

COAT OF PLATES, BUCKLER & CONQUISTADOR

The visitor to the Treasure Chamber of the Bavarian Army Museum will discover outstanding pieces from the old collection that are unique or extremely rare throughout the world. Among them are garments of simple soldiers from the 16th century, a magnificently designed parrying shield, the deer-stalking rifle of Count Palatine Ottheinrich and other precious exhibits.

The focal point of the room is a suit of armour from the 14th century, a so-called "Plattenrock" or coat of plates. In addition to introductory essays, the volume offers a contribution on each exhibit in the Treasure Chamber. All objects are presented in detail and explained with numerous illustrations.



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Items from the Treasure Chamber
of the Bavarian Army Museum

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**Items from the Treasure Chamber of the
Bavarian Army Museum**

Edited by Tobias Schönauer and Ansgar Reiß

Allitera Verlag

Catalogues of the Bavarian Army Museum
Volume 20

Edited by Ansgar Reiß

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Preface

“Coat of Plates, Buckler and Conquistador” is the second catalogue to be published in the course of the reorganisation of the older collections of the Bavarian Army Museum, following “Forms of War 1600-1815” from 2019. “Coat of Plates, Buckler and Conquistador” is the catalogue for a separate exhibition room, the so-called Schatzkammer (treasure chamber), and focuses on an even older time period. The material remains that have come down to us from that time are, by their very nature, sparse. From the Middle Ages or the 16th century, only very few objects made of organic materials, i.e. wood, leather or textiles, have survived. For that reason alone, the 15th and 16th century textiles from our museum’s collections are among the most unusual pieces in the museum. Beyond these, however, a deliberately narrow, exquisite selection was made for the treasure chamber. As the catalogue’s subtitle implies, this is not a cohesive group of objects, but rather individual pieces that are particularly noteworthy for a number of reasons.

This new catalogue also follows a different approach. “Forms of War” was intended as a concise but complete documentation of the exhibition in text and images, but this one delves deeper. At the beginning there is an essay on the “museum in progress”, followed by two contributions of a more general, historical nature on the subject of clothing and armour. The main focus, however, is on detailed individual examinations of the objects presented in the treasure chamber. Each contribution is complemented by a double page on which the “hard facts” about the object are presented in a condensed form. This is in no small part a reflection of the only recently developed, new level of digital indexing of

the museum’s documents, which has made it possible to work out particularly the provenances much more clearly.

This volume was written 2020/2021 during the pandemic. We would like to thank the authors of the contributions above all others. We are pleased that during this demanding time they had the flexibility and the willingness to deal intensively with the respective pieces or ensembles and to allow their studies to flow into this catalogue. We hope that further discussions and research will follow, especially as many of the pieces are very unusual and were hitherto practically unknown. We would also like to thank those who have worked in the background and in an assisting capacity, especially Ms Magdalena Verenkotte and Ms Ursula Hofmann, whose restoration of the conquistador’s frock has led to a complete reassessment and subsequently also a new presentation of this extraordinary piece. This restoration was generously supported by the Ernst von Siemens Kunststiftung.

Thanks are also due to all the staff in the house who looked after the items in preparation for the presentation and especially during the sometimes complex and complicated photoshoots in the museum. From the beginning, it was the explicit aim to illustrate the essays abundantly so that the exhibits could be placed in an overall context. However, in addition to illuminations, paintings, graphics, comparative pieces and other depictions, it is primarily the excellent photographs of the exhibits themselves that distinguish this book. We would like to start by thanking the photographer Gert Schmidbauer, who unfortunately did not live to see the completion of this catalogue. In addition to his photos, the publication contains a large number of

photographs by Erich Reisinger. These detailed photos, which were difficult to realise, sometimes give spectacular insights into the “inner life” and the “secrets” of the objects. Additionally, many private persons and fellow researchers provided various photographs of works of art, which have added colour to the catalogue in the best sense of the word – many thanks for this. Our sincere thanks go to our colleague Daniel Hohrath for his meticulous manuscript editing. Without him, the book could not have been realised in this form. We also thank Christopher

Retsch who just recently joined our staff for reading proofs.

And at the same time, this is the place to express our gratitude regarding the museum space realised three years ago and opened simultaneously with “Forms of War” on 3 June 2019. The imprint names the museum staff who were involved in the project in a significant way. Our thanks go to them as well as to the Ausstellungsbüro (curatorial office) Janet Görner and the graphic designer Luise Wagener, who have created a room with a very special atmosphere.

Tobias Schönauer – Ansgar Reiß

Ingolstadt, September 2022

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Organiser

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Overall Management

Ansgar Reiß, Ph.D.

Idea, Concept and Realization

Tobias Schönauer, Ph.D.

Curator

Tobias Schönauer, Ph.D.

Design

Ausstellungsbüro Janet Görner, Berlin
Luise Wagener, Berlin (Graphik)

Work Shops and Depots

Tobias Baur, Kornelia Koch, Rudolf
Pemsl, Anja Pilz, Franz Prummer,
Hans-Peter Roth, Melita Schluttenhofer,
Jakob Schwaiger, Heinz Weininger

In-House Technology

Konrad Mayer, Christina Thurn

Translation

Karl Veltzé M.A., Bad Cannstatt

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Tobias Schönauer and Ansgar Reiß

Editing, Layout and Typesetting

Tobias Schönauer, Ph.D.

Cover Design

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Manuscript Editing

Daniel Hohrath M.A. and Christopher
Retsch M.A.

Translations

Karl Veltzé M.A.

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Summaries of Contributions

Ansgar Reiß

Museum History, Object History, History of Europe The Treasure Chamber as a Laboratory of Museum Work

The introductory contribution takes a look at the studies collected in this volume. Using these as a basis, it argues that the treasure chamber has a special function within the framework of the new concept for exhibiting the collections in the New Castle. It exemplifies the museum's *modus operandi*. The individual exhibits are elements within a specific historical narrative, but they also have their own object history across the centuries, and thirdly, they are part of the museum's history. It is only in this threefold reflection that the wealth of meanings that the collected and exhibited objects carry reveals itself.



Kerstin Merkel

Sewn and Forged Fashion Transfer and the Social Ideal in the 14th Century Using the Example of Rudolf IV, Archduke of Austria, and Catherine of Bohemia

Around 1350, the boundaries between armour and clothing became blurred. The close-fitting doublet and the low-slung belt were worn by both knights and burghers, as well as by men and women. The reference to elements of knights' attire shows the desire of contemporaries to approximate a social group with a high level of social acceptance, for the knight was the ideal of his time. Considered protagonists of fashion, Rudolf IV, Duke of Austria, and his wife Catherine of Bohemia were appropriately depicted four times in life-size sculptures in St. Stephen's Cathedral in Vienna. Here, the duchess is depicted vestimentally as a bearer of power, but also as a protector. She may have brought this fashion trend from her Bohemian homeland to Vienna.



Fabian Brenker

The Emergence of the Coat of Plates in the 13th Century On the Significance of Written Sources for the Study of the Material Culture of the High Middle Ages

At the end of the 19th century, pictorial sources and preserved originals took centre stage in German-language weapons studies. Written sources were soon neglected to such an extent that the beginning of body armour by means of plates was vaguely dated to the second half of the 13th century and into the 14th century. Some vernacular poetry and Latin laws, however, prove that coats of plates were already used by horsemen in the early 13th century and were also widespread among foot soldiers from the 1230s onwards. Illustrated depictions from the second half of the 13th century seem to be limited to the German culture area and to differ from the armour in the Romanic regions made of hardened leather.



Tobias Schönauer

The "Hirschstein Armour" A Coat of Plates from the Mid-14th Century

Until the discovery of the "Hirschstein armour" by a detectorist, coats of plates were known almost exclusively from illustrations. At the turn of the 14th and 15th centuries, this type of armour evolved into the full plate armour still shaping the image of the knights today. The author begins by describing the development of body armour up to the emergence of the coat of plates in the 14th century, thus illustrating the importance of the Ingolstadt specimen for the study of armour. After that, the special features of this piece are explained and the difficulty of reconstructing this armour on a scientific basis is highlighted.



Alfred Geibig
**Three Swords from the Collection
 of the Bavarian Army Museum**

Three swords, each of them representing in its function and shape a specific period, in one case the Carolingian period, in the second the Romanesque / early Gothic period and in the third the later Gothic period. Thus, different methods of use as well as different fashions can be identified through dimensions, construction and morphology. Most interesting from a scientific point of view is the Carolingian sword, which may be considered exemplary for swords of this period. A second sword is composed in its main components of parts from different periods, whereby the blade seems to be clearly older than the hilt. Possible reasons for the time discrepancy between hilt and blade could be the replacement of hilt parts and / or the adaptation to more modern functional / handling requirements.

The third weapon, whose non-ferrous metal inlays in the blade indicate that it originated from Passau, may be dated to the Gothic period and thus represents the early phase of the art of fencing, which blossomed in the course of the following centuries and developed ever more finely.



Alfred Geibig
**Of Handgonnes and Wooden
 Bumpers**
**A very special Arquebus from
 Markt Schrobenhausen**

In 1904, three extraordinary arquebuses from the town of Markt Schrobenhausen made their way to the Bavarian Army Museum. The focus here will be on a very special hunting rifle that stands out from that trio because of its condition and because it tells an interesting, perhaps even tragic story. In addition to the special butt shape – common to all three rifles and permitting interesting conclusions to be drawn about their former use and areas of activity – the rifle being discussed here shows a disastrous explosion damage around its chamber, which in all likelihood had a considerable, perhaps even fatal effect on its operator(s).



Tobias Schönauer
Wood, Leather and Canvas
A Pavise with the Coat of Arms of
Munich

In 1463, the city of Munich purchased 99 pavises from a man referred to as “Hanns of Transylvania”. This shield form was widespread in the 15th century and could be found in armouries and private households throughout Europe. Although there were at least 99 such shields, just three have survived. One of these pavises was acquired by the Bavarian Army Museum in 1999. The author describes the construction, design and painting of this object as well as its history, as far as it can be reconstructed.



Tobias Schönauer
From Innsbruck to Bavaria
A Buckler from Ambras Castle
as Spoils of War

Bucklers are a special form of shields characterised by a central grip and measuring no more than 45 cm in diameter. They have survived in many historical collections around the world, as they were found on all continents and in many civilisations. In 1932, the Bavarian National Museum handed over an unusual buckler to the Bavarian Army Museum. In the inventories, it is referred to as “parrying shield” or “small fist shield” and was purported to come from the cabinet of curiosities of Ambras Castle in Tyrol. The author presents the unusually shaped and decorated shield and is able to trace its history back – via the royal gun room and its robbery from Tyrol by Bavarian troops – well into the 16th century.



Tobias Schönauer and Dieter Storz
**The Deer-Stalking Rifle of Elector
 Palatine Ottheinrich**
**A Wheel-Lock Rifle with a Checkered
 History**

The oldest dateable firearm in the Bavarian Army Museum is a deer-stalking rifle which belonged to Elector Palatine Ottheinrich, and bears an inscription marked with the year 1533. The wheel-lock was a technical innovation that made it possible for the first time to carry a loaded firearm without having to keep a smouldering slow-match ready. Since this technology was not invented until around 1500, this object represents one of the earliest surviving wheel-lock weapons ever.

The article describes the chequered history of the acquisition of the Pirschbüchse, which, among other things, had to be handed over to the newly founded German Hunting Museum in Munich in 1938, but could be exchanged back in 1951. In addition, the complex mechanism of the wheel-lock is explained with numerous detailed photographs of this unique weapon.



Tobias Schönauer
Inside a Jousting Helm
**An Arming Cap for a Frog-Mouthed
 Great Helm**

Particularly in the 15th and 16th centuries, jousting was a popular, albeit dangerous, sport. Under the helmet, special arming caps or cowls made of linen, wool and leather were worn to prevent serious injuries, of which only a few have survived. The specimen in the Bavarian Army Museum has been meticulously restored and decontaminated. With the help of schematic diagrams and contemporary illustrations, the author presents the object and explains how these cowls were used. Recent measurements have shown the forces that can act on the helmet and thus on the combatant in a joust.



Christopher Retsch

The Armoured Hose in the Bavarian Army Museum Hoses as Pieces of Armour in the Late Middle Ages and the Early Modern Times

The so-called armoured hose consist of two layers of linen fabric with metal plates sewn between them to provide simple protection. The knees, however, are protected by four strips of mail instead of metal plates. These hose are an absolute rarity, as this type of body armour is so far only known from another pair of hose, albeit short ones. Illustrations from the 14th and 15th centuries show that such types of armour existed not only for the legs, but certainly also for the arms. They could be used as sole protective element or in combination with other pieces of armour worn over these. The cut of the fabric on the bottom makes it possible to date the trousers from around 1490/1500 until well into the 16th century.

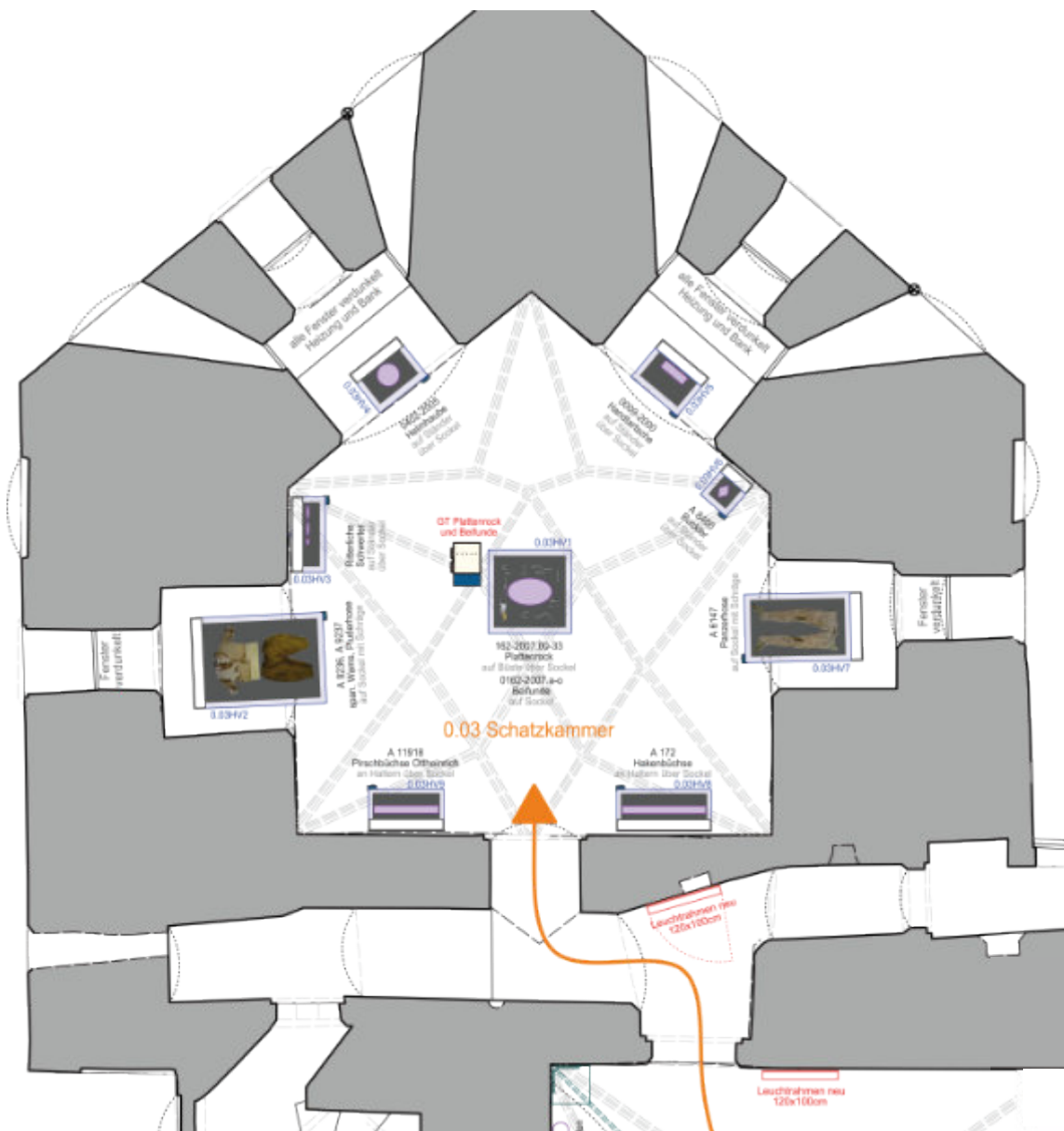


Johannes Pietsch

Frock and Slops of a Conquistador An Unusual Find from Peru

In 1932, the German archaeologist Heinrich Ubbelohde-Doering discovered two pieces of clothing made in the European fashion in an old burial ground in the northern coastal region of Peru and presented them to the Bavarian Army Museum. They comprise a shirt-like frock made of light cotton fabric and a pair of baggy breeches (slops) made of brown woollen cloth. The patterns and tailoring techniques of both garments correspond to those then used in Europe. Even the fabric of the trousers may have come from England. However, the outer fabric and lining used for the frock, as well as the sewing threads, were made in Peru. The frock and breeches can be dated to around 1560/1580 and represent unique evidence of the everyday clothing of Europeans in the New World.





Exhibition floor plan of the treasure chamber,
 5 October 2018
 (Ausstellungsbüro Janet Görner, Berlin)

Buckler

Das so genannte Buckler ist eine besondere Form des Schildes. Es handelt sich dabei um einen kleinen, kreisförmigen, mit einer dünnen, aber sehr flexiblen, aus Leder gefertigten Waffe, welche nicht als vollständige Ausrüstung zum Einsatz kam.

Es war vor allem in der römischen Armee im Einsatz. Es diente vor allem dazu, den Kopf vor Pfeilen und Speeren zu schützen. Die Größe ist auf das Gewicht zu berücksichtigen, da dies in einem Kampf entscheidend war. Die Größe des Bucklers war also ein wichtiger Faktor, um die eigene Sicherheit zu gewährleisten.

Das hier gezeigte Buckler wurde ursprünglich aus Holz gefertigt. Es hat eine runde Form und ist mit einem Leder überzogen. Die Größe ist auf das Gewicht zu berücksichtigen, da dies in einem Kampf entscheidend war. Die Größe des Bucklers war also ein wichtiger Faktor, um die eigene Sicherheit zu gewährleisten.

Buckler oder Buckler sind kleine, runde, kreisförmige Schilder, die aus Holz oder Leder gefertigt wurden. Sie sind im Mittelalter im Einsatz gewesen. Sie wurden vor allem zur Abwehr von Pfeilen und Speeren verwendet.

Dackler

Das Dackler wurde vor allem in der römischen Armee im Einsatz. Es diente vor allem dazu, den Kopf vor Pfeilen und Speeren zu schützen. Die Größe ist auf das Gewicht zu berücksichtigen, da dies in einem Kampf entscheidend war. Die Größe des Dacklers war also ein wichtiger Faktor, um die eigene Sicherheit zu gewährleisten.

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Illustration des Bucklers aus dem 16. Jahrhundert. Die Größe ist auf das Gewicht zu berücksichtigen, da dies in einem Kampf entscheidend war. Die Größe des Bucklers war also ein wichtiger Faktor, um die eigene Sicherheit zu gewährleisten.



Ansgar Reiß

Museum History, Object History, History of Europe

The Treasure Chamber as a Laboratory of Museum Work

It is a truism that the meaning of things is not static, but changes over time and fluctuates depending on the perspective from which they are viewed. Things find new uses and fulfil different functions, while at the same time there is often no consensus even in naming them. Especially objects that have been around for a long time or that are found along the boundaries of cultures, often are in danger of almost slipping away from us when we turn them this way and that, look at them more closely, try to describe and name them. A museum is a place that is specifically created for contemplating things. These are moved out of “real life” and into a new, artificial space. Paradoxically, the very effort to be clear about the objects - an effort shared by curators and visitors alike - often reveals a bewildering number of layers of meaning. To gain clarity, things in the museum are singled out, usually isolated, highlighted as exhibits and placed in the right light. Ideally, they can be viewed from all sides. This dream seems to come true in the 3-D scan and it almost seems as if this would replace the built space of the “white cube” today: The object on its own in the void. But this is of course a dead end, because the more a thing is detached from all con-

texts, the greater the need for explanations. And thus, museums are never just neutral spaces of contemplation, as they assign a place to things at least as much as they create an order. That is why a museum is never just an institution or a working context, but also in most cases an – often very striking – architecture that creates the space for this order (Fig. 2).

In a museum, therefore, there are always at least two conflicting tendencies: On the one hand, it invites the visitor to a thorough contemplation in which the meanings and contexts of the objects tend to become more and more diverse, while they are stripped of their distinct practical value, their monetary value seems to be put on hold and even their ideological value cannot assert itself unbrokenly. On the other hand, the museum assigns a specific place to things. This is not their place in “real life”, but a place in the artificial architecture of the museum, wherein architecture must be understood both literally and metaphorically. For all the esteem in which things are held in a museum, they are immobilised and given an imaginary meaning in a space of rest, contemplation, perhaps learning or imagination (Fig. 3).

In 2019, several objects selected by curator Tobias Schönauer from the collection of the Bavarian Army Museum were gathered in an exhibition space that we have called the Treasure Chamber (Schatzkammer). Illu-

Fig. 1 Display case with the buckler from Ambras Castle, end of the 15th century (Bavarian Army Museum, inv. no. A 8460)

minated in their individual display cases, the objects stand out in the darkness of the room. It was and is an attempt to turn necessity into a virtue. The museum's older collections had been cleared away in 2014, and a completely redesigned display is only gradually taking shape in several steps.¹ At the same time, some special specimens of the collection should reappear as soon as possible. At first, therefore, these were simply finds resulting from curatorial activity. But what has emerged was a kind of museum within the museum, a laboratory of museum work (Fig. 4).

Thanks to the meticulous research on the objects that can be published in this catalogue, the Treasure Chamber opens up a whole range of visual fields, similar to a complex optical instrument. Firstly, there is an insight into the depths of the history of our own institution, i.e. the Army Museum, its partners and its predecessors (collection history); secondly, variants of possible and conceivable histories of individual objects in the collection become visible as in a prism (object history); and thirdly, spotlights fall on cornerstones and imagery of the old Europe, which at the

same time open up a field within which the entire exhibition will unfold (historical significance). This book is thus, beyond the integration of many individual questions, also a plea to consider museum objects per the complexity of these three dimensions.

Museum History

Firstly, looking at the history of the collections and the museum, we find that new work bases have been created for the Bavarian Army Museum in recent years. The inventories, historical finding aids and scientific card indexes have been recorded for the first time, as have the object-related documents, and many of them have been digitised (HA inventory numbers). As a result, many documents that were previously very difficult to use are now directly accessible; if known at all, their context was in many cases often not apparent. This process is by no means complete, and in addition, certain projects relating to specific ensembles are in progress, for example the one on the Ottoman tents. In a further step, this indexing of our own records must be linked with the finding aids of institutions



Fig. 2
A recess in the pentagonal tower, where the Treasure Chamber now resides, before the exhibition was set up, 2018



Fig. 3 Entrance to the Treasure Chamber

with which the history of our museum and its collections is closely interwoven, in particular the Bavarian National Museum, but also the Museum Fünf Kontinente (until 2014: Bavarian State Museum of Ethnology), the Bavarian Palace Department and others. In addition, the files of the former Ministry of War and, from 1919, of the Ministry of Culture relating to the Army Museum are also awaiting sifting.

It quickly becomes apparent that all these documents only make sense if viewed in the context of a history of the museums and their collection exhibitions that is oriented towards parameters, intentions and concepts. To give just one example, it must be assumed that pieces that came to the Army Museum between 1881 and 1904 entered the exhibition rooms immediately. Accordingly, new acquisitions were always associated with changes in the exhibition. The exhibitions displayed since 1880/81 in the Arsenal building in Lothstraße in Munich and from 1905 in the newly constructed building at Hofgarten are comparatively

well documented by printed guides and photo folders – the guides are all available today on the museum’s homepage. Thus, it is relatively easy to see that the arquebus / “handgonne” (see contribution by Geibig), which was added to the collection in 1904, was displayed in Room I from 1905 onwards.² Incidentally, among the objects on display in the Treasure Chamber none entered the museum’s collections earlier than said arquebus (Fig. 5).

Unfortunately, there were no regularly revised printed museum guides for the period between the new arrangement in the same building in 1921/22 and the evacuation in 1942/43 due to the war, even though the new curator of the older department and later museum director Hans Stöcklein (1874-1936) pursued this new arrangement most ambitiously. He was able to secure some additional rooms and sought to “abandon the outdated system of trophies and create a modern scientific and yet popularly instructive arrangement”.³ By using bold room colours and signs created



Fig. 4 Frock and trousers of a conquistador (third quarter of the 16th century) in their current presentation

and executed by the graphic artist Magdalena Koll (1897-1962), the museum strived to become more attractive.⁴ During this time, some important pieces from the small sample of objects in the Treasure Chamber were added to the collection. Ottheinrich's deer-stalking rifle (see contribution by Schönauer/Storz) was acquired in 1928; apparently the Bavarian Prime Minister of the time, Heinrich Held (1868-1938), was directly approached for support.⁵ The three swords (see contribution by Geibig) all entered the museum's collection in different ways during this period: one was sent from the Bavarian National Museum, one was bought in the art trade, and one was donated to the museum by the then Association of Friends of the Bavarian Army Museum (certainly after being acquired in the art trade beforehand); but only the sword from the National Museum can currently be confirmed as having been on display. Finally, the buckler (see contribution by Schönauer) and the armoured hose (see contribution by Retsch) also made their way to the Army Museum as

transfers from the National Museum, while the garments of the Conquistador (see contribution by Pietsch), which are immensely valuable from today's point of view, came from an excavation of the Museum of Ethnology, but were apparently given directly to the Army Museum. They did not make it into the exhibition, though (Fig. 4, 6 & 7).

And this brings us to a point that I would like to emphasise here: ever since the founding of the Bavarian state museums until well into the 1930s, and perhaps even during the (re)separation of the holdings of the Army Museum from the collections of the National Museum in the 1960s, existing objects were repeatedly assigned to other collections. Behind this were factual considerations, which in turn depended on conceptual decisions. In this way, a large number of arms from the National Museum were transferred to the Army Museum, but apparently, the garments of a European soldier in South America were also deemed more suitable for the Army Museum than for the Museum of Ethnology. But to what extent the Army Museum's exhibition concepts acted as pull factors, which is obvious, is still only partially understood. The activities of the aforementioned curator Hans Stöcklein in particular require a more detailed and coherent investigation. With regard to other collections that were not owned by the Bavarian state, similar transfers of objects took place in the form of exchanges. Thus, to cite an example from the Treasure Chamber again, the above-mentioned arquebus came to the Army Museum in 1904 through an exchange with the town of Schrobenhausen. The motive for these exchanges, which were very diversified, especially around 1900, is that the museums were each trying to secure a certain canon of objects. In the case of the arquebus for example, it was the distinctive, shortened butt shape that made it so interesting for the weapons collection of the Army Mu-

seum. Issues such as these will have to be researched further as well. But let us return from these general considerations to the Treasure Chamber. In previous presentations at the Army Museum, no such place existed. The idea of a treasure chamber actually contradicts, in a way, the idea of a military museum. In the latter, the focus is on the (mass) army, the soldiers, the simple weapons in actual use and the violence organised militarily. This idea is reflected in a new format in the large exhibition area “Forms of War 1600-1815”, which opened at the same time as the Treasure Chamber and will be discussed briefly below.

During the monarchy, the focus was initially on a simple presentation of the Royal Bavarian Army and its history and origins, combined with relics from the various regiments and, in addition to arms, above all flags and standards. In the 1920s and 1930s, there were indications of a shift to a more historical museum of Bavarian war history, of course with contemporary accents, which for the “Old Department” focused on the Hussite Wars or the Peasants’ War, for example (Fig. 8). The 1972 presentation in the New Castle in Ingolstadt was characterised by its extreme restraint regarding all staging. The display of the objects followed primarily morphological criteria. The visitors were assumed to have knowledge of historical contexts; they could at best be guessed at from spatial relationships, and there were hardly any descriptions (Figs. 9 & 10). All that remained of the maintenance of the army’s traditions was the erratic and utterly out-of-touch “Colours Hall”, which featured the flags of the Bavarian regiments of the First World War. Opened along with the museum in Ingolstadt in the year of the 1972 Olympics, it once again resurrected the idea of a hall of honour for the army, as it still exists today in the Museum of Military History in Vienna or, for example, in the Central Armed Forces Museum in Moscow.

Today, the Bavarian Army Museum is trying to set other accents. Neither the flags of the regiments nor the relics of great commanders – of whom the Bavarian army did not have so many anyway – were to take centre stage, nor was it at all about presenting captured trophies as symbols of military victories, as was still commonplace in 1881 and 1905.

On the one hand, there is the new permanent exhibition “Forms of War”, focusing on the use of violence in warfare. While it is not easy to point to this, the emphasis here is on the simple soldier and the anonymous arsenal piece. But the museum’s collections also contain a remarkable number of very rare and unusual objects.⁶ Therefore, on the other hand, the “Treasure Chamber” was created. The underlying considerations are quite simple, namely to gather in it such pieces that are valuable due to their sheer rarity: The Hirschstein

Fig. 5 Room I displaying the arquebuses in the building at the Munich Hofgarten





Fig. 6 Display case with medieval swords and helmets in the 1920s exhibition. The 15th sword from the left is A 3621 (see contribution by Geibig) – still unbroken at that time.. (Bavarian Army Museum, inv. no. GP.XII.871)

Armour (see contribution by Schönauer), the frock and trousers of a conquistador from Peru (see contribution by Pietsch), the arming cap (see contribution by Schönauer), the armoured hose (see contribution by Retsch) – unique objects that are at the same time somewhat exotic in the museum's collections and therefore difficult to contextualise, as the Bavarian Army Museum has neither a significant collection on jousting, to which the arming cap (see contribution by Schönauer) belongs, nor, for example, on the Spanish conquest of South America. Then there are those exhibits that could or should be singled out for their simple typology and at the same time perhaps for a special feature: The arquebus with the crack in the chamber (see contribution by Geibig), the pavise with the coat of arms of Munich (see contribution by

Schönauer), Ottheinrich's deer-stalking rifle with one of the oldest wheel-locks (see contribution by Storz/Schönauer), the buckler from Ambras Castle (see contribution by Schönauer) and specially selected medieval swords (see contribution by Geibig). And finally, some pieces are on display that – always particularly electrifying for us museum folks – were almost or completely unknown until now (the arming cap, the garments from Peru, the armoured hose).

The compilation of artefacts, which at first glance seems almost random, is therefore based on certain criteria. And it is a great gain in terms of content that some of the main elements of early modern European warfare can be shown without referring their context in the exhibition from the element of sovereignty and the symbolic legitimisation of specifically monarchical rule – which usually characterises “genuine” Treasure Chambers in princely collections. But a few more key points on this in the third section.



Fig. 7 Fritz Quidenus: "A look into the newly arranged rooms of the Army Museum" in 1924

Object History

Secondly, let us turn to the object histories. These are at times almost inseparable from the history of museums and collections, but of course have much earlier beginnings outside this space. It is important to emphasise that these stories form a rich kaleidoscope. The lesson to be learned from this is that the histories of museum artefacts in general should be considered on a rather individual basis. Thus, the arquebus seems to have a fairly straightforward provenance from Schrobenhausen; yet simultaneously its individual history, the assumed serious mishap and the question of why the destroyed gun was kept in the first place, remain in the dark. The pavise with the "Münchner Kindl" (the Munich child is the coat of arms of Munich), on the other hand, can finally be dated and identified as an item once procured for the Munich Armoury, but its subsequent ow-

nership history remains obscure, despite the limelight of an unsuccessful auction in 1940.

The deer-stalking rifle of Duke Ottheinrich, on the other hand, seems at first glance to have an old Bavarian or Wittelsbach provenance. Surely this one, at least, is an old Bavarian state treasure? Far from it, here too we discover some remarkable detours. Although the rifle can be identified in old Neuburg inventories, it vanished from the scene during the Napoleonic Wars and only surfaced again in 1912 at an auction in Vienna; as mentioned above, it was only acquired in 1928. But this is not where the story ends, because in 1938 the deer-stalking rifle had to be handed over to the newly opened Hunting Museum, and finally returned in 1951 through an exchange. Mind you, this was at a time when the collections of the Army Museum, officially dissolved after the war, were housed at the Bavarian National Museum and a reopening as an independent institution was anything but certain. The buckler, which has now been identified as a former piece of the collection of Ambras Castle near Innsbruck in Tyrol (where it was only recorded about a hundred years after it was made), was in all likelihood "obtained" by the Bavarians as spoils of war during the Napoleonic period. With regard to the armoured hose and the arming cap, it is particularly unfortunate that their provenances cannot be traced back further, all the more so since the hose appear to have always been kept above ground and carefully stored. The arming cap, on the other hand, could be considered to be a quasi-archaeological artefact. Judging from its soiling and its very pungent smell before appropriate treatment, chickens must have been kept in the room in whose dead floor it was allegedly discovered. Attributing it to a specific jousting helm or even to its wearer, however, is quite impossible. The origins of the swords likewise

remain vague – apart from the fact that they are river finds from the Danube, we know little about them. They are evidence that the interest of curators in precise provenances is a recent thing. All the more exciting, then, is the rather precise localisation of the context in which the Hirschstein Armour as well as the conquistador's garments were found. Both can therefore be attributed to fairly concrete historical circumstances or structures, as detailed in the corresponding contributions in this volume.

Looking at the object histories, these are by no means merely the ownership histories. As the Treasure Chamber is not a "seigniorial" one, there is no such focus on the part of the museum. Due to the – in many respects – delayed reappraisal of the art plunder by and under the Nazi regime, today's general awareness often focuses on ownership. This historical injustice will probably not come to the fore in the Treas-

ure Chamber of the Army Museum, unless new documents can be found about the unsuccessful auction of the pavise and about its former owner(s). This contemporary interest in provenance research, however, opens the window to the contexts of origin of the objects and to other sources of their history and interpretation. The provenance of the buckler in the context of the Napoleonic Wars is undoubtedly a matter for research and museum presentation today, just as the circumstances of the excavations in Peru would have to be investigated from the ethnological side today. In addition to the archaeological circumstances of the finds already mentioned, the results of restorative revisions and examinations are of particular importance. It is remarkable, for example, how the removal of an overpainting on the coat of arms of the pavise turned a round-headed Munich "Kindl" back into a monk. The importance of material analyses is particularly evident in the textile objects; the results for the original context of the frock and the slops from Peru are especially impressive, but so, of course, is the meticulous study of the armoured hose's cut and construction. The various stages of the reconstruction of the Hirschstein Armour, on the other hand, show that some discussion cannot be simply ended, but rather must be continued. Regarding this armour in particular, literary and pictorial sources also play an immensely important role, and we witness here, in a methodically difficult field, how a close look and the compilation of related sources initially creates unambiguity, but occasionally also undoes it. Correlations are identified, new questions arise.

And finally, experimentation and reconstruction should be emphasised as further elements for gaining insights. This is particularly evident in the "MOT testing" of jousting armour and helmets, but also, for example, in the handling of swords. A re-

Fig. 8 Fritz Quidenus: "Arms of the citizens and peasants: Poleaxes 1462" in 1924





Fig. 9 The former room 6: The Matchlock, in 2013

construction of the Hirschstein Armour is still pending, but perhaps there are too many unknown parameters for such an undertaking, who knows?

Meanings

And thirdly, if we are to speak of the historical significance of the artefacts in the Treasure Chamber, we can of course only touch on this subject here. The significance of the individual items and their respective object histories are the subject matter of individual studies. The Treasure Chamber is not a thematic room, but a kind of nucleus of the museum, a place for reflection. Basically, it is an answer to the question: why have a museum in the first place? And this is precisely what the obliquely used term “treasure chamber” should signal. In fact, it is not a chamber with a consistent collection history or a consistent representative meaning. Rather, it is an open, heterogeneous reservoir of things and their meanings, with the lines going in many different directions.

An indication of “significance” could be the use of the objects in major exhibitions. However, there is no proper “travelling trophy” amongst them, which is also due to the relatively low profile of the “treasures” of the Army Museum. Just one of the artefacts (one of the three swords) was displayed in the major exhibition “Wittelsbach and Bavaria” in 1980, which was epochal for the Bavarian collections. The buckler, already exhibited in the “königliche vereinigte Sammlungen” (Royal united collections) in the middle of the 19th century, did not attract any attention outside specialist circles. It is astonishing that the deer-stalking rifle was apparently never loaned out either, whereas the Munich pavise has been on display in various exhibitions since its acquisition. The Hirschstein Armour, purchased in 2007, was first shown in a state exhibition in 2008; the state exhibition in Regensburg in 2014 led to a first reconstruction. The significant textile objects were unknown, the arming cap and the armoured hose have not been published in any form until today, and the garment of the conquistador was only published in a single obscure

article in the mid-1930s in the form of a finds report.

So there is a lot to discover. A few keywords may suffice here: The Hirschstein Armour is the missing link between the mail hauberk and the plate armour; it might be regarded as the earliest “knight” wearing a suit of armour according to the European pictorial tradition. The swords likewise are, in a sense, the originals to an imagery which is as vibrant in today’s computer games as it has ever been. The warrior’s image is made complete by the shields. The arquebus fits into the similarly vivid narrative of castles and walled towns (after all, the New Castle, where the Treasure Chamber is located, still shows some

features of a castle), while the arming cap speaks of the knightly jousts. Through the jousting and the hunting rifle, but also through the buckler, it becomes clear how much warfare was embedded in the non-military culture for which competition, arms and combat were nevertheless of central importance. Finally, the conquistador transcends the Central European framework. Early modern Europe also lived and thought in a global horizon, often marked by violence, conquest and exploitation. So if we consider the historical significance of the objects in our Treasure Chamber, it resides in a certain view of the history of Europe.

Fig. 10 The former room 7: The Wheel-lock, in 2013; Ottheinrich’s deer-stalking rifle can be seen on the far left.



Footnotes

- 1 On the development of the museum as a whole in recent years cf. Reiß, Jahresbericht 2015-2019. On the concept of the exhibition cf. Hohrath and Schönauer, *An Exhibition...* and Schönauer, *Schatzkammer und Inszenierung*.
- 2 Fahrnbacher, *Führer*, p. 37 ("158-160 rohgeschäftete Hakenbüchsen aus Schrobenhäusen"). Idem, *Das K. B. Armee-Museum*, p. 39 f. with illustration. Only "relatively" easy, because the printed guides do not give inventory numbers.
- 3 Thus he writes in Stöcklein, *Sammlungen* p. 685 ("das veraltete System der Trophäen verlassen und eine moderne wissenschaftliche und zugleich volkstümlich belehrende Anordnung").
- 4 Cf. Freksa, *Armeemuseum*, p. 416 f.
- 5 Stöcklein, *Neuerwerbungen*, p. 604.
- 6 Cf. for the old collection e.g. the selection in Paggiarino and Schönauer, *The Bavarian Army Museum*.

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Kerstin Merkel

Sewn and Forged

Fashion Transfer and the Social Ideal in the 14th Century Using the Example of Rudolf IV, Archduke of Austria, and Catherine of Bohemia

Armour and clothing of the 14th century followed contemporary fashion and influenced one another.¹ Fashion, however, is not only a change with regard to forms, but also an expression of political and historical backgrounds and social history. Through one's clothing, one visibly fits into a social group that follows the same dress code. This also means approximating social ideals and role models in terms of fashion. So, what is the significance of the correspondence between the forms of clothing and armour that can be observed from around 1350 to the end of the century, especially the adoption of armour elements in women's clothing? Around the time of the Hirschstein Armour's creation in the middle of the 14th century (cf. Schönauer's contribution on the Hirschstein Armour in this volume), an extremely slender body ideal developed. Tight-fitting armour and clothing elongated the upper body and accentuated the waist. Belts were worn low on the hips² and slender legs were elongated visually by pointed shoes. There were various constructive solutions for the construction of armour, which shall not be discussed in detail here, but rather the reader is referred to the essays by Tobias Schönauer and Fabian

Brenker in the present volume. There was a fluid transition between armour and clothing. Several original quilted jackets have survived, of which some can be shown to have been worn in battle.³

Terminology is an unsolved problem because written and pictorial sources rarely coincide. This essay uses the modern German term "Jacke" (jacket), which is derived from the medieval word "Schecke/Jaque", purely descriptively. The garment has a figure-hugging cut as its characteristic feature, usually in combination with a front button placket. In contemporary literature one also finds the terms "Gambaisson", "Lendner", "Pourpoint" and "Sarrock" in various spellings, whereby the terms were used differently locally. [Translator's note: As the section above depicts the situation in the German-speaking world, most of the original German expressions were left untranslated. In the English translation, the term "pourpoint-like top" will be used instead of "Jacke".] This fashion was made particularly popular by Duke Rudolf IV of Austria (1339-1365), and his wife Catherine of Bohemia of the House of Luxembourg (1342-1395), who were married in 1357 aged 17 and 15.⁴ Although Rudolf died when he was only 26, he achieved and set in motion an astonishing amount in just a few young years, from his achievements in building St. Stephen's Cathedral in Vien-

Fig. 1 Catherine of Bohemia, jamb statue on the Singer Gate of St. Stephen's Cathedral in Vienna



Fig. 2 (top) Tomb effigies of Rudolf IV, Duke of Austria († 1365), and Catherine of Luxembourg († 1395), c. 1360 (Vienna, St. Stephen's Cathedral)

Figs. 3 and 4 (bottom right and left) Details of the tomb effigies of Rudolf IV, Duke of Austria († 1365), and Catherine of Luxembourg († 1395), c. 1360 (Vienna, St. Stephen's Cathedral)

na to founding the University of Vienna. The marriage to the emperor's daughter had him hoping for a rise in power. That is why in art Catherine enjoys a place of equal rank with him, pointing to the political power relevance of her origins. In the four sculptural portraits of the couple at and in the "Stephansdom", the two are strikingly matched in form, posture and dress.

The couple is immortalised in prominent positions: Inside the cathedral lying on their cenotaph (Figs. 2-4), on the western façade in the niches⁵ (Figs. 5-8), and flanking the portals of the Singer and Bishop's Gates (Figs. 1 and 9-11).⁶

Probably the oldest of the four pairs of sculptures is the one on the empty cenotaph (Figs. 2-4). Originally, it was placed prominently in the middle of the principal choir in front of the entrance to the family tomb, which Rudolf had had built in 1362. Even then – at the age of only 23 – he meticulously arranged all the details regarding his remembrance, from the hymns to the number of candles. It was also at this time that he commissioned his cenotaph, so we can assume that the appearance of the ruling couple is reasonably authentic. The couple did not aim for an absolute portrait likeness, but had themselves depicted as they wished to be seen. These sculptures

mark the beginning of an image campaign in which Catherine certainly played an active role. Her aesthetic education at the imperial court in Prague, her political education and her diplomatic skills provided a good basis for this.

The two are not shown lying on the tomb as corpses, but as a dynamic couple with their eyes open (Fig. 2). The discrepancy between lying and standing is particularly striking in this sculpture. Rudolf actually “stands” with an engaged and a free leg, Catherine is slightly turned towards him, both “stand” on lions, both once had their forearms raised freely and at the same time had their heads resting on comfortable pillows. The similarity of the garments is striking: both emphasise the long upper body with extremely tight clothing, which in both cases is noticeably curved in the

chest area (Fig. 2). In Rudolf’s case, the lames under the pourpoint-like top stand out at the waist; in Catherine’s case, the tight fit causes cross folds to form. Both are wearing a wide-open mantle fastened with circular brooches to reveal their bodies. Most striking are the identical belts made of heavy rectangular sections, so-called plaque belts, and a central round clasp adorned with a flower (Fig. 4). The belt sections on both are decorated with scrollwork, which is also seen in the central decorative trim on Catherine’s outerwear. The red marble⁷ figures may once have been far more splendid in appearance. Numerous empty depressions point to rich inlay work in the form of precious stones or enamel. The scrolls in the belts are likely to have been painted or inscribed with mottoes. The clothing does not

Figs. 5 and 6 Rudolf IV on the western façade of St. Stephen’s Cathedral, about 1360 (Wien Museum)





Figs. 7 and 8 Catherine of Bohemia on the western façade of St. Stephen's Cathedral, about 1360, (Wien Museum)

contain any emblematic indications as to family origin. It is possible, though, that coats of arms might have been depicted in a coloured version that has since disappeared. As an Austrian duke, Rudolf would have been entitled to the fur-trimmed ducal hat, but here he is shown wearing instead the 12-piece archducal crown he invented with points along the base and an arc with a cross on top – an allusion to the imperial crown – by which he wanted to document his royal claim. Allegedly, the privilege to wear the “gezinnete Kranz” (crenellated wreath) on his ducal hat had been conceded to the Duchy of Austria by Emperor Frederick Barbarossa. Rudolf was referring to the “Privilegium maius” (Major Privilege), a forgery commissioned by him in 1358/59, in which the

privileges of the Duchy of Austria were made manifest, including symbols of power such as the crown above the hat.

Catherine also wears a crown over her veil. This so-called “Kruseler” (frilled veil) consists of an abundance of ruffles framing her face like a white textile garland. A second ruffled garland billows around the shoulders, which are exposed thanks to the very deep décolleté. Rudolf's armour represents a considerable change in the image of a knight compared to that of previous generations. When compared with the massive Saint Maurice in Magdeburg (Fig. 3 in Brenker's contribution in this volume) or the well proportioned Naumburg donors, he seems slender to the point of fragility, with a feminine waist and a protruding chest area almost resem-



Fig. 9 Catherine of Bohemia, jamb statue on the Bishop's Gate of St. Stephen's Cathedral in Vienna

bling female breasts, a shortened pour-point-like top above graceful long legs, elegantly prancing – martial this is not, but rather androgynous from today's point of view. The appearance of the couple is matched in both physicality and clothing. And just as the husband is feminised, the wife is invested with a masculine power potential with the references to armour and belt.

Chronologically, the tomb effigy may have been the first one, possibly also contemporary with the one on the western façade (Figs. 5-8, today Wien Museum), which may have been created by the same sculptor. The two groupings in the portals were

executed somewhat later. Clothing, crown, physiognomy, hairstyle and body image are very similar at first glance (Fig. 1 and 9-11). The most spectacular manifestation of the couple's overly slender bodies can be seen in the sculptures on the western façade. Rudolf balances light-footedly, with flexing knees on a sleeping lion, his mantle puffed up by the wind (Fig. 5-6). The body is completely detached from the mantle, so that the extremely slender silhouette can also be admired in profile. In

Fig. 10 Rudolf IV, jamb statue on the Bishop's Gate of St. Stephen's Cathedral in Vienna





Fig. 11 Rudolf IV, jamb statue on the Singer Gate of St. Stephen's Cathedral in Vienna

profile, his body forms a 'C', and frontally an 'S'. Although the front is heavily weathered, the ring structure of the lames can be made out, probably covered by textile or leather. The arming chains so typical of a coat of plates can still be guessed at. The heavy plaque belt of hinged links is worn low on the hip. On the arm, where the sculpture is less weathered, the structure of the mail hauberk is carved out in detail.

Like her spouse, Catherine is completely detached from the background (Figs. 7-8). Her upper body is tightly enclosed by the robe, which emphasises the very slender and youthful figure. The decorative elements show a lion rampant on the right mantle brooch, and the Austrian coat of arms on the central decorative brooch and the belt clasp. The head of a crowned king

is still visible on the right side of the belt. Catherine is depicted spreading her arms so that her mantle billows out and opens behind her.⁸ She thus presents herself in the role of the "Virgin of Mercy" under whose mantle her subjects can symbolically seek protection. The slimming of bodies and figure-hugging clothing among men and women had its beginnings during the first half of the 14th century. The illustrations from the Poem of Praise for King Robert of Anjou are a particularly fine example for this, because this work can be dated relatively precisely to around 1340.⁹ The Virtues all wear close-fitting tops that model the body by means of button plackets or lacing. In men's fashion, low-slung but still quite narrow belts appear from the middle of the 14th century, as in the case of the minstrel in the "Liber Viaticus" (Bohemia c. 1350, no later than 1364). The miniatures provide a clear view of the fashion of Bohemia, i.e. of Catherine's native country.

The belts worn at waist level with the armour had developed from the sword-belt, but at first they were still made of leather and held in shape by so-called belt-stiffeners. These can be found already on the Naumburg donor portraits, for example on Ekkehard (Fig. 12 and Fig. 18 in Geibig's contribution on swords in this volume). Even after 1350, the first low-slung sword-belt were also made of leather with metal stiffeners, as in the case of Bolesław III, Duke of Legnica, Brzeg and Wrocław

Fig. 12 Leather belt of Ekkehard with metal belt stiffeners, mid-13th century, Naumburg Cathedral



(tomb in the “Muzeum Norodowe we Wroclawi” in Wroclaw). The massive belts made of heavy three-dimensional decorative plates connected with hinges only appear in the course of the late 1350s. In fact, the belts of Rudolf and Catherine are at the very beginning of this fashion trend. The two can be considered to be the protagonists in whom the sword-belt as the symbol of the knight is brought to a completely new, explicitly visible design; the belt as a sign of status becomes an eye-catcher. Even more spectacular, however, is the fact that Catherine also wears such a belt and thus appears as a knight just like her husband, especially in combination with the tight pourpoint-like top upper garment.

The two pairs of sculptures in the Singer and Bishop’s Gates appear much more down-to-earth (Fig. 1 and 9-11). The clothing on all four Rudolf sculptures in St. Stephen’s Cathedral is almost identical, apart from a few minor details. In the case of Catherine, on the other hand, some striking differences can be observed. The vestimentary basis of the two portal sculptures (Fig. 1 and 9) is the same: A long pourpoint-like top with a low-set skirt, a low neckline, a decorative trim running the length of the front, a wide-brimmed mantle and a crowned “Kruseler”.

The differences lie rather in the decorative details. The front trim of Catherine’s clothing on the Singer Gate is excellently preserved thanks to its protected location (Fig. 1), with the coats of arms on it meticulously worked out, which seem to imitate beadwork. They are arranged hierarchically from top to bottom: on the upper part of the body those of Catherine’s parents and on the skirt part those of Rudolf’s parents. The eagle representing the Empire is therefore at the very top, followed by the Bohemian lion (both for Charles IV, Catherine’s father), and underneath the French lilies (for Blanche de Valois, Catherine’s



Fig. 13 Amazon Queen, detail from: Giovanni Boccaccio’s “Cleres femmes”, 1403 (Bibliothèque nationale de France, fr. 12420, fol. 46r)

mother and sister of the King of France). Next, Catherine’s belt plates all feature the Austrian “Bindenschild” (the Austrian red-white-red arms, in heraldic terms: “gules a fess argent”). Below the belt there are the Styrian panther, the coat of arms of Carinthia with three lions, as well as that of the Windic March with the Slovene hat (all three for Albrecht II, Rudolf IV’s father) and finally the two fish of the coat of arms for the County of Pfirt (Johanna von Pfirt was Rudolf’s mother). The dress becomes genealogical evidence and proof of the couple’s claim to power.

The Austrian coat of arms can also be found on both brooches of the mantle and on all belt plates. On the belt clasp, Rudolf’s helm is depicted with crown and plume adornment. The significance of this iconography as a possessive message from the husband becomes clear when we consider the enormous symbolic importance of the belt in the relationship between couples in the Middle Ages.¹⁰

On the sculpture on the Bishop’s Gate (Fig. 9), the reference to Catherine’s family



Fig. 14 Hysicrate, detail from: Giovanni Boccaccio's "Cleres femmes", 1403 (Bibliothèque nationale de France, fr. 12420, fol. 117r)



Fig. 15 Lady and knight, detail from: Rudolf von Ems, "Weltchronik in Versen", c. 1370 (Bavarian State Library, Cgm 5, fol. 66r)

no longer features. The coat of arms of Austria re-appears on the mantle brooches. The upper part of her robe only shows a Habsburg eagle staggered three high. The lower-most one is almost completely obscured behind the wide belt. The pattern repeat of the fabric is reminiscent of heraldic fabrics with eagle trim woven especially for the Habsburgs.¹¹ The predominance of Habsburg emblems looks like symbols of ownership on the body of the emperor's daughter, appropriated by the Habsburgs like an attribute of power. The question must be asked whether the commissions were not awarded posthumously, for the self-confident Catherine of Luxembourg is unlikely to have seen herself in such an attributive role.

If one considers the entire message to be found in the vestimental staging of the emperor's daughter, it combines three components:

1. pourpoint-like top and hinged belt as the signs of a knight

2. the outspread mantle stands for the female patron saint of the city or even of the country
3. an erotic component.

A woman as a knight, equipped with all the signs of power – a scandal? Not at all, for fighting and armed women can certainly be found in contemporary art. Fortitudo, the virtue of strength in the Viennese manuscript of the Poem of Praise for Robert of Anjou, provides a particularly good comparison.¹² She appears in full armour with mail shirt, armguards and greaves; her long torso is accentuated by a jupon of a pink fabric with scattered blue flowers, tightly laced at the front with a red strap. Frowning angrily under her crown, she smites a pitifully small lion. Created around 1340, she does not yet wear a plaque belt.

The Amazons always appear in armour, often in daring combination with contemporary female dress. Even after 1400, when it had long since gone out of fashion, illumi-



Fig. 16 Tomb slab of Reimar and Tcilia (Tcisia?) Barnekow, 1353, in the church of Rühn Monastery (Rostock district)

nations still show them wearing the hip belt as a martial symbol, such as the horsewoman riding into battle with bow and arrow and a plaque belt with a sword (Fig. 13). She does not, however, dispense with the still fashionable “Kruseler”. A hip belt is also found on Queen Hypsicrate, here though in a fluffy white configuration that is less reminiscent of jewellery than of fur (Fig. 14). Apparently, the hip belt had become imprinted in the collective fashion memory as a typical dress element of fighting women.¹³

Fighting women in the Middle Ages have been a neglected topic in research up until recently – apart from Joan of Arc, none have been well remembered. By now, however, archaeological evidence¹⁴ and his-

torical research have proven that the role of women as fighters has been underestimated.¹⁵

The erotic connotation of combative, armed and dangerous women becomes clear in an initial created during the lifetime of Catherine of Luxembourg, who dressed very similarly. A willowy lady with a “Kruseler” and hip belt plunges Cupid’s arrow into the heart of a knight, who wears it as a helmet crest. Clad from head to toe in metal, wearing a pink jupon, he seems to go down on one knee before his lady (Fig. 15). Female eroticism is thus being defined as a form of power over the man. By adopting the belt as an element of armour, the woman becomes a dual danger for the man, which he, however, gladly accepts in the spirit of courtly love.

A fighting woman or a woman in armour was not perceived as normal at that time. She overstepped the boundaries between the masculine and feminine worlds. Countless miniatures in book illuminations meticulously depict the intrusion of women into the world of battle and wars that was the preserve of men. “Female knights” were evidently a source of fascination that was allowed to unfold in the fictional world. These colourful heroines, who were also depicted in a highly feminine way, were marvelled at and admired. Perhaps they even served as role models for their female recipients. The low-worn plaque belt is found on women until about 1390/1400, and is occasionally seen on tomb monuments such as that of Elisabeth and Ulrich Schenk von Erbach in Steinbach.¹⁶ The youthful siblings are dressed in a decidedly fashionable manner. The gravestone was made in 1369, which means that the current fashion must have quickly spread beyond the region. In 1380, Tcilia (or Tcisia), wife of the knight Reimar Barnekow, is shown with a tightly buttoned pourpoint-like top and a massive plaque belt in the couple’s joint tomb slab



Fig. 17 Donor couple, choir window of the church of Viktring Abbey (Carinthia), c. 1390/1400

in Rühn Monastery (Fig. 16).¹⁷ Margarethe Moltke, who died in 1391, is dressed in the same way in her tomb slab in Doberan Minster.

The donor couple in the magnificent stained glass windows in the choir of the church of the former Viktring Abbey (Carinthia) from around 1390/1400 each wears a plaque belt (Fig. 17). The wife with “Kruseler” and ermine cloak is very reminiscent of the overall appearance of Catherine, who must still have been considered a fashion model in Austria up to this time. The low-worn plaque belt, though, evidently had a negative image from about 1400 onwards. In the painter’s instruction for illuminations of a Sallust edition, the author Jean Lebègue 1404/07 describes the conspirator Catilina as a pretentious, dis-

solute and depraved figure, which should also be reflected in his attire. Catilina was to wear a pourpoint and in addition “une sainture de Behaigne sur le cul”,¹⁸ meaning “a Bohemian belt (resting) on the buttocks”. Here we have the rare case where a textual source can be clearly traced in the image, and clearly Catilina is wearing a plaque belt made of heavy round medallions. The designation as a “Bohemian belt” is particularly exciting, because the reference to Bohemia as the country of origin of this fashionable extravagance fits Catherine and Rudolf as the protagonists of this fashion.

Patricians and burghers also adopted the appearance of the knight. Tight pourpoint-like tops with outward curving chests and low-worn belts on which they hung not a sword but a pouch refer to the idol of the Middle Ages, as in the case of the patrician merchant Johann von Holzhausen († 1393) on his tomb slab in Frankfurt Cathedral (Fig. 18). What was it that earned the knight such admiration? It was his role as “miles christianus” (Christian soldier; soldier for Christ), who repeatedly tried to liberate Jerusalem. Meanwhile, the contemporary media also paid homage to him in the form of chivalric novels and heroic legends. In these, the knight was able to cover two aspects simultaneously: Christian integrity on the one hand, and courtly love on the other. By referring to the elements of knights’ attire, the contemporaries were seeking to approach or enter a social group with a high level of social acceptance.

A comparable pattern could be observed in the 20th century: then, the idealised group were the male wearers of dark suits. They were considered successful people who had come so far in their profession that they did not have to do any physical work. Industrial bosses, bankers and managers – they had achieved great success in the capitalist modern era. Office workers and civil servants demonstrated with

their suits that they also considered themselves as belonging to this group. At the same time, the 20th century saw the beginnings of women's entry into the world of employment. They adopted the uniform of the successful men in its female interpretation as a skirt suit, i.e. combining a suit jacket with a skirt and a white shirt or blouse. The first adaptations in the form of the trouser suit were considered scandalous, reprehensible and very erotic. Marlene Dietrich was a role model in the classic films "Morocco" (1930) and "Blonde Venus" (1932), but even in her private life she was the protagonist of the trouser suit. The suit was gradually adopted by the female professional world. In the early 1940s,

Fig. 18 Tomb slab of Johann von Holzhausen (+ 1393) and Gudula Goldstein (+ 1371) in Frankfurt Cathedral



Katherine Hepburn gave men's suits an unexpected feminine appeal in the film "Woman of the Year" (1942). In the 1960s, Yves Saint Laurent enhanced the sex appeal of masculine clothing on women's bodies with his "Le Smoking tuxedo" for women. In the 1980s, it was Anne Klein, Ralph Lauren and Armani who shaped the emancipation movement with the men's suit for women. Armani named it the "Power Suit" and thus created the ultimate status symbol for career women in the early 1980s. Its indispensable feature were the very broad shoulder pads, by which women simply put on the typically male body contour over their own. Broad shoulders stand for masculine assertiveness, and that's exactly what women needed in the eighties. At the same time, the attributes of male power were combined with those of female eroticism, such as the massive perm, high heels and very red lipstick.

Comparing this to the medieval Catherine of Bohemia may seem a bit far-fetched, but it illustrates how this combination of masculine clothing, eroticism and power affected the viewers at that time. From our present-day point of view, we can hardly appreciate this in Catherine's clothing, but the women in male suits who are closer to us in time, can give us an idea. Their adoption of male dress with the simultaneous incursion into the men's professional world was seen equally as a scandal, an erotic attraction and a justified statement. The political and social message of clothing, nowadays most notably of female politicians, but also – as before – the wives of politicians, is employed actively; one only has to think of the attention paid to the clothing of American presidential wives and also of internationally important women in positions of responsibility.

Footnotes

- 1 Kühnel, *Bildwörterbuch*, p. XLII; Krause, *Mode*, p. 45 on the mutual influence of clothing and armour in the 16th century.
- 2 Schopphoff, *Gürtel*, p. 10; Hundsbichler, *Dusing*, p. 67 f. and *idem.*, *Gürtel*, p. 95. In this text, I distinguish between leather belts and (hinged) plaque belts (*Scharniergürtel*). Leather belts were also worn on the hips, but were soft, closed by a buckle with a prong and knotted at the long end. *Scharniergürtel* were composed of plates (or plaques) connected by hinges. In contrast to leather belts, they were much bulkier, heavier and larger. They replaced the leather belt on armour in the late 1350s.
- 3 Such as the quilted white and gold silk jacket of Charles de Blois in which he died in the battle of Auray in 1364 (Lyon, *Musée de Tissus*), cf. Fircks, *Pourpoint und Kania, Kleidung*, p. 307. The arming cote of the Black Prince († 1376), embroidered with his coat of arms, is identical to the one on his tomb effigy, which shows it to be worn with a plaque belt over the armour (Canterbury Cathedral), see Kania, *Kleidung*, p. 313. Cf. also the quilted red silk jacket of Charles VI (*Chartres, Musée des Beaux- Arts*), see Kania, *Kleidung*, p. 307.
- 4 Baum, *Rudolf IV.*, p. 372 f. In April 1353, the symbolic beilager or nuptial was performed in Prague. The marriage did not take place until July 1357.
- 5 This is probably not the location originally envisaged. It was a series in which the parents of the two are also depicted. The sculptures were certainly intended to stand together as an “ancestral gallery”, perhaps near the burial site. The series visualises the family origins of Rudolf and Katharina and manifests Rudolf’s claim to power. All the figures are now in the Wien Museum.
- 6 Up to now, research has mainly focused on the sculptures on the Singer and Bishop’s Gates. In historical treatises, it is usually only Rudolf’s portal sculpture that gets considered. The vestimentary aspects have not received any attention so far. Cf. Kosegarten, *Parlerische Bildwerke*, pp. 47-78; *idem.*, *Fürstenportale*, pp. 74-96 and Schwarz, *Baugeschichte*. Reference should also be made to the research project of the University of Bamberg: “Baustelle Portal. Die Fürstenportale des Wiener Stephansdoms”, which will be published shortly. I would like to thank Professor Dr. Michael Victor Schwarz for his input.
- 7 So-called red marble was a popular stone for funerary monuments, and was used to cite the ancient polyphony. In the sense of material iconography, it is a princely material, as it later reached a design pinnacle on the tomb of Emperor Frederick III in the choir of St. Stephen’s Cathedral. In most cases, the so-called red marble is Adnet reef limestone from the Salzburg region, which was a coveted export product and traded as far as Northern Europe.
- 8 The reconstructive depiction by Marquardt Hergott, *Monumenta Aug. Domus Austriae*, Vienna 1750, pl. XXIV shows her with sceptre and orb. The sceptre is preserved in fragments on her shoulder.
- 9 Poem of Praise for Robert of Anjou, Southern Italy, Austrian National Library, Cod. Ser. n. 2639. I am grateful to Dr. Dieter Röschel for his collegial advice and inspiring discussions.
- 10 On the belt in a couple’s relationship, as a love token and bridal gift, cf. Schopphoff, *Gürtel*, pp. 158-173; on the symbol of power pp. 174-178.
- 11 Heraldic fabrics were extremely popular in the Middle Ages and a costly luxury, being specifically woven custom-made items. Examples with a small repeat can be found in the clothing of Fernando de la Cerda († 1275), Burgos las Huelgas, cf. Kania, *Kleidung* p. 294. Alternatively, the patterns could be embroidered or appliquéd, as in the arming cote of the Black Prince (Canterbury Cathedral), cf. on this Kania, *Kleidung*, p. 313.
- 12 Poem of Praise for Robert of Anjou, Southern Italy, Austrian National Library, Cod. Ser. n. 2639, fol. 33r.
- 13 There are numerous miniatures in book illuminations that feature women fighting and wearing armour. In addition to the numerous Amazons depicted, there are also women defending their castle (e.g. *Smithfield Decretals*, London, British Library, Royal MS 10 E IV, fol. 18v; Heidelberg University Library, Cod. Pal. Germ. 848, fol. 229v – the so-called “Codex Manesse”).
- 14 A crusader in leather and bronze armour discovered during archaeological excavations in Caesarea Maritima, has since been identified as a woman, cf. Bull, *King*, p. 224. Warriors in Viking graves who had previously been declared male have also been identified as women, Hedenstierna-Jonson, *Female Viking*.
- 15 McLaughlin, *Woman Warrior*; Edgington/Lambert, *Gendering the Crusades*; Hager, *Endowed and Rottloff, Pilgerinnen*, pp. 108-117.
- 16 Cf. Scholz, *Inschriften*, p. 21 f., no. 22.
- 17 Cf. Brandt, *Grabmäler*, p. 62, fig. 5.
- 18 Oxford, Bodleian Library, MS. D Orville 141, fol. 43. Quoted in Röschel, *Christine de Pizan*, text volume p. 299, picture volume fig. 99 (*Sallust, Geneva, Bibliothèque de Genève, Ms. lat. 54, fol. 5r*).

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Fabian Brenker

The Emergence of the Coat of Plates in the 13th Century

On the Significance of Written Sources for the Study of the Material Culture of the High Middle Ages

Written and pictorial sources in German-language historical weapons studies

In the image-rich world of the 21st century, it is no longer conceivable that there was a time when people knew only what they had actually seen. While illustrations let alone photographs were difficult to reproduce until the late 19th century,¹ the dissemination of historical textual sources had already seen decades of very productive editing activity. The Prussian lieutenant-general Gustav Köhler († 1896) had drawn on an immense wealth of written chronicles and documents for his “Entwicklung des Kriegswesens und der Kriegführung in der Ritterzeit” (Development of Military Science and Warfare in the Age of Chivalry) and had it published accordingly without illustrations in 1887.²

The German-French author August Demmin († 1898) on the other hand, had already promoted his first edition of “Kriegswaffen” (Weapons of War) of 1869 with the words “With circa 2000 illustrations” on the title page, which he had compiled in his development history drawing on sources

of all kinds.³ Writing his “Das höfische Leben zur Zeit der Minnesinger” (Court Life in the Age of the Minnesingers), the art and cultural historian Alwin Schultz († 1909) had devoted himself primarily to the literary evidence of the corresponding German and French language periods, but still illustrated the first edition of the second volume in 1880 with 136, the enlarged edition in 1889 with 196 woodcuts of artworks.⁴ The Viennese arms historian Wendelin Boeheim († 1900), finally, devoted himself in 1890 in his “Handbuch der Waffenkunde” (Handbook of Weapons Studies) above all to the preserved weapons and some portrait miniatures, which he reproduced in numerous woodcuts, whereas he hardly dealt with the written evidence at all.⁵ The “Zeitschrift für historische Waffenkunde” (Journal of Historical Weapons Studies), published since 1897, was able to boast photo reproductions from its first issue on. Since the early 20th century, pictorial sources in the wake of Wendelin Boeheim and Paul Post († 1956) have been the main sources of German-language weapons and costume studies. After the much condemned collections of material of

Fig. 1 Saint Maurice as a warrior on the reliquary of Løgumkloster, 1st quarter of the 14th century

the late 19th century, only Ortwin Gamber in 1977 consulted once again the literary evidence of the early 13th century for the reconstruction of contemporary body armour; he also pointed out the different testimonial qualities and the time lag between written and pictorial evidence.⁶ 20th century German weapons and costume studies primarily used pictorial sources to develop a typology, which in turn could be used to date artworks.⁷ This can be done within one type of source, similar to a style analysis. Yet to this day, the results are usually equated with the actual development of clothing and weaponry. The following pages illustrate the danger underlying this focus by means of sources that have been known for the most part but ignored for a long time. English and French scholars tend to draw on all sources in a more balanced way.⁸ Language barriers, however, largely prevented the German-language sources from being incorporated there. Bengt Thordeman, for example, failed to address the aforementioned collections of textual evidence in his influential 1939/1940 book on the finds from the mass grave of 1363 at Visby on the Baltic island of Got-

land.⁹ In addition to the standard references of recent decades, the latest works on the history of European body armour using iron plates also cite the mid-13th century for the emergence of the first plates. As explained below the German term “Plattenrock” and the English term “coat of plates” were not actually used in the sources, but are rather neologisms of historical weapons studies. According to the written sources it will be called “plate” or “plates” in this article. While in the case of archaeological finds, it is rather obvious that objects usually only ended up in the ground after their utilisation phase – and even then may often be only inadequately classified chronologically via the oldest and/or most recent datable find of the same site –, there still seems to be a need for discussion when it comes to assessing the contemporary relevance of pictorial sources. This undertaking becomes even more difficult with such objects that are not to be expected in pictorial sources, because they either were worn altogether invisibly or else the artists were not aware of them in the first place.¹⁰

Characteristics of the “platen” according to the textual evidence of the 13th century in the German and Scandinavian regions

It all begins with a third-party testimony in Latin whose interpretation is ambiguous: according to the work “Expugnatio hibernica”, completed by Giraldus Cambrensis († c. 1223) in 1189, some Danes wore long mail hauberks during their attack on Dublin in 1171, while others wore iron plates (“laminis ferreis”) that were skilfully stitched together.¹¹ Apart from the fact that this armour consisted of several plates connected by strings and probably protected the torso, this description reveals little. Their stitching at least sets them apart from the more recent representations in the German-speaking world, so that scale

Fig. 2 The Chivalric Orders in the Retinue of King Balduin in a Middle Rhenish or Lower Saxonian miniature in Alexander of Bremen’s († 1271) “Expositio in Apocalypsim”, 1249/1250 (Cambridge, University Library, MS Mm.5.31, fol. 139r)





Fig. 3 a and b
 Saint Maurice in
 Magdeburg
 Cathedral,
 mid-13th century
 or later

armour and other constructions cannot be ruled out.¹² Mention should be made, for example, of the 7th-century armour made of iron splints in grave 8 at Valsgärde.¹³

In contrast to the Latin authors, who were largely confined to the vocabulary of late ancient times, the Germanic vernaculars came up with their own terms for new developments. This makes innovations easier to grasp linguistically. The Middle High German epics and poems are, both in content and in form, fictional literature and should be viewed as such.¹⁴ Nevertheless, the objects mentioned in the texts can for the most part be regarded as known to the authors or at least conceivable to them. With all due caution, they allow us to draw conclusions about the material culture of their time. First references to body armour

made of sheet metal can already be found in the first decade of the 13th century. At that time, Wolfram von Eschenbach wrote in "Parzival" about Duke Orilus: "In Soissons (?) his plate was beaten" ("Zesesune was geslagen sin plate").¹⁵ It is certainly not wrong to interpret this beating of a plate as embossing and thus some form of armour made of sheet metal. In Konrad of Würzburg's († 1287) unfinished "Trojanerkrieg" (Trojan War), a rather special kind of "plate" is described, which Hector is said to have worn over his mail hauberk and under his surcoat. It is described as being made with care, commendably cut from an iridescent green crocodile skin, which was tanned in such a way that it was soft and smooth; it is to this that Hector's armour ultimately owes its impenetrability. This



Fig. 4 Reconstruction attempt of Saint Maurice from Magdeburg Cathedral in its original colours (Dipl.-Rest. Thomas Groll and team), 2020 (Kulturhistorisches Museum Magdeburg)

highly imaginative but unrealistic epic exaggeration is followed by four revealing verses: Its shining sheet and its elements didn't show any notches. Of well-hardened steel, they were made.¹⁶ Other places of origin for plates are named as Vienna by Neidhart around 1230/1236¹⁷ and as Hesse in Albrecht von Scharfenberg's "Jüngere Titurel" around 1270.¹⁸ A text insert in Version B of the "Weltchronik" (World Chronicle) by Jansen Enikel, written in Vienna in the 1270s/1280s, described the "blate" of the Trojan Paris as being made of broad steel and fitted with nails, which probably means rivets.¹⁹

In "Liet von Troye" (Song of Troy), written sometime between 1190 and 1217, Herbolt of Fritzlar described a combat scene outside Troy in which Priam's spear penetrated Nestor's mail hauberk, while the plates worn underneath (!) withstood the thrust.²⁰ After the spearhead had pierced the mail in the passages described, it could no longer slide off. According to the works of visual art (see below), the plates also seem to have been covered with textiles on the outside, which may also have prevented a weapon from sliding off. With the mail hauberts and wooden shields used at that time, it was not even conceivable to deflect a sharp weapon, so this possibility was obviously not known yet. It was not until the 14th century that pointed visors and domed breastplates were used in an attempt to deflect an opponent's weapon. Around 1230, Heinrich von dem Türlin described in "Diu Crône" (The Crown) the body armour of some knights right down to and including the mail hauberk ("halsperch"). On top of that, or so it says, there ought to be a plate to cover the chest ("Darnach an dem end / Gehört für die brust ein blat") followed by a "wammes" or a silk surcoat ("wapenrock sydin") as the outer layer.²¹ Ulrich of Liechtenstein († 1275) also wore his plates over a mail hauberk and under his surcoat on his quests in 1255.²² The same is true of some of the heroes in the battle for Troy in Jansen Enikel's "Weltchronik" (World Chronicle).²³ In the Old Norwegian "Konungs skuggsjá" (Latin: *speculum regale*; English: King's mirror) – a reliable manual written in the mid-13th century – the prince is advised to first don a soft gambeson ("blautan pannzara") and over this a strong breastplate ("goða briost biorg") made of good iron ("af goðu iarni") covering the body from the nipples to the breech belt ("geirwartna oc broca bælltis"). On top of this, finally, came the mail hauberk ("bryniu") and a sleeveless gambeson ("pannzara").²⁴

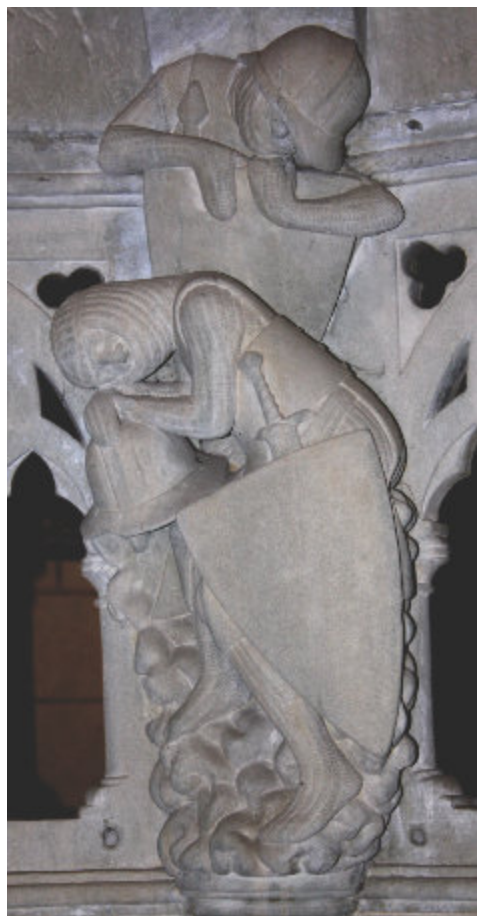


Fig. 5 and 6 The sleeping guards at the Holy Sepulchre in the Maurice Rotunda in Constance Cathedral, c. 1260

The iron reinforcement thus protected the lower half of the chest and the abdomen, but allowed the arms the necessary freedom of movement.

A rhymed chronicle of Louis' III, Landgrave of Thuringia († 1190) involvement in the Third Crusade (1189-1190), written in 1301, bridged the gap between poetry and historiography. In an account of a raid, there is mention of the rush in which someone strapped his plates on for him ("dirre im die platen gurten tet").²⁵ This would suggest that the aforementioned body armour

was fastened by means of leather straps and buckles and that an assistant was required for this task, possibly because the buckles were situated on the shoulders or on the back. In the absence of any known contemporary reference, the armour mentioned will have to be attributed to the poet's living environment and not to the report period of around 1190.

From the isolated textual evidence, it cannot be determined whether the plate at the beginning of the 13th century was identical to the one at the beginning of the 14th

century. In conclusion, it seems to have consisted of one or more forged sheets of hardened steel and rivets. The soft tanned crocodile skin from the poem could perhaps be interpreted to mean a soft leather backing material. The plate could be worn underneath or over the mail hauberk, reached from the nipples down to the belt and needed the help of a third party to be fitted. In "Liet von Troye" it provides protection against a lance thrust (see above), whereas in most of the other texts mentioned here, as well as in a few other epics of the late 13th century, the plate is penetrated by swords and lances.²⁶ For instance, that of Ulrich of Liechtenstein in his joust with Konrad of Streitwiesen.²⁷ In the narrative sources, the plate is thus mentioned almost exclusively in the context of hand-to-hand combat.

The plates described thus far were always used as protective armour by great noblemen or heroes supported by the gods in the

fight for Troy. According to the poet Neidhart, however, around 1230/1236 even sons of peasants were able to acquire such plates.²⁸ Recently, however, the thesis has been voiced whether Neidhart's jibes against the peasants were not in fact directed at the landed gentry of Lower Austria.²⁹

The Latin "Kulmer Handfeste" (Kulm law) of 1233, laid down for all landowners in the Teutonic Order's possessions there, depending on the size of their land, which equipment they were to contribute to the Order in times of war. Even those with less than ten "mansos" (an old agricultural unit of land property), were required to provide body armour, popularly known as "Plata".³⁰ The wording suggests that for all those with up to 40 "mansos", the "Plata" was the sole form of body armour. It therefore seems to have been the most affordable form of protection.

Fig. 7 Sleeping guards at the tomb of Jesus, detail from a psalter from around Magdeburg, c. 1265 (Bavarian State Library, Clm 23094, fol. 77v)





Fig. 8 Cameo with the head of a knight, 2nd half of the 13th / early 14th century (Kunsthistorisches Museum Vienna, Kunstkammer, inv. no. Antikensammlung XII 244)

It becomes apparent at the latest with the inheritance law of the city of Augsburg of 1276, which has survived in the original, that such pieces of armour were also fairly common in cities, as they are listed there as an example of weapons and armour to be bequeathed.³¹ Whether the authors were thinking of craftsmen, wealthy citizens or even ministerials, however, is not made clear by the text.

From about 1285 onwards, the mentions in inventories, wills, chronicles and legal documents became more frequent, which makes it unfeasible to examine individual references.³² Since a Latin invoice with the Counts of Tyrol dated 1298 – as well as the Kulm law above – uses the German term “platten” and not a Latin word³³ it can be assumed that the object – widely used in the German-speaking countries – could still not be adequately described in the same way with any Latin or Romance term. In another invoice from 1293, the German term had at least been declined in Latin.³⁴

Sheet metal and leather body armour in the Romance-speaking world

The following remarks are based exclusively on the references cited in the relevant works. Further research on the terminology and appearances shall be left to the specialists of these languages.

According to the relevant research, the term “plate” in the sense of body armour does not feature in French-language textual evidence until the 1290s.³⁵ Prior to this, only the French author Sarrasin in his “Roman du Hem” occasionally mentions “pelates” at a joust in 1278, which are sometimes pierced by the lances.³⁶ At the beginning of the 14th century, there are frequent records in French invoices of red, more rarely yellow samite (a rich silk fabric) or white leather as a covering for plates.³⁷ As a result of the Norman conquest of England in 1066, Middle English was infused with Gallicisms not only in its administrative and courtly vocabulary, but also in its military one,³⁸ and here the term “plates” was first used in 1300.³⁹ In Old Italian, it only appeared in the early 14th century as “piatine”.⁴⁰ Presumably, this linguistic adaptation was only necessary because the thing referred to as such in German differed from the armour commonly used in these regions and/or because these, along with their name, were imported from the German-speaking world. French sources in the 14th century frequently refer to plates as German,⁴¹ although armour made of sheet metal was known in the Romance cultural area as well.

The Latin “Philippide” by Guillaume le Breton († 1226) describes a duel in 1185 between Richard, called the Lionheart, Count of Poitiers († 1199) – King of England from 1189 – and Guillaume de Barres († 1234), in which each pierced the other’s shield, hauberk and gambeson (a padded garment) with their lances; the latter were only stop-

ped by a “patena” – literally a liturgical metal plate – made of “reboiled”, i.e. probably thermally treated, iron, which safely protected the men’s chests.⁴² The text passage, which was only written in the first quarter of the 13th century, does not yet offer a specific name for this chest guard. However, it is clear from the awkward description that it was a single, probably round, embossed and slightly curved plate in front of the chest. The 1203 inventory of the northern Italian castle of Robbio mentions four leather armours (Latin: *corium*=leather) reinforced with iron and two without reinforcement (“*corcales IIII. ferratas et II. inferratas*”).⁴³

In Italy, whose written language was still dominated by Latin in the second half of the 13th century, the naming of the new plates seems to have been based on the Latin word for sheet metal (*lamina*) – similar to the German-speaking area. For Vicenza, there are mentions of “*panceria*” (from German *Panzer*, i.e. armour) reinforced by “*lama*” (plates) in 1264.⁴⁴ Whereas in 1255, a crew member of the Venetian fleet receiving more than 40 lira of pay had to have mail or iron plates (“*panzeram vel lamam de ferro*”),⁴⁵ which obviously meant

that there was a nominal difference between the two. In the German-speaking world, too, *Platte* and *Panzer* referred to two different things, as the inheritance law of the city of Augsburg of 1276⁴⁶ and the inventory of the Austrian castle of Waidhofen of 24 May 1313 (“*platne*”/“*panczirium*”) show.⁴⁷ In 1259, the “*Libro di Monteperti*” of Florence stipulated “*panceriam sive asbergum*” for the heavy horsemen, implying that these two terms meant very similar things; also listed therein are “*lame-rias vel coraczas*” (plates or leather armour), which are linguistically distinct from the aforementioned and from each other.⁴⁸ These leather armours, as a word and a thing, could also explain the absence of plates in Old French and Old Occitan. Although partly referring to the 11th century, the first mentions of “*coiriés*”, “*corietum*” and “*cuiree*” date from the third quarter of the 12th century and later.⁴⁹ After 1218 it is referred to as a “*cuirie*” in the French *chanson de geste* (an epic poem) “*Gaydon*”, to be worn under the mail hauberk and made of “*cuir boilli*” (boiled leather),⁵⁰ described elsewhere as consisting of tanned leather and finally as reinforced with iron.⁵¹ It is first recorded in 1266 in an

Fig. 9 Sleeping guards at the tomb of Jesus on the central west portal of Strasbourg Cathedral, c. 1280/1290



Fig. 10 Beheading of Saints Servandus and Germanus, detail in a Middle German martyrology, late 13th century (Jena, Thuringian University and State Library, MS.Bos.q.3, fol. 83v)



inventory of the estate of the Count of Nevers as “paires de cuiraces”.⁵² The linguistic characteristics that can be derived from this suggest, at least from this time onwards, a paired item of armour consisting of a rigid but light breast and back section. Derived from this, they appear in German-language sources from the 1230s onwards as “currit” or “gurrut” and are mentioned, among others, by Neidhart⁵³ and in the inheritance law of the city of Augsburg⁵⁴ as alternatives to “platen”. The Romance languages thus rather emphasised the hard leather component of the armour, which thus possibly also differed from the soft backed armour common in German-speaking areas.

Comparison with the pictorial evidence of the 13th century

A miniature for Alexander of Bremen’s († 1271) “Expositio in Apocalypsim”, created in 1249/1250 at the Middle Rhine or in Lower Saxony, may already depict a sur-

coat reinforced with sheet metal, although the plates themselves are not discernible here (fig. 2).⁵⁵ Its white colour and the lack of folds, however, together with its symmetrical internal structure and a wide strap or band running around the abdomen, show striking similarities with the following undisputed evidence.

The oldest reliable pictorial source for a torso protection made of metal plates is the statue of Saint Maurice in Magdeburg Cathedral (fig. 3), which stylistically dates to the middle of the 13th century,⁵⁶ but based on weaponry could well have been created in the course of the second half of the century.⁵⁷ Over his golden mail hauberk the saint wears an originally white surcoat with golden rivets (fig. 4).⁵⁸ His head is protected by a mail coif with rectangular shape at the front and in the rear. The buckles mentioned in the written sources are found on the back. Judging by the two horizontal rows of rivets, nearly rectangular, vertical plates seem to have been riveted from the inside to a carrier material by one rivet each



Fig. 11 Sleeping guard, detail from the sculpture “Resurrecting Christ” (Inv. Nr. Wie Ac 001) at the Holy Sepulchre in Wienhausen Abbey, c. 1290/1300

at the top and bottom, although the two rivets are not always placed directly above each other.⁵⁹ The band that runs centrally between the rows of rivets could therefore have served to stabilise the construction and prevent the plates from shifting and thus the rivets from being torn out. At least, this proved to work well in my own replica, when the overlapping plates were fixed with just one rivet each at the top and bottom and a leather strap sewn horizontally on the outside of the fabric. Two rivets located in front of the collarbone indicate that further plates were attached above this ring of plates. The concentric lines around the armholes, together with the lines on the back of the statue, might indicate a reinforcement of the shoulder area sewn on the

inside, perhaps made of thick leather. In this way, the shoulder area would be protected without restricting mobility. When worn like this, the plates cover almost the entire chest of the wearer, which is why this form of armour does not restrict his freedom of movement, as long as the armholes are wide enough at the front. In the 14th century the protruding shoulder parts were replaced by shield-shaped platelets (fig. 19 in Schönauer’s contribution on the Hirschstein Armour in this volume).⁶⁰

Even though the sleeping guards in the Holy Sepulchre in the Mauritius Rotunda in Constance Cathedral (figs. 5-6) were not installed until around 1300, they are stylistically dated to around 1260. Some figures are considered to be closely related to the sculptures in Magdeburg and are traced back to joint models in Paris, Reims and Meaux.⁶¹ The inner figurines have lost all their coating today, which means that no conclusions can be drawn about their original colouring. Over their mail hauberk they wear an unbelted, sleeveless surcoat that is rigid along the torso and extends into soft folds of fabric at the bottom. Apart from the lack of a visible internal structure and the missing circumferential band, its shape resembles the one of the Maurice statue in Magdeburg. In one figurine, three buckles can be seen on the back as well. The social status of the guards is difficult to assess; none of them wears spurs. Following contemporary seals and written sources, one could interpret the so-called great helm as a knightly attribute and the kettle hat (or war hat) as head protection for the sergeants.⁶² In this case, it would be a pictorial reference towards the spread of plates outside the noble class, which was already detectable one generation earlier in the written sources. A psalter from around 1265 from the Magdeburg area⁶³ also shows a sleeping soldier among the guards at the grave, whose largely obscured white surcoat is creaseless and may depict a rivet in

the small circle at the side of the chest (fig. 7). The angular shape of the mail coif strongly reminds us of Saint Mauritius in the cathedral there, so that a correlation is conceivable here.

A probably French cameo (onyx on jasper), perhaps from the second half of the 13th century or from the early 14th century, shows the head of an armoured man with mail coif (fig. 8).⁶⁴ At the level of the collarbone, a small circle is engraved in his surcoat, which might be interpreted as a rivet. Another instance of this feature can be found on the left sleeping guard on the central west portal of the Strasbourg Cathedral created around 1280/1290 (fig. 9).⁶⁵ The latter's now stone-faced armour, however, has a hinge or clasp on the shoulder,⁶⁶ something that would be more in keeping with a more rigid breast and back armour such as the "cuirie" or "paire de cuiraces". A richly illustrated martyrology produced in Central Germany in the late 13th century depicts the beheadings of Saints Servandus and Germanus (fig. 10).⁶⁷ Over a possible gambeson of brown colour, the soldier wears a red outer garment, slit at the sides and almost sleeveless, and over it merely a white, sleeveless surcoat around the torso and over the chest. Given the lack of a mail hauberk and surcoat, he certainly does not belong to the chivalric class. The plates on the inside are identifiable by vertical lines. Here, at the lower edge in front, there is the first indication of a slight downward taper between the legs, which is still a feature of the vertical plates found in the Visby graves of 1363.⁶⁸ A horizontal band runs halfway around the body, just like in the Magdeburg Maurice.

And then there is a guard figurine dating from the 1290s that still retains its original colours⁶⁹ on an altar in Wienhausen Abbey in Lower Saxony (fig. 11).⁷⁰ His white-grey, ungirded surcoat nearly touches the ground. The plates are still placed vertically, but now for the first time depicted



Fig. 12 Saint George on the reliquary of Løgumkloster, 1st quarter of the 14th century

sculptural in three horizontal rows, each with four rivets. In addition to the rows covering chest and abdomen, there is now a bottom row for the lower abdomen, also found in Visby.⁷¹ The individual plates are riveted to a textile or leather layer from the inside. Slightly younger and comparable to the above in their white, double-row armours are the saints George and Maurice on the reliquary of Løgumkloster in southern Denmark from the first quarter of the 14th century – they also feature an attached stripe tapering upwards at the chest (fig. 1 & 12).⁷² In southern Sweden, this tradition was continued in the tomb for Nils Jonsson († 1316/1319) in St. Mary's Church



Fig. 13 The death of Count Walram († 1311), detail from the “Codex Balduini”, c. 1340 (Koblenz, State Archive, Bestand 1 C Nr. 1, fol. 14r)

in Sigtuna and the knight Valerianus depicted in a wall painting from 1323 of the Martyrdom of St. Hippolytus in Södra Råda Old Church, which was destroyed by arson in 2001.⁷³ It is possible that the depiction of the minstrel Dürner at a joust by the painter of the second addendum of the “Codex Manesse” around 1330/1340 still shows a conventional plate (fig. 7 in Schönauer’s contribution on the Hirschstein Armour in this volume).⁷⁴ The typical shape of the plates, in red and green, but without any discernible rivets or other indications of internal plates, is found in the “Codex Balduini” from around 1340, as Count Walram

(† 1311), struck by an arrow, is not wearing a surcoat (fig. 13).⁷⁵ Around this time, there seems to have been a gradual transition to horizontal metal strips.⁷⁶

The pictorial evidence mentioned above largely agree with each other in five aspects. Firstly, all the 13th century figures depicted have a religious context and were thus historically real based on the understanding of the time. Yet the plate armour does not seem to have been used as an element of antiquisation, which was often the case with the scale armour, for example.⁷⁷ Later developments⁷⁸ reveal them to be contemporary early forms of plate-reinforced textile or leather armour. Secondly, with the exception of the “Codex Balduini” they always show a white curcoat with vertical plates riveted to it from the inside.⁷⁹ The white colour could indicate canvas or oil- and alum-tanned leather. The latter is very sensitive, but would have properties similar to the aforementioned crocodile leather of Hector in Konrad of Würzburg’s “Trojan War”. Thirdly, it is usually a band of vertical plates that is passed around the body once between the nipples and the belt and closed at the back by means of buckles; a row with some further plates protects the chest. In the last quarter of the century, the centre of the bottom row is extended downwards and soon becomes an additional third row. Fourthly, in all of these figures the plate can only be seen because it is worn over the mail hauberk and in lieu of a surcoat. The sculptors and painters thus reproduced what they saw. This is one of the reasons why it is not apparent in the early pictorial evidence.⁸⁰ Fifthly, all known pictorial evidence of the second half of the 13th century, which can reliably be interpreted as such, originate from the German-speaking region of that time – with the exception of the cameo, which cannot be assessed with certainty. In this case, therefore, a French model for the Magdeburg and Constance figures is ques-

tionable. Also, naming Soissons as a supply source in “Parzival” was perhaps intended to emphasise the exclusivity of the piece rather than that plates were actually imported from northern France into southern Germany at the time.

When considering pictorial sources on plates, mention should also be made of similar ones, the details of which, however, probably refer to other types of body armour. A commentary on the apocalypse by Beatus from San Andrés del Arroyo, created in the early 13th century in northern Spain, shows a foot warrior with a mace and a great helm (fig. 14). Over his mail hauberk he wears a brown, sleeveless and thigh-length robe with four vertical rows of dots, which is being discussed as the oldest depiction of a plated torso armour.⁸¹ Apart from the sleevelessness, it thus differs from the later pictorial sources of the century. An interpretation as plate is therefore questionable, especially in view of the vertical rows of dots.⁸²

On an anonymous tomb effigy in Pershore Abbey, Worcestershire, from about 1270/1280 and on the one of Gilbert Marshal († 1241) in Temple Church, London, from the end of the 13th century, there

is another layer of armour clearly visible underneath the surcoat, without rivets and strapped at the side (fig. 15). The breast and back section seem to form a pair, which would be in keeping with the “*paire de cuiraces*”.⁸³ Thus, these two torso armours are markedly different from the form used in the German-Scandinavian region discussed above. The two tomb effigies suggest that England was influenced by France not only in language, but also with regards to the choice of body armour.

Finally, it is worth mentioning all those pictorial records where the surcoat’s protruding shoulders indicate the presence of stiffening underneath.⁸⁴ These appear increasingly in artworks from the second quarter of the 13th century onwards,⁸⁵ also in the German-speaking world.⁸⁶

The oldest datable parts of a small-scale plate armour are thought to come from Rychleby Castle near Javorník in the Czech Republic, which was destroyed in 1281.⁸⁷ Some elongated and slightly curved plates with occasional holes on the rim from Wilnsdorf Castle in North Rhine-Westphalia, which was destroyed in 1233, are somewhat too unspecific to be addressed with certainty as parts of a plate.⁸⁸



Fig. 14 Warriors, detail from a northern Spanish manuscript, early 13th century (Bibliothèque nationale de France, Ms. Nouv. Acq. Lat. 2290, fol. 106v)



Fig. 15 Tomb sculpture for Gilbert Marshal († 1241) in Temple Church, London, c. 1290/1300

Theses on the origin

As a summary of the previous chapters, it can be stated that the “platen” did not only gradually emerge in the last third of the 13th century, but had already become a relatively cheap mass product by the middle third of the century. These early indications refute Bengt Thordeman’s thesis of them being taken over from the Mongols,⁸⁹ who did not encounter the knights of Central Europe until 1241 at the Battle of Liegnitz. For the year 1241, the English Benedictine monk Matthew Paris († 1259) recorded in his “Chronica Majora”, a letter from Emperor Frederick II († 1250) to the English king in which the armour of the Mongols is described as being made of the untanned hides of oxen, donkeys or horses with iron bands sewn into them.⁹⁰

David Nicolle, deviating from the interpretation in the present essay, identified horizontal sheet metal hoops in some of the above-mentioned pictorial works as well as quite correctly in the pictorial records of the 14th century. Emphasising the leather

backing material, he deemed an adaptation of the Near Eastern “jawshan” armour made of horizontal strips of hardened leather from the 12th century onwards to be probable. Such armour might have come to Europe in the course of peaceful and war-like cultural contacts in Spain, Sicily and the eastern Mediterranean.⁹¹ As shown above, however, at least the pictorial records of the second half of the 13th century indicate a distinct form in the German-speaking world, which was neither based on horizontal elements nor significantly on hardened leather.

Nevertheless, contacts with the Middle East, especially through the Crusades, had a formative influence on the development of weapons and armour in Europe. For example, there is evidence of Muslim cross-bow makers in England around the year 1200, manufacturing composite horn bows there.⁹² Also around 1200, wooden windlasses, stirrups and belt hooks and, around the middle of the 13th century, spanning levers are mentioned in European written sources – long before they made their

appearance in pictorial sources –, some of which had already been used in the Middle East in the late 12th century.⁹³ Thom Richardson had already recognised the simultaneous appearance of plate armour with improved crossbows – albeit erroneously only in the late 13th century – and suggested a causal connection between the two.⁹⁴ As shown above, however, the plate is mainly depicted in close combat with lance and sword, which may be due to the ideal fighting style on the part of the heroes. Also in the two decades around 1200, the enclosed helmet with face-protecting plate, an early form of the great helm, replaced the conventional nasal helmet as the protective headgear for knights, also primarily designed for fighting with a couched lance.⁹⁵ One could hypothetically conclude from this that there was a time-delayed reaction to the fighting style with the couched lance. A comparable study on the emergence of daggers and fighting knives in the High Middle Ages shows that all types of blades

of daggers previously dated to the 14th century on the basis of pictorial sources can actually be traced back to the two decades around 1200.⁹⁶ Contemporary accounts of the Battle of Bouvines in 1214, for example, record attempts to thrust the knives under mail hauberks or into the eye-slits of helmets.⁹⁷ They were thus probably more a reaction to the virtually all-over mail armour than to the new plate armour, particularly since mail, according to my own experiments, generally offers sufficient protection against a one-handed thrust.

It cannot be completely ruled out that some of these innovations went even further back into the 12th century. For it was only in the decades around 1200 that written sources providing such details began to grow in number. Those are above all the vernacular poems for a lay audience as well as the transmission of invoices and inventories.⁹⁸ Future research can hopefully clarify where the impulses for this development around the year 1200 had come from.

Footnotes

- 1 Cf. for example Peters, *Bilder*.
- 2 Köhler, *Entwicklung*.
- 3 Demmin, *Kriegswaffen* (1st edition).
- 4 Schultz, *Leben*.
- 5 Boenheim, *Handbuch*.
- 6 Gamber, *Bewaffnung*.
- 7 Cf. for example Gamber, *Bewaffnung*, p. 114 and Fingerlin, *Gürtel*, p. 8.
- 8 Cf. the corresponding titles in the bibliography.
- 9 Cf. Thordeman, *Armour*.
- 10 Cf. Brenker, *Armbrust*, p. 149-71.
- 11 Giraldi Cambrensis *Expugnatio Hibernica* (ed. Dimock), lib. 1 cap. 21, p. 263 f.: "A navibus igitur certatim erumpentes, duce Johanne agnomine ꝑe Wode, quod Latine sonat Inسابو, vel Vehementi, viri bellicosi, Danico more undique ferro vestiti, alii lorici longis, alii laminis ferreis arte consutis, clypeis quoque rotundis et rubris circulariter ferro munitis, hominies tam ferrei quam armis, ordinatis turmis ad portam orientalem muros invadunt." Cf. also the mention of a "lame" in the Norman "consuetudines" in Köhler, *Entwicklung*, p. 92 note 3.
- 12 Cf. Blair, *European Armour*, p. 37; Nicolle, *Jawshan*, p. 208 and Downen, *Introduction*, p. 19.
- 13 Cf. Arwidsson, *Armour*.
- 14 For reasons of space, literature references to the persons and works mentioned have been omitted. For 19th century authors, they can be found in the "Allgemeine Deutsche Biographie" (56 volumes 1875-1912) or in the "Neue Deutsche Biographie" (27 volumes since 1953) with its database www.deutsche-biographie.de and for medieval authors in "Die deutsche Literatur des Mittelalters - Verfasserlexikon" (14 volumes 1977-2008) as well as in the "Repertorium Fontium Historiae Medii Aevi" (11 volumes 1962-2007) and on www.geschichtsquellen.de.
- 15 Verse 261, 26, quoted from the oldest surviving manuscript written in the mid-13th century: Munich, Bavarian State Library, Cgm 19, fol. 31r^c.
- 16 Konrad von Würzburg, *Trojanerkrieg* (ed. Thoelen/Häberlein), verse 3710-3727, p. 53: "geworht mit hôhem flîze gar / fuorte er eine blaten drobe, / diu was gesniten wol ze lobe / ûz eines kocatrillen hût, / diu schein grûen als ein fenichelkrût: / alsô was si geferwet / und alsô wol gegetwet, / daz si was linde unde weich. / ir glanz blech und ir geleich / bliuben ungeschert, / ûz stahele wol gehert / wâren si gemachet. / diu plate niht gewachet / wart von swertes orte, / kein lanze si durchborte / mit ir spitze sinewel, / wan des kocatrillen fel / kein wâfen kan versniden." The sheet metal is mentioned again *ibid.* verse 32274 f., p. 457: "den halsperc und der platen blech / schriet er [Rêmus] enzwei geswinde".
- 17 Quoted from the so-called Riedegg manuscript from around 1300: Berlin, State Library, Ms. germ. fol. 1062, fol. 51r^b: "Irnwart vnd voge die von rehte sollten / phlegen. powes mit ir phvge. di sah man ze wienn chovfen currit vnd platen". (cf. Neidhart-Lieder (ed. Müller et al.), song R 13 (WL 28) strophe V, verse 1-3, p. 112; on this Gessler, *Lieder*, p. 4 f.).
- 18 Quoted from the early 14th century manuscript: Vienna, Austrian National Library, Cod. 2675, fol. 169v^b: "Die plat von hessen rîche, der halsperc von anschowen / geworht so meisterliche, die wurden beide dvrch vnd / dvrch gehowen, biz dar sin menlich ellen lak daz / veste". (cf. Albrechts Jüngerer Titul (ed. Nyholm), strophe 5906, 1-3).
- 19 Cf. Jansen Enikels *Weltchronik* (ed. Strauch), insertion after verse 16020, p. 303: "diu blate was von stahel breit / darûf negel als man seit / geslagen von gimme schön, [...]".
- 20 Quoted from the oldest surviving manuscript from 1333: Heidelberg, University Library, Cod. Pal. germ. 368, fol. 10r^a: "Durch den halsperc er in stach / in gein der brust vf die platen [...] Die plate bestund den sper for". *Ibid.* fol. 31r^b other parts of armours are also mentioned (v. 4735-4737): "Sie [the Trojans] hetten pancir kollir / Krocanir testir / arm ysen vnd platen".
- 21 Quoted from the oldest manuscript containing this passage from 1479: Heidelberg, University Library, cpg 374, fol. 294r-294v. (cf. Heinrich von dem Türlin, *Die Krone* (ed. Kragl/Ebenbauer), verse 18185-18206, p. 167 f.).
- 22 Quoted from the oldest completely preserved manuscript from around 1300: Munich, Bavarian State Library, Cgm 44, fol 100r^a: "Do leit [ich] einen halsperc an / vesten, starch, lieht, wolgetan / dar über eine blaten gût / uf ritterschaft stunt al min mût / min wapenroch was sarlach rot [...]". (cf. Ulrich von Liechtenstein, *Frauendienst* (ed. Spechtler), strophe 1401, 1-4, p. 300).
- 23 Cf. Jansen Enikels *Weltchronik* (ed. Strauch), verse 15737-15744, p. 298: "Ein tjoppen legt er [Achilles] im [Patroclus] an, / diu was minniclich getân, / darob ein halsberc wîz, / die was geworht mit flîz, / einen wâfenroc durchslagen, / in môht ein keiser hân getragen, dar uder ein blaten stechlîn, diu niht vester môht gesîn". *Ibid.* verse 15791-15794, p. 299: "[...] dar nâch ein halsberc snêwîz, / geworht mit guotem vlîz; / dar über er [Hector] die blaten leit, / diu was guot unde weît".
- 24 *Speculum regale* (ed. Brenner), chap. 38, p. 103, line 26-32: "En up / ifra þarf þat at hafa næst ser blautan / pannzara. þann er æigi taki længra en a / mitt lær en þar næst þarf hann at hafa / goða briost biorg gorwa af goðu iarni / þa er taki millim geirwartna oc broca / bælltis en iwir þat goða bryniu en ífir / bryniu goðan pannzara. Gorwan mæð sa- / ma ætti sæm aðr war sagt oc þo ærma- / lausum". (According to the oldest

- surviving manuscript from the 13th century: Copenhagen, University Library, MS AM 243 fol. B, fol. 79r).
- 25 Die Kreuzfahrt des Landgrafen Ludwigs des Frommen von Thüringen (ed. Naumann), verse 6198, p. 283 according to the only record from the early 14th century: Vienna, Austrian National Library, Hs. 2737, fol. 104^b.
- 26 Konrad von Würzburg, Trojanerkrieg (ed. Thoelen/Häberlein), verse 39436 f., p. 560: "im dranc dur halsberc unde platen/ der stich biz ûf die blôzen hût, / [...]"; as well as notes 16 and 18. Further passages in Schultz, *Leben*, p. 47 f. note 4.
- 27 Quoted from the oldest completely preserved manuscript from around 1300: Munich, Bavarian State Library, Cgm 44, fol 59^v^{a-b}: "Er treip gegen mir vast uf den hurt / ein starchez sper der biderbe fûrt / daz er uf miner brust verstach / daz ez mir durch die blaten brach" (cf. Ulrich von Liechtenstein, *Frauendienst* (ed. Spechtler), strophe 865, 1-4, p. 173).
- 28 Cf. footnote 17.
- 29 Cf. Brunner, *Publikum*, p. 17.
- 30 Kulmer Handfeste (ed. Weinrich), p. 448: "[...] armatura, que plata vulgariter dicitur [...]", cf. Demmin, *Kriegswaffen* (4th edition), p. 67 f.; Köhler, *Entwicklung*, p. 41 and p. 93. In a deed of 1246, the Bishop of Kulm probably referred to that arrangement when he stipulated that those with light armour called "platgesser" (plate harness) should serve for three years if civil works were to drag on: *Codex diplomaticus Prussicus* (ed. Voigt), p. 62: "vel si edificatio protrahetur medietas eorum cum leuibis armis que platgesserre dicuntur seruiet ad tres annos". Cf. Köhler, *Entwicklung*, p. 41.
- 31 Cf. *Das Stadtbuch von Augsburg* (ed. Meyer), Art. 76 § 1, p. 151: "[...] unde harnasch, halsperge unde hosen, schinier, banzier, gurrir, blaten, ysenhute, armbrust, cheten, wanbeis, spiezze unde bogen, spanbenche unde chocher unde allez geschutzde, daz ist allez erbegut".
- 32 Cf. footnotes 33, 34 and 35; Köhler, *Entwicklung*, p. 41, p. 53-59, p. 93 and p. 107; Blair, *European Armour*, p. 40 as well as Lehnart, *Früh- und Hochgotik*, p. 99.
- 33 Die älteren Tiroler Rechnungsbücher 3 (ed. Haidacher), No. F/207, p. 278: "Item pro solutione platten domini ducis H(einrici) lb 5".
- 34 Die älteren Tiroler Rechnungsbücher 2 (ed. Haidacher), No. E/158, p. 383: "plattis 2".
- 35 Cf. Schirling, *Verteidigungswaffen*; Demmin, *Kriegswaffen* (4th edition), p. 68 f.; Gay, *Glossaire*, p. 237 and Buttin, *Du costume*, p. 232.
- 36 Cf. Buttin, *Du costume*, p. 236.
- 37 Cf. Gay, *Glossaire*, p. 237.
- 38 Cf. Baugh/Cable, *History*, p. 171 f.
- 39 Cf. Nicolle, *Jawshan*, p. 214.
- 40 Cf. *ibid.*, p. 214.
- 41 Cf. Moffat, *Manner*, p. 6, 9, 17 f. and 22.
- 42 Cf. Philippide de Guillaume le Breton (ed. Delaborde), lib. 3 verse 494-498, p. 84 f.: "Utraque per clypeos ad corpora fraxinus ibat, / Gambesumque audaux forat, et thoraca trilicem / Dissilit. Ardenti nimum prorumpere tandem / Vix obstat ferro fabricata patena recocto, / Qua bene munierat pectus sibi cautus uterque". Mentioned e.g. in Blair, *European Armour*, p. 38; Nicolle, *Jawshan*, p. 208; and Downen, *Introduction*, p. 19 f.
- 43 Specificazione delle armi ed armadure (ed. Angelucci), p. 8.
- 44 Cf. Nicolle, *Jawshan*, p. 210.
- 45 Gli statuti marittimi veneziani fino al 1255 (ed. Predelli/Sacerdoti), chap. XXVII, p. 96.
- 46 Cf. footnote 31.
- 47 *Codex Diplomaticus Austriaco-Frisingensis* (ed. Zahn), p. 75.
- 48 *Codicetto militare* (ed. Ricotti), p. 357: "Item quod quilibet habens equum pro Commune Florentiae tam civitatis quam comitatus florentini teneatur et debeat portare et habere in praesenti exercitu sellam ad dextrarium, covertas equi, panceriam sive asbergum, caligas sive stivelettos de ferro. Cappellum de acciario, lamerias vel coraczas, lanceam, scutum sive targiam vel tabolaccium anglum. [...] Item quilibet pedes civilis Florentiae teneatur et debeat portare et habere in presenti exercitu panceriam sive corictum cum manicis ferreis aut manicas ferreas cum coraczinis, cappellum de acciario vel cervelleriam, gorgieriam sive collare de ferro, lanceam, scutum sive tabolaccium magnum". To this Köhler, *Entwicklung*, p. 42. On the semantic field of "corrazin" and "corellus" in Spain and Italy cf. Nicolle, *Jawshan*, p. 209 f. and p. 213 f.
- 49 Cf. Nicolle, *Jawshan*, p. 207 f.
- 50 This is literally boiled leather/skin, but perhaps also boiled rawhide (cf. more recently Cheshire, *Cuir bouilli armour and ibid.*, *Cuir Bouilli: fracture*).
- 51 Cf. Gaydon (ed. Guessard/Luce), verse 5887, p. 178: "Cuirie ot bonne qui fu de cuir boilli". *Ibid*, verse 6487, p. 196: "Cuirie ot bonne, d'un cuir qui fu tenez". *Ibid*. verse 6402, p. 193: "cuirie ot bonne, ferré largement". Cf. also Gay, *Glossaire*, p. 520; Schirling, *Verteidigungswaffen*, p. 51; Buttin, *Du costume*, p. 400 and Nicolle, *Jawshan*, p. 211.
- 52 Cf. Gay, *Glossaire*, p. 519; Blair, *European Armour*, p. 38 and Buttin, *Du costume*, p. 400.
- 53 Cf. footnote 17.
- 54 Cf. footnote 31.
- 55 Cambridge, University Library, MS Mm.5.31, fol. 139r.
- 56 Cf. Thordeman, *Armour*, p. 285 f. with fig. 288 f.; Blair, *European Armour*, p. 39 f.; Norman, *Waffen*, p. 14 with fig. 11; Nicolle, *Jawshan*, p. 217 with fig. XIII-28 and Krabath, *Brigantinen*, p. 238 with fig. 10.
- 57 Cf. Blair, *European Armour*, p. 40.
- 58 Cf. Groll/Böttcher, *Farbfassung*, p. 92.
- 59 The impression of three horizontal hoops in

- Nicolle, Jawshan, p. 217 is probably based on the horizontal band, cf. below.
- 60 Cf. the finds from Küssnacht and Visby and some pictorial records, e.g. at Thordeman, *Armour*, p. 308-22 and p. 345 f., plates 2-9.
- 61 On the sculptures of the Holy Sepulchre, cf. Hubert, *Grab*; on the guards as well Thordeman, *Armour*, p. 286; Nicolle, Jawshan, p. 217 with fig. XIII-29.
- 62 Cf. Köhler, *Entwicklung*, p. 89-96 and Lehnart, *Kleidung*, p. 98 f. Cf. furthermore the 1181 Assize of Arms of Henry II. of England (*Assisa de armis habendis in Anglica* [1181] (ed. Stubbs): "1. Quicunque habet feodum unius militis habeat loriam et cassidem, clypeum et lanceam [...]. 2. Quicunque vero liber laicus habuerit in catallo vel in reddito ad valentiam de xvi. marcis, habeat loriam et cassidem et clypeum et lanceam; quicunque vero liber laicus habuerit in catallo vel reddito x. marcas, habeat aubergel et capellet ferri et lanceam. 3. Item omnes burgenses et tota communa liberorum hominum habeant wambais et capellet ferri et lanceam".
- (1. Whoever holds a knight's fee must have a hauberk and helmet and shield and lance [...]. 2. Whichever free laymen who have chattels or rent of 16 marks should have a hauberk and helmet and shield and lance; whichever free layman has chattels or rent of 10 marks must have a light hauberk, an iron cap and a lance. 3. Likewise all burgesses and the whole body of free men must have a gambeson, an iron cap and a lance). The equipment of the members of the Knights Templar follows a similar direction in an addition to the Rule of the Order from c. 1200 (*La règle du temple* (ed. de Curzon), art. 138, p. 109-113: "Les freres chevaliers dou covent chascun doit avoir [...] haubers et chaucses de fer, et heaume ou chapeau de fer, espée, escu, lance, mace turquese, jupeau d'armer, espalieres, soliers d'armer, III cotiaus : I d'armes et l'autre de pain taillier et I canivet [...]". Art. 141: "Et [les freres sergens] puent avoir hauberjon sans manicles, et chaucses de fer sans avant-piés, et I chapeau de fer [...]". (Art. 138: The knight brothers of the convent may each have a hauberk and iron chausses, and helmet or iron hat, sword, shield, lance, Turkish mace, gambeson, spaulders, armor shoes, 3 knives: 1 combat knife and the other for cutting bread and 1 pocket knife [...]. Art. 141: And [the serjeant brothers] may have hauberks without [mail] mittens, and iron chausses without booties, and 1 iron hat [...]).
- 63 Munich, Bavarian State Library, Clm 23094, fol. 77v; to this Puhle, *Aufbruch*, p. 201-04, Cat. No. V13 Psalter mit Totenoffizium (Beate Braun-Niehr) with illustration on p. 206.
- 64 Vienna, Kunsthistorisches Museum, *Kunstskammer*, Inv. No. Antikensammlung XII 244: www.khm.at/de/object/21eb663c98.
- 65 Cf. Nicolle, Jawshan, p. 220 with fig. XIII-43.
- 66 For further examples, see Nicolle, Jawshan, p. 219 f.
- 67 Jena, Thüringer Universitäts- und Landesbibliothek, MS.Bos.q.3, fol. 83v. Illustrated in Downen, *Introduction*, p. 25 fig. 8. On the manuscript cf. Kratzsch, *Schätze*, p. 39-44.
- 68 Cf. Thordeman, *Armour*, p. 359-70; plate 39-72 (Type II, *Armour* 8-15).
- 69 Cf. Hartweg, *Holzskulpturen*, p. 223.
- 70 Cf. Thordeman, *Armour*, p. 286 with fig. 290; Blair, *European Armour*, p. 39 with fig. 18; Hartweg, *Holzskulpturen*, p. 212-27; Norman, *Waffen*, p. 14, fig. 12; Nicolle, Jawshan, p. 217 with fig. XIII-30 and Krabath, *Brigantinen*, p. 239 with fig. 34.
- 71 Cf. Thordeman, *Armour*, p. 370-72; plate 73-77 (Type III, *Armour* 16).
- 72 Cf. *ibid.*, p. 292-294 with fig. 297, and Krabath, *Brigantinen*, p. 241.
- 73 Cf. Thordeman, *Armour*, p. 294 with Fig. 298 f.
- 74 Heidelberg, Universitätsbibliothek, cpg 848, fol. 397v. To this Codex Manesse (ed. Walther), p. 263 with plate 128.
- 75 Koblenz, Landeshauptarchiv, Bestand 1 C Nr. 1, fol. 14r; to this Kaiser Heinrichs Romfahrt (ed. Heyen), p. 78 f.
- 76 Cf. Schönauer's contribution on the Hirschstein Armour in this volume.
- 77 Cf. the forthcoming thesis by Christopher Retsch (Bamberg).
- 78 Cf. Schönauer's contribution on the Hirschstein Armour in this volume.
- 79 According to Krabath, *Brigantinen*, p. 249 on the outside.
- 80 Cf. Thordeman, *Armour*, p. 285; Blair, *European Armour*, p. 40 and Lehnart, *Kleidung*, p. 89.
- 81 Paris, Bibliothèque nationale de France, Ms. Nouv. Acq. Lat. 2290, fol. 106v, to this Nicolle, Jawshan, p. 216 with fig. XIII-25.
- 82 The same goes for the relief in Trogir in Croatia (Nicolle, Jawshan, p. 213 with fig. XIII-22), which might well depict a historicised scale armour. Modena, *Archivio capitolare*, Cod. II. 11., fol. 9r (see Nicolle, Jawshan, p. 217 with fig. XIII-27) merely shows protruding shoulders, which is more likely to indicate leather armour, as discussed below.
- 83 For example, Kelly, *Entstehung*; Blair, *European Armour*, p. 38 f.; Norman, *Waffen*, p. 14; Nicolle, Jawshan, p. 217 with fig. XIII-32 and Downen, *Introduction*, p. 23 note 36 all consider this to be a "plate".
- 84 Cf. as well Gamber, *Bewaffnung*, p. 117; Norman, *Waffen*, p. 13 f. and Downen, *Introduction*, p. 23. Nicolle, Jawshan, p. 212 considers this feature to be an effect of the padding.
- 85 For example, on the façade figures in Wells (Norman, *Waffen*, p. 13 with fig. 9) or on a miniature in Modena, *Archivio capitolare*, Cod. II. 11., fol. 9r (Nicolle, Jawshan, p. 217 with fig. XIII-27).

- 86 For example, on the lintel of the Paradise portal of Münster Cathedral in Westphalia (c. 1225) and in the manuscript of Gottfried von Strassburg's "Tristan" in Munich, Bavarian State Library, cgm 51, fol. 10r (Lake Constance area c. 1240/1250).
- 87 Cf. Prihoda, Spangenharnisch and Krabath, *Brigantinen*, p. 233 with fig. 12.
- 88 Cf. Bauer, Wilnsdorf, p. 169; fig. 13.4-6. The shape and holes are more evident on the originals than in the drawings *ibidem*.
- 89 Cf. Thordeman, *Armour*, pp. 288-292.
- 90 [Matheus Parisiensis] *Ex cronicis maioribus* (ed. Liebermann), ad a. 1241, p. 211, l. 22-24: "[...] cruda gestant coria bovina, asinina vel equina, insutis laminis ferreis pro armis muniantur quibus hactenus usi sunt". To this Thordeman, *Armour*, p. 291.
- 91 Cf. Nicolle, *Jawshan*.
- 92 Cf. Bachrach, *Crossbow*.
- 93 Cf. also in Brenker, *Armbrust*.
- 94 Cf. Richardson, *Introduction*, p. 43 f. Similarly in Nicolle, *Jawshan*, p. 207.
- 95 Cf. Schultz, *Leben*, pp. 64-68 and Masser, *Fresken*, pp. 187-195.
- 96 Cf. Brenker, *Dolche*.
- 97 Cf. Guillaume le Breton, *Gesta Philippi Augusti* (ed. Delaborde), p. 278, p. 283 f. and p. 289.
- 98 Cf. Brenker, *Armbrust*, p. 153-58.
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Tobias Schönauer

The “Hirschstein Armour”

A Coat of Plates from the Mid-14th century

In 2007, the Bavarian Army Museum managed to acquire an unusual object, namely the remnants of a coat of plates (German: “Plattenrock” or “Lendner”) from around 1350 (Fig. 1).¹ This type of armour consists of a series of overlapping metal plates that were riveted under a leather or textile base layer (Fig. 2, 3, 5, 9 and 13). A breastplate covered a large part of the chest. Thus, this object constitutes a link or transitional form from the mail hauberk to the full suit of plate armour of the 15th century. What makes this coat of plates from the Army Museum so special is that so many of its components have survived in their entirety, such as the breastplate with its four arming chains and some 33 fragments of individual smaller plates.² The Ingolstadt specimen, also known as the “Hirschstein Armour”, is “possibly the earliest and most extensive example of this type”³ in the world. So far, no comparable piece has been documented.

Fig. 1 Coat of plates (“Plattenrock” or “Lendner”) c. 1350, which is known as the “Hirschstein Armour” (Bavarian Army Museum, Inv. No. 0162-2007)

From the find near Passau to a national heritage

The exact history of the find and acquisition of this object is somewhat murky. Apparently, the detectorist Michael Zimmermann came across the remnants of the armour in 2003 near the ruins of Hirschstein Castle near Fürstenzell-Irsham (district of Passau) and retrieved them from the soil.⁴ This “burgstall” (i.e. site of a castle of which hardly anything is left) had been destroyed in 1374 and completely levelled in 1384, so it stands to reason that the pieces of armour ended up in the ground at that time.⁵ In addition to the fragments of the coat of plates, Zimmermann unearthed some other finds (crossbow bolts, iron nails, a stirrup, keys, a hammer head and more)⁶ that are also highly interesting. He reported the find to the responsible authorities, but cleaned the armour so vigorously that even later restorative examinations were unable to provide any information about the material on which the metal parts were mounted originally.⁷

In the same year, the responsible district archaeology carried out several months of excavations at the site and unearthed further crossbow bolts, shards of clay and other iron parts in addition to some remnants of the original castle building.⁸ According to Zimmermann, the few remnants of the walls of a possible stone building were to indicate the exact location where the coat of plates and the other objects had been found. The responsible district archaeolo-



Fig. 2 Effigy for Walter of Bopfingen († 1359) in the Church of Saint Blasius in Bopfingen, Baden-Württemberg
The coat of plates worn by the person depicted is probably very close to the Hirschstein Armour.

gist, however, raises the question: "how ... the armour parts, some of them rather bulky, managed to remain undiscovered during the widespread removal of material at the time [in the 14th century] is difficult to comprehend".⁹

The foundations of Hirschstein Castle and the quality of the remnants were so poor that it must be assumed that it was a "rather simple complex without any great defensive qualities and with unassuming buildings."¹⁰ The large number of crossbow bolt tips found, only two of which ended up in the collections of the Bavarian Army Museum, suggest an armed conflict at this location, even though crossbow bolts were often kept in large numbers at castles and strongholds for possible emergencies.¹¹ However, the often suggested link between the armour and the robber baron Zacharias Haderer, who held Hirschstein Castle from 1367, is not provable at all.¹² It is obvious that it is an item that found its way into the ground when the castle was destroyed in 1374 and is thus connected to Haderer. But whether it belonged to this man himself is not at all clear, so that it would be wrong to call it "Zacharias Haderer's Plattenrock", as has been done time and again in Germany.¹³

In 1374, Zacharias Haderer killed the episcopal lord steward with his own hands, which is why troops of Bishop Johann of Scharffenberg (1381-1387) destroyed Hirschstein in the same year.¹⁴ Apparently, however, this murder did not have any major repercussions, because in 1390 Haderer and his sons sold Partenstein Castle (Upper Austria) to the new Bishop of Passau. In 1384, the stones of Hirschstein Castle were sold to the Fürstenzell monastery. The abbot of the time, Jakobus Westendorfer, then had the "burgstall" completely dismantled and the stones used as building material for construction work at the monastery. After his discovery, Michael Zimmermann acquired full ownership of the coat of

plates and offered it for sale at the Hermann Historica auction house in Munich in 2007.¹⁵ Among experts, it quickly became clear what an exceptional piece was being put on the market here. There was no comparable object anywhere in the world, which is why the Bavarian Army Museum had two expert opinions prepared on the significance and uniqueness of the coat of plates.¹⁶ The aim was to have this coat of plates classified as a nationally valuable (movable) cultural asset in order to prevent its sale outside Germany. The very fact that such pieces had previously been known only from pictorial representations (Figs. 2 and 3) and descriptions, as well as from sporadic and fragmentary archaeological finds, made this finding so exceptional. It is comparable to the armour and skeletons found in the mass graves of the Battle of Visby (1361) on the Swedish island Gotland, which continue to preoccupy scholars to this day.¹⁷ Further comparative pieces are the armour fragments from Küssnacht and from Helfenstein Castle.¹⁸

But complete breastplates like that of the Hirschstein Armour were found neither in Visby nor in Küssnacht or Helfenstein. It is particularly the four chains on the breastplate of the Ingolstadt specimen that are singular in this form making it an important reference piece.¹⁹ In the end, the expert appraisal and the push by the Bavarian Army Museum were decisive in ensuring that the Hirschstein coat of plates was eventually classified as a nationally valuable cultural asset, which meant that it could no longer be sold abroad. It was only this step that allowed the Army Museum to acquire the piece, now internally referred to as the "Hirschstein Armour", at the auction. The object is of such great scientific importance that colleagues from various countries, including the USA, had come to the auction to bid.²⁰ In this case, it would certainly not have remained in Germany owing to the substantial purchase price to



Fig. 3 Detail of the high altar of the church St. Maria zur Wiese in Soest (unknown artist), c. 1350. The saint wears a coat of plates with three arming chains. (Berlin State Museums, Gemäldegalerie, Cat.No. 1519)

be expected. As it was, however, the Bavarian Army Museum was able to acquire the coat of plates together with the other findings on offer and add it to its collection. Today it is the centrepiece of the new Treasure Chamber.²¹

The remaining findings

In addition to the plates and remnants of the coat of plates, Zimmermann retrieved further metal objects from Hirschstein Castle in 2003, some of which came into the possession of the Army Museum (Fig. 4). They are as follows:

- a) one stirrup
- b) the blade of a knife (?)
- c) one rowel spur with a six-pointed rowel
- d) & e) two spanning hooks for crossbows
- f) & g) two tips of crossbow bolts
- h) one head of a claw hammer
- i) one iron nail
- j) & k) two keys
- l) one pad(?)lock

- m) one bodkin point (?)
- n) one fragment of a bodkin point (?) or an awl (?)
- o) possible part of a mouthpiece of a snaffle bit (?)

Many of these metal objects indicate that they ended up in the ground during a military conflict. At this point, we will only look at a few selected finds that could possibly be attributed to military use. Metal was precious in those times, so it can be assumed that such a large quantity would only have been lost in the course of the destruction of the castle in 1374. Some pieces, however, rather indicate everyday use, such as the iron nail or the lock.²²

But for our question the knife blade certainly is of particular interest.²³ For a time, this object was thought to be the blade of a halberd.²⁴ If this were true, it would represent the oldest halberd that can be dated with any degree of certainty.

However, if one looks at corresponding comparative pieces, such as a butcher's kni-



Fig. 4 The remaining findings.

fe from the Constance fish market²⁵ or a cleaver from the excavations at Tannenberg Castle²⁶, the assumption that it is the blade of a halberd cannot be upheld. Apparently, it is indeed the blade of a knife, although this object could also have been used as a makeshift weapon. As for the two bolt tips²⁷ and the two spanning levers²⁸, it is not certain that they were accessories for war crossbows; the way the former were made, however, suggests that they are war bolts to be used for military ends.²⁹

The two long, triangular metal fragments are difficult to determine. Perhaps they were mounted on a shaft and used as bodkin points in armed conflicts. Comparative pieces, however, do not sport a tang to attach them to the shaft, but rather a socket.³⁰ The fragment of the triangular spike³¹ could also be from a bodkin point, or perhaps just an awl.³² Apart from the stirrup³³ and the rowel spur³⁴, the semi-circular metal fragment³⁵ likewise seems to be part of some horse tack. It is conceivable that this is part of a snaffle bit;³⁶ it could

also be part of the fittings of a saddle tree. The original assumption that a shoe heel had been found here is wrong, since heels were not found in Central European fashion until about 1600 (also on riding boots). Heel irons do not occur until much later.³⁷

Mail hauberk – brigandine – coat of plates. The development of body armour in the 14th century

The 14th century was in some respects a phase of experimentation in armour technology.³⁸ During this period, body armour evolved from the mail hauberk of earlier centuries to the complete suit of (plate) armour. According to Blair, the time frame in which the coat of plates appeared and disappeared again lasted about 150 years: "from the middle of the 13th century on ... to the «white armour» of the 15th century".³⁹ In this, he is probably referring primarily to pictorial representations, as in literary sources the coat of plates can be



Fig. 5 Romance of Alexander, 1338-1344

At least three of the horsemen are wearing coats of plates. On the left, the closure on the rear of the armour is visible. (Bodleian Library, MS. Bodl. 264, fol. 66r)

found even earlier, probably around 1200 (cf. Brenker's contribution in this volume).

The singularity of the Hirschstein Armour lies in the fact that it represents one of the important links between the mail hauberk and the earliest examples of plate armour known to date. Plate armour is a "complete body armour for war and jousting made of interconnected ... iron plates"⁴⁰, which reinforces, "as an additive system, the ring-mail armour".⁴¹ The coat of plates, on the other hand, was originally a "cummerbund raised at the front and made of vertical iron plates riveted into a surcoat or a leather garment".⁴² It is likely that this coat of plates evolved into the brigandine in the mid-14th century.⁴³ This armoured doublet consisted of "iron lames [or small plates] riveted to the inside of the regular linen garment covered with coloured velvet".⁴⁴ Generally speaking, one could say that the brigandine consisted of a larger number of smaller plates, whereas the coat of plates was constructed from a smaller number of larger plates.⁴⁵ The breast plates of the brigandine were often divided into two, so that this garment could be opened at the front;⁴⁶ however, one-piece brigandines also existed.⁴⁷ The mail hauberk (colloquially "chain mail") was invented by the Celts in the 3rd century BCE and later adopted by the Romans.⁴⁸ Although other forms of armour were also used at times (e.g. scale⁴⁹ or Roman iron strip cuirass⁵⁰), mail armour remained in use until the 14th century "more or less unchanged".⁵¹

In the 12th and 13th centuries, sources make isolated references to possible plate armour.⁵² Whether these were only isolated cases which did not yet develop into a "norm" is at least debatable.⁵³ There is also no uniform terminology to be found in the research literature. Among others, the following terms can be found: coat of plates, corrazin, lamellar armour, scale armour,

brigandine or jack of plate.⁵⁴ Often, the sources only refer to "platten"⁵⁵, "cote à plates"⁵⁶ or "pair of plates".⁵⁷ Krabath suggests that the reason for this is "that very little is known about the appearance of early armour. References to plates in the written sources give no indication of their appearance or their arrangement on the protective clothing".⁵⁸ In this context, one should mention above all the statue of Saint Maurice in Magdeburg Cathedral, which is considered the oldest depiction of a coat of plates in the visual arts. It is generally dated to the middle of the 13th century (Figs. 3 and 4 in Brenker's contribution in this volume).⁵⁹ But other depictions, such as a guard figurine from Wienhausen Abbey (Fig. 11 in Brenker's contribution in

Fig. 6 Baptismal font of the Hildesheim Cathedral with the personification of the river Tigris (virtue of bravery), c. 1226
The figure wears mail chausses and mail mittens.



this volume) in the district of Celle (last decade of the 13th century) or effigies, also show different versions of coats of plate (e.g. Fig. 2 or 9).⁶⁰

Yet the mail hauberk remained the most important protective garment for the armoured horseman until the first quarter of the 14th century. "The heavy cavalryman – the knight – wore mail armour that was still basically of a form that had remained in use since it had been adopted in the later Roman Empire".⁶¹ It is worth noting here that the wearing of armour is not necessarily an indicator of social rank or status.⁶² Burghers (e.g. merchants or craftsmen), mercenaries and even servants or simple soldiers wore armour, too. In other words: Not only knights were clad in armour.

In the 12th century, the mail hauberk still reached to about the knees and featured long sleeves.⁶³ The legs, too, were now protected by being covered with mail tied with laces at the rear;⁶⁴ in some cases, these were already stocking-like constructions.⁶⁵ The hands, for their part, were covered with mail mittens, which were directly connected to the mail hauberk (Fig. 6).⁶⁶

In order to effectively slow down the impact of blows, quilted garments stuffed with animal hair or tow were worn under the mail hauberk. Mail, however, only provided protection against cuts and limited protection against thrusts. Thus, around 1250, the body protection was supplemented in some areas with "shaped reinforcing plates"⁶⁷ which were usually attached to the knees and elbows on top of the mail and shaped accordingly.⁶⁸ These plates were made of leather (sometimes also called "cuir bouilli"⁶⁹) or metal and can be seen in book illustrations and on effigies (Fig. 7, 8, 9 and 12).⁷⁰ Apparently, the plate armourers also experimented with a number of other materials such as horn or brass. At the same time, attempts were made to protect the shins with ap-



Fig. 7 Detail from the Codex Manesse, c. 1300 to c. 1340
The horseman on the left wears a greave of leather or cuir bouilli. The depiction can be dated to 1330/1340
(Heidelberg University Library, Cod. Pal. germ. 848, fol. 397v)



Fig. 8 Effigy for Albrecht of Hohenlohe († 1338), former Schöntal Abbey (Baden-Württemberg). Besides the mail hauberk, he is already protected by poleyns and forearm guards. A pair of plate gauntlets is depicted at the top right. The fingers are made of movable, interconnected small lames.

appropriately shaped plates (Fig. 9), too.⁷¹ Until about 1330, the warriors depicted on effigies seem to have relied solely on mail hauberks for protection – only at the knees are plates sometimes visible.⁷² Written references to thigh armour (cuisses) with iron knee protectors (poleyns) or arm guards, believed to have been worn under the mail hauberk, have existed since the early 13th century.⁷³ This is probably the reason why they are not depicted on effigies. By the end of the 14th century, both arms and legs were completely encased in metal tubes for protection.⁷⁴ The articulated elbow and knee protectors were attached to the main arm and leg armour. Plate armour shoes (sabatons) first appeared around 1320, but didn't catch on in Germany until about 1340.⁷⁵

To protect the hands, armoured gloves were used which were made up of numerous plates and were thus quite flexible (Fig. 8).⁷⁶ The first evidence of these can be found from the end of the 13th century onwards, and later the back of the hand was covered with a larger plate. In the first third of the 14th century, these plate gauntlets replaced the mail mittens. The earliest known examples are from the finds at Visby (1361)⁷⁷ and from Körse Castle (district of Bautzen), which was razed to the ground in 1352.⁷⁸ Thus, the protection of the hands by means of a construction of adapted plates in a way predates the development of the coat of plates. In the first half of the 14th century, arms and shoulders were then covered with splints as well, and a complete arm defence made of partially hinged and appropriately shaped plates developed.⁷⁹

Written evidence suggests that some kind of plates were worn under the tunica-like padded outer garment (the so-called gambeson) as early as the 13th century.⁸⁰ There is, however, no pictorial evidence of this, as the plates were completely hidden under the fabric. Most probably, it was the

further evolution of the crossbow in the 12th and 13th centuries that prompted the development of more efficient body protection.⁸¹ Using "composite" crossbows made of different materials (including horn, wood and sinew) and no longer just wood considerably increased the penetrating power of this dreaded weapon,⁸² which was further amplified by the various devices invented to make the crossbows easier to span (belt hook, windlass, etc.).

But it was not until the second quarter of the 14th century⁸³ that the chest began to be protected with a larger breastplate, which was fastened inside a fabric cover with rivets.⁸⁴ The rest of the torso was protected by smaller plates that overlapped slightly "in vertical lines and horizontal rows".⁸⁵ Instead of the smaller plates, it was also possible to use horizontally arranged longer lames (laminar armour).⁸⁶ And so, through experimenting over the decades, the later coat of plates gradually developed.⁸⁷

From the outside, only the rivet heads on the backing material were visible on these armours (e.g. Fig. 2, 3 or 9). To prevent the fabric from tearing, the rivet heads were forged to be relatively wide and flat.⁸⁸ In the case of the Hirschstein Armour, it is not clear what backing material had been used. The rivet heads have a diameter of 8 to 10 mm and the distance between the rivet head and the plate is about 2 mm,⁸⁹ which means that it might have been leather or textile. Perhaps a small piece of leather was placed between the rivet head and a textile to serve as a kind of washer, as was done, for example, on the brigandine from Tyrol Castle.⁹⁰ This would have prevented the textile from tearing. Leather alone, on the other hand, would probably have stretched considerably around the rivet holes over time, causing the plates to lose their hold,⁹¹ or the coat of plates would have elongated due to the stretching of the holes. Using a leather washer

Fig. 9 Effigy for Otto VI (VII) of Orlamünde († 1340) in the monastery of Himmelkron (District of Kulmbach, Bavaria)

From the outside, only the four arming chains of the coat of plates are evident (one of them hanging over the shoulder) as well as the rivet heads.





Fig. 10 The eyelets for the arming chains of the Hirschstein Armour are decorated with rosettes. Rivets were used to secure the plate to the backing material from the inside. Several of the rivet heads can be seen in the photo.

might have prevented both. However, since no remnants were found, this must remain speculation. Analyses allegedly carried out by the finder before restoration or cleaning indicated that only one layer of leather had been used.⁹² However, as neither the organic material remnants examined nor the analyses themselves are available or have been published, this claim cannot be verified. The objects examined from Visby show that both textile and leather were used,⁹³ while only textile was used in the finds from Tannenberg.⁹⁴ Metallurgical examinations have shown that the rivet heads of the Hirschstein Armour were tinned, probably to protect them against rust.⁹⁵ The eyelets to which the arming chains were attached were well visible on the outside and therefore

heavily decorated with rosettes. Two of the originally four rosettes have survived (Fig. 10).⁹⁶ Metallurgical analyses conducted at the “Anwenderzentrum Material- und Umweltforschung” of the University of Augsburg on 19 January 2016 using a scanning electron microscope moreover concluded that the armour was made of steel with a carbon content of about 0.5 to 0.9%, although it is conceivable that being embedded in the burnt layer led to a change in the carbon content.⁹⁷ Initially, coats of plates tended to be barrel-shaped and were usually completely concealed under the surcoat, an overgarment, so that it is difficult or impossible to identify them clearly in illustrations.⁹⁸ Between 1350 and 1370, the coat of plates was given a more tailored cut (Fig. 13), in kee-

ping with civilian fashion, and is referred to as a "Lendner" in German weapons studies.⁹⁹

Although there are archaeological finds of this type of armour, they are neither extensive nor numerous.¹⁰⁰ It is above all the completeness of the breastplate, the four preserved arming chains and the large number of surviving smaller plates that make the Hirschstein find so exceptional and important for science. During excavations, single plates turn up now and again that are most probably part of a coat of plates or a brigandine. Such fragments have been found, for example, at Tannenberg Castle¹⁰¹, in Treuchtlingen¹⁰², at Schönenwerd Castle (Switzerland)¹⁰³, at the Lichtenegg castle ruins west of Sulzbach-Rosenberg¹⁰⁴, at the tower castle of Nürings (municipality of Königstein, Hochtaunuskreis)¹⁰⁵ or the Landeskron mountain near Görlitz.¹⁰⁶ Renowned findings include those at Otepää Castle in Estonia (destroyed in 1396)¹⁰⁷ or the laminar armours from Küssnacht in the canton of Schwyz, which can be dated to the period between 1340 and 1360.¹⁰⁸ In 2019, the Army Museum also managed to purchase the remnants of a brigandine that had been found in a cellar in Lower Bavaria (Fig. 11).¹⁰⁹ Archaeological finds of indivi-

dual plates, however, cannot always be attributed without doubt to a specific type of armour (coat of plates, brigandine...),¹¹⁰ in part because the organic remnants of the backing material are usually no longer detectable.¹¹¹ The breastplate of the coats of plates became larger over the decades, as it was evidently realised that a larger plate did not interfere with the bending of the torso. Until 1360, the breastplate only covered the chest up to above the diaphragm, while the rest of the torso was protected with horizontal metal strips.¹¹² It was not until around 1370 that the breastplate was gradually worn in a more visible manner, extended to the hip and also more elaborately fashioned and executed.¹¹³ Complete comparative pieces are few and far between (e.g. in the collections of the Churburg in the Vinschgau region of South Tyrol), but they are generally dated to 1380/90 and are already significantly larger than those of the Hirschstein Armour.¹¹⁴ The Hohenaschau breastplate in the Bavarian National Museum, which dates to about 1380, is already quite large, but still covered in red velvet.¹¹⁵ It seems to be the only surviving example of this type. On tombstones, it is often impossible to tell whether a coat of plates is depicted or such a later, larger breastplate.¹¹⁶

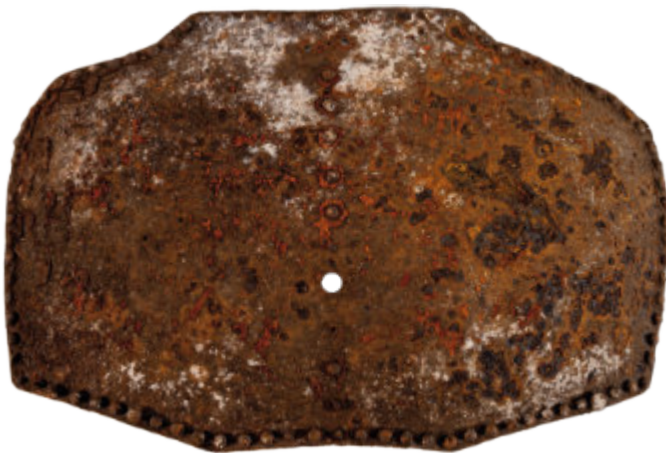


Fig. 11 Backplate of an unrestored brigandine (found in a cellar in Lower Bavaria). Remnants of the textile backing material are still in place. (Bavarian Army Museum, Inv. No. 0665-2019)

Fig. 12 Tomb of Günther of Schwarzburg (1349) in the cathedral at Frankfurt a. M. Forearms, legs, knees and elbows are already protected with splints and curved pieces of metal.



Later, the individual parts of the armour were no longer riveted into a textile or leather overgarment, but rather displayed openly.¹¹⁷ This trend was probably also related to the development of tournaments with their special equipment (cf. also Schönauer's contribution on the tournament cap in this volume). The back, however, was still protected by smaller plates riveted onto textile or leather.¹¹⁸ It took a while, before this "brigandine system ... [was supplemented by] smaller back-plates as well as two back halves suspended from the chest piece".¹¹⁹ It was probably not until after 1400 that the back was also covered with a larger back-plate.¹²⁰

The Churburg chest armour consists of nine plates riveted to a leather backing and already forming a flexible system together.¹²¹ At the back, these plates were joined together with leather straps and thus also protected the sides against strikes. It did not yet feature a back-plate. Thus, the Churburg armour is already an evolution of the coat of plates. As far as the visual arts are concerned, the statue of Saint George on the Hradčany in Prague should be mentioned at this point. It dates from 1373 and shows the large breastplate in great detail.¹²² The remainder of the torso (back and front) is protected by smaller plates. The level of detail on the saint is extraordinary and suggests that here "the individual plates were attached on the outside of some kind of backing".¹²³

Coinciding with the development of the coat of plates, one began to protect not only their knees but also the elbows, arms and legs with tubes or plates made of hardened leather or metal.¹²⁴ There had been earlier, isolated instances of tubular leg and arm armour combined with the mail hauberk, but these now seemed to be catching on more and more. Eventually, these protective measures were applied step by step to the entire body. The mail hauberk was shortened to the level of the buttocks.

Fig. 13 Detail from:
Guiron le courtois, Milan
 c. 1370-1380.
 A coat of plates is suspended
 on a stick/hanger. Next to it
 a bascinet with attached
 aventail.
 The great helm on its stand
 sports a cross-shaped perforation
 on the front.
 (Bibliothèque nationale
 de France, 5243, Nouvelle
 acquisition française, fol. 26r)



A very well preserved example of such a "German mail shirt" (probably made between 1390 and 1450) can be found today in the Royal Armouries (inv. no. III.4675).¹²⁵ Other mail hauberks are either very difficult to date or not precise enough. Over the decades, the individual plates became larger and their number decreased.¹²⁶ In this way, the suit of complete plate of the 15th century evolved – the archetypical "knightly" armour. The coat of plates was still worn over a mail hauberck – this is evident from some effigies, sculptures or paintings.¹²⁷ Although there are indications that the coat of plates was sometimes worn underneath the mail¹²⁸, this is rather implausible, as the plate was meant in part to deflect weapons or make them slip off to the side.¹²⁹ A heavily padded undergarment remained in use as well.¹³⁰ This protected against bruises, broken bones, internal injuries, etc. otherwise caused by blows with

swords or striking weapons. Sometimes, this garment is clearly visible under the coat of plates on effigies; sometimes it was also worn over the armour.

An interesting detail of the Hirschstein Armour are the four arming chains sometimes called *mamelieres*, which are attached to the breastplate via highly decorated eyelets (Fig. 1 and 21). "These [arming chains] are the first surviving ones to be discovered".¹³¹ Only two of the eyelets were still present, of the other two just the rivet hole has survived. These chains are a special feature of this period. They were used to secure a sword, helmet, dagger, the shield or another piece of equipment.¹³² If, for example, the sword was knocked out of the knight's hand in battle, he could recover it. A great helm (dated 1310-1320) from Madeln Castle in Switzerland sports a cross-shaped hole on the lower right edge where the arming chain could be fastened with the help of a toggle



Fig. 14 Bascinet, 1350-1370
Supposedly found in the "moor near Chiemsee"
(Bavarian Army Museum, Inv. No. A 5601)

(a similar hole is visible in Fig. 13).¹³³ The statues of the so-called "Mainzer Kurfürstentzenzyklus" from around 1330 show these arming chains and their use quite distinctly.¹³⁴ Thus, when not in use, the helmet was simply hung over one shoulder.¹³⁵ These chains also appear sporadically on effigies, giving an indication of their use. Particularly striking examples are visible on the effigies of Otto of Weimar-Orlamünde († 1340) in the monastery of Himmelkron (Bavaria, Fig. 9), Walter of Bopfingen († 1336) in the Church of Saint Blasius in Bopfingen (Baden-Württemberg, Fig. 2) or Heinrich of Seinsheim († 1360) in the Cathedral of Saint Kilian in Würzburg (Bavaria).¹³⁶ Effigies showing coats of plates (some with arming chains) have also survived in England.¹³⁷ However, the purpose of these chains is at the very least questionable.¹³⁸ When striking with a mace or a war hammer, for instance, the weapon

could easily get caught in the opponent's mail or armour, and when fighting on horseback, an opponent plunging from his horse would pull the attacker with him, off his own horse – in this case the chain would be a hazard. In a sword fight, it would have been more of a hindrance than a help as well. Apparently they did not last long as a piece of equipment either and are far more common on the continent than in Britain.

At the turn of the 13th and 14th centuries, the bascinet, a light helmet that left the face exposed, was used to protect the head (Fig. 14).¹³⁹ Often, a so-called aventail, a mail collar could be attached to the lower rim of the helmet. The aventail extended over the upper part of the chest and the back and almost always was fixed to some textile backing material.¹⁴⁰ This wearing method can be clearly seen on effigies. The tomb of Edward Plantagenet "The Black Prince" (1330-1376) with its original weapons and equipment is a case in point.¹⁴¹ The bascinet was sometimes worn underneath a great helm which developed into a pure jousting helm in the second half of the 14th century.¹⁴² In its stead, the bascinet was fitted with a nasal and, from the 1360s onwards, with a visor.¹⁴³

In addition to the sword (cf. Geibig's contribution on swords in this volume), a dagger also formed part of the equipment in this period. Blade length and the shape of the grip differed greatly. A popular type was the ballock dagger, "with two ball-like swellings at the transition to the blade"¹⁴⁴ and the baselard dagger with a transverse pommel, that runs parallel to the crossguard.¹⁴⁵ Other striking weapons (especially the battle axe or the mace) were also common, but lances and another pole weapons were also used.¹⁴⁶ Coats of plates were used until about 1410, before they were gradually replaced by the complete suit of armour.¹⁴⁷

The Hirschstein Armour and its distinctive features

The Hirschstein Armour today consists of the breastplate as well as 33 individual smaller plates in very differing states of preservation.¹⁴⁸ The breastplate measures 29.5 by 21.5 cm and has a material thickness of 1.7 to 2.3 mm. In terms of size, it corresponds to the two breastplates found in Otepää Castle in Estonia.¹⁴⁹ It should be born in mind, however, that the rigorous and unprofessional cleaning measures of the finder¹⁵⁰ may have affected the wall thickness. Moreover, the progressive corrosion of the item has certainly taken its toll, too. The individual components of the coat of plates were discovered in a burnt layer.¹⁵¹ Therefore, it is conceivable that the individual plates were exposed to fire over a longer period of time. If this were the case, it would have led to a carburization of the surface and thus to a kind of protective layer.¹⁵² However, this layer would only have been located on the surface, whereas the metal core inside would have continued to corrode. This causes an increase in volume "which has the tendency to crack the outer burnt layer".¹⁵³ But as the top layer was almost completely removed by the finder, it is not possible to say with certainty whether and to what extent fire and "cleaning" had an effect on the wall thickness of the plates.

The breastplate features a row of rivets along the upper rim, as well as the armholes and the sides. There is also a row of rivets that runs across the plate slightly below the centre. Of the original 29 rivets on the breastplate, 17 can still be traced with heads. The sequence of almost all the rivets, however, can be well reconstructed from the existing rivet holes.¹⁵⁴ Despite the corrosion, it can safely be assumed that there were no rivets on the lower rim of the breastplate. This is an indicator that the various plates overlapped, for other-

wise the breastplate could have been better secured to the textile or leather covering with a number of rivets running around it, as is usually the case with breastplates of brigandines.¹⁵⁵

There is a star-shaped mark on the reverse of the Ingolstadt breastplate (Fig. 15). It is impossible to say with certainty whether this is really an armourer's mark in the strict sense, an accidental indentation/scoring or a mark deliberately applied at a later date.¹⁵⁶ If it were authentic, and so far, this can be assumed, this may in fact be the oldest known armourer's mark ever.

There are five perforations in a symmetrical arrangement on plate 0162-2007.5, which could also be a mark, but because of the heavy corrosion this cannot be said with certainty.

Most of the smaller plates from the find feature one, sometimes several rivets or holes where the rivets were once located. The different state of preservation of these plates makes it nearly impossible to group them. Today, the thickness of 27 of the 33 plates is between 1.5 and 2 mm, so that it can be assumed that the small plates were probably 2 mm thick and thus somewhat thinner than the breastplate. The riveting was "probably accomplished with a few blows".¹⁵⁷ The rivet heads are flat and not particularly decorated. Apparently, only

Fig. 15 Star-shaped mark (?) on the reverse side of the breastplate



the attachments of the arming chains to the breastplate were given special attention in terms of their decoration. Yet on effigies, we often see that any visible rivet heads were made of bronze or precious metal as an ornamental element.¹⁵⁸ This was, however, an additional, rather significant cost factor. Since most of the plates of the Hirschstein Armour have a maximum size of 11 x 6.5 cm and are thus rather small and cross-rectangular, it would have been easier to fit the coat of plates better to the body of the wearer, compared to specimens with larger plates.¹⁵⁹ Thus, it is very likely that we are dealing with a waisted coat of plates (called 'Lendner' in German) rather than a barrel-shaped one.

Presentation up until 2014

Shortly after its acquisition, the armour was made accessible to the public in the permanent exhibition in the New Castle of Ingolstadt and was also shown in the Bavarian State Exhibition in Rosenheim in 2008.¹⁶⁰ Inexplicably, however, the find was presented in the configuration of the Hermann Historica auction house (Fig. 16), which was designed to show as many of the larger and therefore supposedly more interesting pieces as possible – but this led to just 13 of the altogether more than 30 individual pieces to be visible. None of the metal plates, however, were attached to the back of the bust. Moreover, the bust was displayed lying on its back and not illuminated separately.

The composition of the individual plates on the chest was not very satisfactory, but the circumstances of the find were not suitable for attempting a reconstruction based on the position of the individual parts in the ground.¹⁶¹

From 2013 onwards, the author began to study this object more intensively with the aim of reconstructing and presenting it in a more reasonable way. From the begin-

ning, it was clear that the distribution and arrangement of the plates could not be correct. The position of the rivet heads was arbitrary, the collar directly above the breastplate would have made lowering the head impossible. The positioning of the plates on the bust was based only on their height, not on their width; other parts, such as a clasp, were neither attached nor displayed, and so on. Therefore, we wanted to attempt to reconstruct the coat of plates professionally on a scientific basis.

Fig. 16 Coat of plates in the configuration of the auction house Hermann Historica (2007)



The reconstructions of 2014 and 2017

The visit of Dirk H. Breiding and Tobias E. Capwell provided the perfect occasion for this. Both only knew the object from the auction catalogue and were very interested in it. When the coat of plates was being requested for the 2014 state exhibition "Ludwig der Bayer – Wir sind Kaiser!" ("Louis the Bavarian – We are Emperor!") that same year, the author, as the new curator for the Department of Edged Weapons at the Army Museum, attended to the issue of reconstruction. It quickly became clear that the uniqueness of the object also brought with it considerable difficulties: there was a lack of comparative pieces on which to base a reconstruction. Moreover, some parts of the Hirschstein Armour have only survived as fragments, while other parts are missing completely. There were also various approaches to reconstructing the original arrangement: should it be based on other archaeological finds (e.g. Visby), on effigies (e.g. Walter of Bopfingen or Otto of Orlamünde) or paintings (e.g. a retable from around 1340/1350 in the Bode Museum in Berlin).¹⁶² Another approach would have been a reconstruction based on historical clothing and fashion, as it is well known that the placement of the rivet heads, which were usually visible on the backing material, could often provide information about the positioning of the plates. In the end, it was decided to pursue all approaches together and a small team of specialists was assembled. On 3 and 4 February 2014, the following people were brought together in Ingolstadt for this working meeting:

Dr Raphael Beuing:
Curator of Arms and Armour at the Bavarian National Museum in Munich

Dr Dirk H. Breiding:
Former Curator of Arms and Armor at the Philadelphia Museum of Art (then still at the Metropolitan Museum of Art, New York)



Fig. 17 Reconstruction of the Hirschstein Armour in February 2014 (from left to right: Dr Alfred Geibig, Tobias Capwell PhD, Dr Tobias Schönauer, Dr Raphael Beuing)

Dr Tobias E. Capwell:

Curator of Arms and Armour at the Wallace Collection in London

Dr Alfred Geibig:

Former Curator of Historical Weapons at the art collections of the Veste Coburg

Dr Kerstin Merkel:

Honorary Professor at the Catholic University of Eichstätt-Ingolstadt (focus: medieval tombs, social function of clothing and fashion in the Middle Ages)

Dr Tobias Schönauer:

Curator of Arms and Armour at the Bavarian Army Museum in Ingolstadt

After various preliminary considerations, all the pieces were taken off the bust of the auction house. We did not want to be influenced by their rather arbitrary positioning. It goes without saying that all the pieces were used for the reconstruction, including those that had not previously been seen on the bust. Tobias Capwell described the endeavour very aptly as follows: “It felt very much like trying to put together a jigsaw puzzle with forty or fifty percent of the pieces missing, the available pieces having had their original external surfaces completely removed, and with no box cover image to work from”.¹⁶³

When examining the small plates, the team found that some had been very badly deformed during restoration – e.g. individual pieces had been partially covered with synthetic resin and glued together.¹⁶⁴ In the case of fragment 0162-2007.27, a strip of sheet metal from another part of the armour had been glued on to stabilise it.¹⁶⁵ The proper reconstruction work started out with the assumption that the coat of plates ended at waist level and did not extend lower. The clues for this were the finds from Visby,¹⁶⁶ period effigies and pictorial representations. This type of protective armour did not extend beyond the waist until 1370. The actual dating of the piece results from the relatively small breastplate.¹⁶⁷ Together with the fact that the castle was destroyed in 1374 (see above), the assumption that it is a specimen from around 1350 can be maintained. However, it is still unclear how long such items were actually in use, so it might well be older.¹⁶⁸ It seems that in the beginning smaller breastplates were used, probably for technical reasons, because it was not until the 14th century that forging larger plates became easier (probably also due to the advent of hammer mills).¹⁶⁹ Hence, breastplates became larger and larger in the course of the following decades. Perhaps this was because it was assumed that the

area below the chest remained more flexible with a smaller breastplate and that the wearer could only move with ease – especially bend over – when using a small plate. Soon, however, the warriors realised that this was not the case. This and other considerations served as the basis for the reconstruction.

Some of the individual pieces display notches, which the team identified as “serial marks”, i.e. a kind of construction mark (Fig. 18). They could have served to show the blacksmith or plate armourer¹⁷⁰ which parts belonged to a particular coat of plates or how the armour had to be assembled. Quite interestingly, similar conjectures were also made in 2015, i.e. one year later, with regard to the armour fragments from the Landeskrone near Görlitz, where notches were likewise found on individual pieces.¹⁷¹ One possible explanation could be that after polishing, the finished pieces were sent as a lot (in “one big crate”, so to speak), by the polisher to the craftsman (presumably a plate armourer¹⁷²), who then undertook their final assembly. Perhaps such coats of plates were also made in larger numbers, so that it was easy to lose track of the individual parts. This would indicate that this type of armour was also affordable for less affluent secti-

Fig. 18 Fragment with probable construction marks (clearly visible at the lower right edge) (Bavarian Army Museum, Inv. No. 0162-2007.21)





Fig. 19 Shoulder plate
(Bavarian Army Museum, Inv. No. 0162-2007.01)

ons of the population and thus probably more widespread than previously assumed.¹⁷³ The reconstruction attempt began with the parts that could be clearly assigned – i.e. with the breastplate and the shoulder plate (Fig. 19). The possible positioning of the other pieces was discussed on the basis of the curvature of the rivets, the condition of the edges, etc. One small plate in particular, perhaps originally heart-shaped, attracted attention and was placed between the shoulder plates.¹⁷⁴ The back piece of the brigandine from Helfenstein Castle in Württemberg served as a comparison, even though it is considerably larger.¹⁷⁵ Coats of plates were tailored to the anatomy of the wearer through the use of differently sized and curved plates.¹⁷⁶ This fact was used for the reconstruction. Thus, the extant shoulder plate was placed on the left shoulder because of its curvature, whereas the second one – which has not survived – was probably of the same shape, i.e. symmetrical, so that the right shoulder would also have been a possibility. The team placed the clasp mechanism, which until then had been located on the back, on the right shoulder. Models for

this can be found in historical illustrations, and the shape also seemed consistent here. Another positioning is also conceivable, however, and was discussed again in a later reconstruction (see below). Furthermore, it is not entirely certain that this clasp belongs to the armour. Above all, the various patterns of coats of plates known from the Visby finds do not allow any clear statements about the position of the clasp mechanism.¹⁷⁷

Initially, the direction of overlap of the individual plates was unclear: overlapping or underlapping.¹⁷⁸ The team thought it conceivable that the two top rows overlapped in a different way than the two bottom ones. Examples of this include a brigandine in the depot of the Musée d'art histoire in Geneva, where the bottom four rows of little plates overlap each other in a different way than the top 17,¹⁷⁹ or the brigandine from Helfenstein Castle.¹⁸⁰ But as no corresponding traces of wear are detectable due to the heavy corrosion, this cannot be said with any certainty. Nevertheless, these considerations were made, as it would have resulted in more flexibility when bending the torso.

In the end, when mounting the individual pieces on the bust, it was decided not to overlap the plates (see p. 92). Instead, this was to be made more obvious in a future presentation with the help of drawings, photos of the finds from Visby and possibly also a replica of the armour. The team considered the Hirschstein find to be so unique that they wanted to give specialists and interested visitors the opportunity to show each individual piece in its entirety, which would not be possible if the plates overlapped. This idea was abandoned, however, during a later reconstruction attempt in the museum.

This reconstruction was of course only a first attempt and the team members agreed that it would certainly have to be revised in the light of more recent insights.

The objective of the meeting, however, was to reconstruct what the Hirschstein Armour of the Bavarian Army Museum might have originally looked like. In any case, we wanted an interpretation more accurate than that of the auction house and whose genesis should also be plausible. This is also the reason why not all parts were mounted. Pieces that were too corroded or could not be sensibly attached to the figurine because of their shape were to be presented together with the reconstruction, but alongside the figurine and not attached to it arbitrarily. This seemed the "more honest" approach to the team. Only three years later, in January and November 2017, two further reconstructions were carried out in collaboration with Maximilian Sebald, who had studied this coat of plates and its possible appearance intensively as part of his teacher's thesis.¹⁸¹ As a result of the scientific research that had continued in the meantime, much more was now known about the Hirschstein Armour. Regarding the curvature of the plates and the stronger inclusion of the finds from Visby and Helfenstein in the considerations, we concluded that the reconstruction of 2014 could be improved upon. Again, we took our cue from the rivet heads of the individual small plates, as the representations known so far suggest their even distribution on the backing material. Thus, the arrangement of appropri-

ately shaped plates resulted in a natural curvature from under the armpits into the neck area, which seems to be absolutely coherent. Now it is easy to see that the little plates riveted to the backing material meet or overlap at the back along the spine.¹⁸² This means that, according to our hypothesis, the coat of plates was closed on the back. There are examples of this amongst the finds from Visby¹⁸³ or on such depictions as the wooden statue in the cathedral of Verden (second quarter of the 14th century). This shows a knight with a coat of plates whose armour is closed with buckles at the back.¹⁸⁴ Although there are some indications that the preserved clasp could have been located at the back, it was not placed there, as this seemed too speculative to us.¹⁸⁵

The differently shaped small plates now match the shape of the body ideally. A semi-circular lame bent in upon itself¹⁸⁶ was partially pushed under the breastplate. This configuration closes the gap between the breastplate and the armpit better when the arm is moved. Shaped plates of this kind can also be seen on some effigies (e.g. Walter of Bopfingen, Fig. 2 or Otto of Orlamünde, Fig. 9). On this particular piece, however, no rivets can be made out and the counterpart is missing, so that this positioning is not certain. In contrast to the reconstruction of 2014, it was agreed that the small plates would now be attached in

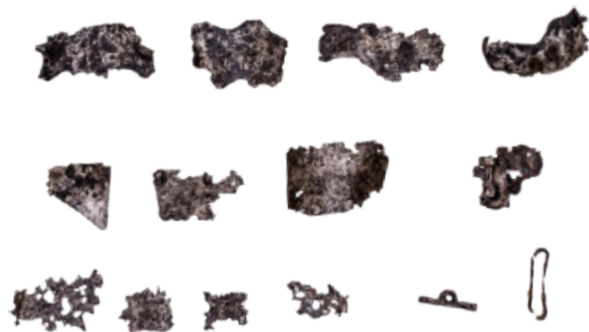


Fig. 20 The pieces of Hirschstein Armour not attached to the figurine in the 2017 reconstruction

an overlapping manner to give the visitor a better idea of how the armour would function. As before, we stuck to the decision to only mount those small plates that could be positioned in a reasonable way. The remaining pieces (12 plate fragments and three parts of an arming chain, Fig. 20) were placed in front of the bust.

After the completion of this latest reconstruction, a new picture of the Hirschstein Armour emerged, culminating in the realisation that probably no more than 20 to 25 % of the original body armour has survived (see p. 93).¹⁸⁷

The uniqueness of this coat of plates makes it an important reference object for research into understanding the development of medieval armour types, even though research on it is still far from complete. The extraordinary and hitherto unique coat of plates is thus rightly the centrepiece of the newly designed Treasure Chamber of the Bavarian Army Museum.

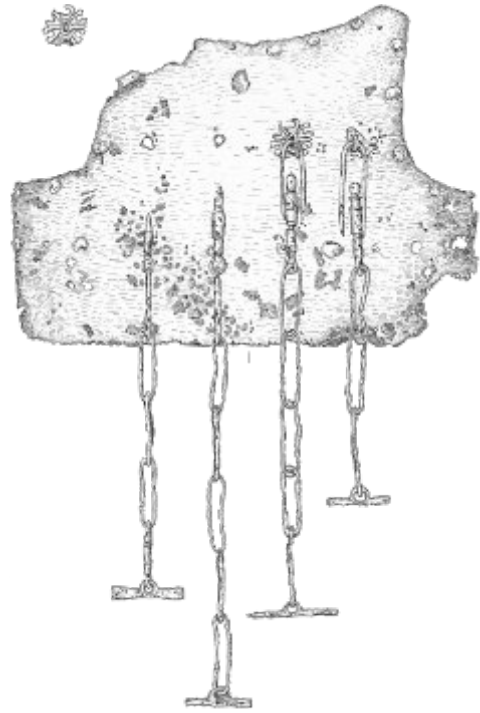


Fig. 21 Drawing of the breastplate

Coat of plates

Inv. No. 0162-2007

Dating and restorations

Southern German, Passau (?), c. 1350

Coarse cleaning by finder c. 2003

Restoration March 2014

Reconstructions on 3 February 2014,
on 18 January and on 2 November 2017

Material

Steel (carbon content 0,5 to 0,9%)

Dimensions

Length (breastplate): 28 cms

Width (breastplate): 24 cms

Thickness (breastplate): c. 1,7 to 2,3 mms

Description

Remnants of a coat of plates, today consisting of a breastplate, four arming chains as well as 33 (partly strongly fragmented) small plates in very different states of preservation.

Some of the small plates display marks (presumably construction marks), while the reverse side of the breastplate most likely bears an armourer's mark in the shape of a star.

The coat of plates also includes a further 15 finds (including crossbow bolts as well as parts of horse tack).

Provenance and acquisition history

Archaeological find near the former Hirschstein Castle near Passau

Acquired in the art trade from the original finder on 5 May 2007

Inventory

Inventory book 2007 (Bavarian Army Museum, Inv. No. HA.05.01.114): "Rüstung, Deutschld. u 1350, Plattenrock; Ankauf Hermann Historica PF 201009, 80010 München, 21.05.2007"



Fig. 22 Side view of the Hirschstein Armour in the 2017 reconstruction

Literature (selection)

Boshof, Grenzenlos, p. 89;

Kern, Rüstung;

Paggiarino/Schönauer, The Bavarian Army Museum, p. 71 f. and p. 253;

Schönauer, Plattenrock;

Idem., Schatzkammer und Inszenierung;

Wandling, Ausgrabungen;

Idem., Ein Harnisch.

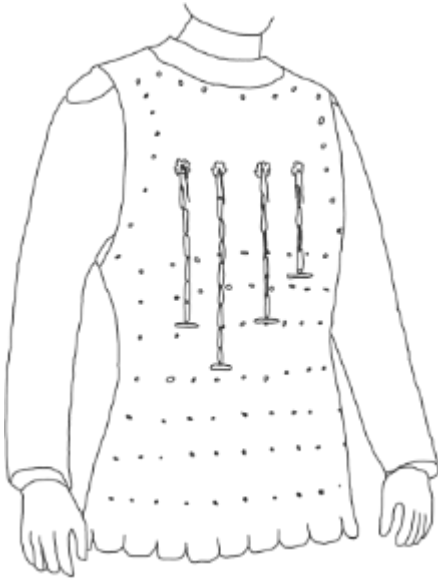


Fig. 23 Reconstruction drawing of the armour (front view) as an attempt to depict the actual appearance of the coat of plates (after Sebald, *Passauer Rüstung*, p. 43)

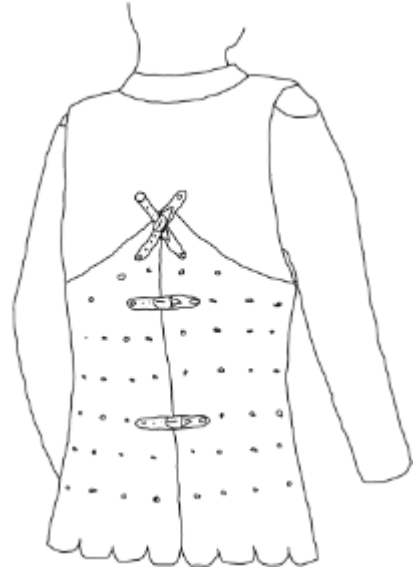


Fig. 24 Reconstruction drawing of the armour (rear view). The buckles for closing the coat of plates have not survived, but are a possible option (after Sebald, *Passauer Rüstung*, p. 43)

Exhibition history

2008 to 31 August 2014

Permanent exhibition of the Bavarian Army Museum in Ingolstadt

26 April to 5 October 2008

Bavarian State Exhibition "Adel in Bayern. Ritter, Grafen, Industriearbete" in Rosenheim and Aschau in the Chiemgau area

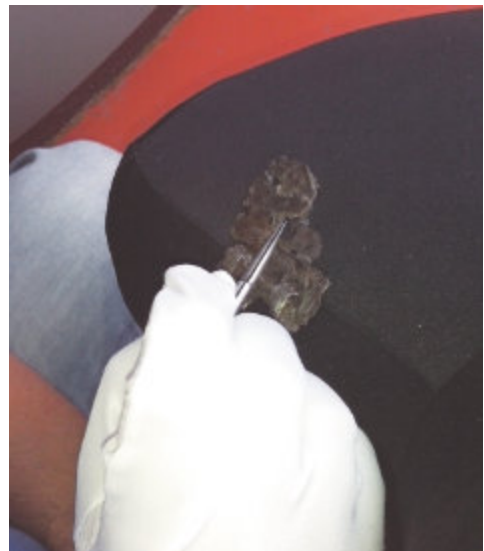
16 May to 2 November 2014

Bavarian State Exhibition "Ludwig der Bayer. Wir sind Kaiser!" in Regensburg

since 3 June 2019

Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt

Fig. 25 Extracting a material sample from the armour for examination with a scanning electron microscope at the "Anwenderzentrum Material- und Umweltforschung" of the University of Augsburg



Reconstruction of 2014



Reconstruction of 2017



Footnotes

- 1 For more on terminology, see the section "Mail hauberk – brigandine – coat of plates. The development of body armour in the 14th century" below. For the sake of simplicity, the term "coat of plates" is used throughout.
- 2 The exact number can no longer be determined due to the sometimes heavily corroded condition. Moreover, the affiliation of individual fragments to the armour is not clear (see the section "The reconstructions of 2014 and 2017" below).
- 3 Breiding, *Harnisch und Waffen*, p. 134.
- 4 This was also confirmed by the Passau district archaeology. Cf. Wandling, *Ausgrabungen*, No. 64, p. 245. Cf. also the website of the finder www.mesa-online.de as well as www.sondengaenger-deutschland.de/higr/supr/fundritter-ruestung/plattenrock.html (both retrieved on 16 June 2020).
- 5 Cf. Wandling, *Ein Harnisch*, p. 15 and Kern, *Rüstung*, p. 40.
- 6 Cf. here and in the following Wandling, *Ausgrabungen*, No. 64, p. 245.
- 7 Cf. restoration report by Ernst Bielefeld in the Bavarian Army Museum and physical examinations at the Anwenderzentrum Material- und Umweltforschung (Innovation Centre of the University of Augsburg by Mr. Alexander Hartwig).
- 8 Cf. Wandling, *Ausgrabungen*, No. 64, p. 245.
- 9 Wandling, *Ein Harnisch*, p. 58 f., here p. 58 ("wie ... die teils sperrigen Panzerteile während der seinerzeit [im 14. Jahrhundert] weitläufigen Materialentnahme unentdeckt bleiben konnten, ist schwer nachzuvollziehen"). At this point I would like to thank Mr. Wandling for making the manuscript available and for his information.
- 10 Wandling, *Ein Harnisch*, p. 59 ("eher schlichten Anlage ohne große Wehrhaftigkeit und mit einer anspruchlosen Bebauung").
- 11 Cf. *ibid.* and Bizer, *Oberflächenfunde*, p. 55-58.
- 12 Cf. Kern, *Rüstung*, p. 40.
- 13 Most recently *ibid.*, p. 39 f. or in the Wikipedia article "Plattenrock des Zacharias Haderer", https://de.wikipedia.org/wiki/Plattenrock_des_Zacharias_Haderer (retrieved on 22 October 2020).
- 14 Cf. here and in the following Kern, *Rüstung*, p. 40; Veit, *Passau*, p. 188 and Wandling, *Ein Harnisch*, p. 58.
- 15 Cf. 52. Auktion, *Hermann Historica* (4 and 5 May 2007), here lot no. 3641.
- 16 The expert opinions were written by the renowned military historian and specialist in historical weapons Dr Marcus Junkelmann and by the then director of the Hofjagd- und Rüstammer der Kunsthistorisches Museum in Vienna, Dr Matthias Pfaffenbichler.
- 17 Cf. Thordeman, *Armour*. The significance of this find lies in the fact that "the armour has been scientifically recovered in the exact context of the find, so that the original shape of various types can be vividly reconstructed." (Krabath, *Brigantinen*, p. 249). In 1927, the Bavarian Army Museum received seven fragments of mail from the mass graves of Visby as a gift from the "Hist. Museum Stockholm". Four of these were lost during the Second World War. Unfortunately, the other three can no longer be identified today (they bear the inv. nos. A 7321, A 7326 and A 7327).
- 18 Cf. on Küsnacht Gefßler, *Spangenharnische; Leutenecker, Brigantinen*, p. 93-96 or Krabath, *Brigantinen*, p. 234 and on Helfenstein Fleischnauer, *Spangenharnischfund and Post, Panzerfragment*.
- 19 Cf. e.g. Capwell, *The Puzzle Armour*.
- 20 I would like to thank Dr Dirk Breiding (Formerly Philadelphia Museum of Art, previously The Metropolitan Museum of Art, New York) for this information.
- 21 Cf. on the Treasure Chamber Schönauer, *Schatzkammer und Inszenierung*, p. 267-272.
- 22 Cf. on cities and archaeological finds in cities in general Flüeler, *Stadtluft*.
- 23 Inv. No. 0162-2007.b
- 24 Cf. Wandling, *Ausgrabungen*, no. 64, p. 245.
- 25 Cf. Oexle, *Metallfunde*, p. 433 with illustrations (I would like to thank Dr Fabian Brenker for this information).
- 26 Cf. Hefner, *Tannenberglage*, plate VI, fig. 5 and Schmitt, *Burg Tannenberglage*, p. 187 f., plate. 52, 1.
- 27 Inv. Nos. 0162-2007.f and 0162-2007.g
- 28 Inv. No. 0162-2007.d & e
- 29 Cf. for example similar objects in the German Historical Museum, Berlin (Lüken/ Sensfelder, *Armbrust*, Kat. Nr. 85, p. 301 f. In general, also Bizer, *Oberflächenfunde*, p. 55-58 or Schmitt, *Burg Tannenberglage*, p. 152-157.
- 30 Cf. Kaufmann, *Burgstall Warberg*, p. 75 (pl. 39). It could be a type of stiletto, although this form of thrusting weapon can only be traced from the beginning of the 16th century (cf. e.g. Capwell, *Messer*, p. 44 f.).
- 31 Inv. No. 0162-2007.n
- 32 I would like to thank Dr Gerd Riedel (Stadtmuseum Ingolstadt), Mr. Andreas Franzkowiak and Ms. Chris Wenzel for their help in identifying the finds.
- 33 Inv. No. 0162-2007.a
- 34 Inv. No. 0162-2007.c
- 35 Inv. No. 0162-2007.o
- 36 Cf. Clark, *The Medieval Horse*, p. 47, fig. 30 c and p. 48, fig. 33; also Kock/Roesdahl, *Boringholm*, p. 153, fig. 8.99 (fig. 608).
- 37 I am grateful to Mr Andreas Franzkowiak and Ms Chris Wenzel for these assessments.
- 38 Cf. Lehnart, *Spätgotik II*, p. 83 and Blair, *European Armour*, p. 54.
- 39 Thordeman, *Armour I*, p. 285. "White armour" refers to brightly polished steel armour. Blair, *European Armour*, p. 54 says that "throughout the last three-quarters of the 14th century the

- coat of plates was the main body-defence". However, he also points out that "a version of coat-of-plates construction made of small overlapping scales seems also to have remained in constant use" (p. 19).
- 40 Quaas, Eisenkleider, p. 123 ("vollständiger Körperschutz aus miteinander verbundenen ... Eisenplatten für Krieg und Turnier").
- 41 Krabath, Brigantinen, p. 228 ("[verstärkt] als additives System den Ringelpanzer").
- 42 Gamber, Plattenrock, column 15 ("[eine] vorne erhöhte[...] Leibbinde aus vertikalen Eisenschienen, die in einen Waffenrock oder Lederrock genietet waren").
- 43 Cf. Capwell, Armour, p. 113 and Starley, Brigandine and Jack Plates, p. 1.
- 44 Gamber, Brigantine, column 688 ("aus eisernen Lamellen [oder Plättchen], die an der Innenseite des gewöhnl. leinernen, mit farbigem Samt überzogenen Kleidungsstücks festgenietet wurden").
- 45 Cf. Capwell, Armour, p. 113. On the difference between brigandine and "jack-of-plates" cf. Starley, Brigandine and Jack Plates. For a preserved example in the Germanisches Nationalmuseum Nuremberg, see Eser, Gepanzertes Wams.
- 46 Cf. *ibid.*, p. 113 f. Examples in the Kunsthistorisches Museum Vienna, Inv. Nos. A 190 and A 229 (cf. Angermann/Poyer, Bestandsaufnahme, p. 148-57) or in the Metropolitan Museum of Art, New York, Inv. No. 29.15.101-2.
- 47 Cf. for example the breastplates from Otepää Castle in Estonia (Mäesalu, Brigantinenfunde, esp. ill. on p. 109) or the specimen in the Bavarian Army Museum (Inv. No. 0665-2019 – backplate see fig. 11, the Inv.-No. includes more than 100 individual components).
- 48 Cf. Lehnart, Spätgotik II, p. 84; Krabath, Brigantinen, p. 248; *idem.*, Untersuchungen, p. 96; Schuckelt, Harnische, p. 40 and Gut, Flechttechniken, p. 68.
- 49 Cf. the depictions on Trajan's Column in Rome. This has already been described in Demmin, Kriegswaffen I, p. 200, p. 218 or p. 233-234. Cf. in general Blair, European Armour, p. 19 and p. 37; Schuckelt, Harnische, p. 40 and on comparative finds Krabath, Brigantinen, p. 231-237.
- 50 Cf. for example the recently uncovered complete Roman lorica segmentata from the time around the birth of Christ in Kalkriese (<https://www.kalkriese-varusschlacht.de/forschung/fundschienenpanzer>; retrieved on 12 October 2020) or in general Blair, European Armour, p. 19 and p. 37 and Schuckelt, Harnische, p. 40.
- 51 Lehnart, Spätgotik II, p. 84; Blair, European Armour, p. 19-24 and Gut, Flechttechniken.
- 52 Cf. Brenker's contribution in this volume and Richardson, Introduction, p. 41.
- 53 Cf. Richardson, Introduction, p. 41. On comparative finds in general cf. Krabath, Brigantinen, p. 231-237.
- 54 Cf. Leutenegger, Brigantinen, p. 101 f. or Krabath, Brigantinen, p. 248. Also Blair, European Armour, p. 59 or Capwell, Armour, p. 113 f. cannot make an exact distinction between "brigandine" and "coat of plates".
- 55 See Brenker's contribution in this volume.
- 56 Blair, European Armour, p. 40.
- 57 Cf. Capwell, Armour, p. 113.
- 58 Krabath, Brigantinen, p. 248 ("dass über das Aussehen der frühen Rüstungen nur ausnehmend wenig bekannt ist. Belege in den schriftlichen Quellen von Platten geben keinen Hinweis auf ihr Aussehen bzw. ihre Anordnung auf der Schutzkleidung").
- 59 Cf. Thordeman, Zur Entstehung, p. 56 f.; Krabath, Brigantinen, p. 238 with fig. 10 on p. 229; or Blair, European Armour, p. 39 f. Further reading in Brenker's contribution in this volume.
- 60 Cf. Krabath, Brigantinen, p. 239 with fig. 16-18 and fig. 34. There, on p. 237-248, is an excellent list of representations of coats of plates in the visual arts. In general, the dating of effigies and the armour depicted on them is not always straightforward. On source criticism, see generally Dinzelbacher, Quellenprobleme and also very clearly Capwell, Armour, p. 50-52. In the inheritance law of the city of Augsburg of 1276, it is stated that not only weapons but also pieces of armour could be and were bequeathed. This shows that in some cases pieces of armour were in use beyond the death of the owner. Cf. on this and on further source criticism the contribution by Brenker in this volume).
- 61 Blair, Arms and Armour, p. 169.
- 62 Cf. here and in the following Breiding, Arms and Armour: a Farewell, p. 170-173 and *idem.*, Arms and Armour – Common Misconceptions.
- 63 Cf. Breiding, Harnisch und Waffen, p. 130 and Schuckelt, Harnische, p. 40.
- 64 Such leg protection can already be seen in the Bayeux Tapestry from the 11th century, even if it only reached to the ankles and did not enclose the feet. Cf. La Rocca, Notes, p. 69 f. For general information on the Tapestry, see Bouet/Neveux, Teppich.
- 65 Cf. Breiding, Harnisch und Waffen, p. 130 and generally on the so-called chausses (mail hose) La Rocca, Notes.
- 66 Cf. Breiding, Harnisch und Waffen, p. 130 f.; Blair, European Armour, p. 29-32; Lehnart, Spätgotik I, p. 78; Krabath, Brigantinen, p. 222 and Schuckelt, Harnische, p. 40-42.
- 67 Blair, Arms and Armour, p. 169. Cf. also Blair, European Armour, p. 37.
- 68 If the mail sleeves did not reach down to the wrists, sometimes splinted bracers were worn underneath the mail (cf. Lehnart, Spätgotik I, p. 78). The development in France, Italy, Germany and England differed somewhat in terms of time, but this will not be discussed in detail here. For more details, see Lehnart, Früh- und Hochgotik, Spätgotik I and II.

- 69 There are only very few surviving examples, for example a rerebrace for the right upper arm in the British Museum (Inv. No. MLA 56, 7-1, 1665, cf. Alexander/Binski, *Age of Chivalry*, Cat. No. 171, p. 261 f.), another rerebrace found in the Lower Castle of Vilnius (Blaževičius/Bugys, *Reikšmingas XIV*), an arm guard from the Roomburg in Leiden (Brandenburgh, *Een zeldzame leren armbeschermer*), a vambrace from Dordrecht in the Netherlands (Rijkelijkhuizen, *A rediscovered leather vambrace*) or two vambres from Tartu in Estonia (Mäesalu/Haiba, *Nahast küünarvarrekaitsmed*). What cuir bouilli is exactly is not entirely clear. Until now it was believed to be leather dipped in hot wax (cf. Blair, *European Armour*, p. 19 and Lehnart, *Spätgotik I*, p. 114, footnote 122). Recent studies, however, assume that this was rather boiled rawhide. Cf. on cuir bouilli Cheshire, *Cuir bouilli armour*; idem., *Cuir Bouilli: fracture as well as Brandenburgh, Een zeldzame leren armbeschermer*, p. 127. On leather armour in general, Rijkelijkhuizen/Volken, *A poor man's armour*.
- 70 Cf. here and in the following Blair, *Arms and Armour*, p. 41 and p. 169.
- 71 Cf. Breiding, *Harnisch und Waffen*, p. 132 or Lehnart, *Spätgotik I*, p. 87. Examples in Codex Manesse (Cod. Pal. germ. 848, Heidelberg University Library), fol. 192v and fol. 397v.
- 72 Cf. Blair, *Arms and Armour*, p. 169. Examples in Alexander/Binski, *Age of Chivalry*, Cat. No. 234 and 235, p. 293-295, and in Coales, *The Earliest English Brasses*, p. 95, fig. 88.
- 73 Cf. Lehnart, *Früh- und Hochgotik*, p. 90 and 85 Blair, *Arms and Armour*, p. 169.
- 74 Cf. here and in the following Breiding, *Harnisch und Waffen*, p. 135-137 and Schuckelt, *Harnische*, p. 45-48.
- 75 Cf. Blair, *European Armour*, p. 43 and Lehnart, *Spätgotik I*, p. 87.
- 76 Cf. here and in the following Krabath, *Brigantinen*, p. 222 f.; Blair, *European Armour*, p. 41 and p. 46; also Capwell, *Armour*, p. 158 f. and illustration on p. 163.
- 77 Cf. Thordeman, *Armour I*, pp. 230-244 and pp. 414-434.
- 78 Cf. Krabath, *Brigantinen*, pp. 221-224 and Schmitt, *Burg Tannenberg*, p. 165. These also refer to the plate gauntlets found in Tannenberg, which, however, must probably be dated to the turn of the 14th and 15th centuries (p. 166). The fragments of a gauntlet from the ruins of Hünenberg Castle in the canton of Zug (Switzerland) are dated to the third quarter of the 14th century by Frey, *Neufund*, p. 100. A good overview is found in Lehnart, *Spätgotik I*, p. 89-92 with plate XII.
- 79 Cf. Blair, *European Armour*, p. 45.
- 80 Cf. Blair, *Arms and Armour*, p. 169.
- 81 Cf. Lehnart, *Spätgotik II*, p. 85; Richardson, *Introduction*, p. 43 and Lüken/Sensfelder, *Armbrust*, p. 34. The firearms sometimes cited in this context did not supplant the crossbow until the second half of the 15th century. In terms of range and penetrating power, they were also no more effective than the crossbow for a long time (cf. Breiding, *A Deadly Art*, p. 3 and p. 7). Longbows were also known long before the 13th century (Richardson, *Introduction*, p. 42). Brenker dates the emergence of improved crossbows as early as the 12th century (cf. Brenker's contribution in this volume)
- 82 Cf. here and in the following Richardson, *Introduction*, p. 43 f. and Breiding, *A Deadly Art*, p. 16 f.
- 83 In Western Europe this seems to have taken place earlier – at least this is suggested by German accounts from this period (cf. Breiding, *Harnisch und Waffen*, p. 134).
- 84 Cf. Capwell, *Armour*, p. 113; Breiding, *Harnisch und Waffen*, p. 134 and Schuckelt, *Harnische*, p. 44. Previously, the torso was covered by smaller plates; only from 1340 onwards is there a tendency to combine the plates protecting the chest into "a rudimentary breastplate" (Blair, *European Armour*, p. 56). In the Visby finds, only two pieces had the plates riveted to the outside of the backing material. And in these cases, it was "minor ones on the shoulders, which formed the transition to free shoulder-plates" (Thordeman, *Armour I*, p. 210).
- 85 Krabath, *Brigantinen*, p. 229 ("in senkrechten Bahnen und horizontalen Reihen").
- 86 Cf. in general on the laminar armour Thordeman, *Zur Entstehung und idem., Armour I*, p. 312 f., fig. 318-323. Also Steeger, *Ritterliche Schutzwaffen*, p. 70 f. and Lehnart, *Spätgotik I*, pp. 80-85.
- 87 Thordeman, *Zur Entstehung*, p. 59 ("allmählich herausexperimentiert").
- 88 Cf. Krabath, *Brigantinen*, p. 229.
- 89 The breastplates from Otepää also show a spacing of 2 mm (cf. Mäesalu, *Brigantinenfunde*, p. 108).
- 90 Cf. Stadler, *Brigantine*, p. 22.
- 91 Cf. Lehnart, *Spätgotik I*, p. 82.
- 92 Cf. Sebald, *Passauer Rüstung*, p. 38.
- 93 Cf. Thordeman, *Armour I*, p. 210.
- 94 Cf. Schmitt, *Burg Tannenberg*, p. 164.
- 95 Cf. Sebald, *Passauer Rüstung*, p. 26. Similar results can be found in other objects, e.g. in the brigandines from Basel, Bern and Geneva, as well as in the finds from the Bibentenburg or from the castle of Alt-Wädenswil (Leutenegger, *Brigantinen*, p. 98 and p. 101), where even the entire lames were tinned (Geßler, *Plättchenharnisch*, p. 58). Cf. also Blair, *European Armour*, p. 41.
- 96 Detail in Paggiarino/Schönauer, *The Bavarian Army Museum*, pp. 71-73.
- 97 Cf. Sebald, *Passauer Rüstung*, pp. 24-26. The unprofessional cleaning of the object with sandpaper, sanding discs and probably a wire brush by the finder also led to considerable contamination of the specimens with aluminium or

- chrome, among other things. On the problem of carburization, see Peine, *Ein Blick in die Waffenkammer*, p. 51, footnote 9 (in more detail in footnote 152).
- 98 Cf. Lehnart, *Spätgotik I*, p. 78; *idem.*, *Spätgotik II*, p. 86; Breiding, *Harnisch und Waffen*, p. 134; Blair, *European Armour*, p. 28 und p. 53; Schuckelt, *Harnische*, p. 43; also Richardson, *Introduction*, p. 40 and Capwell, *Armour*, p. 115.
- 99 Cf. Lehnart, *Spätgotik II*, p. 86; Breiding, *Harnisch und Waffen*, p. 134 and Krabath, *Brigantinen*, p. 228. This waisted form remained in fashion until around 1420 (cf. Capwell, *Armour*, p. 114).
- 100 The Visby finds are probably also somewhat younger.
- 101 Cf. Schmitt, *Burg Tannenberg*, p. 164-166, cat. nos. 2643-2677, plate 37, 1-23.
- 102 Cf. Steeger, *Ritterliche Schutz Waffen*, pp. 70-73.
- 103 Cf. Gefßler, *Spangenharnischfund*.
- 104 Cf. Conrad, *Fund*.
- 105 Cf. Müller, *Turmburg*, p. 153 and fig. 2 on p. 156.
- 106 Cf. Krabath, *Brigantinen*, pp. 225-228. A list of other comparative finds *ibid.*, pp. 231-237. The Bavarian Army Museum also has historical photographs of finds from Hohenfels Castle (Palatinate), which were excavated by the then director of the Historical Museum of the Palatinate in Speyer, Dr Friedrich Sprater, in 1932/1933 (Bavarian Army Museum, Inv. No. GP.V.244a and b).
- 107 Cf. Mäesalu, *Brigantinenfunde*.
- 108 Cf. Gefßler, *Spangenharnische*; Leutenegger, *Brigantinen*, p. 93-96; or Krabath, *Brigantinen*, p. 234.
- 109 Inv. No. 0665-2019 (with more than 100 individual components).
- 110 Cf. for example the find of a lame composite from Kempton and the difficulties in its attribution in Atzbach/Elser, *Fragmente*. The small plates found at Schönenwerd in the Limmat valley (Switzerland) or from the castle of Alt-Wädenswil cannot be clearly assigned to body armour either (cf. Leutenegger, *Brigantinen*, p. 96-98 and p. 100 f.). The same applies to individual finds from castles on the Swabian Alb (cf. Bizer, *Oberflächenfunde*, p. 58, footnote 358 with references to the catalogue section).
- 111 Cf. Krabath, *Brigantinen*, p. 228 and p. 231. In individual cases, it might even be debatable whether they are really always remnants of body armour.
- 112 Cf. Blair, *European Armour*, p. 56.
- 113 Cf. Breiding, *Harnisch und Waffen*, p. 134; Peine, *Ein Blick in die Waffenkammer*, p. 57; Blair, *European Armour*, p. 56 and Capwell, *Armour*, p. 114.
- 114 Cf. Thomas/Gamber, *Kriegsleid*, p. 357 f. as well as detailed photographs in Paggiarino, *Churburg Armoury*, p. 38, p. 40 f. and p. 44 f. Schuckelt, *Harnische*, p. 44 f. dates this piece to between 1360 and 1370.
- 115 Bavarian National Museum, Inv. no. W 195. Cf. e.g. Peine, *Ein Blick in die Waffenkammer*, p. 54 f. and close-ups in Paggiarino/Beuing, *Bavarian National Museum*, p. 46-53 as well as descriptions on p. 355. Also Capwell, *Armour*, p. 113 f. and Schuckelt, *Harnische*, p. 45.
- 116 Cf. Capwell, *Armour*, p. 115.
- 117 Cf. here and in the following Blair, *Arms and Armour*, p. 170.
- 118 Cf. Peine, *Ein Blick in die Waffenkammer*, p. 62.
- 119 *Ibid.*, p. 62 ("[this] Brigantiniensystem ... [wird später durch] kleinere Rückenplatten sowie zwei am Bruststück hängende Rückenhälften [ergänzt]").
- 120 Cf. also Blair, *European Armour*, p. 61.
- 121 Cf. here and in the following Paggiarino, *Churburg Armoury*, p. 44 f. and p. 281; see also Schuckelt, *Harnische*, p. 48.
- 122 Cf. Krabath, *Brigantinen*, pp. 244-246; Thorde-man, *Armour I*, pp. 317-319 (fig. 331-333), as well as the depiction in Wagner, *Tracht*, plate 2 – part II.
- 123 Krabath, *Brigantinen*, p. 246 ("[dass] die einzelnen Platten außen auf einer Unterlage befestigt [sind]").
- 124 Cf. here and in the following Breiding, *Harnisch und Waffen*, p. 134 f.; Lehnart, *Spätgotik II*, p. 86 and Blair, *Arms and Armour*, p. 170.
- 125 Cf. Richardson, *The Archibald hauberk*, pp. 29-31.
- 126 Cf. here and in the following Blair, *Arms and Armour*, p. 170.
- 127 Cf. Breiding, *Harnisch und Waffen*, p. 132 and Blair, *European Armour*, p. 40 and p. 74.
- 128 Cf. the note in Brenker that in the "Liet von Troye" a spear first penetrated the mail armour, whereas the "platen" worn underneath withstood it (cf. Brenker's contribution in this volume, footnote 20). Yet this could also be a literary embellishment to dramatize the situation.
- 129 Cf. Paggiarino, *Churburg Armoury*, p. 280.
- 130 Cf. Breiding, *Harnisch und Waffen*, p. 134 and Blair, *European Armour*, p. 53.
- 131 Capwell, *The Puzzle Armour*. In other cases, it is frequently assumed that chains that are no longer present were attached to the breastplate, as in the case of the velvet-covered breastplate in the Bavarian National Museum (Inv. No. W 195). Cf. Paggiarino/Beuing, *The Bavarian National Museum*, p. 355. In English, *mamelier* usually refers only to the eyelet to which the arming chains were attached.
- 132 Cf. e.g. Breiding, *Harnisch und Waffen*, p. 134; Capwell, *The Puzzle Armour* and Blair, *European Armour*, p. 48. Stone, *A Glossary*, p. 433 still uses the term for the round plates "fastened to the breast of a knight's surcoat in the 14th century".
- 133 Cf. Blair, *European Armour*, p. 48 and more recently also Breiding, *Some Notes*, p. 2. The second helmet from Madeln, the specimen in the

- Royal Armouries (Inv. No. IV.600), which is dated between 1331 and 1370, and the helmet of Sir Richard Pembridge (National Museum of Scotland, Inv. No. A.1905.489) also display such perforations.
- 134 Mainz State Museum (Inv. Nos. S 3099 to S 3106). Cf. Wolf, *Ludwig der Bayer*, p. 220.
- 135 Cf. Blair, *European Armour*, p. 48. Lehnart, *Spätgotik I*, p. 93 takes the presence of a third arming chain as an indication that the coat of plates could not have been used for tournaments, but rather for battle, since at tournaments the helmet could be handed over directly to a helper if not needed. This would mean that the older Madeln helmet – due to its cross-shaped perforation – was not used for the tournament, and would thus contradict Breiding, *Some Notes*, p. 2.
- 136 Cf. Hefner-Alteneck, *Waffen*, here plates 20, 23 and 24, whereby the depiction of Walter of Bopfingen (plate 23) by Hefner-Alteneck is incorrect, as he only depicts three of the actual four arming chains. The chains are also clearly visible on the effigy of Rezzo of Bächlingen († 1320) in the Lutheran Church St. John's in Bächlingen, although here the breastplate appears to be worn on top of the actual coat of plates.
- 137 The statement that arming chains are not found on English armour (cf. Lehnart, *Spätgotik I*, p. 87), is incorrect. The Black Prince's helmet, for example, still has remnants of the arming chain (cf. Blair, *European Armour*, p. 48) and the effigies of Sir Roger de Salaman in Horley (Surrey) or Ralph de Knevynton in Aveley (Essex) clearly show such chains, too.
- 138 I would like to thank Dr Fabian Brenker for this pointer.
- 139 Cf. Schönauer, *Plattenrock*, p. 117; Blair, *European Armour*, p. 30, p. 51 f. and p. 67 f.; Lehnart, *Spätgotik I*, p. 93 and Capwell, *Armour*, pp. 66-78.
- 140 Cf. Schönauer, *Plattenrock*, p. 117; Blair, *European Armour*, p. 68; Lehnart, *Spätgotik I*, p. 94 and Capwell, *Armour*, p. 66-78.
- 141 Cf. Alexander/Binski, *Age of Chivalry*, Cat. Nos. 626-633. Other examples are the effigies of Walter of Bopfingen or Rudolf of Hürnheim (formerly in the monastery church in Klosterzimmern).
- 142 Cf. Breiding, *Harnisch und Waffen*, p. 137; Blair, *Arms and Armour*, p. 170; idem., *European Armour*, p. 47; Peine, *Ein Blick in die Waffenkammer*, p. 66 and Lehnart, *Spätgotik I*, p. 93.
- 143 Cf. Lehnart, *Spätgotik I*, p. 93-95; Capwell, *Armour*, p. 80-84 and Schuckelt, *Harnische*, p. 47.
- 144 Breiding, *Harnisch und Waffen*, p. 143 ("an dessen Übergang zur Klinge zwei ballartige Verdickungen ansetzen").
- 145 Cf. Schönauer, *Plattenrock*, p. 117 and Capwell, *Messer*, pp. 28-30.
- 146 Cf. Blair, *Arms and Armour*, p. 170.
- 147 Cf. idem., *European Armour*, p. 75.
- 148 However, the drawings provided to me in May 2014 by Mr Walter Wandling (Passau district archaeology) list 36 other plates or fragments in addition to the breast plate. The fragments with the numbers 34 to 36 are not in the possession of the Bavarian Army Museum.
- 149 Cf. Mäesalu, *Brigantinenfunde*, p. 108 f.
- 150 See footnote 97.
- 151 Cf. Sebald, *Passauer Rüstung*, p. 15.
- 152 "Carburization of the surface causes ... a storage of carbon. This results in a higher hardness and a higher corrosion resistance than with pure metal". Comment by the responsible restorer Andreas Weisgerber at the Westphalian Museum for Archaeology on weapon finds in Haus Herbede on the Ruhr (Quoted in Peine, *Ein Blick in die Waffenkammer*, p. 51, footnote 9).
- 153 Peine, *Ein Blick in die Waffenkammer*, p. 51, footnote. 9 ("welche das Bestreben hat, die äußere Brandschicht zu sprengen").
- 154 Cf. Sebald, *Passauer Rüstung*, A 18.
- 155 Cf. for example the finds from Otepää (Mäesalu, *Brigantinenfunde*, p. 109, fig. 4.1), the fragments of a brigandine with inv. no. A 229 in the Kunsthistorisches Museum Vienna, Hofjagd- und Rüstkammer (Angermann/Poyer, *Bestandsaufnahme*, p. 155, fig. 6), as well as the brigandine of the Bavarian Army Museum with the inv. no. 0665-2019. In the case of the finds from Haus Herbede the fragmentarily preserved "uppermost cuirass skirt ... of a short tasset covering the lower abdomen" extends over the lower edge of the breastplate (Peine, *Ein Blick in die Waffenkammer*, p. 53). There are also fragments of one or more cuirass skirt featuring a rivet row along both longitudinal sides and therefore provide a clue regarding the lowermost cuirass skirt (Peine, *Ein Blick in die Waffenkammer*, p. 58 as well as fig. 10 on p. 56; furthermore also Peine/Breiding, *An important find*, esp. p. 7 f.).
- 156 The team of 2014 (see later the section "The reconstructions of 2014 and 2017") did not want to commit themselves here either, but considers the mark to be authentic.
- 157 Sebald, *Passauer Rüstung*, p. 37 ("wohl mit wenigen Schlägen realisiert").
- 158 Cf. Lehnart, *Spätgotik I*, p. 80.
- 159 Only the plates 0162-2007.6 (14 x 5.5 cm) and 0162-2005.7 (15.3 x 5.5) are larger. No. 6 might have been an armpit protection. This plate was also used in the reconstruction of 2017 (see below). On the terminology, cf. the section "Mail hauberk – brigandine – coat of plates. The development of body armour in the 14th century" above as well as the overview in Lehnart, *Spätgotik I*, pp. 80-87.
- 160 Cf. Kern, *Rüstung*, p. 39 f.
- 161 A more detailed finds documentation allegedly exists with the finder, but has not yet been published. Cf. Sebald, *Passauer Rüstung*, pp. 15 ff.

- 162 Bode Museum, Gemäldegalerie Cat.No. 1519.
- 163 Capwell, *The Puzzle Armour*.
- 164 Inv. No. 0162-2007.27. Cf. also Sebald, *Passauer Rüstung*, p. 21 and A 40.
- 165 Cf. here Sebald, *Passauer Rüstung*, p. 21.
- 166 Cf. Thordeman, *Armour*.
- 167 Cf. Gamber, *Harnischstudien*, p. 45 f.; Thordeman, *Armour I*, pp. 308-320; or Mäesalu, *Brigantinenfunde*, p. 111.
- 168 Cf. here Scalini, *Plattenpanzer*, p. 120.
- 169 Cf. Sebald, *Passauer Rüstung*, p. 24.
- 170 It seems likely that in parallel with protecting individual body parts with iron plates, the trade of the plate armourer evolved from the mail makers and helmet makers. Hence, this term seems appropriate here (cf. Reitzenstein, *Waffenschmied*, p. 34-36).
- 171 Cf. Krabath, *Brigantinen*, p. 228.
- 172 The trade of the plate armourer probably developed in tandem with armour in the 12th or 13th century (cf. Reitzenstein, *Waffenschmied*, p. 36). However, it cannot be ruled out that the final assembly was undertaken by another craftsman (e.g. a saddler).
- 173 A source from 1390 in the Turin archives speaks of a process based on the division of labour, in which a plate armourer from Milan cuts the leather and prepares it accordingly. Then he also nails the individual metal parts onto the leather. Another craftsman then attaches some mail to the armour – apparently to reinforce certain parts (source quoted in Buttin, *Du costume*, p. 239). Allegedly, even peasants' sons could afford such armour (cf. Brenker's contribution in this volume).
- 174 Inv. No. 0162-2007.23
- 175 Cf. Stadler, *Brigantine*, p. 25 f. (also p. 25, fig. 4) referring to Post, *Panzerfragment*, esp. p. 229 f., fig. 8. On the Helfenstein find in general, see also Fleischhauer, *Spangenharnischfund*. In the subsequent reconstruction in 2017, however, it was decided to no longer place this part on the back.
- 176 Cf. here Krabath, *Brigantinen*, p. 229.
- 177 Lehnart, *Spätgotik I*, pp. 81-85 with plates IX-XI provides a good overview of the various patterns and closures.
- 178 An overlap was taken as given, since the breastplate has no rivets at the lower edge and armour from Visby with smaller plates was also clearly constructed to overlap (cf. Thordeman, *Armour II*, e.g. armour 24 and 25, pl. 117-145). Cf. as examples also the brigandine from Tyrol Castle (Stadler, *Brigantine*, fig. 3), two specimens in the Dresden Armoury (Schuckelt, *Harnische*, p. 130 f., Inv. Nos. M 0155.01-.05 and M 0153.01.-.05) or a brigandine in the Kunsthistorisches Museum Vienna, Hofjagd- und Rüstkammer, Inv. No. A 338 (described in Angermann/Poyer, *Bestandsaufnahme*, pp. 158-163).
- 179 Cf. Leutenegger, *Brigantinen*, pp. 84-86 (clearly visible on p. 85, fig. 6).
- 180 Cf. Fleischhauer, *Spangenharnischfund und Post, Panzerfragment*, p. 226 with fig. 1 a and b.
- 181 Cf. Sebald, *Passauer Rüstung*.
- 182 Cf. here Scalini, *Plattenpanzer*, p. 120.
- 183 Cf. Thordeman, *Armour I*, p. 210 ff. Illustrations in *idem.*, *Armour II* (e.g. armour 9,11 or 24). A good overview of the different types of armour found at Visby in Krabath, *Brigantinen*, p. 240, fig. 23.
- 184 Cf. e.g. Thordeman, *Armour I*, p. 311; *idem.*, *Entwicklung*, p. 58 f.; or Krabath, *Brigantinen*, p. 235.
- 185 Thus, on a tomb effigy in Pershore Abbey (County Worcestershire, England) shows that the plates worn under the surcoat were held together at the sides with buckles (Blair, *European Armour*, p. 39 and close-up in fig. 17), whereby it must be assumed that this was probably a leather or cuir-bouilli armour.
- 186 Inv. No. 0162-2007.6
- 187 In 2014, it was still assumed to be 50 to 60 % (cf. Capwell, *The Puzzle Armour*).

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Alfred Geibig

Three Swords

from the Collection of the Bavarian Army Museum

Three swords, each one representing a certain period in its function and shape: in one case for the Carolingian period, in the second for the Romanesque/early Gothic period and in the third case for the later Gothic period. Thus, their dimensions, constructive structure and morphology reveal different forms of utilisation as well as different fashions.

The oldest of the three pieces, a sword from the Carolingian period (inv. no. A 3621) is – compared to similar specimens and in view of its age of more than 1,200 years – quite well preserved and has suffered only minor corrosion-related loss of substance, which has relatively little effect on its shape and appearance (Fig. 1). It is probably the most interesting and also the scientifically most valuable piece of this trio.

All the organic elements of the grip itself and the scabbard, which was probably made of comparable materials, are no longer present. The grip – probably consisting of a one- or two-piece, form-giving wooden core that had originally been covered with leather or textile (Fig. 4)¹ – was slid down over the tang to the crossguard

and firmly fixed by the two-piece pommel, which was also slid flush and riveted (Fig. 4).

Particularly the roof-shaped form of the pommel crown with its slightly convex lateral lines in side view is significant² and of a rather great importance for the chronological classification. With regard to the question of the appearance and construction of the lost scabbard, numerous reliable findings of scabbards and scabbard fragments can be referred to for this type of sword, especially from northern Germany.³ Thus, the body of the scabbard may have consisted of two wooden half-shells carved to match the blade. These were either glued and pinned together flat or were rebated and held in place merely by the tight binding of the textile cover that followed. The wooden elements forming the hollow body of the scabbard were lined with fur before being joined together. This was supposed to both provide support for the inserted blade and protect it from moisture due to its inherent tallow content. After joining the two lined halves of the body, these were then covered with organic

Fig. 1 (left) Sword from the Carolingian period (found near Deggendorf, Bavaria), c. 750-800 (Bavarian Army Museum, Inv. No. A 3621)

Fig. 2 (centre) “Hand-and-a-half” sword, c. 1250-1400 (Bavarian Army Museum, Inv. No. A 11136)

Fig. 3 (right) “Hand-and-a-half” sword, early 14th century (Bavarian Army Museum, Inv. No. A 3940)

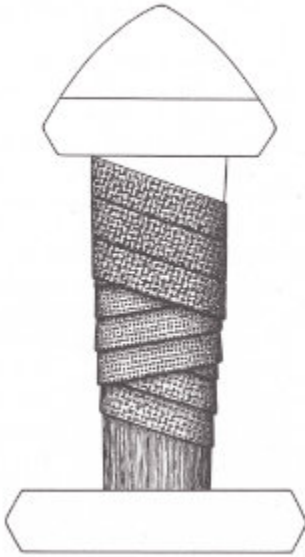
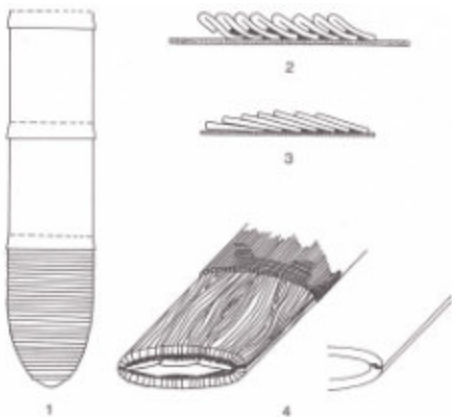


Fig. 4 Possible construction of a hilt made of wood and textiles
(after Geibig, Beiträge, p. 101, Fig. 26)

Fig. 5 Diagram showing the construction of Carolingian sword scabbards based on archaeological findings. 1 Schematic of the narrow band wrapping, 2 Narrow band with folded edge, 3 Narrow band single laid, 4 Sequence of layers within the scabbard body: fur – wood – textile
(after Geibig, Beiträge, p. 105, fig. 28)



material, most frequently textile. For this, larger, slightly overlapping, horizontally arranged textile bands were wound along the length of the scabbard body (Fig. 5).

It was reinforced at its bottom end only, where some narrow bands, probably folded over and closely overlapping, were applied (Figs. 5 and 6). As there are hardly any surviving carrying devices and suspension systems, we have to take contemporary pictorial sources as a guide.⁴ One example of this is the Stuttgart Psalter, dated around 820 (Fig. 7 a and b). It shows the wide segments, the finely wound fabric chape as well as decorative cross bindings and a pull-through loop for the narrow carrying strap. The scabbard of the sword under discussion here may have been designed in a similar way.

Fig. 6 Fragment of a sword from Cleverns (Lower Saxony), grave 179. The well preserved organic components of the scabbard allow a basic reconstruction of the scabbard. The finely bound “chape” of narrow textile strips is recognisable
(from Geibig, Beiträge, p. 328, Cat. no. 189)

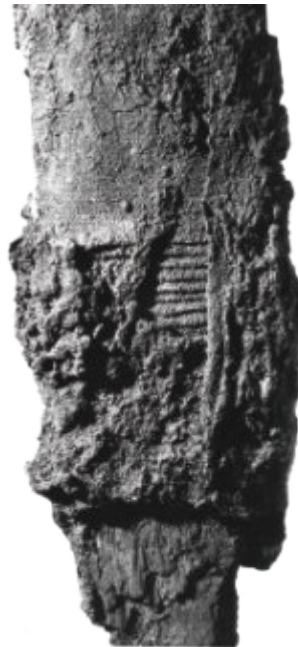
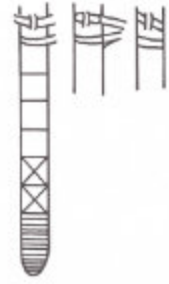




Fig. 7 a This detail from the Stuttgart Psalter (c. 820) clearly shows the wide binding segments on the scabbard as well as the finer textile strips of the “chape”. (Württemberg State Library Stuttgart, Cod. bibl. fol. 23, fol. 58v)

While we can only draw on comparable archaeological finds and iconographic illustrations for both the grip and the scabbard, the other two main elements of the sword, namely the hilt and the blade, have come down to us reasonably well.⁵ The crossguard, ogival in plan view, is slid over the tang onto the shoulder of the blade and sits there in a (now) tight binding with a recessed fit on the shoulders (Fig. 8). The upper guard – somewhat smaller, but otherwise of comparable shape to the crossguard – can be slid loosely onto the tang today. In its original state, it was held in place against the crossguard by the organic grip and against the upper end by the separately mounted pommel crown, which in turn had been riveted to the tang (Fig. 9). This constructional evidence is also of considerable importance for the dating. The second main element of a sword is the blade. Although the present piece has suf-

Fig. 7 b Redrawing of the features from the Stuttgart Psalter from Fig. 7a (from Geibig, *Beiträge*, p. 109, no. 7)



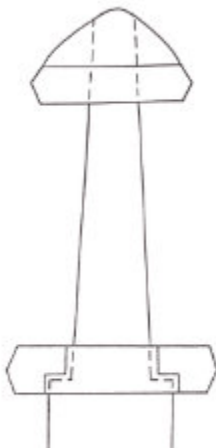
fered some loss of substance due to corrosion, especially around the cutting edges, the original shape can still be easily reconstructed. It is a double-edged, symmetrical blade with almost parallel cutting edges, which only converge in a convex curve in the foremost section to form a comparatively short point. It is broken approx. 55 cm below the crossguard, but as the fragments fit together well, a substantial loss in length is improbable and the length of approx. 77 cm that can be ascertained today is probably authentic. The blade shows an extremely shallow, but nevertheless recognisable groove, the fuller, about 1.9 cm wide. The pattern-welded centre section of the blade consists of a two-banded herringbone pattern with the torsion sequence SZ. The total width of the two quite irregular bands is between 2.4 and 3.0 cm. A few centimetres below the root of the blade, the side lines of the two-banded pattern converge in



Fig. 8 View of the hilt elements from an angle below. The bearing recess in the underside of the crossguard is clearly visible (Bavarian Army Museum, Inv. No. A 3621)

a convex curve, leaving the pattern-welded core of the blade pointed about 2.0 cm below the crossguard. This feature is present on both sides of the blade. The pattern-welding is evident in the corrosion structure of the entire blade.

Fig. 9 Construction especially of early Carolingian hilts (after Geibig, Beiträge, p. 91, fig. 24)



In the case at hand, the entire core seems to be pattern-welded. In contrast to the more recent thin plates (“veneers”) of pattern-welded steel that were welded onto both sides, this has not only a decorative function, but also a constructive one. Attempts to improve the quality of blades by pattern-welding date back to the times before the birth of Christ. From the third century AD onwards, the classical pattern-welding process seems to emerge, in which layers of tough but soft iron and hard but brittle layers of high-carbon steel are alternately hammer-welded together.⁶ These are then forged into rods, then twisted and forged again. In a further step, several such rods, usually two to five, are welded together to form the blade core. In this way, the positive properties of tough iron are combined with those of hard steel in one product. In a separate step, the particularly hard but also brittle cutting edges are then welded (“edge-wrapped”) onto this core, which in turn are protected from breakage by the more flexible core. By grinding the rough blade, it is brought into the desired form, before the surface is polished. The subsequent etching with acid makes the interlocked layers of

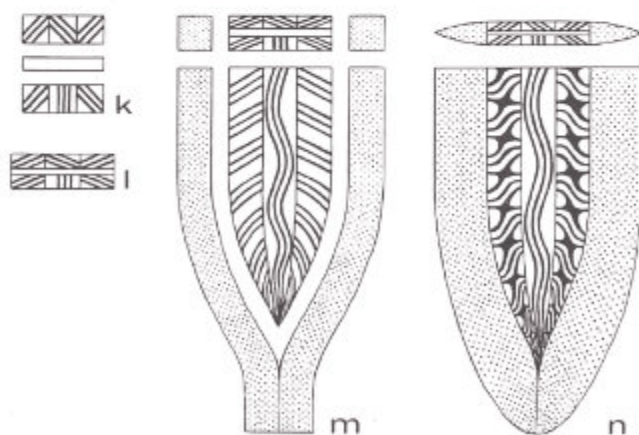
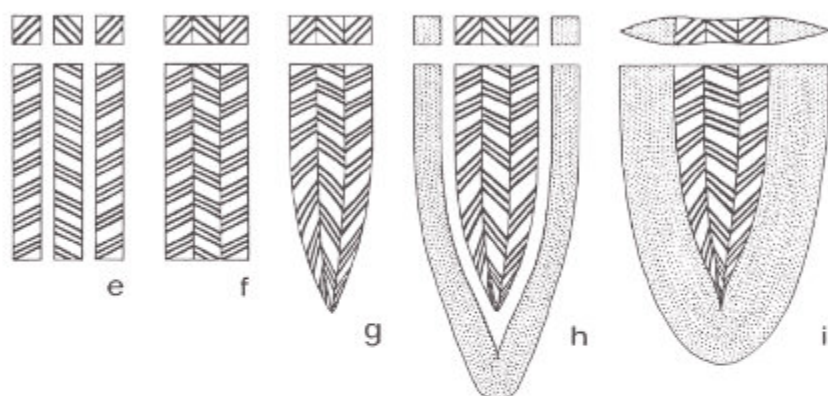
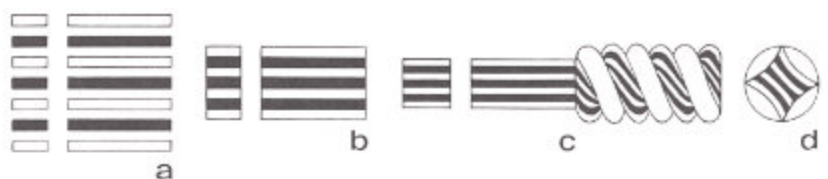
Fig. 10 (opposite page top)

Blade of sword A 3621

The two twisted rods forming the core of the blade and the separate cutting edges of hard carbon steel welded to them can be clearly seen. In the case of this sword, the pattern-welded core consists of two twisted rods in an SZ configuration, which means that one rod is twisted to the right and the other to the left.

Fig. 11 (opposite page bottom)

Schematic representation of the manufacturing steps involved in making a pattern-welded blade (after Ypey, Europäische Waffen, fig. 7)



steel and iron appear in different shapes and patterns depending on the way they have been welded together (Fig. 10 and 11).⁷

With the advent of newer forging methods, the custom of pattern-welding sword blades for functional reasons slowly faded away towards the end of the 8th or the early decades of the 9th century;⁸ only a few examples from a more recent period⁹ can be attested.¹⁰ In addition to the structural design of the hilt and its morphology, the blade also provides us with important clues for the final chronological classification of the sword.

When it comes to estimating the date of origin of the sword found at Deggendorf, all chronologically relevant elements must be brought together. Firstly, there is the hilt, which, due to its morphology, can hardly be dated later than the second half of the 8th century. This assessment is supported by its structural design, which also points to the hilt's placement within the same chronological framework. In the 9th century, pattern-welded blades would have been produced in the German regions only in a few isolated cases, their production peaking probably

before that time. Rather massive blades like the one we have here, with their almost parallel cutting edges that only form a comparably short, roof-shaped point near the lower end, were probably manufactured until the 10th century, but as early as the second half of the 8th century. If we now concentrate on the overlap of all these chronologically significant aspects, it is very likely that the Deggendorf sword was made in the second half of the 8th century.

The second example of our group of three swords (inv. no. A 11136) allows even the untrained observer to recognise clear morphological, but also evident metrical differences (Fig. 12) from the Carolingian piece discussed above.¹¹

Thus, with a blade length of 84.8 cm and a hilt length of 23.9 cm, it clearly surpasses the dimensions of the Carolingian specimen (71.1 / 16.9 cm).

The length of the crossguard also differs considerably, with 17.3 cm versus 8.5 cm for the early piece. On the surface of the blade, which is somewhat washed out due to corrosion, a narrow fuller can be seen on both sides, which, seen from the tip, begins about halfway down and extends into the lower section of the tang; when viewed from the side, only a slight taper is noticeable. The lower end is formed by a relatively elongated point shaped in a convex curve of the lateral line. In contrast to the Carolingian sword, the blade is obviously no longer made of a pattern-welded core with a welded-on cutting edge, but of a more or less homogeneous monosteel. In at least one part of the blade's surface, sharp-edged chipping can be detected in the corrosion structure, which, with all due caution, could possibly be interpreted as an indication of a former vertical iron inlay.¹²

The long sides of the relatively strong and wide tang run almost in parallel along the bottom three quarters, tapering considerably towards the pommel through appropriate forging. The drawn-out, pointed end

Fig. 12 Radnabenknauf with rivet head and cross-shaped recesses for a non-ferrous/precious metal inlay in the centre (Bavarian Army Museum, Inv. No. A 11136)



of the tang passes through the disc-shaped pommel and is riveted at its apex with an additional conical rivet head underneath (Fig. 12). Except for a small circular central section, the sides of the pommel are concave. The central section shaped in this way is reminiscent of a wheel hub, which is why it is called “Radnabenknauf” (wheel hub pommel) in German – plain “disc pommel” in English, though. In the central section, there are still traces of cross-shaped grooves, which may indicate a previous metal inlay (Fig. 12). The crossguard, when viewed from the side, is straight; when viewed from above, it shows a flared central section and slender arms, that widen slightly towards the straight terminals.

In order to arrive at a chronological classification of the item, it is necessary to concentrate on the morphological and metrical details due to the lack of further dating features.

The fuller of the blade seems rather narrow, but because of the washed-out surface, its width can no longer be measured exactly; however, it is very likely to have been between 1.5 and 1.8 cm wide. This, together with its form, length and width, places the blade within the range of type 7 according to Geibig.¹³ This type can be assumed to have emerged between the end of the 11th and the middle of the 12th century.¹⁴ This chronological assessment can be consolidated by comparison with blades that the great sword expert of his time, Ronald Ewart Oakeshott, attributes to his medieval sword type XI.¹⁵

He dates disc-shaped pommels of his type J to the period between 1250 and 1400.¹⁶ A rather similar pommel also appears on the sword of Count Ekkehard of Naumburg, whose life-sized statue can be dated to 1243-1249 (Fig. 18).¹⁷ According to Oakeshott,¹⁸ this style of crossguard was mainly used between 1200 and 1350.¹⁹ The chronological classification of the hilt reveals a broad overlap of the individual elements,

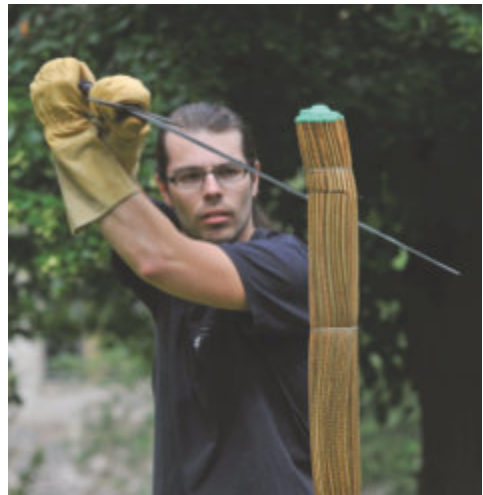


Fig. 13 a and b Hand-and-a-half sword “Ars Gladii” – cutting demonstration during the “Zeitreise auf der Veste Coburg” in 2009

ranging from c. 1250 to 1350, suggesting that the parts of the hilt were probably made within this time frame. This leaves us with a time gap of about 100 years between the blade and the hilt, although this may well be explicable. Hence, it is conceivable that the hilt was remounted in part or in its entirety after a long period of use.²⁰ Possible reasons for this could be wear and tear or adaptation to more recent fashion, functional or handling requirements. When looking at the surviving hilt elements, it seems that the tang was slightly lengthened, which resulted in a thinning of the third near the pommel. The reason for such a lengthening could have been the desire to turn a one-handed weapon into a more “modern” hand-and-a-half sword. This designation indicates different handling options. For one thing, the comparatively light sword could be wielded single-handedly with its pivot point positioned relatively close to the hilt. Yet if necessary, the second hand could also be used to control the sword (Fig. 13).

The third specimen from the Bavarian Army Museum (inv. no. A 3940, Fig. 3) bears more resemblance to the second sword than to the Carolingian one, but nevertheless differs significantly morphologically from the former. The blade, for example, when viewed from its flat side,

has an elongated triangle shape, with a long, distinctly sharp point and a maximum width of only 2.5 cm; in cross-section, the 82.3 cm long blade is hexagonal in the third on the crossguard side, on the two front thirds it is diamond-shaped. The hilt is quite long at 21.2 cm, which might also indicate that it can be wielded with both hands.

The slender tang runs through a heavy octagonal iron “disc pommel” and is hammered flat (peened) on its upper side. Towards the blade end it is terminated by a slender crossguard, slightly sloping down towards the point of the sword and quite long at approx. 22.5 cm. In the centre of the pommel disc there is a slightly recessed circular area with the remnants of a raised cross, now somewhat blurred (Fig. 21).

There are many different types of symbols on the pommels of knightly swords. They may be engraved, inlaid, or cut, or they may be recessed or raised. In the case of non-ferrous metal pommels, they were also incorporated as part of the casting mould.²¹ In the central facet of the blade, some 7 cm from the root of the blade or from the crossguard, a sign or mark is inlaid in non-ferrous metal (Fig. 14). It consists of individual, mostly shorter line segments, which are probably to be associated with the Passau wolf mark. Furthermore, only a few

Fig. 14 Details of the blade
On the left the wolf mark executed in non-ferrous metal, on the right the remnants of a bishop’s crook (Bavarian Army Museum, Inv. No. A 3940)





Fig. 15 Sword handling through the centuries
Page from the Leiden 1 Maccabees manuscript,
c. 925, Abbey of St. Gall
(Leiden University Library, F 17, fol. 9v)



Fig. 16 Sword handling through the centuries
The so-called Tower Fechtbuch (Tower Fencing Manual), Frankish origin, possibly Würzburg, around 1300
(Tower Fechtbuch, Royal Armouries, Ms. I.33, fol. 31v)



Fig. 17 Sword handling through the centuries
Fencing manual by Hans Thalhoffer, 1467
(Bavarian State Library, Cod. icon. 394a, fol. 9v)

centimetres further in the direction of the point are the remnants of a second non-ferrous metal inlay (Fig. 14), which with due caution could be interpreted as the curved top of a crosier.²²

The “Passau running wolf” is usually characterised by short strokes placed across the lines, but this is not necessarily always the case.²³ This mark, however, seems to have been copied or adopted by a number of different workshops and towns, as something of a quality label to promote sales.²⁴ Classifying the sword chronologically is comparatively difficult due to the relatively few chronologically corresponding individual elements. On the one hand, there is the form of the pommel, which can be attested as early as the 13th century,²⁵ and on the other hand, the maker’s mark without the characteristic cross strokes, whose absence is usually associated with

more recent times. Likewise, the metrics and shape of the blade speak for a markedly later date, as such slender and pointed blades without a fuller are usually dated to the 14th or more likely the 15th century.²⁶ Since the period of use of the profiled disc pommel, which can be traced from the 13th century onwards, is quite long,²⁷ it would be advisable to take the younger element of the sword, the blade, as a guide, meaning that the sword probably did not come into being until the earlier 14th century.

If one compares the three swords discussed here according to their form and metrics, obvious differences become immediately apparent. Just as with the Schrobenthausen “handgonne” (cf. Geibig’s contribution on the arquebuses in this volume), we can apply the principle of “form follows function” and assess the pieces according to this. Thus, the distribution of mass in the

blades and the design of their hilts have an effect on their handling. The Carolingian sword (Fig. 1), suitable for both slashing and thrusting²⁸ (Fig. 16), stands at the beginning of an increasingly refined art of fencing that flourished over the coming centuries and probably reached its perceived peak in the 17th and 18th centuries.

The second sword, with its lengthened grip and heavy “Radnabenknauf” (Fig. 12), indicates that the requirements in terms of grip variation and thus use in the context of a more sophisticated fencing technique have increased considerably.

The final piece (Fig. 3) of the group of three appears to be the most specialised. It dates from the early heyday of fencing and is specifically designed for the skilled and refined wielding of the blade (Fig. 17).²⁹



Fig. 18 Statue of Ekkehard II of Naumburg († 1046), 1243-1249, located in Naumburg Cathedral. The “disc pommel” of his sword is clearly visible.

Sword

Inv.-No. A 3621

Dating

German (?), c. 750-800

Material

Iron

Dimensions

Upper fragment with grip:

Length 57 cm / Width 8.5 cm / Height 1.8 cm

Fragment of the blade:

Length 37 cm / Width 4 cm

Description

The sword is quite well preserved for its age and is almost complete. Except for the organic parts of the grip and scabbard, the weapon is completely preserved, though the blade is broken.

The scabbard and the grip most probably consisted of a wooden body covered with textile. The loss of substance due to corrosion only slightly affects the morphological significance of the piece.

Characteristic and relevant to the sword type and/or particularly significant are the pommel, which is roof-shaped in side view, and the broad blade with approximately parallel cutting edges, a short roof-shaped point, a broad, shallow fuller and a pattern-welded centre section with separately welded-on cutting edges.

Provenance and acquisition history

On 14 May 1921 received as a loan from the Bavarian National Museum

On 14 November 1935 permanently transferred to the Bavarian Army Museum

Inventories

Acquisition book 3 (Bavarian Army Museum, Inv. No. HA.05.01.93), entry 21045: "1 Schwert. 9. Jahrh., 1.6.21, vom National=Museum (~~vorerst leihweise~~) 14.11.1935 überlassen"



Fig. 19 Underside of the pommel (Bavarian Army Museum, Inv. No. A 3621)

Collection receipts for the year 1921 (Bavarian Army Museum, Inv. No. HA.05.01.62), receipt no. 39: "Verzeichnis der an das Armeemuseum am 14.5.1921 leihweise abgegebenen Gegenstände": Nr. 4838 "Schwert (Z.B.IV, p. 212)"

Local inventory book (A-Buch, volume 1, Bavarian Army Museum, Inv. No. HA.05.01.27a-c), entry no. 3621: "ein Schwert mit damaszierter Klinge. deutsch 9. Jhdt. Länge 93. cm"

Literature (selection)

Geibig, Beiträge, Cat. 4, p. 213, plate 3; Paggiarino/Schönauer, The Bavarian Army Museum, pp. 33-35 and p. 250.

Exhibition history

1921 to 1942/43

Permanent exhibition of the Bavarian Army Museum in the old museum building at the Munich Hofgarten (cf. Fig. 6 in Reiß's contribution in this volume)

since 3 June 2019

Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt

Sword

Inv.-No. A 11136

Dating

German (?), c. 1250-1400

Material

Iron

Dimensions

Length 108.5 cm / Width 17.3 cm

Height (pommel) 4,8 cm

Description

Except for the organic elements of the grip and scabbard, the sword is almost completely preserved. Corrosion-related loss of substance hardly detracts from its morphological significance. Characteristic features are the clearly profiled disc-shaped pommel (Radnabenknauf), the slender crossguard and the lengthened tang, the latter pointing to a hand-and-a-half sword. Traces of grooves on the pommel's surface indicate a former cross-shaped inlay of non-ferrous metal. The blade is fashioned from homogeneous monosteel. Faintly discernible sharp structural edges in the corroded surface of the blade suggest a former inlay of iron or non-ferrous metal. With its slender, elongated shape and narrow fuller, the blade is clearly older than the hilt. For the latter, a secondary mounting about 100 years later can be assumed.

Provenance and acquisition history

On 5 August 1936 received as a donation from the old "Verein der Freunde des Bayerischen Armeemuseums" (Association of Friends of the Bavarian Army Museum)

Inventories

Acquisition book for the years 1935-1941 (Bavarian Army Museum, Inv. No. HA.05.01.96), entry 202 in the section on the year 1936: "1 Schwert, deutsch, um 1400, Preis



Fig. 20 Pommel, grip and crossguard (Bavarian Army Museum, Inv. No. A 11136)

bzw. Schätzwert 150, 5.8.1936, Geschenk der Armee=Mus. Freunde"

Collection receipts for the year 1936 (Bavarian Army Museum, Inv. No. HA.05.01.73), receipt no. 100: "München, 5. August 1936. Eingetragen unter Samml. Zug. Buch Nr. 2020/1936. Den Sammlungen des Armeemuseums, Abteilung Aeltere Zeit wird überwiesen: A 11136, 1 Schwert, deutsch, um 1400, Erwerbungsart: Geschenk des Vereins der Freunde des Bay. Armeemuseums in München, Wert bzw. Preis: 150.-RM, Schriftwechsel: ohne"

Local inventory book (A-Buch, volume 3, Bavarian Army Museum, Inv. No. HA.05.01.29), entry no. 11136: "1 Schwert, deutsch um 1400, Länge 108,5 cm Wert 150 M, Geschenk Verein der Freunde des A.M."

Literature (selection)

Paggiarino/Schönauer, The Bavarian Army Museum, p. 78 f. and p. 253.

Exhibition history

since 3 June 2019

Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt

Sword

Inv.-No. A 3940

Dating

Bavaria (Passau) (?), early 14th century

Material

Iron, wood

Dimensions

Length 103.5 cm / Width 22.5 cm /
Height 2.5 cm

Description

A well-preserved, barely corroded sword with a delicate hilt and a typologically characteristic octagonal pommel when viewed from the side. Remnants of a raised cross are visible in the sunken circular centre. The blade, predominantly diamond-shaped in cross-section, is elongated triangular with a long tapered point. Remnants of a fine inlay of non-ferrous metal in the shape of a stylised wolf are still quite clearly visible in the blade. A few centimetres further towards the point there is a second inlay, which can probably be interpreted as the rolled crook of a crosier. This would suggest that the sword originated in Passau.

Provenance and acquisition history

Acquired in the art trade (Ernst Schmidt, Munich) on 3 August 1921

Inventories

Acquisition book 3 (Bavarian Army Museum, Inv. No. HA.05.01.93), entry 21086: "1 frühgotisches Schwert Preis 3892,50 M; 3.8.1921 Ankauf von Ernst Schmidt München, Pfandhausstr. 5 [today's Pacellistraße]"

Collection receipts for the year 1921 (Bavarian Army Museum, Inv. No. HA.05.01.62), receipt no. 63: "Eingetragen unter Inv.Nr. 21086; München, 3. August 1921. Den Sammlungen des Bayer. Armee-Museums. Abteilung: Aeltere Zeit, wird überwiesen:



Fig. 21 Pommel with recessed circular section with remnants of a relieved cross (Bavarian Army Museum, Inv. No. A 3940)

1 frühgotisches Schwert, Erwerbungsart: Ankauf bei Ernst Schmidt, München, Pfandhausstr. 5, Preis: 3892 m 50 d, Ankauf genehmigt mit Min. Entsch. v. 28.7.1921 No. 32963 s. b. No. 448/21"

Local inventory book (A-Buch, volume 1, Bavarian Army Museum, Inv. No. HA.05.01.27a-c), entry no. 3940: "ein Schwert; Griffschallen[!] aus Holz, deutsch, 14. Jhd. Länge [no entry] cm"

Literature (selection)

Glaser, Wittelsbach, p. 171, Cat. 244; Paggiarino/Schönauer, The Bavarian Army Museum, pp. 63-65 and p. 252.

Exhibition history

14 June to 5 October 1980
Exhibition "Wittelsbach und Bayern. Die Zeit der frühen Herzöge von Otto I. zu Ludwig dem Bayern" in Trausnitz Castle in Landshut

since 3 June 2019
Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt

Footnotes

- 1 Cf. Geibig, *Beiträge*, pp. 100-102.
- 2 See also Szameit, *Karolingische Waffenfunde*, pp. 385-412 and especially the swords from Tauchendorf, St. Georgen, Sierninghofen and Hainbuch.
- 3 As far as can be judged at present, the scabbards of Carolingian swords in the German-speaking countries all seem to have been of approximately the same construction and design. Findings of scabbards in typologically closely related specimens from North Rhine-Westphalia and Lower Saxony, especially from Schortens, Cleverns, Aurich, Zetel, Buxtehude and Lankern, allow a quite reliable reconstruction. Therefore, a corresponding construction seems quite probable for the piece under discussion here, which also belongs to this type family. On the construction of Carolingian and later medieval scabbards, see Geibig, *Beiträge*, pp. 104-111.
- 4 Cf. *ibid.*, p. 109, fig. 29.
- 5 Measurements: total length of hilt: 16.1 cm, grip width: 9.8 cm, max. tang width: 3.0 cm, tang button: 6.9 cm long, 1.21 cm high; upper guard: 7.8 cm long, 1.8 cm high; crossguard: 8.5 cm long, 1.7/1.9 cm high.
- 6 Cf. Ypey, *Europäische Waffen*, p. 381.
- 7 See also Geibig, *Beiträge*, p. 112 f. with further explanations and references. It would seem that etching is not always an imperative, as the pattern-welded structure can be brought out in a delightful way by intensive polishing alone.
- 8 See also Jahnkuhn, *Ulfberht-Schwert*, p. 224 f; Kirpicnikov, *Connections*, p. 63; Emmerling, *Zur Technologie*, p. 120 f. and Menghin, *In-schriftenschwerter*, pp. 266-268.
- 9 Especially in the 19th century, pattern-welded "veneers" were rediscovered and used again as a decorative element in thin layers for the outer barrel surfaces of valuable hunting and other rifles, and shotguns. Ottoman and other non-European rifles in particular also featured barrels made of solid Damascus steel.
- 10 Cf. Ypey, *Europäische Waffen*, p. 387.
- 11 Total length of hilt: 24.5 cm, length of cross-guard 17.1 cm, current weight 1150 g; blade: length 84.6 cm, max. width c. 4.7 cm.
- 12 On iron inlays in the form of vertical bars cf. Geibig, *Beiträge*, p. 155.
- 13 Cf. *ibid.*, p. 87.
- 14 Cf. *ibid.*, p. 153 f., fig. 40.
- 15 Oakeshott, *Archaeology*, p. 184. Cf. there also figures 6 c, d and 7a. Oakeshott assumes that these blades were produced between 1130 and 1200. For a parallelism with Oakeshott's typology, see Geibig, *Beiträge*, p. 146. For a comparison of Geibig's and Oakeshott's typologies see also Aleksic, *Medieval Swords*, pp. 19-22, 29 and 82.
- 16 Cf. Oakeshott, *Archaeology*, p. 224 f.
- 17 Cf. *ibid.*, p. 244, fig. 121 and Krohm, *Naumburger Meister 2*, p. 935 f.
- 18 Cf. *ibid.*, p. 232.
- 19 Such crossguards most likely correspond to Oakeshott's type 2, which he dates to between 1200 and 1350 (Oakeshott, *Archaeology*, p. 232 f., fig.113). The author places such examples mainly in the 13th century. However, the short length of the guard in question speaks for a particularly early date of manufacture (Geibig, *Beiträge*, p. 158), so that an origin of the piece in the last quarter of the 12th century cannot be ruled out.
- 20 Cf. Geibig, *Beiträge*, p. 152.
- 21 Cf. for example the pommels with cross symbols in Oakeshott, *Archaeology*, p. 322, p. 324, fig. 164; Wagner, *Hieb- und Stichwaffen*, p. 56; Müller, *Europäische Hieb- und Stichwaffen*, p. 28 f., p. 164, figs. 21, p. 167, fig. 23 and Aleksic, *Medieval Swords*, p. 55, fig.18, pl. 3, fig. 2, pl. 11, figs. 3 & 4. Besides these, various other decorative designs are found, often in circular recesses within the flat sides of disc pommels. Heraldic symbols and coats of arms are particularly common. Cf. for example Seitz, *Blankwaffen*, p. 148, fig. 88 and Müller, *Europäische Hieb- und Stichwaffen*, p. 159, fig. 9.
- 22 See, for example, the inlays, some of them very reduced, which could be interpreted as bishop's crooks: Müller, *Europäische Hieb- und Stichwaffen*, p. 381, no. 155; Glosek, *Miecz*, cat. no. 319, 330 and 348, plate XIV, cat. nos. 437 and 439, plate XVII.
- 23 Cf. especially Huther, *Passauer Wolfsklingen*. In this work, Huther deals intensively and comprehensively with the Passau wolf marks on blades. The focus of Huther's work is particularly on the history and origins of the Passau mark, the diversification of the artisans and the cultivation of legends associated with this famous mark.
- 24 Cf. Huther, *Passauer Wolfsklingen*, p. 44 f.
- 25 Cf. Oakeshott, *Archaeology*, p. 320 ff., fig. 161 and Scalini, *A Bon Droyt*, p. 122, no. 17.
- 26 Cf. for example Oakeshott, *Archaeology*, p. 184, figs. 6c & 7a.
- 27 Cf. for example Seitz, *Blankwaffen*, p. 137; Wagner, *Hieb- und Stichwaffen*, p. 58 f.; Kovac, *Le spade*, p. 22, no. 15 and Aleksic, *Medieval Swords*, pp. 54-58.
- 28 The overwhelming majority of all contemporary depictions of combat show the swords in a thrusting function. Two rather rare depictions, possibly showing a grip position for stabbing, are found in the Maccabees manuscript from the Abbey of St. Gall, c. 925, now held in the Leiden University Library, PER F 17, fol. 9r and 15v.
- 29 For a comprehensive study of the historical fencing techniques and schools as well as the functional secrets and morphological specifications, cf. the extensive works by Johnsson, *Schwert*, pp. 13-15; *ibid.* pp. 16-27; *ibid.* pp. 28-40 and Warzecha, *Greif zu!*, pp. 27-46.

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Alfred Geibig

Of Handgonnes and Wooden Bumpers

A very special Arquebus from Markt Schrobenhausen

Among the numerous items in the Bavarian Army Museum's collection, there are some objects that are more than simple contemporary witnesses. Due to their special morphological, technical and usage characteristics, they can tell stories that provide information about special technical tricks, special characteristics and special ways of using these weapons. In some cases, however, they also tell of tragic and perhaps even frightening events that befell their owners or operators, who otherwise remain anonymous to us. The "Hakenbüchse" (arquebus), a heavy handgun that probably dates back to the last decades of the 15th century (Fig.1), would be one of those exceptional, special items. But before this firearm begins to tell its story, let us first give a factual and technical description of it.

The weapon consists of two main components, a wrought-iron barrel and a wooden stock. The two-stage barrel is eight-faceted, with the surfaces of the short rear stage adjacent to the chamber twisted at 45° to those of the much longer first stage. The muzzle is upset, i.e. reinforced in a bead-like manner. The barrel bore has a calibre of 22.5 mm.¹ The barrel itself does not yet feature a breech plug, which, together with the lack of an attached pri-

ming pan and the relatively rough finish of the barrel's exterior, indicates that it dates from an early period in the last two decades of the 15th century.

In the chamber area, just below the touch hole there is a long, horizontal, wide-open crack, which is evidence of a capital barrel burst (Fig. 2). On the lower edge of the crack, on the same level as the touch hole, there is a lip-like rim turned outwards, which may indicate a small igniting pan (an early form of touch hole) worked from the material, but lost to the burst, which seems to confirm the chronological approach assumed above.

At the trailing edge of the rear barrel end, set on the upper facet, there is a massive rear sight with slightly sloping flanks and with a vertical sight slot. No front sight appears to have been applied to the muzzle end of the barrel. The barrel is bedded on a stock, possibly made of oak,² and firmly attached to it at its front end by a band-shaped iron ferrule. This appears to be a "provisional" repair, as the stock features a drill hole, which has broken away on one side (Fig. 3). A corresponding hole in the base of the solid hook welded to the underside of the barrel once made it possible to connect the two elements by means of a pin.

Fig. 1 a and b Arquebus from Schrobenhausen (right and left side) with shortened butt, presumably end of the 15th century (Bavarian Army Museum, Inv. No. A 172)



Fig. 2
Detail of the
cracked chamber
(Inv. No. A 172)

This tapered hook shows a straight vertical line on the chamber side, while the front vertical line runs down in a double curve. Recessed in the stock, behind and below the touch hole, are possible traces of a pivot base (Fig.1). Conceivably, these are the remains of an early mechanical firing mechanism whose very simple lever mechanism was mounted on the outside of the stock. In this case, a simple cock, either rigidly connected to the lever or integral with it, for holding a fuse or a match-cord was merely controlled via a single- or multi-part lever mounted on the axle (Fig. 4). This ignition aid, which was quite new at

the time, allowed the arquebus operator to discharge a shot by himself, if necessary. Since the recoil was compensated by the hook that was hooked into the wooden bumper, a firm two-handed grip by the shooter was not necessary. A special ignition assistant was therefore probably not needed, but may have been used to improve the process (Fig. 5).

If we now compare the two other arquebuses from Schrobenhausen with the inventory numbers A 173 and A 174, which came into the Bavarian Army Museum in the same year, we cannot find any traces of a possible ignition mechanism (Fig. 6).



Fig. 3
Left side of the muzzle.
The broken hole at the
front end of the wooden
stock is clearly visible,
as is the related repair in
the form of an iron band
ferrule
(Inv. No. A 172)

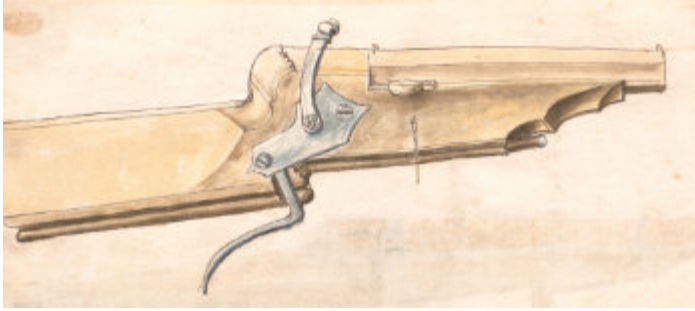


Fig. 4
Simple ignition
mechanism on a
Maximilian
Hakenbüchse
(Bavarian State
Library, Cgm. 599,
fol. 10r)

These have their recessed touch hole at the top of the barrel and required at least one more hand or a second person as an assistant to ignite the charge (Fig. 5).

The stock of our specimen, meanwhile, is greatly shortened at its rear end and instead of an elongated butt or “rod” (Fig. 1), it has only a horn- or hook-like, tapered short armpit rest. The two other arquebuses from Schrobenhausen (Fig. 6) have a very similar design.

At 11.6 kg, the rifle to be discussed here is comparatively light and can thus be carried and operated by a single man. With a length of “just” 108 cm, it is also relatively short for such a weapon.

There is a mark struck into the upper facet of the barrel which could represent a dragon striding to the left, probably breathing fire, without any other heraldic symbols (Fig. 7); this is not a known maker’s mark, though. Nor can the “coat of arms” be directly associated with the Schrobenhausen either, as the one of the town is composed of a bear’s head and the Bavarian lozenges. The signature might be associated with a noble family living in the vicinity or in the town itself.³ Taking into account the morphologically very similar pieces from Schrobenhausen, we can find the “cross crosslet mark” of the gunsmith family Pögel on inv. no. A 174 (Fig. 8).

Two more arquebuses

Stylistically as well as chronologically, the arquebus group from Markt Schrobenhausen lies between the “Tüllenhaken” of 1485 (Peter Pögel) and the Maximilian “Kurzhausen” of 1498/1500 ff. (Sebald Pögel).⁴ The first one is a forged barrel en-

Fig. 5 Arquebus shooter with ignition assistant
(*Zeitreise auf der Veste Coburg* 2005)





Fig. 6 a and b Two more arquebuses from Schrobenhausen with heavily shortened butts (Bavarian Army Museum, Inv. Nos. A 173 and A 174)



Fig. 7 Mark struck into the barrel of the arquebus with Inv. No. A 172

Fig. 8 Cross crosslet mark of the Pögel family (Styria) on the Schrobenhausen arquebus (Inv. No. A 174)



ding in an integral socket – the “Tülle” – into which a stout wooden stick is inserted for handling. A Maximilian “Kurzhaken” shows a comparatively short barrel embedded in a stock with an attached butt. Thus, a Styrian provenance is conceivable for these weapons and thus also for the piece to be discussed here. With a distance of approx. 350 km as the crow flies, production there and subsequent delivery to Schrobenhausen is quite a possibility.

What then can this weapon tell us? First of all, there is the weight of the gun of 11.6 kg, which indicates that it was unlikely to have been fired from a standing position without support. And then there is the hook on the underside of the weapon, which probably allowed it to be “hooked” into a bearing that served as a secure rest for the heavy device and thus made aiming easier. This hook transferred the weapon’s recoil, which must have been substantial, to a buffer element, which ultimately compensated the rearward thrust, that was unpleasant for the shooter.⁵

For the shooting of arquebuses⁶ there were, on the one hand, so-called “Schießbladen”, simple, semi-mobile wooden racks for inserting the weapon (Fig. 9), comparable to a gun carriage, but also and above all wooden bumpers (“Prellholz/Prellhölzer”), which were inserted, wedged or mortared into corresponding recesses in the side walls of loopholes (Fig. 10).

Most of these wooden bumpers have since disappeared, were removed during modifications or later restorations, or were deformed by bearings that may have been added. A few, however, have survived; even some of the guide grooves have been preserved into our time. Thus, the attentive observer can sometimes recognise organic remnants and traces of bearings and guide grooves when visiting castle ruins or urban fortifications. They can be found as a later modification in medieval ar-

rowslits (Fig. 10)⁷, originally designed for the use of crossbows or bows, in the specific Hussite fishtail loophole type, typical for the 15th century,⁸ or in connection with inverted keyhole loopholes⁹ or differently sized rectangular firing windows with and without wooden shutters, which can be traced from the Middle Ages to the early modern period.¹⁰

An impressive example of mortared-in wooden bumpers can be found in Glurns (South Tyrol) (Fig. 11). The original woo-



Fig. 9 Heavy arquebus with shooter and ignition assistant (Bavarian State Library, Cod. icon. 222, fol. 72r)

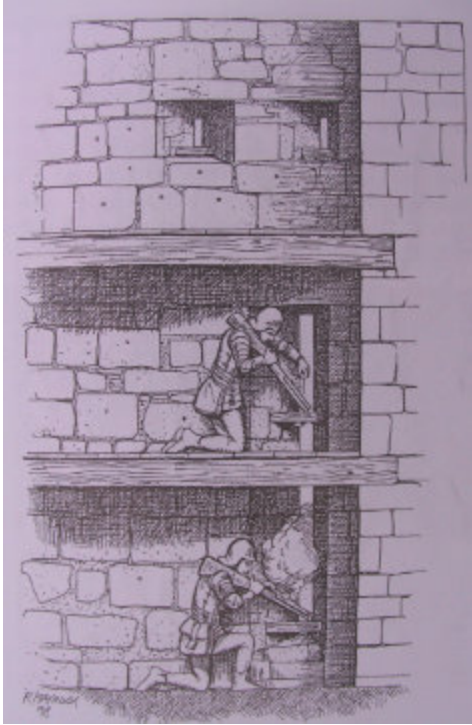


Fig. 10 Sectional view of the arquebus tower of the ruined castle of Lichtenstein (Bavaria) (Drawing by Roger Mayrock per specifications and measurements by Joachim Zeune)

den bumper, which was set approximately in the centre of the loophole opening, is underpinned.¹¹ Whether the underpinning is contemporary cannot be answered at this point. There is a rectangular recess in the wooden bumper into which a arquebus with an iron hook protruding from the bottom of the stock could be inserted. The recess also made it possible to fire the weapon downwards at a steep angle, something that might have been necessary under very specific conditions, e.g. to rake the trench adjoining the wall.

Another loophole of the same city fortification only shows the imprints of the former wooden bumper (Fig. 12).

Another variant to be mentioned are recesses in the side walls of the embrasures,



Fig. 11 Glurns (Merano, South Tyrol) Cemented wooden bumper in a loophole in the town walls

usually rectangular and of varying depth, into which timbers were loosely inserted and probably also wedged (Fig. 13). These bumpers could be quickly installed if necessary and also removed again. This type of inlay can be verified most frequently.¹² Among these findings, however, might also be those in which the wooden bumper was originally cemented in place, but was then lost, leaving behind a rectangular depression. Belonging to the same range of bearings, but more elaborate and sophisticated in their workmanship, are wooden bumpers, which could be slid into their bearing by means of a guide groove worked into the side walls of the embrasu-

Fig. 12 Glurns (Merano, South Tyrol) In the same wall as Fig. 11, an indentation of a past or removed wooden bumper preserved only in the mortar



re (Fig. 14). These bumpers are held firmly in place in their bearing so that there is no need for wedging and mortaring. They are very quick to install and remove. One of the most impressive designs can be seen on an original Hohenstaufen castle complex near Ottrott (Alsace).¹³ There, the distinctive “force-guided” bearings can be observed in the side walls of a inverted keyhole embrasure, ideal for the use of firearms, especially arquebuses. On the left side, there is a roughly circular hole into which the wooden bumper, being too long for the actual width of the embrasure, was inserted. The wood was then probably guided along a sloping guide groove to the sack-like bearing itself, where it was inserted in such a way as to prevent it from escaping.

The most elaborate form of wooden “embrasure fittings” was certainly the so-called “Balkenschirm”. These embrasure shutters consisted of beams placed one on top of the other and were used to delimit the openings of larger embrasures or gun ports. Probably one of the best preserved “Balkenschirme” (if not the best of all) is found in one of the southern towers of the outer ring of the Veste Coburg. Dendrochronologically, this can be dated to the 1420s (Fig. 15). This protective screen consists of five horizontally superimposed beams of different heights that fit into vertical grooves on both sides.

On the underside of the third beam from the top, a horizontal recess of 11 x 82 cm forms a long rectangular slit, resulting in a loophole that is much smaller than the opening in the embrasure. It was possible to thrust a rifle through it, which was then held in place by hooking it to the outer edge of the beam below. Only very few “Balkenschirme” have survived to the present day; somewhat more common are traces of their installation in the form of vertical grooves for the beams in the side walls of embrasures and gun ports.¹⁴ These



Fig. 13 Aggstein Castle (Wachau, Austria)
Recesses in the embrasure cheeks allow the insertion of loose beams



Fig. 14 Inverted keyhole embrasure in the Ottrott castle complex (Alsace)
The precisely worked guiding groove for the safe insertion of a wooden bumper is clearly visible.

Fig. 15 Veste Coburg, first mural tower, lower floor with inserted Balkenschirm with firing ports (1420s)





Fig. 16 Heavy arquebus, provisionally mounted on a later wheeled carriage, irreparably damaged by a massive chamber blow-out. (NordJURA-Museum Weismain, Bavaria)

examples listed here should suffice for describing the possible operational environment of the Schrobenhausen “handgonne”. Let us now turn to its external features: The much shortened butt is striking. According to the maxim “form follows function”, this arquebus – and this is also true for the other two examples – seems to be a firearm “optimised for handling” for use in narrow action spaces such as covered chemins de ronde / allures or the like. The butt area, shortened to a short pointed nose, can also be used very well for downward shots. Particularly for the 15th century, there are corresponding loopholes for giving off such steep downward shots and in doing so, shortening any dead angles. The same applies to caponiers / flankers and the frontal loopholes in enceintes, built opposite to counterscarps. These types of embrasures are sometimes referred to as “Hussitische Senkscharten” (Hussite fishtail loopholes), a term that Achim Zeune has been using for some years.¹⁵ Such embrasures probably date to the first half of the 15th century and are somewhat consistent with the age of the

town of Schrobenhausen, which was rebuilt into a ring-shaped fortress from 1392. But subsequent vertical loopholes and their early predecessors, the long vertical arrowslits for archers, later modified for firearms and equipped with wooden bumpers, also allowed for steep shooting, where the rear end of the arquebus had to be lifted up considerably (Fig. 10).

Since not every loophole and embrasure could be fitted with firearms, which was particularly true for smaller fortifications, a high degree of mobility was a good compromise solution. While larger-calibre terrace-guns were able to bring significantly more firepower to the opponent, these also meant a marked reduction in mobility.

Then there is the chamber burst that ended the service life of the Schrobenhausen “Hakenbüchse” in the Army Museum’s collection (Fig. 2). This occurrence was not all that rare in those days (Fig. 16).

In the author’s opinion, there are three main reasons that could have caused the damage: firstly, a material weakness (blow-hole or forging/welding defect), secondly,

an (unintentional) multiple charge, and thirdly, an intentional or perhaps unintentional charge with void space that would have caused a considerable increase in chamber pressure.¹⁶ Since guns by the Pögel family – and at least one of the three Schrobenhausen rifles has been identified as one of their products¹⁷ – were meant to be shot with forged iron balls, it can be assumed that their mass was lower than with lead projectiles.¹⁸ One can assume, if only for reasons of supply or simply because of the lighter and more common in-house production of lead bullets, that the use of lead projectiles was the more common method. With their significantly higher mass and thus higher inertia and, therefore, probably also higher pressure build-up in the chamber, this could also be a fourth possible cause of the accident. Interestingly, the piece was not recycled but retained. Why? As a souvenir of an accident or as a material reserve?

In principle, this arquebus could be operated by the shooter alone via a simple trigger mechanism that activated a matchcord holder; at least this seemed to have been the original design. Since the hook hooked into the wooden bumper compensated for the recoil, a firm two-handed grip by the shooter was also unnecessary. This is especially true for the manual ignition with a hot iron or a glowing match. It is likely that the detonation caused considerable injuries to at least the firing arm and the face of the shooter. If there had been an additional ignition assistant, perhaps for safety's sake, which cannot be ruled out at that time and in the case of an action with the barrel pointing strongly downwards, he would also have had to reckon with considerable, perhaps even fatal, injuries. Thus, the Schrobenhausen "Hakenbüchse" may well be the grisly testimony of a terrible accident in olden times for those involved.

Arquebus

Inv.-No. A 172

Dating

Southern German/Styrian (?),
end of the 15th century

Material

Iron, Wood

Dimensions

Height 15 cm / Width 10.5 cm /

Length 108 cm

Bore (diameter) 225 cm

Weight 11.6 kg

Calibre 22.5 mm

Description

Arquebus with a wrought-iron, eight-faceted two-stage barrel. The two stages are twisted at a 45° angle to each other. Compressed muzzle with bead-like reinforcement.

Drilled barrel with a calibre of 22.5 mm. A breech plug has not yet been applied. The muzzle is compressed, i.e. reinforced bead-like. massive rear sight with slightly sloping flanks and with a vertical sight slot.

Solid hook welded to the underside of the barrel with a straight rear edge on the chamber side and a curved front edge. In the chamber area, just below the touch hole there is a long, horizontal, wide-open crack, which is evidence of a capital barrel burst.

On the upper facet of the barrel a mark that cannot be made out at present, but could represent a dragon striding to the left, probably breathing fire, or a lion, leopard or panther. The stock, possibly made of oak, provisionally repaired with an iron band ferrule. The specially trimmed very short conical butt end suggests mobile use in confined spaces such as gun ports and chemins de ronde / allures.

In the stock, behind and below the touch hole, possible remnants of a pivot base for



Fig. 17 Muzzle end of the arquebus
(Bavarian Army Museum, Inv. No. A 172)

a firing mechanism in the form of a simple lever mechanism to hold a fuse or a match-cord.

Provenance and acquisition history

Acquired by the Bavarian Army Museum on 2 November 1904 in an exchange with the market town of Schrobenhausen, as the gun stock represented a particular stage in the history of the development of firearms that had not yet been represented in the collection.

Inventories

Acquisition book 1 (Bavarian Army Museum, Inv. No. HA.05.01.91), entry 172: "eine Hakenbüchse, 2.11.04 Tausch Magist. Schrobenhausen"

Collection receipts 1902-1904 (Bavarian Army Museum, Inv. No. HA.05.01.57), receipt no. 81 (for the year 1904): "Verzeichnis der mit Genehmigung des K. Gen. Stabes No. 1711/04 abgeschlossenen Tausche": Nr. 6810 "3 geschäftete Hakenbüchsen, vom Stadtmag. Schrobenhausen"

Local inventory book (A-Buch, volume 1, Bavarian Army Museum, Inv. No. HA.05.01.27a-c), entry no. 172: "Hakenbüchse, 8 kan-

tiger 88 cm langer Lauf aus Schmiedeeisen, gekerbter Mündungsbund, seitliche Zündung, rohgeschchnittener Schaft aus Eichenholz, Kaliber 25 mm, Marke“

Literature (selection)

Vizthum, Von Feuerwaffen;
 Fahrnbacher, Führer, p. 37.


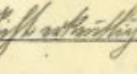

Exhibition history

1905 to 1942/43
 Permanent exhibition of the Bavarian Army Museum in the old museum building in the Hofgarten in Munich

May 1972 to 31 August 2014
 Permanent exhibition of the Bavarian Army Museum in Ingolstadt

since 3 June 2019
 Permanent exhibition “Treasure Chamber” of the Bavarian Army Museum in Ingolstadt

Fig. 18 Entry for the three arquebuses in the local inventory book (A-Buch, volume 1, Bavarian Army Museum HA.05.01.27a-c)

172	172	459/1	Guckenbüsse, 88cm langer Lauf aus Schmiedeeisen, gekerbter Mündungsbund, seitliche Zündung, rohgeschchnittener Schaft aus Eichenholz, Kaliber 25mm, Marke: 	Z Rev.48 300
173	173	459/2	Guckenbüsse, 91cm langer zylindrischer Lauf mit gekerbtem Mündungsbund, seitliche Zündung, Schaft aus Eichenholz, Kaliber 25mm. Marke: 	Z Rev.48 300
174	174	459/3	Guckenbüsse, 89cm langer zylindrischer Lauf seitliche Zündung, Schaft aus Eichenholz, Kaliber 25mm. Marke: 	Z Rev.48 300

Footnotes

- 1 I owe this and other technical details to Dr. Wilfried Tittmann, who in his dissertation "Die Nürnberger Handfeuerwaffen vom Spätmittelalter bis zum Frühbarock" (Nuremberg small arms from the late Middle Ages to the early Baroque) dealt extensively and knowledgeably with firearms of this period.
- 2 The wood species is very difficult to determine due to its washed-out surface. Of all the woods that could be used, the structure is most likely to be oak. I owe this assessment to Ansgar Geibig.
- 3 It might also be the coat of arms of the city of Ingolstadt, a blue panther incensed on a silver background. However, this is an exclusively visual connection that cannot be proven from sources.
- 4 Cf. especially Tittmann, *Nürnberger Handfeuerwaffen*, pp. 95 ff., who deals in detail with the gunsmith family Pögel and Styria as a place of manufacture of early iron arquebuses.
- 5 Cf. Geibig/*Zeune*, *Wider die verdampften keczr*, pp. 185 ff.
- 6 On the location and use cf. Geibig, *Waffen im Alltag*, pp. 189 f. and also Geibig/*Zeune*, *Wider die verdampften keczr*.
- 7 Cf. *ibid.*, fig. 1.
- 8 Cf. *ibid.*, fig. 8 ("hussitische Senkscharte").
- 9 Cf. *ibid.*, fig. 10-11.
- 10 Cf. *ibid.*, fig. 15.
- 11 Other examples of wooden bumpers used in a similar way can be found in Glurns (South Tyrol). At Plesse Castle (Lower Saxony), a wooden bumper with a rounded cross-section was found deep in the floor of a rectangular embrasure in the castle complex. Somewhat over-moulded traces in at least one, but probably two other embrasures, further suggest the basic use of wooden bumpers. Other mortared-in examples can be found at Seebenstein Castle (Lower Austria). Various wooden bumpers installed in embrasures can also be found at the Veste Coburg (Bavaria). In some cases, however, it cannot be ruled out that they were (re-)installed during the restoration of the complex by Professor Bodo Ehard in the first decades of the 20th century. Other wooden bumpers, some with recessed barrel or stock bearings, can be found in the city wall of Bacharach on the Rhine and in the Pfalzgrafenstein Castle near Kaub. The same applies to the city wall in Rothenburg o.d.T. For the findings on the Veste Coburg and Glurns cf. Geibig, *Waffen im Alltag*, p. 189, fig. 3, 8-11 and 12. On the problem of extant wooden bumpers cf. especially Geibig/*Zeune*, *Wider die verdampften keczr*, footnote 21.
- 12 Traces of this kind (in at least three cases) can be found at Wertheim Castle (Baden-Württemberg), Burghausen Castle (Bavaria), an unnamable castle ruin in Franconian Switzerland, Seebenstein Castle (Lower Austria), Aggstein Castle (Lower Austria), Falkenstein Castle (Upper Palatinate), Marksburg Castle on the Middle Rhine (Rhineland-Palatinate), Zavasdin Fortress (Croatia) and possibly at Sesslach (Upper Franconia).
- 13 Vertical grooves in embrasure cheeks in the city wall of Dinkelsbühl can be cited as further bearings for wooden bumpers that are comparable in a functional sense. Here the beams were inserted loosely. Technically, however, it is also possible that several beams could be inserted on top of each other to completely close the embrasure (cf. footnote 6).
- 14 In addition to the completely preserved *Balkenschirm*, traces of such embrasure shutters can be found in two other towers at Coburg Fortress in the form of vertical grooves in the side cheeks of two gun ports (cf. Geibig/*Zeune*, *Wider die verdampften keczr*, pp. 198-201, fig. 19-21 and Geibig, *Waffen im Alltag*, p. 189, fig. 13). Much narrower grooves, but also suitable for the layered insertion of beams, are found in embrasures of the city wall of Dinkelsbühl. Further vertical grooves are preserved in an embrasure on the Pfalzgrafenstein Castle near Kaub. There, the shutter seemingly did not cover the whole embrasure. At least one shutter in the form of a strong, wide wooden beam that could be pushed in a channel can be detected behind an embrasure in the town fortifications of Glurns (Merano, South Tyrol). A rather large *Balkenschirm* with firing holes and iron fittings on the outside seems to have survived at Breuberg Castle (Hesse). It is still awaiting a personal examination.
- 15 Cf. Geibig/*Zeune*, *Wider die verdampften keczr*, pp. 192-194.
- 16 On loading with an intentional void between the propellant and the projectile with the intention of increasing performance, see Tittmann, *Eltzer Büchsenpfeile*, p. 60 and *idem*, *Büchsenwerk*, especially pp. 155-157. Following Tittmann's explanations, the loading of slow meal powder with a corresponding void space was experimentally reproduced in the art collections of the Veste Coburg. It was actually possible to determine or prove a considerable increase in performance. The experiment can be reproduced at will.
- 17 Cf. Tittmann, *Nürnberger Handfeuerwaffen*, p. 97.
- 18 Iron has a mass weight of about 7.8 g, whereas lead has a mass weight of more than 11 g. With a weight of about 55 grams, the lead projectile could theoretically exert considerable kinetic energy on the target. An iron bullet of the same calibre, on the other hand, weighs only about 38 grams.

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Tobias Schönauer

Wood, Leather and Canvas

A Pavise with the Coat of Arms of Munich

Shields are among the oldest defensive weapons of mankind.¹ In the course of the Middle Ages, a multitude of different types developed, which varied greatly in size, strength, weight and shape.² The steady development of body armour was always accompanied by a corresponding adaptation of the shield. It became smaller, more manageable and increasingly specialised. Mounted troops, for example, used other shapes and sizes than foot soldiers. From the 14th century onwards, more attention was paid to the protection of infantry, which until then had used the same shields as cavalry.³ It was during this period that so-called pavises (in earlier times also called “Tartschen” or “Handtartschen”) like the one presented here came into use.

They were widespread in the cities of the Middle Ages and can still be found in numerous museums today.⁴ Surviving inventories show that hundreds of them were kept in private households or armouries for use in the event of an attack. In 1466, for example, “almost every house in Leipzig had ... at least one pavise”;⁵ a total of 854 of them were counted in this city alone. In 319 of the surrounding villages there were more than 2,000 further pavises.⁶ In 1444, the arsenal inventory of Vienna speaks of “300 Tartschen (small shields) red grey and black and yellow” and another “111 painted Tartschen”.⁷ In 1462 there were 152 pavises in storage in Augsburg, while Nurem-

berg counted 209 in 1449.⁸ These examples show that large numbers of this shield form were prevalent in Central Europe in the 15th century. Relative to these former quantities, only a few specimens have survived. Today they are found scattered all over the world. Above all, pavises from the cities of Klausen, Constance, Winterthur, Zwickau, Schongau or Vienna have been preserved worldwide.⁹ The collections of the Bavarian Army Museum also hold pieces from Vienna and Schongau.¹⁰

The pavise was probably named after the city of Pavia, whose military importance in the 13th and 14th centuries may have been the decisive factor.¹¹ This, however, is not conclusive, as there are neither larger stocks of shields from this city, nor is Pavia singled out in archival sources as a production site for shields.¹²

Use in combat, shape, construction and function

The 14th and 15th centuries saw great changes in warfare. Mercenary armies, but also urban and rural militias, became more and more important compared to mounted troops.¹³ The cities in particular were able to raise larger contingents of armed citizens within a short period of time. All male residents had to provide themselves with weapons and equipment at their own expense, which had to be presented in the event of a

Fig. 1 Pavise with the coat of arms of Munich, so called “Münchner Kindl” (Munich child), Bavaria (Munich), 1463 (Bavarian Army Museum, Inv. No. 0009-2000)

muster.¹⁴ Later, municipal “Zeughäuser” (arsenals or armouries) were built, mainly to store heavy guns, but also pole and side arms, armour components, shields and other items, so that they could be made available in a very short time. Very few such arsenals have survived to this day, along with substantial parts of their contents, to give us an idea of just how much material was stored there. Among these are

Fig. 2 Siege of a city, detail from: Rudolf von Ems, *Alexander*, 1st half of the 15th century
The crossbowman (bottom centre) uses the shield on his back as protection against enemy crossbow bolts while cocking his weapon.
(Bavarian State Library, Cgm 203, fol. 1v)



the “Landeszeughaus Graz” (Styrian Armoury)¹⁵ and the recently restored Princely Armoury of Schwarzburg.¹⁶ When the crossbow and later handguns became widespread, warfare changed more and more.¹⁷ Shields had become increasingly smaller since the beginning of the 13th century. Horsemen and foot soldiers had used the same types of shields until then.¹⁸ Due to the increasing importance of urban militias and mercenary armies in battle, special shields for fighting on foot began to evolve. Pavise-bearers appeared in Italy, together with crossbowmen, as early as the 14th century.

Pavises have a characteristic shape and often bear an elaborate painting with the respective (town) coat of arms or other designs.¹⁹ This type of shield usually has a largely rectangular basic shape, sometimes in the form of a parallelogram, with an arched upper edge. In addition, most specimens are curved. The most prominent feature, however, in the truest sense of the word, is the concave central spar or ridge. The “Handhabe” (i.e. the grip) on the back usually had the shape of a large “T”. This made it possible to hold the pavise directly in front of the torso. When this was done, the bulge accommodated the bearer’s arm. Contemporary illustrations also show that such shields were held above the head, e.g. when approaching a wall during a siege. This was an effective way of protecting oneself against shots from above (Fig. 2). But pavises were also used for shield walls, behind which foot soldiers would be protected from the attacking enemy (Fig. 3).²⁰ There are known illustrations, at least from the time of Emperor Maximilian, in which fighters also carry a hand pavise together with a hand-and-a-half sword.²¹ It would therefore be conceivable that this shield form was also used in combination with an edged weapon for fencing in battle. The core of this type of shield consists of a wooden corpus, either carved out of one solid



Fig. 3 Shield wall, detail from: Andreas Zainer, *Chronik des Landshuter Erbfolgekrieges*, 1st quarter of the 16th century (Bavarian State Library, Cgm 1598, fol. 138r)



Fig. 4 Lower right edge of the shield. The individual layers that make up the pavise are clearly visible here.

piece or made up of several planks.²² The planks could simply be glued together edge to edge, doweled, spliced or connected via spliced strips. As early as the 12th century, Theophilus Presbyter recommended weather-resistant casein glue for this purpose.²³ A simple wooden shield, however, is not sufficient to withstand the impact of a crossbow bolt. So, a kind of composite technique was used for pavises and other war shields of the time. The basic wooden body was covered with one or more different materials, which made it more resistant.

For this “a wide range of materials such as sinew, rawhide, parchment, leather or textiles were used”.²⁴ For large pavises (“Setzschilder”) of that time, on the other hand, which were usually (almost) man-high, a variety of different materials – especially animal sinew – and even glass was used, resulting in their extremely high resilience;²⁵ that said, it also makes the shield very heavy. Therefore, only rawhide, parchment or leather along with textiles were normally used for smaller pavises, but not all of them at once in order to save weight and costs.²⁶ This makes pavises light enough to be easily wielded with one hand, but sturdy enough to withstand projectile fire. Damage to pavises in other collections (e.g. in Coburg) shows that these pavises were certainly fired at with crossbow bolts. Others were damaged by thrust-weapons or arrows.²⁷ Only in one case was the shield body penetrated by a bolt. Of course, it is conceivable that pavises were destroyed or so badly damaged that they were discarded. But the surviving examples show that they offered protection against arrows and crossbow bolts.

The shield with the Munich city coat of arms

The specimen in the Bavarian Army Museum consists of a rectangular, curved wooden body whose sides taper slightly towards the bottom (Fig. 1). The vertical,

Fig. 5 Lower rim of the pavise, where the three wooden planks glued together can be seen.



bulge-shaped central ridge was probably carved out of a thicker piece of wood and tapers off to an angular shape in the lower area. The wooden body is made up of three wooden planks glued together (Fig. 5), although it is not clear which technique was used to join them.²⁸ The back of the shield is covered with leather, which was folded over at the edge towards the front. As the leather was applied while damp, it retained its shape during the drying process. Two nails, with which the covering was likely fixed during this process, are still visible on the back.²⁹ The coarse hide was dyed dark brown or black. A defect or a tear or cut was repaired – probably contemporary – with very rough stitches and a leather strip (Fig. 6 and 8). The front was then covered with coarse hessian. This was also folded over – in this case to the back. This “canvas” was then undercoated with gesso, which was then painted with colours (Fig. 4). The grip on the back consists of bull pizzles wrapped with leather strips (Fig. 6). To attach it, the three ends of the grip were pulled forward through all the layers of the shield and knotted there. This rather crude attachment method points to a low-cost purchase. The front of the pavise shows the coat of arms of the city of Munich (Fig. 1, 9 and 10). Since 1304, the monk has been the symbol for Munich, as so-called “self-explanatory symbol for the place name (München = by the monks)”.³⁰ The figure stands in a white (actually silver) escutcheon, his right hand raised for an oath, while holding the city’s red oath book in his left.³¹ The monk wears a gold-trimmed black cowl with the hood up, red shoes and has a yellow (actually



Fig. 6 Back of the Ingolstadt specimen

golden) halo. The figure took on childlike features as early as the 15th century, but it was not until 1727 that there is evidence of the name “Münchner Kindl” (Munich child), which has survived to the present day. On this pavise, the city coat of arms itself was painted on a ground decorated with tendrils and stripes in shades of brown and black. The depiction is framed by an arched and serrated band with a leaf and vine pattern and a cloud frieze. In 1940, the pavise looked completely different. The

front had been painted over, probably to make the original design stand out more clearly. In the mid-1940s, this overpainting was removed, so that today the viewer again sees the original depiction of the “Münchner Kindl”.³²

The Munich pavises can all be traced back to the year 1463. Back then, the city paid on “Laetare Sunday [20 March] master Hannsen of Sibenbürgen for xxiii small tartschen and iii pavises”³³ one Rhenish guilder each. On “Saturday before Saint Bartholomew’s” (20 August) another 76 “small tartschen”³⁴ were bought off him.

For the second batch, however, the city only had to pay one Rhenish guilder for two “small tartschen”, although it is not clear why this second batch was so much cheaper. Another detail from the chamber records is particularly interesting. According to this, one “Ludwig Zainmach was paid to produce [the] straps [for] the aforementioned tartschen”.³⁵

This must have been the first of the batches delivered, as Zainmach was paid on the same day as Hans of Siebenbürgen. Apparently, these shields at least were delivered without their straps.

Of the total of probably 99 original small “Tartschen”, only three bearing the Munich City coat of arms have been identified so far: two are in the Munich City Museum (Fig. 11 and 12)³⁶ and one in the Bavarian Army Museum. Another pavise in the Munich City Museum was created at the end of the 19th century for the tavern in the New Town Hall (“Ratstrinkstube”). Originally, a genuine pavise was earmarked as decoration for this room, but the directors of the Bavarian National Museum and the Munich City Museum were probably able to convince the councillors that it was too valuable to be displayed in the tavern. Thus, in 1898, the art restorer Karl Joseph Zwerschina crafted an elaborate replica based on one of the specimens.³⁷ The two original pavises, on the other hand, had been on long-

term loan to the Bavarian National Museum since 1873,³⁸ with one of them passing from there to the Bavarian Army Museum in 1922.³⁹ In 1977, the Munich City Museum began planning a presentation of the old Munich arsenal holdings,⁴⁰ so the shield was returned in December of that year.

The specimen now on display in the treasure chamber came into the collections of the Bavarian Army Museum in 1999 by way of an auction,⁴¹ but originated from the arsenal holdings of the city of Munich. As early as 17 June 1940, this object was auctioned in Berlin by Hans W. Lange as part of the arms collection of the company E. Kahlert & Sohn, which was “in liquidation”.⁴² Under lot number 231, a “Reitertartsche” (horseman’s pavise) was offered for sale, which

Fig. 7 The pavise of the Bavarian Army Museum before the removal of the subsequent overpainting in the auction catalogue of the company E. Kahlert & Sohn (1940)





Fig. 8 Back of the Ingolstadt specimen with the roughly repaired crack or cut

und Kostümkunde" (Journal of Historical Weapons and Costume Studies) of the same year states: "A Gothic Tartsche with Münchner Kindl as its coat of arms barely meriting the price of RM 1250.- nevertheless went back."⁴⁴

Unfortunately, it is not known who acquired the pavise later. Nor has the last owner or the consignor of the object purchased at an auction by the Bavarian Army Museum been identified.⁴⁵

was described as follows: "Leather-covered, painted wooden shield; the Munich city coat of arms on the central field, the edges bordered by a cloud frieze. German, Munich, 2nd half of 15th century. Height 66 cm".⁴³ The illustration shows a shield that is not identical at first glance, but very similar (Fig. 7), although at that time the pavise still bore the overpainting that probably dates from the 19th century. However, due to the measurements, individual damages and above all because of the distinctive shape of the grip knotted at the front, it becomes clear that this is the pavise now in the possession of the Bavarian Army Museum. Apparently, however, the item was not auctioned off at the 1940 sale, for the "Zeitschrift für historische Waffen-

Pavise

Inv.-No. 0009-2000

Dating and restorations

Bavaria (Munich), 1463

Overpainting (probably 19th century) removed in the mid-1940s

Material

Wood, leather, coarse hessian, gesso, bull pizzle, metal

Dimensions

Height 66.5 cm / Width 38 cm / Depth 12 cm

Description

Curved wooden body with hollow central ridge, the front covered with coarse hessian and painted in colour on a gesso undercoat. At the centre the coat of arms of the city of Munich ("Münchner Kindl"). Back covered with rawhide, the T-shaped grip made of bull pizzle wrapped with leather strips, the three ends of which are pulled through the pavise and knotted at the front.

Provenance and acquisition history

1463 originally made for the city of Munich by one Hans of Siebenbürgen

Offered on 17 June 1940 at the auction of the arms collection of the company E. Kahlert & Sohn, but apparently not sold

On 28 October 1999 purchased by the Bavarian Army Museum at the 38th Hermann Historica Auction

Inventory

Inventory book 2000 (Bavarian Army Museum, Inv. No. HA.05.01.111): "Münchener Handtartsche; Ankauf Hermann Historica, Linprunstr. 16, 80335 München, Nr. 38, 10.11.1999"



Fig. 9 Detail of the front (Bavarian Army Museum, Inv. No. 0009-2000)

Literature (selection)

Baumeister, Handtartsche;
Kern/Steiner, Handtartsche;
Paggiarino/Schönauer, The Bavarian Army Museum, pp. 108 f. and p. 256;
Schedelmann, Waffenbestände, p. 33, lot no. 231, and plate 18.

Exhibition history

23 November 2002 to 2 March 2003 Special exhibition "Der Mohr kann gehen. «der Mohr von Freising»" in the Diözesanmuseum Freising

8 September 2013 to 2 March 2014 Special exhibition "Die Wittelsbacher am Rhein. Die Kurpfalz und Europa" in Mannheim

13 November 2014 to 1 March 2015 Special exhibition "Das goldene Jahrhundert der reichen Herzöge" in the Landshut City museums

since 3 June 2019

Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt



Fig. 10 (right) The Ingolstadt specimen (Bavarian Army Museum, Inv. No. 0009-2000)

Fig. 11 (bottom left) Pavise of the Munich City Museum (Inv. No. Z-XIV/1)

Fig. 12 (bottom right) Pavise of the Munich City Museum (Inv. No. Z-XIV/2)



Footnotes

- 1 Cf. Breiding, Late medieval shields, p. 69.
- 2 A very good overview can be found in Beuing, Schilde, Formen, Verwendung – which also provides further reading. There was of course a wide range of shields even in classical times, but these are omitted here.
- 3 Cf. *ibid.*, p. 4.
- 4 In Bavaria, the Bavarian National Museum, the Bavarian Army Museum and the art collections of the Veste Coburg are particularly worthy of mention. Cf. Beuing, Schilde im Bayerischen Nationalmuseum; Paggiarino/Schönauer, The Bavarian Army Museum and Geibig, Untersuchungen. But they can also be found in non-European collections, especially in the USA (cf. for Philadelphia Breiding, Late Medieval Shields, esp. pp. 79-90 and for the Metropolitan Museum of Art in New York Kienbusch/Grancsay, Bashford Dean and www.metmuseum.org; accessed on 2 December 2020).
- 5 Herzer, Kriegsgerät, p. 243.
- 6 Cf. *ibid.*, p. 244.
- 7 Source cited in Schlager, Wiener Skizzen, p. 123 (“300 Tartschen (kleine Schilde) rot grab (grau) vnd swarz vnd gelb [and] 111 gemalten Tartschen”). Cf. also Siennicki, Untersuchung, pp. 25 f.
- 8 Cf. Siennicki, Untersuchung, p. 25.
- 9 Cf. Beuing, Schilde, Formen, Verwendung, p. 4 f.; *idem.*, Schongauer Pavesen.
- 10 Inv. Nos. A 7200 and A 197.
- 11 Cf. Beuing, Schilde, Formen, Verwendung, p. 6. Boeheim, Handbuch, p.180 already suggests that this was the case and refers to a “shield factory that is proven to have been famous in ancient times”. Alas, he does not provide proof.
- 12 Cf. Beuing, Schilde, Formen, Verwendung, p. 6.
- 13 Cf. Kroener, Kriegswesen, pp. 4-6; Fiedler, Taktik, pp. 7-9; Staudinger, Geschichte, pp. 2-8 or Beuing, Schilde, Formen, Verwendung, p. 4.
- 14 Cf. Siennicki, Untersuchung, p. 27 f.
- 15 Cf. Habsburg-Lothringen, Landeszeughaus.
- 16 Cf. Henkel/Kessler, Fürstliches Zeughaus.
- 17 Cf. Siennicki, Untersuchung, p. 28 f.
- 18 Cf. here and in the following Beuing, Schilde, Formen, Verwendung pp. 4-6 or Siennicki, Untersuchung, p. 31.
- 19 Cf. here and in the following Boeheim, Handbuch, p. 180.
- 20 Cf. Andreas Zainer, Chronik des Landshuter Erbfolgekrieges, 1st quarter 16th century (Bavarian State Library Munich, Cgm 1598, fol. 144r).
- 21 Cf. Beuing, Schilde, Formen, Verwendung, p. 6 f.
- 22 Cf. here and in the following Karl, Aufbau, pp. 177 f. and Alt, Zwei mittelalterliche Schilde, p. 76 f.
- 23 Cf. here and in the following Scholtka, Teophilus, p. 13 and Alt, Zwei mittelalterliche Schilde, pp. 75-77.
- 24 Karl, Aufbau, pp. 179 (“verschiedenste Materialien wie Sehnen, Rohhaut, Pergament, Leder oder Textilien zum Einsatz”). Cf. also Geibig, Untersuchungen, on the different construction of pavises.
- 25 Cf. especially the study by Siennicki, Setzschild, pp. 131-138 on a heavy pavise from Kaufbeuren in the Bavarian National Museum. An identical piece resides in the collections of the Bavarian Army Museum and is on display in the new permanent exhibition (Inv. No. A 5616).
- 26 Cf. Karl, Aufbau, p. 179, as well as Geibig, Untersuchungen and Bösenberg/Wosnitza, Restaurierung, here esp. pp. 205-218.
- 27 Cf. Geibig, Untersuchungen, pp. 239-241 with fig. 15-17.
- 28 Cf. on the various techniques (glued edge to edge, doweled, spliced or connected via spliced strips) Alt, Zwei mittelalterliche Schilde, p. 77.
- 29 Cf. Karl, Aufbau, p. 179.
- 30 Morenz, Wappen, p. 141 (“redendes Sinnbild für den Ortsnamen (München = bei den Mönchen)”) and Kern/Steiner, Handtartsche, p. 91.
- 31 Cf. here and in the following *ibid.*, p. 141.
- 32 Cf. description in the auction catalogue of Hermann Historica Munich, 38th auction on 28 October 1999, lot no. 720, p. 130.
- 33 City Archive Munich, Kaem-001-72-1463, fol. 117r (“Suntag letare [20. März] maister Hannsen von Sibenpürgen umb xxiii klain tarschen und iii pafesen”). I would like to thank Klaus Peitzmeier of the Munich City Museum for this source.
- 34 *Ibid.*, fol. 117r (“Santztg vor Bartolomei [20. August kaufte man ihm weitere 76] klain tarschen [ab]”).
- 35 *Ibid.*, fol. 117r (“Ludwigen Zainmach umb [das] geriem [für] die benannten tartschen zu fassen”).
- 36 Inv. Nos. Z-XIV/1 and Z-XIV/2 (currently on display).
- 37 Inv. No. Z-2014/1. These references are found on a label that has survived on this item. The pavise with the inv. no. XIV/2 served as a model.
- 38 Cf. documentation in the Munich City Museum. An illustration of a pavise can be found, for example, in Haenel, Alte Waffen, p. 43.
- 39 It bore three Inv. Nos. here, first L 3066, then L 4109 and finally A 5615 (Cf. Bavarian Army Museum, Inv. Nos. HA.05.01.54 and HA.05.01.28a-b).
- 40 Cf. Wackernagel, Zeughaus, p. 7.
- 41 Hermann Historica Munich, 38th Auction on 28 October 1999, lot no. 720.
- 42 Cf. Schedelmann, Waffenbestände.
- 43 *Ibid.*, lot no. 231, p. 33 and plate 18 (“Lederbezogener, bemalter Holzschild; auf dem Mittelfeld das Münchener Stadtwappen, die Ränder von einem Wolkenfries eingefasst. Deutsch, München, 2. Hälfte 15. Jahrh. Höhe 66 cm”).

- 44 Cf. Post, *Versteigerung*, p. 67 f. (“Eine gotische Tartsche mit Münchner Kindl als Wap-pen verdiente kaum den Preis von RM 1250.-ging dennoch zurück”).
- 45 According to information from the auction house Hermann Historica, the “data systems have been changed several times in recent years.” There is no longer any information available on “such old transactions” (email dated 9 July 2020).

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Tobias Schönauer

From Innsbruck to Bavaria

A Buckler from Ambras Castle as Spoils of War

The oldest shields in the Bavarian Army Museum date from the 15th century, but whereas there are a large number of such defensive weapons in the collections, only two of them are so-called bucklers.¹ The object with the inv. no. A 8460 is special both in terms of its shape and its history, which is why it has found its way into the museum's Treasure Chamber (Fig. 1).²

What is a buckler?

It is not easy to answer the question of what type of shield constitutes a buckler. There are a number of definitions based on shape, size and/or the position of the grip. Even the name is somewhat misleading. In 19th century Germany, for example, this type of shield was also called a "Handtartsche", "Fausttartsche" or "Faustschild".³ In the old inventories of the Bavarian Army Museum from the end of the 19th century or the beginning of the 20th century, they are referred to as a "Parierschild" (parrying shield), a term that also appears repeatedly in historical sources from the 16th to the 19th century.⁴ In older sources, on the other hand, this type of shield is called "pucklär" (Andre Lignitzer, 15th century), "bügkeler" (Paulus Kal, 1470), "buckeller" (Hans Talhoffer, 1467) or "bucklier" (Christian Egenolff, 1531) – to name just a few of the spellings;⁵ variations of this term are also found in Ita-

lian ("broccchio") and Spanish ("broquel"), and even in Old Icelandic ("buklari").⁶ Hence the name may be derived from the Latin word *buccula* for shield boss, which protected the shield hand of the fighter.⁷

It seems that this type of shield is found in almost all civilisations and on all continents, not just in Central Europe.⁸ Shields like these are found in many museum collections around the world.⁹ In Europe, the buckler can be traced back to the Bronze Age and is "the earliest documented form of the art of defence".¹⁰ The earliest medieval sources depicting fencing techniques date back to the 14th century and interestingly show fighters equipped with swords and bucklers.¹¹ According to Capwell, sword and buckler fencing was "the most prominent non-noble form of sword fighting"¹² on the battlefields of the 15th and 16th centuries. The larger and heavier sword types (e.g. the long sword or the hand-and-a-half sword) were reserved for the knight or the man-at-arms in full armour. That said, medieval manuscripts also show bucklers in combination with a knightly sword (Fig. 2 and 10 as well as Fig. 16 in Geibig's contribution on swords in this volume).

In the civilian world, the buckler was widely used, especially in urban areas. It was very popular with apprentice craftsmen

Fig. 1 Buckler from Ambras Castle lined with red velvet, end of 15th century (Bavarian Army Museum, Inv. No. A 8460)



Fig. 2 Rudolf von Ems, *Weltchronik*, c. 1300 (St. Gallen, Cantonal Library, Vadian Collection VadSlg Ms. 302, fol. 109r)

and students, as they frequently engaged in gang fights and duels.¹³ In the narrow alleys and streets of the cities, the small shield offered great advantages and was also easy to carry around. Fencing schools taught the art of fencing with sword and buckler. Fencing manuals, especially from the 14th to 16th centuries, give a good impression of fighting with sword or rapier and buckler, although the interpretation of this source genre is still largely in its infancy.¹⁴ Moreover, one should not assume that fencing manuals were intended to “teach the reader, how to fight, but how to think and feel about fighting”.¹⁵ In a sense, they were the “Wunderkammer of fighting”.¹⁶ Nevertheless, they are an important source for the question of how the buckler was used in combat. Yet these

shields by no means appear in all fencing manuals. After 1320, they can only be found in a handful of German fencing manuals and only in a rather minor role.¹⁷ In this context, it is interesting to note that most of the surviving bucklers can be dated to the 15th or 16th century.¹⁸

As this type of shield is found in various shapes, sizes and materials, it is first of all important to define what constitutes a buckler. Blair describes it as follows: “The buckler, small and equipped with a cross-bar inside by means of which it was gripped. It was often concave towards the front and equipped with a hollow spiked boss in the centre”.¹⁹

The shield of the Army Museum could be subsumed under this “definition”, but not a number of other surviving examples that

are undoubtedly bucklers. The most up-to-date and probably also the shortest definition was provided by Herbert Schmidt in 2015. For him, a buckler is a shield that fulfils the following characteristics: “It is centre gripped [and] it has a maximum diameter / dimension of approx. 45 cm”.²⁰ Both are important in order to be able to wield this type of shield as shown in fencing manuals and other sources. In addition, the buckler comes in so many different forms and shapes and is so versatile that it seems almost impossible to cover it with a more specific definition.²¹ Nevertheless, it is sufficient in its brevity, as it defines both the size and the use – both important for the determination of this type of shield.

A buckler with a very unusual shape?

Most bucklers are round. This seems to be the only shape they took in the ancient world, and it was also the dominant type later on.²² But they are also known in a vari-

ety of other shapes: Trapezoidal, rectangular, oval, etc., while being corrugated, flat, convex or concave. The buckler from the Bavarian Army Museum in particular, though, is almost impossible to categorise because of its unusual shape, so that Schmidt speaks of a “very unusual type”.²³ So far, no comparable pieces have been found in other collections.²⁴

The extraordinarily beautifully crafted shield probably comes from southern Germany or Italy and weighs a mere 0.46 kg. Particularly noteworthy are the elaborate design of the openwork centre spike and the four high arched sides that end in four points (Fig. 7). Two of these four points were originally decorated with heart-shaped eyes (Fig. 4), one of which is lost; the other two are crowned by two forged flowers (Fig. 5). Although it was not unusual to add additional elements to bucklers (e.g. for embellishment or “structural reinforcement”²⁵), this specimen is rather unusual. The red velvet covering in particular suggests that this buckler was designed to look

Fig. 3 The buckler was also popular with bearers of pole arms (here: a glaive). Detail from: *Roman de Guiron le Courtois*, 1420 (Bibliothèque nationale de France, Français 357, fol. 47r)



particularly prestigious.²⁶ The corpus itself is oval and edged with a metal band running around it. It is concave along both the longitudinal and transverse axes. Measuring 20.5 by 14 cm, it is not particularly large, but appears much more massive and heavier than it is due to the main spike, which is set centrally on the front and has multiple perforations. This spike tapers off into eight bands. On every second band sits a smaller spike, so that these four spikes are grouped in a circle around the main one. Another 12 even smaller spikes – three each between an eye and a flower – round off the front. It is rather unlikely that all of these spikes and eyes were meant to serve as parrying aids, although it is not entirely impossible. Many are however too small or too narrow to trap or deflect a blade. The buckler shows no traces of combat, which also speaks against this assumption. Nor could professional fencers see any real use for them. At a conference in Munich,²⁷ where this specimen was presented in its original state, the participants speculated whether this shield may have been so elaborately decorated and designed to protect the wearer from being killed in the event of an attack.²⁸ This thesis would be conceivable, since at least in the 16th century the rapier became “part of the mainstream of the male dress”.²⁹ Paintings from this period show



Fig. 4 Surviving heart-shaped eye

swords whose decoration and baldrics were carefully matched to the clothing.³⁰ Thus, a correspondingly elaborate buckler would have been entirely feasible. However, one must assume that in this case not only the shield, but the man’s entire appearance (clothing, armament, etc.) would have been fashioned so luxuriously that it would have made the capture of the obviously wealthy owner appealing to potential attackers, for a ransom could be extorted here. This would have made said owner of the



Fig. 5 Flower crowning one of the points

buckler more valuable alive than dead. As elaborate as the front of the shield is, the grip and the reverse are very robust, almost roughly executed (Fig. 7). Both are completely covered with dark brown leather. The wooden grip, however, is very crude and protrudes far from the body of the shield. This would have been a good way to put it over the hilt and pommel of a sword, a method of carrying known from paintings (Fig. 6). Another possibility was to hang the shield on the belt with a hook or to secure it with a loop placed over the hilt of the sword or over the mouth of the scabbard.³¹ With this crude grip, however, the buckler in the Army Museum must have been very difficult to handle. Performing elaborate movements with it was virtually impossible.³² The design of the grip could also imply that the shield was used more like a kind of knuckle-duster. In this case, the spike-covered front would have been advantageous.

Nowadays, bucklers are mainly associated with fencing. However, their use goes far beyond this. Since this shield form was in use throughout the Middle Ages and all over Europe, "there was no clearly defined area of use".³³ Illustrations show the buckler in battles (Fig. 2), in duels (Fig. 10), in trials-by-combat and on travel.³⁴ It is therefore obvious that the buckler was used in both the military and civilian context. Since it was light and handy, it was easy to carry and was probably therefore used more often in disputes. In the military, it was particularly popular with archers or men armed with pole arms (Fig. 3). Other armed men of lower rank also appreciated these light shields that could be used in various ways, as the sword was not their primary weapon. They only used it when their arrows were spent or when it came to hand-to-hand combat. In these situations, a buckler that was easy to carry was immensely convenient. Nevertheless, fencing manuals are an important source to show how this type



Fig. 6 Detail from: *The Crucifixion of Christ*, 1502/1503, by Gerard David
The soldier on the far right has slipped his buckler over the hilt of his sword.
(Berlin State Museums, Gemäldegalerie, Cat. No. 573)

of shield could be used in combat. It was often used with the left arm stretched far away from the body, while the sword was raised above the head. In other illustrations, the buckler can be seen covering the sword hand (Fig. 9) or being used to keep an opponent at bay.

The specimen in the Bavarian Army Museum can almost certainly be placed in the ci-

vilian sector, as the elaborate design would have been too costly for a shield used purely for military purposes. That being said, shields very similar to the Ingolstadt example can be seen in a 1467 fencing manual by Hans Talhoffer (Fig. 9).³⁵ The bucklers depicted there in a chapter on fencing “with the buckeller and with the knife [sword]”³⁶ are very similar to the shield in the Army Museum. Talhoffer’s book shows very clearly the most diverse uses of this type of shield. The buckler is used to block the opponent, to lock his blade, to guide it away from one’s own body, to cover individual parts of the body or to force or deflect the sword arm of the opponent in a certain direction. It is also interesting to note that this shield was by no means only used in combination with a sword or a dagger or knife. According to fencing manuals and illuminations, bucklers were also used together with pole arms and even with slingshots and javelins.³⁷

“from the cabinet of curiosities of Ambras in Tyrol”

The buckler of the Bavarian Army Museum has had a chequered history. On 1 April 1932, the piece was “transferred” (i.e. donated) from the Bavarian National Museum to the Army Museum.³⁸ While still in the National Museum, it had been listed in the authoritative hall book around 1890 as follows: “Schwertbrecher, kleiner Faustschild in Leder u. Eisen, mit Handhabe, Stacheln u. Widerhaken, vermit man das Schwert des Gegners auffing, abbrach oder aus der Hand wend. 1480-1520” (“Sword-breaker, small fist shield in leather and iron, with handhold, spikes and barbs, used to catch the sword of the opponent, break it off or twist it out of the hand. 1480-1520”).³⁹ The first appearance of the item in Bavaria, however, is in the “Inventarium der königlichen Gewehr-kammer 1838” (“Inventory of the Royal Gun Room 1838”). Here it says: “Ein eiser-



Fig. 7 The rather crude finish of the grip is clearly visible in this photograph

nes Parier, in wendig mit rothem Sammet gefüttert und mit 5 Spitzen versehen" ("An iron parry, lined on the inside with red velvet and fitted with 5 points") and further "1819 Nov. 17. Ist auf Allerhöchsten Befehl Sr. Königl. Majestät aus dem Kunstkabinet zu Ambras in Tyrol durch den damaligen Büchsenmeister Wolfgang Riegel am 15. July 1808 übernommen worden, und dann erst nach getroffener Auswahl zur Gewehr-kammer übernommen am 17. Nov. 1819" ("1819 Nov. 17. By order of His Royal Highness, taken from the cabinet of curiosities at Ambras in Tyrol by the then master gunsmith Wolfgang Riegel on 15 July 1808, and subsequently, after careful selection, transferred to the Gun Room on 17 Nov. 1819").⁴⁰ As early as 1805, the Ambras collection had been plundered by French

and Bavarian troops.⁴¹ Most of the collections had been brought to safety in Vienna in 1806 and were later displayed in the Lower Belvedere.⁴² Apparently the shield fell into Bavarian hands at that time, although it is unclear whether in 1805 or in 1808. In fact, this buckler can already be traced back to the 16th century in the Ambras collection, because in an "Inventari über das fürstlich gschlosz Ombras sambt den rüst- und kunstcämern"⁴³ ("Inventory of the Princely Castle of Ambras together with the arms and art chambers") dated 1596, the following entry is found: "Ain pragier, inwendig mit rotem sammet und mit spützen, in der mitte ain hohen spicz"⁴⁴ ("A parrying shield, on the inside with red velvet, and with spikes, in the centre a high spike"). It can be assumed with near certainty that this is the

Fig. 8 Matthäus Merian, Das fürstliche Schloß Ambras (The Princely Castle of Ambras), c. 1650 (Bavarian Army Museum, Inv. No. 0393-2020)

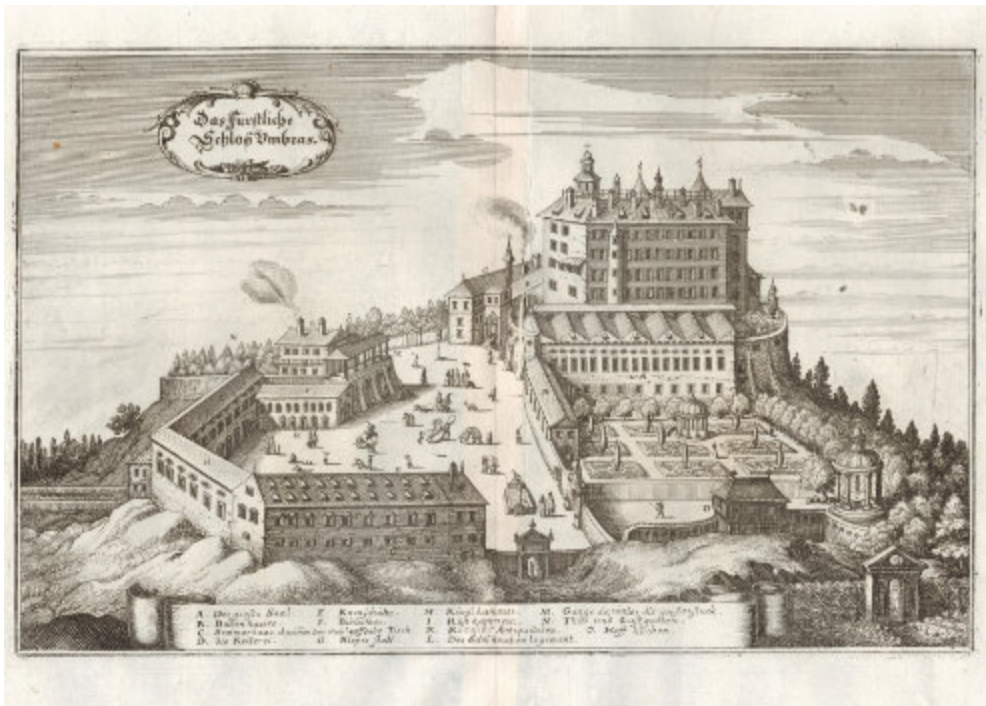




Fig. 9 Fechtbuch (literally “fight book”) by Hans Thalhoffer, 1467 (Bavarian State Library, Cod. icon. 394a, fol. 117v)

shield that is now in the Army Museum. “Ambras Castle is considered to be the first or oldest museum in the world”.⁴⁵ The collection, known today as the “Kunst- und Wunderkammer” (“Chamber of Art and Curiosities”), was begun by Archduke Ferdinand II. (1529-1595), who had already embarked on his collecting activities in Bohemia (1547 to 1567).⁴⁶ He turned the castle “into a splendid Renaissance pleasure palace”.⁴⁷ The separate wings of the building, constructed solely for this purpose from 1571 onwards, were known as “Musaeum”.⁴⁸ They housed the “Grosse Kunstcamer” (“Great Art Chamber”) and the “Rustcamer” (“Arms Chamber”), and in 1589 the “Heldenrüstkammer” (“Arsenal of Heroes”) was added, in which the armour of famous commanders and princes was collected (Fig. 8).⁴⁹

At the time when the Chamber of Art and Curiosities at Ambras was created, such establishments did not actually collect old or historic objects – the only exception being antique works of art.⁵⁰ Instead, collections were aimed at creating an “encyclopaedia’ of all things knowable”.⁵¹ Ideally, such a collection would represent the entire cosmos.⁵² Exactly why this shield was kept there is unknown. Perhaps it came to the “Kunst-kammer” because of its unusual shape and design.

In 1847, the buckler was included in the arms collection, which was exhibited as part of the “vereingten Sammlungen” (“united collections”) in room VII of the former Electoral Gallery in the Hofgarten in Munich. In the corresponding catalogue, the buckler is described as “an iron parry, lined on the inside with red velvet



Fig. 10 Detail from the Codex Manesse, c. 1300 to c. 1340
Fight with sword and buckler
(Heidelberg University Library, Cod. Pal. germ. 848, fol. 190v)

and fitted with 5 points".⁵³ Since it was only transferred from the National Museum to the Bavarian Army Museum in 1932, it is unclear whether this extraordinary buckler was also exhibited in the old building of the Army Museum in the Hofgarten. So far, this could not be proven – there are no pertinent documents or pho-

tos. There are also no references to special exhibitions in which this extraordinary piece might have been displayed. From 1972, however, it was part of the medieval section in Ingolstadt's New Castle and has now found its way into the museum's newly furnished Treasure Chamber.

Buckler

Inv.-No. A 8460

Dating

Southern Germany (?) or Italy (?), late 15th century

Material

Iron, velvet, leather

Dimensions

Height 13 cm / Width 13.8 cm / Depth 20.5 cm

Description

Shield (oval), concave along both the longitudinal and transverse axes. On the front multiple openwork, octagonal main spike (tapering off into bands) as well as four smaller spikes on bands (arranged in a circle around the main spike). Twelve smaller spikes on a circumferential main band, which curves upwards at the four corners, where it ends in two heart-shaped eyes (one lost) and two blossoms. Front covered with red velvet in between the iron bands. Large, unshapely wooden grip covered with dark brown or black leather.

Provenance and acquisition history

Originally from the cabinet of curiosities of Ambras Castle (first documented in 1596), in Bavaria since at least 1808

Transferred to the Royal Gun Room in 1819
Transferred to the Bavarian National Museum (Inv. No. W 1481) before 1890, handed over from there to the Bavarian Army Museum on 1 April 1932

Inventories

Inventari über das fürstlich gschlosz Ombras sambt den rüst- und kunstcämern von 1596 (published in Boeheim, Urkunden, pp. CCLVIII-CCCXIII, Regest 5556): "Ain pragier [parrying shield], inwendig mit rotem sammet und mit spüczen, in der mitte ain hohen spicz"



Fig. 11 Top view of the buckler

Inventarium der königlichen Gewehr-
kammer 1838 (Bavarian Palace Department,
BSV.Inv0129.01), fol. 321v and fol. 322r:
"Ein eisernes Parier, inwendig mit rothem
Sammet gefütterter und mit 5 Spitzen versehen"

Catalog der vereinigten Sammlungen Nro.
6. Waffen-Sammlung, p. 18, no 106: "Ein
eisernes Parier, inwendig mit rotem Sam-
met gefütterter und mit 5 Spießen versehen"

Saalebuch of the Bavarian National Museum
for 1890 (BNM Dokumentation, Saal-
buch, Maximilianstraße, 1. Obergeschoss,
Saal V), p. 213: "Schwertbrecher, kleiner
Faustschild in Leder u. Eisen, mit Hand-
habe, Stacheln u. Widerhaken, vermit man
das Schwert des Gegners auffing, abbrach
oder aus der Hand wend. 1480-1520. Ge-
gen die Mitte des XVI. Jahrh."

Acquisition book 1928-1934 (Bavarian Army Museum, Inv. No. HA.05.01.95), entry 162 in the section for 1932: "1 Parierschild, Ende 15. Jh.; Preis bzw. Schätzwert 500 [Reichsmark], 1.4.32 Überweisung von Bayer. National=Museum in München"

Collection receipts for the year 1932 (Bavarian Army Museum, Inv. No. HA.05.01.69), receipt no. 15: "gem. Min. Entschl. v. 23.3.32 Nr VII 10904 an das Bayer. Armee-Museum abgegebenen Waffen [...] Schwertbrecher"

Local inventory book (A-Buch, volume 2, Bavarian Army Museum, Inv. No. HA.05.01.28a-b), entry no. 8460: "Parierschild Deutsch Ende 15. Jh. Länge 20,5 cm"

Literature (selection)

Bassermann-Jordan, Faustschild;
 Paggiarino/Schönauer, The Bavarian Army Museum, pp. 140-143 and p. 259;
 Schmidt, Book, pp. 208-211;
 Schönauer, Ein Buckler.

Exhibition history

1847 verifiable in the catalogue of the united collections in room VII of the former Electoral Gallery in the Hofgarten

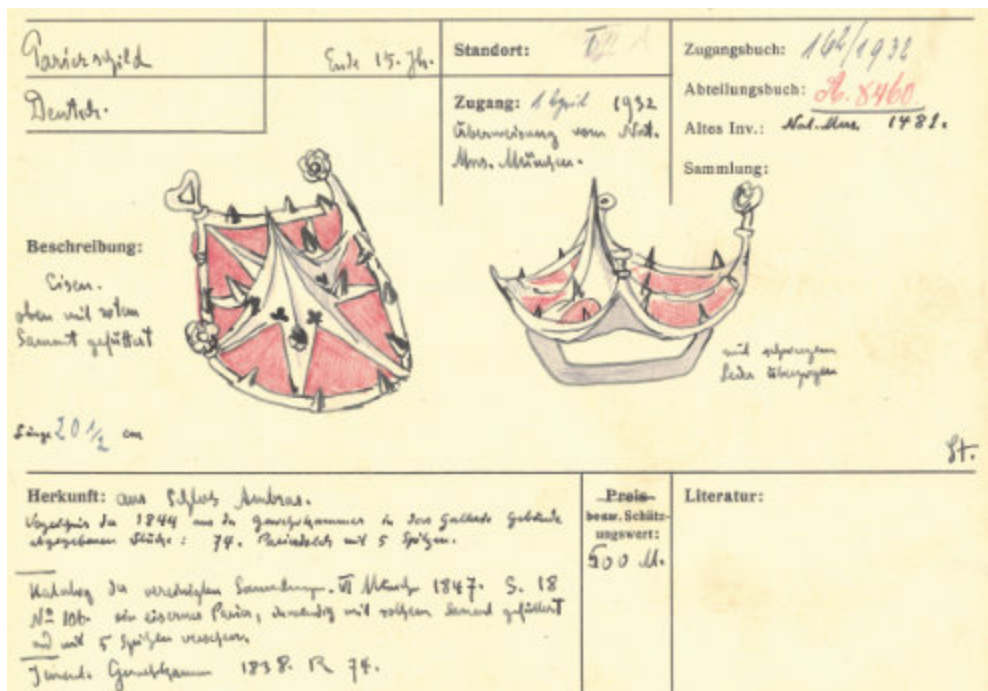
1890 verifiable as part of the permanent exhibition of the Bavarian National Museum

May 1972 to 31 August 2014
 Permanent exhibition of the Bavarian Army Museum in Ingolstadt

8 September 2018 to June 2019
 Special exhibition "In the Photographer's Sights. Old Weapons in a New Light"

since 3 June 2019
 Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt

Fig. 12 Inventory card for the Ambras buckler (here referred to as a parrying shield), written and drawn by Hans Stöcklein (Bavarian Army Museum)



Footnotes

- 1 Inv. nos. A 8460 and A 6584. A third buckler with the inventory number A 9704 is on permanent loan from the Munich City Museum (there inv. no. St.M.XIV/4).
- 2 Cf. on the Treasure Chamber Schönauer, Schatzkammer und Inszenierung, pp. 265-270 and generally on shields of this period Beuing/Augustyn, Schilde.
- 3 Cf. Demmin, Kriegswaffen I, p. 557 with illustrations on p. 569 f.; Bassermann-Jordan, Faustschilder or Boeheim, Handbuch, p. 190 f. According to Schmidt, Buckler, p. 365 the term is of recent origin, i.e. it cannot be found in sources before the 19th century.
- 4 Cf. Boeheim, Urkunden, p. CCCVI, Regest 5556, fol. 455r and Catalog Nro. 6, p. 18, No. 106.
- 5 Quoted in Schmidt, Buckler, p. 365.
- 6 Cf. here and in the following Schmidt, Buckler, p. 365 f.
- 7 Cf. Beuing, Schilde, Formen und Verwendung, p. 19. Here also the reference to the Oxford English Dictionary 17, p. 640 f.
- 8 Cf. Schmidt, Book, p. 13 and p. 16.
- 9 Cf. the currently most comprehensive list *ibid.*
- 10 Capwell, Noble Art, p. 11. Cf. also Schmidt, Book, p. 16.
- 11 For example, the Holkham Bible, c. 1320-1330 (British Library, MS. Add. 47682), the so-called "Tower manuscript" or "Tower Fechtbuch" (Royal Armouries I.33) or the Codex Manesse, c. 1300-1340 (Heidelberg University Library, Cod. Pal. germ. 848). See also illustrations in Capwell, Noble Art, p. 12 and p. 15 f., Cat. 1.03.
- 12 Capwell, Noble Art, p. 11.
- 13 Cf. here and in the following *ibid.*, p. 13 and p. 35.
- 14 Cf. Berthold/Petri, Passiv, p. 33 and pp. 35-37 and on the German fencing manuals Forggeng, Owning the Art, for our topic especially pp. 165-167.
- 15 Forggeng, Owning the Art, p. 170.
- 16 *Ibid.*, p. 174.
- 17 Cf. *ibid.*, p. 166. Sword and buckler feature in the works of e.g. André Lignitzer, Hans Talhoffer, Paulus Kal, Paulus Hector Mair, but also in the Gladiatoria manuscripts and in the Wolfenbüttel Sketchbook (I am grateful to Helmut Schmidt for these references).
- 18 Cf. the list in Schmidt, Book, pp. 248-255.
- 19 Blair, European Armour, p. 182.
- 20 Schmidt, Book, p. 13 and *idem.*, Buckler, p. 363.
- 21 Beuing, Schilde, Formen, Verwendung, p. 19 f. also uses this definition. Cf. generally on the various forms Schmidt, Book and *idem.*, Buckler, pp. 363-365.
- 22 Cf. Schmidt, Buckler, p. 366. Cf. e.g. also special shields for Roman gladiators in Junkelmann, Spiel, p. 79 f.
- 23 Schmidt, Book, p. 26.
- 24 A buckler of a similar type that is repeatedly cited and supposedly held at Sigmaringen Castle does not exist. All the pieces there are of a completely different shape and design. I would like to take this opportunity to thank the Sigmaringen Castle Administration for providing me with the relevant photographic material.
- 25 Schmidt, Buckler, p. 366.
- 26 Cf. *idem.*, Book, p. 208.
- 27 4 and 5 March 2016 in the Bavarian National Museum (cf. Beuing/Augustyn, Schilde).
- 28 Cf. Schönauer, Buckler, p. 373.
- 29 Capwell, Noble Art, p. 46.
- 30 Cf. *ibid.*, pp. 46-48.
- 31 Cf. Schmidt, Buckler, p. 368.
- 32 Cf. *idem.*, Book, p. 208.
- 33 *Idem.*, Buckler, p. 369 ("es [gab] kein klar abgegrenztes Einsatzgebiet").
- 34 Cf. here and in the following *idem.*, Buckler, p. 369 and Capwell, Noble Art, p. 11.
- 35 Bavarian State Library, Cod. icon. 394a.
- 36 *Ibid.*, fol. 117r. Cf. also, fol. 117v-122r ("mit dem buckeller und mit dem Messer").
- 37 Cf. Schmidt, Book, pp. 32-34.
- 38 The inv. no. in the Bavarian National Museum was W 1481.
- 39 Next to the entry is the note by Ernst von Bassermann-Jordan: "towards the middle of the XVI century". I would like to thank Dr. Raphael Beuing for providing the documents from the Bavarian National Museum.
- 40 Inventory of the Royal Gun Room 1838 (Bavarian Palace Department, BSV.Inv0129.01, fol. 321v and fol. 322r).
- 41 Cf. Sandbichler, „souil schönen“, p. 186 and Primisser, Ambraser Sammlung, p. 24 f. On the occupation of Tyrol cf. Junkelmann, Napoleon, here especially pp. 127-133 and pp. 167-168 or Hamm, Napoleon und Bayern, esp. pp. 215-226.
- 42 Cf. Primisser, Ambraser Sammlung, p. 24 f.
- 43 Quoted from Boeheim, Urkunden, p. CCLVIII, Regest 5556, fol. 247r.
- 44 Quoted from Boeheim, Urkunden, p. CCCVI, Regest 5556, fol. 455r.
- 45 Sandbichler, „souil schönen“, p. 172 ("Schloss Ambras gilt als das erste bzw. älteste Museum der Welt") and *idem.*, Welt und Gegenwart, p. 432.
- 46 Cf. *idem.*, Welt und Gegenwart, p. 432 f.
- 47 *Idem.*, „souil schönen“, p. 168 ("zum prächtigen Lustschloss der Renaissance"). On the construction of the buildings, see also p. 171 f.
- 48 *Idem.*, „souil schönen“, p. 168.
- 49 Cf. *idem.*, Welt und Gegenwart, p. 434.
- 50 Cf. *idem.*, Welt und Gegenwart, p. 434; *idem.*, „souil schönen“, p. 174 and Fiedler, Relationen, p. 360. Blom, Schafft die Museen ab! Sandbichler, Welt und Gegenwart, p. 433 ("Enzyklopädie: alles Wissbaren").
- 51 Cf. *idem.*, „souil schönen“, p. 173.
- 52 Cf. *idem.*, „souil schönen“, p. 173.
- 53 Catalog Nro. 6, p. 18, no. 106 (see p. 160 in this volume).

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Tobias Schönauer and Dieter Storz

The Deer-Stalking Rifle of Elector Palatine Ottheinrich

A Wheel-Lock Rifle with a Checkered History

The “Ottheinrich Rifle” is not the oldest firearm in the Bavarian Army Museum, but it is the oldest of which we know the exact date of manufacture. This rifle is not only of considerable interest because of its age, but also because of its original owner and its chequered history.

On the left side of the butt, the hunting rifle has two bone inlays. One shows the Bavarian coat of arms with the blue chevrons in black. Above it, a curved scroll is embedded in the butt: “● H OTTH ● P ● 1533 ●”, standing for “H[erzog] Otth[einrich] P[falzgraf] 1533” (Fig. 4), i.e. Count Otto Henry Elector Palatine 1533. The weapon has a certain prominence, and is mentioned and illustrated in standard works of historical weapons studies.¹ On one occasion it is even described as “the earliest example of a shoulder butt on a German wheel-lock”.²

Ottheinrich of the Palatinate and the hunt

The Wittelsbacher, who was born in Amberg in 1502 and died in Heidelberg in 1559, was certainly the most flamboyant ruler in the history of the Principality of Palatinate-Neuburg (Fig. 2).³ This territory had only been created in 1505 following the end of the Landshut War of Succession, which had been fought over the succession of George, Duke of Landshut, who had died in 1503. The Munich line of the Wittelsbachers refused to accept the succession arrangement put in place by George, resulting in a wide-ranging war covering southern Germany from the Palatinate to the east of Bavaria. Duke Albrecht of Munich was able to prevail in this “Landshuter Erbfolgekrieg”, but had to accept cessions of territory to Austria as well as the creation of a new principality for Duke George’s grandsons, Ottheinrich (also called Otto Henry in English) and Philipp. In 1522, the brothers assumed the rule of the principality of Palatinate-Neuburg, although Philip never succeeded in stepping out of the shadow of his brother, who was a year older. Ottheinrich is deemed a typical representative of his epoch, the Renaissance. In 1532/33 he be-

Fig. 1a and b Wheel-lock rifle of Count Palatine Ottheinrich, 1533 (Bavarian Army Museum, Inv. No. A 11918)



Fig. 2 Portrait carpet with the image of Count Palatine Ottheinrich, Brussels 1535, today in the Neuburg Castle Museum (Historischer Verein Neuburg a. d. Donau e.V.)

gan to rebuild the old Neuburg Castle into a modern residential palace.⁴ Like many great lords of his age, the Count Palatine loved grandeur, and Neuburg Castle is the most significant testimony to his relish for princely representation. This rifle was also created at that time.

Ottheinrich shared a passion for hunting with many of his peers. In Grünau Castle, about an hour's walk east of Neuburg, he owned an attractive base for this.⁵ At that time, the German sovereigns enjoyed the privilege of the so-called "Hohe Jagd" (noble hunting), i.e. the hunting and killing of particularly prized wildlife such as red deer, bear, lynx, wild boar, but also caper-

caillie, bustards or pheasants.⁶ Our gun was also intended for hunting. It's German designation as a "Büchse" is owed to tradition, since in weapons terminology "Büchsen" are usually defined as long guns with a rifled barrel, whereas the "Ottheinrichsbüchse" has a smooth barrel. The effective range of such a weapon is unlikely to have exceeded 50 metres.

Guns such as the Ottheinrich Rifle were used in the 16th century primarily for stalking deer, roe deer and, to a certain extent, wild boar.⁷ A popular form of hunting in Germany from the 16th to the 18th century were so-called "eingestellte Jagden". In these hunts, the game was rounded up a few days before the actual event with the help of nets and large pieces of cloth and then held in readiness.⁸ On the day itself,

Fig. 3 Fowling with matchlock rifle
Detail from: Martin Löffelholz (attributed),
Fragment of a Gunsmith's Book, Nuremberg
c. 1500
(Württemberg State Library, Stuttgart,
Cod.milit.qt.31, fol. 12r)



the animals were hounded to the actual shooting gallery. There, from a tent or pavilion, the game could be comfortably killed by the high lords at close range. In the "Wasserjagd", the animals were shot from the shore or from boats after they had been driven into the water and were then swimming slowly.

The use of firearms in hunting was slow to catch on.⁹ Such weaponry, which was still new and unusual at the time, was nevertheless readily displayed at courtly hunts.¹⁰

A chequered history of acquisition

The Neuburg armoury, where the Ottheinrich Rifle was also kept, perished in 1800 when the city was sacked by French troops.¹¹ Among many other things, 14 wheel-lock rifles were taken to Augsburg, and this rifle may have been one of them.¹² There the trace of the rifle is lost for the next almost 100 years. Some French officers had taken weapons from the inventory for personal use – perhaps the stalking rifle was among them. Eventually, the remaining

stock, which was still considerable, was moved to Munich. But here, too, the inventory continued to dwindle.¹³ Hans Stöcklein, who directed the Bavarian Army Museum from 1931 until his death in 1936, had studied the surviving inventories of the Neuburg collection intensively, which included a description of this particular object. It was listed in 1628 as follows:

"Nr. 64. Item ein kurze dicke Pürschbüchsen mit einer großen Kugel, Schloß und Rohr gefirnist und hat einen braunen Schaft, auf den Ecken mit schwarzem Horn eingelegt, hinten am Anschlag das Bayrisch Wappen mit einem Zettel von Beinwerk eingelegt, worauf Herzog Ott Heinrichs Namen ist, am Anschlag geschift, wie ein Hacken".¹⁴

(Translation: "No. 64. Item a short thick stalking rifle with a large calibre, lock and barrel varnished and with a brown stock, inlaid on the corners with black horn, at the back of the butt the Bavarian coat of arms and a scroll in bone inlay work, bearing the name of Duke Otto Henry, the shoulder stock shaped like for an arquebus.")



Fig. 4 Bone inlay on the left side of the butt with the coat of arms of Ottheinrich



Fig. 5 Opened butt container

And in 1654, under the number 93, one can read:

“Item ein kurze Büchsen, außen gefirnist, mit vier gereiften Bünden, wie auch das Schloß mitsamt einem geblankten Buckel gefirnist, der Schaft braun, hinten beim Anschlag des Herzog Ott Heinrich Hochsel. Gedächtnus Wappen mit der Jahr Zahl 1533.”¹⁵

(Translation: “Idem a short rifle, varnished on the outside, with four hooped flanges, as well as the lock with a plain hump varnished, the stock brown, at the back the coat of arms of Duke Otto Henry, Blessed be his Memory, with the date 1533.”)

In 1912, Stöcklein came across this rifle in an auction catalogue of the Dorotheum auction house in Vienna, but unfortunately only after the auction.¹⁶ He later managed to track down the purchaser of the rifle at Sighartstein Castle.¹⁷ The museum did not have the financial resources for a purchase, though. But since the weapon was of special importance for the history of Bavaria, the then Bavarian Prime Minister Held (1868-1938) provided the necessary funds for its acquisition. That was in 1928, but ten years later the rifle had to be handed over to the Munich Hunting Museum. It is unclear whether the Army Museum’s new management was less interested in owning a fire-

arm that was dynastic, or at any rate not military, than Stöcklein, who had died unexpectedly in 1936,¹⁸ or whether pressure from Christian Weber was the decisive factor. Weber was an influential Nazi figure in Munich and had successfully lobbied for the founding of a hunting museum in the so-called “capital of the movement” after 1933.¹⁹ But that was not the end of it. In 1951, the hunting rifle of the Count Palatine returned to the Army Museum through an exchange. Instead of its old inventory number (A 7411), it was given a new one: A 11918. When it was purchased in 1928, it still included the following accessories: “ramrod, 1 bullet puller, 1 bore wiper”²⁰ and a screwdriver. For the small parts, there was a container in the butt that could be closed with a slide (Fig. 5). Unfortunately, only the wooden ramrod has survived (Fig. 16).²¹ The rest of the accessories were probably lost before the exchange in 1951 or could no longer be matched.

Fig. 6 Rifleman with smouldering match in his right hand, detail from: Diebold Schilling, *Amtliche Berner Chronik, 1478-1483* (Burgerbibliothek, Bern, Mss. hist. helv. I. 1, p. 156)



The wheel-lock as a technical innovation

The simplest form of firearm is the muzzle-loader. Here the barrel consists of a tube closed at one end, which is loaded from the muzzle, i.e. "from the front". Powder and bullet ("ball") are inserted from there, in that order, and separately. In order to discharge the shot, the powder must be ignited. This is done by the barrel having a small hole close to the powder. Next to this hole is a small notch with a depression, the so-called priming pan. It holds a small amount of fine gunpowder, the "priming powder" (or meal powder). For firing, this powder is ignited, the flame strikes through the touch hole into the inside of the barrel, ignites the powder there, and the shot is fired.

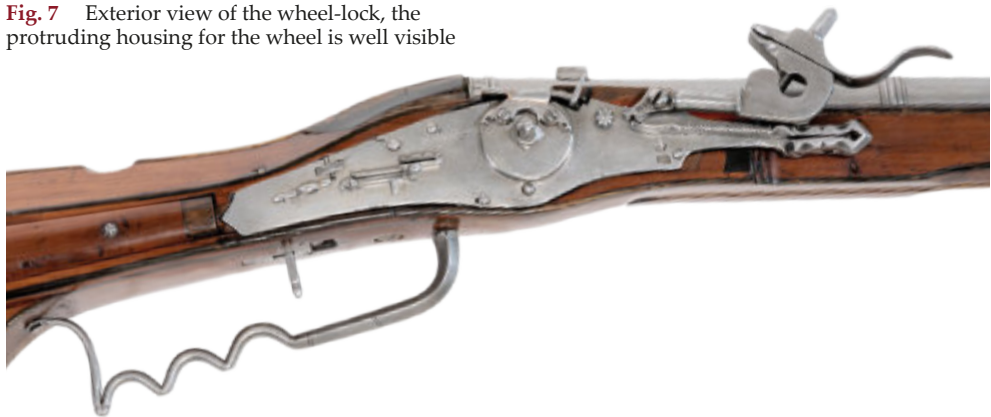
The usual means of igniting the priming powder in the 16th and 17th centuries was the slow-match. This was a cord impregnated with chemicals that caused it to burn slowly. To discharge the shot, the smouldering tip was lowered into the priming pan. This process was facilitated by the slow-match being clamped into a curved arm, the "serpentine", which was lowered into the priming pan through the trigger by means of a leveraged connection. In this way, the right hand could trigger the shot

without letting go of the rifle. The mechanical devices for firing the gun were traditionally called a "lock". The matchlock was simple in design and reliable, yet using a slow-match had a number of disadvantages. Such guns were ready to fire only when a smouldering match was on hand. Also, the match was only lit when the gun was likely to be used, i.e. before a battle or when on guard duty (Fig. 6). For stalking deer, etc., such rifles were of little use, as the game could smell the smouldering match.

If it were possible to ignite the priming powder by means of a spark-generating, spring-driven mechanism, the result would be a weapon that, once loaded, would be permanently ready to fire without further manipulations. This problem was solved by the wheel-lock. A fully developed form of it was available in the first decade of the 16th century. Our rifle is therefore a very modern weapon for its date of manufacture.

The exact date of the wheel-lock's invention is still disputed today. Leonardo da Vinci is mentioned as well as Johann Kiefuß from Nuremberg.²² However, both men are now strongly doubted as its inventors. The entry "malslot" in the so-called "Tafelamtsrechnungen" (public account books) of Goslar from 1447 was also construed as a friction

Fig. 7 Exterior view of the wheel-lock, the protruding housing for the wheel is well visible



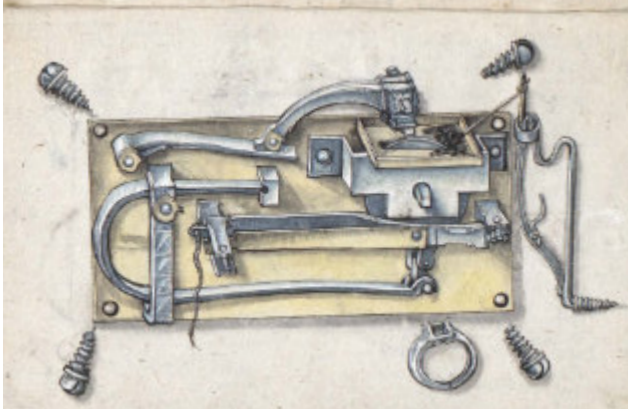


Fig. 8 Wall mounted tinder lighter, detail from: Löffelholz Codex, Nuremberg 1505 (Biblioteka Jagiellońska, Cracow, Ms. Berol. Germ. Qu. 132, fol. 27v)

lock (from the German verb “mahlen” in the sense of grinding), i.e. as a wheel-lock. But this identification was quickly disproved.²³ According to the current state of research, it may be assumed that the wheel-lock was probably developed – after several improvements and adaptations – from the tinder-lighter as known, for example, from the famous Löffelholz Codex²⁴ of 1505 (Fig. 8).

The heart of the wheel-lock system is a steel disc with grooves all around its circumference – the eponymous wheel. It is mounted on a shaft that passes right through the lock plate, also made of steel. The upper segment of the wheel forms the base of the priming pan, which has a cut-out for this (Fig. 9). The wheel can be attached either to the inside or the outside of the lock plate. In our rifle, the lock plate has a protruding housing in which the wheel moves (Fig. 7), so that it is well protected against outside factors. To clean it, however, you have to remove the lock from the rifle. Attached to the front of the lock plate is the “dog” (cock), whose jaws clamp a piece of iron pyrite. Apparently, the Romans already used this mineral to start a fire quickly.²⁵ To fire the gun, the cock is pulled back so that the pyrite rests on the wheel. When it rotates rapidly, it generates sparks that ignite the powder on the pan. The “dog” of this

rifle does not date from the time the lock was manufactured, but was replaced around 1600.²⁶

To bring about this fast rotation, the wheel must be wound up: The part of the shaft inside the lock is connected to the branch of a strong V-shaped tension spring by a chain (Fig. 10). The design of the chain is similar to a bicycle chain, so it cannot get twisted. While winding up the mechanism – for which the shooter has to use a suitable spanner –, the chain wraps around the

Fig. 9 A look through the cut-out in the priming pan at the grooved wheel





Fig. 10 Interior of the lock
On the right the V-shaped tension spring can be seen, which is connected to the chain. The chain is hidden here by the so-called wheel bracket.

wheel shaft (Fig. 11), the outward end of which has a square cross-section. The wheel of the Ottheinrich Rifle turns about 260° . In its cocked state, the wheel is held in place by the sear, an internal steel rod that can pivot around a vertical axis. It is connected to the actual trigger at its rear end and has a nose at the front. A spring forces the rear part of the sear outwards and presses the nose against the wheel. To lock it in the cocked position, the wheel has a small funnel-shaped blind hole into which the nose of the sear engages during cocking. When the trigger is pulled, the rear part of the sear moves towards the lock

side so that the front part – the nose – becomes free and the wheel, driven by the tension spring, spins and strikes sparks from the pyrite.

This mechanical complexity is necessary in order to keep the loaded weapon ready to fire over an extended period of time. It therefore also needs a device to ensure that the priming powder remains on the pan and is protected against the elements (wind, moisture). This is ensured by the sliding pan cover that is fitted with two springs. To close it, the shooter can pull it back by a small handle or press a small, rosette-shaped button which neutralises the effect of an in-



Fig. 11 The chain wound around the wheel shaft. It is similar in design to a modern bicycle chain.

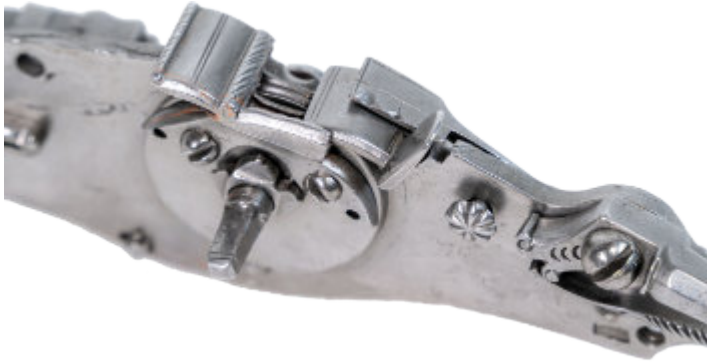


Fig. 12 The lid of the pan can be opened by pressing the rosette-shaped button.

ternal spring and causes the pan cover to spring backwards (Fig. 12). In order to ready the gun for firing, the shooter must pull the “dog” backwards so that the pyrite is resting on the wheel. When he does this, the pan cover opens halfway (Fig. 13); it does this all the way when the trigger is pulled. For this purpose, the wheel shaft is equipped with a cam, which knocks back the inner, downward pointing finger of the priming pan. This graduated opening of the pan should ensure the priming powder was protected right until the moment of pulling the trigger.

To prevent an accidental discharge, a safety was built into the lock of this rifle fixing the sear in the cocked position in such a way that it cannot be moved by the trigger.

The barrel of the weapon is round and segmented by four flanges. They are reinforced at the muzzle and the base. The rear sight and the front sight (on the muzzle bead) form a simple open sight. Because the original touch hole was burnt out, the barrel was bored out at this point and a new touch hole sleeve fitted (Fig. 14). This and the renewal of the cock show that the weapon was used extensively, but was also considered worth repairing. To connect it to the stock, the barrel was provided with eyelets on its underside for pins that were inserted through the stock. The pins and screws are reinforced on the stock with

bone inserts to protect the wood of the stock from chipping (Figs. 15 and 16). The bore of the smooth-bore barrel is 19 mm in diameter.

The three finger loops of the trigger guard correspond with a thumb incision on the comb of the butt, which is typical of the so-called German type butts.²⁷ The trigger itself is square and ends in a drop-shaped tip (Figs. 5 and 7). The wooden ramrod has also survived, the tip of which is made of light-coloured bone and is held in a long iron sleeve on the underside of the stock (Fig. 16). It cannot be said with certainty where the stalking rifle of 1533 was manufactured. Sadly, there are neither marks of gunsmiths nor of gunstock makers to be found on the weapon. The similarity to Augsburg made examples such as a short wheel-lock rifle (acquired by Emperor

Fig. 13 The “dog” lowered onto the wheel; the piece of pyrite that was clamped into the jaws of the “dog” is missing here.





Fig. 14 Right side of the barrel with refitted touch hole sleeve

Charles V in 1530) in the Real Armería in Madrid (inv. no. K. 32) suggests that this could also be an Augsburg gun, possibly by Bartholomäus Markwart.²⁸ This would also explain the lack of marks, as these were often not applied to commissions for the court.²⁹

The “Ottheinrichsbüchse” is one of the few firearms in the Bavarian Army Museum that can be clearly attributed to a Bavarian ruler. This, together with its chequered history, good condition and early wheel-lock construction, makes this weapon a rarity within the museum’s old collection.

Fig. 15 Left side of the stock with reinforcements to a pin and a screw



Wheel-Lock Rifle

Inv.-No. A 11918 (formerly A 7411)

Dating and restorations

Augsburg(?), 1533

Cock (dog) of the lock renewed (end of the 16th century)

November 1972: De-rusting and protective coating; cleaning; wooden stock partially completed, loose inlays fixed; changing the already renewed bridle on the lock, which held the wheel axle in an inclined position, to achieve straight bearing of the axle

Material

Iron, wood (fruit tree), bone

Dimensions

Total length 86 cm; Barrel length 55.4 cm

Height 20.5 cm; Width 8 cm

Description

Wheel-lock rifle, referred to as the deer-stalking rifle of Count Palatine Ottheinrich. Round barrel (19 mm calibre) with flange-like reinforcements at the front and rear and sectioned by two rows of cross grooves. Single rear sight with front sight on bead-like reinforced muzzle. Angular, so-called German type butt made of fruit wood with inlays of dark bone, which mainly border the edges and the front end of the stock. In addition, the barrel retention pins and the front carriage bolt are also

reinforced with bone. On the left side of the butt diamond crest and scroll with the inscription “•HOTTH•P•1533•”. Trigger guard with finger loops and straight, square trigger pin. The wooden ramrod with a tip of light-coloured bone and an iron sleeve is still preserved. Lock construction with an internal lock, trigger safety, and a spring-loaded pan cover. The cock (dog) was renewed around 1600.

Provenance and acquisition history

1628 and 1654 recorded in the inventory of the princely arsenal in Neuburg

On 28 January 1928 purchased from the previous owner (then at Sighartstein Castle) with special funds from the Bavarian Minister President Held

On 12 December 1938, the gun was handed over to the Munich Hunting Museum 1951 re-exchange of the deer-stalking rifle from the Munich Hunting Museum

Inventories

Inventarium über das fürstliche Zeug und Rüsthauss alhier zur Neuburg Anno 1628 (Bavarian Main State Archive, Dreißigjähriger Krieg XXIV Fasc. 222 – quoted in Stöcklein, Leibjagdbüchse, p. 364): “Nr. 64. Item ein kurze dicke Pürschbüchsen mit einer großen Kugel, Schloß und Rohr gefirnist und hat einen braunen Schaft, auf den Ecken mit schwarzem Horn eingelegt, hinten am Anschlag das Bayrisch Wappen

Fig. 16 Right side of the rifle with removed ramrod



mit einem Zettel von Beinwerk eingelegt, worauf Herzog Ott Heinrichs Namen ist, am Anschlag geschift, wie ein Hacken“

Inventarium über daß fürstl. Zeug: und Rüsthauss alhie Anno 1654 (Bavarian Main State Archive, Pfalz-Neuburg no. 128 – quoted in Stöcklein, Leibjagdbüchse, p. 364): “Item ein kurze Büchsen, außen Gefirnist, mit vier gereiften Bünden, wie auch das Schloß mitsamt einem geblankten Buckel gefirnist, der Schaft braun, hinten beim Anschlag des Herzog Ott Heinrich Hochsel. Gedächtnus Wappen mit der Jahr Zahl 1533“

Acquisition book for the years 1922-1927 (Bavarian Army Museum, Inv. No. HA.05.01.94), entry 534 in the section on the year 1927 (partially deleted): “1 Radschloßbüchse. Zeit: 1533 (Leibbüchse des Pfalzgrafen Ottheinrich von Neuburg, späterer Kurfürst von der Pfalz). Mit Zubehör; 21.1.28; Beleg Nr. 159/27; Ankauf durch H. Dr. Stöcklein aus bes. Mitteln des bay. Ministerpräsidenten; 12.12.38; Beleg Nr. 113; Abgabe an Jagdmuseum München“

Collection records for the year 1927 (Bavarian Army Museum, Inv. No. HA.05.01.65), record no. 159: “Den Sammlungen des Armee-Museums, Abteilung Ältere Zeit wird überwiesen: 1 Radschloßbüchse 1533 (Leibbüchse des Pfalzgrafen Ott Heinrich von Neuburg); Mit Zubehör: 1 Wischstock, 1 Kugelzieher, 1 Pfropfwischer, 1 Schraubenzieher; Erwerbungsart: Ankauf von Scheurer, Wien (durch Dr. Stöcklein) aus besond. Mitteln des bay. Ministerpräsidenten); Preis: 400.- RM; Schriftwechsel: 740/27, 45/28“

Local inventory book (A-Buch, volume 2, Bavarian Army Museum, Inv. No. HA.05.01.28a-b), entry no. 7411 (partially deleted): “Radschloß-Büchse Deutsch 1533 Länge 87. cm. dazu 1. Kugelzieher 1 Pfropfen. 1. Schraubenzieher u. 1. Wischer; 12.12.1938 abgegeben an Jagdmuseum Mü; s. A 11918“

Local inventory book (A-Buch, volume 3, Bavarian Army Museum, Inv. No. HA.05.01.29), entry no. 11918: “Jagdbüchse des Pfalzgrafen Ottheinrich s. A 7411; Tausch mit Jagdmuseum München 1951; Beleg 7/1950 [Beleg nicht vorhanden]“

Literature (selection)

Aichner, Führer, p. 36 f.;
Blackmore, Guns and Rifles of the World, fig. 77 (listed there as an artefact of the Bavarian National Museum);
Hayward, Kunst der alten Büchsenmacher 1, p. 58 und fig. 13;
Hoff, Feuerwaffen I, p. 60 f.;
Morin, Armi antiche, Nr. 29;
Reitzenstein, Feuerwaffen, p. 95;
Schalkhaußer, Alte Abteilung, p. 15 f.;
Idem., Peter Peck, p. 24;
Stöcklein, Leibjagdbüchse, p. 364 f.;
Idem., Neuerwerbungen;
Idem., Zwei Radschloßbüchsen;
Tittmann, Handfeuerwaffen, p. 339.

Exhibition history

May 1972 to 31 August 2014
Permanent exhibition of the Bavarian Army Museum in Ingolstadt

since 3 June 2019
Permanent exhibition “Treasure Chamber” of the Bavarian Army Museum in Ingolstadt

Footnotes

- 1 Cf. Hayward, *Kunst der alten Büchsenmacher* 1, p. 58 and fig. 13 and also Hoff, *Feuerwaffen* I, p. 60 f.
- 2 Hayward, *Kunst der alten Büchsenmacher* 1, p. 58 (“das früheste Beispiel für einen Schulterkolben bei einem deutschen Radschloß”).
- 3 On Ottheinrich cf. Reichold, *Himmelsstürmer* and Bäumler, *Von Kaisers Gnaden*.
- 4 Cf. Langer, *Schloss Neuburg*, p. 20.
- 5 Reichold, *Himmelsstürmer*, pp. 120-123.
- 6 Cf. Geibig, *Der Herzöge Lust*, p. 31.
- 7 Cf. Pfaffenbichler, *Höfische Jagdwaffen*, p. 84. Thanks to Dr. Alfred Geibig for these pointers.
- 8 Cf. here and in the following Geibig, *Der Herzöge Lust*, p. 103.
- 9 Cf. Sälzle, *Eröffnungs-Katalog*, p. 75 and p. 82 and also Ergert, *Jagd*, p. 59 f.
- 10 Cf. Geibig, *Der Herzöge Lust*, p. 103.
- 11 Cf. Reitzenstein, *Harnische*, p. 41 f.
- 12 However, the lists are too summary to identify this particular weapon conclusively.
- 13 Cf. Reitzenstein, *Harnische*, p. 42 f.
- 14 *Inventarium über das fürstliche Zeug und Rüsthauss alhier zur Neuburg Anno 1628* (Bavarian Main State Archive, *Dreißigjähriger Krieg XXIV Fasc. 222*). Excerpts quoted in Stöcklein, *Leibjagdbüchse*, p. 364.
- 15 *Inventarium über daß fürstl. Zeug: und Rüsthauss alhie Anno 1654* (Bavarian Main State Archive, *Pfalz-Neuburg No. 128*). Excerpts quoted in Stöcklein, *Leibjagdbüchse*, p. 364.
- 16 Cf. here and in the following Stöcklein, *Leibjagdbüchse*, p. 364.
- 17 Cf. Stöcklein, *Neuerwerbungen*, p. 604, collection receipts for the year 1927 (Bavarian Army Museum, Inv. No. HA.05.01.65), No. 159.
- 18 Cf. Bezzel, Dr. Hans Stöcklein.
- 19 <http://www.jagd-fischerei-museum.de/museum/geschichte> (accessed on 14 October 2020).
- 20 Collection receipts for the year 1927 (Bavarian Army Museum, Inv. No. HA.05.01.65), No. 159 (see p. 175 in this volume).
- 21 Cf. *ibid.*
- 22 Cf. here and in the following Sälzle, *Eröffnungs-Katalog*, p. 77. On the discussion about the invention of the wheel-lock, cf. more recently and in more detail Tittmann, *Handfeuerwaffen*, pp. 163-224.
- 23 Cf. Hoff, *Radschloss*, p. 61 f.
- 24 Cf. Biblioteka Jagiellońska, Ms. Berol. Germ. Qu. 132, fol. 27v (formerly Berlin State Library, Prussian Cultural Heritage, Ms. germ. qu. 132, fol. 27v)
- 25 Thierbach, *Geschichtliche Entwicklung*, p. 27.
- 26 Cf. Schalkhauser, *Alte Abteilung*, p. 16 and Tittmann, *Handfeuerwaffen*, vol. 1, p. 339.
- 27 Cf. Pfaffenbichler, *Höfische Jagdwaffen*, p. 84.
- 28 Cf. Stöcklein, *Leibjagdbüchse*, p. 365; Schalkhauser, *Alte Abteilung*, p. 16; *idem.*, Peter Peck, p. 24 and *Catálogo de la Real Armería*, p. 306. A photo of the specimen from the Real Armería can be found in Tittmann, *Handfeuerwaffen*, p. 338, fig. 217.
- 29 Cf. Schalkhauser, Peter Peck, p. 24.

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Tobias Schönauer

Inside a Jousting Helm

An Arming Cap for a Frog-Mouthed Great Helm

Tournaments, also called tournays, were extremely popular at the end of the Middle Ages. A large number of different types of tournaments developed.¹ During the reign of Emperor Maximilian I (1459-1519) in particular, tournaments flourished. “Als einer der eifrigsten und besten Turnierreiter seiner Zeit widmete er diesem elitären Sport besondere Aufmerksamkeit” (“As one of the most zealous and best tourney riders of his time, he devoted his special attention to this elitist sport”).²

Specialised equipment for tournaments

The first references to tournaments can be traced back to the 11th and 12th centuries, although the equipment used at that time was the same used for warfare.³ It was not until the subsequent centuries that specialised equipment for this sport emerged.⁴ In jousting, massive forces are exerted on the armour and thus indirectly on the fighter’s body. The re-enactment of historical jousting courses on a scientific basis has yielded great insights in this area in recent decades.⁵ In jousting, as in many modern sports today, the head is particularly at risk. It therefore had to be specially protected. As early as the 14th century, a type of tour-

namment evolved in which the combatants rode against each other with their lances lowered, trying to hit the opponent squarely on the shield or helmet.⁶ The aim was to knock the opponent out of the saddle or at least break the lance (Fig. 4).⁷ In the 15th century, this gave rise to the so-called “Gestech” or “Stechen”, called joust of peace in English. By using a special saddle that raised the rider about 10 to 20 cm above the horse’s back and also secured him in place, it was now almost impossible to unseat the opponent.⁸ The German name for this form of jousting – “Stechen im hohen Zeug” (jousting in a high saddle) – refers to this particular saddle.⁹ The weapon used for this was a jousting lance made of spruce or pine wood measuring 3.5 to 4.5 m in length,¹⁰ although the shorter length is more likely, as it is easier to handle.¹¹ To lessen the impact of this dangerous weapon, it was fitted with a three-pronged tip, the “Krönlein” (coronel).¹² A funnel-shaped “Brechscheibe” (vamplate) was slid onto the lance as a hand protection.¹³ If a so-called tilt barrier separated the horses’ trajectories, this was called the “welsches Gestech” (Italian joust), whereas the “deutsches Gestech” omitted the barrier.¹⁴ The combination of the acceleration of the two galloping horses and the weight of the ani-

Fig. 1 Arming cap for a “Stechhelm” probably South German, 1480-1530 (Bavarian Army Museum, Inv. No. 0402-2005)

mals and their riders meant that the strike was delivered with great force. Particularly the neck and chin, the chest, the left shoulder and both hands had to be strongly protected, which made special equipment necessary.¹⁵ This special harness, known as the “Stechzeug”, weighed between 40 and 45 kg and was thus about twice as heavy as a suit of field armour.¹⁶ The head was protected by a specially designed “Stechhelm” (“Jousting helm”, Fig. 3), which was screwed to the chest and back in an adjustable manner.¹⁷ “Dieses Fixieren des Stechhelms verhinderte, dass sich der Turnierier durch die Wucht des gegnerischen Stoßes das Genick brach” (“This fixing of the Stechhelm prevented the joustier from breaking his neck due to the force of the opponent’s strike”).¹⁸ The front of these helms, shaped like a ship’s bow, was made from a steel plate up to 6 mm thick (about four times stronger than most helmets for combat), which made them extremely heavy.¹⁹ One specimen in the “Hofjagd- und Rüst-kammer” in Vienna weighs an impressive 9.6 kg,²⁰ while another (somewhat corroded) in The Wallace Collection in London weighs 7.4 kg.²¹

As with a modern-day crash helmet, however, the joustier might have been seriously injured in the event of a lance impact or a fall from the horse if the head had slammed unprotected against the hard shell of the helm. Anything from a concussion to a fracture of the base of the skull would have been a possibility. Thus, the head was enclosed by a padded arming cap made of linen (Fig. 1). Usually, such caps were lined with tow and tied into the helm with sewn-on straps or laces in such a way “dass sie den Kopf praktisch frei schwebend innerhalb des Helmes festhielten, so dass er nicht direkt an die Helmwand anstoßen konnte” (“that they retained the head more or less free-floating inside the helm, so that it could not hit the helm wall directly”) (Fig. 2).²² A watercolour pen-and-ink dra-

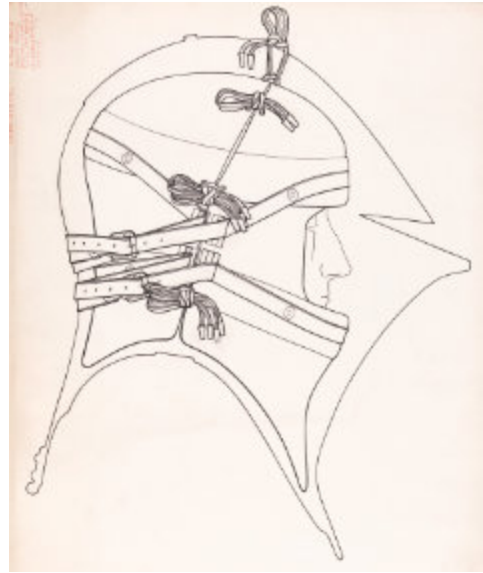


Fig. 2 Schematic depiction of an arming cap tied into a “Stechhelm” (“Jousting helm”) (Metropolitan Museum of Art)

wing by Albrecht Dürer shows this attachment (Fig. 3).²³ The laces and straps passing through openings in the helm where they are fastened with knots and buckles on the outside are clearly visible here. Apparently, this particular arming cap was secured with knots in three places at the crown and twice at each side. There are also wider leather straps passing through slits in the helm sides, which are fastened with buckles at the back of the helm. It is only thanks to this Dürer drawing that we have a detailed idea today of how such a cap was fastened in the helm.

A chicken coop find and its restoration

The arming cap of the Bavarian Army Museum was acquired in September 2005 at an auction in the art trade. Little is known about the origin of the item. It came from the collection of an Austrian long-time collector



Fig. 3 Albrecht Dürer, Three views of a "Stechhelm" (watercolour pen, ink drawing), c. 1498/1500 (Musée du Louvre, Paris, Département des arts graphiques, RF 5640r)



Fig. 4 Detail of: Hans von Kulmbach (entourage), Nuremberg “Gesellenstechen” (watercolour over pen and brown ink on handmade paper), c. 1500 (Staatliche Graphische Sammlung Munich, Inv. No. 41464 Z)

of antique weapons and armour, now deceased, which was sold. He himself had purchased it “aus einer aufgelösten Schlosssammlung in Südtirol” (“from a dissolved collection of a castle in South Tyrol”).²⁴ Unfortunately, it has been impossible to find out any more details. Although there have been repeated references to its proximity to the well-known collection at the Churburg,²⁵ it would be pure speculation to assume that this object indeed originates from this source.

Arming caps such as this are extremely rare. For one thing, they were probably not considered important enough to keep in former times. For another, textile objects are extremely susceptible to pest infestation and have therefore rarely survived. The

world’s largest collection of such items is in the “Hofjagd- und Rüstkammer” of the Kunsthistorisches Museum in Vienna. There, eight arming caps from the estate of Archduke Sigmund of Tyrol (1427-1496) are held.²⁶ Another one is kept in Ambras Castle in Innsbruck.²⁷ Some of these caps were reinforced with leather straps on the forehead and chin, which are missing from the Ingolstadt specimen.²⁸ The extraordinary thing about the Viennese and Innsbruck caps, however, is not only their state of conservation, but also the fact that some of them can be attributed to individual “Stechhelme”.²⁹ Arming caps were presumably manufactured individually for their wearers by the court tailor, silk embroiderer or upholsterer.³⁰ “Diese Handwerker



werden nämlich häufig im Zusammenhang mit Aufträgen für Turniergerätschaften [in Rechnungsbüchern genannt] (“These craftsmen are frequently [mentioned] in connection with orders for jousting equipment”)³¹ in account books.

Apart from the Austrian examples, there is only one other arming cap to be found in the German-speaking world, namely in the German Historical Museum in Berlin, dated to the end of the 15th century.³² This example is made of linen and padded with wool;³³ the leather laces are still in place.

The cap of the Bavarian Army Museum was apparently found in the dead floor of a chicken coop – which also explains the abysmal stench it emitted. Since it could not be exhibited in this state, it first had to be extensively decontaminated and restored. The smell was reduced by means of a four-week vacuum desorption in a special chamber.³⁴ The item then lay in the fume hood of the Bavarian National Museum for

Fig. 5 Comparison of the Ingolstadt arming cap with examples from the Kunsthistorischen Museums Vienna (October 2016)





Fig. 6 Pupa cysts are removed during restoration

another two years.³⁵ In total, the process took more than four years.³⁶

This exhibit is an arming cap made of sewn linen with a v-shaped flap on the chest and one on the neck, which could be secured with leather laces: Some of these laces are still present (Fig. 7). The cap suffered severe insect infestation, which the restoration report puts quite drastically: “the cap was covered with pupa cysts of moths and their excrement” (Fig. 6).³⁷ The original wool padding was almost completely eaten away. Due to the feeding traces, the item itself is also rather fragile and partly full of holes.³⁸ The cap originally had a natural white colour, but today it is darkly discoloured. Particularly the lining in the neck area is heavily soiled – presumably from sweat. At the Swiss Federal Institute of Technology in Zurich, the arming cap was dated to between 1680 and 1800 using the radiocarbon method.³⁹ When the laboratory submitted the results, however, it was verbally communicated that the heavy contamination of the sample could have caused false results. So, it was decided to compare the specimen on site in Vienna with the original pieces kept there in order to ensure a more validated dating (Fig. 5). The comparison of form, design and material, which took place in October 2016 in the Kunsthistorisches Museum, permitted no other conclusion than that it must be an

arming cap from the period around 1480-1530.⁴⁰ Moreover, the design of the caps is largely determined by the technical specifications (form of the helmet, attachment options, etc.), so that even a purely stylistic comparison supports the dating “pre-1530”.

Of head hits and impact tests

Arming caps had to withstand great stresses. The forces exerted on the helm and thus on the leather straps and laces and finally the cap in the event of a hit were extreme. Detailed photographs of the eyelet holes show how massively they were reinforced to withstand these forces (Fig. 7). Reliable data on this was provided by measurements on a test stand of TÜV Süd in 2013.⁴¹ Various impact situations were simulated with reconstructed armour. In these tests, the horseman and armour together weighed 120 kg, while the impact speed was 60 km/h.⁴² The findings were most interesting because, contrary to the assump-

Fig. 7 Reinforced eyelet holes (right side) with remnants of the leather laces



tions, the potential severity of injury is far below the limit. The values are measured with the so-called Head Injury Criterion (HIC for short), which helps to assess the “severity of injury”. The limit⁴³ lies at 650, yet “only” 141 were reached for a head hit; the measures for the neck were also beyond a dangerous value.⁴⁴ In jousting, one normally tries to achieve a strike on the chest. This is where the lance breaks much earlier than at the helmet and where the highest forces are measured. The armour, however, spreads most of the impact away from this point. If the lance hits the helmet, “the forces exerted on the armour are at the highest, but still below the limits for a strong risk potential in accidents”.⁴⁵ The forces acting “on and through the lance”⁴⁶ had already been studied in 2011. The scientific evaluation undertaken with The Wallace Collection

in London was intended to show whether reconstructed armour would withstand the impact of the lance and how big the absorbed shock was.⁴⁷ The forces measured were over 600 Newtons. By using a lance rest, each strike reached over 200 joules (J), in some cases even 250 J.⁴⁸ In comparison, the energy of a blow from a sword or an axe lies between 60 and 130 J and that of a fired arrow between 90 and 100 J.

These measured values show that the arming caps were essential for the safety of the jousting. Every contestant possessed at least one. They were widespread pieces of equipment, but have rarely survived in museums. This makes this item, which at first sight seems inconspicuous, all the more significant for the Bavarian Army Museum’s medieval collection.

Fig. 8 Seams running across the top of the head



Arming Cap for a Jousting Helm

Inv.-No. 0402-2005

Dating and restoration

Southern Germany (?), 1480-1530

Last restoration from November 2007 to February 2012 (mainly decontamination)

Material

Linen (sewn), leather

Dimensions

Height approx. 60 cm / Width approx. 34 cm (exact measurements not possible due to the material)

Description

Cap of natural-coloured linen (heavily soiled, originally white) with chest and neck flap; padded with wool; leather laces partly preserved

Provenance and acquisition history

The item allegedly comes from a dissolved collection of a castle in South Tyrol (according to the auction house), where it was found in the dead floor of a chicken coop. Acquired in the art trade (auction house Landshuter Rüstammer) on 12 September 2005

Inventories

Inventory book for 2005 (Bavarian Army Museum, Inv. No. HA.05.01.113): "Kopfhäube für Turnierhelme, Innsbruck, um 1500; Ankauf Landshuter Rüstammer, Bodenklang 8, 84184 Tiefenbach, 12.09.2005"

Literature

Paggiarino/Schönauer, The Bavarian Army Museum, p. 16 f. und p. 258.



Fig. 9 Rear view

Exhibition history

since 3 June 2019

Permanent exhibition "Treasure Chamber" of the Bavarian Army Museum in Ingolstadt

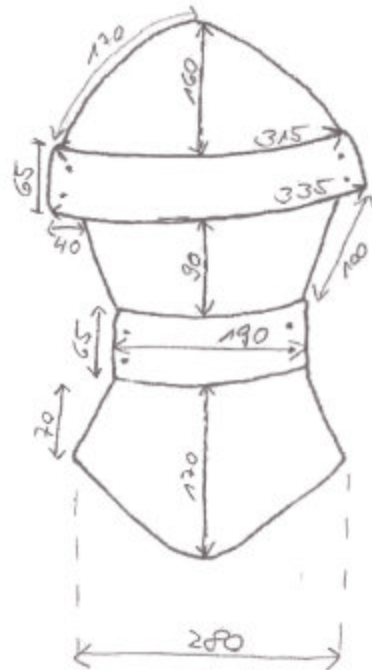
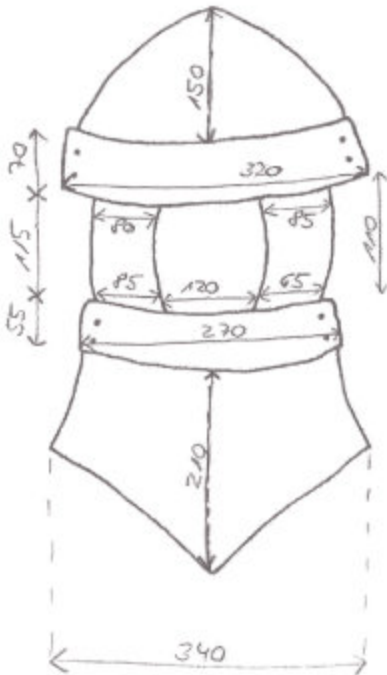


Fig. 10 Side view left



Fig. 11 Side view right

Fig. 12 Schematic drawings



Footnotes

- 1 Cf. e.g. Jezler, Ritterturnier; Krause, Turnier; Capwell, Medieval Joust.
- 2 Pfaffenbichler, Kaiser, p. 93.
- 3 Cf. idem., Anfänge, pp. 15-18.
- 4 Cf. on the development of this specialised equipment Breiding, Turniere und Turnierausrüstung.
- 5 A good overview is provided by Capwell, Ritter des 21. Jahrhunderts. Furthermore, also Koets, Bericht.
- 6 Cf. Jezler, Ritterturnier, cat. no. 7, p. 154 and Breiding, Rennen, p. 64.
- 7 Cf. Breiding, Rennen, p. 64 and Pfaffenbichler, Kaiser, p. 98.
- 8 Cf. Jezler, Ritterturnier, cat. no. 7, p. 154 and Breiding, Rennen, p. 64 f.
- 9 Cf. Pfaffenbichler, Kaiser, p. 98 and Breiding, Rennen, p. 64 f.
- 10 Cf. Jezler, Ritterturnier, cat. no. 16, p. 159 or Koets, Bericht, p. 393. Capwell, Ritter des 21. Jahrhunderts, p. 371 mentions "Pinienholz" (stone pine), although this could also be a less than correct translation of the English "pine wood", for at that time it would have been difficult to obtain a sufficient quantity of stone pine in England (cf. also Williams et. al., Experimental investigation, p. 4).
- 11 Cf. Williams et. al., Experimental investigation, p. 4.
- 12 Cf. Atzbach, Burg, p. 195; Breiding, Rennen, p. 66 or Williams et. al., Experimental investigation, p. 5. There are very few surviving original jousting lances, an example in Jezler, Ritterturnier, Cat. 16, p. 159. Some have survived in the "Hofjagd- und Rüstammer" of the Kunsthistorisches Museum in Vienna (inv. nos. B 1, B 8, B 13, B 15, B 50, B 84, B 130, cf. Williams et. al., Experimental investigation, p. 4).
- 13 Cf. Breiding, Rennen, p. 65. On the purpose of vmaplates Capwell, Ritter des 21. Jahrhunderts, pp. 371-374.
- 14 Cf. Pfaffenbichler, Kaiser, p. 98 or Breiding, Rennen, p. 65 f.
- 15 Cf. Pfaffenbichler, Kaiser, p. 100.
- 16 Cf. ibid., p. 99 f. and Jezler, Ritterturnier, cat. no. 7, p. 114.
- 17 Cf. Pfaffenbichler, wie der jung [] kunig, p. 135 and Breiding, Rennen, p. 64. Generally, Jezler, Ritterturnier, pp. 20-23 as well as cat. nos. 7 to 11 on pp. 144-154. This helmet type probably goes back to the 13th century great helm composed of several plates (cf. Peine, Herbede, p. 66 and Peine/ Breiding, Important find, p. 6).
- 18 Pfaffenbichler, Kaiser, pp. 100 f.
- 19 Cf. Capwell, Armour, p. 82 and p. 89. Cf. also an early example in Peine, Herbede, pp. 64-66 with fig. 14 or Peine/Breiding, Important find, pp. 5 f.
- 20 Inv. no. Hofjagd- und Rüstammer, S VI (I would like to thank Dr Stefan Krause, Vienna, for this information).
- 21 Inv. no. A 186 (cf. Capwell, Masterpieces, p. 38 f.).
- 22 Pfaffenbichler, wie der jung [...] kunig, p. 135. Cf. also idem., Kaiser, p. 101. Cf. also Haag, Ritter!, p. 154.
- 23 Cf. here and in the following Müller, Dürer, pp. 117-120.
- 24 Information provided by the auction house Landshuter Rüstammer oHG on 19 October 2016.
- 25 Cf. most recently Paggiarino, Churburg Armoury.
- 26 Inv. nos. Hofjagd- und Rüstammer B 44, B 45, B 46, B 47, B 112, B 113, B 114, B 115. Cf. on the pieces to some extent Thomas/Gamber, Katalog, pp. 152 f. or Haag, Kaiser Maximilian, p. 146 f.
- 27 Inv. nos. Ambras Castle Innsbruck WA 1687 (cf. Haag, Ritter!, p. 154 f.)
- 28 Cf. Müller, Dürer, p. 117.
- 29 Cf. Jezler, Ritterturnier, cat. 8, p. 146 and Thomas/Gamber, Katalog, p. 153.
- 30 Cf. Haag, Ritter!, p. 154.
- 31 Ibid., p. 154.
- 32 Inv. No. W 2000/1. Cf. Atzbach, Burg, cat. no. 10.8, p. 195 f.
- 33 Cf. here and in the following ibid., cat. no. 10.8, p. 195.
- 34 Company "ConsolidaS Kunst und Kulturgut GmbH" in Scheßlitz/Bamberg.
- 35 Cf. restoration report on 0402-2005 in the Bavarian Army Museum, p. 4.
- 36 See ibid. The conservators involved were Ms. Dagmar Drinkler and Mr. Martin Pacher (ConsolidaS in Scheßlitz/ Bamberg).
- 37 Ibid., p. 3 ("die Haube war übersät mit Puppenhüllen von Motten und deren Exkrementen").
- 38 Cf. here and in the following ibid., p. 3.
- 39 Cf. measurement in the restoration report, p. 25.
- 40 Many thanks to Dr Matthias Pfaffenbichler and Dr Stefan Krause for their assistance with the dating at the Kunsthistorisches Museum.
- 41 Cf. Pöschl, Crashtest. [Translator's note: The German TÜV (Technical Inspection Association) are regionally organised, independent certification and inspection bodies for technical systems and objects of all kind.]
- 42 Cf. ibid., p. 352.
- 43 This limit is defined by the Economic Commission for Europe and the European New Car Assessment Programme (cf. Pöschl, Crashtest, p. 352).
- 44 Cf. Pöschl, Crashtest, p. 352.
- 45 Ibid., p. 353 ("so sind die auf den Harnisch einwirkenden Kräfte am größten, aber immer noch unter den Grenzwerten für ein starkes Gefährdungspotential bei Unfällen").
- 46 Koets, Bericht, p. 394 ("die auf und durch die Lanze").
- 47 Cf. here and in the following ibid., p. 394.
- 48 Cf. here and in the following Williams et. al., Experimental investigation, p. 7 f.

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Christopher Retsch

The Armoured Hose in the Bavarian Army Museum

Hoses as Pieces of Armour in the Late Middle Ages and the Early Modern Times

The so-called Panzerhose or armoured hose (Fig. 1) in the Bavarian Army Museum is a not exactly unique, but nevertheless extremely rare object among the surviving pieces of clothing and armour from the Late Middle Ages and the early modern period. The distinctive method of fastening metal plates between two layers of fabric is so far known only from one other specimen in England.¹

Until a few years ago, the Ingolstadt hose were virtually unknown, or rather only from two old black-and-white photographs, presumably from the beginning of the 20th century, in the photo database of the “Deutsches Dokumentationszentrum für Kunstgeschichte - Bildarchiv Foto Marburg” (Fig. 2).² These were taken when the hose were still in the collection of the Bavarian National Museum in Munich, which had bought the garment in 1863 or 1864 from the Munich art dealer Aron Schmaya Drey (1813-1891).³ It is unknown, however, where he in turn had acquired the hose originally. In the National Museum, they initially received the inventory number 229, somewhat later the number 212, and when the museum moved from Maximilianstraße to the new museum building on Prinzre-

gentenstraße in 1900, they were finally given the number 208.⁴ In 1922, the Bavarian National Museum passed the hose on to the Bavarian Army Museum where they were then given the inventory number A 6147.⁵ Although another photograph was taken of them in the 1930s (Fig. 3), they were then forgotten in the museum’s depot. It was not until 2014/2015 that Martin Sienicki, during his time at the Bavarian National Museum,⁶ began researching the whereabouts of the object on the basis of his knowledge of the two old black-and-white photographs. This took him to the Bavarian Army Museum, where an initial inspection of the hose there took place on 20 February 2015.⁷ This was followed by a second, more intensive examination on 6 May 2015, which also led to the preparation of a cut pattern (Fig. 4).⁸ Finally, on 13 April 2016, 45 X-ray images were taken at the Bavarian National Museum, which Tobias Schönauer was later able to assemble into an overall view (Fig. 5). The rarity of the hose, which was soon recognised, made them a predestined exhibit for the so-called Treasure Chamber in the Bavarian Army Museum, which was newly established in 2019.⁹

Fig. 1 General view of the armoured hose, c. 1490/1500 to mid-16th century (Bavarian Army Museum, Inv. No. A 6147)



Fig. 2 Rear view of the hose
(photo taken before 1914, in the Bildarchiv Foto Marburg)



Fig. 3 Front of the hose
(photograph around 1930, Bavarian Army Museum)

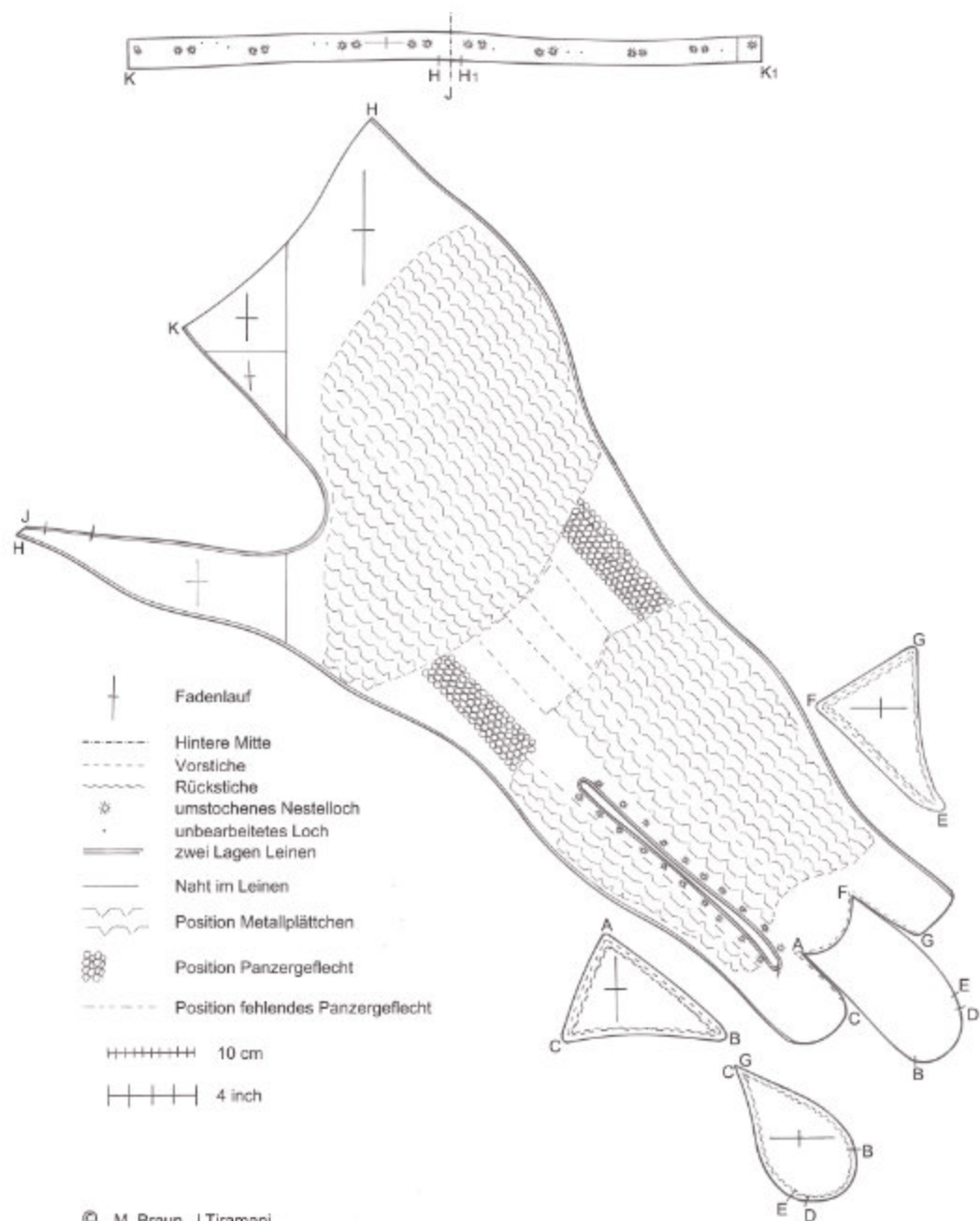
Description of the armoured hose

The hose are made of two layers of plain weave linen fabric with about 18 to 22 threads per centimetre. The cut of the two hose legs follows the usual pattern of one-piece joined hose.¹⁰ The seams of the close-fitting hose legs run along the backs of the legs all the way up to the waistband. The two tubular hose legs are sewn together with another short vertical seam in the centre of the buttocks. This results in three approximately parallel seams at the buttocks (Fig. 6). It is thinkable that a codpiece was once sewn into the gusset between the two hose legs, but since no evidence of it can be found, e.g. in the form of a sewing thread still present in remnants or its stitch holes, it must be assumed that the hose did

Fig. 4 (opposite page)

Cut of the left hose leg

Fadenverlauf = Thread run
 Hintere Mitte = Centre back
 Vorstiche = Running stitches
 Rückstiche = Backstitch
 umstochenes Nestelloch = Eyelet with buttonhole stitches
 unbearbeitetes Loch = Unfinished hole
 zwei Lagen Leinen = Two layers of linen
 Naht im Leinen = Seam in linen
 Position Metallplättchen = Location of metal plates
 Position Panzergewebe = Location of mail mesh
 Position fehlendes Panzergewebe = Location of missing mail mesh



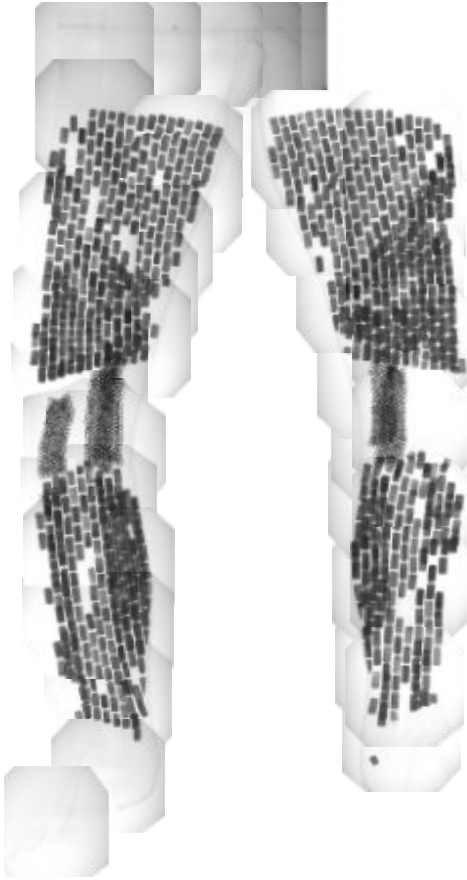


Fig. 5 X-ray image of the hose (composed of 45 individual images), the metal plates positioned next to each other can be seen particularly well

not have a codpiece at the time of use. Located above the hose legs and the three vertical seams there is a waistband. This is not merely draped as reinforcement over the fabric of the hose legs, but rather attached to them as a double-layered strip of fabric, thus extending the hose upwards. This is clearly visible on the X-ray image, as the three vertical seams do not continue inside the waistband (Fig. 5). In the strip of fabric forming the waistband, there are eight eyelets set in pairs, as well as two single eyelets at each front end of the waistband, making a total of 18 eyelets. Unlike the arrangement of these pairs of eyelets often found in pictorial sources showing a centred pair at the back, the centre back here lacks one and instead is flanked by two pairs of eyelets a few centimetres apart. All eyelets are sewn around with a double thread (Fig. 20).

The feet consist not only of the extensions of the hose legs, which enclose the heels, but also of four more pieces of fabric: one at the top of the foot, from the base of the tibia to the front edge of the toes; two lateral wedges; and a sole (Fig. 7). The sole piece is tapered towards the back so that the side wedges are pulled under the heel, resulting in a central point under the sole of the foot where a total of five seams converge (Fig. 8).¹¹ In a departure from the ideal pattern, some of the fabric parts of the hose are composed of several pieces – it seems that there was too little fabric available to cut out the complete parts of the ideal pattern from it. Thus, the two layers of fabric for each of the two hose legs are each made up of three or four individual pieces. The fabric was cut with the warp and weft threads at a 45° angle to the vertical of the pattern. At the same time, it was used up to the selvage, which runs as a diagonal line from the outer sides of the hip into the crotch.¹² To complete the pattern, the three pieces of fabric (or rather only two on the inside of the right hose leg) were sewn to these selvages. This results in two attached

triangles on the outer and front sides of the hips, respectively, as well as an attached, almost wedge-shaped strip from the crotch over the buttocks to the centre back of the waistband.¹³ On the right front end at the fabric strip of the waistband an extension is attached (Fig. 4). The hose were thus assembled from 25 individual pieces of fabric.

An unusual feature in the cut pattern of the armoured hose are the two vertical slits on the lower legs. These are not located along the seams on the back of the legs, but rather on the inside of the legs, i.e. they were cut into the two layers of fabric. Both slits are 30 and 31 centimetres long, respectively, and are each accompanied by 20 individual eyelets.¹⁴ The latter are slightly offset (or have been shifted into such a position through use), pointing towards a possible zig-zag lacing system. On the left leg, in the lowest rear eyelet, a small remnant of a lace ("point") is still present (Fig. 9), namely a flat, possibly tablet-woven textile band, about 0.5 centimetres wide and still some 2 centimetres long.¹⁵ It has been preserved in this eyelet because the two (present-day) ends were sewn together with a few stitches. The two slits are to be considered unusual, as purely textile late medieval and early modern hose did not have such slits. Ordinary hose had a tight fit on the lower legs that was achieved by cutting alone and did not require any additional lacing.¹⁶ Thus, the fabrics used must have been elastic enough for the heel to pass through the narrowest part of the leg. Such elasticity does not seem to have been present in the armoured hose, although they were cut at a 45° angle to the grain. The sewing for the metal plates no doubt prevented the material from stretching along the lower legs, so that the two slits provided the necessary space for putting on the hose. In between the two layers of linen fabric, hundreds of small metal plates were sewn in, both on the thighs and on the lower legs. Of the ori-



Fig. 6 The three seams on the buttocks (outside): the central seam connects the two legs; the adjacent seams extend from the heels over the backs of the legs to the waistband



Fig. 7 Foot part of the left foot consisting of four individual parts sewn to the leg piece



Fig. 8 Sole of the left foot; five seams converge at one point centrally under the arch of the foot

Fig. 9 Remainder of a flat, probably tablet-woven lace band in an eyelet on the left leg

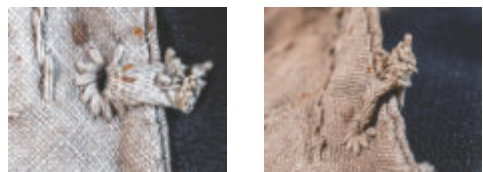




Fig. 10 By means of a thread taken twice, small pockets were sewn between the two layers of linen to hold the small metal plates. The appearance of the seams is clearly different from the outside and inside (left hose leg)

ginally approx. 1,050 to 1,100 metal plates, about 950 have survived. Most of them are rectangular, a little over two centimetres long and one centimetre wide. In addition, however, there are also some more square-shaped plates along the upper and lower edges of the plate-protected surfaces, as the adjoining rows of rectangular plates are staggered by half a plate length and therefore smaller compensating plates were necessary (Fig. 5). The four corners of these metal plates are either rounded or irregularly chamfered. They are secured between the two layers of fabric by a double thread sewn around the plates to create small pockets holding the metal plates. This means that the individual plates sit loosely in their pockets with a bit of slack without overlapping (Fig. 10).¹⁷ In some cases, the (chamfered or rounded) corners of plates have pierced the fabric and are visible (Fig. 11). This mounting technique thus differs significantly from the overlapping mounting me-

thods, for example in brigandines, where metal plates were riveted to a backing material,¹⁸ or in jacks of plates, where the metal plates were also fixed by means of threads, but have a central hole through which the threads are passed.¹⁹

Since the vertical rows of metal plates would make it impossible to bend the knee, the two knee areas have been left out. So, these are, or were, not protected by metal plates, but rather with four strips of mail mesh each, two strips on the front and two on the back. Of these, three strips have survived on the right knee and two on the left knee (Fig. 12). Their length ranges from 13 to 16 centimetres, their width is 4 centimetres. The inner diameter of the riveted rings is about five to six millimetres.

On the designation of the hose

At present, these hose is mainly known under the term “Panzerhose” (armoured hose), whereas they were referred to as “Panzerstrumpfhose” (armoured tights) in the inventory of the Bavarian National Museum.²⁰ In each of the two photographs mentioned above (Fig. 2) from the period in the Bavarian National Museum, they are labelled “Panzerhose, 14.-15. Jh.”. Later, the index card of the Bavarian Army Museum states “Leinwandhose” (linen hose) (Fig. 21), and in the current digital inventory of the museum it is listed as “Leinwandhose / Panzerhose” (linen hose / armoured hose). However, none of these terms can be traced back to sources from the times when hose were used and are therefore not contemporary names for the object. What may be considered certain is that mostly textile garments for the legs were called in German “hosen” in the late Middle Ages and in the early modern period.²¹ This applied both to the two-piece, separate hose legs,²² and to the one-piece joined ones worn from the 14th century onwards.²³ It is thus likely that the so-called “Panzerhose” were also



Fig. 11 Damage caused by the metal plates and repair on the inside of the right hose leg



Fig. 12 Since it would not have been possible to bend the knees if the metal plates had been placed all the way through, the knees were protected by mail strips instead (two of the three surviving strips on the right knee)

referred to by the term “hosen” during their period of use, even though another descriptive term was certainly added in most cases, due to their particular construction, to distinguish them from ordinary “civilian” hose. Which term this might have been, alas, remains unknown, but it is very unlikely that “Panzer” was used in this context, as – at least in the German-speaking world during the late Middle Ages – this was the usual designation for pieces of armour made of mail. On its own, the term was thus mostly used for the mail hauberk, which was simply called “das Panzer”.²⁴ In compound nouns or as adjective, it also described the materiality of further pieces of armour.²⁵ Although today’s Ingolstadt hose sports strips of mail mesh at the knees, these are clearly secondary compared to the sewn-in metal plates, so that it would be

more than surprising, if these of all things had served as the eponymous component of the hose. If the term had existed, “Panzerhose” from the High Middle Ages to the early modern period would certainly have been understood to mean two separate hose legs or a one-piece hose made entirely of mail.²⁶ If the predominant protective technology of the hose were to be used for naming, the term “Plättchenhose” (metal plate hose) would also be conceivable in addition to the already introduced but misleading term “Panzerhose”. However, this would not be a term used in contemporary sources either, so that one modern technical term would merely be swapped for another. Therefore, as long as the artificiality of the term is kept in mind, we can continue to use the term “Panzerhose”.

Possible dating and use of the so-called Panzerhose

The unknown provenance of the hose before 1863/1864 precludes any conclusions about the original region of their use and thus also about the presumed place of manufacture in the same region.²⁷ Some details concerning the workmanship, however, allow at least a rough dating. The inventory list of the Bavarian National Museum for 1890 contains the following note on the chronological classification: "They were worn before the invention of the full suit of plate armour. 1320-1380. Around 1500."²⁸ This means that the hose were initially dated to the 14th century, but this date was later crossed out and corrected to "Around 1500". The new assessment seems to be based on Wendelin Boeheim (1832-1900), as the inventory also contains the following note: "Böheim dates the hose to the time of Emperor Max I [1459-1519] (oral communication 8 April 1891." Although the reason for Boeheim's assessment is not given and must therefore remain unknown, his dating may nevertheless have been correct or at least quite plausible. On the photos mentioned above, which were taken before 1914, a kind of compromise between both dates was found, since they simply state



Fig. 14 The left henchman wears pieces of armour on his arms and legs which are probably to be interpreted as metal plates sewn between two layers of linen cloth, his head is protected by a mail coif, detail from: *De Lisle Psalter*, miniature with Christ before Herod, c. 1310 (London, British Library, Arundel MS 83 II, fol. 125r)



Fig. 13 Another armoured hose cut as short hose, but without eyelets in the waistband, c. 1490/1500 to the middle or end of the 16th century (?) (Pitt Rivers Museum, Oxford, Inv. No. 1884.31.42)

"14-15 Jh." ("14th-15th century") (Fig. 2). First of all, it should be noted that the garment is a one-piece hose, as both legs are joined at the buttocks (Fig. 6). Such hose completely enclosing the buttocks can indeed be found since the second half of the 14th century, from about 1360 at the latest.²⁹ The specific design of the joining at the buttocks provides another important clue to dating, even if this section with the three seams running side by side almost vertically to the waistband is quite short here (about two centimetres long). One-piece joined hose with a cut pattern like this can be traced in the German-speaking world from the late 1490s onwards. At first they were used alongside an older pattern, but in the course of the 1510s they almost completely replaced this older hose pattern.³⁰ If, therefore, the hose were acquired by the art dealer Drey in the German-speaking world, they would probably date from somewhere in the last decade of the 15th century to well into the 16th century.³¹ Therefore Wendelin Boeheim's dating of the hoses to the reign of Maximilian I as emperor (from 1508 to 1519) is by no means wrong, but somewhat too narrow. The dating of the armoured hose to the period from the 1490s onwards is further supported by another pair of hose that ought to be discussed here. As mentioned at the beginning, there is another pair of hose in England that also consists of two layers of linen fabric with small metal plates fastened in between in the same manner. These feature the same three seams on the buttocks reaching to the waistband as the later pattern of one-piece hose, so that the same dating criteria apply. Furthermore, the "English" pair are short hose whose legs terminate (presumably just) above the knees (Fig. 13).³² This provides a further dating criterion. Short hose were worn in the German-speaking world from around 1490 or the 1490s, and during the first decades almost exclusively by



Fig. 15 Armoured horsemen wearing linen hoses with metal plates sewn into them under simple leg armour, detail from: Livy, *History of Rome (Ab urbe condita)*, c. 1370, French translation by Pierre Bersuire, miniature showing the Lifting of Romulus to heaven during a military muster on the Campus Martius (Paris, Bibliothèque Sainte-Geneviève, MS. 777, fol. 7r)

footmen and lansquenets.³³ They were even regarded as characteristic of fighting on foot, which becomes particularly clear when mounted men switched to foot combat and cut off their hose legs to do so. Thus, for example, Götz von Berlichingen (c. 1480-1562) relates in his autobiography "*Mein Fehd und Handlungen*" (*My Feuds and Actions*) how in 1499 he lost his horse in the Swabian War in Thayngen near Schaffhausen and continued to fight on foot: "Vnnd nachdem mir mein gaul dar auff ich vf den marggrauen wart, gestorben wahr, lieff ich alls ein boser bub zu fueß mit denn knechten hinein zu der kirchenn, erwischett ein allts scheffellin, vnnd hett mein tegenn auch vff denn bordt gebundenn, vnnd die hossenn abgesschnittenn."³⁴ There is no practical reason why he should have cut his hose legs off, so this would seem to be a deliberate act of changing into a foot soldier also on the

outside. Such hose with short legs were called “Halbhosen” in German in those days. This term is found in the third stanza of a lansquenet song by Jörg Graff (c. 1475/1480-1542), which was printed around 1530 by Kunigunde Hergotin († 1547) in Nuremberg as a song pamphlet: “In wammes und halbhosen müß er springe”.³⁵

The hose in the Pitt Rivers Museum in Oxford can therefore be dated to the period from the 1490s to the 16th century on the basis of not one but two criteria (seam course at the buttocks and short hose). This strongly supports the chronological classification of the Ingolstadt “Panzerhose”, which were manufactured using the same technique.

And yet, the original dating to the 14th century³⁶ was not entirely far-fetched, since the technique of fastening small metal plates in pockets sewn between two layers of fabric

may be found in a number of late medieval illustrations that also date to the 14th century.³⁷ In an English manuscript from around 1310, in a full-page Passion cycle divided in eight compartments, we can see two henchmen armed with spears.³⁸ One of them wears a textile hood (in contemporary German “gugel”), the other a mail coif, which was probably referred to in contemporary German as “huntzgugel” and “huntzkapp” (Fig. 14).³⁹ On their arms and hands as well as on their legs and feet, both wear white items of armour with a mainly brickwork-like structure underneath their surcoats. It can be assumed that the miniaturist intended to depict white linen fabric here, and that the brickwork-like structures were not meant to represent rectangular scale armour, but rather the visible seams of staggered metal plates arranged in their small pockets. As for the circular structures at the joints (including the finger and toe joints), it is not sufficiently clear whether these are merely intended to represent a different arrangement of the metal plates at the joints, or whether they could be reinforcing pieces placed on the outside.

Other possible illustrations of such armour can be found in a manuscript produced around 1370 for King Charles V of France (1338-1380). In this French translation of the “History of Rome” by Livy (c. 59 BCE to c. 17 CE), several horsemen and an emperor (historically more precisely a consul) on foot are equipped with corresponding hose with metal plates. While the emperor, stepping ashore from a ship, merely wears gilded poleyns over his hose,⁴⁰ the horsemen additionally wear leg armour, in the shape of half tubes, each covering the front of the lower and upper thighs (Fig. 15),⁴¹ while two further horsemen wear just armoured hose in combination with poleyns.⁴²

A likewise French book of hours from about 1375 to 1380 features two henchmen in scenes from the Passion, each leading Christ by the arm. They are apparently

Fig. 16 Goliath wears pieces of armour on his arms and legs, probably made of linen, with sewn-in metal plates, and mail elements on his knees and feet, detail from: Psalter and Prayer Book of Alfonso V, 1436-1443, miniature with the fight of David against Goliath (London, British Library, Add MS 28962, fol. 81v)



wearing hose made of linen with sewn-in metal plates.⁴³ Interpreting these depictions here, however, is not as clear-cut as with the two manuscripts mentioned above, since the structure and colour of the upper and lower legs differ in one of the henchmen, and in the other – who is wearing a set of greaves with poleyns⁴⁴ (but no cuisses) – the colour of the hose is repeated on the sleeves, where the structure, however, is more reminiscent of scales and quilted linen.

In addition to these three English and French illustrations of possible hose with sewn-in metal plates from the 14th century, there are two or three Spanish illustrations from the 15th century. In the prayer book of King Alfonso V of Aragon (1396-1458; as King of Naples and Sicily Alfonso I), produced in Valencia between 1436 and 1443, a miniature shows the fight between David and Goliath (Fig. 16).⁴⁵ The latter, already lying on the ground, wears white pieces of armour with the above-mentioned structure on both his arms and legs, which is why these can be interpreted as consisting of linen with sewn-in metal plates. At the knees, the plates are again arranged in a circular pattern, but unfortunately it is not clear whether these are an integral part of the hose or added reinforcements. The mail elements in the backs of the knees and on the tops of the feet, on the other hand, are clearly attached to the surface of the hose. In the scene of Christ's capture (Fig. 17), Malchus – who is about to have his ear cut off by Saint Peter – also wears such armour on his arms and legs.⁴⁶ The colour of the linen itself, however, is a rather greyish hue, so that the type of armour is only recognisable by its characteristic surface structure.

The other Spanish depiction of what appear to be hose of this kind can be found in a panel painting by Juan de la Abadía the Elder (active from 1469-1498), which shows the archangel Michael weighing souls (Fig.



Fig. 17 The armour on Malchus' arms and legs can only be recognised from the structure as probably consisting of linen and sewn-in metal plates, detail from: *Psalter and Prayer Book of Alfonso V*, 1436-1443, miniature with the Arrest of Christ (London, British Library, Add MS 28962, fol. 361v)

18).⁴⁷ The archangel does wear neither cuisses nor greaves with his otherwise very fantastical armour, but apparently only a pair of linen hose with sewn-in metal plates, which is recognisable thanks to the structure of the vertical rectangles arranged in staggered rows. In addition, his knees are protected by mail elements encasing their entire surface. They are probably sewn onto the hose along their upper edge. In contrast to the "Panzerhose" in Ingolstadt and some of the hose in the aforementioned picture sources, the hose of Saint Michael do not have any foot parts, but instead just simple stirrups, which are, however, also reinforced with metal plates all the way down to the heel.

Along with the supposed armours featuring metal plates sewn between two layers of fabric, the mail strips at the knees were also depicted in some late medieval works



Fig. 18 The hose of the Archangel Michael shows the typical structure of sewn-in metal plates, the knees are protected by all-round mail cuffs, Juan de la Abadía the Elder, Saint Michael Weighing the Souls, 1480-1495, panel painting (Barcelona, Museu Nacional d'Art de Catalunya, Inv. No. 005082-000)

of art. They can be found, for example, on the Schlüsselfeld high altar retable created by Wolfgang Katzheimer (c. 1430/1440-1508) and his workshop in Bamberg, which was made around 1480. One of the henchman there, in the Arrest of Christ, is wearing red hose, with a long strip of mail mesh attached along the outside from top to bottom.⁴⁸ Some ten years later, such a strip was depicted on the likewise red hose of an armoured horseman in the large-format Babenberg family tree in Klosterneuburg (Fig. 19).⁴⁹ The best-known depiction of such hose is probably that by Albrecht Dürer (1471-1528) on the Paumgartner altarpiece from about 1498. On the right altarpiece from the former Dominican Church of St Catherine in Nuremberg, the donor Lukas Paumgartner (c. 1478-1546) is depicted as Saint Eustace in a minimised equestrian armour.⁵⁰ There are strips of mail down the sides of his red hose.⁵¹ In 1505, Albrecht Dürer depicted similar mail strips on the right hose leg of the copperplate engraving of Saint George on horseback.⁵² Such mail strips were also found on the sleeves, but less often. For example, a woodcut of a marching army in the "ROmische[n] Historie vß Tito liuio gezogen" printed in Mainz in 1505 depicts them on the arm of an armoured foot soldier.⁵³ The above-mentioned pictorial sources show that linen hose with sewn-in metal plates were known in both the 14th and 15th centuries and were quite common pieces of armour for serious combat. They were either worn as the sole item of protective garment, or additionally combined with poleyns or simple leg armour. Since the knee joints, especially in the hollow of the knee, could not be protected with sewn-in metal plates, they were either covered by separately worn poleyns or by sewn-on elements of mail. Such sewn-on strips of mail are also found, albeit in much longer form, in pictorial sources dating mainly to the last decades of the 15th century and the early

16th century. This could be understood as additional confirmation of the dating of the Ingolstadt “Panzerhose” from the 1490s onwards. Moreover, the pictorial sources not only show the possible combinations of such hose with other pieces of armour, but also their use by both foot soldiers and mounted troops.⁵⁴ Since both the hose in Ingolstadt and the short-legged hose in Oxford lack a codpiece (in contemporary German “latz”), it seems unlikely that they were worn directly over the underpants (in contemporary German “bruche”, English “braies”). In all probability, both armoured hose were instead worn over conventional textile legwear (in the case of the Oxford specimen, maybe even short hose). Of course, they did not offer as much protection as the leg armour of a suit of plate (in Germany then also called “Bleeharnisch”⁵⁵) would have done, but they at least seem to have been sufficient against cuts to make them preferable to mere textile legwear.⁵⁶ The origin of the two armoured hose will have to remain unclear, as their provenance cannot be traced back beyond the 19th century. Given the scarcity of known illustrations of possible armour components of this type, it would seem premature to locate them based on pictorial sources (i.e. to England, France or Spain), especially since only one of these illustrations also dates from the presumed period of manufacture and use of these two hose. On the other hand, the very few known illustrations of strips of mail elements on hose all hail from German-speaking countries and would therefore make the purchase of the Ingolstadt hose by the Munich art dealer in the German-speaking world seem plausible.

Fig. 19 A strip of mail mesh is attached to the outside of the red hose of the horseman, Hans Part, Babenberg family tree, 1489-1492, detail of the medallion with Adalbert the Victorious (c. 990-1055) (Klosterneuburg, Abbey museum, Inv.-No. GM 86)



Armoured hose

Inv.-No. A 6147

Dating

German (?), c. 1490/1500 to mid-16th century

Material

Linen, metal (iron?)

Dimensions

Length 118 cm / Width 71 cm

Description

Hose made of two layers of linen fabric in plain weave, thread running at a 45° angle diagonally to the vertical, assembled from a total of 25 individual pieces of fabric. Between the layers there are about 950 small sewn-in metal plates, and attached to the knees five sewn-on strips of mail mesh. Slits on the insides of the lower legs, formerly to be closed by means of lace bands, in one eyelet still a small remnant of one lace band

Provenance and acquisition history

1863/1864 acquired by the Bavarian National Museum from the Munich art dealer Aron Schmaya Drey

1922 transferred on loan from the Bavarian National Museum to the Bavarian Army Museum

1935 converted from a loan to a permanent transfer

Inventories

Inventory list of the Bavarian National Museum from 1890 (BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V), no. 212: "(229) 208 [stamp], Panzerstrumpfhose, reicht von den Hüften bis zum Vorfuß u. besteht aus zwei Lagen ziemlich feiner Leinwand, zwischen welchen 2,3 cm lange u. 1 cm breite an den Ecken abgerundete Stahlplättchen der Art eingenäht sind, daß ei-



Fig. 20 Eyelet, sewn around with double thread (at the slit of the left trouser leg, rear fifth hole from below)

nes an dem andern doppelt umnäht anliegt. Die Plättchen reichen vom Unterleib bis zum Knöchel (der Fuß wurde durch einen Lederschuh gedeckt), jedoch ist ihre Reihe am Knie unterbrochen, das außen der Beweglichkeit wegen mit 2 15-17 cm langen u. 1 7 cm breiten [later insertion into the text, crossed-out text passages in the original of this insertion] Streifen von Kettengeflecht besetzt ist. An der In[n]enseite der Unterschenkel ist vom Knöchel aufwärts ein 32 cm. langer Schlitz angebracht, welcher mit Schnürlöchern versehen ist. Sie wurde getragen vor Erfindung der vollständigen Plattenrüstung. 1320-1380. Um 1500. / L. 1,14 cm. Gew. 1,660 kg / Gekauft vom Händler Drey 1863/64 um 99 fl. / Böhmeim setzt diese Hose in die Zeit des Kaisers Max I. (mündliche Mittheilung 8 April 1891. / 21. VI 22. A Mus. abgeg."

Inventory list of the Bavarian National Museum from the late 1890s (BNM Dokumentation, Renner Waffen), old no. 212: "Strumpfhose / gekauft v. Händler Drey

1863/64 / 21. VI 22. a. d. Armee Mus. abgeg.”

Collection receipts for the years 1922-1923 (Bavarian Army Museum, Inv. No. HA.05.01.63), receipt no. 141/1922: “Zur Ergänzung der Sammlung des Armeemuseums sind aus der Sammlung des Nationalmuseums weiter noch benötigt & werden erbeten [...] 1 Leinwandjacke und =hose, 198, 208 (?)”

Accession ledger (L-Buch, volume 2, Bavarian Army Museum, Inv. No. HA.05.01.54), entry no. 3428: “A 6147, 1 Leinwandhose, 14. Jahrh., 21.6.22, Beleg 141/22, 14.11.1935, Beleg 214, S. Z. B. No. 809/1935”

Acquisition book for the years 1935-1941 (Bavarian Army Museum, Inv. No. HA.05.01.96), entry no. 809 in the section on the year 1935: “A 6147, 1 Leinwandhose, 14. Jahrh. (bisher Leihg. Buch No. 3428)”

Collection receipts for the year 1935 (Bavarian Army Museum, Inv. No. HA.05.01.72),

receipt no. 214/1935: “Mit Beleg No. 214/1935 in das Eigentum des Armeemuseums übergegangen” (quoted in HA.02.02.09)

Local inventory book (A-Buch, volume 2, Bavarian Army Museum, Inv. No. HA.05.01.28a-b), entry no. 6147: “eine Leinwandhose mit Panzerbelag. Deutsch 14. Jhdt. Länge 113 cm”

Literature (selection)

Paggiarino / Schönauer, The Bavarian Army Museum, pp. 167-169 and p. 261; Retsch, Hose, part 2, p. 124 f.

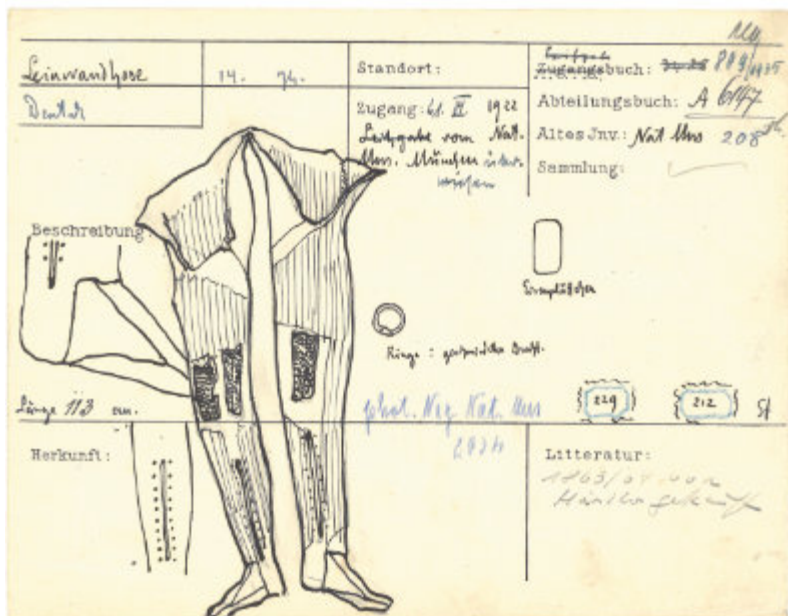
Exhibition history

around 1890 traceable in the permanent exhibition of the Bavarian National Museum

since 3 June 2019

Permanent exhibition “Treasure Chamber” of the Bavarian Army Museum in Ingolstadt

Fig. 21
Inventory card of the armoured hose, here called “Leinwandhose” (canvas trousers), described, written and drawn by Hans Stöcklein (Bavarian Army Museum)



Footnotes

- 1 These are a pair of short hose, Oxford, Pitt Rivers Museum, inv. no. 1884.31.42. See below for more details on these hose. I am grateful to Tobias Schönauer for pointing them out to me.
- 2 Both photographs are labelled "Aufn. vor 1914" (pre-1914 photo).
- 3 In an inventory list of the Bavarian National Museum from 1890 (BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V), the following was entered in the column "Acquisition type and date": "Purchased from dealer Drey 1863/64 for 99 fl.". On Aron Schmaya Drey and his art trade as well as his family, see Hagedorn, *Islamische Kunst*, pp. 88-90.
- 4 The inventory list of the Bavarian National Museum of 1890 (BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V) gives all three numbers, in handwriting: "212. (229)", and stamped underneath: "208".
- 5 In the inventory list already mentioned, the words "21. VI 22. A. Mus abgeg." are entered in red and the object text is crossed out (BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V). In the inventory index card of the Bavarian Army Museum there is the following entry in black ink "1922 Leihgabe vom Nat. Mus. München", which was changed by apparently the same handwriting in blue ink to "21. VI. 1922 vom Nat. Mus. München überwiesen".
- 6 Martin Siennicki restored the Kaufbeuren Setzschild (large pavise), inv. no. W 1, at the Bavarian National Museum and made a replica of it for his diploma thesis at the Academy of Fine Arts Vienna; see: Siennicki, Setzschild. I owe him my sincere thanks for all the information and photos of the so-called "Panzerhose", so that I was able to integrate a mention of the Ingolstadt hose in the second part of my article on late medieval hose, see Retsch, *Hose*, part 2, pp. 124 f.
- 7 The following specialists from the Bavarian National Museum were involved: Dipl.-Rest. Martin Siennicki, Dr Raphael Beuing (Curator of Weapons, Clocks, Scientific Instruments and Base Metals), Dr Johannes Pietsch (Curator of Textiles, Costumes, Leather and Traditional Garments), Dipl.-Rest. (Univ.) Dagmar Drinkler and from the Bavarian Army Museum Dr Tobias Schönauer (Curator of Edged Weapons and Armour).
- 8 Jenny Tiramani and Melanie Braun from the London School of Historical Dress were involved in this study, as were Martin Siennicki, Dr Johannes Pietsch and Dr Tobias Schönauer. The cut pattern was produced by Ms Braun and Ms Tiramani (Fig. 4). Another pattern was made by Ms Dagmar Schrade (dressmaker at the Bavarian Army Museum) on 17 March 2021.
- 9 On the Treasure Chamber, cf. Schönauer, *Schatzkammer*.
- 10 Retsch, *Hose*, part 1, pp. 13-20.
- 11 A reconstruction of a foot part made by Dagmar Schrade with this pattern showed that the point where the five seams meet does not result in an irritating pressure point, as it lies exactly in the arch of the foot. Contrary to what one might think at first glance, the wearing comfort is therefore not hampered.
- 12 The selvage could be clearly identified on the outside of the right hose leg (at an opened seam), but can also be assumed on the other three pieces of fabric in the corresponding areas.
- 13 Since the legs are made up of two layers of fabric, there are a total of 15 individual parts from which the two legs were sewn. To these parts must be added two pieces for the waist band and eight for the two feet.
- 14 Possibly there was also a single eyelet in each of the two lower, badly damaged parts of the slits. This is not clearly discernible, as the torn areas appear rounded at their ends, but on the other hand no remnants of the sewing threads are recognisable. Since such threads have been preserved on torn eyelets on the waistband, it seems more likely that we are not looking at eyelets here at the lower ends of the two slits, but only at tears in the fabric.
- 15 The identification of the fabric as a tablet-weave was provided by Melanie Braun, Enschede (The Netherlands), whom I thank most sincerely for this information.
- 16 Retsch, *Hose*, part 2, p. 125. An illustration of a henchman in a Cologne passion scene from about 1465 is often referred to as supposed evidence of lacing on the lower legs. This, however, only shows the seam of the back of the leg opened at the calf and no such lacing (c. 1464-1466, Master of the "Lyversberg Passion", active in Cologne c. 1460-1490, two wings of a triptych; Cologne, Wallraf-Richartz Museum, inv. no. WRM 0143-0150).
- 17 I would like to thank Melanie Braun for her vivid description of the attachment technique associated with the term pocket. My own older description in Retsch, *Hose*, part 2, p. 125 "mit einem über die Ecken geführten Faden fixiert" ("secured with a thread passed over the corners") is incorrect, since although there are slanted thread runs at some of the corners of the pockets, these are firstly too few and secondly do not work with rounded or chamfered corners.
- 18 See Stadler, *Brigantinen-Symposium* and *Krabath, Brigantinen*. A miniature in a Bruges manuscript from about 1470 to 1475 could depict hose with metal plates possibly riveted in the manner of a brigandine (Retsch, *Hose*, part 2, p. 125). A scene depicting the sacking

- of a town shows a foot soldier with a sack on his back and a basket at his belt wearing hose and additional poleyns. The hose show rows of dots on their outside, which could be interpreted as rivet heads of a construction corresponding to a brigandine. While the lower legs are completely armoured, the thighs are unprotected on the inside (c. 1470-1475, Bruges, *Chroniques sire Jehan Froissart*; Paris, Bibliothèque Nationale de France, Ms. Fr. 2644, fol. 135r). However, the illustration of these hose could also suggest pieces of armour made of cuir bouillie, which the illuminator did not quite clearly succeed in reproducing, and which were also frequently provided with metal rivets on their outer sides (on this, see Cheshire, *Cuir Bouilli*: fracture toughness).
- 19 A preserved specimen can be found in Nuremberg, Germanisches Nationalmuseum, W 2175, see Eser, *Gepanzertes Wams*, 2015, p. 93 f.
 - 20 Inventory list of the Bavarian National Museum of 1890 (BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V). In a presumably more recent, more concise inventory volume of the National Museum, it is simply described as “Strumpfhose” (tights) (BNM Dokumentation, Renner Waffen).
 - 21 See Retsch, *Hose*, part 1, p. 1. On the materiality, which occasionally also included leather, see Retsch, *Hose*, part 2, p. 126.
 - 22 In the German research literature, such two-piece hose are mostly referred to by the modern term “Beinlinge”. For the late medieval term “Hosen” for two-piece legwear, see De Co, *Josephs Hosen*, pp. 152-154. For example, on a woodcut with the most important relics from Maastricht, Aachen and Kornelimünster, printed in 1468 or 1475 on the occasion of the seven-yearly pilgrimage to the shrine, there is an illustration of the two “Beinlinge” or “Hosen” that Joseph is said to have used as nappies for the infant Jesus. These are labelled “Ite[m] Josephs hosen do jhesus in gewonde[n] wart vnd in die krippen geleit wart.” (unique copy in Munich, Staatliche Graphische Sammlung, inv. no. 118 308). An illustration of the woodcut can also be found at [https://en.wikipedia.org/wiki/File:Toningsformulier_heiligdomsvaarten_Maastricht,_Aken_%26_Kornelim%C3%BCnster_\(Midden-Rijn,_1468\).jpg](https://en.wikipedia.org/wiki/File:Toningsformulier_heiligdomsvaarten_Maastricht,_Aken_%26_Kornelim%C3%BCnster_(Midden-Rijn,_1468).jpg) (accessed on 15 February 2021). On the woodcut, see also Feßl, *Heiltumsbuch*, p. 175 f. Josef de Co also mentions another use of the term “Hosen” as a designation for two-piece legwear that extends into the present or at least the recent past, namely for stockings in the Aachen or Öcher Low German (“eine hoss”), in East Limburg (“kousen”) and in Frisian (“hoazzen”), De Co, *Josephs Hosen*, p. 153 and *idem.*, *Adenda*, p. 249. In the late Middle Ages, the term “Hosen” also referred to the two-piece legwear worn by women, see Retsch, *Hose*, part 1, p. 1 (footnote 4) for two examples.
 - 23 Illustrations of one-piece hose with the corresponding caption of these as “Hosen” can be found, for example, several times in the “*Kleidungsbuechlin*” (Book of Clothes) of Matthäus Schwarz from Augsburg. He had himself painted in at least one ensemble of clothes for each year from 1520, also retrospectively back to his birth in 1497. See Minning, *Dressed for Success and Emmendorf / Trebesch, Dressed for Success*. For example, the caption to the clothing of March 1523 reads “den weisen vberzüg mocht man über all hosen anlegen” (Brunswick, Herzog Anton Ulrich-Museum, inv. no. H 27:67a, fol. 59r), by which was meant an “Überzug” (overtrousers) elsewhere also called “Gesäß” or “Gesäßhosen”, which featured the slit pattern of the thighs and could be combined with various (un-slit) hose (for concise information on this see Retsch, *Hose*, part 2, p. 114 and in more detail Zander-Seidel, *Hausrat*, p. 185 f.). The one-piece hose emerged in the middle or, at the latest, the second half of the 14th century. In addition to the pictorial sources I have cited with clearly one-piece hose from c. 1380, 1383 and 1387 (Retsch, *Hose*, part 1, pp. 4-8 with figs. 4, 5 and 7) there are also some two decades older illustrations of clearly one-piece hose: In an Alsatian manuscript dated 1362 with the translation of the “*Legenda sanctorum aurea*” by Jacobus de Voragine (probably 1226-1298) into German, there are several miniatures showing such hose, for example in the martyrdoms of Saint Stephen, Saint Thomas of Canterbury, Saint Felix of Nola, Saint Urban and Saint Apollinaris of Ravenna (Munich, Bavarian State Library, Cgm 6, fol. 17r, 21v, 35v, 97v and 119v).
 - 24 See in detail Retsch, *Sprechendes Metall*, in the chapter ‘Rüstungs- und Waffenterminologie der Quellen’, sub-chapter ‘Panzer, Halsberge, Lorica’ (typescript pp. 55-58). A combination of term and illustration is found, for example, at the beginning of the “xvii. Ca[pitel] von dez panzer” in “*Der füzspfadtz zu der ewigen seligkeit*” printed in 1494 (Anonymous, *füzspfadtz*, fol. 21v; the text interprets the knight’s riding gear and arms and armour from a Christian perspective in order to inspire the reader to live a pious life).
 - 25 As a descriptive component, the term is found, for example, in an decree by King Maximilian I to raise and equip a troop of 100 horsemen with associated further mounted men, foot soldiers and retainers from 1498. There it says, among other things: “under der tüchsen ain pantzerfleck auf die juppen geneet und ain beheng von pantzerringen wie an einem kyris, doch um drey finger lenger” (Vienna, Austrian State Archives, War Archives,

- Alte Feldakten I/1, 1498/13, fol. 4-6, quoted after Wiesflecker-Friedhuber, *Quellen Maximilian I.*, p. 92).
- 26 In this sense the term “Panzerhose” is used in the inventories of the Bavarian Army Museum for the mail breeches A 189. Whether the term “Panzerhose” was actually used in the sources remains to be seen. In any case, the “Mittelhochdeutsche Begriffsdatenbank” does not know it, but lists 24 hits for “Eisenhosen” (iron hose) and “Isenhosen” respectively (<http://mhdadb.sbg.ac.at/mhdadb/App?Action=TextQueryModule&string=eisenhosen&filter=&texts=%21&startButton=Suche+starten&contextSelectListSize=1&contextUnit=1&verticalDetail=3&maxTableSize=100&horizontalDetail=3&nrTextLines=3> [accessed on 16 February 2021]). For example, Wolfram von Eschenbach’s (1170/75-after 1220) poem “Willehalm” says: “Diu iserhose sanc uf den sporn: des wart sin blankez bein verlorn” (Schroder, Wolfram von Eschenbach, *Willehalm*, p. 78, verses 1 f.). The *Deutsche Wörterbuch* by Jacob and Wilhelm Grimm only knows of a single reference for “Panzerhosen” from the 18th century (www.woerterbuchnetz.de/DWB/panzerhosen [accessed on 16 February 2021]).
- 27 Due to the rather simple production technique of the hose, it can be assumed that they are less a product of specialised craftsmen with a large export radius than an item of local production and use. At best, scientific studies of the materials used (linen and metals) could provide a certain amount of insight. However, such investigations were not planned for the present work.
- 28 Inventory list of the Bavarian National Museums of 1890 (BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V), see p. 204.
- 29 See Retsch, *Hose*, part 1, pp. 4-8, as well as the reference given above to pictorial sources showing one-piece hoses as early as 1362.
- 30 The oldest unambiguous illustrations of such a pattern in the German-speaking world / north of the Alps known to me so far date from 1498. They are found on a total of six henchmen depicted from behind on a St John Altarpiece by Rueland Frueauf the Younger (Klosterneuburg, Abbey Museum, inv. no. IN GM 75, IN GM 76, IN GM 78 und IN GM 79), see on this (and on a possible earlier illustration) in more detail Retsch, *Hose*, part 1, p. 19 (with fig. 27 and endnote 62). In the online catalogue of the Abbey Museum, for example: <https://www.stift-klosterneuburg.at/collection/enthaeupfung-johannes-des-taeufers-rueland-frueauf-d-j/> (accessed on 22 March 2021). In the previous, older pattern, the seams of the backs of the legs merged at the buttocks with the vertical centre seam, so that only the latter ran through to the upper waistband of the hose and the back view showed an inverted V-shaped seam course (see in detail Retsch, *Hose*, part 1, pp. 13-18).
- 31 The cut pattern with the three seams running all the way to the waistband was, however, probably known earlier in Italy (for an illustration from an Italian manuscript from 1460, see also Retsch, *Hose*, part 1, p. 19, footnote 62). If, therefore, the hose originated in Italy, which cannot be ruled out without a scientific examination of the materials used, then they could even be three to four decades older.
- 32 Oxford, Pitt Rivers Museum, inv. no. 1884.31.42. I would like to thank Melanie Braun, Enschede (Netherlands), for information about these hose. Detailed information on the “Armoured culottes” can be found in the museum’s online catalogue: objects.prm.ox.ac.uk/pages/PRMUID126756.html (accessed on 22 March 2021).
- 33 On the rather rare use of the term “Landsknechte” in contemporary archival sources and the more frequent designation of those fighting on foot as “Knechte” and “Kriegsknechte” see Xenakis, *Gewalt*, pp. 53-57. In contemporary illustrations, the wearers of short hose are also to be addressed as “Schergen” (henchmen) due to their activity as torturers of Christ or saints. On the use of this term in the late Middle Ages see Retsch, *Sprechendes Metall in the chapter ‘Rüstungs- und Waffenterminologie der Quellen’, subchapter ‘Scherge’* (typescript pp. 105-107).
- 34 Ulmschneider, *Götz von Berlichingen, Fehd und Handlungen*, p. 11. Translation: “After my horse, on which I had waited for the margrave, was killed, I ran on foot like a simple lad to the church with the ordinary foot soldiers. I found an old Schefflin [light spear] and had tied my Degen [dagger or short sword] to a belt and cut off my trousers.” On the polearm used by Götz von Berlichingen, the “Schefflin”, see for example two preserved original blades in the Bamberg cathedral museum, Retsch, *Waffen der Heiligen*, pp. 108-112. For more detailed information on this weapon and its misinterpretation as a throwing spear (also by me in the aforementioned article) see the correction by Seeburger, Schefflin, also the passage cited here on p. 167 f.
- 35 Translation: “In his doublet and short hose he has to jump.” For the song pamphlet, see <https://gams.uni-graz.at/o:ldr.lieddrucke#LDR.1453> (accessed on 15 March 2021). The song with 15 stanzas is printed in Ludwig Uhland’s collection as song no. 188 under the title “Landsknechtorden” (Uhland, *Volkslieder*, vol. 1, pp. 516-519, the quotation on p. 517, the source reference to it in vol. 2, p. 1020). The title of the song pamphlet is “Ein new Lied, von dem || Lantzknecht auff der stelten, Jn || des Schüttensamen thon.|| Ein anders, von der kriegßleut orden.|| Jm thon, Wöl wir das korn scheyden.||”, the beginning of the

- first stanza is "Gott gnad dem großmechtigen keiser frumme".
- 36 BNM Dokumentation, Saalbuch [Maximilianstraße], 1. Obergeschoss, Saal V.
- 37 I owe most of my knowledge of the following illustrations to various online forums and blogs in the living history scene. McLean, Panzerhose, is representative, as it summarises the widely scattered references well. I would like to thank Fabian Brenker (Vienna), Fabian Maier (Constance) and Jonathan Frey (Olten) for their help in researching the illustrations from manuscripts published online, most of which lacked useful references.
- 38 Around 1310, De Lisle Psalter (London, British Library, Arundel MS 83 II, fol. 125r). Another leg with foot in a corresponding armour is found on fol. 124v (scene of the Arrest of Christ). Detailed information on the manuscript: http://www.bl.uk/manuscripts/FullDisplay.aspx?ref=Arundel_MS_83 (accessed on 21 March 2021).
- 39 See in detail Retsch, Hundsgugel, pp. 190-194.
- 40 Around 1370, Tite-Live, Histoire romaine, version française par Pierre Bersuire (Paris, Bibliothèque Sainte-Geneviève, MS. 777, fol. 316r). Detailed on the manuscript: <http://www.calames.abes.fr/pub/#details?id=BSGA12181> (accessed on 21 March 2021).
- 41 Around 1370, *ibid.*, fol. 7r. The individual parts of the leg armour can be classified as Goll's upper-leg-type-I; knee-type-II and lower-leg-type-I, see Goll, Iron documents, p. 48 f. and 64 f.
- 42 Around 1370, *ibid.*, fol. 316r. The poleyns can be classified as Goll's knee-type-II (Goll, Iron documents, pp. 48 f. and 64 f.).
- 43 1375-1380, Jean Le Noir, Petites Heures de Jean de France, Duc de Berry (Paris, Bibliothèque National de France, Ms. Lat.18014, fol. 76r und 79v). Detailed on the manuscript: <https://archivesetmanuscrits.bnf.fr/ark:/12148/cc784809> and <https://gallica.bnf.fr/ark:/12148/btv1b8449684q/f159.item.r=Petites%20heures%20de%20Jean%20de%20Berry#> (accessed on 21 March 2021).
- 44 The greaves etc. consist of Goll's lower-leg-type-III and knee-type-II; Goll, Iron documents, p. 48 f. and 64 f.).
- 45 1436-1443, workshop of Domingo Crespi, Valencia, Psalter and Book of Hours (Prayerbook of Alphonso V of Aragon; London, British Library, Add MS 28962, fol. 81v). For detailed information on the manuscript, see: http://www.bl.uk/manuscripts/FullDisplay.aspx?Ref=Add_MS_28962 (accessed on 21 March 2021).
- 46 *Ibid.*, fol. 361v.
- 47 1480-1495, Juan de la Abadía the Elder, St Michael Weighing the Souls, panel painting, 127.7 cm x 76 cm, probably formerly the central panel of an altar from Liesa in the province of Huesca (Barcelona, Museu Nacional d'Art de Catalunya, inv. no. 005082-000). For more details on this panel painting, see the museum's online catalogue: <https://www.museunacional.cat/en/colleccio/saint-michael-weighing-souls/juan-de-la-abadia-ellvell/005082-000> (accessed on 21 March 2021).
- 48 Around 1480, Wolfgang Katzheimer and workshop, Arrest of Christ, Schlüsselfeld high altar retable (Würzburg, Museum für Franken; formerly Mainfränkisches Museum; on loan from the Bavarian National Museum). On the Schlüsselfeld high altar retable, see Suckale, Erneuerung, vol. 1, pp. 314-327, vol. 2, pp. 176-187. See also Retsch, Hose, part 2, pp. 124 f. and fig. 58.
- 49 1489-1492, Hans Part, Babenberg family tree in Klosterneuburg, medallion on Adalbert the Victorious (Klosterneuburg, Abbey Museum, inv. no. GM 86). I owe the pointer to this depiction to Marcel Schultz, Aschaffenburg, who presented it under the topic "Ringpanzerstreifen an Hosenbeinen" (Strips of mail on hose legs) in an online forum (<https://www.mittelalterforum.com/index.php/Thread/25854-Ringpanzerstreifen-an-Hosenbeinen/> [accessed on 21 March 2021]).
- 50 For such minimised armour see Retsch, Sprechendes Metall, in the chapter 'Adlige Stifter in reduzierten Rüstungen' (typescript pp. 231-235). There also more detailed information on the armour depicted in this altar.
- 51 1498, Albrecht Dürer, Paumgartner Altar (Alte Pinakothek, Munich, inv. no. 702). On the altar see: <https://www.sammlung.pinakothek.de/de/artwork/W6kLay7L8V> and <http://www.hdbg.de/portraitgalerie/gemaelde-706.php> (accessed on 22 March 2021).
- 52 1505, Albrecht Dürer, Saint George on Horseback (e.g. in Amsterdam, Rijksmuseum, inv. no. RP-P-OB-1214). The inscription on the copperplate was later changed from 1505 to 1508.
- 53 Schöfflerin, Römische Historie, fol. CCCXXX; e.g. in Munich, Bavarian State Library, Rar. 2086:urn:nbn:de:bvb:12-bsb00004902-8 (accessed on 23 March 2021).
- 54 This also applies to the hose with lateral mail strips from the hips to the ankles.
- 55 For the contemporary designation of the suit of plate as "Blehharnisch" see Retsch, Sprechendes Metall, in the chapter 'Rüstungs- und Waffenterminologie der Quellen', subchapter 'Harnisch' (typescript pp. 49-51).
- 56 This also applies to hoses with mail strips down the sides, although here the protective effect is even less pronounced.

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Johannes Pietsch

Frock and Slops of a Conquistador

An Unusual Find from Peru

Clothing from the 16th century – especially that of the common people – has survived only in isolated cases. Even rarer are European-influenced vestimentary testimonies from the early colonial period in South America. The German explorer Heinrich Ubbelohde-Doering (1889-1972) discovered the two garments in June 1932 on an old burial ground at the foot of the pyramid of Cao Viejo in the northern coastal region of Peru (Fig. 17) and handed them over to the Bavarian Army Museum a few months later.¹ Dr. Ubbelohde-Doering was one of Germany's most important scholars in the field of ancient Peruvian culture. From 1930 he worked as curator at the State Museum of Ethnology in Munich and was director of this institution from 1936 to 1956. The garments from Peru provide information about a style of dress that has survived in only a few pictorial records. The thigh-length tunic, or frock (Fig. 1), consists of a front and a back part (Fig. 5).² The side seams are slightly contoured, the garment itself is moderately flared at the bottom and has a short opening on the right side. The left side probably originally had a long fastening slit that could be closed via stitched eyelet holes; only one such hole is still extant on the front left, cut skirt section (Fig. 4). The front has a short neck slit cut

into the fabric and a 6-cm high attached stand-up collar. At the rear, the collar is cut to the back part. Of the sleeves, only the upper arm puffs have survived to such an extent that their cut can be reliably reconstructed. They each consist of four rectangular upper arm sections with gaps left open in between, which are attached to a 7-cm wide, close-fitting band (Fig. 16). Sewn to this is a narrow sleeve, of which only fragments remain, so that its original length can no longer be determined. Presumably, however, it reached down to the wrist.

The breechers, so-called slops (Fig. 1), are gathered together at the top with a thread and are fitted with an approx. 2.8 cm high waistband. Both breech legs, which reach down to slightly beyond the knees, are cut in a quarter circle and therefore taper to a round cut-out without a band (Fig. 6). There is a fastening slit in the centre front.

The very materials from which the two garments are made offer indications of their history. The outer fabric of the tunic is a light natural-coloured cotton fabric in plain weave with a two-thread warp.³ Its special feature is that usually every fourth weft is also two-threaded, resulting in a horizontally-striped pattern (Fig. 7).⁴ Due to irregularities in the fabric, it was even possible to

Fig. 1 Frock and slops from the third quarter of the 16th century (Bavarian Army Museum, inv. no. A 9236 and A 9237)



Fig. 2 and 3
Photographs of the front
and back of the frock
(1930s)

reconstruct the original position of the skirt section during the most recent conservation, which had previously been misinterpreted (Fig. 2 and 3), and thus to reveal the actual cut of the garment.⁵ The tunic is lined with three different, but very similar, cotton fabrics in plain weave with a slight

cross-rib structure⁶ and a plain-weave cotton fabric with a slight longitudinal rib structure,⁷ all equally with a two thread warp. The material used, as well as the weaving technique, suggest that these fabrics were produced in northern Peru, in the tradition of the Chimú culture there.

The area had been occupied by the Incas since the 1460s, but those Chimú textiles continued to be manufactured.⁸ Characteristic of these fabrics are the paired warp threads as well as monochrome cotton fabrics, whose weft stripes were done by two-thread weft insertions.⁹ After Francisco Pizarro landed in northern Peru in 1532, it still took about forty years to break the power of the Incas. From then on, the Spaniards set up their own textile workshops, the so-called “obrajes”. The fabrics produced there, however, never reached the quality of the pre-colonial period.¹⁰ This could be the kind of textiles we have here.

The collar interfacing consists of a linen or hemp fabric in plain weave (Fig. 10).¹¹ This material had to be imported from Europe at that time.

The same is true of the woollen 2/2 twill fabric with a once fluffy surface structure,¹² of which the breeches were made (Fig. 8). This is almost certainly the woollen fabric called “kersey”, which was made in England and was of rather coarse quality and small weaving width; it was also used for rather basic men’s clothing.¹³ This fabric was certainly not made in an “obraje”, but was imported from Europe, probably from England. In Spanish, it was referred to as “carisea”.¹⁴

For the pocket pouch of the breeches (Fig. 14), on the other hand, the tailor used a 2/1 twill fabric with one thread system made of dark brown camelid wool and the other of light brown wool. This fabric was probably woven in Peru, as was the black lace of camelid hair, which probably served to fasten the breeches and is still stuck in the left elongated hole at the waistband (Fig. 9). Thus, the fabrics themselves show a fascinating mixture of European and South American traditions and bear witness to what the clothing of a Spaniard in Peru could be made of. The rarity of the two garments justifies a detailed account of the manufacturing techniques, which are also extremely informative for locating and

dating them. The fragmentary preservation of the tunic does not allow for a complete reconstruction of its construction, but the most important production steps are still recognisable.

To close the side and shoulder seams, the two outer fabrics were laid on top of each other, right side on right side, with the lining material on top of that on the back part. The three layers were joined with running stitches and the seam allowances were folded over to one side. Then the lining was hemmed on the front with the seam allowance folded in over the seam (Fig. 11).

The joining and attaching of the sleeves can also be reconstructed to a large extent. The outer fabric and the lining material of the lower sleeve were sewn together with the seam allowances folded in against each other by running stitches. At the upper arm band and the puffed sleeve, the layers of

Fig. 4 Left front section of the skirt with overedged eyelet hole



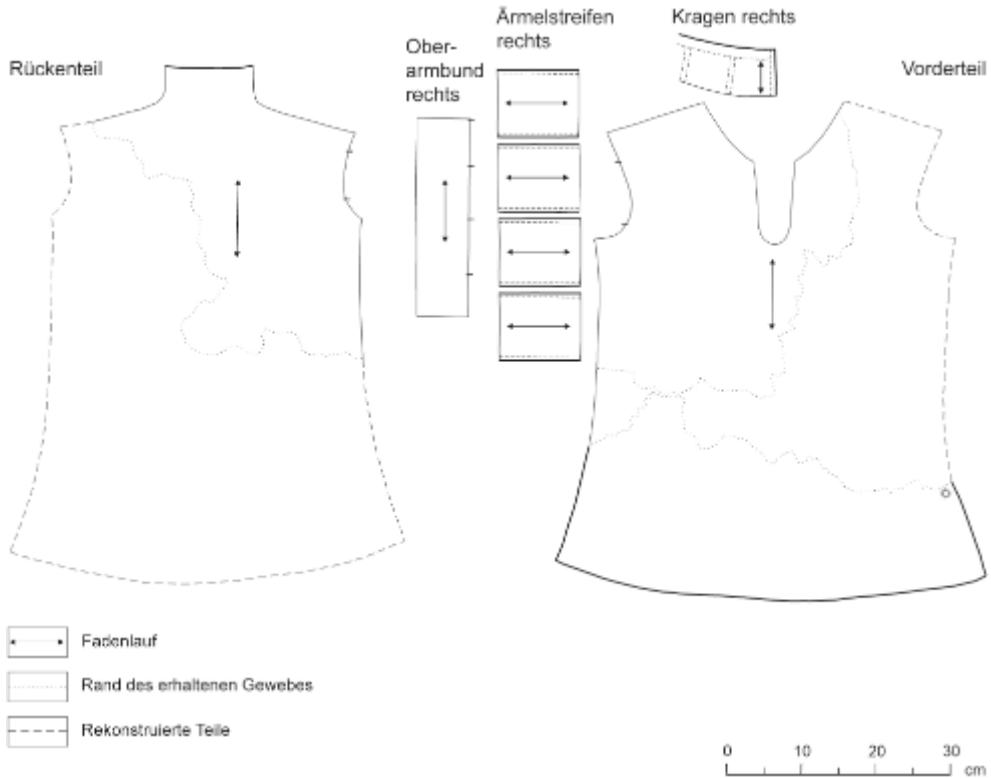


Fig. 5 Sewing pattern of the frock with remaining parts

Rückenteil = Back part
 Oberarmbund rechts = Upper arm band, right
 Ärmelstreifen rechts = Rectangular arm section, right
 Kragen rechts = Collar, right
 Vorderteil = Front part
 Fadenlauf = Grain line
 Rand des erhaltenen Gewebes = Edge of the preserved fabric
 Rekonstruierte Teile = Reconstructed parts

Fig. 6 (opposite page) Sewing pattern of the breeches

Hintere Mitte = Centre back
 Hosenbund = Waistband
 Rechtes Hosenbein = Right leg
 Schlitz = Slit
 Linkes Hosenbein = Left leg
 Zwickel = Gusset
 vorn = front
 hinten = rear
 rechts = right
 links = left
 Fadenlauf = Grain line
 Webkante = Selvedge
 Taschenbeutel = Pocket pouch

outer and lining fabric were joined in one seam with an inserted piping strip. To do this, the seam allowance of the upper arm band's lining, which had been slightly extended, was placed over the others and sewn on with fell stitches (Fig. 12). The upper arm band was sewn to the lower sleeve

in the same way, except that the latter was secured to the former with fell stitches from the inside. Finally, all layers of outer and lining fabric were joined together at the armhole with an inserted piping strip, folded lengthwise, in a seam with running stitches. These were then covered with a lining

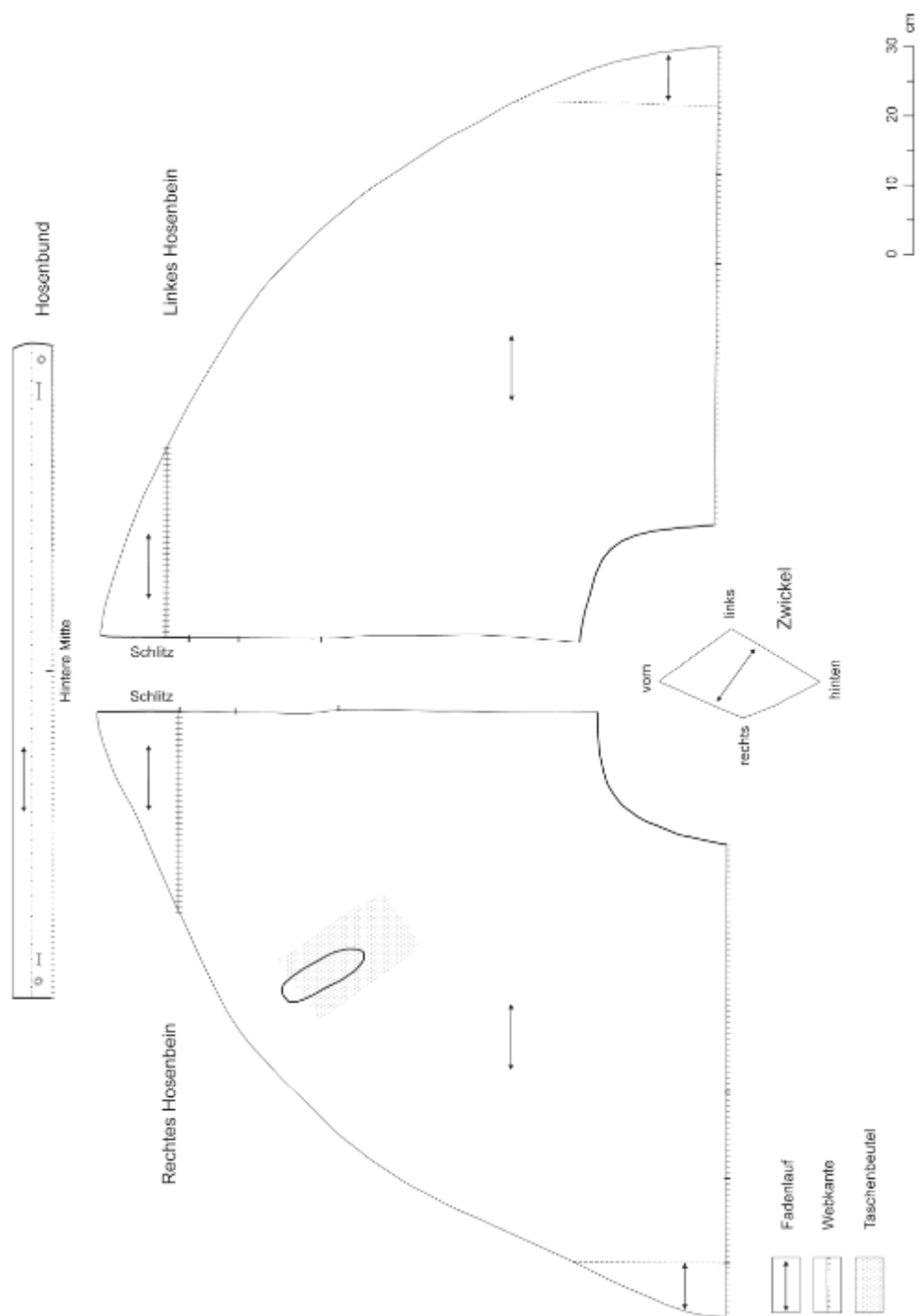




Fig. 7 Outer fabric of the tunic (detail) with horizontally-striped pattern woven in



Fig. 8 Outer fabric of the breeches (detail)

strip that was folded in on both sides and fastened with fell stitches.

At the collar, in addition to the hemp (?) interfacing, a piping strip was included between the outer fabric and the lining material. The edges of the sections of the puffed sleeves, the lower edge of the skirt and the neck line were edged with strips of outer fabric. The decorative ribs – also made of outer fabric – were turned over on the stand-up collar, the puffed sleeves and the

skirt. The individual steps in assembling the breeches can be reconstructed precisely. First, the seams of the large segments were sewn together. Next, the right breech leg was stitched together, the gusset was attached to the right front and the centre front seam was sewn from the gusset to the fly. This was followed by closing the left breech leg including sewing in the gusset. These seams all follow the same technique: After joining the fabric pieces right side on

Fig. 9 The waistband with stitched holes and tape for fastening



right side with back stitches, the seam allowances were folded over to one side and fixed with fell stitches (Fig. 13). The hems of the breech legs, on the other hand, were simply folded in and secured with fell stitches. The right breech leg had a lateral incision for the pocket opening, the edges were folded over to the back and tacked in place with running stitches (Fig. 14). The pocket pouch with open cutting edges along the slit bindings was sewn on with back stitches, the edges with fell stitches. The edges of the front fly were folded back and also hemmed.

Along the upper edge, the breeches were gathered together with back stitches, i.e. smocked. The waistband was sewn on right side on right side with back stitches, turned over to the back and secured with fell stitches. Overlock stitches secure the front ed-

ges of the waistband. In the front of the waistband, a small round and an elongated hole were added on the left and right sides (Fig. 9).

Overall, the execution of the seams corresponds to the stitches and techniques com-



Fig. 10
Interfacing of the collar (detail)

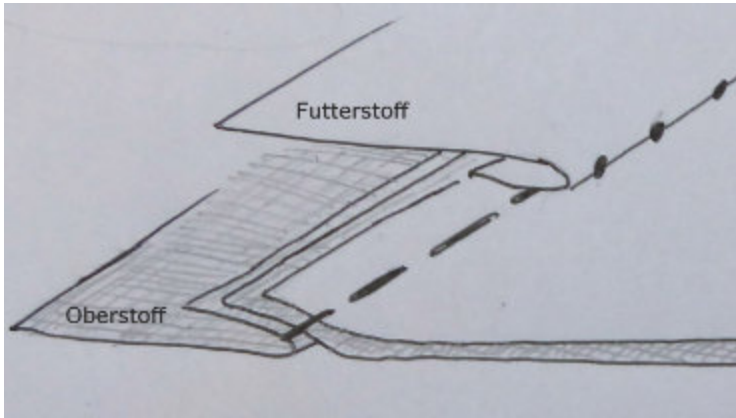


Fig. 11
Schematic drawing of the side seam, seen from the lining

Futterstoff = Lining material
Oberstoff = Outer fabric

Fig. 12 Schematic drawing of the seam connecting the puffed sleeve to the upper arm band, seen from the lining

Puffärmel = Puffed sleeve
Futterstoff Oberarmbund = Lining material, upper arm band
Oberstoff Oberarmbund = Outer fabric, upper arm band

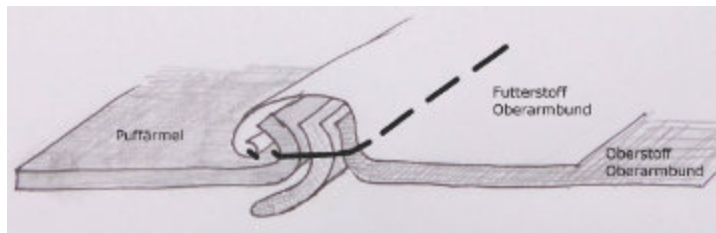




Fig. 13 Longitudinal seam on the right breech leg, seen from the inside

mon in Europe at the time.¹⁵ However, the sewing thread used for the tunic was cotton thread in addition to the usual linen.¹⁶ The slops are actually sewn entirely with cotton.¹⁷ This material was certainly produced locally, as sewing threads made of cotton were unknown in Europe until the late 18th century.¹⁸

On the slops, several patches are backed with the outer fabric or a very similar material. This proves that the garment was worn over a longer period of time. In Spain, wide, knee-length breeches tapering towards the bottom were part of soldiers' clothing and also became fashionable around 1560. They were called "greguescos".¹⁹ We owe perhaps the most beautiful depiction of such breeches to Paolo Veronese in a fresco in the Villa Barbaro in Maser (Veneto), which he painted himself in 1560/1561 (Fig. 15), with him portrayed as a huntsman. In Italy, these breeches were called "calzoni". The church of San Domenico Maggiore in Naples still keeps a pair of breeches in this cut from 1581, which Cardinal Flavio Orsini wore in his tomb.²⁰ Another very similar pair of woollen slops has been preserved among the clothes of a 16th-

century Basque sailor in the University of Montreal.²¹

The form of the tunic worn with the breeches, on the other hand, is not so easy to classify. It does not actually correspond to any garment worn in Europe at that time. In the first publication of the two garments in 1935, Sigrid Flamaud Christensen termed it a "Wams" (doublet).²² In the 16th century, this was a garment that fitted closely to the upper body and could be buttoned down the front. It had a stand-up collar, long straight sleeves and attached skirts. Another characteristic detail was a provision on the doublet to attach the breeches.²³ This could be tabs or plackets provided with eyelet holes or eyes. Almost all of these typical features are missing here. Thus, on closer inspection, it becomes clear that this is a special form of "ropilla" ("little gown"), which was worn as an outer garment first in Spain and then throughout Europe. It was tight-fitting, fastened at the front with buttons and had short attached skirts. In the years between 1540 and 1570, its sleeves featured small upper-arm puffs that terminated in a snug band. Soldiers in the New World turned it into a loose outer garment with fitted skirts, aptly called "saco" (sack) in Cuba and other parts of

Fig. 14 Pocket opening with pocket pouch underneath on the right side of the breeches



South America because of its smock-like cut.²⁴

That is the kind of tunic we are dealing with here. It also bears features of the “*sal-tambarca*”, a wide, closed garment that was pulled over the head. Its name refers to the fact that sailors, dressed in one of them, could jump into a boat with ease.²⁵ Among the garments of another Basque sailor from the 16th century are two tunics with a neck slit and long sleeves, worn one over the other and cut like a shirt.²⁶ The Museum of London owns another set of sailors’ garments made of linen, consisting of a wide top that can be pulled over the head and pleated, knee-length breeches that taper downwards.²⁷ It originates from England and can be dated roughly to the period between 1590 and 1650. However, the two garments are cut much wider than those of the person from Peru. Whether the latter was actually a soldier or perhaps had another profession, we can no longer determine today, because Heinrich Ubbelohde-Doering only found the two garments scattered on the ground together with early Peruvian textiles. They had been left behind by treasure hunters,²⁸ which means that the historical context is missing. The dark stains, which at first glance look like blood, are more likely signs of ageing and corrosion of the fabric²⁹ and therefore also provide no information about the erstwhile wearer. Unfortunately, 16th-century depictions of conquistadors are extremely rare. The clothing depicted in the “*Lienzo de Tlaxcala*”, the illustrated history of the town located in the central Mexican highlands, comes close to being comparable. Of this codex from 1552, unfortunately only a copy from 1773 has survived.³⁰ Here the Spaniards wear tunics with short skirts and slit puffed sleeves with a wide band on the upper arm, albeit still invariably with short Spanish trunk-hose (“*calzas*”).³¹ In addition, however, there is a fragment of an illustrated original text from the 1530s, which also shows



Fig. 15 Paolo Veronese, Self-portrait (?) as a hunter, 1560/1561, Maser (Veneto), Villa Barbaro

scenes from the city of Tlaxcala.³² Here the tunics with puffed sleeves are more visible, but the breeches are still tight and long. This confirms Sigrid Flamand Christensen’s dating of the two original garments to the third quarter of the 16th century.³³ Although it is no longer possible to establish who the wearer of the two garments was, technological studies together with the evaluation of pictorial and written sources could prove that the tunic and the slops date from around 1560/1580 and were made in Peru. Both locally produced fabrics and some imported from Europe were used for them. The fact that this extraordinary set has survived to this day is a real stroke of luck.

Frock and Slops

Inv.-Nos. A 9236 (frock) and
A 9237 (slops)

Dating and restorations

Peru, c. 1560/1580

Restoration March to July 2019 by
Ms Magdalena Verenkotte in collaboration
with Ms Ursula Hofmann (with the sup-
port of the Ernst von Siemens Kunststif-
tung)

Material

Frock: Cotton and linen fabric

Slops: Wool and camelid wool fabric,
camelid wool tape

Dimensions

Frock: Length 71 cm / Width (back) 43 cm
Length (sleeves) approx. 27 cm

Slops: Length approx. 65.5 cm / Circumfe-
rence (waist) 94.4 cm

Description

Frock

Thigh-length tunic made of one front and
one back part (preserved in fragments),
slightly flared, short neck slit cut into the
fabric (front) with an attached stand-up
collar, slit upper arm puffs preserved on
both sleeves, forearms largely lost.

Slops

Ruffled breeches with a waistband, the
breech legs reaching to slightly beyond the
knees, tapering to a rounded leg cutout
without a band, a closure slit in the centre
front.

Provenance and acquisition history

The breeches and tunic were found by Dr.
Heinrich Ubbelohde-Doering in June 1932
in an old burial ground "nahe dem Fuss
der Pyramide von Cao" ("near the foot of
the pyramid of Cao"), which is located on
the north coast of Peru, in the valley of

Fig. 16 Right puffed sleeve with upper arm band



Chicama. “Die beiden Stücke waren von Schatzsuchern (Huaqueros) ausgegraben und auf dem Gräberfeld mit anderen alt-peruanischen Geweben gemischt zurückgelassen worden” (“The two items had been unearthed by treasure hunters (huaqueros) and left in the burial ground mixed with other ancient Peruvian fabrics”) (from Ubbelohde-Doering’s report in the Bavarian Army Museum).

On 24 November 1932, both objects were transferred to the Bavarian Army Museum by the Museum of Ethnology.

Inventories

Acquisition book for the years 1928-1934 (Bavarian Army Museum, Inv. No. HA.05.01.95), entry no. 934 in the section on the year 1932: “1 Landsknechts=Wams, um 1520, 24.11.1932, Überweisung vom Museum f. Völkerkunde in München”, and entry no. 935 in the section on the year 1932: “1 Landsknechts=Hose, um 1520, Überweisung vom Museum f. Völkerkunde in München”

Collection receipts for the year 1932 (Bavarian Army Museum, Inv. No. HA.05.01.69), receipt no. 139: “München 24. November 1932. Den Sammlungen des Armeemuseums, Sammlung Aeltere Zeit wird überwiesen: ... 1 Landsknechtswams, um 1520, Wert 300.- RM ... 1 Landsknechtshose, um 1520, Wert 200.- RM; Überweisung vom Museum für Völkerkunde in München ... Schriftwechsel: ohne”

Local inventory book (A-Buch, volume 3, Bavarian Army Museum, Inv. No. HA.05.01.29), entry no. 9236: “Landsknechtswams, um 1520, Länge 50 cm. Wert 300 M.”, entry no. 9237: “Landsknechtshose, um 1520, Länge 68 cm. Wert 200 M.”



Fig. 17 Location where the garments were found

Peru
Discovery site

Literature

Flamand Christensen, Männerkleidung; Paggiarino/Schönauer, The Bavarian Army Museum, pp. 210-213 and p. 264 f.

Exhibition history

since 3 June 2019

Permanent exhibition “Treasure Chamber” of the Bavarian Army Museum in Ingolstadt

Footnotes

- 1 Cf. Flamand Christensen, *Männerkleidung*, p. 55.
- 2 All technical specifications related to the tunic are taken from the report of the textile restorers Magdalena Verenkotte and Ursula Hofmann, Nuremberg (original in the Bavarian Army Museum).
- 3 Warp: Cotton, S-twist, 2 threads in one shed, 56-64 threads/cm. Weft: Cotton, S-twist, single or double thread, 12 threads/cm. Weaving width: at least 52 cm (on the left side of the cut skirt part, the outer fabric is sewn together with another piece of the outer fabric, selvedge to selvedge, at a width of 52 cm).
- 4 Occasionally a two-thread weft follows only after five single weft threads or already after one weft thread.
- 5 In the previous presentation, not only was the cut but now loose skirt piece incorrectly placed; the tunic had even been turned inside out (see Flamand Christensen, *Männerkleidung*, p. 56 f.) The two textile restorers were able to correct these misinterpretations.
- 6 Lining 1: Warp: Cotton, S- or Z-twist, 2 threads in a shed, 26-30 threads/cm. Weft: Cotton, S- or Z-twist, 2 threads in one shed, 14-18 threads/cm. Weaving width: at least 52 cm (on the left side of the cut skirt part, lining 1 is sewn together with lining 4 selvedge to selvedge at a width of 52 cm). Special feature: In a narrow strip on the right side of the fabric the warp threads are Z-twisted, all warp threads to the left are S-twisted. The weft threads are S-twisted over larger sections, Z-twisted in other sections, and mixed in still others, i.e. a Z-twisted and an S-twisted weft thread lie in one compartment.
Lining 2: Warp: cotton, S- or Z-twist, 2 threads in one shed, 24-28 threads/cm. Weft: Cotton, S- or Z-twist, 2 threads in one shed, 14-18 threads/cm. Weaving width: not determinable. Special feature: in one area of the fabric the warp threads are Z-twisted, all warp threads to the right of this are mixed, i.e. there is one S-twisted and one Z-twisted warp thread in a compartment (this area is approx. 4.5 cm wide), then S-twisted warp threads follow. The weft threads are S-twisted over larger sections, Z-twisted in other sections.
- 7 Lining 3: Warp: cotton, S-twist, 2 threads in one shed, 40-48 threads/cm. Weft: Cotton, S-twist, 1 thread in a shed, 8-12 threads/cm. Weaving width: not determinable.
- 8 Lining 4: Warp: Cotton, Z-twist, 2 threads in a shed (selvedge approx. 8 threads in a shed), 14-16 threads/cm. Weft: Cotton, Z-twist, 2 threads in one shed, 20-22 threads/cm. Weaving width: not determinable.
- 9 Cf. Rowe, *Costumes*, p. 14 and p. 31.
- 10 Cf. *ibid.*, p. 24 f., p. 100 f. and p. 104. Cf. also Calonder / Rickenbach, *Textilien*, p. 412 f.
- 11 Cf. Calonder / Rickenbach, *Textilien*, p. 453 f.
- 12 Warp: Bast fibre, Z-twist, 14 threads/cm. Weft: Bast fibre, Z-twist, 11 threads/cm. Weaving width: not determinable.
- 13 2/2, Z-twill. Warp: Wool, strong Z-twist, 12 threads/cm. Weft: Wool, S-twist, 8 threads/cm. Weave width: 89.0 cm. Surface of the fabric heavily napped at the front and back.
- 14 Cf. Justi, *Manufacturen*, p. 41 and Montgomery, *Textiles*, p. 272 f.
- 15 Cf. Covarrubias, *Tesoro*, fol. 2020v.
- 16 Cf. Niekamp / Woś Jucker, *Prunkkleid*, p. 65, p. 127 f. and pp. 138-141.
- 17 Linen, S-ply from 2 Z-spun yarns; cotton; Z-ply from 4 S-spun yarns.
- 18 Cotton, S-ply from 2 Z-spun yarns.
- 19 Cf. Sykas, *Re-Threading*, p. 129.
- 20 Cf. Herrero García, *Estudios*, pp. 47-49.
- 21 Cf. Orsi Landini, *Moda*, p. 86.
- 22 Cf. Dubuc, *Costumes*, p. 133, p. 135 and p. 141.
- 23 Cf. Flamand Christensen, *Männerkleidung*, p. 55.
- 24 Cf. Herrero García, *Estudios*, p. 89.
- 25 Cf. *ibid.*, p. 107.
- 26 Cf. *ibid.*, p. 127 f.
- 27 Cf. Dubuc, *Costumes*, p. 137 and p. 140.
- 28 Cf. Cooper, *Elizabeth I*, p. 202 f.
- 29 Cf. report by Dr. Heinrich Ubbelohde-Doe-ring, Munich, dated 16 November 1932, now in the Bavarian Army Museum, Ingolstadt.
- 30 I owe this reference to Magdalena Verenkotte, Nuremberg.
- 31 México, Biblioteca Nacional de Antropología e Historia.
- 32 Cf. Herrero García, *Estudios*, p. 56 f.
- 33 Austin, Benson Library at the University of Texas.
- 34 Cf. Flamand Christensen, *Männerkleidung*, p. 57.

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Authors

Dr Fabian Brenker

Curator at the Hofjagd- und Rüstkammer
Kunsthistorisches Museum Wien
Burgring 5, 1010 Vienna (Austria)
fabian.brenker@khm.at

Dr Alfred Geibig

Former Curator of Historical Weapons
Art Collections of the Veste Coburg
Veste Coburg, 96450 Coburg
alfred@geibig1.de

Prof Dr Kerstin Merkel

Catholic University of Eichstätt-Ingolstadt
Ostenstr. 26, 85072 Eichstätt
kerstin.merkel@ku.de

Dr Johannes Pietsch

Academic Officer for Textiles, Costumes,
Leather and Traditional Garments
Bavarian National Museum
Prinzregentenstrasse 3, 80538 Munich
johannes.pietsch@bnm.mwn.de

Dr Ansgar Reiß

Museum Director
Bavarian Army Museum
Paradeplatz 4, 85049 Ingolstadt
ansgar.reiss@armeemuseum.de

Christopher Retsch M. A.

Apprentice Curator
Bavarian Army Museum
Paradeplatz 4, 85049 Ingolstadt
christopher@c-retschi.de

Dr Tobias Schönauer

Curator of Arms and Armour
Bavarian Army Museum
Paradeplatz 4, 85049 Ingolstadt
tobias.schoenauer@armeemuseum.de

Dr Dieter Storz

Curator of Firearms
Bavarian Army Museum
Paradeplatz 4, 85049 Ingolstadt
dieter.storz@armeemuseum.de

Helmhaube

Die Helmhaube ist ein aus Leder gefertigtes Kopfschutzstück, das im 14. Jahrhundert in Europa eingeführt wurde. Sie bestand aus einem Netz aus Lederstreifen, das über dem Helm getragen wurde, um den Kopf vor Schlägen zu schützen.

Die Helmhaube war ein wichtiger Bestandteil der Rüstung eines Kämpfers und wurde oft mit einem Helm verbunden, um den Kopf vor Schlägen zu schützen.

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