CHAPTER THREE

MINING SCIENCE: VERNACULAR KNOWLEDGE

Report on what special knowledge [Wissenschaft] is obtained from the divining rod in the furthering of noble mining:

In the business of mining, it is undeniable that God the Highest in His grace has granted to some who make this their profession, more than to others, special knowledge, such that much is learned through nature and experience to promote mining. Although, indeed, mineral rifts and veins can reveal themselves by their outcroppings, hidden veins, by God’s grace, are revealed with the divining rod, and anyone for whom the divining rod dips by nature can learn much in this manner.1

—Anonymous eighteenth-century manuscript

To historian of mining, Hans Baumgärtel, divining and other miner traditions constituted a ‘side branch’ in the history of mining science. The major theoretical influence in mining, in his view, was the mechanical philosophy of Descartes and Boyle, which unified with production at schools like the Freiberg Academy in the eighteenth century.2 However, dowsing was a central concern in the anonymous report above, preserved in the Saxon State Archive with other mining-related documents of the early eighteenth century. The report addressed major questions concerning the Wissenschaft of dowsing, including whether it required holding a piece of lodestone, whether the rod dipped to all varieties of mineral earth, including saltpeter, cobalt, and cinnabar, and whether it distinguished between minerals. In this report, ‘Wissenschaft’ meant the God-given ability to acquire hidden knowledge of nature, clearly a different understanding of the term than Baumgärtel’s.

This chapter focuses on the mining knowledge (Berg- or Montanwissenschaft) dominant in Saxon mining during the economic rebound

1 “Nachricht, was durch die Wünschel Ruthe vor sonderbahr Wißenschafft bey Bauung des edlen Bergwercks zuerlangen.” DHSA, Loc. 10690/47, ff. 33–34. Undated.
that followed the Thirty Years War. It argues that, notwithstanding a growing bureaucratic and scholarly presence in mining, and substantial top-down reforms, mining officials like Nicolaus Voigtel (Chapter One) advanced a vernacular, or experience-based science. Their mining books (Bergbücher) upheld a new standard of systematization and professionalism that was not incompatible with miner lore, an (al) chemical conception of mineral generation, and digging and dowsing knowledge. To these officials, Bergwissenschaft was a synthetic body of knowledge of disparate social and intellectual origins, including the mathematics of mine surveying, and craft skill and tacit knowledge such as dowsing. It is simply not true that mathematics and theory informed mining practice only after Descartes.

To appreciate the mining science that preceded the Mining Academy, we must discard the notion developed by some economic historians and historians of geology that the crafts were devoid of theory prior to the eighteenth century. For example, though Smith and Forbes conceded that Boyle, Glauber, and other natural philosophers had an interest in artisanal knowledge, the authors argued that artisans and scholars remained distinct social groups: “The great sixteenth-century works on metals have many quantitative aspects derived from experience, but make no effort to elucidate theory. To discern any theoretical metallurgical considerations of lasting importance we must wait the eighteenth century.” And also: “Practical knowledge continued far in advance of theory. Not until the eighteenth century was theoretical science in a position to aid practice in any but minor ways.” Mining historian Hermann Kellenbenz adopted the same rigid distinction between theory and practice for the pre-industrial period: “Technologically speaking, the age to which the great scholars Copernicus, Galileo, and Newton belonged was not stamped by science and learning but by the work of practical men.” Thomas Kuhn discussed an older tradition of mathematical inquiry and newer tradition of experimental work, which, he argued, remained divorced before the nineteenth century.

---

4 Smith and Forbes, “Metallurgy and Assaying,” 68.