

Hidden Bullion: Silver Production in North-East Wales

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Abstract: The silver in the lead ores of north-east Wales was at times an important factor in the exploitation of some of the mines. The evidence clearly shows that the Romans had extracted the silver from their lead. There may have been some activity in the early medieval period and definitely during the medieval period in the twelfth century. There were probably links between the local mines and the Rhuddlan mint and possibly the Chester mint. In the eighteenth century part of the success of the London Lead Company was down to their improved efficiency in silver extraction. In the nineteenth century the Pattinson process allowed the recovery of silver from ores with low silver content. The post 1851 data indicates modest silver contents of only 2½ to 9 ounces/ton of lead metal whereas during the eighteenth century data suggests 14 ounces was more common. The importance and quantity of silver production in the area should be given greater emphasis when considering the history of the orefield, especially prior to the nineteenth century.

Introduction

The paper ‘Rediscovering the lead and zinc production of north-east Wales’ (in this volume), by C.J. Williams and the author of this paper, provides a historical framework for the orefield. This paper focuses in on the silver hidden within the lead ore of the orefield (Fig. 1) and reviews its fluctuating importance across the various historical periods.

Silver content of the lead ore or lead metal

Some confusion can arise in the literature as silver content can be given in two different ways. Sometimes ounces per ton of dressed lead ore is quoted (oz/t ore), which is potentially confusing due to the variable lead content of various dressed ores. Alternatively, ounces per ton of lead metal (oz/t lead) from which the silver is refined is used, which is preferable as the lead metal has a relatively constant composition.*

Robert Hunt (1887, 837) tabulated the typical average ounces per ton of lead metal for each district based on data he had around 1851, as shown in the second column of Table 1 below. Estimates of ounces per ton of dressed ore have been added, assuming a typical 76% lead content, although in reality the lead content could vary considerably (e.g. 67% to 79%).

Unfortunately, this table hides a multitude of variation between and within mines, and so does not show the full picture. There are extremely rich silver contents recorded (or claimed) at certain British mines, particularly in Devon (40 to 207 oz/t lead), in Cardiganshire (40 to 80 oz/t lead) and the northern Pennines (18 to 421 oz/t lead) (Hunt 1887, 837; Claughton 2003, 49, 114, 118).

Tylecote (1986, 53) has a similar table to Hunt’s but it shows more of the extremes. While Flintshire and Denbighshire appear well down the league table on average silver contents, there are several mines in these counties which, at times, were well above the typical 7 oz/t lead quoted in Hunt’s table. Pennant (1796, 124) in the eighteenth century claimed the ‘usual produce is fourteen ounces’ in the Flintshire lead. Mines of particular note (often only single pieces of data), are Silver Rake (25 oz/t lead), Old Rake (41 oz), Holway (16–19 oz), Gorsedd (17 oz), Rhoemor (11 oz) and Dyserth (9 oz) (Burt, *et al.* 1992; Smith 1921, 20–1; Woodward 1729, 212; Davis 1881, 92).

No exceptional values have been found for the Denbighshire mines which, in general, had lower silver values. Apart from the few exceptional values mentioned above, the government mineral statistics for 1851–1913 (see Burt *et al.* 1992) give the typical silver content of Flintshire lead as

Table 1 Typical silver content from British lead mines claimed by Hunt (1887)

Orefield	Silver oz/t of lead metal	Silver oz/t of dressed lead ore**
Devon	40	30
Cornwall	25	19
Isle of Man	20	15
Cardiganshire, Caernarfonshire, Carmarthenshire	15	11
Westmorland, Durham, Northumberland	12	9
Ireland	10	8
Cumberland	9	7
Scotland	8	6
Flintshire, Denbighshire	7	4½
Montgomeryshire, Merioneth	6	5
Yorkshire	0 (2.5 to 5)*	0 (2 to 4)*
Derbyshire	0 (1 to 2.5)*	0 (0.8 to 2)*
Shropshire	0 (0.5 to 2.5)*	0 (0.4 to 2)*

Sources: Hunt (1887); * Smith (1921); ** calculated from Hunt’s data assuming 76% lead content of ore. For approximate comparison 1 troy oz/t = 31.1 g/t = 31ppm = 0.0031%.

* In this paper ounces are troy ounces, tons are UK (long) tons.