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EXAMINATION AND ASSESSMENT OF THE WENCESLAUS MAIL HAUBERK

Abstract:

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The mail shirt kept in Prague Castle which is said to have belonged to Sv. Vaclav (Saint Wenceslaus) has been examined to assess the methods used in its construction. The use of “tailoring” (alterations in the number of links attached to each link in order to alter the shape of the shirt) is discussed, as well as the presence of repairs. A number of features of its construction appear to suggest an earlier rather than a later date.

Key words: Mail shirt, riveted links, welded links, mail tailoring, hauberk, ventail, hood, standard

The Mail Coat

In 2011 small group of armour curators and conservators from the Wallace Collection in London travelled to Prague at the invitation of the Castle authorities to view and assess the Wenceslaus mail coat. The Wallace Collection had organised an exhibition (*We've Got Mail*) on the origins and construction of historic mail armour only the year before, so all those involved were particularly absorbed and interested in the subject, and especially excited to be granted the privilege of viewing and handling such an important historic garment out of its display case. This was a rare opportunity, since the mail coat was not normally available for study in this way. Only the fact that it was in the conservation workshops of Prague Castle for routine conservation and re-mounting prior to it eventually returning to its old home in the Cathedral Treasury as part of a wholly new display, enabled this visit to take place.

All those fortunate enough to be present on this expedition felt a particular sense of awe and reverence on first seeing the coat... indeed, one of our number felt an almost eerie connection with the past, immediately reminded of armour and weapons the names of which have been passed down in folklore and sagas for the past thousand years... the mail *byrnie* of Harold Hardrada ‘hringserker’, for example (of such importance to him that he named it in the same way that swords were often named, his mail coat’s name being ‘Emma’).

When first seen (Fig. 1-2) the Wenceslaus mail coat was mounted on a wooden mannequin

and affixed to a polypropylene supporting mesh (Fig. 3). It was not possible to remove the garment from its support, since it was comprehensively tied down onto it with a fine clear nylon filament (Fig. 4). This method of securing loose rings and rendering the coat as stable as possible for both movement and display was an extremely effective solution to a serious problem, given the age and fragility of the piece; however, it did have the disadvantage that once the mail had been secured onto its support it was very difficult to assess the ‘flow’ of the material and the more subtle constructional details. As well as making any detailed assessment of its form and tailoring very difficult, securing it in this way would also make it very tricky to carry out repairs or improvements to the display-mount in future. The one thing that the support could not disguise, however, was the overall size of the garment... whoever it had been made for, or belonged to, he would not have been a short man, and (even allowing for padded textile underneath) he would have been quite stockily-built. The overall shape of the coat, wide-bodied, long, with flaring skirts and wide sleeves, was also immediately evident... a shape very unlike that of the later medieval and Renaissance mail garments that we were all familiar with from other museum collections.

Due to the method of its mounting, measurements were difficult to take with any accuracy; however, to give an overall sense of the coat’s form and dimensions, the following were recorded:



Fig. 1. The Wenceslaus mail coat during examination. *Photo by N. Checksfield.*

Ryc. 1. Kolczuga św. Wacława w trakcie badań. *Fot. N. Checksfield.*

From neck (of an imaginary wearer) to left cuff
 From neck (of an imaginary wearer) to right cuff
 Left armpit to cuff

= 82 cm

= 82 cm

= 50 cm



Fig. 2. A former made by the Conservation Department of Prague Castle in order to show the original shape of the mail shirt. *Photo by N. Checksfield.*

Ryc. 2. Model kolczugi wykonany w Dziale Konserwacji Zamku Praskiego w celu zaprezentowania jej oryginalnego kształtu. *Fot. N. Checksfield.*

Right armpit to cuff	= 50 cm
Shoulder to hem	= 108 cm
Right armpit to hem	= 72 cm
Left armpit to hem	= 71 cm
Circumference 36 cm below the centre/middle of neck	= 122 cm
Circumference of left cuff	= 43 cm
Circumference of right cuff	= 47 cm

It was immediately obvious (Fig. 5) that there was extensive damage to the coat around the neck and upper right arm, partly no doubt due to the extreme age of the coat (the upper areas being those most prone to wear and strain from bearing much of the hauberk's overall weight), but partly also perhaps owing to rings being taken as relics over hundreds of years, which would have hastened deterioration due to the added stress imposed on the remaining rings in the surrounding area. It also soon became apparent that there were very many repairs and patches to the mail. Occasionally one can see, for example, what appears to be an early repair (Fig. 6), as indeed one might expect with so ancient an artefact, made for use in battle as well as

being an object of rank and status. There are also areas that appeared to be inside-out, presumably an indication of later repair phases. Any competent mail-maker during the period of the coat's wear and use would have known to have had all the protruding rivet-heads of his mail on the outside, with the smooth surface of the links on the inside; this was done for the comfort of the wearer and to prevent excessive chafing and wear to the textile of any garment(s) worn beneath the mail. The presence of such 'inside-out' patches is slightly unusual therefore, but perhaps understandable if the repairs were not being carried out for wear in the field, but instead to preserve a precious holy relic.

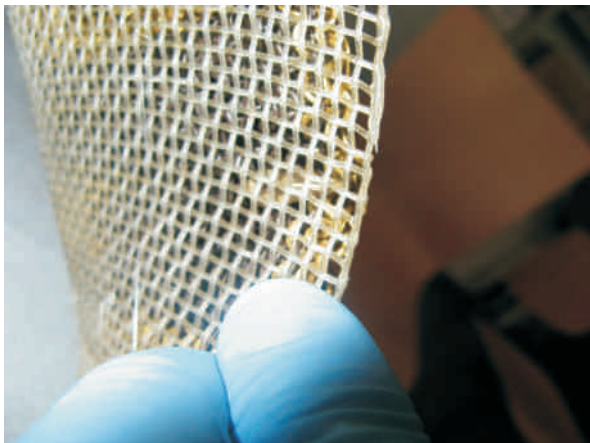


Fig. 3. Polypropylene supporting mesh on which the mail was settled.
Photo by N. Checksfield.

Ryc. 3. Polipropylenowa siatka wzmacniająca, na której osadzono kolczugę. *Fot. N. Checksfield.*

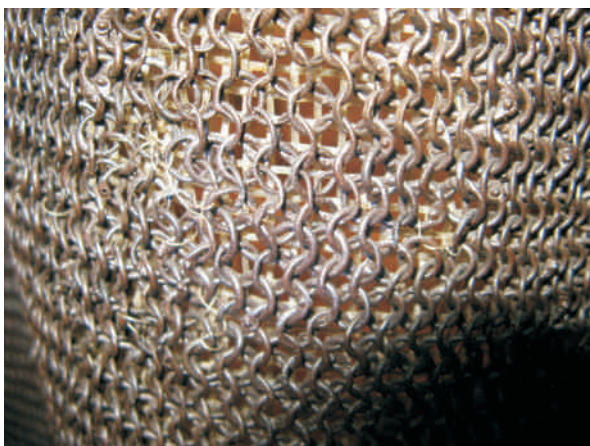


Fig. 4. Examples of parts of the mail where nylon filament is visible.
Photo by N. Checksfield.

Ryc. 4. Przykłady części kolczugi, gdzie widoczne jest nylonowe wzmocnienie. *Fot. N. Checksfield.*

The general shape of the coat appeared to all of us to be rather different from the mail we more usually encounter in museum collections, most of which can be dated to the 14th or 15th-c. or later.



Fig. 5. The mail coat around the neck and upper right arm. *Photo by N. Checksfield.*

Ryc. 5. Fragment kolczugi w okolicach szyi i prawego ramienia. *Fot. N. Checksfield.*

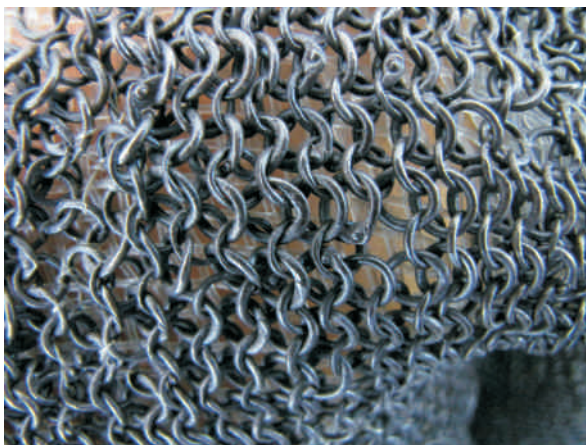


Fig. 6. The example of the repair of the mail coat. *Photo by N. Checksfield.*

Ryc. 6. Przykład naprawy kolczugi. *Fot. N. Checksfield.*

The individual rings were small, and arranged in alternate horizontal rows of riveted and solid links (even though C. Blair in his monumental work (1958, 24), had described it as constructed entirely of riveted links).

This feature is usually the sign of an 'early' date, since in western Europe this form of construction seems to have been going out of fashion by the end of the 14th c., replaced by wholly-riveted mail. In both museums and private collections, mail earlier in date than the 15th c. is extremely rare... and mail of the 10th-14th c. virtually unknown, other than from an archaeological context.



Fig. 7. Missing area around the neck of mail. Photo by N. Checksfield.

Ryc. 7. Partia kolczugi zniszczona w okolicach szyi. Fot. N. Checksfield.

The large missing area around the neck does however raise the question of the original shape and form of that area (fig. 7). No evidence survives of the form of the neck: whether there was a collar, for example, or whether there could have been an integral hood of mail once attached to the coat. Was the neck and/or upper part of the chest reinforced by thicker, or additional layers, of mail? Was there a collar of denser mail, as found on many later medieval mail shirts? There seemed to be evidence of some sort of reinforcing, or perhaps even the vestiges of a ventail, at the upper chest although due to the heavy wear, damage, and losses to that area, its precise nature is by no means clear. Another view in this general area seems to show a later mend with a clearly visible rivet, as well as links that are clearly very old and an integral part of the coat as first made (Fig. 8). Just to confuse matters further, of course, this section appears to be inside-out (as indicated by the fact that no rivet-heads are visible on the outside), but even so it is apparent (in the centre of the top front, when viewing the armour on its stand, from the front) that there is a flap of mail behind the main fabric of the

coat. If that part of the coat was the right way round it would look very much like a ventail, or indeed simply further protection for the chest. Some such square panel of mail can in fact be seen on the hauberk of some of the Norman knights depicted in the 11th-c. embroidery known as the *Bayeux Tapestry* (Wilson 2004). If it is indeed a ventail, then that might also suggest that the coat could have been fitted with an integral mail hood, which (according to the scant few pictorial sources we have from this era) was worn either alone or underneath the typical conical helmet of the era (like that of Wenceslaus himself, preserved for centuries along with the mail in the Prague Cathedral Treasury). In 1905, Groebbels recorded the archaeological discovery of just such a long-skirted hooded mail coat, dating to the 6th or 7th c., in Gammertingen, Germany (Groebbels 1905). A *spangenhelm* helmet of similar date, together with a number of swords, was found in the same area. Like the Wenceslaus hauberk, this particular coat (although heavily corroded) was definitely constructed of similarly small rings, similarly arranged in alternate horizontal rows of riveted and solid links.

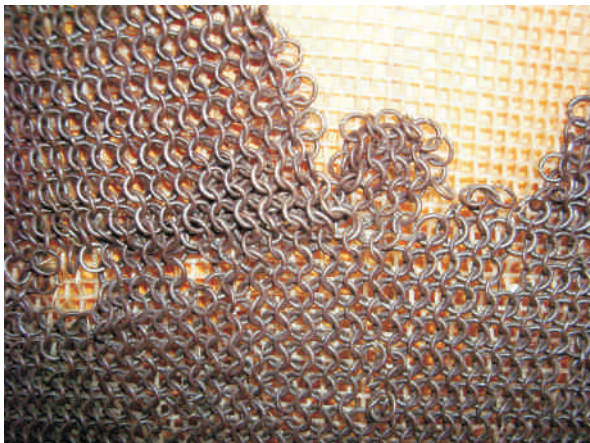


Fig. 8. Missing area around the neck of mail at the upper chest. *Photo by N. Checksfield.*

Ryc. 8. Partia kolczugi uszkodzona w okolicach szyi. *Fot. N. Checksfield.*

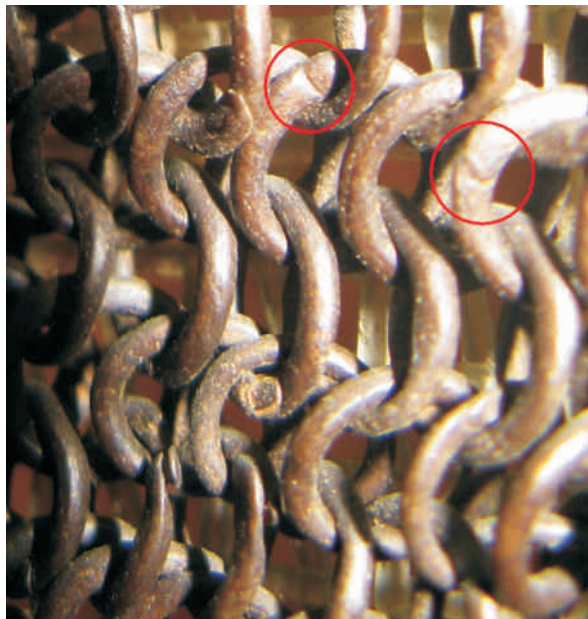


Fig. 9. Examples of welded rings in the examined mail. *Photo by N. Checksfield.*

Ryc. 9. Przykłady zgrzewanych ogniw w badanej kolczudze. *Fot. N. Checksfield.*

The overall shape and form of the Wenceslaus hauberk are unique among surviving non-excavated mail coats. Nothing else we have seen has quite the same full flaring skirt and wide sleeves. The damage and losses around the neck of the Wenceslaus hauberk, however, make it impossible to be certain of its original form in the all-important front/chest area. At the very least, however, the evidence provided by the intriguing reinforcing of the chest, unique to surviving mail coats, would

seem to confirm the depiction in the Bayeux Tapestry of square reinforcements over the chest. Created during the 1070s immediately following the Norman Conquest of England in 1066, probably sewn in England but with its design and content

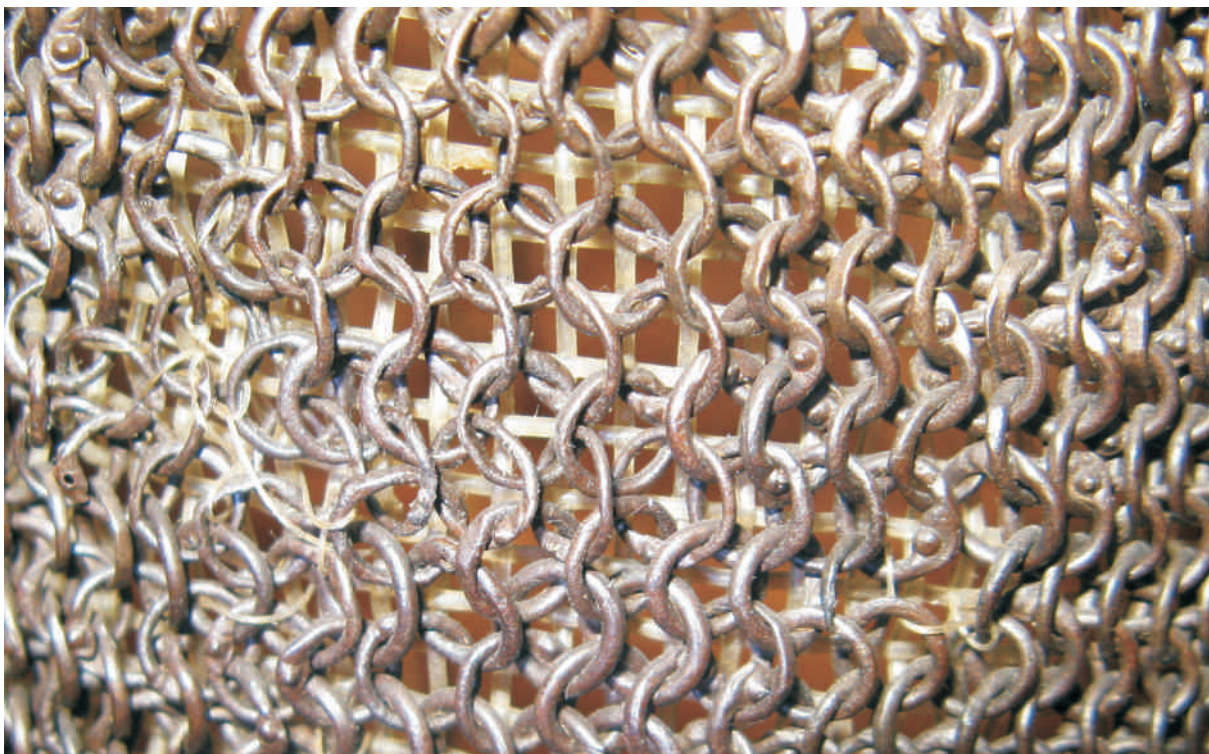


Fig. 10. Examples of the links in the Wenceslaus mail coat. *Photo by N. Checksfield.*

Ryc. 10. Przykłady ogniw w kolczudze św. Wacława. *Fot. N. Checksfield.*



Fig. 11. Examples of the links in the Wenceslaus mail collar. *Photo by N. Checksfield.*

Ryc. 11. Przykłady ogniw w kołnierzu kolczugi św. Wacława. *Fot. N. Checksfield.*

almost certainly deriving from Norman French input, this hugely important embroidery is almost contemporary with the earliest projected date of the Wenceslaus hauberk (the 10th c.), and is as relevant a pictorial source of evidence for the latter's possible original appearance as we are ever likely to get.

Both the riveted and solid rings were seemingly made from drawn-wire, approximately circular in cross-section. The latter were almost certainly welded, as far as we could ascertain, rather than being punched from a flat sheet of metal. In Fig. 9 what appear to be welded rings can clearly be seen in the top right-hand corner of the image, the overlap where the ring was welded closed being particularly clear in this picture (Fig. 9). The individual links ranged in wire-thickness from 0.66-1.10 mm, with an internal diameter between 3.67-4.8 mm (Fig. 10). This is comparable in ring-size to many surviving archaeologically-excavated examples of Celtic and late-Roman mail, as well as the few surviving extant examples of early medieval mail (such as that forming the camail of the so-called Coppergate helmet from York, dated to the 8th c. AD –

see Tweedle 1992 with paragraphs made by S. A. O'Connor 1992; O'Connor, Gardner 1992). The form and style of the riveting is also very similar, with round holes and round-section wire rivets very different to the flat 'wedge' rivets so prevalent in later medieval mail, although it has to be said that there are only so many ways

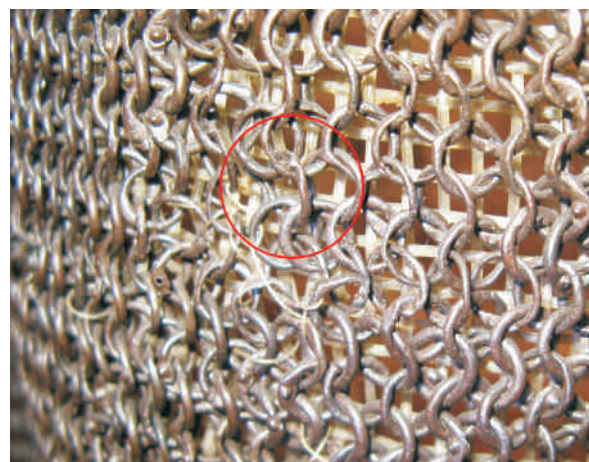


Fig. 12. "Pseudo"-riveted rings. *Photo by N. Checksfield.*

Ryc. 12. „Pseudonitowane” ogniewa. *Fot. N. Checksfield.*



Fig. 13. The method of overlapping and riveting seen in St. Wenceslaus mail, characteristic rather for eastern European mail. *Photo by N. Checksfield.*

Ryc. 13. Metoda łączenia i nitowania widoczna w kolczudze św. Wacława, charakterystyczna raczej dla wschodnioeuropejskich kolczug. *Fot. N. Checksfield.*

a pin-riveted ring of this type can be made. Welding which closed each individual solid ring was an operation carried out by hand; considerable skill and practice was required to ensure the weld was strong in every one of an estimated 40-50.000 welded links. Similar skill would have been needed to make and fit the 40-50.000 riveted links, each one pierced and riveted together as the coat was being assembled. We did not have time to carry out a detailed and accurate count of the links present, but we estimated that when the coat was complete there would have been at least 80-100.000 links in total, not including any hood or coif that may or may not have been present originally.

Understandably, the coat seems to have been repeatedly repaired in the course of its long lifetime. Some repairs were most probably carried out during its working life, although there are a few obviously much later repairs. For example, a patch can be seen on the rear of the coat about half-way down, which appears to be of the same (somewhat later) date as the mail of the separate standard (collar) (Fig. 11).

This also raises the question, why was a small patch mended late in the coat's life, but the damage evident elsewhere was not? Did extensive widely-scattered damage only occur *after* this time? These are questions now impossible to answer, however. It is likely that a precious religious relic such as this might have undergone very many excursions in its lifetime, during which any movement might have put strain on the very worn and ancient links, causing them to fail and come apart... a long-running series of repairs and 'improvements' throughout its existence therefore seems very likely, but at this stage it would be practically impossible to put these into any sort of sequence. Certainly, virtually all of the repairs that we were able to note were carried out by relatively experienced mail-makers or general armourers... there was no immediate evidence of 'unprofessional' repairs, for example using 'budded'-joint links for ease, speed and cheapness. It is true that sections of the coat now appear to be inside-out, and there is considerable evidence of patching, but this said, we were all of the opinion that the coat itself was

certainly an integral garment and not something put together later from pieces of early mail. The bulk of the rings certainly seemed to match each other. However, it was not possible in the limited time available to the assessment team to devote to the mail coat the several days of detailed and painstaking analysis that it deserved. We all felt that detailed study and ‘mapping’ of the coat would be very fruitful and reveal a great deal of its past history, but unfortunately we all also knew from previous experience just how time-consuming such work would be, and no-one’s time-schedule would permit such a luxury. This is something that will have to be postponed until some time in the future.

As to the construction of the mail itself, interestingly there are a few “pseudo”-riveted rings. One can be seen (Fig. 12), four rows from the top three rings left of centre and another one next to it. The ends of a supposedly riveted link have been flattened, overlapped and seemingly punch-riveted, but in fact there is no rivet present, and never was. This could be deliberate, a repair, or an accident. We have certainly encountered this

phenomenon before in oriental (Indo-Persian and Ottoman) mail, albeit mostly much later in date, and there is no reason to believe that ‘pseudo-riveting’ wasn’t practiced occasionally in Europe (Williams 1997, 394, Pl. 5).

That said, the coat shows some characteristics of eastern rather than later western European mail... for example, the method of overlapping and riveting seen in (Fig. 13), but so little mail of this very early period exists outside archaeological collections that it is very hard to be certain about the significance of such features; very much more work needs to be done in this area, and in particular a data-base of known dated and identified mail needs to be compiled.

The following measurements of individual links were taken: 1. ring thickness (ie. the diameter of the wire), and 2. the internal diameter of the links. Owing to the way the coat had been mounted, it was often difficult to obtain extremely accurate measurements, and since all the links (being hand-made) varied very slightly in shape and size anyway, these measurements should be taken as a broad over-view only.

Wire thickness, and internal diameter of links

Key: O = original, W = welded, R = riveted, ERp = early repair, LRp = late repair, F = front, B = back, T = top, M = middle, BT = bottom, L = left, C = centre, RT = right

Mail Coat

Type of ring thickness mm internal diameter mm position

O w	1.01	4.32	B T C
OR	1.02	4.12	B T C
ER R	1.10	4.16	B R T of C
OR	1.10	4.16	T L
OW	1.10	4.28	T L
OW	0.95	4.30	C
OR	0.91	4.14	C
ER R	1.07	3.59	160 below T line 60 L of C
OR (?)	0.66	4.8	M 270 below T line
OW	0.79	4.45	M 270 below T line
ER R	1.04	3.67	90RT of C , 510 below T
OR	0.72	4.31	BT 40R of C
OW	0.87	3.69	120 R of C BT
OW	0.68	3.92	adjacent ring to above
OR	0.80	3.94	left sleeve C
OR	0.77	4.2	adjacent to above
OW	0.93	3.99	L sleeve 270 above C
OR	0.94	4.16	adjacent to above
OW	1.07	4.12	L sleeve 600 above C
OR	0.82	4.18	adjacent to above
R R p	1.14	3.95	T F C
OW	0.80	3.84	F T C
OR	1.10	4.10	adjacent

Pseudo R	0.68	4.51	10LC 330 below T
OW	1.08	4.06	B C R sleeve
OR	0.97	4.03	M275 above cuff R sleeve
OR	1.00	3.74	T23 below neck R sleeve

Standard

R	0.79	3.89	B of skirt 1st expansions
Ar	0.82	3.92	25 from L

‘Tailoring’

The mail of the coat did not seem to have much in the way of tailoring, although the neck and shoulder areas were so badly damaged that any evidence of idling (the insertion of ‘idle’ rings, enabling the maker to ‘tailor’ the overall shape to better-fit a human body, and aid in movement) would have been lost. Most significantly, there were no signs of contractions down the back of the coat or at the waist. This is certainly usually a feature of later medieval mail shirts, and it was interesting that there was no sign of it here. On the other hand, from a constructional point of view,

the sleeves were attached in the same way as those on an early 15th-c. German mail shirt in the Wallace Collection (Cat. No. A2) (Edge 2001). We were unable to find any tapering towards the cuffs. In fact, the only place we found expansions was at the bottom front, slightly to the left (from the viewpoint of the observer) starting at row 470 from the hem: one expansion every other row forming a triangle of expansions. 150 rows from the hem inside the triangle was another set of expansions, one to every row. The back has another row 355 from the bottom edge, 100 from the centre to the right, one every other row. The expansions at the rear



Fig. 14. The expansions at the rear of the mail. *Photo by N. Checksfield.*

Ryc. 14. Poszerzenia widoczne z tyłu kolczugi. *Fot. N. Checksfield.*

of the coat can clearly be seen (Fig. 14). In terms of tailoring construction, the back does not match the front, but due to extensive damage along the line of the hem it was impossible to postulate any further.

The fact that there were few idle rings in itself is interesting, because this feature normally denotes a mail garment of relatively early date. By the 15th and 16th c. the 'tailoring' pattern can actually become quite complex... work is ongoing at the Wallace Collection in London to 'map' the original construction of mail garments, but the Armoury collection there contains (as far as we can tell at this stage) no mail earlier than the beginning of the 15th c., and certainly nothing as early in date as the unique Wenceslaus hauberk.

The Mail Standard

The *standard* (a term used to describe a detached mail collar protecting the neck and upper shoulders) was interesting due to the fact that its construction seemed to imply a number of different periods of manufacture or significant alteration... perhaps as many as three, at least (Fig. 15). Unfortunately it was difficult to examine as it had been mounted inside-out, with the rivet heads on the inside instead of the outside.

First, at the top, encircling the neck, we find a mail strip, forming an up-standing collar, which appears contemporary with the mail of the coat. Suggestions have been made that this might once have been part of an aventail (mail fringe) for the helmet which has long been associated with the hauberk, although it seems too short and there do not seem to be sufficient holes in the helmet's rim to make this very likely.

Then, the gold border was attached along this top section, and later the gold on the sides and bottom; finally, later still, the mantle of iron mail, in sections, was applied to make the whole into a standard. It is clear (Fig. 16) that the top gold border-section was applied by a different craftsman and at a different time to the rest, due to the rings having different cross-sections and the fact that the one group of links bear a mark made by the setting pliers while the other does not. Some of the gold rings have gold rivets, and some iron (fig. 17) ...these differences appeared to occur randomly. Interestingly, the individual links of the brass or *latten* copper-alloy borders often found on much later medieval mail are usually closed with iron rivets, rather than copper-alloy.

Tailoring notes

The collar was 25 rows deep including three gold rows at the top and three at the bottom; no idling was present here.

The mantle was 48 rows deep and had four sets of expansions with (from the left) the first line having one every other row; the second had the same, the third near the centre had two every row, the fourth had one every other row, and the fifth had one every row.

The rows were not symmetrical, or evenly spaced.

There was a butted repair 150 links to the left of centre.

Conclusion

Is the standard (collar) original? Dating is very difficult, owing to a lack of firmly dateable comparative material, but it does seem quite likely that the mail collar is of much later date than the mail hauberk. Collars of this type are more a feature of later medieval armour. Moreover, as a group we were far more suspicious of the structural integrity of the standard than we were of the coat. We rather agreed with our Prague colleagues that it was of later date (perhaps 14th-c.?) and that its principal purpose had been to disguise, cover up and 'improve' the appearance of the ragged edges and losses of the neck on the mail coat, which could well have already been present by that early date. We also thought that it appeared to be something of a conglomeration of parts; some parts potentially as old as the mail coat, perhaps, but the whole item not originally made as we see it today. The slightly different lines of gold links, showing evidence of more than one hand in their creation, and the slightly mis-matched mail panels that the whole item was built from, all combined to raise the suspicion of later alterations, most probably in the interests of 'improvement'. Certainly the addition of gold borders would fit this surmise. The gold links are even more difficult to date, because of an almost total lack of comparable material to assess them against. Borders of gold-coloured '*latten*' (copper-alloy) mail, and even traces of gilding, do survive on later-medieval and Renaissance mail, but solid gold links are of the utmost rarity, even on mail much more recent in date than this, and of equally significant, even princely, provenance.

Is the coat original? The assessment team was unanimous in thinking so. Having seen many examples of mail throughout the world, we all agreed that this coat certainly showed all the signs of being old enough (if not older) to date from the 10th or 11th c., although the lack of comparable closely-dated mail (other than excavated fragments) from this era makes any such assertion as much a statement of faith as of fact.



Fig. 15. Collar of the Venceslaus mail. *Photo by N. Checksfield.*

Ryc. 15. Kołnierz kolczugi św. Wacława. *Fot. N. Checksfield.*

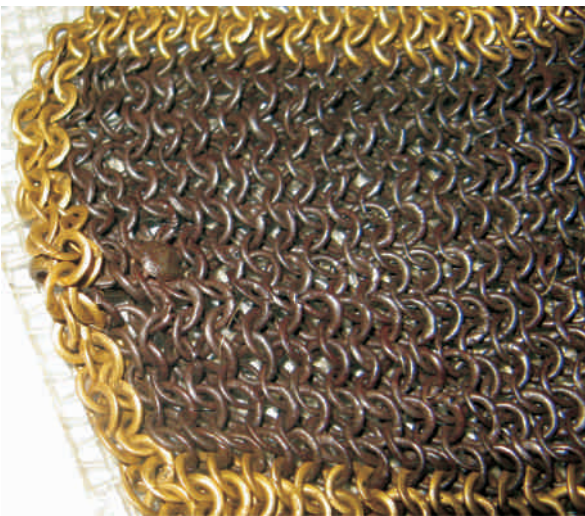


Fig. 16. Fragment of collar where different shape gold links in top border section are visible. *Photo by N. Checksfield.*

Ryc. 16. Fragment kołnierza – przy górnej krawędzi widoczne są złote ogniwa o innej konstrukcji. *Fot. N. Checksfield.*



Fig. 17. Gold links on the collar's border with gold and iron rivets. *Photo by N. Checksfield.*

Ryc. 17. Złote ogniwa na obrzeżach kołnierza ze złotymi i żelaznymi nitami. *Fot. N. Checksfield.*

Was it the actual armour of St. (King) Wenceslaus? We would like to think so. The strength of the Wenceslaus cult having become so potent so soon after his death in the 10th c., the early establishment of a 'Treasury' of relics belonging to the saint, and the fact of the mail coat's existence in Church records since the early 14th c., raises the probability of its being genuine quite considerably. On the other hand, of course, as relics and pilgrimages became increasingly important to the Church both financially and as indications of status and regional importance, the 'creation' of relics became a significant industry throughout Europe. In England, Thomas à Becket was martyred in 1170, and within just a few years his shrine and the pilgrimages that it attracted had become 'big business'. The authenticity of the Wenceslaus hauberk in this respect, however,

is impossible to confirm through present-day examination and analysis alone, but its recorded existence at such an early date is certainly a strong point in its favour.

Acknowledgements and thanks

Both mail garments were absolutely fascinating and we could all have spent a lot more time examining and discussing them. We would all particularly like to thank Dr. M. Bravermanova for allowing us to examine these unique and historic artefacts so closely and in such detail out of their display-cases, a very rare privilege indeed. We also owe an enormous debt of thanks to all our hosts in Prague, who were extraordinarily generous with their time and without whom we would never have been able to stay for as long as we did in that beautiful city.

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ANALIZA FORMALNA I METRYCZNA KOLCZUGI ŚW. WACŁAWA

Streszczenie

Skarbiec katedralny w Pradze zawiera kilka przedmiotów uzbrojenia uważanych za należące do św. Wacława. Znajduje się wśród nich również kolczuga, którą datuje się na X w. Została ona (wraz z towarzyszącym jej kołnierzem, bądź obojczykiem) zbadana w celu określenia metod użytych do jej wytworzenia. Dopasowywanie kolczugi jest często obserwowalne w konstrukcji pancerzy kolczych. Są to generalnie zmiany w liczbie ogniów przymocowanych do innego ogniwa w celu zmiany kształtu kolczugi. Dużo częściej obserwowalne są one w zabytkach późnośredniowiecznych. Wykonano schemat kolczugi, na który naniesiono zastosowanie „technik krawieckich”, napraw, jak i rozmiarów poszczególnych ogniów. Relatywnie mała ilość zastosowanych „technik krawieckich” wskazywać może na wczesne datowanie kolczugi. Zauważyć można kilka śladów napraw, jak i obszernych ubytków kolczugi wokół karku i górnej części lewej ręki; górne obszary są najbardziej podatne na naderwanie, ze względu na to, że na nich spoczywał ciężar całości kolczugi.

Stwierdzono również występowanie obszarów, które wydają się być wywrócone „na lewą stronę”, co może wskazywać na późniejsze naprawy. Każdy kompetentny wytwórca kolczug wykonałby ją tak, by wszystkie wystające główki nitów skierowane były na zewnątrz, z gładką powierzchnią ogniów do wewnątrz; było to wykonywane, by zapobiec obszer- nym otarciom tekstylnego okrycia noszonego pod kolczugą. Obecność takich łat „na lewą stronę” jest nieco niezwykła, ale zrozumiała, jeśli naprawy zostały

wykonane tylko po to, by zachować cenny, święty zabytek, nie zaś w celu ponownego użytkowania na polu walki.

Wydaje się, że zauważalne jest istnienie w górnej części klatki piersiowej pewnego rodzaju wzmocnienia, bądź może czepca kolczego, gdyż w centralnej partii góry właściwego przodu kolczugi występuje kłapa z plecionki kolczej, z tyłu głównego wątku struktury kolczugi. Gdyby ten element kolczugi nie był wywrócony „na lewą stronę”, wyglądałby jak czepiec bądź dodatkowa osłona klatki piersiowej. Tego typu kwadratowe elementy z plecionki kolczej można w istocie zauważyć na pancerzach niektórych rycerzy norman- skich wyobrażonych na XI-wiecznym hafcie, znanym jako *Tkanina z Bayeux*. Wyobrażenie to jest nieomal rówieśnikiem kolczugi św. Wacława (X w.) i z tego powodu jest odpowiednim źródłem potwierdzającym jego występowanie.

Kolczuga zawiera na przemian ułożone rzędy ogniów nitowanych i nie nitowanych – oba typy wydają się wykonane z ciągnionego drutu. Ten ostatni typ był niemal z pewnością zgrzewany. Wielkość pierścieni jak i sposób ich nitowania jest porównywalny ze znanymi przykładami późnorzymskich pancerzy kol- czych, jak również z kilkoma zachowanymi egzem- plarzami wczesnośredniowiecznymi (jak ta przy heł- mie z Coppergate w Yorku, datowanym na VIII w.). Wszystko to wskazuje na X-wieczną metrykę niemal całości kolczugi, jednak z wieloma późniejszymi na- prawami. Szacujemy, że gdy kolczuga została ukoń- czona, zawierała co najmniej 80-100.000 ogniów.

Tłumaczenie: Arkadiusz Michalak