

16th-century German Hemd (Shirt) with Pleatwork Embroidery

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Image 1: My linen hemd with pleatwork embroidery.

Introduction and Background Material

This is a 16th century German hemd (shirt) with pleatwork embroidery (also known as smocking) at the collar and cuffs. It is made of a lightweight bleached linen and is entirely hand sewn with bleached linen thread.

This style of linen undergarment was worn by both men and women of various social classes throughout the German-speaking regions of Europe during much of the 16th century (Nutz and Stadler 2012, p. 86). Various pictorial examples can be found in both woodcuts of lower classes, including those of Landsknecht mercenaries and members of their Tross (camp followers) [Image 7], as well as portraiture of members of the merchant and noble classes [Images 2-6]. While there are several examples of shirts and shifts from the 16th century that have survived, few exhibit the dense pleating, smocking, and embroidery depicted in the

mentioned artworks. Luckily one extant example, remnants of a pleated hemd cuff found at Kloster Alpirsbach in what is today Germany has survived and gives some insight into how the pleatwork was created and reinforced [Images 8 and 9].

Like the shirts and smocks found throughout 16th century Europe, hemds were made of a series of rectangles, squares, and triangles, with no curved lines so as to avoid wasted fabric (Malcolm-Davies and Mikhaila 2015, p. 16). While linen was being woven in most European countries during the 16th century and widely available, the quality of linen used for one's undergarments would be determined by the wearer's wealth; the wealthier one was, the finer, smoother, and more tightly woven linen one could afford (Arnold 2008, p. 5). Variations in style and types of pleatwork and/or embroidery were mainly at the neckline and collar, as evident in



Image 2: Detail of "Portrait of Matthäus Schwarz," by Hans Maler, 1526.



Image 3: Detail of "Portrait of a Young Man," by an Anonymous German Artist, ca. 1525-1530.



Image 4: Detail of "Portrait of a Woman," by Christoph Amberger, ca. 1548.



Image 5: "Portrait of Anne of Bohemia and Hungary," by Erhard Schön, 1528.



Image 6: Detail of "Allegory of Virtues and Vices at the Court of Charles V," by Hans Daucher, 1522.



Image 7: Detail of "Der Schneider als Landsknecht und die Näherin," by Erhard Schön, ca. 1535.



Abb. 743 Hemd, Ärmelabschluss in Smokarbeit (Kat.-Nr. 28).

Image 8: Extant hemd cuff, Kloster Alpirsbach. ca. 16th century.



Image 9: Inside lining of extant pleatwork cuff, Kloster Alpirsbach, ca. 16th century.

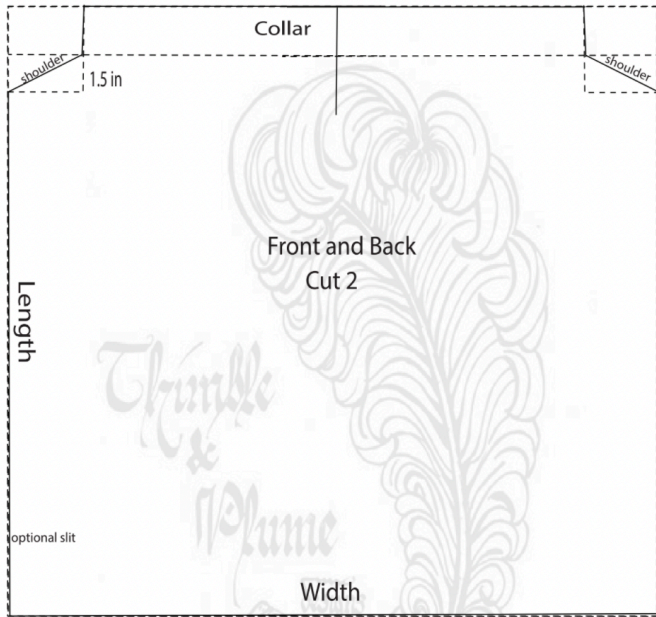
the small sampling of images on page 2 of this paper. Embroidery could range from simple to elaborate and be made from plain linen thread or more costly and colorful silk or precious metal-wrapped threads (Ibid.). Hemds were usually fastened with either cord ties, thread buttons, or hooks and eyes at neck and cuff [Images 2-4] (Malcolm-Davies and Mikhaila 2015, p. 16).

By wearing it close to the skin, undergarments such as hemds protected less-frequently laundered outer garments from sweat and body oils (Arnold 2008, p. 8). “As such, shirts were closely linked to ideas of health and cleanliness, which meant that men needed to be able to change their shirts regularly and have them laundered” (Hayward and Rublack 2015, p. 31.) Therefore, great care was taken in their construction to ensure that they were durable and could withstand not only the regular wear and tear of daily life but also period laundering practices (which included, but were not limited to: beating, use of caustic detergents, and boiling, etc.). The stitches used in their construction (often running stitch, backstitch, a combination of the two, or whip stitch) were often very regular and very small to ensure the strength of the seams and any raw, cut edges were hemmed or felled to avoid fraying (Arnold 2008, p. 8; Malcolm-Davies and Mikhaila 2015, p.16). Pleatwork hemds did not have separate, flat neckbands; instead, “the whole width of the sleeves and of the body pattern pieces was gathered into the neck and wrists, controlled and decorated by fine even gathering stitches” (Hayward and Rublack 2015, p. 378). These hand-gathered pleats and pleatwork embroidery were further protected by being backed with strips of lining, as seen in the extant cuff from Kloster Alpirsbach [Image 9].

What sets a hemd such as this apart from other shirts and smocks common in other parts of early modern Europe is the pleatwork embroidery. Pleatwork embroidery appears to have been practiced since at least the fourteenth century as illustrations in the Luttrell Psalter of 1340 depict a woman wearing long aprons gathered and embroidered at the waist and “featuring a geometric design which contained the fullness of the fabric” (Marshall 1980, p.). Depictions of what appear to be various types of pleatwork embroidery, including pattern darning and smocking, increase drastically during the 15th and into the 16th centuries and become characteristic of the fashions found in the German-speaking regions of Europe. These techniques for fabric manipulation continued to be in use well into the 19th century (Marshall). While portraits by renowned artists such as Albrecht Dürer and Hans Holbein the Younger were generally executed in great detail, the method of stitching used on pleatwork hemds is not defined clearly enough to concretely determine how the gathers were secured (ibid.). Therefore, our modern interpretations of period hemds are largely experimental and conjectural. However, smocking and darning stitches commonly found in 19th century laborers’ smocks can be used to create a similar effect as depicted in 15th and 16th century hemds (ibid.).

Pattern and Construction

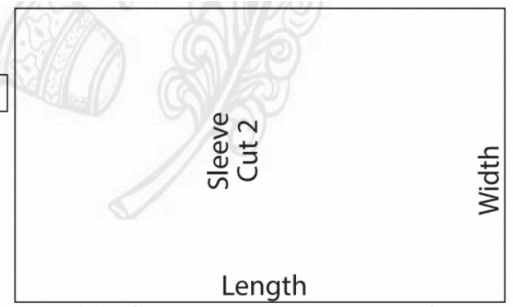
I patterned my hemd by following Thimble and Plume Designs’ YouTube series “Making a Smocked Shirt.” For those unfamiliar with Thimble and Plume, it is the pattern company of Caid’s very own German costuming Laurels: Mistresses Adelheit Schwarzekatze and Whilja de Gothia. The series walked me through taking my measurements, calculating the dimensions I would need for my hemd, including seam allowance and desired fullness for the pleatwork embroidery [Images 10 and 11], preparing and cutting my fabric, pleating, embroidering and assembling the finished hemd. Using their pattern diagram and associated formulas, I was able to multiply my neck and wrist measurements by three (desired fullness) to determine how wide I needed the body and sleeve pieces to be in order to pleat back down to the finished neck and wrist measurements.



wrist stay-cut 2

neck stay-cut 1

Gusset cut 2



16th Century Smocked Shirt Pattern Diagram,

Thimble and Plume Designs

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Image 10 (left): Body diagram (Thimble and Plume Designs 2021).

Image 11 (above): Sleeve, gusset, and stays diagram (Thimble and Plume Design 2021).

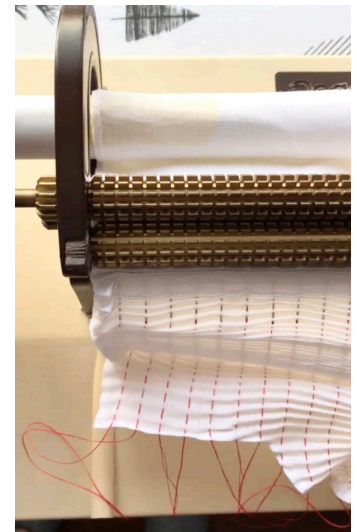
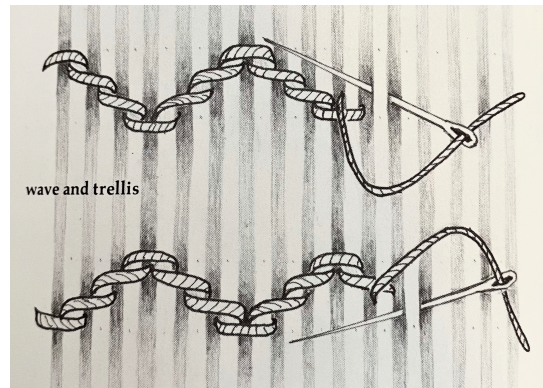
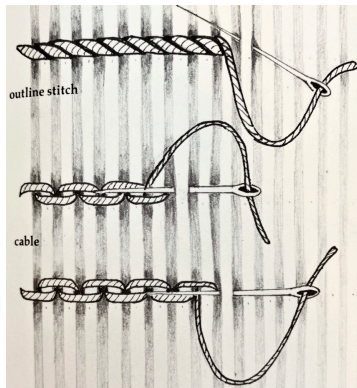


Image 12: Outlining stitches for pleatwork embroidery (Marshall 1980, p. 49).

Image 13: Wave-style stitches for pleatwork embroidery that can be used to create diamond shapes (Marshall 1980, p. 49).

Image 14: Machine pleater in action.



Image 15: Gathered cuffs before embroidery.

Image 16: Cuff embroidery in progress.

I then prepared my linen fabric by washing, heavily starching it (in order to help get crisp, even pleats), and then ironed it. Starching pleated linen was common in period (Nutz and Stadler 2012, p. 81).

Using the measurements calculated earlier, I cut out a front, back, two sleeves, two underarm gussets, a collar stay and two wrist stays. When a straight cut was needed, I pulled a thread unsure my cut was on the straight of grain and as precise as possible. While the period practice would most likely be to sew the seams before finishing any raw edges, I decided to experiment with finishing all the raw edges first by folding twice and hemming using whip stitches with waxed linen thread. To reinforce the neck slit, I made a bar tack from buttonhole stitches [Image21]; similar reinforcements appear on extant garments from the period (Arnold 2008, var.).

Now is where I made my first major deviation from period practices. While period hemds would have been hand gathered with parallel running stitches made one row at a time, I decided to use a modern, hand-cranked pleating machine to simultaneously create 8 or more rows of gathering stitches at a time [Image 14]. This allowed me to quickly and evenly pleat the collar and cuffs of my hemd in a fraction of the time required to do it by hand, and as the mother of an infant, my time is limited. Once the entire length of the cuffs and collar were gathered, I tied off the ends of the gathering threads in pairs to help keep the pleats even and secure while embroidering [Image 15]. With the spacing of the needles on my pleating machine, I averaged approximately 6 pleats per centimeter.

Using waxed white linen thread, I used outline, cable, and wave stitches to create my pleatwork embroidery pattern and secure the pleats in place [Images 12 and 13]. The white thread on white linen fabric resembles the geometric embroidery effect present in Images 2-4.

Once the embroidery was completed, I assembled the individual parts of the hemd by placing right sides together and whip stitching the various panels together, leaving openings at the bottom side seams of the body (for mobility) and at the wrists. I decided to make ties out of linen sewing thread for the collar and cuff closures. While finger loop braiding is one period way of making ties, I decided to hand twist several strands of linen thread together, much like how rope is twisted [Images 18, 21, and 22]. These spiral twisted ties resemble those in the 1526 "Portrait of Mathaus Schwarz" by Hans Maler [Image 2]. These were then whip stitched to the edges of the collar and the cuffs.

To finish off the hemd, the stay pieces of the collar and cuffs were placed wrong sides together with the backside of the pleated areas; the edges of the stays were folded under and then they were carefully slipstitched to each pleat to ensure that the stay would take any strain instead of the embroidery [Image 22].

Lessons Learned

While this was not the first pleated hemd I have made, this was the first one I've made by preparing the linen with heavy starch and pleating it with a machine pleater. The finished effect is very pleasing and crisp. However, pleating such wide panels of fabric with a hand-cranked pleating machine had a steep learning curve and the gathering rows were not quite as even as I would have liked. Hopefully with practice I can improve this. The collar and cuffs also ended up being a little smaller than anticipated once pleated. In the future, I will multiply my widths using a larger fullness. Also, while the hand twisted ties look nice, they are not very secure. In the future I would like to try making thread buttons and loops [Images 3 and 4].

In conclusion, the use of pleatwork embroidery stitches common in more recent centuries (outline, cable, and wave stitches) make for an effective result when trying to recreate the overall look of pleated German hemds depicted in 16th century woodcuts and portraiture.

References and Sources Cited

Ahlén-Cordero, Malin and Lalena Hutton. "Making a Smocked Shirt." YouTube, uploaded by Thimble and Plume, 2021, <https://youtube.com/playlist?list=PLNCcpUKH2nZRtcnwdrwqD8XiCgSAEO7Be>

Arnold, Janet. *Patterns of Fashion 4: The Cut and Construction of Linen Shirts, Smocks, Neckwear, Headwear, and Accessories for Men and Women, ca. 1540-1660*. Macmillan, 2008.

Hayward, Maria and Ulinka Rublack. *The First Book of Fashion: The Books of Clothes of Matthäus and Vest Konrad Schwarz of Augsburg*. Bloomsbury Academic, 2015.

Johnson, Caroline. *The King's Servants: Men's Dress at the Accession of Henry VIII*. Fat Goose Press Ltd. 2020.

Malcolm-Davies, Jane and Ninya Mikhaila. *The Tudor Tailor: Reconstructing Sixteenth-century Dress*. Batsford, 2008.

Marshall, Beverley. *Smocks and Smocking*. Alphabooks, 1980.

Nutz, Beatrix and Harald Stadler. "How to Pleat a Shirt in the 15th Century." *Archaeological Textiles Review* 54, pages 79-91, 2012, [https://www.academia.edu/3213526/How to pleat a shirt in the 15th century](https://www.academia.edu/3213526/How_to_pleat_a_shirt_in_the_15th_century). In *Archaeological Textiles Review* 54 2012 79-91

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Thursfield, Sarah. *The Medieval Tailor's Assistant: Common Garments 1100-1480*. Ruth Bean Publishers, 2016.



Image 17: Completed hemd.



Image 18: Detail of collar pleatwork embroidery.



Image 19: Detail of cuff pleatwork embroidery.



Image 20: Detail of underarm gusset.



Image 21: Detail of front opening, reinforcing bar tack, and hand-twisted linen ties.



Image 22: Detail of inside of collar lining, hemmed ruffle, and hand-twisted linen ties.



Image 23: Detail of bottom hem.