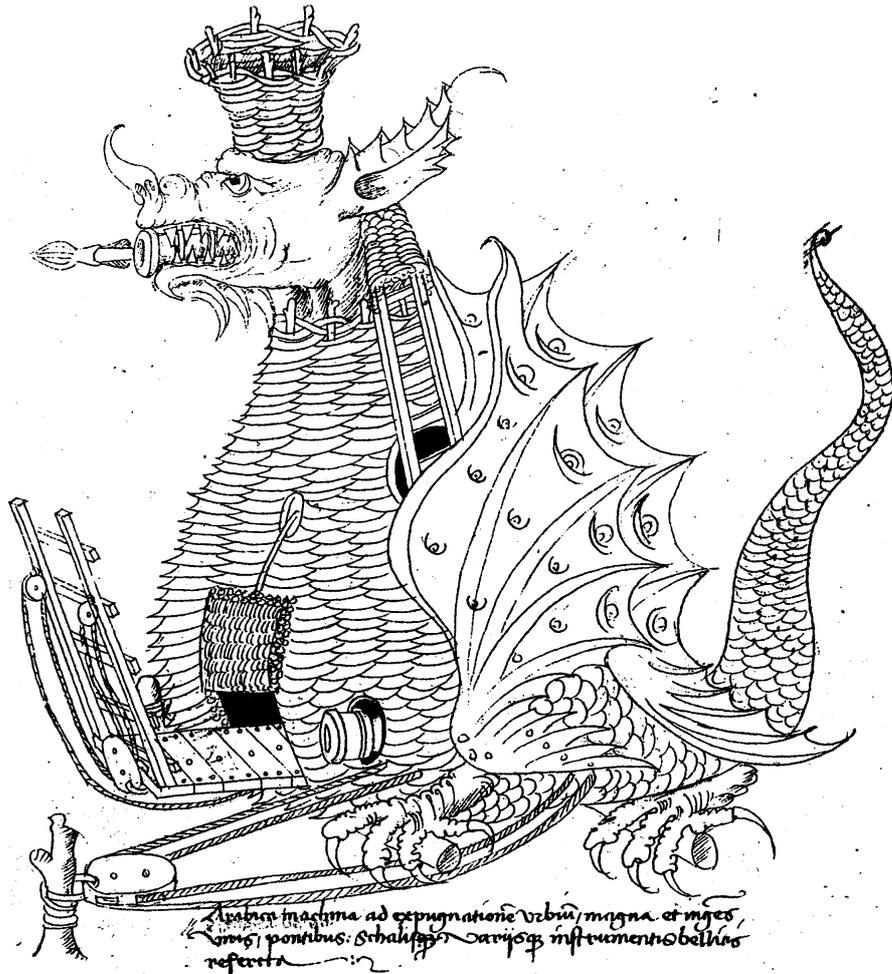


DRAGON

THE VOICE OF THE COMPANIE OF SAYNTE GEORGE



CONTENTS

- Pg. 3 MEDIEVAL CLOTH, by Dave KEY
Pg. 10 ELLS, AUNES & BRACCIA, by Gerry
EMBLETON and John HOWE
Pg. 11 SWORDS, by Peter JOHNSON
Pg. 17 TENTS, by Gerry EMBLETON

EDITORIAL

Dragon is back. Admittedly, given our publishing record, other animals spring more readily to mind - the cicada, sleeping for several years, or perhaps the phoenix, reborn from its own ashes.

We are proud to have three comprehensive articles in this issue - cloth, swords and tents. Dave Key has put together a wide survey of cloth types, with particular recommendations for both our period and our stations, Peter Johnsson shares his thoughts and experience on the fine art of swordsmithing, and Gerry has updated with a great deal of new research his article on tents from Dragon No.5. On the authors' behalf, I would like to underline that they do not in any way consider their texts to be

definitive statements, but more as white pebbles dropped along the endless road of research and greater understanding of the period. They are open invitations for discussion, appeals for new documents and additional information.

As ever, optimism is our greatest and perhaps most pardonable fault. We would like to continue at a rate of not less than two issues per year. Thankfully, Issue 11 is in the hands of Martin Jungnickel, who is preparing an additional article on tents, a survey of soldier's clothing and an overview of medieval pottery. Odds & Ends will expand to include much more of the mundane and the sublime. See you there!

John HOWE

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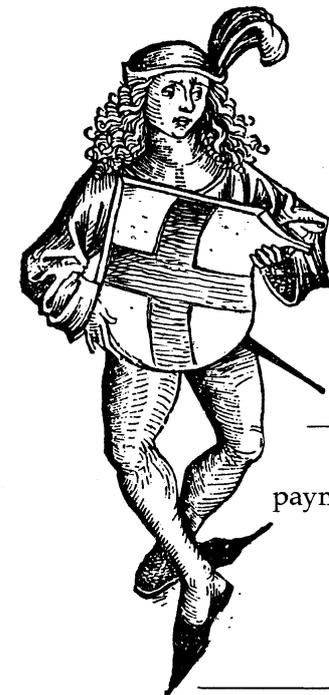
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MEDIAEVAL CLOTH

CLOTH TYPES IN THE LATE 15TH CENTURY

BY DAVE KEY

INTRODUCTION

Following a discussion at Haut-Koenigsbourg about some of the cloth used for clothing, Dave Key and I agreed that it was not particularly constructive to criticise without also providing the information to define the problems involved and to help us all to avoid making the same mistakes in the future. To this end Dave has repackaged part of a "Minimum Standards" guideline he originally wrote for The White Company (1450-1485). This document contains a very basic introduction and analysis of the raw materials used in the manufacture of English clothing of the 1460's and 1470's.

The sections on the design and construction of the specific clothing recommended for new members have been excluded. The section that remains concerns only the raw materials used in these clothes. Dave has done a thorough survey of cloth types and their principal characteristics. To recreate the clothing of any period it is essential to understand what it was made from. Only cloth of the correct raw material, weave and weight will act in the required way. The quality, and cut, of the cloth is directly related to the social standing of the wearer, hence all of the clothes worn should be consistent in quality and style. It is however important to remember that this is intended as an introduction and relates only to a very specific period and to England.

The sections on Leather and Fur are included simply to help round out the picture of the raw materials for clothing and as such are even more abbreviated than the cloth and dyes sections. Throughout the later fifteenth century there were major developments in both textile manufacture and the textile industry, sufficient to make drawing too close comparisons with continental Europe and with the end of the century dangerous. Lastly, Gerry Embleton and I have added a short mention concerning measurements commonly used in the cloth trade.

John Howe (with Dave Key)

MEDIAEVAL CLOTH

For the purposes of this guide references to different social strata in the text, have been roughly categorised into lower, middling and upper social 'degrees'. The lower degree includes labourers, 'servants of husbandry' (agricultural labourers) and the poorer artisans and yeomen. The middling degree includes the better off yeomen and artisans but focuses on gentlemen and those with an annual income of £40 or more. The upper degrees include the nobility.

References to servants have been largely avoided as typically servants clothing would reflect

the social level of the head of the household and their position within that household, a situation normalised in sumptuary legislation which allowed Masters to dress certain of their servants to levels often only one rank below their own. For example Esquires of the King's Household were placed on a par with Knights, whilst other officers of the Royal Household were permitted the same as Esquires and gentlemen.

It should not be considered acceptable to produce garments which compromise authenticity for personal preference or modern ideas of style or comfort. The accuracy of the clothing, matched to the status and role of the wearer, should be of paramount importance.

STYLE & FASHION

The prevalence of contemporary tracts bemoaning the excesses in both the types of cloth and the style of the garments at all levels of society was seen as at the core of the moral decline of the period. Clothing was central to the outward display of the social hierarchy, a view formalised in Edward IV's 1463 and 1483 Acts of Apparel (or Sumptuary Laws).

While Sumptuary Law cannot, and must not, be taken as a categorical guide to cloth usage people did expect to be able to identify different parts of society by their appearance and these Laws were a reflection of this rather than the cause.

This has always been the case as social and economic pressures affect the clothing of every part of society. The need to balance practicality and expense with the vagaries of fashions had an impact on everyone, from the labouring classes to the highest court circles. However the impact these fashions made was not consistent in either their manner or their scope, each "degree" and social grouping within that degree reacting differently.

The clothing of the middling and lower "degrees" showed many interrelated influences but they are not simply poor representations of those of their social superiors, nor are they simply outdated versions of it. Each section of society had its own individual style.

THE MATERIALS

THE CHOICE OF CLOTH

To understand the clothing it is first necessary to understand something of the raw materials from which they were made. The size, weight, texture and finish all affect how a garment is cut,

how it can be used and what it will look like when finished. For example the width of the cloth will have a direct impact on the ability to cut certain shapes and patterns. For this reason, it is essential to use the materials which are as correct as possible.

All of the cloth used must be either pure wool or linen of appropriate quality and finish. Silk, although available, should not be used as it is beyond the social and financial bounds of the clothes discussed here. It is understood that it is impossible to buy cloth which is completely authentic (correct fleece, hand spun and woven etc.) but get cloth as close to authentic as possible. When buying cloth you are strongly advised to

take into consideration what it will be used for and whether the garment will be lined. Do not buy cheap, lightweight cloth and try to use interlinings to simulate the correct weight; they are inaccurate, require more work, do not hang correctly and will usually prove a false economy.

COMPARATIVE MEASUREMENT AND COSTS

For all cloths a comparative guide is given, this shows three values: The first and second are the original standard width of the cloth and an average price range per standard measure. The third is a comparison of cost based on a price per "quarter"; this is an invented measure to give approximate comparisons based on a standard length and width.

In all of the measures the English costs and measures are used. These are roughly as follows:

Money: £1 = 20s = 240d. 1s = 12d. The daily rate for a skilled artisan was 4d per day, 2d for unskilled labour and 6d for an archer.

Measurements: 1 yard = 36 inches = 91.5 cm. 1 Flemish ell = 27 inches = 68.5 cm. 1 English ell = 45 inches = 114 cm.



Peter Veber, a Fuller, the 18th Brother, 1425

WOOLLEN CLOTH

The vast majority of textiles used to make clothing was made from wool, either as cloth (woollen or worsted) or felt. Cloth production was carried out on a massive scale with enormous variation in finish and quality, even for a given type of cloth. The main distinguishing features between the cloths were the weave (the number of threads and the complexity with which they were woven) and the degree of finishing.

Cloths were either woven with a plain (tabby) weave, where the weft (the horizontal thread) passes alternatively over and then under the warp (the vertical thread), or twill weave, where the number of warp threads passed over and then under by the weft is not one to one, e.g. two over then two under, a technique which can be used to produce patterned cloth and which is generally more elastic when stretched on the "bias" (diagonally across the cloth).

Finishing (by scouring, fuling, raising and shearing) could produce luxurious, soft cloths with a raised and shorn nap which gave a fluffy, felted appearance and obscures the weave beneath. However many, particularly cheaper cloths, were left unfulled and/or unnapped.

There was a vast array of cloths available; often the name giving an indication of weave, finish, 'usual' colour place of manufacture, or a combination of some or all of these factors.

In England woollen cloth was typically measured in quarters of yards, hence Kersey (at 45 inches wide) would be 5 quarters whilst Broadcloth (at 63 to 72 inches) 7 to 8 quarters.

The following is a small sample of the cloths which were available:

BROADCLOTH: (63 - 72" wide, from 1s 4d per yard, usually 2s-4s per yard: [3d-7d/quarter]) The basis of the English export trade, tabby

woven, heavily fulled and napped giving it a felted surface, increasing its warmth and waterproofing. Typically dyed a single colour 'in the cloth' after weaving.

Quality and price varied widely. Undyed cloth cost 1s 4d per yard whilst a fine crimson 'engrained' (kermes dyed) cloth was 13s 4d per yard. Most cost 2s-4s in standard colours; putting them out of reach of lower degrees but just within that of an artisan, where it was used for gowns and hats. Many names used for different types, grades and/or colours of broadcloth. Scarlet was the finest quality broadcloth dyed in the finest dye (kermes). Plunkett, a cheap blue/grey; Musterdevilles a good/mid quality grey and Blanket, a cheap undyed cloth.

WORSTED: (36" wide, 1s-2s per yard : [3d-6d/quarter]) Worsted was a generic term for a variable quality twill cloth with no nap. Primarily woven in East Anglia it could be very fine and is mentioned as a doublet cloth by the Pastons. Say was a fine, lightweight worsted.

KERSEY: (45" wide, 6d-2s per yard : [1.2d-4.8d/quarter]). A fairly heavy medium grade 'national' cloth largely woven in the South of England with a twill weave. Often mentioned as a hose cloth.

RUSSET: (36" wide, ?d-?d per yard), A cheap cloth, typically grey or brown. Often exported with raised but unshorn nap ('Cotoned')

FRIESE: (36" wide, 6d-10d per yard : [1.5d-2.5d/quarter]). Coarse cloth often of Welsh manufacture, often undyed

with a twill weave. Used for linings and cheap clothing.

KENDAL: (36" wide, 4d-6d per yard : [1d-1.5d/quarter]). Coarse regional cloth from the North West of England, typically green.

RAY: (48" wide) Striped cloth using different coloured yarn in the weave. Often used as one side of parti-coloured liveries. Ray lost favour during the century as finer broadcloths became more popular.



Haintz Hertzog, a Cloth Shearer, the 183rd Brother, 1472

LINEN CLOTHS

Typically a plain woven cloth of variable quality and often bleached. Although by definition Linen is made from flax it is unclear how far the term was used to encompass hemp cloths as well. Certainly hemp and flax cloths were both widely manufactured. Widely used for undergarments (breeches and shirts for men, smocks for women) and for lining garments, it appears to have been used only very rarely as the outer layer on other garments (such as doublets) or dyed (linen does not take natural dyes particularly well) although frequently better quality clothes used a black lining cloth which was probably linen.

The best linens were imported from Flanders, France and Germany although England and Ireland also had a strong linen industry. Typically made 1 Flemish ell (27") wide. English, and Irish linen may have been an English ell (45") in width (by the fifteenth century linen does not feature in the Cloth Assizes which regulated the widths of the different types of cloth so a definitive statement is impossible. However, the Household accounts of Sir John Howard list linens of 1 Flemish ells width alongside those simply listed as an ells width, suggesting a difference between the two).

CANVAS: (27" wide, 3d-4d/ell : [0.8d-1d/quarter]). Coarse heavy linen or hemp cloth, often undyed.

BUCKRAM: (27" wide, 5d-6d/ell : [1.3d-1.6d/quarter]). Stiff fabric used to interline clothing; e.g. doublets

LINEN: (27" wide, 4d+/ell : [1d+/quarter]). Standard, generic name for linen cloths of middling quality

HOLLAND: (27" wide, 7d-12d/ell : [1.9d-3.2d/quarter]). The finest plain linen.

PARIS and DIAPER: (27" wide, 1s-2s/ell : [3.2d-6.4d/quarter]). Fine patterned linen cloths. Diaper would now be called linen Damask as it is

a linen cloth made with designs worked into the fabric. True Damask is made from silk.

SILK

Owing to the relatively high cost of silk cloths it is not considered appropriate for the majority of styles of clothing included in this document. However there are occasional situations where small pieces of silk are appropriate, as such a basic list of some of the main types is included for reference. Where silk appears in the clothing of the middling degrees it tends to be in small quantities, like a girdle for a woman's gown or as the collar on a man's doublet. In both cases it is used as a small but conscious display of wealth. For the doublet collar the effect is to suggest that the whole doublet is silk as it is hidden by the gown worn over it. A similar technique was adopted with pinned sleeves worn under women's gowns. Throughout history where expensive cloth has been used as a lining or facing it was not uncommon for the expensive silk to end and be replaced with linen as soon as it ceased to be visible.



Cuntz Dorenberger, a Cloth Dealer, the 135th Brother, 1443

In Edward IV's Acts of Apparel and in his issues of cloth to household servants and retainers there was a clear hierarchy in the status associated

with the type of cloth; Knights of the body receiving velvet and damask silk cloths whilst the Squires of the body received satin and their henchmen, wool.

As silk cloth was only imported the widths matched the continental (primarily Lombard) width of approximately 18", or 3/4 braccia

SARCENET: (18" wide, 2s-5s per yard : [12d-30d/quarter]) A plain, lightweight wide variety of silk cloth, widely used for linings.

SATIN: (18" wide, 6s-7s per yard : [36d-42d/quarter]) A particular weave producing a characteristic shimmered surface. Often used for the middle degree girdle by women.

DAMASK: (18" wide, 7s-12s per yard : [42d-

72d/quarter]) A rich patterned silk cloth, often featuring pomegranate designs. Costly but the cheapest of the fine silk cloths and occasionally seen as under-sleeves pinned to the kirtle sleeve.

VELVET: (18" wide, 10s+ per yard :[60d+/quarter]) An extremely elaborate and costly cloth which utilised a weaving technique which inserted additional threads into the weave which were then shorn to create a tight "felted" surface. Velvet is beyond the scope of these guidelines as it is too costly.

OTHER CLOTHS AND FABRICS

FUSTIAN: (27" wide, 6d per ell : [1.6d/quarter]). Typically a mixed cloth with a linen warp and cotton weft. Often heavy and/or brushed and shorn giving a felted surface. Usually white (bleached), also frequently dyed a cheap black (note: it is possible that "black" fustian may simply mean unfinished rather than dyed, see the section on leather for a contemporary use of colour to denote the level of finishing). Used for 'linen' armours and occasionally doublets, and even gowns, but banned for lowest degrees by the 1463 Act of Apparel, it was increasingly popular as the century progressed and it became more widely available.

COTTON: Available as a raw fibre, where it was used for padding or making wicks for good quality candles, but not used for cloth except in mixed fabrics like fustian. 'Coton' typically referred to a woollen cloth with a raised, but probably unshorn, nap e.g. 'Coton Russet'.

NARROW WARES: Tablet woven and braided wool, silk and, probably, linen. Used for laces, points and girdles (belts) and as finishing or reinforcing strip (facings) on garments, in place of a lining. Varied in width from simple braids to strips 2"- 4" wide. The girdle worn by the ladies of middling degree was often one other most outward displays of wealth and would typically be a strip of very tightly woven narrow-ware with buckle and eyelets.

FELT, KNITTED WOOL and THRUM (loose ends of wool added to cloths to create a 'shaggy' appearance), were all used for hats. Knitted caps appear to have been fairly common and were

made by knitting the cap oversized, raising the nap and then shrunk to produce a tightly compacted "felted" surface. Knitted linen was also used for gloves.

GOAT and HORSE HAIR: Occasionally used for coarse cloths.

LEATHER

There were two main types of leather used in the 15th century: Tanned and Tawed. The finest leather was Spanish, or Cordovan, which was originally goatskin but by the 15th century the term was probably simply used to denote fine leather. Leather articles were often decorated with incised lines and/or patterns of stamped dots. They were also coloured by dyeing and painting.

Tanned leather was typically made from cattle hide (cow and ox) which was oak tanned to produce 'red' (unfinished) and 'black' (finished) leather. It was used for shoes, purses, gloves and belts.

Tawed leather was made using alum, to create 'White' leather, or oil, creating buff leather. Usually made from non-cattle animal skins like goat, pig, deer, horse or cat, the best being imported from the Baltic. Tawing leather produces a strong but soft and supple leather making it suitable for purses, gloves and points.

FURS

Although furs were a practical means of providing warmth they were also one of the most noticeable, and most noted, outward displays of wealth as they were often used as a trim (purfell) on gown hems, cuffs and collars. It would not be unusual to line a garment in one, cheaper, fur and purfell it in another.

The finer furs were imported, principally from the Baltic regions controlled by the Hansa merchants, periodic disputes between these merchants and Edward IV resulted in regular disruption of this trade. In 1463 Edward IV's Act of Apparel restricted the furs available for use by labourers and artisans (with an annual income of less than £40) to black or white lambs wool, this

was a further restriction on the previous sumptuary legislation (of Edward III in 1363) which had also permitted the wearing of cat, fox and rabbit.

For Gentlemen and their families with £40 per annum (or members of the Royal Household) Martens, Foyns, pure Grey or pure Miniver was also permitted.

COLOURS and DYES

In a Scottish Act of Parliament of 1457 it was stated that "no labourers nor husbands [in this context an agricultural labourer] wear on the work day but grey and white and on the holy day but light blue or green or red...". As stated earlier a Sumptuary Law should not be taken as a definitive statement on what was worn, but it does suggest what was considered normal and this limited range of simple colours does accurately reflect the large scale industrial process of commercial dyeing which meant that only relatively few (essentially 3 or 4) dyes were practical for the mass production of relatively cheap cloth, these being: Madder (red), Woad (blues and grays) and Weld, and Dyer's Broom, (yellow). Although other dyes were used (Brazilwood, Kermes etc.) these are beyond the scope of these standards as they were typically used for the finer cloths.

What is perhaps most noticeable about the colours used in mediaeval cloth is not the range of colour but that the quality of the colour was closely related to the quality of the cloth. This can lead to a degree of confusion as we talk about colours rather than hues and tones and explains why black could be both a cheap, poor quality, colour and at the same time one of the most expensive colours. The significance of the differing quality of colour is indicated by the wide range of names for different hues of the same

colour. Red, for example, can encompass pinks and rose through to crimson and scarlet.

When cloths were dyed the strength and depth of colour often reflected the quality of the cloth. Grey, created using a very weak woad dye bath, came to symbolise the clothing of the poor and although Woad and Madder could produce a wide range of shades (from pale to dark blue and pink to deep red respectively) the darker shades being generally more costly as they required both more dye and better quality cloth (repeated dyeing damaging the cloth). Hence deep navy blues and bright crimsons or scarlets are beyond the scope of these standards, but quite rich reds and blues are entirely within the range of the reasonable quality Broadcloths and Worsteds.



Carl Verber, a Cloth Dyer, the 81st Brother, 1425

Yellow dyes seem to have been used primarily to blend with other dyes, though yellow cloth was not unknown (in 1471 Edmund Paston wrote to his brother asking for yellow Kersey for hose and by the 16th century yellow hose had come to be associated with bachelorhood) and could give very bright results.

By blending woad, weld and madder in differing quantities and with different mordants a wide range of colours could be obtained e.g. Lincoln Green (woad and weld), Tawny (madder and weld) and Murrey (madder and woad). Reusing dye baths, and possibly the different natural colours of wools, it was possible to create other colours like Plunkett (blue/grey), Musterdevilles (a grey using woad) or brown (woad and madder).

Black was an increasingly popular colour but typically more of a very dark green/brown (which faded rapidly and rotted fabric) made with Oak Galls mordanted with iron. Effectively reserved for headgear and Fustian (see the section on fustian for a note of caution) by the lower and

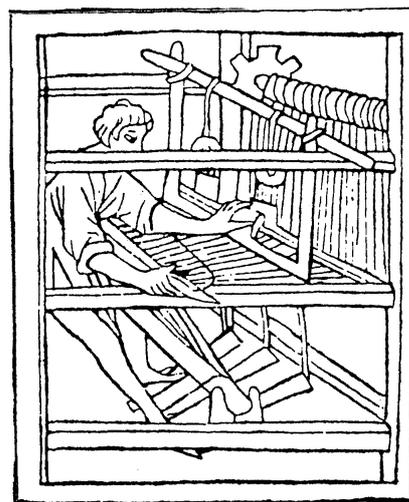
middling degrees. Good, true, blacks were obtainable but were expensive as they required substantial quantities of dye, principally woad, a process which again damaged the fabric and which consequently required a higher quality cloth leading to a higher final price.

It is extremely likely that individual dyers modified these basic dye baths with their own "secret" ingredients to obtain specific hues, a practice often done fraudulently to mimic more expensive dyes using short term "bright" dyes. These, however, were an addition to the standard dyes, rather than the basis of the colour.

Undyed woollen cloth was also widely used, especially at the lower end of social scale where, for woollen cloths, it was referred to as 'blanket' or 'white' (terms which could encompass a wide range of natural wool colours, from creams to grey and browns, although there appears to have been little use of the "natural" colours of sheep's wool). Cheap linens were also left undyed and

unbleached (bleaching could cost as much as dyeing), especially as linen does not take natural dyes particularly well, however when dyed it tended to be in black, blue or red.

Dave KEY



The Ulm Master, German, late 15th century

Bibliography

The preceding article was written using a wide range of primary and secondary sources too lengthy to list here. The majority of the prices for cloth have been derived from a combination, and comparison, of prices recorded in extant accounts (e.g. the Household Books of Sir John Howard), passing references (e.g. in the Paston and Cely letters) and valuations in Wills and Port Accounts (e.g. for London, Hull and Southampton).

The following list of books is intended to give a good introductory grounding to the topic and point to further reading.

- Bridbury, A.R., "Medieval English Clothmaking : An Economic Survey", (London, 1982)
- Britnell, R.H., "Growth and Decline in Colchester, 1300-1525", (Cambridge, 1986)
- Crowfoot E., Prithard, F & Staniland K. "Textiles & Clothing, Medieval finds from Excavations in London, c.1150-c.1450", (London, 1992)
- Harte, N.B. & Ponting, K.G. eds., "Cloth & Clothing in Medieval Europe, Pasold Studies in Textile History, 2" (London, 1983)
- Mazzaoui, M.F., "The Italian Cotton Industry in the late Middle Ages, 1100-1600", (Cambridge, 1981)

All illustrations, unless otherwise indicated, are taken from the Mendel Hosebook.

ELLS, AUNES & BRACCIA

NOTES ON MEDIAEVAL CLOTH MEASURES

Philip the Bold possessed an etendard in 1386 which measured 16 aunes in length, with a width of two and one half aunes, as well as a banner measuring 2.5 by 1.5 aunes. The aune or aulne was the French equivalent of the English ell, a cloth measure now standardised at 45 inches (114 cm). This would make the above flags of ridiculous dimensions, 60 feet long (18.3 m) for the largest.

The aune varied considerably from one century to the next, and one region to another. It was standardised by François 1er in 1544 as measuring 46.5 inches (118.84 cm.), based on the toise of Châtelet. It was subsequently redefined in 1667 and again in 1745 as measuring 45 inches.

Cloth in Paris was measured with an "aune plus a thumb or inch", adding 2.3%, giving an average length of 121.6 centimetres. The same measure was used in Aix and Marseilles, but an aune in Avignon measured 116.7 cm. In many towns of the north-east of France, the aune of Provins was used, undoubtedly fixed during the prosperous period of the Champagne Fairs in the 12th and 13th centuries. (A metal rule was kept under lock and key by the Keepers of the Fair, and all other rulers were expected to conform.) It measures two and a half Burgundian feet or 82.6 cm. It was also predominant in Dijon and Macon, where it was also known as a "step" (pas or démarche). The aune of Brittany measured 135.57 cm, that of Flanders 68.91 cm, the aune of Troyes slightly longer at 81.43 cm, the aune of Lorraine (based on the foot of Lorraine) 63.85. The aune of Rouen was a short 57.7 cm, while that of Lyon measured 187.9 cm. The aune of Poligny, legal measure enforced in the County in 1587 was worth 3 feet 8 inches of the old Burgundian foot of 18 Roman inches, or 120.7 cm.

Another cloth measure commonly seen was the braccio or tesa, of the same etymological origins* as the ell and the aune. Corresponding to the "passo romano" of 4 cubits, it measured 148.42 cm. Like its counterparts, the braccio also varied in length, depending on region and period, standardisation apparently coming after long centuries of use.

The German equivalent of the ell varied considerably from region to region and even from town to town. Its length was generally between 35 and 70 centimeters.

What appears clearly is the lack of the modern convenience of standard measures, recalling the innumerable monetary systems in vigour in Europe at the time. Prudence should therefore be the rule in establishing modern measures from mediaeval; it is not enough to know the length, one must also know the context, and as usual, refrain from the temptation to generalise from the particular.

Gerry EMBLETON & John HOWE

*Ell, Middle English elle, elne. Anglo-Saxon eln, a cubit. Icelandic alin, the arm from the elbow to the tip of the middle finger; Swedish aln, Dutch alen, Goth. aliena, German elle, ell; Latin ulna, cubit, from the Greek word for elbow.

THE NATURE OF SWORDS

by Peter Johnsson

Traditionally, the evolution of the European sword has been described as a typology of change in hilt forms and decoration. Very little has been done to try to understand the importance of blade shape, weight and balance. Even Oakeshott makes his typology based mostly on silhouettes of swords..

I believe a sword can only be properly understood as a moving three dimensional object and as a tool designed for a specific purpose. For a sword to be able to deliver shearing cuts and piercing thrusts, it needs to be quick, sharp and resilient. Depending on type it needs to be more or less flexible. Historically, the emphasis was put on toughness rather than hardness.

The edge of a sword can be thought of as the edge of an axe shaped on a chefs knife - like a slim gothic arch in cross section.

There are variations to this shape, but I believe it is one of the most common. The thickness of a broad sword blade where the main cutting is done is not unlike that of a kitchen knife, somewhere around 1,8-3 mm. This is very important if the sword is to behave properly. The blade must also be self balancing to a certain degree.

A widespread misconception is that the point of balance needs to be very close to the hilt on a well balanced sword. This is misleading, as a sword meant for serious use will need a pull forwards to direct the blade and track properly through the air (and an unfortunate opponent). If the blade of a sword has good proportions and is of correct heft it is possible to balance it further out from the hilt without making it awkward or cumbersome.



One of the tricks to make a sharp blade strong and agile is to concentrate the mass of the blade close to its centre of gravity, or point of balance. This is the result of proper distal taper and gradual change in cross section. A sword needs only just so much material in its edge to make it strong enough to be sharp. Too thin and it will fold, too thick and it will drag. The spine needs only to be thick enough to give acceptable stiffness.

To have low mass at the point of a weapon serves many purposes. Perhaps most important is the fact that less mass at the point makes for a quicker sword. The speed of a strike is what makes a cut powerful. Obviously, less mass also means thinner cross section or/and slimmer point, making for better cutting and penetration potential. Most of the mass reduction in a blade most often occurs as a tapering in thickness. This is less obvious than a narrowing in width, so it is often overlooked. The tapering also helps to distribute bending and wrenching tensions along the blade more efficiently. As the blade will have to carry less and less of its own weight as one gets closer to the point, a blade with proper distal taper will also be perceived as stiffer. The

same effect applies to fullers. A sword that has an overly heavy pommel and an overbuilt blade will be slower to wield than a sword with identical weight and identical point of balance that has its mass concentrated around its centre of gravity.

Another of the most important aspects of how efficiently a sword will deliver a cut is its tendency to vibrate. Where the nodes of no vibration are situated is also a matter of profound importance for its performance. How to manipulate the placing of these nodes is one of the "secrets" of a proficient sword smith. There will always be an area of no vibration on a blade close to one third of its length from the point. By making the blade thinner or relatively stiffer this node is moved up and down the blade. The use of fullers, midribs and hollow grinding are ways of accomplish this. The node in the blade is something relatively well known, but the importance of a node in the grip is generally less understood. A badly balanced sword, or a sword with less than optimal dimensions, will rattle in the hand when striking a target. These vibrations may become severe enough to get uncomfortable or even painful in extreme cases. Such vibrations will also shorten the working life of a sword. If there is a node some 3,5 cm behind the cross,

where the first two fingers grip the sword, little or no vibration will be transferred to the wielder. The sword will also bite harder as less resonance from the arm and body of the wielder makes the blade less prone to vibration.

There are several ways to manipulate the placing of the node in the grip. The mass, length and shape of the tang are of great importance, both for the self balancing of the blade and the placing of the node.

Pommel weight is another important factor. Adjusting the weight of the pommel moves the node. A heavier pommel will attract the node towards itself. To fine tune the node one can also file the tang slightly on the side to which one wishes to move the node.



There are at least two obvious and important directions of vibrations in a sword: across the flat and across the edge. The nodes of these vibrations do not necessarily coincide, a fact that is often overlooked.

Ideally both directions should have their nodes in the grip placed at the same spot. This will make the sword feel very solid and strong in ones hand. To achieve this, utmost care must be given the shaping of the tang and the adjusting of the pommel according to the dimensions of the blade.

It is interesting to note that one feature often has several beneficial effects. If a sword has a graceful shape and attractive proportions, it will probably have good potential to be an efficient weapon. One doesn't have to know the theories to make a good sword, but it certainly helps.

In my opinion, these notions are more than helpful in evaluating historical swords. It is very much easier to know what to look for, and what details to note. The theories can also help reconstructing partly ruined swords. A missing pommel can be reconstructed, as well as a broken blade.

The quality of European mediaeval steel has a characteristic nature. As a result of the process of its

making it has a streaky structure. This is because of the slag inclusions that are present to a more or less obvious degree, since the iron was never completely melted. The heat of the furnace caused the non iron components in the ore to melt and separate as slag from the partially molten particles of iron. The iron sintered to a heterogeneous lump of material with a varied degree of carbon content and slag inclusions. Before tools or weapons could be made of this material it had to be folded and welded upon itself several times. During this process most of the slag was forced out of the iron, but some of it remained as long needle shaped inclusions. One talks about a fibrous nature of such steel and iron. This was the case with iron until a complete smelting of ore was introduced that resulted in a homogeneous material.

The slag inclusions and the streaky nature are sometimes beneficial since it makes the material easier to forge. It also helps tremendously in forge welding. Charcoal iron and wrought iron, as this material is known today, has good corrosion resistance compared to modern mild steel. However, slag inclusions represent a structural weakness, so a more homogeneous material was needed for the making of top quality tools, weapons and armour.

Metallographical studies of armour and weapons from Innsbruck produced at the end of the 15th century show that the processing of iron sometimes resulted in a very homogeneous material. The idea that armour was case hardened with a hard surface and a soft core seems to be a modern myth based on misinterpretation of test results. The studies of A R Williams show that top quality armour was made of more or less homogeneous steel whose carbon content varied from barely hardenable to something close to spring steel. Case hardening could of course also have been used, but it is interesting to note that history is not so simplified as we are sometimes led to believe. Possibly it is from this period (end of 15th century) that the method of fully quenching and subsequent tempering is introduced. Before that slack quenching was the preferred method. How this was achieved is beautifully described in *The Pirotechnia* by Biriguccio, printed 1540.

Suffice it here to say that slack quenching involves a quenching in short bursts during which the smith uses the remaining heat in the material for tempering. For this to be possible the smith had to have good control over time and temperature, knowing exactly what to look for. To know the proper severity of tempering, the smith noted the tempering colours that manifest themselves in the temperature range from 200 to 300 degrees Celsius. There were several tricks to get a more easily readable result. Properly executed this method produces a very good compromise between toughness and hardness, without undue stresses. This is of course desirable in sword blades and armour.

When describing the quality of mediaeval European steel, weapons and armour one is often confronted by the belief that contemporary Asian methods and results were vastly superior. This is a variation of reality based on myth, popular belief and misinterpreted facts.

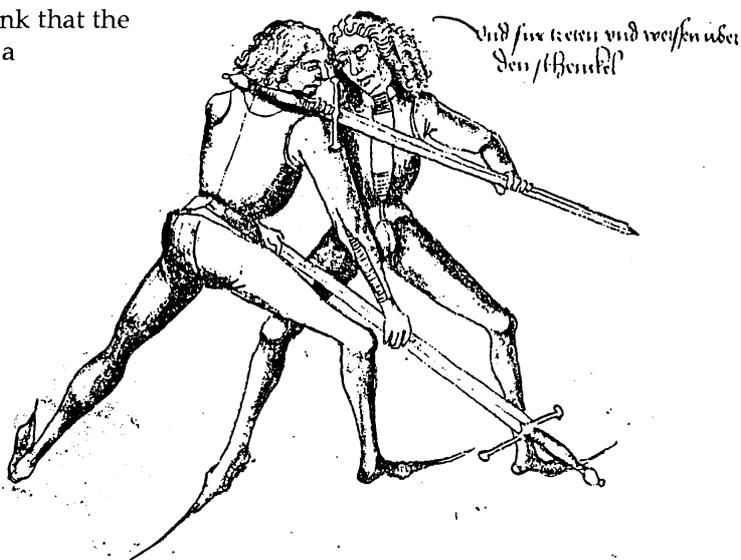
The methods of the Japanese sword smith resulting in a multilayered sword with a hard cutting edge and a semisoft back is just a way to match the slightly different demands that are a result of its intended use. The multiple layering in a Japanese sword is born of the necessity of making the steel more homogeneous and also a method to control the carbon content, just as was the case in Europe. In Japan this was pursued to an artistic level of craftsmanship and the structure, the watering of the surface, was a much appreciated effect. The ideal of the patterned surface was abandoned during the 11th century in Europe, when better methods of processing iron resulted in more homogeneous steel.

If a late mediaeval European sword is corroded or its surface etched it can also show a pattern but not necessarily an attractive one as this was not sought after. The sharp edge of a Japanese sword is made possible by the high hardness in the thinner part of the blade. To avoid having the blade snap in use, the body of the sword was left semisoft. The consequence of this is that a Japanese sword might bend if a cut is not clean and precise. The hard edge can also be prone to chip.

A European sword is thinner and more flexible with a somewhat softer edge. As a European sword is used primarily for cleaving, chopping and thrusting this is a desirable quality. The Japanese

sword is used in sweeping cutting attacks, therefore it needs a sharper edge that will stand up to abrasive resistance. It is a pity that the European sword is looked upon with such disdain and that knowledge has been substituted with myth and ignorance. It is a futile task to try to find the best sword when comparing different cultures and periods. Weapons are shaped according to intended use and should be viewed from that perspective. Only by doing this a better understanding is achieved.

There has been much discussion the nature of parrying with a sword. Some state with firm belief that the edge must be used if a strong resistance is to be achieved. Others, like myself, think that the edge is too fragile for such use. I am not a sword fighter. I have not studied the use of the sword by practice. (Not yet, anyway.) Still, after study of historical originals and making sharp swords myself, I think that the edge is often misunderstood by modern students of the sword. No one would consider evaluating the quality of a knife by hacking its edge on another knife. This would obviously destroy both tools. The sword is by some reason often expected to survive such abuse. I do not believe the notion that the bases of blades were left blunter in order to permit edge to edge parrying. The base is the



least hard portion of a sword. It would take severe damage from an incoming edge.

Swords in use are represented in art throughout the Middle Ages. The shield was long the obvious companion to a sharp cutting weapon. By the late 15th century the shield had taken a more subdued position. Swords were used to a greater degree for both attack and defence and had evolved into elongated thrusting shapes. The broad cutting swords were still popular, but their use differs slightly from the fencing swords shown by Thalhoffer and his fellow sword masters. It is not altogether clear if representations in art intend to show dead blocking of an incoming blow or a deflecting movement.

In many fencing manuals from the 15th century one can see fighting from a distance where both combatants have free mobility to use in trusting and cutting attacks. When the swords have crossed, close quarter techniques are put to use.

The swords represented in the drawings of Thalhoffer (and most other fencing manuals showing these techniques) are eminently suited for thrusting but also have a cutting, cleaving potential. The cross section of such a sword is diamond shaped with a blunter edge angle than is the case with the broader flatter swords primarily intended for cutting/cleaving.

To grip the blade of a broad cutting sword is a different experience indeed than gripping the blade of a stout awl-shaped "Thalhoffer" sword. This should be kept in mind when fencing technique is meditated upon. To use broad fullered blades in the techniques of Liechtenauer and Thalhoffer is perhaps not the best way to understand the nature of sword fighting.

ON THE USE OF TRAINING SWORDS

Most historical swords with marks of use have only a few minor blemishes in their edges and perhaps one or two deep nicks. (One idea is that they might have been discarded just because of deep nicks and thrown into the nearest river...) The point is: swords weren't made of some magical material. Modern steel has better potential to make swords. If old swords have few and small marks from wear it is because parries were executed with the flat of the blade and rather by deflecting than dead blocking. If modern students of the sword used sharp weapons more often for training cuts and thrusts the nature of the sharp edge would be better understood and consequently, modern interpretation of mediaeval sword fighting would be closer to what it might have been like.

We don't want wrist breakers, but we do not want swords that get flimsy and vague from being balanced too closely to the hilt either. This is the case with most modern safe sparring steel swords. For them to be wielded safely for a long time, the ideal is to balance them just beyond the cross. (Or even in the middle of the cross.) At the same time the point of these swords needs to have a certain mass for making a safe edge and tip. This spreads the total mass too evenly along the length of the sword, which must be compensated by moving the point of balance even further towards the hilt by making the pommel a bit too heavy. As blunt safe swords are never expected to deliver efficient cuts, this change of concept is rarely noticed and not properly understood. Even if a safe sparring sword is made by closely copying the silhouette, weight and point of balance of an actual historical sword, there would be a slight but noticeable difference in the way the two swords handled, because of the difference in mass distribution.

A better way to solve the problem of safe sparring would be to use historically correct training swords during public shows. The "blades" of these are slim, flat steel rods with a flaring ricasso. The shape resembles closely the form of a sharp blade before edge bevels and fullers are forged in. As a result the training sword has almost the same distribution of mass as a sharp weapon. Another consequence of using only blunt swords in learning swordsmanship is that the fragility of the edge isn't appreciated. Many tend to fully block incoming blows with the edge of their sword. If a sharp sword was used like that it would sooner or later break. Probably sooner. It would also lose much of its cutting potential.

Peter Johnsson

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Ewart Oakeshott has devoted his long life to the study of the European mediaeval sword. He has developed a classification system for swords that is partly chronological and partly based on blade shape. His work is an invaluable contribution to our understanding of these weapons.

These are two of his most important works:

-Oakeshott, R E: "The Archaeology of Weapons", Lutterworth press 1960.

-Oakeshott, R E: "Records of the Medieval Sword", Boydell Press 1991.

The work of A R Williams has a refreshing scientific approach to the subject of arms and armour manufacture. He has made many important contributions to the knowledge of these matters. Some important articles are:

- "Seven Swords of the Renaissance from an Analytical Point of View", *Gladius* 1977.

- "Methods of manufacture of Swords in Medieval Europe: Illustrated by the Metallography of Some Examples", *Gladius* 1978

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ODDS & ENDS



KITCHEN EQUIPMENT

Detail of a woodcut showing 15th century kitchen equipment (unfortunately, no details of the source were given). What appears to be a grater of some sort can be seen in the bottom left corner. Any educated guesses? Also of interest is the dish rack. If anyone has the details of the source, please send it along.

ARMOUR POLISHERS

Görg, the 20th Brother, 1425 and Hans Pernecker, the 204th Brother, 1483, both from the Mendel Housebook. Both are listed as "harness polishers". Of particular interest are the sloping benches and the polishing sticks. If you have any idea of what these may actually consist, please give us your opinion or better yet, your sources!



We would very much like to make ODDS & ENDS a permanent feature in DRAGON. Directly inspired by the Questions and Answers page, we see it not only as a convenient page filler but as a showcase for information of all sorts, either exceptional, curious or mundane, but not warranting a full article. Rather than have these tidbits sleep in drawers and between the pages of books, we would like to share them and solicit further contributions.

TENTS FOR THE COMPANY OF SAYNTE GEORGE (revised)

Gerry EMBLETON

AN INTRODUCTION

The officers have proposed that we take a hard look at the Company's tents. We have not been really satisfied with them for a long time.

A brief history will help members understand why we have them. Many moons ago some members of the embryonic company of St. George and the White Company set about "researching" 15th century military tents with a view to having some made. Before that time the captain of the groups "1476" and "1515" – parents of the CoStGeorge – had managed to purchase some ancient boy-scout and military tents with a faintly medieval flavour. This was quite a feat as no historical replicas were then available and tents of any other kind than the camping variety were difficult to find. The naive but enthusiastic researchers were two groups helping each other. Henry Landis, Will Hutt, Simon Metcalfe and one John Waterhouse, and Vic Shreeve, Ian Ashdown, Nick Michael and myself. Research was difficult and we were beginners. The two groups took slightly different paths and the resulting experimental tents had their strengths and weaknesses.

A lot of the work undertaken by Henry, Will and Simon can still be seen in the tents made by "Past Tents", John Waterhouse's firm. (1)

Ian, Vic, Nick and I drew up plans and consulted a long established professional tent maker. Both sets were innovations, among the first of their kind but long since overtaken by developments in the last few years. The shape and concept was good but accuracy was then sacrificed to practicality (brass eyelets, machine sewing, plastic under-floors, etc.) not only because these were established techniques used by the manufacturers

but, as our tents were "one-offs", they cost us all we could raise at the time. To have had them hand sewn using only known 15th century techniques (about which we know very little) was beyond our purse.

Since then the best looking medieval tents at affordable prices have been those made by "Past Tents". Only recently has the chance to find more realistic tents become possible and I believe that some people have hand sewn their own.

We are reprinting here an article written by myself some years ago in "Dragon 5". It was the very best I could do at the time, having had the luck to study regularly the various Swiss chronicles and many hundreds of contemporary illustrations – and a very few texts that mention tent manufacture and supply and descriptions of the various camps.

This article is a very carefully considered synthesis of all the information I had gathered. I have made very few corrections to the text as I've very little to add. New footnotes will be found at the end of the article.

Could we now ask members for contributions of information (from contemporary sources, not re-enactment hearsay) and constructive suggestions (accompanied by offers of help).

Hopefully this will allow us to consider new designs for future tents incorporating some of your suggestions. (2)

THE TENTS

It is clear from contemporary documents that tents were not usually supplied for the common soldiers (3) – in fact 18th and 19th century armies frequently campaigned without tents. Soldiers were billeted in villages and towns, or made shelters for themselves often at the sacrifice of farm, crops and fences. (something polite reenactors usually avoid). What is certain is that the boxes, chests, furniture decorative hangings and elaborate kitchen equipment carried to events by many would-be common soldiers is not at all realistic and should be kept strictly for the “plastic” camp or castle garrison. However the practicalities of 20th century life dictate that reenactors usually need tents to live in.

Many 15th century manuscripts show tents of satin, brocade and other rich materials. The tents of nobles were, we know, sometimes vast, many-roomed and breathtakingly rich. However, most illustrations of soldiers’ camps show tents of simpler construction and decoration, and it is these that we have illustrated in this article. Company members should concentrate on acquiring a practical, simple, waterproof and comfortable tent with simple decoration, ideally incorporating a shield or shields bearing the Company badge.

A painted initial from a Milanese manuscript c. 1476 in the Wallace Collection shows behind the kneeling figure of Galeazzo Maria Sforza the camp of a Burgundian force sent by Charles the Bold. Each tent carries a small flag, and flanking each doorway are two shields with the red and gold arms of Salins, a district of Burgundy. This, and the Schilling chronicles are the models for a uniform shield decoration for the Company’s tents.

PLATE 1

A–K are taken from the various Swiss chronicles c. 1470–1513 (4). They obviously have a central pole, some sort of wooden construction (like umbrella spokes?) to support the roof, and many have walls that are obviously hooked-on, sometimes shown opened out (see plate 2 A and B for details). Most have red cones and a ball finial on their rooftops.

- A. A Burgundian tent, white with red decorations and a Burgundian banner in full colours.
- B. An all-yellow tent of the Swiss canton of Uri, bearing a motto.
- C. White, with red herringbone pattern.
- E. A white Bernese tent with red stripes and black “flames” on the roof.
- F. Burgundian. White with red decorations. Yellow flag with a red cross.
- G. White, with red binding to the wall-panels and Burgundian badges.
- H. White; red binding, crosses, flames and flint. The “steels” of the Burgundian arms are black.
- I. White, with black decorations shown in detail above.



J. Six tents from Schilling, the first four from his original chronicle. Many undecorated tents are shown, and some with just simple shield badges and flags.

K. A variety of roof-decorations.

L. Examples of simple decorations from the Swiss chronicles and various MSS.

M-N. Note the stepped roofs, suggesting a more complex internal roof construction.

O. Various sources show tents with tautly stretched roofs (over a wooden frame?) and a very loose-hanging valance or even a thick fringe.

P. On these two examples the guy-ropes seem to be attached to a stiffened hoop from which the walls hang.

Q. Various types of tents are shown in use as stables, but this illustration is a unique example from Schilling's 1513 chronicle. The horse appears to be tethered to the edge of the roof of the tent which stands on its central pole like an umbrella. Several drawings show tents like this with walls hooked on, apparently supported by the central pole alone, which must have been dug into the ground.(5)

R-V. Taken from marvellous miniatures in René d'Anjou's *Le Coeur d'Amour Epris*. These give us some idea of the elaborate construction of the tent of a nobleman.

R. The walls are stiffened with what looks like strips of wood slipped into sleeves of blue cloth. The roof is perfectly smooth and beautifully decorated with gold bands embroidered or painted with mottoes. There are many guy-ropes, and the crows-feet have five "toes".

S. Another example which clearly shows a red-painted wooden wall-frame, carpeted floor and a window. The construction is remarkably like surviving 17th century Turkish tents (6). Note the carefully painted curious details. – the very large number of guy-ropes; the six-toed crows-feet (fig.T) supporting every inch of the roof's circumference; the fine cords tied around the pairs of red wall-supports and connected to the middle of the guy ropes. Note also the trefoil wooden foot of each wall-support, from which two cords emerge to tie around a metal tent-peg.

DECORATION

It is not clear how tents were decorated. 15th century miniatures are often printed enlarged in modern books. A tiny tent simply patterned by the artist's brush to give an impression of rich cloth can, when enlarged, give a totally false idea of the scale of the patterns.

The tents of nobles were made with rich cloths – brocade and even cloth of gold (7) paint, embroidery and applique were probably all used, but it doesn't seem that soldiers tents were frequently painted with designs. Coloured bands are frequently shown laid along the seams joining the canvas panels, which suggests reinforcement rather than paint. Certain features are extremely common, i.e. ball or disc finials, small flags, sometimes stiffened, and a red cone at the apex of the roof, probably a canvas or leather reinforcement sewn in (8).

I can find no reference to interior construction, but the "umbrella" type, with spokes radiating from the central pole seems likely in some cases. Those without guy-ropes must have had a rigid support



to stretch the base of the roof, the whole being kept up by the pull of the tent pegs on the walls. Many seem to have had the roof stretched taut by guy-ropes, with the walls simply hanging from the edge of the roof. The area covered by the spread of guy-ropes and tent pegs must have been substantial.(9)

PLATE 2

A-B. Two very fine examples of the tents most commonly illustrated in Schilling's 1513 chronicle.

B. Is an all-yellow tent of the Swiss canton of Uri. Only a few tents are coloured like this and may represent commanders' tents.

C-E. Many of the camps illustrated in the Schilling chronicles have a large single tent of this, seemingly pre-fabricated, type. There are no guy-ropes, and the canvas seems to be a single sheet draped over a wooden frame: the sides sometimes do not reach the ground.

F A "captain's" tent from an Italian MS de re militari, by Roberto Vaturio c. 1460.

G-L A selection of the simpler and plainer tents from *The Camp at Neuss* by the Master of the Housebook, c. 1475. J., and particularly L. are practical soldiers' tents.

M A large French noble's tent with stiffened roof and freely hanging walls. There are no guy-ropes. Fouquet c. 1460.

N A richly decorated Burgundian tent. The roof is stiffly supported by two poles, possibly joined together by a third, and some sort of wooden frame. The highly decorated valance looks as if it is a stiff, box-like construction.

O Like M., this tent has a stiff valance, tightly stretched roof, loose walls and no guy-ropes.

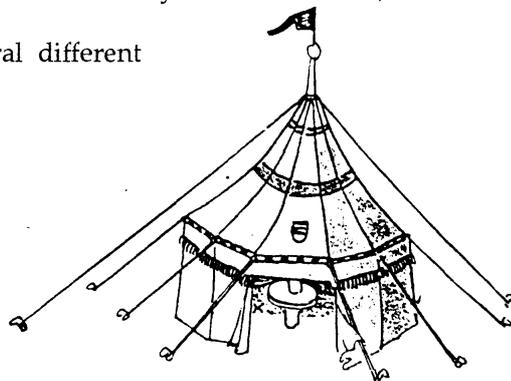
P A Burgundian tent (same source as N.) showing details of construction. Note the tent-peg at the base of the pole- it is unclear in the original drawing whether this is outside the far wall or inside the tent (10).

Q-S Italian soldiers take down their camp. In Q., one soldier struggles to unhook or unbutton the walls of his tent (company members will be familiar with these poses). V. shows a tent without its walls, and S. lowering the tent to the ground. These tents appear to be quite small and to have no internal wooden supports other than the pole. From a miniature by Giovanni Bettini, c. 1460.

T-W Types of wooden tent pegs appearing in several different sources. Roughly cut branches were also used, as were metal pins.

NOTES

- (1) "Past Tents" John Waterhouse
Hill View Bungalow. Main Street
Clarbrough. Retford.
GB - Nottinghamshire DN22 9NG



(2) Write to Gerry Embleton who is preparing a follow up article, at Time Machine AG, La Chaîne 15, CH – 2515 Prêles, Switzerland.

(3) Large numbers of tents were prepared for various expeditions but who they were for is not clear, perhaps more often for officers, officials, stores and stables than for soldiers. Very large numbers were ordered for the Burgundian Army and were maintained by a special department. In 1476, for example, the Duke ordered “600 small tents and pavilions, 100 other square pavilions, two wooden houses, 130 square tentelettes and 50 other pavilions, six large tents and six large pavilions and another wooden house”.

The tents were under the responsibility of the Master of tents. Olivier de la Marche wrote: “–and certainly the Duke delivered for his company at least 1.000 tents and 1.000 pavilions, for ambassadors and foreigners, for the Duke’s household, for his servants and men-at-arms. And at each expedition the Master of tents has new tents and pavilions paid for by the Duke, and he spends more than 30.000 francs for material and work alone.”

The Burgundian artillery accounts cover all sorts of military supplies and there are occasional mentions of transportation for tents, large quantities of cords, poles, blue and white canvas and, in 1442, 200 wooden tent pegs. Ribbons, fringes, laces and rings are all mentioned as purchased for the repair of tents after expeditions.

One manuscript mentions tents 24 feet by 10 and pavilions 13 to 11 feet in diameter. By “square” the writers may mean rectangular...

I have examined several hundreds of illustrations and I have yet to find a square tent. This is puzzling as a tent of this shape with a central pole and four ‘spokes’ one to each corner, is simple and immensely practical. Burgundian records refer to “square” tents, and the lack of pictorial reference does not prove they were not used, but they do seem to have been at least fairly uncommon.

(4) Diebold Schilling (1435–1486) and his nephew (also Diebold Schilling) wrote several chronicles describing both the history of their region and current events between 1476 and 1513, illustrated by at least four different hands. The hundreds of illustrations are the best illustrated source for reference of daily and military life during the late 15th century.

(5) In a drawing by Wolf Huber ‘The Battle of Pavia’ c. 1530 in the *Stattliche Graphische Sammlung* in Munich, some semi-collapsed tents are shown with their stout tapering poles fixed into the ground with wedges driven in around the base. Soldiers are actually shown chopping one of the tall tent poles down like a tree.

(6) A splendid Turkish tent which displays many of the characteristics of the richer medieval tents, may be seen at the Bavarian Army Museum, Ingolstadt. It was captured at the battle of Mohacs in 1687.

(7) Just how richly decorated and magnificent some noble’s tents were during the 15th century is difficult to grasp. In an age when princes strove to outdo each other in splendour and display the Burgundian Dukes seem to have outshone most.

A description of Duke Philip the Good’s tent at Boulogne-sur-Mer gives us a good idea of the sort of housing the Dukes of Burgundy were used to. “The tent of the Duke of Burgundy was of extraordinary size, larger than any ever seen before. The construction was so vast and elegant as to

capture all looks. It was a pavilion in the form of a town, surrounded by wooden towers and crenelated walls. The entrance consisted of two great towers with a curtain suspended in between. In the middle of the tent was the main room, from which extended, like the spokes of a wheel, a large number of apartments separated by tiny alleys, in which it was said that up to 3,000 people may be lodged." Another description (1460) of this tent confirms that it "had inside...a main room, a chapel, many dining rooms and bedrooms." It is reasonable to assume that the living accommodation of Charles the Bold was equally sumptuous, for it is known that at Grandson, Charles' tent stood next to one of similar size – the old tent of Philip the Good! Schilling records that at Grandson, "the silk tent of the old Duke of Burgundy was captured". Schilling's curt statement leaves the sheer visual experience of two such large tents, surrounded no doubt by the only slightly less ornate tents of the nobility, to the reader's imagination.

It is not only the sheer size of the tents that stretches the imagination, but also the opulence of the materials that were used to construct them. Knebel describes Charles' tent as being "made inside of velvet and outside of silk", the canopy being "embroidered with gold, pearls and precious stones". In fact, the quality of the work was such that parts of the captured tent were distributed to churches in Bern and Schwyz to be made into vestments!

NOTE freely quoted from John Richards' article in *Dragon* No 3. Sept 1990.

(8) Some surviving 18th century Austrian military tents have red leather cones and a ball finial sewn into place at the apex of their roofs to take the top of the tent pole. Other features are reminiscent of medieval tents, i.e. sewn eyelets and hemp ropes with crow's feet.

(9) I have drawn guy-ropes only when the 15th century artist has shown them. Apart from occasional lazy lapses many tents are clearly intentionally drawn without ropes, sometimes next to tents which have them.

The writer would like to thank Nick Michael, Ian Ashdown, Simon Metcalfe, Will Hutt, Henry Landis, Eli Tanner, Anne Embleton and John Richards. My special thanks to Victor Shreeve who helped make our first tents (still the best made I've seen) and John Howe for his never failing help, interest and encouragement.

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Woodcut of the Battle of Grandson, from "Histoire Bourguignonne", Strasbourg, late 15th century

