

## 15th CENTURY MINING AS SHOWN IN THE KUTTENBERGER KANZIONALE

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**Abstract:** An English language description of the colourful title page to the late 15th century silver-miners' songbook from Kutna Hora is presented.

The magnificent series of woodcut engravings of mining scenes in Agricola's "De Re Metallica" published in 1556 are well known, particularly through the Hoovers' version in their English translation of 1912, but they are not the only drawings of their type. Several which pre-date Agricola by a century or more have been noted and illustrated in modern works on the history of technology, and of mining in particular. Although more limited in their scope than Agricola's they show that mining practices did not change much in the 14th, 15th and 16th centuries.

Among the finest of these pre-Agricola drawings is that forming the title page to the Kuttenger Kanzionale. It has been reproduced in various works, mostly with comments in Czech or German (e.g. Winkelmann, 1958; Fritsch 1967; Slotta and Bartels, 1990), and the only English language version traced so far is in a museum booklet on the history of silver mining (Anon. 1968). A reproduction also appears on the front of another museum booklet "Mining at Kutna Hora" (Pechocova, no date, c. 1992). Neither analyses the painting in any detail, though they do have reproductions of parts of it. The Kanzionale was also noted briefly by Robert Annan (1960) but he did not describe the title page.

Kuttenger is the German name for the ancient silver-mining centre now known as Kutna Hora, about 70 kilometres east of Prague in the Czech Republic. The mining field produced principally silver, but also yielded much copper, and some zinc, arsenic, pyrite and lead ores as well as traces of gold. The field covered some 20km<sup>2</sup> and was reputed to be the richest silver mining area in Europe. The town of Kutna Hora which grew on and around the mines is today something of a tourist centre with the magnificent St. Barbara's Cathedral and many other fine buildings, largely financed by the profits of mining. Only a small part of the workings themselves is known today and a short section is open to visitors.

Mining is generally regarded as having

started in earnest in the mid 13th century though there are records of a mint nearby in the 10th century, and the silver may have been a factor in attracting the monks into founding a Cistercian monastery there in 1142. The economic significance of the silver mines is confirmed by the establishment of a Royal Mint there about 1300, and by the proclamation of a Royal Codex of Mining Laws. St. Barbara's Cathedral has mural paintings of miners and minters at work, as well as a statue of a miner in a long white hooded tunic. Mining reached a climax in the late 14th century, and the whole silver-production trade there seems to have been something of a target for the frequent wars in this part of central Europe, so that investment in mining and in subsequent silver-manufacture waxed and waned over the next two centuries. The town was burnt twice, in 1422 and 1424, and serious mining did not resume until late in the 15th century. The early 16th century saw mining in progress on a large scale but some of the mines on the Osel lode ran into difficulties and closed in the mid 16th century, after which the mining industry gradually declined. The Thirty Years War (1618-1648) caused an almost complete cessation of mining, but activity resumed thereafter. The Royal Mint closed in 1726 and that was effectively the end of silver mining. At the peak of the industry some 2000 people were employed in mining, dressing and smelting, and the produce reached 10,000 kilogrammes of silver and 50,000 kilogrammes of copper annually (Anon. 1968). Agricola knew the mines and referred to them several times in his "De Re Metallica" (1556).

The Kanzionale is a manuscript book on vellum with 252 pages bearing biblical and mining illustrations. It was compiled by an unknown author about the year 1471, and the frontispiece is somewhat uncertainly attributed to an artist who took the name Mattheus Illuminator. He is said to have died before the work was complete and other artists completed it about 1490. The Kanzionale (literally song-book) comprises a collection of miners' songs in Latin, many with a

religious flavour, and it is now housed in the Austrian National Library (Oesterreichische National Bibliothek) in Vienna. The title page measures 69 x 45 centimetres (picture size 57.5 x 28.5 cm) and its contents are said to be based on earlier manuscripts. It combines many of the features of Agricola's later black and white woodcuts (hand-tinted in some early copies, but not in the Hoover version) into one brightly coloured diagrammatic painting.

The painting is a cartoon blending scenes underground, in the open air and in a large room. It is in three parts: at the bottom is a cut-away diagram of mining practices underground; in the middle the processes of concentrating the ore and extracting the silver are illustrated; whilst at the top are the merchants and traders in silver products. In the top centre is the monogram W (looking rather like a premature advert for VW cars) which is that of King Wenceslas II of Bohemia (also known as Wenzel and as Vladislav).

The underground section shows miners in a sort of uniform of a short white tunic with a hood and short sleeves; some have a pouch slung on a belt in front of them. Presumably they wore some sort of hose below though the detail is not clear enough, nor are the details of their shoes. A few have the Roman type of lamp but most seem to be working without lighting! At the very bottom the miners are shown extracting the ore with hammers and picks; two are even shown with one in each hand, apparently using a chisel-ended pick as a wedge being driven in by a square-headed hammer. Most of the extraction appears to be by overhead methods, though no details are shown of ore veins or of stopes. Although fire-setting was probably used it is not portrayed. At the bottom right the ore is apparently loaded into oblong box-like corves which are shown being dragged up a gallery. Nearby a miner sits by a wooden chest whose purpose is not clear, though further left ore is being tipped into a box. In the bottom centre the ore is being loaded into baskets and a cut-away at the top centre shows these being raised by a windlass not unlike the Derbyshire stows. To the right, however, water is being raised in a bag, probably leather. Ore is known to have been raised in leather bags but nothing of such a practice can be seen. Access to the workings is shown to be largely by wooden ladders (not stemples). At the top left of this section a man is shown by a ladder winding the handle of a large wheel, perhaps a ventilating device. Immediately to the right of him is what appears to be a mine entrance with a miner climbing out up a ladder and three miners about to go in perhaps as a shift changes; an official in a red coat appears to be taking the tally of who goes down. A humorous touch is provided by a man clad only in briefs flexing his muscles; perhaps he has been washing the grime of

the mine off in the adjacent stream!

Across the centre are cartoons of what happens when the ore reaches the surface. On the left is a shaft top protected by a roof: one miner is half-out of the shaft whilst another is being frisked by an official to see that he is not stealing any silver ore! To the right is a windlass being turned by two miners and around it are stacks of ore-baskets, some lying empty on their sides, whilst others are full or being carried away to the processors. The number of baskets suggests either a fairly rapid rate of production or a rapid turnover in baskets! The surface workmen wear blue uniforms whilst officials are in red or yellow. On the processing floors the workers are women in long blue dresses with a turban-like headgear in white. On the right is a larger building with a conical roof but no walls covering a horse-gin; two teams of two horses each driven by a man with a whip turn a toothed pinion wheel driving a round beam in an extension which covers a large windlass. It has a wood-framed tower on top with one side open, perhaps as an air trap for ventilating the mines below. The gin and windlass seem to be for raising water as a bag is being lifted off the hook and a stream issues from a pipe. A little way downstream a half-naked man is seated on a plank, either washing ore or himself. Nearby a miner is crawling out of a small building with a large bag. It seems unlikely that the gin is also functioning as a crusher. Crushing seems to be somewhat haphazard with both men and women wielding hammers whilst seated on the ground or on stacked corves to the left. A woman in a red dress and white head-scarf is working at a large vat behind the conical roof; presumably she is washing ore. Whatever the process the ore seems then to be placed in corves, or perhaps they are measuring "dishes" in the Derbyshire Barmoot sense. Two humorous touches here: on the extreme left centre a woman in blue appears to embracing a red-clad official or are they dancing together? To the right, above the conical roof a monk is receiving a hat full of ore from a man crushing it on a round stone: perhaps this is a tithe taken by the church.

At the top of the drawing the focus is on the merchants and dealers seated round an octagonal table apparently with two rows of benches. Standing on the table a miner displays ore on a cloth whilst to the left another miner brings a dish of ore for assessment. Further to the left others are assessing individual dishes whilst a red-clad official has his hand across a woman's face - was she talking too much? Close by them is the open door of the ore-store with bags of ore stacked high within. Above them a musician with a sackbut (ancestor of the trombone) plays a fanfare, perhaps calling everybody's attention to the arrival of the Lord of the mines. Above the table stands

the lord (king?) surrounded by his entourage, some of whom have turban-like headgear. Are they arabs or women? To the right on a wooden platform are two men who may be tax or tithe collectors. Immediately right of the table ore is being tipped into a bag, presumably after being assessed and sold. Through the windows there are three views of the countryside with important buildings portrayed. Finally, at the top is the monogram W for King Wenceslas II.

The whole picture is a depiction of mining as practiced in the late 15th century showing that most techniques and customs did not differ much from those known long before, or from those shown by Agricola some 70 years later. It should be noted that there is no specific indication of fire-setting, and of course gun-powder blasting only came in after Agricola. Also there is no indication of any machines driven by water-power. But the picture shows that there were then, as now, a large number of people on the surface cashing in on the labours of a similar number of miners underground. Unfortunately the final aspects of the silver story are not included - smelting and the articles manufactured from the silver.

A Mining Museum has recently opened at Kutna Hora.

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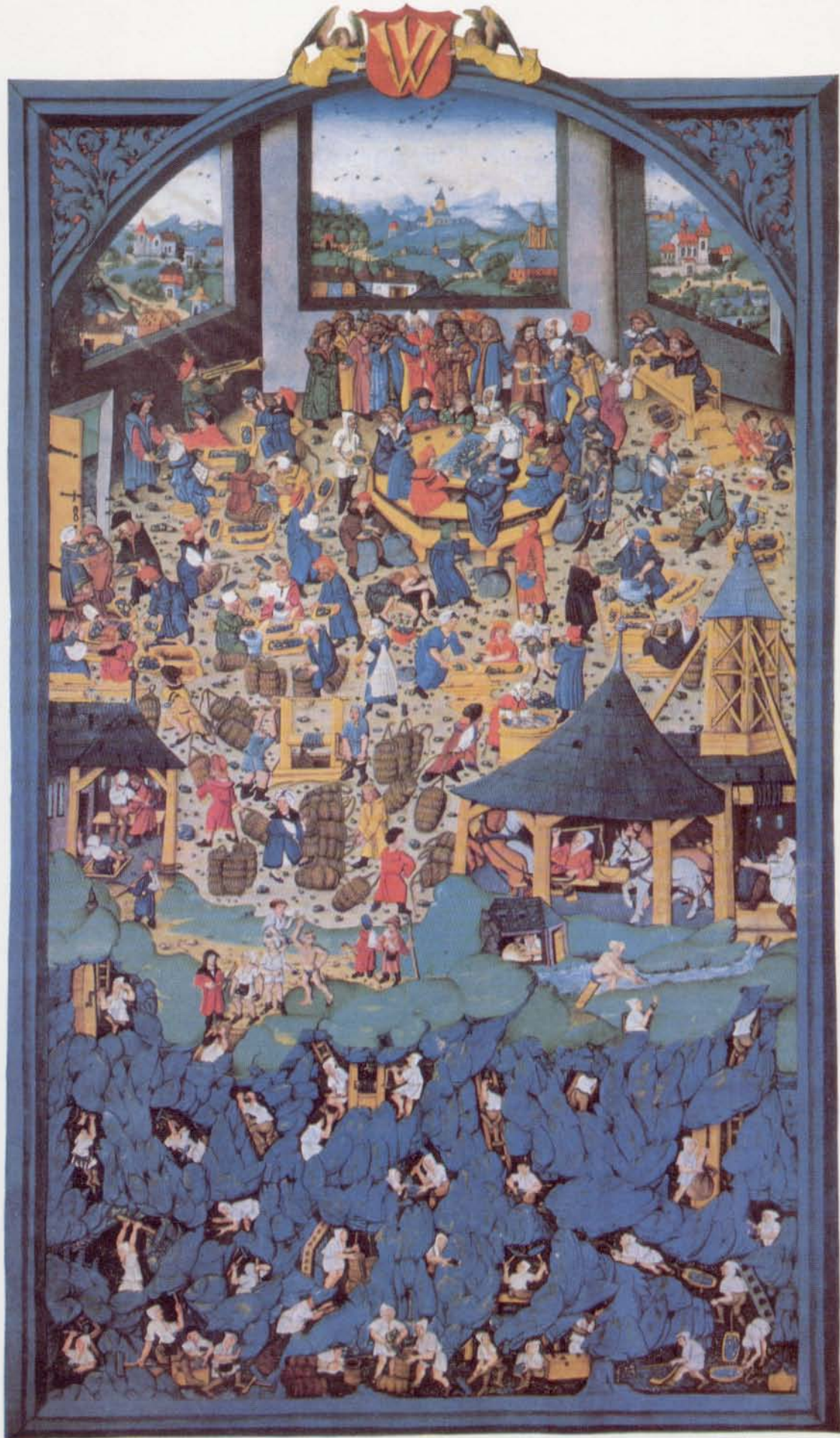
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The Kuttenger Kantonale - mining in the 15th Century