



Colour black in eighteenth-century silk clothing fabrics' design: Aesthetic value and durability issues of black yarns*

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Introduction

When discussing the topic of textile dyeing, one enters into a very complex history of finishing methods and processes. Contemporarily, the latter constitute a whole separate field of materials engineering that encompasses the refinement (dyeing application included) of all kinds of natural and chemical materials – not merely textiles.

Looking back, we should point out that the beginning of the development of professional dyeing in Europe – that is to say, the kind that operated in the form of specialized workshops organized according to municipal regulations – dates back to the twelfth century. In the Middle Ages and the Renaissance, Italian cities led the way in modern textile dyeing management. In stages, the principles of operation of fabric dyeing workshops also became regulated in the Netherlands, France, and England. From the end of the eighteenth century, the European dyeing business, developed within urban craft guilds, ceased to be governed by municipal regulation;¹ instead, it gradually began to follow free market principles of emerging capitalism.

The range of natural dyes used and the technology of dyeing particular types of textiles (made of different raw materials, as well as having a variety of structures) have become more and more standardized over the centuries. This was particularly influenced by the publication of books on professional textile dyeing, that were subsequently translated into various languages.²

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1 J. Hofenk de Graaff, *The Colourful Past: Origins, Chemistry and Identification of Natural Dyestuffs*, Riggisberg 2004, p. 3.

2 Ibidem, s. 4.



1. Seventeenth-century portrait of a lady wearing a dress made of plain black silk fabric (presumably satin). Portrait of Jacqueline van Caestre, Anthony van Dyck, ca. 1618–1622. The Royal Łazienki Museum in Warsaw, Accession Number Łkr 841, <<https://www.lazienki-krolewskie.pl/pl/katalog/obiekty/lkr-841>> (as of 29 January 2022)

European dyeing business had an opportunity to grow in those regions where two basic branches of development intersected. First and foremost condition was the existence of international trade, both import (enabling access to dyeing plants, among others) and export (allowing efficient trade in finished products with different countries). The second condition, *de facto* resulting from the first, was the presence of financial and intellectual capital.

Establishing a professional textile dyeing operation required sufficient capital to build a technological park, capable of running a dyeing workshop, and access to skilled, trained workforce. In the eighteenth century and earlier, acquisition of adequate knowledge and practice in the field of dyeing took more time and money than training a weaver or a spinner.³

At the time in question, the varying quality of the dyes used was well known. There were national regulations requiring the dyeing of high-quality materials (silk or wool) with the best and most durable substances. At the same time, the use of low-durability dyes was

banned. However, in many cases, this provision was wishful thinking, as inferior dyes were still used for cheaper materials, often intended for the domestic market, where it was easier to avoid liability than in the case of export.⁴

There was a high level of specialization in the dyeing business – both when it came to dyeing of silk and of other textile raw materials. Some workshops dyed only wool; others specialised specifically in the dyeing silk. Also, particular workshops specialized in particular colours. For instance, in eighteenth-century Toruń, there were four black (*czarny*)⁵ and two beautiful (*piękny*)⁶ dyers.⁷

The development of dyeing business, the possibility of obtaining durable and aesthetic colours, and the introduction of new shades and hues influenced European fashion. The interest in colourful fabrics, predominant in the Renaissance, turned into a fashion for clothes dominated by the colour black in the sixteenth and seventeenth centuries⁸ (see: **Fig. 1**).

Already at the end of the seventeenth century, a new design style was introduced on the European silk market, based on intense colours, bright combinations, and a wealth of shades and hues. Fabric lines with fanciful patterns – the so-called *bizarre* – opened a new chapter in the aesthetics of silk materials. It is believed that this type of composition was the response of European producers to the growing

3 Ibidem, p. 5.

4 Ibidem, p. 7.

5 Presumably the term “black dyer” meant that the workshop dyed materials in dark colours (including black).

6 Dyed with woad (*glastum*), from which blue indigo was obtained. This did not mean that the workshop dyed only in blue. Mixing colours together allowed for a wide range of bright hues to be obtained.

7 E. Kowecka, *Farbiarstwo tekstylne na ziemiach polskich (1750–1870)*, Warszawa 1963, p. 65.

8 See also: A. Bender, *Czarna moda w Hiszpanii*, [in:] *Sztuka doby El Greca*, A. Witko (ed.), Kraków 2018.

competition from Asian manufactures, who offered Western customers their Asian aesthetics as well as patterns and designs developed especially for export to the Old Continent.⁹ It is worth mentioning that this marriage between European preferences and Asian patterns crystallized in eighteenth-century silk making (and in other crafts) to form a distinct type of patterns – the so-called *chinoiserie*¹⁰ style.

When analyzing the theme of black dye, it can be further pointed out that fabrics in the *bizarre* style also initiated a new opening in textile craftsmanship, leading to a wide-range colour palette (see: **Fig. 2**). The latter could also have been an attempt to break the growing monopoly on the colour black



2. Fragment of a piece of silk fabric with the design in the *bizarre* style, Italy, ca. 1700. Author's collection

in clothing. In hindsight, the attempt turned out to be effective, because in no single decade of the eighteenth century did black predominate in the palette of fashionable shades. Black still remained very much attractive and wanted, but it featured among other, no less interesting, lighter colours. As we will demonstrate later in this presentation, in woven patterns, black or very dark shades of brown or purple were combined with light colours in order to sharpen the contours, to shadow, or to visually strengthen specific parts of the patterns.

The fashion for solid black clothes in the eighteenth century was no longer as widespread as before. Black fabrics were still available on the market, and black clothes were still being made, and yet multi-coloured materials took the lead.

All-black fabrics – both plain and patterned – were produced throughout the eighteenth century. Black taffeta, shimmering satins, and thick velvets were considered no less elegant than fabrics that were dyed in other colours.

The colour black worked well on various types of velvets used in textile industry. Smooth and patterned velvets were made in manifold varieties. The technology at the time facilitated obtaining a rich palette of patterns, with varying treatment of the fibre cover. Italian silk making in particular boasted a diversity of more or less decorative black velvets.¹¹

9 M. Taszycka, *Pochodzenie tkanin typu "bizarre" w świetle analizy niektórych motywów dekoracyjnych*, "Rozprawy i Sprawozdania Muzeum Narodowego w Krakowie", 9, 1968, pp. 149–161; P.K. Faryś, *Styl chinoiserie na przykładzie osiemnastowiecznych jedwabnych tkanin odzieżowych manufaktur europejskich*, "Res Historica", 54, 2022, pp. 197–218.

10 D.N. Zasławska, *Chinoiserie w Wilanowie. Studium z dziejów nowożytnej recepcji mody chińskiej w Polsce*, Warszawa 2008.

11 In the trading context, these received distinct, separate names. At least since the seventeenth century, Italian manufacturers were able to offer a range of more than 70 multicoloured velvet

In the eighteenth century (much as before), black was not exclusively reserved for times of mourning.¹² In addition to plain black¹³ or patterned black¹⁴ fabrics, there were textiles also available on the market that had black backgrounds upon which colourful patterns were designed. Colour black was also incorporated into multi-coloured patterns. Depending on the technique used to weave the patterned fabric and depending on the intended composition, black yarns were introduced into specific sections thereof.

Plain black or solid black¹⁵ fabrics

Solid black silk fabrics were used both for mourning, and for the formal and evening wear. The use of black mourning clothing was codified by regulations that specified, among other things, the duration of mourning at court. There are known cases of producers of exclusive silks exerting pressure on the court, aimed at shortening that period, as it led to a drastic reduction in orders for other, light types of silk fabrics. In France, on June 23, 1716, the length of courtly mourning was halved. In 1730 it was shortened again.¹⁶

The aristocracy took the protocol regarding appropriate mourning attire very seriously. The cuts of clothes, types of materials and accessories that had to be worn during the so-called public mourning were established and codified. Dresses had to be made of solid silk fabrics, or monochrome black damask. There was a set, limited range of very modest trimmings to finish the outfit. Men were allowed to wear woolen jackets, but only black ones, devoid of decorative buttons or embroidery. If the deceased person died suddenly, women's dresses were immediately altered and dyed black (using the so-called Indian wood), and men's clothes were similarly coloured.¹⁷

Poorer townspeople resorted to dyeing more or less formal clothes black. The poorest peasants were usually unable to prepare clothes that would be dedicated

fabrics. Alongside satin and damask, velvet fabrics were considered the most luxurious and elegant. See: J. Pietsch, *Die Kostümsammlung Hüpsch im Hessischen Landesmuseum Darmstadt Bestandskatalog der Männer- und Frauenkleidung Studien zu Material, Technik und Geschichte der Bekleidung im 17. Jahrhundert*, München 2008, pp. 84–85.

12 There are known eighteenth-century portraits in which women are wearing dresses made of solid black fabrics or black caraco. Examples include: 1) a portrait of a viscountess dressed in a black dress in the English style, sir Thomas Lawrence, *Philadelphia Hannah, 1st Viscountess Cremorne*, 1789, Tate gallery, reference: T05466, <<https://www.tate.org.uk/art/artworks/lawrence-philadelphia-hannah-1st-viscountess-cremorne-to5466>> (as of January 2022); 2) a portrait of a young girl in a black dress, Joseph Highmore, *Susanna Highmore*, ca. 1740–1745, National Gallery of Victoria, Melbourne Felton Bequest, 1947 1761-1764, <<https://www.ngv.vic.gov.au/essay/susanna-highmore-by-joseph-highmore-a-fathers-perspective/>> (as of January 2022); 3) a portrait of Madame Perregaux in black (navy blue?) (velvet?) dress, Elisabeth Louise Vigée-LeBrun, 1789, The Wallace Collection, P457, <<https://wallacelive.wallacecollection.org/eMP/eMuseumPlus?service=ExternalInterface&module=collection&objectId=65391&viewType=detailView>> (as of January 2022).

13 For instance: black taffetas, satins, velvets.

14 For instance: patterned black damasks, velvets, moiré taffetas and solid black fabrics with patterns woven using the liseré technique (either weft or warp).

15 Plain – i.e., without a pattern. Solid black – i.e., monochrome, that is dyed in one colour – either plain or patterned (the pattern could have been made using, for example, a monochrome damask or liseré technique).

16 L. Taylor, *Mourning Dress: A Costume and Social History*, London 1993, pp. 106–107.

17 Ibidem, pp. 108–109.



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specifically to mourning. It was assumed that the appropriate outfit for the occasion would be the one they always wore when going to church. These clothes usually had subdued, darker colours anyway.¹⁸

Those who had to maintain the legally imposed discipline of mourning attire would order appropriate types of black materials and accessories, either in person or through intermediaries. A complete and detailed form of appropriate clothing for the time of mourning was established; black clothes were rented out or debt was incurred in order to meet those requirements. A grossly inappropriate public appearance in incomplete mourning attire could result in accusations of misconduct and causing offense.¹⁹

Having said that, at the time black silk fabrics were not reserved only for the periods of mourning. In the preserved portraits we can see examples of black dresses (Fig. 3), accompanied by accessories that would contradict their mourning style, including rich, cream lace and white gloves. Black silks or woolen fabrics were also considered very practical materials in men's clothing (see: Fig. 4).

It should also be noted that eighteenth-century European fashion focused heavily on accessories such as sashes, trims, openwork fabrics, and other materials that allowed milliners to imaginatively decorate women's outfits.²⁰ These elements also came in black. As a side note, it is worth mentioning that chiffon and lace constituted

3. Portrait of Anna Teofila Potocka, née Sapiaha, wearing a dress made of uniformly black silk fabric (presumably satin), Marcello Bacciarelli, ca. 1780–1783. The Royal Łazienki Museum in Warsaw, Accession Number ŁKR 118, <<https://www.lazienki-krolewskie.pl/pl/katalog/obiekty/lkr-118-2>> (as of 29 January 2022)

4. Men's caftan (with waistcoat and shorts) made of black taffeta, England, mid-eighteenth century, Metropolitan Museum of Art., Accession Number: 2011.104a-c, <<https://www.metmuseum.org/art/collection/search/162899>> (as of 29 January 2022)

18 Ibidem.

19 Ibidem, pp. 110–112.

20 P.K. Faryś, *Jedwabne tkaniny odzieżowe 1700–1800. Francja, Anglia, Włochy. Produkcja, wzornictwo, handel*, Poznań 2021, p. 129.



5. Page from a catalogue of fabric samples by French manufactories from 1737. Sample No. 1945 is a plain black silk fabric (presumably satin), while sample No. 1941 has a black background and a colourful pattern. Bibliothèque Nationale de France – Gallica, <<https://gallica.bnf.fr/ark:/12148/btv1b69361019.r=soie%201737?rk=64378;0>> (as of 29 January 2022)

6. Page from a catalogue of fabric samples by French manufactories from 1735. Sample No. 1061 (at the bottom of the page) is a patterned silk fabric with a colourful pattern woven on a black background (the background is probably a satin weave). National Library of France – Gallica, <<https://gallica.bnf.fr/ark:/12148/btv1b69359611?rk=472105;2>> (as of 29 January 2022)



a separate group of accessories. Black chiffon or lace shawls, which were combined with dresses, were also highly fashionable.²¹

Silks with patterns based on the colour black and on other dark colours

In their craftsmanship, eighteenth-century designers of patterns for silk fabrics, or pattern makers, experimented with new compositions, weaving structures, and the shaping of individual pattern elements. They also worked on colour combinations. The appropriate selection of colours brought out the complex spectrum of aesthetic features of the designed compositions.²² Black backgrounds gave pattern designers a new space of opportunity to achieve original ornamentation. An interesting group are compositions with a very limited colour palette, placed on uniformly black backgrounds. Flat or lightly shaded floral patterns with subdued hues of just two or three colours give the impression of being lightly superimposed against a black background. Thanks to the premeditated colour structure of the designs, the background appears to shine through the pattern. This type of silk went on sale, as exemplified by trade samples of textiles from French factories from the year 1735 (see: **Fig. 5**, sample No. 1941; **Fig. 6**, Sample No. 1061), among others.

Dark backgrounds were also selected for ornaments that were richer in structure and colour. Navy blue, purple, and black shades robustly enhanced multicoloured fabrics. Both broaching and flashing with coloured yarns produced excellent results

21 Example: Jean-Étienne Liotard, portrait of Louise d'Épinay, ca. 1759, Musée d'art et d'histoire de Genève, <https://www.flickr.com/photos/m_strasser/27003344687> (as of 14 October 2023).

22 P.K. Faryś, *Jedwabne tkaniny odzieżowe*, pp. 66–105.



against the darkest backgrounds. The compositions were also enriched with pseudo-damask patterns in the colour of the background, obtained using the *liseré* technique or the damask technique (also in the colour of the background) (see: Fig. 7). One can assume that such richly coloured materials with dark backgrounds would be more expensive than those with light, for example cream, backgrounds. This would be linked to a larger amount of dyes needed when dyeing silk yarns.

The preserved examples also include patterned silks with monochromatic ornaments. The collection of the Metropolitan Museum of Art includes a fabric designed by combining several shades of the basic colour - in this case, brown (see: Fig. 8). Beginning with the background, individual elements of the woven pattern were formed by shading brown yarns of various hues - from beige, to chocolate shade of brown, to nearly black, even. New York experts tentatively date this fabric to the beginning of the eighteenth century. The composition might suggest that the fabric was woven in the 1730s. Without a doubt, the gore of the fabric is very interesting. It documents the work of pattern-design artists at the time, showcasing the way they obtained artistic effects on silk, also using a dark, monochromatic colour palette. In Polish silk factories, we also find examples of fabrics in which dark colours (either black or brown) dominated the composition (see: Fig. 9).

General condition of preservation of black silk fabric

Very few plain silk fabrics from the eighteenth century have survived. Plain taffeta or plain satin are rare today. Even if they have been preserved to our times, they are notoriously difficult to date. In the group of the surviving textiles, solid black fabrics are the least common. Although we can employ the analysis of dyes, fabric thicknesses, and widths, or preserved selvages to our aid, still in many cases there remains high uncertainty in dating.²³ The lack of pattern makes dating difficult indeed. Furthermore, the state of preservation of the textiles was also influenced

7. A gore of patterned silk fabric in the style of Jean Revel. The multicoloured pattern is laid out against a very dark background (probably navy blue or black), France, 1735–1740. Metropolitan Museum of Art, Accession Number: 33.156, <<https://www.metmuseum.org/art/collection/search/222979>> (as of 29 January 2022)

8. An example of a silk fabric with a pattern woven using dark brown yarns. The fabric was designed to shade a nearly monochromatic pattern using several shades of brown, from light to almost black, France, Tours (?), early eighteenth century, Metropolitan Museum of Art, Accession Number: 33.49.2, <<https://www.metmuseum.org/art/collection/search/222691>> (as of 29 January 2022)

9. Fragment of a *kontusz* sash woven using black or dark brown yarns, Poland, eighteenth century, Metropolitan Museum of Art, Accession Number: 09.50.1126, <<https://www.metmuseum.org/art/collection/search/216295>> (as of 29 January 2022)

23 For example: a plain fabric dyed with natural dyes (rather than synthetic dyes) with a width between 55 and 65 cm can be dated to either the eighteenth century or the first half of the nineteenth century - especially if the material was woven on a traditional, manual loom. Looms of this type were still used in the first half of the nineteenth century.

by the factors of the dyeing process and the aging characteristics of both the raw material and the black colouring preserved within it.

Natural dyes are considered more durable than many synthetic dyes, the industrial usage of which has been increasingly common since the 1870s and 1880s.²⁴ Nevertheless, they also fade over time. The passage of time, which has a destructive effect on both silk and the colouring, is less visible on light colours than on dark ones. Natural silk is a fibre with low resistance to insolation (to light).²⁵ The impact of rays of light leads to the aging of the fibre over time. Thus the fibre loses its mechanical strength (for example, resistance to friction or to stretching); in addition, it turns yellow, which also affects the quality of the colour embedded in the fibre.

Based on the fundamentals of optics, we are reminded that dark colours, especially black, absorb more light rays falling on the surface than they reflect. Greater light absorption for black compared to lighter colours may (along with other factors) lead to faster physicochemical degradation of the fibre material and dye molecules. This is manifested, among others, by fading or yellowing of the fibre and a reduction in strength parameters.²⁶

Therefore, black materials could wear out faster, especially if we are talking about clothes that were used quite intensively. Black was certainly practical because it masked the progressive soiling of clothes, which became visible more slowly on dark clothes.

The black dyeing process, which was quite aggressive for silk fibres, could have had a negative impact on their durability. This issue is described in more detail later in the article. Natural black dyes were difficult to obtain, and many different methods have been used over the centuries for the purpose. In addition to charring animal bones or obtaining black pigments from nuts of specific trees, cherry, apricot and peach pits were also charred. Sometimes the dyeing process was carried out in two stages, especially when the desired effect was to obtain a deep black hue. The materials, yarns or fibres were pre-dyed in a dark colour - navy blue or purple - and then, in the second dyeing process, black pigments were added to obtain the ultimate shade of black.²⁷ The so-called *gallas* was also used, which was a growth (formed as a result of the feeding by females of specific insects) on the leaves of an oak species growing in India and the Levant. As a result of processing these growths, natural dark dyes were obtained - in a spectrum from brown to black.²⁸

Respective composition of different colours to obtain the colour black has been used for centuries. Often, the black hue fixed in the silk fibre contained dyes such as indigo, madder, tannins, and iron compounds.²⁹

24 P.K. Faryś, *Konfekcja damska 1800–1914. Produkcja, wzornictwo, handel*, Warszawa 2019, pp. 70–74.

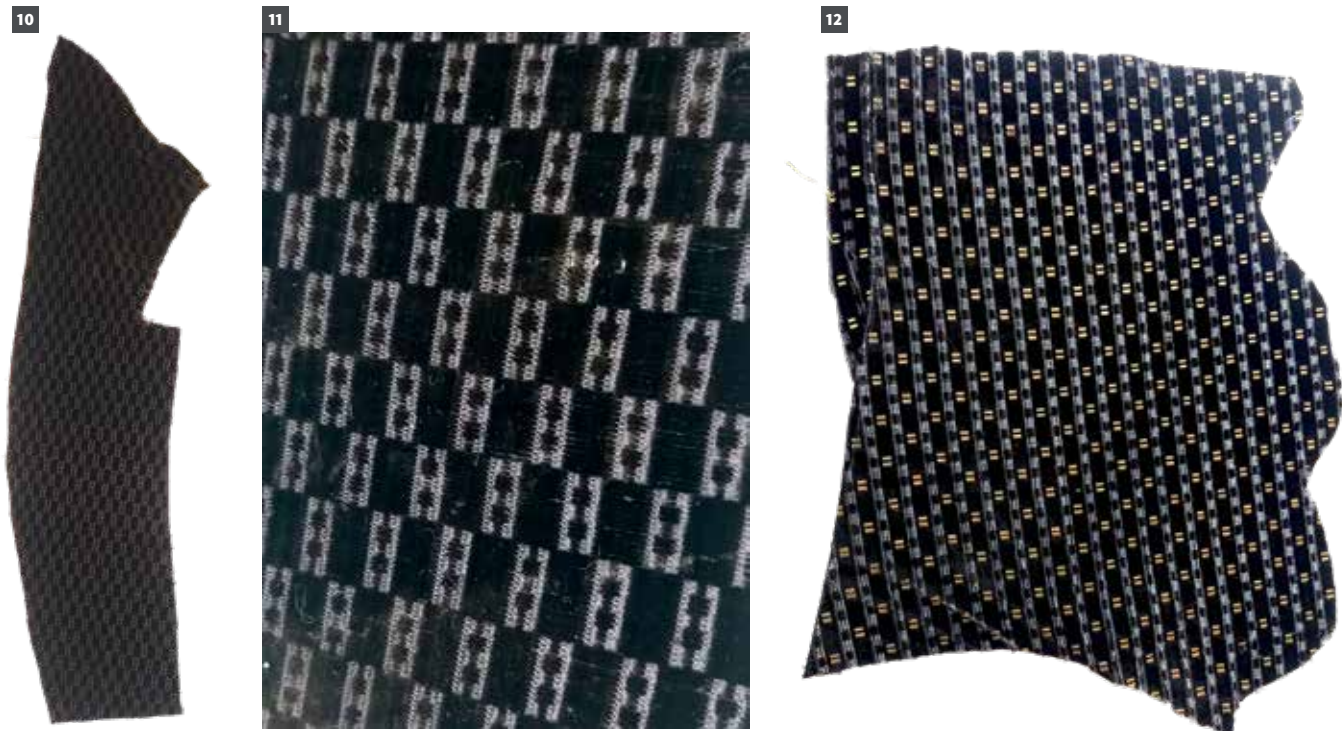
25 Insolation resistance of fibres (resistance to light) – physico-chemical resistance of fibres made of a specific polymer (either natural or chemical) to the action of light rays.

26 The basic strength parameters include tensile strength, bending strength, friction strength and tear strength.

27 L. Broecke (ed.), *Cennino Cennini's "Il Libro dell'Arte": A New English Translation and Commentary with Italian Transcription*, Archetype 2015, p. 60; W. Cranshaw, *Garden Insects of North America*, Princeton 2004.

28 E. Kowecka, *Farbiarstwo tekstylne*, p. 22.

29 J. Hofenk de Graaff, *The Colourful Past*, p. 287.



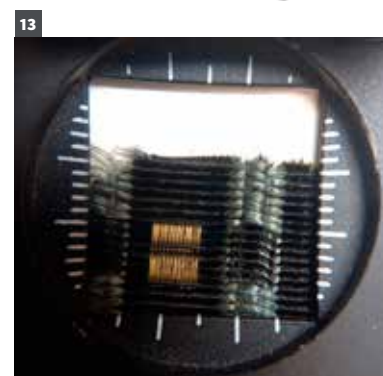
Since the seventeenth century, silks dyed in black often reveal an attempt to increase the weight of the fibre while dyeing it black. The direct use of indigo and madder was replaced by the use of galls (which increased the weight of silk fibres³⁰ and dyed them black together with iron salts) with the addition of indigo or iron compounds.

Analysis of examples of eighteenth-century black silk fabrics, and of textiles with black elements

Only a few examples of plain black fabrics from the eighteenth century have survived in the collections of the National Museum in Kraków. One of those is black sheared velvet from the second half of that century, with a design in the form of rectangles arranged in a checkerboard pattern.³¹ The cut of the preserved fragment could have been intended for a sleeve of a presumably male costume (see: **Fig. 10, 11**). It is believed that velvets were often dyed in dark colours – including black. Their structure, specifically their fibre cover, were well suited to the aesthetics of black hue.

Another example is also a piece of patterned sheared velvet.³² The black fibre cover which produces the stripes was composed with lighter belts woven with long interlacing of blue-gray yarns. Yellow accents appear in a checkerboard pattern against the background of black stripes (see: **Fig. 12, 13**).

The condition of both fabrics is very good. It is possible that they were never used or were cut out as the best preserved elements in the clothing. The black fibre cover has been preserved in a very good condition. There has been no



10, 11. Black patterned silk velvet and its fragment showing details of geometric pattern, France, ca. 1750–1800. National Museum in Kraków, Accession Number MNK1508. Photo by Joanna Regina Kowalska, MNK

12, 13. Patterned silk velvet and its fragment showing details of the geometric arrangement, France, ca. 1750–1800. National Museum in Kraków, Accession Number MNK1548. Photo by Joanna Regina Kowalska, MNK

³⁰ The importance of increasing the weight of silk fibres in the dyeing process will be discussed later in the article.

³¹ National Museum in Kraków, Textile and Clothing Collection (Muzeum Narodowe w Krakowie, Kolekcja Tkanin i Ubiorów, henceforth: MNK, KTU), Accession Number MNK1508.

³² Ibidem, Accession Number MNK1548.



14. Fragment of a patterned taffeta (broidered and weft-patterned), England, Spitalfields, ca. 1738–1742, presumed author of the pattern: Anna Maria Garthwaite (the pattern may also have been based on her designs from that time). Author's collection

the fabric, it will dominate the whole. Therefore, from the design perspective, black was introduced with great care and consideration. Generally, in specific parts of the composition, black was supposed to produce the impression of shadows and mid-tones, giving selected elements of the pattern depth and three-dimensionality. It could also constitute an outline for the pattern in order to obtain the impression of bringing it out against the secondary background.

In the eighteenth century (especially in the 1730s), colour black, much like dark shades of all colours (e.g., green, blue or brown), was introduced as shading in certain parts of patterns. New weaving techniques allowing for obtaining highly three-dimensional patterns required the use of a wide range of colour shades – from the lightest to the darkest. The silk clothing fabrics described below are interesting examples of the use of black in woven patterns.

The presented patterned silk taffeta (see: **Fig. 14**) was woven³³ in one of the English factories in Spitalfields at the turn of the 1730s and 1740s. The design of the pattern can most likely be attributed to Anna Maria Garthwaite. The collection of the Victoria and Albert Museum in London preserves a large collection of drawings of patterns by this British pattern designer, including several that are similar to the pattern on the described fabric.³⁴

The pattern was designed as divided into two spaces – shown on a flat plane, and strongly shaded, in order to produce a distinctly three-dimensional space. The diagonally oriented composition consists of foliage, woven mostly flat, with

abrasion or visible colour change due to fading.

Black was also used in patterned silk fabrics, where the patterns made using several colours, up to a dozen or so. Even very light fabrics sometimes had black elements. Typically, black hue was used sparingly. Eighteenth-century design artists realized that black was the end of the colour palette, whereas the depth of intensely dyed black could be aggressive and attract attention. Thus, the presence of this colour within the pattern will always be visible and, if it is too abundantly distributed across

33 Silk taffeta with a weft-broidered pattern (colourful flowers in the foreground, and secondary pistachio and cream-coloured sections filling the interiors of the green leaves) and a weft pattern (green sections of leaves, stems, and fruit of a plane tree in the background of the pattern).

34 In Anna Maria Garthwaite's designs from 1738–1742, similar patterns have been preserved. This similarity is particularly apparent in terms of: composition, colour combinations, and the design of leaves and flowers. A good example is a design from 1738, which uses identical shading, leaf arrangements, and the fruit of a plane tree, a species that is commonly found in English parks. Designs from 1740–1742 also feature very similar shading, colour combinations and the design of flowers, leaves and stems. C. Browne, *Silk Designs of the Eighteenth Century from the Victoria and Albert Museum*, London 1996, p. 39 (design no. 72), p. 50 (design no. 104 from ca. 1740).



a predominant use of one shade of green. This part of the composition was presented in a slightly simplified way, similar to a sketch, in which it is mainly the contour that shapes the character of the drawing,³⁵ placing it in the background. The foreground consists of blooming flowers, growing from the background thicket of leaves and twisting stems. Slightly oversized large flowers stand out against the cream backdrop and greenery in the background – not only because of the vivid colours, but above all thanks to the clear shading achieved with the application of black yarns. The black hue was very skilfully introduced into the flowers, by means of employing sharp boundaries between colours and black in specific parts, as well as through shading, achieved by interlocking black yarns with neighbouring yarns of a different colour (using the *points rentrés* weaving technique, very fashionable in the 1730s, also known as *berclé*). Sharp boundaries were introduced to separate individual flowers from each other, and shading (using the *points rentrés* technique) was intended to create the impression of penumbra modeling the three-dimensionality of the flower petals. The introduction of black yarns and their precise combination with other colours produced the impression of an almost real physicality of the flowers, giving them the semblance of mass and movement, and placing them in the foreground thanks to the play of light reflections (broidered with light yarns) as well as shadows and mid-tones (broidered with black yarns) (see: **Fig. 15**).

Without the use of black, it would not be possible to achieve all these effects, and the entire composition would become flat. The effect in the absence of black can be observed on the described piece of material, because some flowers have almost completely lost the parts originally embroidered with black yarns (see: **Fig. 16**).

The next object is a silk textile also from the 1730s, a broached and threaded lampasse with a satin background (see: **Fig. 17**). The perfectly preserved fabric

15. Fragment of the fabric from Fig. 14 – with colourful flowers, whose three-dimensionality was achieved mainly by means of shading with black yarns

16. A fragment of the fabric from Fig. 14 – with colourful flowers, in which the black yarns have almost completely worn away. As a result, the flowers have become difficult to discern, and they appear flat

35 The lighter fillings of some of the leaves were woven using cream yarns (acting as light reflections in the pattern) and pistachio-coloured yarns introduced very sparingly into selected parts of the leaves – constituting a colour transition between the green of the contours and the cream filling. The boundaries between individual colours run sharply, and they take the form of the so-called shading in the form of shallow or deep depressions of neighbouring multicoloured yarns (as part of the *points rentrés* weaving technique, also known as *berclé*). Typically, this procedure allowed for obtaining highly pronounced three-dimensional patterns, however, in this instance the use of light colours (cream yarns) and similar colours together (green with pistachio) as well as sparing use of shading in favour of the predominance of sharp, contoured boundaries between colours allowed for maintaining the impression of a flat sketch. In several places, black yarns were used on the leaves. Through the application of shading, they produce the impression of shadows cast by multicoloured flowers on the leaves.



17. Fragment of a lampas-se fabric length, France/England, ca. 1735. Author's collection



18. Section of the fabric from Fig. 17 with visible black yarns padding a fragment of the floral pattern

length³⁶ invites observation of the bright palette of colours used and the structural details of the pattern. Large exotic flowers with massive stems and leaves are woven on a blue satin weave background. The green parts are intensively shaded (using the *points rentrés* technique) with three shades of green (from the lightest and brightest to the most subdued and dark). Black yarns were also used, albeit they were introduced sparingly into selected parts of the leaves. Their shading has been so meticulously, graphically planned that it resembles the shading used in sixteenth- and seventeenth-century Brussels tapestries.³⁷ Colour black is also present in blooming flowers, whose petals are arranged in the form of a jagged fan. This part of the pattern is strongly accentuated by the use of black hue. Analysis of the composition of this fabric shows that it is largely based on colour contrasts, where, next to black and saturated green, very bright and intense, more vibrant colours are present. This produces the impression that black not only facilitates modelling three-dimensionality of specific parts of the pattern, but it also constitutes a kind of plastic *confluence* between the intense blue of the background and the bright colour palette of the pattern. This is especially visible on the threshold between the blooming flower bud and the black zone of growing petals in the form of a plume. Originally, the brocade flower bud was gold-plated (now traces of the gold-plating remain, although most of it has been worn off or darkened by oxidation). The gold-plated glitter certainly shone brightly against the black background. In turn, the black surrounded by the glitter would have appeared even deeper (see: Fig. 18).

The following five fabrics (see: Fig. 19–24) are examples of partially contouring selected fragments of a multi-coloured pattern with black in order to highlight them against a patterned background. If, at the design stage or during tests on the loom,³⁸ the pattern designer decided that it was necessary to colour-separate spe-

36 Fabric length – a term for fabric together with selvages, or technical edges of the material. A length is the full width of the fabric. Among other things, it facilitates tracing the composition of the pattern laid out across the entire width of the material.

37 The presented piece of fabric is a good example of textiles in the style of the French pattern maker Jean Revel, who at the turn of the 1720s and 1730s made famous the new technique of shading the patterns on clothing fabrics (a weaving technique called *points rentrés* or *berclé*), derived from tapestry-making techniques. It is not certain whether Revel was the first to introduce the new technique of shading patterns to the market, because at that time English pattern makers were also working on obtaining three-dimensional patterns. P.K. Faryś, *Jedwabne tkaniny odzieżowe*, pp. 148, 152, 154.

38 Loom tests were performed to check all the details of the new design. The aim was to test how the new pattern was woven, and whether there were any technical errors in the design. It also facilitated observing how the finished material would look. It is possible that the approved tests

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cific parts of the pattern from the patterned or smooth background, then colour or texture-colour treatments were used to visually divide the entire composition into individual planes. Contouring (of the entire pattern or a part thereof) using black or very dark yarns worked well, among other reasons because black hues would fit perfectly among the various colours of both the background and the pattern itself.

Thanks to the aptly selected line and arrangement of contours, they became artistically integrated with the pattern's elements - indeed, they became fragments of the contoured pattern. The adopted solution eliminated the risk of losing the naturalistic character of the composition and prevented flattening of the pattern.

Further fabrics, originating from the same period, feature partial contouring of the colourful pattern with black yarns. Several small fragments of silk fabrics with black highlights within a colourful pattern have been preserved in the collections of the National Museum in Kraków.³⁹ It is difficult to determine whether they have been used to the extent that would lead to visible signs of material wear. Two pieces of fabric (see: **Fig. 21, 23, 24**) were used to craft a chasuble.⁴⁰

The third fragment (see: **Fig. 22**) shows traces of wear (namely, a significant number of silver stitches that originally tightly covered the background of the fabric have been worn away). The black and coloured pattern yarns did not wear out. Two factors related to the construction of this fabric could have influenced this remarkably good state of preservation of the yarns broaching the pattern: the elevation of some parts of the pattern and short interlacing of coloured threads. In the first instance, the point is that the emphasis on large parts of the pattern meant that they were most exposed to friction during use. The retracted fabric decorations were then subject to weaker friction. Short interlacing of black yarns means that they only cover fragments of the fabric to a limited extent. This, in turn, could make the yarns less prone to wearing.

Another textile from the Kraków collection is an interesting example of silk fabric on which black yarns formed the foreground pattern and were later almost completely wiped out (see: **Fig. 25**).⁴¹ Large expanses of black originally covered selected parts of the background and filled floral compositions (these were long interlaces of black warps that were introduced into the fabric as a second system

19. Fragment of a patterned taffeta showing fragmentary contouring of the woven floral pattern with black silk yarns to visually highlight the colourful pattern against the striped background, France, ca. 1765–1775. Author's collection

20. Fragment of a patterned taffeta from the 1770s with a pattern partially woven with black yarns. The use of black was intended to visually separate the foreground pattern from the striped background. Author's collection

were sent to the internal library of the manufactory and were used as catalogue samples. Based on the latter, merchants could collect orders, which were then fulfilled by the manufactories.

³⁹ MNK, KTU, Accession Numbers MNK1298, MNK1224, MNK1263.

⁴⁰ This was determined based on the shape of the fabric cut, which is typical for the side panels in chasubles.

⁴¹ MNK, KTU, Accession Number MNK1552.

of warps, probably intertwining with the main wefts in the satin weave order). As a result, a black satin background was obtained, which was composed in such a way that in some places it turned into pseudo-damask, highlighting subtle patterns. Remains of black warps survived only where trimmings were sewn on, under which the yarns could be preserved. It is worth noting that the black has worn off almost completely, but the creamy yarns of the plant patterns are still visible in many places.



21. Silk fabric with a brocade and *lisère* pattern, France, ca. 1760–1770. National Museum in Kraków, Accession Number MNK1298. Photo by Joanna Regina Kowalska, MNK

22. Silk brocade fabric with a brodered pattern, Prussia, late eighteenth century. National Museum in Kraków, Accession Number MNK1224. Photo by Joanna Regina Kowalska, MNK

23, 24. The right and wrong side of a patterned taffeta with a brodered pattern. On the wrong side, black yarns are visible, outlining selected parts of the floral pattern, France, ca. 1760–1780. National Museum in Kraków, inventory number MNK1263. Photo by Joanna Regina Kowalska, MNK

25. Fragment of a patterned silk fabric used to sew a church cape. Originally, the fabric was largely covered with black yarns, France, eighteenth century. National Museum in Kraków, Accession Number MNK 1552. Photo by Joanna Regina Kowalska, MNK



Brown in lieu of black in design

The search for examples of silk clothing fabrics with black yarns in the collections of the National Museum in Warsaw was unsuccessful. Namely, no textile therein was identified as having black yarns. Instead, a group of several fabrics (about eight) was selected, with fragments of patterns made of yarns that were dyed in very dark brown. In some of these textiles, the browns were so dark that without magnification the colour indeed appeared black.

Browns that look confusingly like black were probably introduced for several reasons. One of those could be the issue of limited access to black yarns (including their higher price).⁴² It is possible that black yarns were more difficult to work with. The production of structurally complex silk clothing fabrics depended not only on the design, but also on the weaver's skills and the technical capabilities of the loom. Eighteenth-century pattern makers, knowledgeable about looms, pointed to many technical factors influencing the quality of weaving silk fabrics, including skillful work with yarns (both basic yarns and pattern yarns). They were well aware of the effects of incorrect selection of yarns for a specific loom and type of fabric.⁴³ There was also an aesthetic aspect to consider. Richly coloured ornamentation would not typically be dominated by black (unless this was clearly the artistic intention). Therefore, good composition featuring colour black required great design skill. The use of dark browns could be a compromise solution, at least for some projects. In this way, the result that was very close to black would be achieved.

An interesting use of brown instead of black can be observed in two fabrics from the collections of the National Museum in Warsaw (see: Fig. 26, 27).⁴⁴ Both of those were decorated with patterns in the style of Jean Revel, that was particularly fashionable in the 1730s. In both cases we are dealing with very dark browns that without closer observation could be considered black. The pursuit of a three-dimensional effect required clear shading with very dark or black yarns.

When analyzing these fabrics, one may have doubts whether the yarns were indeed originally black. We need to remind ourselves that natural silk fibre has low resistance to light (so-called insolation resistance).⁴⁵ Aging fibre, especially as a result of exposure to light, reacts not only by deterioration of strength parameters, but also by yellowing. A change in the colour of the fibre may result in



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26. Fragment of silk fabric with a pattern in the style of Jean Revel, France, ca. 1735. National Museum in Warsaw, Accession Number SZT135MNW, <<https://cyfrowe.mnw.art.pl/pl/katalog/460664>> (as of 27 January 2023)

27. Fragment of silk fabric with a pattern in the style of Jean Revel, France, ca. 1735. National Museum in Warsaw, Accession Number SZT131MNW, <<https://cyfrowe.mnw.art.pl/pl/katalog/460642>> (as of 27 January 2023)

42 The higher price of silk yarns dyed black colour could result from the need to use a larger amount of natural dyes capable of dyeing the silk in this colour.

43 P.K. Faryś, *Jedwabne tkaniny odzieżowe*, pp. 36–51.

44 National Museum in Warsaw, Textile Collection, Accession Number SZT135MNW, SZT131MNW.

45 A. Jeziorny, B. Lipp-Symonowicz, *Nauka o włóknie – laboratorium*, Łódź 1980.

a change in the overall hue. Yellowing combined with black dye can change the intensity of black, bringing it closer to dark brown. This issue is worth exploring, especially by chemists or textile conservators. Based on the organoleptic, sensory assessment, the author is unable to unequivocally determine whether black or dark brown yarns were originally used in the fabrics described.

Colour black in the context of mechanical resistance of coloured yarns

When analyzing the fabrics indicated in the article in terms of the influence of dyeing on the strength of the yarns used in the woven patterns, it is immediately discernible that parts of the patterns created using black yarns are sometimes in worse condition than the remaining fragments of coloured patterns. In some of the fabrics shown in the article, it is clearly visible that the black yarns suffered the greatest deterioration. Possible individual errors in the fibre dyeing process should be excluded by conducting an extremely aggressive dye bath (of fibres or ready-made yarns) in the process of dyeing to colour black, as these materials come from various decades of the eighteenth century. They were probably woven in different silk factories, based on different designs. Furthermore, they also applied yarns with different physical characteristics (e.g., linear mass density, which affects the thickness of the yarn).⁴⁶ Therefore, we must exclude a one-off error in the technological process resulting in a reduction in the strength of the black yarns used in the analyzed materials.

Moreover, in the assessment of the lower durability of black yarns, it should be noted that all the quoted examples concern patterns woven using the weft broidering technique using multi-coloured yarns. All or most of the patterns in the fabrics were made using the same weaving technique. Additionally, in the analyzed fabrics, very thin figured warps whose function is to weave on the right side of the fabric in a specific weave with broidered threads,⁴⁷ run in the very same way on black yarns and on yarns in other colours (this is clearly visible in Fig. 15 and 18). There are no differences in the weaves of figured warps – between those with black wefts and with other coloured wefts broidering the patterns. This state of affairs excludes different treatment (in the weaving process) of black yarns compared to yarns of other colours, which could affect durability. We might also consider whether black yarns are sometimes thicker than the other broidering threads. If this is so, then the lower strength of black threads could be at least partially attributed to the fact that fragments of patterns woven using these threads are raised above the surface of the remaining threads weaving the pattern. Then, the elements that are raised the highest in the fabric may be more exposed and prone to faster abrasion than the threads embedded deeper in the fabric. However, this is not the case. The black threads, according to a visual assessment also made using a magnifying glass with a tenfold magnification, are not raised above the pattern.

46 Conclusions were drawn based on visual evaluation of black yarns on the described silk fabrics.

47 Figured warps were used in fabrics with complex warp and weft systems. They were to intertwine with the broidering wefts – creating a weaving pattern on the fabric surface (either monochromatic or multi-coloured). The figured warps were intentionally very thin so that when intertwined with the thicker broidering wefts, they would not dominate them. They were meant to “attach” the broidering wefts to the fabric, as the former were typically introduced during broidering as part of long weft covers (without the figured warps, they would be too loosely arranged on the fabric surface).

We can also observe that the shorter the interlacing of black threads, the better their condition. By comparing the longer weft interlaces visible in Figures 15, 18 and 25 with the short ones visible in Figures 19–24, used as dark contours of a multi-coloured pattern, it can be concluded that the length of the weft coverings affects durability.

There are more examples of variables interfering with the results, and such variables will always occur, especially when we are talking about objects of material culture, for which metric tests are very limited and sometimes even impossible due to their invasiveness in relation to the examined object.

However, this does not change the fact that based on simple but detailed non-invasive organoleptic, sensory assessments, conducted on a collection of sample fabrics from different decades, it is feasible to draw conclusions that will at least indicate certain noticeable regularities that may constitute the basis for further, in-depth work on durability of yarns dyed in different colours. As the examples of several fabrics described above already show us, to a large extent, regardless of the pattern composition, the black yarns used to weave the patterns show reduced mechanical strength. The black, woven fragments of the patterns were preserved in worse condition than those with lighter colours.

It can therefore be concluded that the reduced durability of black yarns used in woven patterns of eighteenth-century silk fabrics may be due to a particularly aggressive process of dyeing the fibres black. It was not at all an easy task to obtain good quality, deep black hues. It was probably not only the mixture of various natural dyes that burdened the silk fibre. Also, the longer dyeing process, necessary to obtain satisfactory colour intensity, had a negative impact on the textile.

Historians indicate that in the eighteenth century, as well as before then, the specific characteristics of silk dyeing process led to the weakening of the fibre – and that was particularly true of colour black. Namely, during the degumming process (aimed at dissolving the sericin which glues together two fibroin fibres of raw silk), the silk fibre loses up to 30 percent of its original mass (of when the fibre was in its raw state). The dyeing process increased the weight of the fibre, which was highly desirable considering that textile raw materials (including fibres) were traded in units of weight. Single or repeated dyeing increased the weight by about 30 percent, but dyeing the silk black three or more times could increase the weight of the fibre by up to 50 percent compared to the weight of the soupled, undyed silk. While dyeing with lighter colours, even repeated several times, did not have such a strong effect on the fibre, repeated dyeing of silk in a deep shade of black – in order to obtain not only the right colour, but also the right weight – resulted in the weakening of the fibre. Attempts were made to condemn such practices in city regulations to protect the quality of the goods.⁴⁸

However, excessive loading of silk dyed black (as well as in other colours) as a way of obtaining more and more weight did not stop. With the progressive industrialization of textile manufacturing, new dyeing techniques were introduced, thanks to which it was possible to increase the fibre's weight more than twofold. This resulted in the low durability of clothing materials intensively dyed in darker colours.⁴⁹

48 J. Hofenk de Graaff, *The Colourful Past*, pp. 286–287.

49 *Ibidem*.

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28, 29. An example of a fabric with a shaded pattern using black silk yarns. It is apparent that only the black yarns have been almost completely worn away (sections of the pattern originally shaded in black are marked with red arrows on Fig. 29), while yarns in other colours have been preserved. Lampasse, France, ca. 1735. Author's collection

The durability of black yarns in silk clothing fabrics from the eighteenth century depended on several fundamental factors. Chemists will say that the dyeing process is crucial in this respect. Spinners will emphasize that the type of yarn and the quality of its production will translate into deterioration or improvement of the strength parameters of the fibres. According to the weavers, apart from dyeing, the structure of the weave by which black yarns were introduced into the fabric is also important. Pattern designers will add that the appropriate pattern composition is also a significant factor. The clothing designer will focus on the functional aspects of clothing made of fabric, as well as the conditions and intensity of use. The historian will mention the passage of time, which is destructive to all products of human hands. They will all be right. The factors mentioned above all impacted the condition of the textiles, including the black yarns that were used to make the entire silk fabric or some sections of its pattern.

To sum up, we should indicate that the quality of the raw material is the most important basis for further work. It is the silk, its quality and reliability during the dyeing process, that will have a significant impact on the durability of the fibres in the textile product. Other aspects related to the structure of the material, the method and intensity of its use, as well as the age of the object are very important, nevertheless, they constitute a secondary set of factors influencing the durability of the yarns in the finished product.

Summary

The eighteenth-century silk industry continued the centuries-old tradition of producing uniformly black fabrics, used for mourning purposes, among other things. Black silk taffeta, black satins, damasks and gauze were also used to produce clothes of everyday use. Colour black was a very important addition to women's clothing made of lighter fabrics.

A separate issue were multi-coloured patterns designed for silk clothing fabrics. If the pattern concept required it, black yarns were introduced in specific sections of the fabric. Typically, the idea was to shade a colourful pattern to give it a three-dimensional impression, or to contour it.

The state of preservation of black yarns in some eighteenth-century silk fabrics is worse than that of neighbouring yarns dyed in lighter hues. This may be due to the more aggressive method of dyeing silk black compared to other colours. The fibres weakened, especially when the goal was to increase their weight rather than merely to dye them black. The structure of the fabrics and the question of whether and how they were used are also important, which in turn is reflected in their state of preservation.

Among the clothing fabrics analyzed that could have been used for mourning attire, there is only one, from the collection of the National Museum in Krakow (Fig. 10–11). The patterned black velvet could also be part of the everyday attire of a men's or women's caraco. Other multi-coloured silk fabrics with the addition of black yarns are examples of clothing materials, which remained fashionable

for many decades, and from which various women's clothes were made; sometimes men's as well (vests, home clothes – this applies to fabrics from Fig. 12, 13, 22, 26–29).

The history of black in the production of clothing materials is interesting. Over the centuries, the fascination with black came in waves; it followed a sinusoidal curve. The highest amplitude occurred in the sixteenth and seventeenth centuries (in selected European countries). Black was balanced with light colours in the eighteenth century, and the renewed interest in this colour (especially in men's fashion) began at the turn of the eighteenth and nineteenth centuries⁵⁰ – and it continues, with varying intensity, to this day. It was a considerable challenge to obtain uniformly black materials in the centuries before machine production and the use of synthetic dyes. The lack of direct natural colouring substances for a deep shade of black required the use of appropriate dye compositions and recipes. This increased both the difficulty of the dyeing process and its cost.

This state of affairs may also affect conservation work. Fabrics with black yarns (especially those used in patterns) with visible traces of losses in the black parts must be more robustly protected against external factors, which could further worsen the condition of the fabric.

The value of black turns out to be highly universal in the history of art and the history of crafts. Designers used this colour (or rather, optically, the lack of colour) in monochromatic silk products as well as to highlight selected batches of multi-coloured patterns. The loss of black yarns means not only physical damage to the material, but also (or perhaps above all) the loss of expression of the entire pattern composition.

Abstract

Colour black in eighteenth-century silk clothing fabrics' design: Aesthetic value and durability issues of black yarns

The article concerns the use of colour black in multi-coloured patterns of silk clothing fabrics in the eighteenth century, and the state of preservation of black-coloured fragments of the patterns. Using colour black in multi-coloured compositions would introduce three-dimensionality and depth to the patterns. Both contrasts and sharp contours were built using colour black. Unfortunately, in many known surviving examples of silk fabrics, where the fragments of patterns were woven with black yarns, deterioration is more visible than in other fragments of the patterns, woven with yarns of other colours. The deterioration process of black yarns significantly and negatively affects the aesthetic value of multi-coloured patterns. Thus, it is extremely important to protect silk fabrics against external factors that would lead to further deterioration of black yarns. The analysis of black silk yarns was conducted using the examples of fabrics from the collections of the National Museum in Kraków, the National Museum in Warsaw, and the collection of the author of the article.

KEYWORDS:

black colour in the design of silk clothing fabrics, black colour in fashion, eighteenth-century fashion, black yarns, fabric conservation

⁵⁰ E. Kowecka, *Farbiarstwo tekstylne*, p. 15.

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