influenced by this original decision. It reduced considerably the freedom of choice of terrain most favourable for settlement with a permanent buildup.

It appears from current findings from archaeological investigation that in the 11<sup>th</sup>–12<sup>th</sup> centuries an area north-east of the fortified settlement, on

a large island or on the right bank of the river, referred to as Ołbin, was considered as the most attractive. Settlement on the left bank of the Odra goes back to the 12th century, its more intensive development started at the end of the same century. This change in the direction of development of settlement had been influenced mainly by political factors associated with the return to Silesia of sons of Władysław the Exile (d. 1159). But let us also stress that environmental change also may have played an important role. Janusz Badura, author of a geomorphologic analysis (Badura 2010), has noted that this new direction taken by settlement coincides with a significant change of climate – the coming to an end of the medieval climatic optimum. With the colder longer lasting autumn-winter seasons, and the growing soil moisture, the lower-lying districts in Ołbin were no longer attractive for settlement. Especially since the second half of the 12th century brought the first river regulation projects and the construction of impoundment structures for economic purposes. In consequence, terraces on the opposite, left bank, of the river, had gained in value. Admittedly, the land along the river in that area would continue to be inundated by floodwater, but the new town centre – the Market Square and its surrounding area – were at 117.50–118.00 m above the sea level, or about 6 m over the level of water in the Odra. For all that, the change in the direction of settlement to the left bank and occupation by the incorporated town of a terrain with a slightly greater elevation had not changed the circumstances of land use in any radical manner. The six-months' autumn-winter season, the declining average yearly temperature and growing water level in the regulated Odra made it necessary

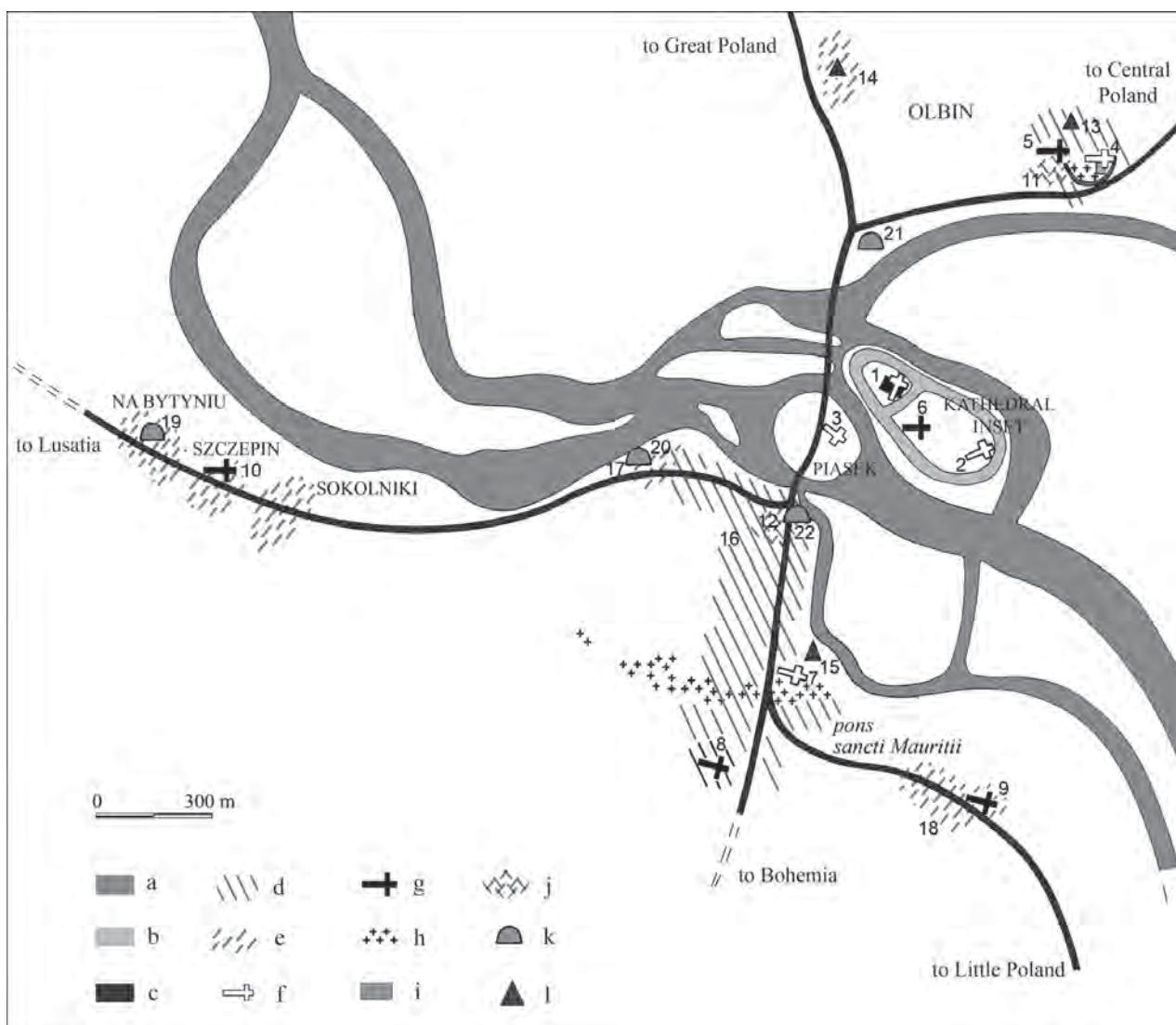


Fig. 1. Wrocław, settlement districts predating the rise of the communal town (after M. Mlynarska-Kaletynowa with supplementary data from J. Piekalski and P. Konczewski): 1 – stronghold with its chapel; 2 – St John Cathedra; 3 – Augustinian Abbey with the church of Our Lady; 4 – Premonstratensian abbey with St Yincet church; 5 – St Michael church; 6 – St Peter church; 7 – St Wojciech/Adalbert church; 8 – St Mary of Egypt church; 9 – St Maurice church; 10 – St Nicholas church; 11 – site of the annual market in front of St Yincet church; 12 – presumable location of the market in the district on the left bank; 13 – estate of the noble Włostowic family; 14 – estate of the nobleman Mikora; 15 – presumed location of the estate of Gerung; 16 – district centred on St Adalbert church; 17 -Jewish district; 18 – Walloon district; 19 – inn in the district “Na Bytyniu”; 20 – inn “Birvechnik”; 21 – inn “ad fine pontis”; 22 – inn of the Augustinian Abbey. a – flows, b – rampart of the stronghold, c – main roads, d – settled zone (based on archaeological research), e – settled zone (based on written sources), f – located churches, g – churches with an approximate location, h – graveyards, i – secular and monastic brick/stone buildings, j – markets (based on written sources ), k – inns (based on written sources ), l – mansions (based on written sources ).

Drawing N. Lenkow

to take increasingly greater care of the soggy, muddy and ice covered road surfaces.

The network of pre-incorporation roads is still poorly understood. What we know of their appearance is based on hypotheses or outright guesses. The key issue in the discussion seems to be the route of the road which ran from the ford across the Odra to the church of St Wojciech (Adalbert), and which, we assume, was adapted to fit the plan of the commu-

nal town (Niegoda 2005, p. 77–83; Chorowska 2010). We may say that the main factors which helped shape the network of roads of the proto-urban settlement district were as follows: its natural setting, the spatial relationship of individual elements of the settlement district and the relationship to external roads. We also know little about the road surface of the early communication routes. In the fortified settlement on Cathedral Island they were lined

with bundles of brushwood or with timber recycled from repaired ramparts (fig. 2ab, Bykowski et al. 2004, p. 120, 148). The left bank of the Odra mostly had dirt roads although some of the more waterlogged stretches may have had raised wooden walkways for pedestrian traffic. It was so in Szewska Street, on the corner with Nankera Square (fig. 3).

Our principal source of information on the road surfaces of the communal town, their road surface constructions, maintenance and cleaning, differences in quality and changes which they underwent, are

culture layers accumulated during the medieval period which have been investigated by archaeologists.

Methods of road surface consolidation differed depending on the stage of the town's development, soil moisture levels and socio-topographic status of individual streets. In Wrocław, most streets, even in the more prosperous districts, during the first decades of their existence had natural, unconsolidated dirt surfaces. With time they developed a layer of churned up and trodden down natural humus and sand, mixed with at least some of the refuse dumped

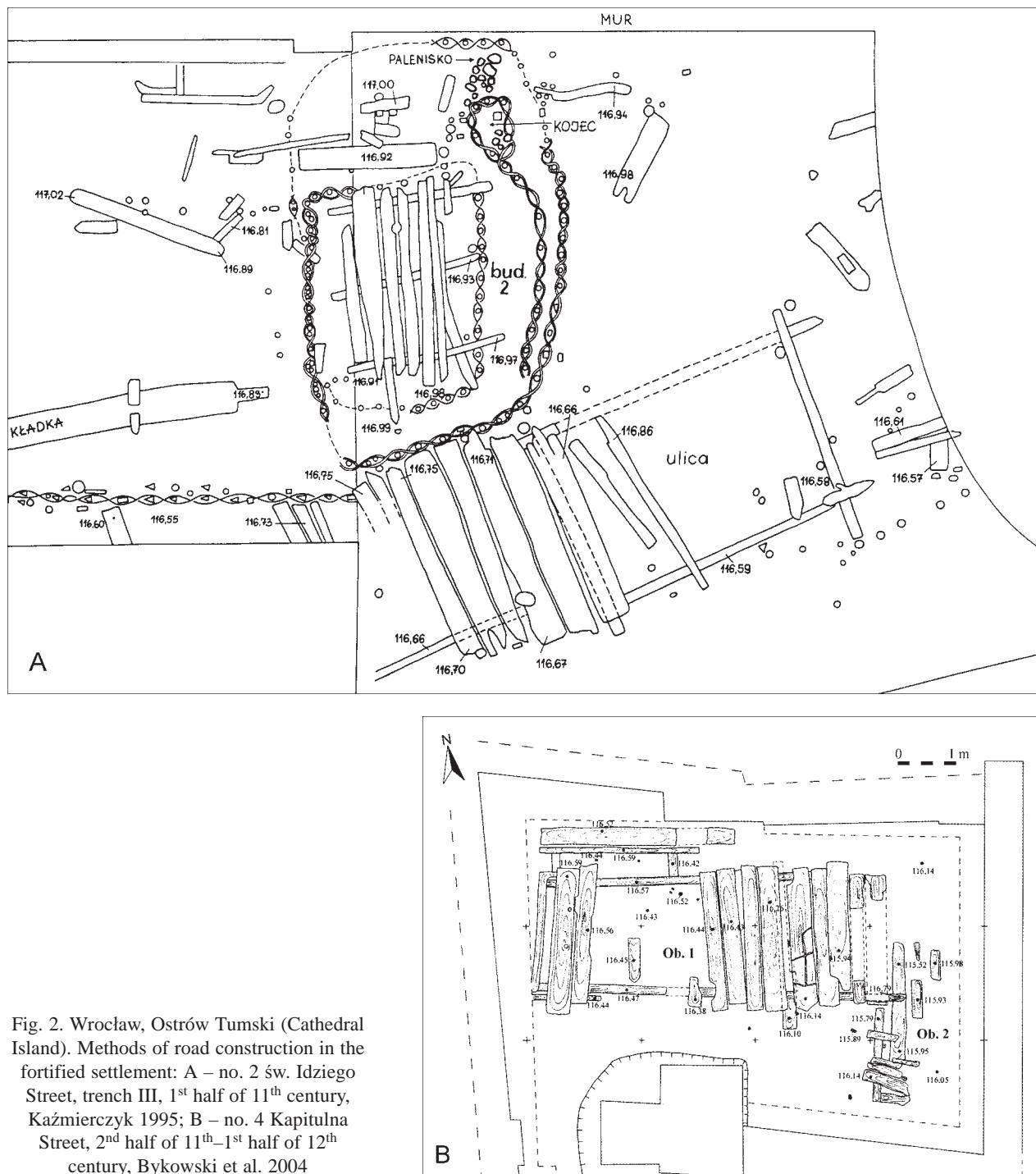




Fig. 3. Wrocław, Szewska Street/Nankera Square. Timber-lined surface of a pedestrian walkway. Photo. P. Konczewski

into the street from the town plots, and also, animal manure. Locally, in front of the houses, this surface was improved and drained using a number of different basic methods. Analysis of these layers has confirmed that these areas were lined with loose rough planks, covered with sand, wood shavings, ashes and detritus from burnt-down timber-framed buildings. We found no evidence to sustain the claim found in earlier literature on a quite early introduction of more sophisticated timber-lined road surfaces (Kaźmierczyk 1966–1970, part 2, p. 60–67; Buśko 1997, p. 126; Piekalski 2004, p. 355). Using evidence from dendrochronology it used to be accepted that the first such surfaces were introduced as early as in the first half of the 13th century. Furthermore, by comparing dates obtained in different streets, attempts were made to reconstruct the spatial changes thought to be associated with the town's incorporation (Niegoda 1999; 2005, p. 78–81). Meanwhile, even a macroscopic analysis of a larger amount of better preserved timber from the streets proves that usually road surfaces were lined with recycled oak, most often, obtained from pulled down timber-framed buildings and sold at a price lower than new timber (Goliński, in this volume).

More stable timber road surfaces were introduced during the 13th century only rarely, as their more widespread use characteristic for the 14th century. Technically the most advanced streets were surfaced in the form of raised walkways (fig. 4). Construc-

tion started with vertical timbers being driven into the soggy ground. Over them, at right angles to the line of the street, supporting timbers were laid every 3–4 m. Next came a layer of sleepers laid parallel to the line of the street. Only over this substructure the road surface was laid – transverse 46 cm thick rough planks (Kaźmierczyk 1966–1970, part 2, p. 63–64, fig. 14; Mruczek 2000, p. 263–271). This method of construction is documented in the main streets of the better off districts in Wrocław (Pańska, Junkierska, Oławska, Kurzy Targ, Kotlarska streets), and in the northern areas, on lower lying ground, also in streets inhabited by less well off tradespeople (Szewska, Łaciarska, Malarska, Drewianka). Rough planks covered a 2–2.5 m wide area down the middle of the street; Kaźmierczyk (1966–1970, part 2, p. 62) suggested that even up to the width of 4.5 m. In the market squares raised walkways were provided only for passage through the square. It is notable that the presence of these walkways, especially in the northern districts of the town, was remembered in typical Wrocław street names – Schmiedebruecke, Schuebruecke, Oderbruecke (Stein 1995, p. 20, 66).

The high standard of the rough plank lining of the walkways ensured good conditions for foot traffic and transport, in particular, during the autumn–winter season. Research results confirm the use also of more simplified methods of road making, divided by Kaźmierczyk into three groups (Kaźmierczyk 1966–

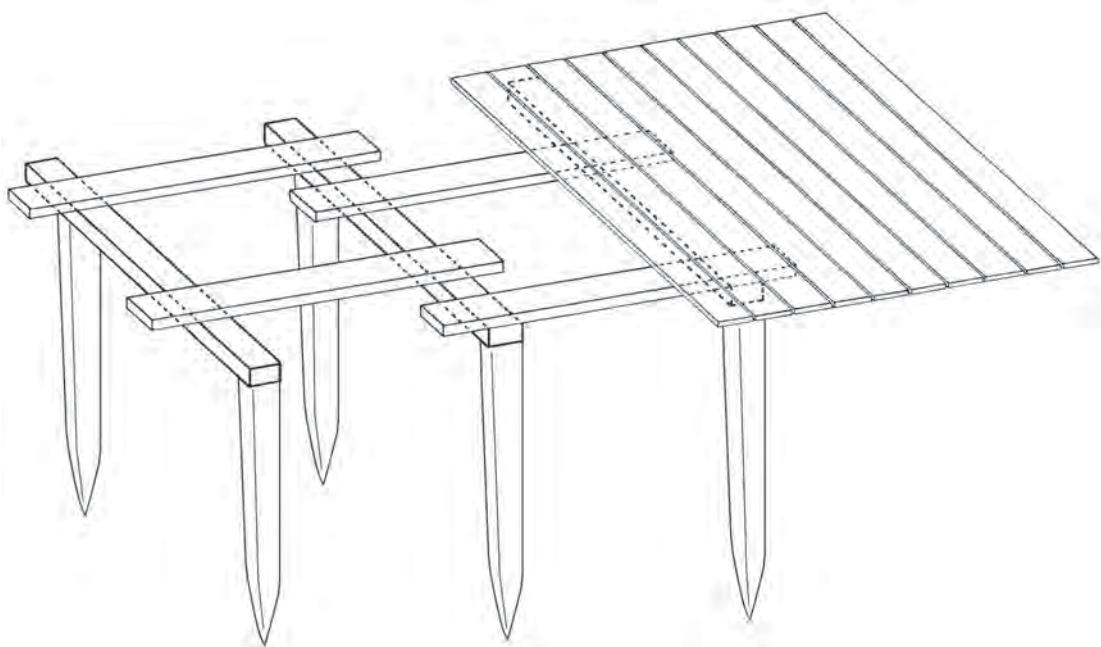


Fig. 4. Wrocław. Graphic reconstruction of a street walkway. Drawing N. Lenkow

1970, part 2, p. 60–63). They were used especially on the street margins next to the town plots, but also to repair or temporarily improve stretches of the main streets. Some elements of the raised walkway were dispensed with (fig. 5). If the ground was not likely to become compressed, no stabilising uprights were used. The structure then consisted of just the supporting timbers laid crosswise over the sleepers surfaced with rough planks laid at right angles to them. The next step towards simplification was to leave out the supporting timbers. In this case the sleeper beams rested directly over the organic layer or over a bed of sand. These simplified techniques of street surface maintenance are reflected in the culture deposit as a sequence of layers of humus-and-animal-manure alternating with a layer of sand (fig. 6). Spreading the streets with sand was a method used regularly to drain them and keep them clean and level. The ratio of sand to manure could be as high as 7:1. The structure of the stratigraphic sequence shows that the muddy road surface was spread repeatedly with a layer of sand several centimetres thick. With time this sand was probably absorbed by the dirt in the street, unless its top layer was consolidated in some way for example by lining the sandy layer with loosely laid rough planks. Traces of such a treatment have been detected on occasion (Buško 1997; 1999). They have the form of a well-defined top layer of the sandy stratum, with occasionally, at the bottom, smudges from decomposed wood. In stratigraphic sequences they are observed as a sort of a „layer cake” built by alternating layers of sand and humus

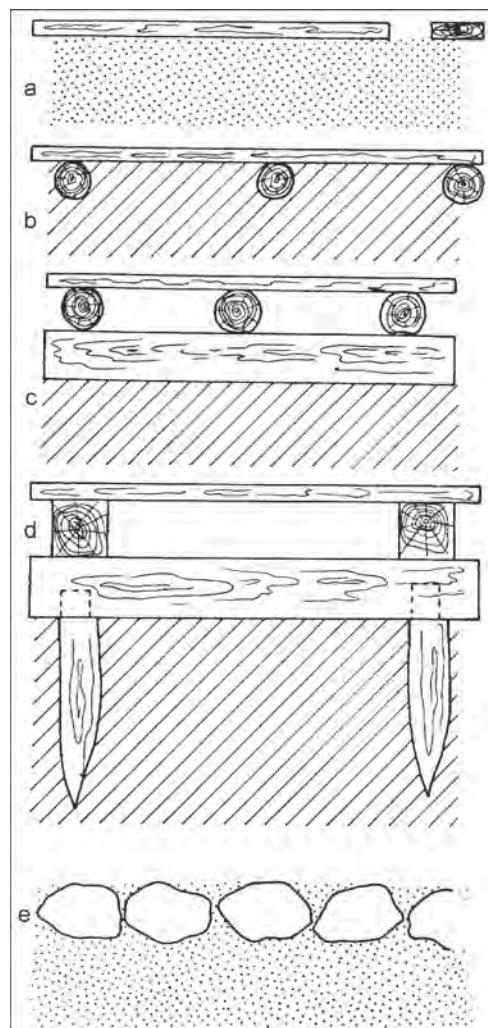


Fig. 5. Wrocław. Street constructions of a medieval town, Kaźmierczyk 1966–1970, part 1, with supplement from the authors

(fig. 6). More rarely, the edge of the street was surfaced with a pavement of pebbles, laid right over the muck or humus, something which has been observed in a number of locations in Szewska Street.

In point of fact, the most advanced method of keeping the layer of sand in the street more or less intact was to cover it with a pavement of stones. In Wrocław pavements were built of post-glacial cobbles which are typical in the European Lowland (fig. 7). The best quality pavements were laid over a bed of pure sand which helped to level and drain the ground below and create a stable substrate for the stonework. This resulted in a rise of the ground level by 20–40 cm, sometimes, even by up to 80 cm. The diameter of the cobbles was on average 15 cm, at most, around 20 cm. They were laid close together in stretches bounded by courses of larger stones or rough planks set vertically (on end). The earliest stone pavements of Wrocław, in its Market Square, have been dated to late 13<sup>th</sup> century (Buśko 1997, p. 118; Płonka, Wiśniewski 2002, p. 121n; Bresch et al. 2002, p. 14n). Their distribution there was localised. They lined the passages across the market and some of the access ways to some market stalls.

In the streets stone pavements were introduced during the 14<sup>th</sup> century, by 1400 they had become a regular method of road surface construction. In most streets they replaced the wooden walkways. The spread of pavements was important for slowing down the rate of accretion of the organic culture layer. The outlook of the streets, and at the same time culture deposit which remains, changed after the introduction of stone pavements. In any case, their spread during the second half of the 14<sup>th</sup> century does not seem accidental. Next to being more durable they made it much easier to meet the increasingly strin-

gent regulations on sanitation passed by the town council. From this time on sand becomes the main component of the culture deposit, containing only a small proportion of humus.

Because of the medieval practice of recycling stones from derelict pavements better preserved courses of cobbles are recorded very seldom. Usually, what remains is only the bed layer of sand and some solitary stones. The sandy beds were laid in succession one over the other or could be replaced partly during repairs and the laying of a new pavement. In the late medieval period and during the post medieval age in every street this was repeated several times.

The street layers analysed show considerable variation in terms of their character, their content may change from one short stretch to the next. This applies especially to the more poorly consolidated road surfaces. As mentioned earlier, streets with a dirt surface and those lined with timber tended to rise rapidly in their level. All manner of waste from activities pursued in the town plots was dumped into the streets – sand from digging cellars, foundation trenches and cesspits, clay left over from the construction of timber-framed buildings, ashes from ovens and hearths. Also the destruction of buildings – by fire or dismantled – is occasionally legible in street stratigraphy. The content of the layers in individual stretches is, at least partly, the effect of the activity of property owners and the inhabitants of each building, whose treatment of the area in front of their property could vary. Some stretches show clear evidence of levelling and contain more sand. In others, unlevelled, the dominant component is humus rich in organic remains. Wooden street surfaces were not cleaned. With time they acquired



Fig. 6. Wrocław, Kiełbaśnicza Street. Layers of humus and sand. Photo. R. Kamiński



Fig. 7. Wrocław, Kielbaśnicza Street. Stone pavement, 14<sup>th</sup> century. Photo. R. Kamiński

a thick layer or muck. When these timber structures had served their purpose they were partly dismantled in order to recover the better fragments of oak-beams and rough planks (fig. 8). This practice throws light on the ways the timber resource was managed. Road surfaces were built of raw material recycled after several score years in service in other structures, mostly buildings, bought at a lower price. And even the soggy wood battered from long years in use in the street was still considered worth recovering.

In attempting to trace the general tendencies in the evolution of methods of road surface construction in streets of Wrocław we may say that the early stage of development of the communal town was characterised by a lack of an organised system for disposal of impurities and construction debris. This resulted in a rapid accretion of the culture deposit and rapidly rising street levels. The ground floor of brick buildings erected during the 13<sup>th</sup> century, sunk into the ground only to a small depth, in 14<sup>th</sup> century, during the Gothic reconstruction, were converted into cellars (Chorowska 1994, p. 26–36). The presbytery of the parish church of St Elisabeth in the Market Square was raised around 1250 when the ground level was around 117.00 m above sea level. After c. 1350 it was rebuilt in the Gothic style, the new floor now at more than 120.00 m above sea level, which indirectly provides us with information on the approximate level of the street outside the church (Lasota, Piekalski 1996, p. 16–17, fig. 4).

Even so, still during the 14<sup>th</sup> century we observe a deceleration of rapid accretion of the man-made layer. This observation, confirmed by archaeology, is in correspondence with information found in the written record. Analysis of these accounts made by



Fig. 8. Wrocław, Szewska Street. Partly dismantled road surface. Photo. P. Konczewski

Mateusz Goliński (in this volume) has shown that the change in the appearance of the streets of Wrocław around c. 1350 was the result of deliberate and determined action by the town council. It included on the one hand, street building projects financed by the commune, on the other, making it the duty of the property owners to clean and take proper care of the street in front of their properties. The nature of these

activities was regulated by law and their proper performance was subject to control by the town council. These duties included making emergency repairs to the road surface, individual maintenance work and cleaning. The height of the door sills, required by the regulations, not higher than the street level, prevented the street levels from rising.

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