

Smetánka, Zdeněk; Chotěbor, Petr; Kostílková, Marie

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Archaeological excavations in the chapel of St. Ludmila (St. George's basilical church, Prague Castle) – a preliminary report

ZDENĚK SMETÁNKA–PETR CHOTĚBOR–MARIE KOSTÍLKOVÁ

1. History of investigations

Following the request of the Bureau of the President of Czechoslovak Socialist Republic, the Institute of Archaeology (Czechoslovak Academy of Sciences, Prague – furthermore abbreviated as IA) initiated an exploratory investigation of a tomb presumed to contain bodily remains of St. Ludmila, duchess of the Přemysl dynasty (martyred in 921 A. D.) and consort of Bořivoj I (852/3–888/9), the first duke of the early state of Bohemia recorded by history (Třeštík 1981; id. 1983; Vlček 1984a; id. 1984b). The impulse for these investigations was constituted by repairs of the Gothic tomb and by an attempt to recover the remains of the duchess in order to carry out a detailed physical-anthropology examination. Both of these main motives of the work are rooted in the systematic effort at an integral concept of protection of ancient monuments of the Prague Castle, National cultural monument of the Czech Socialist Republic No. 1. Specialists of the IA were called upon to carry out their investigations at the moment when restoration specialists ascertained the existence of a hollow space below the tomb.

2. Conditions and method of the investigation

The aim of the archaeological work was to ensure the opening of the grave pit visible underneath the tomb, extraction of the remains, and establishment of chronology of the grave pit. Complete investigation of the whole situation was excluded, as a total examination would have inflicted damage on the very core of the ancient monument – a unique high-quality Gothic tomb with a sculptural effigy of the second half of the 14th century (Kutal 1984). It has been decided finally to sink a minor sounding at the W front of the grave pit which fulfilled all the demands placed on the work. In order to carry out a first inspection of the pit prior to its opening, the Bureau of the President has procured a miniaturized television set containing a camera and a monitor screen. In the case of the objects entrusted to the care of the IA for further examinations, the assessment of the technology of the recovered receptacles, spectral analysis of their metal, and indispensable analyses of mortar have been carried out in collaboration with specialists. Some groups of the academic community were extremely sceptical to the first results, dating the whole situation into the time of the 19th century rebuilding; others welcomed them with an optimism of equal pitch, assigning the situation to the first third of the 13th century or – in most cases – into the 14th century.

3. Stratigraphy of the grave pit

The sounding measuring 247×102 centimetres was taken down to the depth

of 61–65 centimetres. The following stratigraphic situation was exposed: The basic matrix is represented by a layer composed of fragments of „opuka“ (soft limestone of local origin), poured over with incoherent crumbling mortar of a light shade of rusty colour with small clods of lime. On the Prague Castle site, this type of mortar bears the designation of „Romanesque mortar“. In fact, this layer represents a poured-in filling above the Romanesque vault of the ground floor of St. Ludmila's chapel. This layer was poured over with a very thin sheet of almost identical mortar the surface of which was smoothed. This, however, is hardly more than a surface finish of the lower mortar layer. Its crumbling consistence notwithstanding, it could have served – at least for a short time – as the floor of the chapel; this may be the reason why it is preserved at some spots only, being obviously easily damaged. It was replaced by a pavement of rectangular floor tiles of opuka stone measuring $32 \times 27,5 \times 7$ centimetres, embedded in a layer of mortar very slightly differing from both abovementioned types. This „sequence of layers“ was cut by the excavation for the grave pit the walls of which were revetted by coarser whitish mortar visibly different from the preceding mortars. The grave pit was covered by flat slabs of stone and poured over with an identical whitish mortar; this bears several layers of other mortars assignable to numerous rebuildings of the tomb. The situation above the described circumstances is not safely ascertainable in detail as pursuing the investigation further on could have threatened the tomb but subsequent developments may be reconstructed. The Gothic tomb, of which the last adjustments took place in the 19th century, is situated above the closed grave pit. Around the half of the 19th century, its W side was provided with an adjacent altar block as well and the whole chapel floor was re-paved with large square floor tiles in service until now. Works were terminated here in 1858. From the viewpoint of chronology, the key moment is represented by the incut into the filling above the late Romanesque vault from the period of abbess Agnes (1220

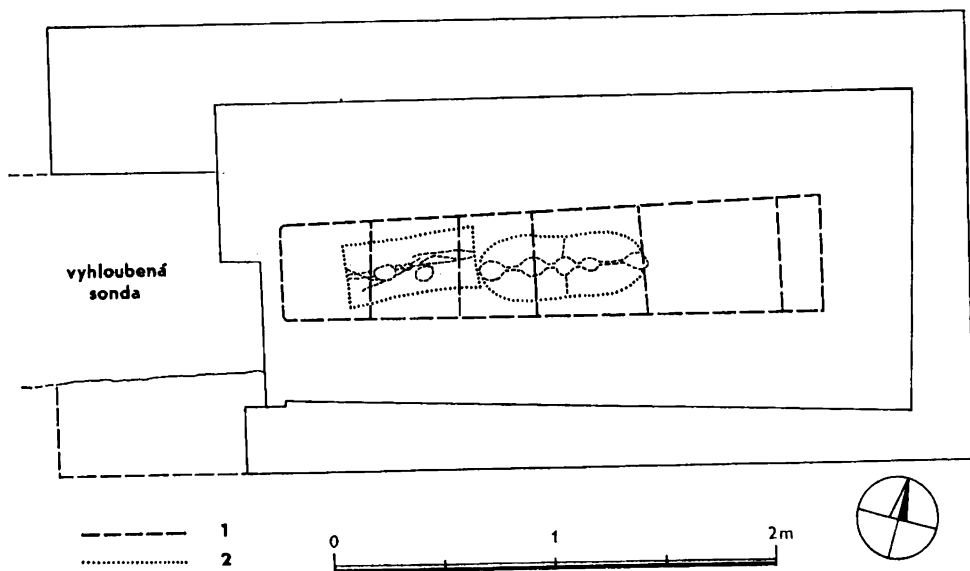


Fig. 1. – St. George's basilical church, Prague Castle; chapel of St. Ludmila. – Situation of the Gothic tomb and the grave pit with lead receptacles. 1 – outline of the grave pit and the cap stones. 2 – lead receptacles. Drawn by J. Morávek and V. Richterová.

to 1228) and into the late Romanesque paving which, however, after some repairs functioned until the half of the 19th century.

4. Construction and contents of the grave pit

The pit has an oblong rectangular shape on a slightly trapezoidal ground plan. The walls are more or less vertical. Maximum length amounts to 246 centimetres, maximum width to 52 centimetres, the depth varies around 67 centimetres. The pit has no particularly constructed walls, being, in fact, a hollow excavated into the earlier Romanesque situation and plastered by the abovementioned whitish and coarser mortar, the same throughout all parts of the pit. Surface of the walls is smoothed. The upper part of the pit is closed by six flat „opuka“-stone slabs of different sizes, of which the E and narrowest one measures $20 \times 52 \times 8$ centimetres. It is especially this last narrow slab that carries a special chronological significance. After all the cap-stones had been put in position, the still wet mortar of the walls was used to fill the joints between the walls and stones and wiped off clean. Only this last slab was laid into the fresh mortar and pressed into position but there was no way of smoothing the mortar inside because of the lack of space. The excess mortar oozed out into the pit. Laying of this stone thus sealed off the find group in the pit. Any manipulation with objects inside the pit between the fixing of this stone and the year 1981 is out of question. The cap-stones were subsequently poured over with an identical mortar and from that moment on, the space inside the grave pit was intact. What is the exact date of closing the pit cannot be established by means of stratigraphy. The earliest possible date would be the first third of the 13th century while it may be reasonably assumed that no provisions for any grave pit were included in the schedule of building works of the late Romanesque chapel. Remains of duchess Ludmila must have been enshrined here in some other way than in a grave pit. The latest date of closing the grave pit could be put before the half of the 19th century. We have thus arrived at a rather prolonged time interval.

On the bottom of the grave pit and in its W part we found a rectangular chest-shaped lead receptacle No. 1 with a lid the maximum dimensions of which amount to $600 \times 300 \times 268$ millimetres; the sheet of lead used for this receptacle is 1.2–1.4 millimetre thick. This was closed by means of a lead rod passing through two loops soldered on the receptacle by means of tin. It was tied around by a cord of which the W end was found to be lying loose with three seals resting below it; three other seals on this cord were lying along the oblong axis of the lid and a single seal was suspended on the E side. A strip of lead with a rather carelessly engraved inscription *CORPUS · S · LUDMILE* written in majuscule letters with elements of the capital and uncial writings (Smetánka 1982) was resting on the receptacle.

According to E. Vlček, this receptacle enshrined only remains of a single skeleton which may be, on grounds of morphology, biology, and history, identified as bodily remains of duchess Ludmila (Vlček 1985). The relics were wrapped in five fragments of textile.

Lead receptacle No. 2 (again with a lid) is also rectangular and oblong but has rounded narrower sides. This contained three skulls wrapped in three shrouds of which two of brown taffeta have been separated from the same fabric as one of the textiles used in the receptacle with remains of duchess Ludmila; the third one was of red taffeta. Maximum dimensions of this container equal $733 \times 283 \times 204$ millimetres, the thickness of its sheet metal to 1.2–1.4 millimetre. This was



Fig. 2. — Surface of the trench at the west side of the tomb after removal of the 19th century tiles; Romanesque floor tiles visible on the left side at the step of the altar mensa; aperture into grave pit in the front of the sounding. Photo by V. Jílková.



Fig. 3. — View of the northern and east sides of the trench before opening of the grave pit. Photo by V. Jílková.



Fig. 4. – East side of the trench with partly opened grave pit. The difference between the grave-pit mortar and "Romanesque mortar" may be clearly seen in front of the picture at the aperture. Photo by V. Jílková.



Fig. 5. – Lead receptacle No. 1 in the opened grave pit. Photo by J. Král.

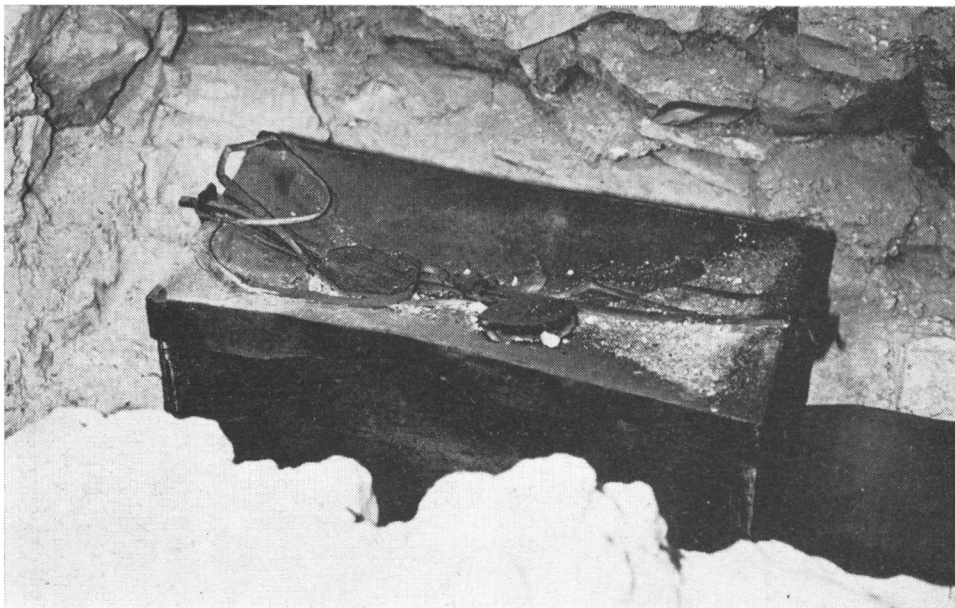


Fig. 6. — Lead receptacle No. 1 after removal from the grave pit; two larger and one smaller seal on the lid. Photo by J. Král.



Fig. 7 — Lead receptacle No 2 after removal of the grave pit; five seals on the lid. Photo by J. Král.

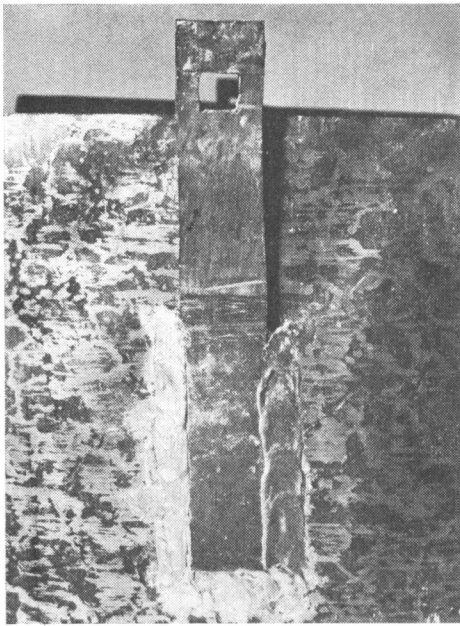


Fig. 8. - Lead receptacle No. 1. Detail with the relative recent soldering by means of the tin. Traces of the scraping of the old surface of the walls. Photo by H. Toušková.

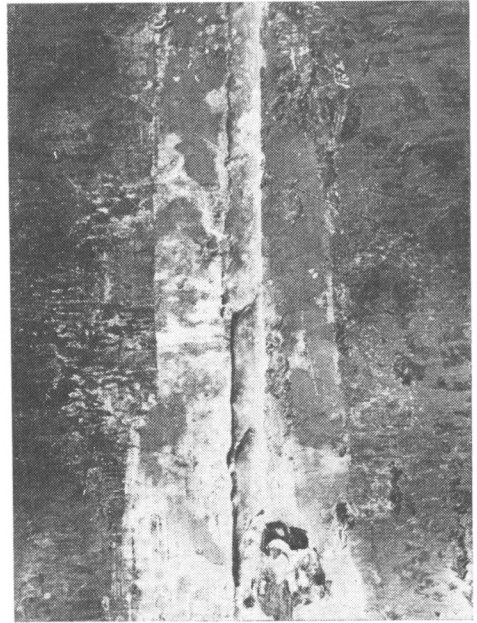


Fig. 9. - Lead receptacle No. 2. Detail of the soldering by tin with the aid of animal fat. Photo by H. Toušková.

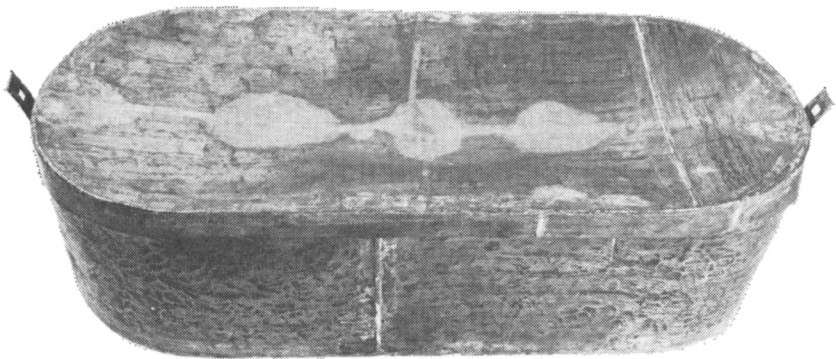


Fig. 10. - Lead receptacle No. 2 with the shadow traces of the seals. Photo by H. Toušková.

secured by means of a lead rod with a remnant of transversal tying with a flat cord; five seals were situated along the oblong axis of the lid.

Even a cursory inspection of the finds revealed that several chronologically discreet phases of arrangement of objects within the grave pit are discernible – as is, in fact, usual in most cases of important and rich graves. A particularly clear proof of this is constituted by the seals of two archbishops of Prague who could on no account have sealed together. Let us now see in what way may these finds contribute to more precise determination of the time of sinking the grave pit within the rather prolonged interval indicated above.

5. Mortar of the grave pit

The whitish mortar is distinctly different from all mortars used on the site, being conspicuously incompatible with all 19th-century mortars, even with that which is macroscopically the most similar. The Castle mortars of 19th century contain only an admixture of sand; mortar from the grave pit includes – according to the analysis of L. Hrdlička of the Mining Institute of the Czechoslovak Academy of Sciences – a prominent admixture of crushed „opuka“ stone. Together with some of the written records, this fact makes the sinking of the grave pit during the 19th century highly unlikely. This makes the possible time interval at least half a century shorter.

6. Textiles

According to the results of N. Bažantová of the State restoration workshops of Prague, the whole group of textiles is of early mediaeval origin (Bažantová 1983). It is the most important set of ancient textiles of early mediaeval date in Czechoslovakia. N. Bažantová says that they were added to the remains of duchess Ludmila in several phases, during the Early Middle Ages but before the building undertaking of abbess Agnes in the 13th century. Thus the textiles do not have any bearing on the limitation of the time interval. Even if the application of the author's rather straightforward historical interpretation of the sequence of adding the textiles to the remains and her historical argument – which will have to be checked – are open to doubt, the conclusion concerning the narrowing of interval of sinking the grave pit with the help of textiles will remain valid.

7. Seals

Detailed analysis of the seals (seal imprints in wax, to be precise) brought safe evidence for two or three periods of seals and sealings not too far from one another and datable c. 1350–1400, as well as for at least two secondary manipulations with seals. Seals of the first period very probably belonged to some protecting devices deposited above the floor surface. If the grave pit had been sunk by then, no subsequent sealing could have taken place as the grave pit is undisturbed. The terminal point of the interval is represented by the last sealing procedure which took place around 1400. Our original interval near of 600 years is thus diminished almost by another two hundred years, consisting, nevertheless, of a long time of four centuries. Well-known historical circumstances make most of the 15th century a highly unlikely period as well because of the Hussite revolution and the following uneasy period of emergence of a new religious equilibrium.

8. Lead receptacles

Two receptacles of lead which contained all the abovementioned articles offer a radical narrowing of the interval in question, though not without problems. Specialist's reports by Ing. M. Soudný (Institute of Archaeology, Czechoslovak Academy of Sciences) and F. Janský (restorer and specialist of the Soluna, national jewellery enterprise) have characterized the material of the receptacles and the procedures visible thereon as follows: the sheets of lead are elastic, sections are clean and corrosion effects minimal. Most of the surfaces of the receptacles bear traces of scraping in the state of sheet metal before its arrangement into the receptacle shapes, as there are clear traces of applying the tools on the corner surfaces. Traces of scraping are more shiny than the original surface which is quite matt and homogenized by hammer blows. More shiny traces of scraping may be found even below the seals. Receptacle No. 1 with remains of duchess Ludmila was probably attacked by corrosion earlier than receptacle No. 2; its material is less elastic but by far more so than in the case of a certainly mediaeval container from the grave of duke Vratislav I, the material of which is fragile and differs in chemical composition. Still more persuasive is the evaluation of tin joints. Animal fat has been used as a soldering agent; this procedure was frequent until the 19th century. The remains of this substance are visible on the joints only to well. Neither of the specialists have indicated any exact date of manufacture of the receptacles but they unanimously declare that this must have taken place „relatively not too long ago“. With the abovementioned exclusion of the 19th century, this makes the 18th century a hopeful choice. Thus it seems highly probable that we cannot reckon with the 14th–17th centuries, the interval being confined – in an optimum case – to some 100 years.

9. Evidence of written sources

The analysis of archival materials carried out by specialists of the Archive of the Bureau of the President has not revealed any direct, exact, and concrete evidence which could determine with any reasonable accuracy the time „relatively not too long ago“. In pondering over the archival documents, we will do well to realize that during the process of sinking the grave pit, a certain quantity of crushed opuka stone – possibly as building rubbish – was available on the spot. This is hardly likely to have occurred after 1782 when the nunnery was abolished. Two dates are more promising – the years 1731, when the whole building underwent substantial repairs and adjustments, and 1736, when work was going on at St. Ludmila's altar.

Although there is nothing in the written sources that would pertain directly to the situation described by our findings, this dating may be plausible from the viewpoint of the corrosion of the receptacles. It is especially the period around 1731 that may provide a key. In 1731, the archiepiscopal consistory addressed a reprimand to the head of St. George's nunnery for unauthorized repair work during which the pavement and tombs were interfered with demanding to apply for an additional approval of all that had been done. A number of other reports specify the works carried out to a considerable detail while in this particular case the data are very general. There is a possibility that the head of the nunnery had some tasks executed to which she was not entitled as manipulation with remains of the duchess surpassed not only her rights but even the competence of the archbishop, involving the privileges of the sovereign.

Theoretically, we might take into consideration one of the Renaissance-period

adjustments after the 1541 fire when the tomb was most probably damaged. The first opportunity could be dated into the years 1550–1554, during the office period of the abbess Ludmila Blíživská of Blíživo, for which there are some indications; another possibility may be the last quarter of the 16th century under abbess Ludmila Eybenštolerová of Eybenštol. Nevertheless, these possibilities do have some weak points, above all, state of the surface of lead receptacles and their tin joints. On the contrary, it might be argued that generally speaking, we know little about the chronological laws of the oxidation processes.

10. Conclusions

After evaluation of all circumstances, we have to admit that the time interval for sinking the grave pit, at first very long, may, after all, be more closely determined. Its maximum extent is theoretically conceivable from the half of the 16th century down to about the third quarter of the 18th century. Taking into account the state of the receptacles and the indirect evidence of written sources, we may suggest rather the end of this period, the 30's of the 18th century. Research on the evaluation of this exceptional find will be going on. It remains to follow in detail the history of a number of manipulations with remains of duchess Ludmila and to investigate in detail the unfolding of the temporal sequence of accumulation of objects within the grave pit. Studies of the history of the building and of re-shapings of the tomb will definitely also be carried on. All the three abovementioned themes may not fall together in all important points.

For the amplification and higher precision of our knowledge, evidence concerning the temporal sequence of archaeologization, that is, the temporal laws of destruction and reduction and thus of the loss of information value of archaeological sources is missing. This basic auxiliary discipline of archaeology is not generally – the less so in our case – elaborated upon. May the complexity of procedures around the tomb and burial of duchess Ludmila remind us of the necessity to dedicate our attention to this branch of the discipline of archaeology as well.

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Note

Dr. E. Opravil, CSc. (Opava branch office of the Institute of Archaeology of the Czechoslovak Academy of Sciences at Brno) has found and identified a remain of an asparagus plant (*Asparagus sprengeri*), which may be considered a postmediaeval import, among the textile fragments of the tomb. Import of this African plant is usually dated into the 19th century; in principle, an earlier arrival date may not be excluded, especially in ecclesiastical circles. At any rate, this detail rules out the Middle Ages and, highly probably, also the Renaissance period as the time of closing the contents of the grave pit. (The authors are grateful to Dr. E. Opravil for his kind conveying of this information.) During the printing of this preliminary report the competent evaluation of sculptures of the Gothic tomb appeared in *Umění (Arts)* XXXIII, 1985, 377-402 written by Ivo Hlobil.

(English by P. Charvát)

