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## Innovations in medieval mining laws

**ABSTRACT:** *The present article examines the aspect of innovations in medieval mining laws, in form of an insight in the only historical project within the Leibniz Graduate School „Raw Materials, Innovation and Technology of ancient Cultures“ (RITaK), which was still in progress at the time the conference took place. With a focus on the Freiburger Bergrecht it will be discussed if we learn something about innovations through mining law texts and how innovative medieval mining laws themselves have been. Besides, it will be studied how aware the contemporaries were of innovative elements.*

**KEYWORDS:** MINING HISTORY, MINING TECHNOLOGY, MEDIEVAL MINING LAW, INNOVATIONS

In my doctoral thesis I dealt with the mining regulations of the Margraviate of Meißen – the so-called Freiburger Bergrecht (FBR). In order to study the topicality and practicability of this mining law text (on the basis of a translation into modern German), I classified it into the middle European history of mining law from the 12<sup>th</sup> to the 14<sup>th</sup> century and used an interdisciplinary approach by consulting mining-archaeological findings and results.<sup>1</sup>

Medieval studies did not define the term “innovation” yet, although the image of the “dark middle ages” gets more and more revised (Hesse and Oschema, 2010b, pp.12-14), Uta Lindgren’s “Technik im Mittelalter” (Lindgren, 1996) and Hesse and Oschema’s „Aufbruch“ (Hesse and Oschema, 2010a) raise the question of what an innovation in the Middle Ages is or was. Besides all difficulties with the term or the underlying concepts, it seems to be clear that novelty (*innovatio*) plays a central role (Hesse and Oschema, 2010b, p.21; Lindgren, 1996, p.15). Though, the transfer of modern perspectives into historical times has to be avoided. As Schmidt emphasizes, the perception of “the new” in medieval times has not been investigated in detail yet (Schmidt, 2010, p.13). *Novitas*, for example, was a term with negative connotations throughout the Middle Ages, whereas in some technical spheres (Dohrn-van Rossum mentions military and architecture) *novitas* seemed to have a positive meaning (Dohrn-van Rossum, 2010, p.37, 45; Schmidt, 2010, p.13). In this paper, I will use the term “innovation” in a very broad interpretation, in the meaning of novelty linked with progress – being conscious of the fact that the term would actually need more examination.

A growing demand for silver and copper can already be registered in the 10<sup>th</sup> and 11<sup>th</sup> century, as a conse-

quence of the Carolingian politics and the resulting economic changes and growth. The first medieval mining areas known from written sources are those of the Harz, the Vosges and the Black Forest (10<sup>th</sup> and 11<sup>th</sup> century) (Bartels and Klappauf, 2012, p.144, 165, 176). Since the 12<sup>th</sup> century, the need and use of money – especially in politics – had been increasing again and, correspondingly, the interest in silver-mining areas. How important silver and other metals and minerals were to the sovereigns is visible for example in the so-called “Bergregal” – the royal mineral right. All the mining laws from the period between the 12<sup>th</sup> and 14<sup>th</sup> century contain this general claim. It was recorded 1158 by Frederick I. and separated the minerals from the land property so that they did not belong to the land owners any longer but to the king. Territorial lords could get the Bergregal as a fief. On this basis, they allowed miners to dig for ores in their territory. Of course, they had to tithe and to sell the silver for a special price to the corresponding lord (Hilsch, 1995). Gradually, the Bergregal slipped away from the hands of the kings and became an economic instrument of the territorial lords (Hägermann, 1984).

Medieval written record on mining mostly comes from the privileged mining sector (Bartels and Klappauf, 2012, pp.112-119). Silver mining areas from the 12<sup>th</sup> to the 14<sup>th</sup> century are known from sources like mining law texts, deeds, records of travelers and archaeological evidence. Since the further upswing of silver mining in the 12<sup>th</sup> century, the Ore Mountains, Bohemia, South Tyrol (Trento), Tuscany (Montieri and Massa Marittima), Sardinia (Iglesias) and Lavant Valley (Carinthia) have been among the most important silver mining regions in Europe (Gilomen, 2014, p.80). The known mining laws of

the time period between 12<sup>th</sup> and 14<sup>th</sup> century are the mining law of Tridentinum (Trento; first known written mining regulations in form of treaties from 1185 to 1214), the mining regulations of Massa Marittima (first half of the 13<sup>th</sup> century), the mining law of Iglau (Jihlava; second half of the 13<sup>th</sup> century), the *ius regale montanorum* of Bohemia (1300), the mining law of Goslar (in the middle of the 14<sup>th</sup> century) and the mining law of Freiberg (14<sup>th</sup> century). The rising silver production in the 12<sup>th</sup> and 13<sup>th</sup> century led to the consequent rise of technological complexity. The written sources on mining – like contracts and other mining law texts – are clearly showing this increase (Bartels, 1996, p.236). Especially the 13<sup>th</sup> century has been characterized as a century of inventions and innovations. Key words like “commercial revolution”, “era of innovations” or the beginning of a “technological age” reflect this reception in historical sciences (Bayerl, 2013, pp.74-75). As Popplow states, mines in the Middle Ages belonged to the central places of technological activities (Popplow, 2010, p.90). It is supposed that silver mining encouraged innovations more than e.g. iron mining did. Among others, this could be related to the formation of the ores and to the value of the precious metal (Reininghaus and Köhne, 2008, p.40).

For the time after the often announced crisis of mining in the 14<sup>th</sup> century, Popplow sees technical innovations as a reason for further recovery of mining and links this amongst others to transfers of knowledge through migration and mining laws (Popplow, 2010, p.89). It is discussed whether the “crisis” predominantly had technological or economic reasons. Gilomen e.g. states a general technological decline since the 1330ies (Gilomen, 2014, p.117), whereas Schmidtchen and Ludwig see an economic crisis (Schmidtchen and Ludwig, 1992, p.35).<sup>2</sup> Apparently, mining law texts often come up in phases of political renewal or economic decline (Asrih, in prep.).

Relating to mining law texts, one can distinguish different kinds of innovations. On the one hand, there are innovations by name in the text. In the mining law of Massa Marittima, for example, a general technological innovation of the time, the compass, appears for the first time in mining context (Hägermann and Ludwig, 1991, p.32). In addition to that, there are innovations in mining organization, like the institution of the “Erbstollen”, *inter alia* in the FBR (see below). On the other hand, there are innovations affecting the texts themselves. Mining regions were – and are – embedded in a network of exchange on various economic, political and societal levels. It is not for nothing that miners are often characterized as a very mobile group of people – although sometimes with a tendency to mythical transfiguration. Many mining law texts contain similar regulations or at least topics. Historical source criticism helped to identify paths of knowledge transfer and active exchange of mining law texts (Herrmann and Ermisch, 1882, pp.131-133).

Medieval mining law texts are an important source of many different aspects in the political and social life, and also of technological questions. This range is reflected in the works of Karl-Heinz Ludwig and Dieter Hägermann on

the mining law texts of Trento and Massa Marittima (Hägermann and Ludwig, 1986; 1991). Those rich written sources are not very considered in research, contrary to their value. Important works have been and continue to be the works of representatives of the history of law from the 19<sup>th</sup> and beginning 20<sup>th</sup> century. Especially the works of the law historians Hubert Ermisch (Ermisch, 1887) and Adolf Zycha (Zycha, 1900a; 1900b), who focused on the mining laws of Freiberg and Iglau, provided a basis for most of the investigations of mining law texts until today. There are only few modern works on medieval mining laws and there is no summarizing work on this topic.

The secondary literature available, dealing with mining law texts, has one thing in common: the contents are broken down into different topics, following either the operational requirements or superordinate topics like work organization, fees or groups of persons. Of course, the selection of the subtopics depends on the professional background and the focus of the respective author, a fact that renders comparative analyses difficult. There must be many similarities and dependences between different mining law texts which are unknown until today, due to the lack of research. Those similarities are discussed to be founded in operational requirements and exchange processes (Pfeifer, 2002, pp.113-114; Bartels and Klappauf, 2012, p.189; Asrih, in prep.).

The FBR is a good example for that. It is preserved in two versions – an earlier one and a later one. Since Hubert Ermisch has been working on them, those two versions are named and dated as follows: Freiburger Bergrecht A (FBR A) 1310–1327 and Freiburger Bergrecht B (FBR B) 1346–1375. Their development is closely linked to and partly dependent on the municipal and mining law of Iglau and the municipal law of Freiberg and has non-written (or not passed on) precursors. As an example, we can regard the so-called “Erbstollen” and its appurtenant regulations. Erbstollen are adits which were driven by groups of people (“Stollengewerken”) to dewater and ventilate the mines in a specific area, for a fee. Their implementation led to detailed regulations on how to manage the complex situation with all the persons involved above and below ground. In the questions, version A raises and B partly answers, we see the need of novelties, but also the dynamics of mining practice. Freiberg asked Iglau for a mining law text which would be suitable for this new situation. That is why the FBR B contains, besides parts of the FBRA, lot of regulations deriving from the mining law of Iglau (Herrmann and Ermisch, 1882).

In order to analyze the FBR, I translated it from Middle High German and formed ten subject areas: 1. persons and groups of persons, 2. basic authorizations – Bergregal (royal mineral right) and Bergbaufreiheit (right of mining), 3. mining authorizations, 4. claim surveying and standards, 5. technology and work equipment, 6. transported material, 7. economy, 8. judicial spheres, 9. instruments to keep order and 10. land usage apart from mining. The basis of my translation was the edition of the FBR by Hubert Ermisch (Ermisch, 1886, pp.267-276,

Persons and groups of persons in the FBR (A and B)		
a. Territorial lord and administrative officers		
b. Persons with monitoring and control role		
Bergmeister	Zehntner	Hutleute
Leiher	Steiger	Ganghauer
c. Persons of court and for protecting legal interests		
Bergrichter	Schöffen	Bürger von Freiberg
Geschworene	Stufenschläger	Stadtrichter
d. Providers of labor and capital for mining		
Gewerken	Lehnhäuer	
Häuer	Waldwerken	
e. Other designations of persons and groups of persons		
Mann/Männer	Bergmann/-leute	Bürger
Leute	Amtmann/-leute	Grubenzimmermann
Muter	Gesinde	Schmied
Finder	Besteller	Messer
Neufänger	Boten	Sachwalter
Bauer	Dorfherr	

Tab. 1. Persons and groups of persons in the FBR (A and B) (German names).

285-299).<sup>3</sup> To put the question on the topicality and practicability of the FBR, it was necessary to choose a limited number of appropriate topics. The four topics chosen (judicial spheres, associations of persons, claim surveying and technology and working materials) resulted from the examination of the mining historical and archaeological literature and the information potential of the source, the FBR (Asrih, in prep.).

I will now briefly refer to the point “persons and groups of persons” to give an example of the FBR contents. A genuine demonstration of the variety and richness of the FBR is the compilation of all appearing designations of persons and groups of persons (Tab.1), taking into account that the FBR is – compared for example to the *ius regale montanorum* or the *Ordinamenta of Massa Marittima* – a shorter text.

Mining laws generally regulated the relations between different interest groups and described – in sometimes more, sometimes less detailed manner – the characteristics, duties and obligations of the different stakeholders like judges (Bergrichter, Stadtrichter), head miners (Steiger), mine surveyors (Messer, later Markscheider) or the providers of labor and capital (e.g. Gewerken and Lehnhäuer). Those early records of the prospect of how administrative structures and processes in mining should be handled are important for the history of the development of institutions like the “Gewerkschaft” (the association of people who shared the financial risks and benefits of mining activities) or the “Direktionsprinzip” (the control of mines by state officials). The innovation level is difficult to identify in this field. So, it has not been investigated yet how many of the designations listed above are already known from earlier and other contemporary sources, especially mining law texts.

After this short overview on medieval mining laws, their context and contents, it is obvious that this type of sources came up in very dynamic times. The implementation of the royal mineral right, as a basis, could be seen as an innovation of the 12<sup>th</sup> century, which strongly changed mining administration and practice. Closely connected to that, mining law texts themselves are innovations of the 12<sup>th</sup> century and their development correlate with the general development of law in middle Europe. The question of how aware the contemporaries were of innovations can be answered by a well-known example in mining historical literature. In the first preserved mining law text (Trento) we find a rule of using one water wheel for each smelting furnace. If someone drove two furnaces by one wheel, a practice that had been in use only as of recently, he should pay double fee (Hägermann and Ludwig, 1986, p.19, 45, 63). But also the many references to customs and their denial – or sometime affirmation – show the awareness of development and innovation. Many rules of those laws trace back to a problem, a conflict or an innovation which has to be handled. The research potential of those surprisingly detailed, elaborate and pragmatic written sources is underestimated and barely tapped. The current excavations in the Saxon Ore Mountains, especially in Dippoldiswalde and Niederpöbel, revealed plenty of new results.<sup>4</sup> In combination with such archaeological mining research, the possibility of comparing or completing pictures or of examining states of research is given (Asrih, in prep.).

## Notes

- 1 Asrih, in prep.
- 2 In the context of a decline or "crisis of mining in the 14<sup>th</sup> century", Bartels emphasizes the necessity of not only focusing on precious and non-ferrous metals. The picture is much complexer than sources and the current state of research suggest. (Bartels, 2012)
- 3 The Codex diplomaticus Saxoniae regiae online: <http://codex.isgv.de/codex.php> (the Freiburger Bergrecht is in volume CDS II 13).
- 4 [www.archaeomontan.eu](http://www.archaeomontan.eu).

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