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## OUTFITS OF ORE MINERS AT THE TURN OF MIDDLE AGES AND THE RENAISSANCE – REMARKS FROM SILESIAN PERSPECTIVE

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*historic mining, ore-mining,  
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Iconographic sources were reviewed to describe outfits of European ore-miners of the turn of the 15<sup>th</sup> and 16<sup>th</sup> centuries. Two fundamentally different types of these costumes were characterized. In the German cultural environment clothes worn on everyday basis were widely used in underground work. Miners from the area of today's Czech Republic (Kutna Hora) and Poland (Olkusz) used standardized mining uniforms.

### 1. Introduction

Research activities in various disciplines of science are connected to the popularization of research results. This is also true in the case of the history of mining. An attractive tool in this case is reconstruction of historic working methods of miners. Such actions are undertaken by the staff of the Institute of Mining and students of the Faculty of Geoengineering, Mining and Geology of Wrocław University of Technology (Poland). Presenting mining heritage (which is part of geoheritage) also serves to publicize the fundamental importance of mining to the development of civilization, both in the past centuries and today.

The object of our interest is ore mining, which has developed in the area today known as Lower Silesia (SW Poland) at the turn of Middle Ages and Renaissance (the last decades of the 15<sup>th</sup> century and the first years of the 16<sup>th</sup> century). During that period the first mining “boom” began in the area, associated with the working of a number of metals: gold, silver, copper, tin, lead, iron, etc. In dozens of places between the Jizera Mountains in the west, and the Zuckmantel area (Gluchołazy – Zlate Hory) in the east, big mining centers were created or re-established, but

numerous isolated tunnels were also dug (see Ciężkowski, 1989; Dziekoński, 1972; Mikoś et al., 2009).

Reconstructions (and demonstrations) of work methods, tools and equipment would be, however, incomplete without the presentation of miners' clothing. The main problem is the lack of sources showing Lower Silesian miners, hence the need to examine materials from other regions and interpolate results.

## 2. Background of Lower Silesian mining at the time

The socio-political situation of Silesia was at that time quite complicated. The legacy of the Polish reign (although it had stopped in the 14<sup>th</sup> century) was the division of this relatively small area into several separate principalities and heavy germanization, which was the result of long-term, intensive settlement under German law. About half a century earlier Hussite Wars (1419–1434) swept through the area.

The end of the 15<sup>th</sup> century was marked by trouble some political upheavals and military struggle for supremacy over Silesia. In 1471 Vladislaus Jagiellon and Matthias Corvinus began fighting for Silesia. Four years later, the latter became the ruler of the area, but its governor was Stefan Zápolya. High taxes and ruining of the economy caused an increase of anarchy, robberies were numerous. The lack of stable power yielded activity of so-called Raubritters (robber knights). In 1490 Vladislaus Jagiellon became the ruler of Silesia, but Silesian lords have not made him fealty for 20 years after that. During his reign anarchy was rampant, and internal struggles continued (including fights of Silesian princes and burghers against the bishopric) in the area, as it was also during the reign of Vladislaus son – Louis II. Upon the death of Louis Silesia, along with all Bohemia came under Habsburg rule.

Mining in the Lower Silesia region was developed between the largest and strongest centres of Central European mining: Krušné Hory/Erzgebirge (eg. Freiberg, Annaberg, Jachymov) to the west, Bohemian-Moravian Highlands to the south (Kutna Hora, Jihlava) and borderland of Silesian Highlands and Lesser Poland to the east (Olkusz, Bytom, Tarnowskie Góry).

The work of medieval miners involved the need of permanent movement. Deposits became exhausted quickly and mines were often damaged and destroyed (especially by flooding), so miners wandered in search of new places of work. They were also encouraged to do so by a gracious treatment by the rulers of various lands, who wished to increase their wealth by exploiting mineral resources (mainly metals). This trend had been intensifying since the 13<sup>th</sup> century, in the period of colonization under German law. Migrations of miners were multidirectional and the participants were both of Germanic and Slavonic origin. For example, professionals came to Kutna Hora from both the Europe's oldest mining areas (Rhineland, Westphalia, Wallonia and Tyrol) and from Poland, Pomerania, Meissen, Pilsen and Banská Štiavnica (Molenda, 1963). To Poland came mainly miners from Germany (Saxony), but also from Wallonia, France, Italy, Slovakia, Czech Republic and Hun-

gary, as well as from Lower Silesia (Mikoś et al., 2009, Molenda, 1963). Agricola (2000) wrote about “Germans settled in the Carpathians”, as well as about migrations of Italians to Germany. Information about the influx of miners is also known from the Lower Silesia. In the year 1483 Cistercians received a mining ordination for mines in Zloty Stok which was based on Kutná Hora and Jihlava law. The consequence of introduction of that particular law was bringing the miners from Kutná Hora, however in Zloty Stok settled also miners from Germany and Poland (Mikoś et al., 2009). In 1512 the first miners coming from the Czech Jachymov arrived at Gierczyn. Their names were Hans Wiese and Mathäus Söhnel (Staffa, 2003), what shows their German origins.

It seems that Lower Silesia, due to its location, received migrants from the west, the south and the east.

### 3. Sources of information

The basis for the comparisons made are diverse iconographic sources, in many cases showing miners of that time in great detail. These include the scenes presented on altars of churches in historic mining towns, pictures in books and other graphics. Iconographic materials are acceptable sources of historical information, which are used also in the study of the history of mining (Gille, 1967).

Changes in the technology of mining that took place in pre-modern era (the type of tools used, but also in clothing) were relatively slow. Therefore, the selected sources analyzed were created in a period slightly wider than the narrow time frame presented in the introduction.

Primary sources are:

– Kutná Hora Cantional dating back to 1490 (authors would like to thank Dr Eng Wojciech Preidl for sharing a photocopy) and Kutná Hora Gradual (Antiphonary) (1471) (*cantica...*, 2014) as well as other images of miners from that city: painting in the church of Saint Barbara (1493), city emblem (1462) (*Rudne a uranove...*, 2003) and a late medieval graphic – probably cover of one of Kutná Hora liturgical manuscript (see: *stavitele-catedral...*, 2013);

– the mining altar of Annaberg (1521), by Hans Hesse (*commons...*, 2014);

– Georgius Agricola’s work – from 1550, but based on observations from years 1527 to 1531 (Agricola, 2000),

– a fresco in the parish church in Olkusz (dated to 1592; Molenda, 1972).

As additional sources of information the illustrations of mining altars from Rožnava (1513) (*technologiaartis...*, 2013), Blühnbach near Salzburg (1500–1510) (*austria-forum...*, 2014) and Colle Isarco (northern Italy, 1510–1520) (*tarvos...*, 2014) were used. Interesting sources are also the mining panorama of Hausbuch von Schloss Wolfegg (1480) (*de.wikipedia.org...*, 2014) and 8 woodcuts of Heinrich Gross-Moller showing a Saint Nicolaes Silver Mine in La Sainte Croix-aux-Mines (Lorraine) (see: *archeologischepers...*, 2013). Worth mentioning source of infor-

mation about the iconography of mining was a web site Medieval and Renaissance Material Culture (larsdatter..., 2014).

Reconstruction of tools and other equipment, which were used by miners of that time is not difficult. Review of these sources shows that they were widely uniform. First of all, they included hammers and irons, ceramic and iron oil lamps, as well as vessels and wheelbarrows for ore transportation. A look at the clothes of miners leads to the conclusion that in Europe at that time there were two fundamentally different, types of clothing used for work underground.

#### 4. Clothes of European miners around Anno Domini 1500

Based on these sources, a diversity of mining clothes found in different cultures has been clearly identified in the analysed period. A distinctly different characteristics of Western dress (“Germanic”) and Slavonic can be presented, although some items of clothing are found in both cases (Zagożdżon & Zagożdżon, 2008).

Clothing used by miners from the area of present-day Germany and neighbouring countries, can be seen best in the work of Agricola and the altar by Hans Hesse in Annaberg. Details of the altars of Blühnbach, Colle Isarco, Rožnava (where a large group of miners were brought from Germany), as well as most of the Gross-Moller’s illustrations complete the picture. It can be concluded that the usual practice was to use clothes worn everyday for underground work. The basic components of this costume were linen shirts, typical doublets and leggings. These articles of clothing might have taken a simple form or be more fancy, both in terms of style and colour, as well as type of material used (fig. 1–3, 4A). Such diversity could indicate differences in wealth or susceptibility to influence of the nascent Renaissance fashion (Zagożdżon & Zagożdżon, 2008).

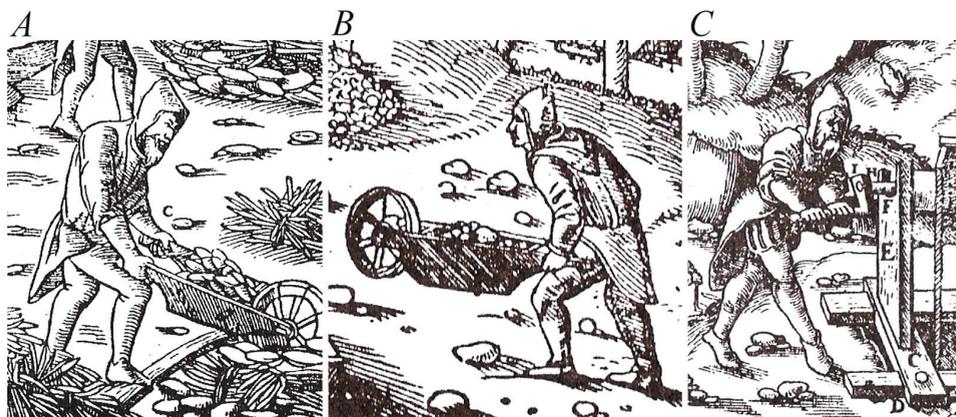


Fig. 1. Fragments of illustrations of Georgius Agricola’s work (2000); simple (A, B) and fancy “Western-style” clothes (C), mining leathers, men’s cap (B)

Ryc. 1. Fragmenty ilustracji z dzieła Georgiusa Agricoli (2000); proste (A, B) i fantazyjne (C) stroje „stylu zachodniego”, górnicza skóra i męski czepek (B)



Fig. 2. The details of the mining altar in Annaberg; hoods pulled out from under the doublets, men's caps and a turban, buttoned mining leathers, boots with "cow's mouth" and knee pads are well visible (commons..., 2014)

Ryc. 2. Detale ołtarza górniczego z Annabergu: kaptury wyciągane spod dubletów, męskie czepki i turban, skóra górnicza zapinana na guziki, buty – tzw. „krowie pyski” oraz nakolanniki (commons..., 2014)

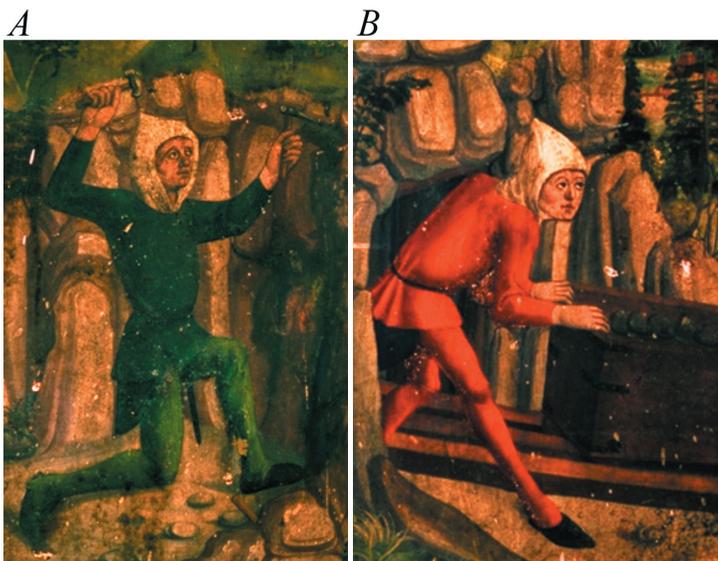


Fig. 3. Fragments of the altar in Colle Isarco; simple "Western-style" clothes, hoods pulled out from under the doublets and 16th century foot-wear (B) (tarvos..., 2014)

Ryc. 3. Fragmenty ołtarza górniczego z Colle Isarco: proste ubrania stylu zachodniego, kaptury wyciągane spod dubletów oraz ciżmy (B) (tarvos..., 2014)

An important modification of everyday clothes were hoods, sewn together with shirts and pulled out from under the doublet (figs 2–4). Miners were girded with narrow belts. The mining leathers – buttoned (fig. 2, 4B) or probably hanging on the belts (fig. 5A) – were widely used. Legs were protect by low shoes in a form compatible with current fashion – this could be 15th century foot-wear (figs 1, 3), or shoes with characteristic blunt “cow’s mouth” (fig. 2).

Quite a different style of mining dress was shown in a number of illustrations of Kutná Hora. The best and most detailed source (even showing underwear) is Kutná Hora Cantional (fig. 6). The miners working underground are dressed almost identically. The elements of their clothing are a large shirt (‘perkytle’ in Czech) with a hood, fastened with a belt, and brown or black leggings and low boots. Shirts could have breast pockets (fig. 7A, B). These miners did not use mining leathers. A similar suit is shown on the only known iconographic source from Poland – paintings in the chancel of the parish church in Olkusz (fig. 7C). It seems that we are dealing with, perhaps, the first European working uniform characteristic for a specific profession (Zagożdżon & Zagożdżon, 2008).

In the images discussed we find a wide range of other elements of clothing and items of everyday use. An interesting issue is various headgear. In the illustrations



Fig. 4. A: A fragment of the mining altar in Blühnbach; simple and fancy clothes, mining leathers, headgear clearly visible: hoods and a hairnet (austria-forum..., 2014); B: Details of the Rožnava mining altar; simple “Western-style” clothes and caps or mining shakos (technologiaartis..., 2013)

Ryc. 4. A Fragment ołtarza górniczego w Blühnbach; ubranie proste i fantazyjne, skóry górnicze oraz nakrycia głowy: kaptury i siatka na włosy (austria-forum..., 2014); B Detale rožnavskiego ołtarza górniczego; proste ubrania stylu zachodniego oraz czapki i czaka (technologiaartis..., 2013)

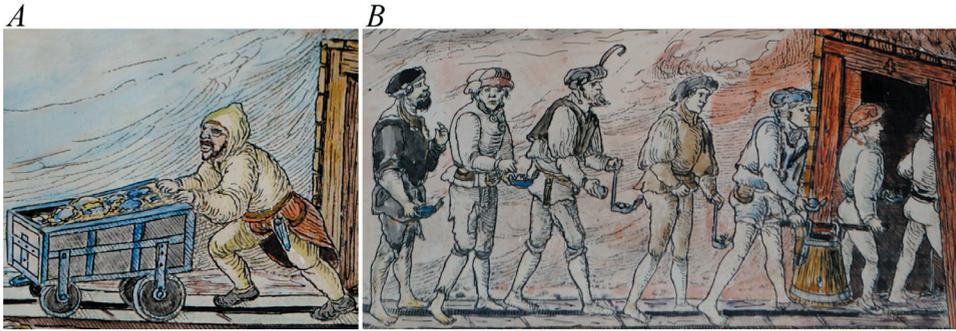


Fig. 5. Fragments of the Gross-Moller woodcuts (La Sainte Croix-aux-Mines); simple clothes with mining leather hanging on a narrow belt (as on most of illustrations) (A) and a group of miners in fancy caps – some of them barefoot (B) (reproductions from Guido Mine in Zabrze, Poland)

Ryc. 5. Fragmenty drzeworytów Gross-Mollera (La Sainte Croix-aux-Mines); proste odzienia ze skórą górniczą na wąskich pasach (na większości ilustracji) (A) oraz grupa górników w fantazyjnych czapkach – niektórzy z nich idą boso (B) (reprodukcje z kopalni Guido w Zabrze)

in the work of Agricola, and on the altar of Annaberg, you can see the medieval men's caps under the hoods (fig. 1, 2). A miner of the painting of Blühnbach has an intricate hairnet on his head (fig. 4A). Characteristic high hats are shown in the il-

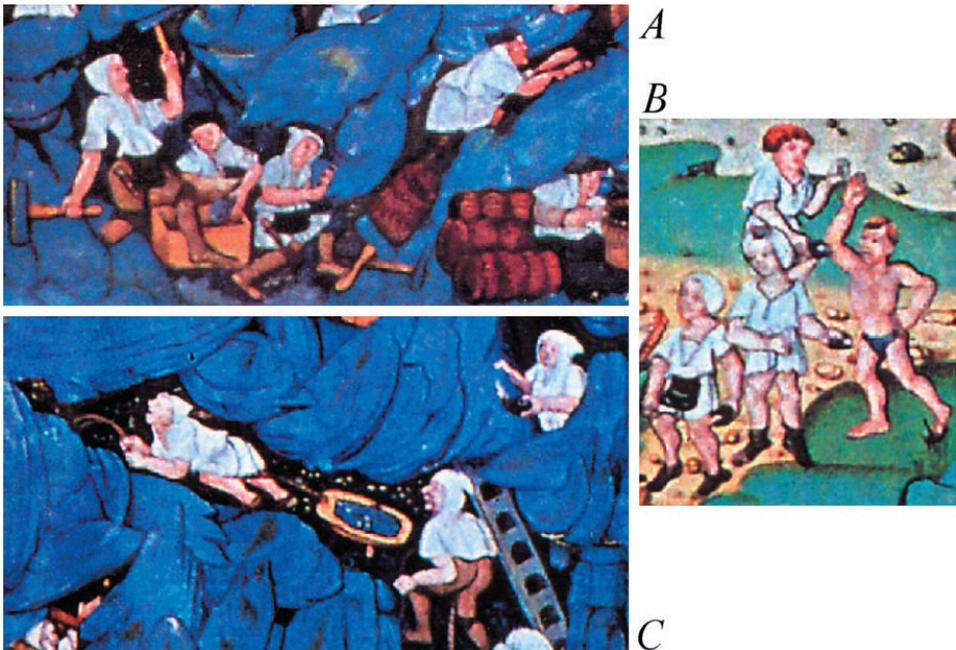


Fig. 6. Details of Kutná Hora Cantional; large shirts (perkytle), simple caps and turbans (A, C), knee-pads (B), pants (C) and bags with Hauswehr (A)

Ryc. 6. Detale z Kancjonału Kutnohorskiego; obszerne koszule (perkytle), kaptury i turbany (A, C), nakolanniki (B), bielizna (C) oraz torby z kordami gburскими (A)

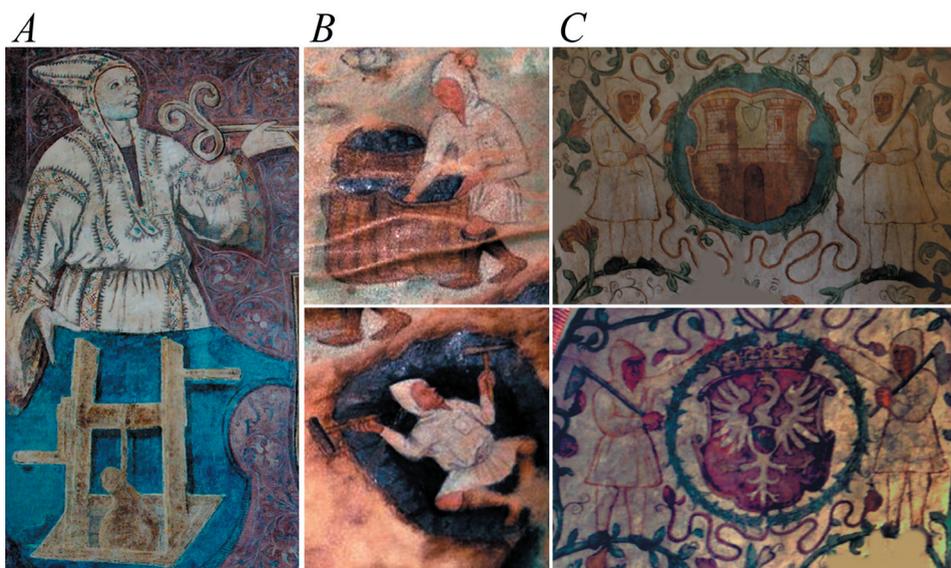


Fig. 7. A painting of St. Barbara church in Kutná Hora (A), details of the Kutná Hora Gradual (B; cantica..., 2014) and paintings in the chancel of the parish church in Olkusz (C); shirts (perkytlich) with a breast pockets (A, B), leggings rolled down (B)

Ryc. 7. Fragment malowidła w kościele św. Barbary w Kutnej Horze (A), detale z Graduału Kutnohorskiego (B; cantica..., 2014) oraz malowidła z kościoła parafialnego w Olkuszu (C); koszule (perkytyle) z kieszonkami (A, B), nogawice rolowane w dół (B)

illustration of Hausbuch von Schloss Wolfegg (fig. 8), but only miners working on the surface are wearing them. In the altar of Rožnava we can see a simple cap or mining shako (fig. 4B). Also, a few of the miners depicted in Kutná Hora Cantional have a similar headgear (fig. 6). One of the illustrations of Gross-Moller “The entrance to the mountain”, shows a group of miners in fancy Renaissance caps (even with a bird’s feather; fig. 5B). A surprising head protections are turbans, which we see both in the altar of Annaberg, as well as Kutná Hora Cantional (figs 2, 6).

Sometimes miners worked without leg protection – barefoot, or only wearing low boots (fig. 5B, 6). On the other hand, both in the iconography of Kutná Hora, and on the altar of Annaberg we find additional leg protection – knee pads (figs 2, 6). As mentioned, the Kutná Hora Cantional, as the only one of the reviewed sources, shows the elements of underwear. These are fitting pants, probably tied at hips (fig. 6C).

Perfectly depicted items of everyday use are noteworthy. The Kutná Hora Cantional and the Hausbuch von Schloss Wolfegg show bags in a characteristic shape and large knives, so-called (Germ.) Hauswehr (lower class short swords) – the symbols of masculinity at that time (figs 6, 8). The latter of these sources is the only one showing miners with swords – in the foreground of a picture. This can be considered as proof of their proficiency in the use of weapons.

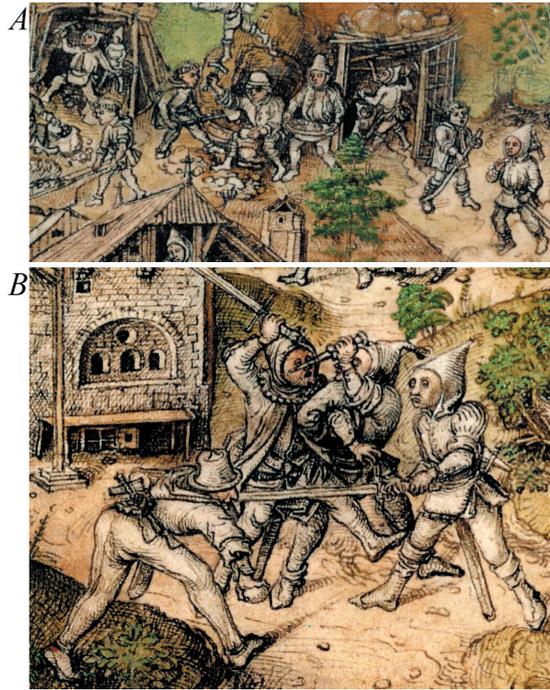


Fig. 8. Fragments of illustration in Hausbuch von Schloss Wolfegg (de.wikipedia.org..., 2014); non-typical high hats, bags and a sword (A), a scene of fighting with swords and knives (B)  
 Ryc. 8. Fragmenty ilustracji z dzieła Hausbuch von Schloss Wolfegg (de.wikipedia.org..., 2014); nietypowe wysokie kapelusze, torby i miecz (A), scena walki z użyciem mieczy i kordów gburskich (B)

## 5. Miner outfit and equipment in Lower Silesia – conclusions

The area of Lower Silesia in the discussed period was one of many mining centres in Europe. The region is characterized, however, a specificity that could affect the nature of mining activities, as well as the type of used clothing. You can indicate the following determinants of the specificity:

- the area traditionally belonged to the Slavonic (Polish and Czech) cultural background, but for at least a century it had been subject to intensive germanization,
- there was a steep influx of German miners here, but the presence of Czech miners is also documented, also Polish miners could operate here,
- at that time Silesia was divided into a number of separate principalities, was heavily damaged due to the impact of various factors: the Hussite wars, frequent changes of rulers, bad governance of Stefan Zápolya and chaos during the reign of Vladislaus Jegiellon caused that it to be certainly an uneasy land. Silesia could be

perceived as a promising area for mining activities, but also dangerous for miners itself.

Reflecting on the nature of the clothes worn by the miners in Lower Silesia at the time it can be concluded that “Germanic” dress (with multicoloured doublets and mining leathers) was dominant. It seems certain, however, that there were mining centres dominated by Czech miners, and perhaps Polish miners – in the characteristic white shirts with hoods (perkytlich) (Zagożdżon & Zagożdżon, 2008). The coexistence of miners of different origin could lead to the introduction of various borrowings to their clothes, the main criterion was practical usability. In difficult times, it was necessary to protect oneself, so the miners probably had an appropriate weaponry – Hauswehr and swords.

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## UBIÓR GÓRNIKA KRUSZCOWEGO NA PRZEŁOMIE ŚREDNIOWIECZA I RENESANSU – SPOSTRZEŻENIA Z PERSPEKTYWY ŚLĄSKIEJ

*górnictwo historyczne, górnictwo rud, XV w, XVI w,  
ubiór górniczy, uniform górniczy, Dolny Śląsk*

Artykuł przedstawia studium źródeł ikonograficznych ukazujących postaci europejskich górników kruszcowych z końca XV w. i początków wieku XVI. Wykorzystano bogato ilustrowane dzieło Georgiusa Agricoli (*De re Metallica...*), szereg źródeł z terenu Kutnej Hory (ilustracje tamtejszego kancjonału oraz graduła, malowidło z kość. Św. Barbary, godło miejskie itd.), fragmenty kilku ołtarzy górniczych (z Annabergu, Rožnavy, Blühnbach k. Salzburga i Colle Isarco w północnych Włoszech), malowidła z kościoła parafialnego w Olkuszu, a także zespół drzeworytów Heinricha Gross-Mollera, przedstawiających pracę górników w La Sainte Croix-aux-Mines w Lotaryngii oraz górniczą panoramę z księgi *Hausbuch von Schloss Wolfegg*.

Na podstawie wymienionych źródeł udokumentowano wyraźne zróżnicowanie górniczych ubiorów roboczych na terenie Europy. Na terenie dzisiejszych Niemiec i krajów ościennych, oraz w rejonach, gdzie zaznaczył się istotny wpływ tamtejszej myśli górniczej, w pracy pod ziemią wykorzystywano stroje codzienne. Składały się na nie lniane koszule, typowe dublety (niekiedy bardzo fantazyjne i kolorowe) oraz nogawice. Istotną modyfikacją stroju codziennego były kaptury, doszyte do koszul i wykładane spod dubletu. Górnicy ci przepasani byli wąskimi pasami, powszechnie wykorzystywane były, noszone u pasa, górnicze skóry (zapinane na guziki albo prawdopodobnie zawieszane na pasie), używano niskiego obuwia o różnym kroju.

Całkiem odmienny styl ubioru górniczego występuje na ilustracjach z czeskiego (słowiańskiego) kręgu kulturowego. Górnicy dołowi odziani są właściwie identycznie – głównym elementem ich ubioru była obszerna koszula z kapturem, tzw. *perkytl*, posiadająca niespotykany w ówczesnej garderobie element – kieszenie. Strój uzupełniały nogawice oraz niskie buty, nie używano skór górniczych. Wydaje się, że był to, prawdopodobnie pierwszy w Europie, roboczy uniform charakterystyczny dla określonej grupy zawodowej.

Źródła ikonograficzne ukazują szereg różnorodnych nakryć głowy. Poza, będącymi przejawem wpływu ówczesnej mody, męskimi czepkami i siatkami na włosy widzimy przede wszystkim kaptury, ale też kapelusze, proste czapki (być może czaka) oraz turbany. Górnicy obu kręgów kulturowych stosowali nakolanniki. Uwidocznione są również różne elementy codziennego użytku – charakterystyczne torby, kordy gburskie, miecze.

Analiza wymienionych źródeł, charakter ówczesnej działalności górniczej oraz sytuacja polityczna w zachodniej części Śląska (współczesny Dolny Śląsk) sugerują, że przeważał tu strój „germański”, wydaje się jednak pewne, że istniały ośrodki wydobywcze zdominowane przez gwarków czeskich, a może też polskich, w charakterystycznych białych koszulach z kapturami.