

**Mining in European History and its Impact
on Environment and Human Societies –
Proceedings for the 1st Mining in European History-Conference
of the SFB-HIMAT, 12.–15. November 2009, Innsbruck**

Editors:

Peter Anreiter
Gert Goldenberg
Klaus Hanke
Rüdiger Krause
Walter Leitner
Franz Mathis
Kurt Nicolussi
Klaus Oegg
Ernst Pernicka
Mario Prast
Jörg Schibler
Ingo Schneider
Harald Stadler
Thomas Stöllner
Gerhard Tomedi
Peter Tropper

Spezialforschungsbereich (SFB) HiMAT
Die Geschichte des Bergbaus in Tirol und seinen angrenzenden Gebieten –
Auswirkungen auf Umwelt und Gesellschaft
Universität Innsbruck

The Special Research Program HiMAT is supported by the Austrian Science Fund (FWF), the Autonomous Province of Bozen – South Tyrol, the Countries Tyrol, Salzburg and Vorarlberg, the Stand Montafon, the Municipalities of Bartholomäberg and Silbertal, the City of Schwaz, the University of Innsbruck, transidee transfer center of the Innsbruck University, the Federation of Austrian Industries and the Wilhelm-Mommertz Foundation.



© *innsbruck* university press, 2010
Universität Innsbruck, Vice-Rectorate for Research
1st edition.
All rights reserved.

Coverphotos: Dr. Nadja Riedmann
Processing: Mag. Barbara Viehweider
Printed by: Fred Steiner, Rinn

www.uibk.ac.at/iup

ISBN 978-3-902719-69-0

Fuel Wood Economy of Historical Mining in the Black Forest (Germany)

Thomas Ludemann¹

¹University of Freiburg, Institute of Biology II, Dept. of Geobotany, Schaezlestrasse 1, D-79104 Freiburg, thomas.ludemann@biologie.uni-freiburg.de

For millennia wood played an important role in the development of human society, culture and economy. Especially past mining activities and archaeometallurgical processes were closely dependent on the availability of timber and fuel wood and on an effective fuel supply based on wood and forest exploitation, until the comprehensive usage of fossil fuel began in the 19th century. An adequate wood and charcoal supply was an indispensable precondition of historical mining and archaeometallurgy. Remnants of the activities mentioned, especially wood charcoal fragments, are widespread in the landscape and contain detailed information on past wood use and historical fuel economy. From charcoal analyses we can deduce indications on the historical forests and landscapes, on the anthropogenic influences thereto and on the changes therein. At nearly every mining archaeological excavation well-preserved wood charcoal macro-remains could be found. Their anthracological investigation provides a valuable contribution to understanding the corresponding historical occurrences and processes. Such studies are an essential part of a holistic consideration and research programme of historical mining and archaeometallurgy. Example is given by two medieval historical mining areas of the Southern Black Forest, these being at the same time scientifically the best investigated historical mining areas of this region, (1) mining area Sulzburg with excavation complexes A and C and (2) mining area St. Ulrich-Birkenberg (Fig. 1), both situated at the west edge of the Black Forest.

Unexpected anthracological results could be established here. A general preference for distinct tree taxa for fuel wood is not to be found. On the contrary, in the historical charcoal from the sites mentioned we found all of the tree taxa to be expected for the given natural conditions. Moreover, their frequencies also reflect a natural situation. The tree species of the climax vegetation (beech-fir-oak forests) were mainly used and all other taxa were quantitatively unimportant. Most frequent taxa in the charcoal samples are *Fagus*, *Quercus* and *Abies*, reaching 55%, 22% and 16% respectively (Tab. 1).

However, upon considering the individual exploitation periods, comprehensive differences in taxon composition can be established (Tab. 1). Thereby the temporal development of wood use and species composition of the historical forest stands, deduced from charcoal analyses, obviously seems to be in contrast to the expected usual anthropogenic degradation processes and tendencies of the forest vegetation, indicated by an inverse trend of tree species succession.

This phenomenon could be explained (1) by a spatial expansion of the wood exploitation from the close surroundings of the mines and settlements into more remote less influenced, close-to-nature forest stands and (2) by a step-by-step use of those wood species which provide the best fuel, e.g. preferring first deciduous hard wood of oak and beech if available, so that in some areas afterwards the less suitable conifer wood had to be used for fuel wood supply, e.g. by postmedieval charcoal burning.

Main features of fuel wood economy of historical mining in our investigation areas are

- (1) shortage of deciduous hard wood after the Middle Ages (partly, spatial and temporal), but
- (2) no general shortage of fuel and timber wood after the Middle Ages.
- (3) The natural tree species composition has only been affected close to settlements and mines.

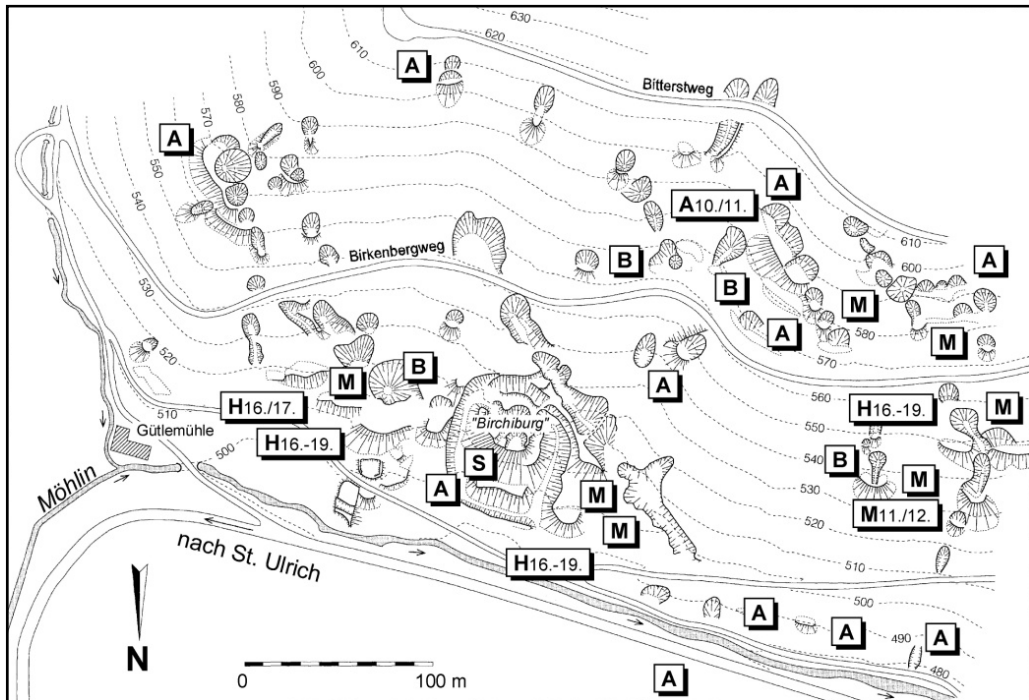


Fig. 1: Medieval mining area St. Ulrich-Birkenberg, Southern Black Forest, SW Germany with many anthropogenic relief features at the north-facing slope. Sample sites of wood charcoal macro-remains: A working terraces, B mines, H kiln sites, M smithies, S settlement. Map based on Goldenberg 1999, modified.

References

- (pdfs: www.biologie.uni-freiburg.de/data/bio2/geobotanik/ludemann/publikationen.htm)
- Goldenberg, G. (1999): Mittelalterlicher Silberbergbau am Birkenberg bei St. Ulrich. *Archäolog. Info. Bad.-Württ.* 41, pp. 73-81.
- Ludemann, T. (1996): Die Wälder im Sulzbachtal (Südwest-Schwarzwald) und ihre Nutzung durch Bergbau und Köhlerei. *Mitt. Verein forstl. Standortkunde u. Forstpflanzenzüchtung* 38, pp. 87-118.
- Ludemann, T. (1999): Zur Brennstoffversorgung im Bergbaurevier Sulzburg. *Archäolog. Nachrichten aus Baden* 61/62, pp. 131-138.
- Ludemann, T. (1999): Holzkohle - Energiequelle für den Bergbau, Informationsquelle für die Wissenschaft. *Archäolog. Info. Baden-Württ.* 41 (Früher Bergbau im südl. Schwarzwald. Begleitheft zur Bergbauausstellung. Museum Ur- u. Frühgeschichte Stadt Freiburg i. Br.), pp. 123-129.
- Ludemann, T. (1999): Zur Brennstoffversorgung einer römischen Siedlung im Schwarzwald. In: Brather, S.; Bücker, C.; Hoepfer, M. (eds.): *Archäologie als Sozialgeschichte. Studien zu Siedlung, Wirtschaft und Gesellschaft im frühgeschichtlichen Mitteleuropa (Festschrift Steuer)*. *Internationale Archäologie* 9: *Studia honoraria*, pp. 165-172.
- Ludemann, T. (2008): Natürliches Holzangebot und historische Nutzung – Heutige Vegetation und historische Holzkohle als wertvolle Quellen. *Das Mittelalter. Perspektiven mediävistischer Forschung* 13 (2), pp. 39-62.
- Ludemann, T.; Nelle, O. (2002): Die Wälder am Schauinsland und ihre Nutzung durch Bergbau und Köhlerei. *Freiburger Forstl. Forschung* 15, pp. 139.