
REVIEW ARTICLES

Mining in Medieval and Modern Poland

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In his new book on the division of Europe into economic areas in the late Middle Ages and the modern period Prof. Marian Małowist¹ singles out two large mining regions in Eastern Europe: the Baltic region, comprising Dalmatia, Serbia and Bosnia, and the Sudetic and Carpathian region, covering Bohemia, Slovakia and Transylvania and that part of Poland which includes the silver and lead deposits of the border areas of Poland and Little Poland. Until now little has been written or published on Polish ore mining in the Middle Ages or in the modern period, and the studies that do exist have been sketchy. The somewhat obsolete work by Łabęcki² should be mentioned, but generally speaking knowledge of silver and lead mining in Poland has been rather perfunctory. Danuta Molenda's works³ are, then, the first systematic studies

¹ M. MAŁOWIST, *Wschód a Zachód Europy w XIII-XVI wieku. Konfrontacja struktur społeczno-gospodarczych* (East and West Europe from XIIIth to XVIth century. The confrontation of social and economic structures), Warsaw 1973.

² H. ŁABĘCKI, *Górnictwo w Polsce* (Mining in Poland), Vol. I-II, Warsaw 1841.

³ D. MOLENDĄ, *Górnictwo kruszcowe na terenie złóż śląskokrakowskich do połowy XVI wieku* (Lead and Silver Mining in the Silesia-Cracow region to the mid XVIth century), Instytut Historii Kultury Materialnej PAN, Zakład Narodowy im. Ossolińskich, Wydawnictwo PAN (The Institute of the History of Material Culture, Polish Academy of Sciences, Publishing House OSSOLINEUM, Wrocław-Warsaw-Cracow 1963, 426 pp., map. Summaries in Russian and English: IDEM, *Kopalnie rud ołowiu na terenie złóż śląsko-krakowskich w XVI-XVIII wieku. Z dziejów postępu technicznego w eksploatacji kruszców* (Lead ore mines between the XVIth and XVIIIth centuries. Technical progress in the mining of the Silesia-Cracow deposits), Instytut Historii Kultury Materialnej PAN, Zakład Narodowy im. Ossolińskich, Wydawnictwo PAN (The Institute of the History of Material Culture, Polish Academy of Sciences, Publishing House OSSOLINEUM, Wrocław-Warsaw-Cracow-Gdańsk 1972, 424 pp. summary.

of the whole history of mining, from its beginning to the XVIIIth century. Her two books named above have separate titles but are in fact two volumes of one single work: volume 1 covers the history of Polish silver and lead mining in the Middle Ages up to the crisis in the XVIth century, while volume 2 deals with the end of this crisis and the subsequent stages in the development of Polish ore mining until its decline and fall in the XVIIIth century.

Danuta Molenda's work has many merits. First of all, it is based on a very wide range of source material. As well as mining records, the author has studied municipal and individual archives and a great many bills and accounts hitherto almost untouched by historical research. She has used cartographic materials to full advantage, especially those mining maps still in existence. She has also drawn on archeological material and has carried out field research in places where there were once mines. Studies and research in foreign archives, and in the rich European literature on the subject, have enabled her to take an extremely broad view of her subject and to adopt a very wide perspective in her research. This has also enabled the author to trace the links between Polish ore mining and mining and the economy of Europe as a whole.

Another merit of this work is the attention it pays to technical problems, for it includes an extensive, thorough and expert examination of the development of mining techniques (cf. special chapters in each of the two volumes - e.g. chapters II and V in vol. 1, part 2 of chapter II and part 3 of chapter I in vol. II). Of even greater importance is the penetrating and thorough investigation of the connections between the technical changes on the one hand, and social and economic on the other.

This method represents that approach which is known in Poland as the history of material culture, or perhaps even better as technical economic history. This has already produced many interesting results and Mrs Molenda's achievement is undoubtedly one of the most valuable. Her thorough investigation of mining techniques has increased the store of knowledge already accumulated and studied — and most important of all, it has shed light on the social and economic transformations brought about by changes in mining techniques. It also provides an explanation for both crises and developments in mining. Finally, it has also provided a more accurate evaluation of the importance of technical progress.

The author divides the history of Polish silver and lead mining into periods in which changes took place in mining techniques. Her method seems both appropriate and correct. In Mrs Molenda's view each period of mining development produced its own specific techniques. The way in which ore was obtained, the way in which mining was organized, and its economic consequences, were as important as the technical methods at the miners' disposal. The range and quality of those methods depended not

only on the technology and its development alone, but also on the funds invested in mining equipment, on the investors' interest in mining, that is, on the income it might yield and so on the market situation and on economic conditions in general. Thus the development of mining techniques was closely connected with changes in both the organization of mining and its economic functions. The author argues that the main technical problem in the early days of Polish mining was the struggle against water. Progress in this field determined the depth of the mining, methods of transport, and influenced production costs and the earning capacity of the mines. For these reasons Mrs Molenda has taken the changes in methods of drainage as the basis for the division into periods.

Mrs Molenda picks out for periods in the history of Polish ore mining. The first period covers the mining of deposits above the water level. The initial stage was the opencast mining of the Silesia-Cracow deposits, and archaeological sources reveal the existence of opencast mining in that region as long ago as 700-400 B.C. It was undoubtedly carried on in the IXth-XIth centuries, during the period when the Polish state was established. However, written sources bear witness to the existence of opencast to underground mining, although this was still confined exclusively a conspicuous increase in ore prospecting in the Polish lands and an intensification of ore extraction, especially in the regions of Bytom and Olkusz. This coincided with a similar increase in ore mining in other European countries, first in Germany and Bohemia. In the author's view this intensification of Polish mining in the XIIIth century was due to the change from opencast to underground mining, although this was still confined exclusively to work on deposits situated above the water level; they were usually several metres below ground level, but sometimes more than 10 metres. These activities were remarkably extensive, and in this period production depended mainly on the yields from shallow deposits. As they covered an extensive area this "dry" mining lasted until the XIVth century and was of considerable importance in many respects, especially as it stimulated both the country's economy and its trade, and led to the development of new settlements and accelerated the growth of towns in Silesia and Little Poland. Since this technique was simple, working costs were quite low, while the reward was high. Consequently the organization and financial management of mining lay in the hands of small producers who were also members of miners' guilds.

As soon as the richest and most conveniently placed and shallow parts of the deposits were worked out, it became necessary to start mining below the water level. This directly affected working costs, which rose and became too high for small producers to manage and too great even for those members of the miners' guilds who had already accumulated some capital. By the middle of the XIVth century, then, the mining crisis began and

with it the slowing down and even complete abandonment of ore extraction. It should be stated that other European mining centres underwent a similar crisis at the same time. Activity was renewed, but not until the XVth century. This second period in the history of Polish ore mining was connected with the adoption of a new drainage technique, which consisted in scooping water up to the surface by means of various appliances, which were usually horse driven. Drainage affected many other mining techniques, and compelled the mine owners to build special shafts, to provide better protection for open pits and to exploit the deposits more thoroughly. Mining improved and became more efficient as a result. It also spread to a much larger area, and besides the revitalized traditional mining centre near Olkusz, other centres emerged, the most important of which was Tarnowskie Góry. The southern part of deposits near Chrzańów was also mined. Adoption of the new techniques was made possible by the interest which merchants showed in mining, and the Cracow and Wrocław merchants soon took over the financial management from the small workers who were soon reduced to poverty. Beside such direct investments as the construction of mines, capitalist merchant also used their money as a means to gain indirect financial control. But in such cases the individual miner, a member of a miners' guild, also continued to participate, using his own equipment and bearing some of the production costs. Consequently even the main mining enterprises of that period could hardly be termed centralized manufactures. Only some external centralization and the beginnings of a capitalist organisation of production occurred and this proved to be decisive in determining the brief span of economic development which took place in the period in question.

The middle of the XVIth century was marked by a new setback in the development of mining, especially in the Olkusz region. Scooping water up to the surface was inefficient and unrewarding, for the water pressure grew in proportion to the depth reached by the mine, so that water submerged everything and flowed in from neighbouring pits. With the general rise in prices drainage costs became higher and eventually threatened to exceed profits. Other difficulties appeared simultaneously which affected the export of lead, as competition from England began to damage the Polish lead industry. At this point the merchants quickly withdrew their funds, leaving the small miners to their fate. The urgent need for new drainage methods and the necessity of overcoming the gravitational force of the water demanded modifications in the organization and management of mining. These innovations came in the second half of the XVIth century and many large long-term investments were then made, chiefly in the construction of drainage adits. The investors included wealthy Cracow merchants, among them the Fuggers and Turzons, citizens of Olkusz and the King, the richer miners grouped in miners' guilds, noblemen and magnates. Investments

in adit building reached an unprecedented level and brought about a completely new type of enterprise called the adit guild with a much wider range of activities than that of the small miners' guilds. These new guilds operated over a much larger area, used large supplies of manpower and also attained a much larger output and provided much higher profits. With the adit guilds a strict and complete separation between investment funds and labour was achieved. The extremely difficult and disadvantageous hydrogeological conditions compelled all concerned to study new technical developments or to adapt new European mining techniques to local requirements. The solution of these technical problems and the resulting growth in the size and value of production made Poland one of the most important European ore mining centres of the time. The "adit period", the third in the history of Polish mining, lasted from the mid XVIth to the mid XVIIth century. During this period lead ore mining in the Silesia-Cracow deposits reached its peak for the whole feudal period, but it is perhaps the case that the author's enthusiasm for her material leads her to overestimate somewhat the achievements of Polish ore mining at the time. However, its development undoubtedly influenced decisively the whole of the Polish economy. It should be noted that the exceptional conditions of production and the nature of the productive and technical organization of mining, in particular its use of free labour and the attention paid to market requirements, meant that it constituted a pocket of economic innovation in the surrounding feudal economy. The export of large quantities of lead greatly stimulated Polish trade and the abundant supply of lead to the home market stimulated various branches of manufacture based on the processing of lead ore, such as armament production. The exchange of technical knowledge and experiment with other European mining centres also accelerated the development of Polish technology. Moreover, mining was the source of the townspeople's wealth, it provided the basis for the development of the mining towns and centres and it stimulated the economy of the whole region.

In the second half of the XVIIth century the golden age of Polish mining came to an end. The reasons were many and various. Firstly the rapid rise in the price of corn, and especially of oats, which were indispensable in mines using horse power, adversely affected mining. As the rise in the price of lead was no means equally rapid, lead mining became unprofitable. Secondly, the effects of the wars of the XVIIth century were still felt, and the blockade of the port of Gdańsk hampered the export of lead. Thirdly, natural conditions were no longer as advantageous as they had been as deposits situated on the adit level were worked out, and so the quality of the ore declined and the adits deteriorated. The profitability of the mines fell and although new investments were badly needed they were not forthcoming. The industry became more and more disorganized and the miners' guilds disintegrated. When in the XVIIIth century the adit activity came

to an end as a result of carelessness and lack of initiative the seal was set on the end of Polish ore mining. The fourth period in the history of Polish ore mining was then one of decline.

Before the partition of Poland in the XVIIIth century ore mining played little part in the economic life of the century, but it had nevertheless an essential economic importance, in Danuta Molenda's view. The vicissitudes in mining coincided with the periods of general development and with the crises in the Polish economy as a whole. The period when Polish mining flourished, from the mid XVIth to the mid XVIIth century, is an especially good example, for it corresponds with the period in which Poland's economic and political strength was being consolidated. Another typical period lies between the second half of the XVIIth and the XVIIIth century, which corresponds with the economic crisis of the Polish Republic.

For all these reasons Danuta Molenda's work on the history of Polish ore mining is essential for an understanding of the economic history of Poland. But because of the links between mining in Poland and other European countries and the importance of Polish lead for other European countries, Mrs Molenda's work is also essential for the study of the economic history of Central and Eastern Europe as a whole.

(translated by HALINA GOLEBIOWSKA)