The Story of Shropshire's Lead Industry

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The lead-producing district of Shropshire occupies an area of about seven miles by three miles, lying along the western side of a ridge known as the Stiperstones, on the border of Wales, and many of the mines are situated on open moorland, at an elevation of over 1,000 feet above sea level. The ore found here is galena - lead sulphide - containing approximately 80 per cent of lead.

As in many other districts, the earliest workers to leave definite evidence of their activities were the Romans, who were already familiar with the use of the metal for making water pipes, and with its compounds as cosmetics and in paint, when they reached Britain. Their workings were probably confined to the surface, and have long since been obliterated, but in the name of one of the mining centres - Roman Gravels - their association with this part of Shropshire has been preserved to this day.

The discovery of three authentic Roman pigs of lead in the district, bearing the imprint of the Emperor Hadrian, indicates that the ore was smelted on the spot. Many ancient furnaces - though not necessarily Roman ones - have been found containing lumps of partially melted ore. They were little more than holes in the ground to form receptacles for the ore and fuel. A wood was used in those days, and more than a ton was required to smelt a ton of galena, it was the common practice to carry the ore to the fuel, and thus the old "slag hearths" are often some distance away from the ore veins.

Early Evidence of Lead Smelting

Very little survives of the history of the industry in feudal times, but there was undoubtedly a considerable demand for the metal in the building of monasteries, churches and castles all over the country after the Norman Conquest. No mention of any minerals found in Shropshire is, however, contained in the Domesday Book, but the Pipe Roll of Henry II between the years 1179 and 1184 has several references to lead obtained in the county. In 1179, for instance, the Sheriff of Shropshire accounted for the sum of £55 received for the King's lead from the mine at Shelve, while among other entries, one shows that, in 1181, 110 loads of lead, valued at £38, were sent from Shrewsbury to Gloucester, presumably down the river, the cost, of carriage being 68 shillings. The works in Gloucestershire were foundries, as they supplied bells to Shropshire by way of the Severn, so it seems as though the lead ore was smelted locally at this period before shipment to Gloucester.

This was almost certainly the case at the beginning of the seventeenth century, when Camden visited some of the smelting works, and noted the harmful effects of the fumes given off during the roasting of the ore. He tells us that "the smoke of the lead produces palsies, consumption, the 'byon', which resembles the quinsy, and a disorder of the bowels, called the belland, and affects cattle which feed on the grass or heath contaminated by the smoke. It gives a sweetness to the herbage and makes them eat greedily, but the proprietors are often forced to pay damages for the cattle which are killed by it."
The Flintshire reverberatory smelting furnace was first introduced in 1698, but little was done to improve the working conditions of the smelter until three quarters of a century later, when Watson, in 1778, suggested collecting the fume, and condensing it by making it pass through a horizontal chimney of suitable length. This suggestion was first adopted at Middleton Dale in Derbyshire, and marked a great step forward. It was many years, however, before this invention reached Shropshire. Meanwhile, the mines and smelting works were working busily.

In 1795, Aiken tells us, the Snailbeach mine was being worked to a depth of 180 yards, though the Bog mine at this time was choked with water. The ore was then being reduced at Minsterley, and other places near the mines. Afterwards it was sent by land carriages to Shrewsbury, and there shipped in Severn barges to Bristol. (Aiken, "Journal of a Tour through North Wales and Part of Shropshire" 1797) In 1758, the freight, from Shrewsbury to Bristol was about 10 shillings a ton and from Bristol to Shrewsbury, 15 shillings a ton. The names Frankwell Quay, Barge Inn, and others in Shrewsbury still remain to testify the importance of the traffic.

The main smelting works of this period were at Pontesford, and the old buildings may still be seen. This is some three miles from the mines at Snailbeach, but adjacent to old coal mines, which also belonged to the Snailbeach Mining Company. The principle of bringing the ore to the fuel thus still survived. Some of the buildings, which once contained the beam engines for pumping water from the coal mines, have been modified slightly to house human beings, and have served in this capacity during the last sixty or seventy years.

**Working Conditions**

The working conditions at the Pontesford smelting works are vividly described by John Wood Warter, in his book. "An Old Shropshire Oak" 1661}, referring to the observations of Camden, he says : "In the days of my boyhood, this was the case at Pontesford, and. indeed, till the great smelting chimneys were erected ; nor is the evil (of the fumes) even yet entirely done away with. . . . Formerly at the Pontesford smelting houses, great quantities of oil were drunk by the smelters to counteract the evil effects of the arsenic. In examining the works last year, I was told that much oil was still used but not so much. Years ago, many experiments were tried on the smoke as it issued from the chimneys by a well-known practitioner in the neighbourhood. Among other things, it was observed that no bird could pass through the volume unscathed, but fell down dead. . "

"Those who visit the lead district must not omit to visit the smelting furnaces, for, however deleterious the fumes thrown off may be, and however one shrinks from the pale, cadaverous faces of the smelters with pity and sorrow, one may ease the labours of the day with a small 'douceur' and some kind words, which will not be thrown away."

The chimneys at Pontesford were built in 1832, being, respectively, 180 feet and 150 feet high, and were some distance away from the works, to which they were connected by brick flues, which still exist. The chimneys, however, were dismantled some years ago as they were
becoming unsafe. The base of the larger one, forty feet in diameter, with walls six feet thick, gives some idea of their proportions.

After 1832, when the fume condensers were installed, the Snailbeach Company was evidently giving some attention to the well-being of its employees. The Free School at Minsterley was built in 1843 at the joint expense of the Marquis of Bath and other gentlemen belonging to the Snailbeach Company. The Company endowed the school with £40 yearly, and ordered that every miner should pay to the schoolmaster the sum of sixpence every quarter.

The annual output of the mines is not accurately known until 1845, when the compilation of official statistics was commenced. In 1845, the output of ore from the Snailbeach mine was 3,000 tons - about 83 per cent of the total for Shropshire, and one-fifteenth of the output for the whole of Great Britain. This annual output was closely maintained until 1878 when a decline set in, and by 1885 the output had fallen to 300 tons per annum. Subsequently, however, there was an improvement, and from 1886 until 1909 the output increased to about 1,000 tons per annum. Since the latter date, when the mine had reached a depth of about 550 yards, the output has been practically nil.

In 1863 the smelting of the ore from Snailbeach was transferred to the newer works close to the mine, these occupying a situation on the hillside favourable to the construction of a long inclined underground flue terminating in a chimney high up above the village. The ore from the other Shropshire mines at this period, however, was conveyed to the river Dee, where it was reduced at the smelting works on the river banks. (Casey. Directory of Shropshire, 1871)

The peak production of lead ore for the county occurred in 1875, when 8,000 tons were obtained. This figure was achieved by an increase in the productiveness of the Roman Gravels, the Oven Pipe, and other mines from about 1865 onwards. The greatest annual output of the Gravels mine was 3,100 tons of lead ore in 1883, but by 1895 all the mines except Snailbeach had virtually ceased working.

The fortunes of these mines have, however, in some cases, not been solely determined by their ability to produce lead at an economic price. From the middle of last century they have had a fairly steady, though low, output of zinc blende. During the last fifty years or so, however, the staple product of many of these mines has been barytes, which, from being valueless in earlier days, had either been left on the mine tips or can be obtained from the lead mines without deep and expensive working.

One mine known as Potters' Pit was interesting from the fact that the lead ore raised there was so free from stone and other contamination that it could be ground directly and used by potters for glazing ware. Another remarkable feature of this mine was the high temperature which prevailed - it is said to have reached from 130 to 140 degrees Fahrenheit. The Oven Pipe Mine derived its name from the shape of the vein, which did not extend far on either side of the shaft but resembled a huge chimney, and was worked about 500 yards deep.
At one time the mines must have possessed some notable machinery. On the hillside at Snailbeach is a massive stone building of cathedral-like proportions, which once housed a very large beam engine used for pumping, but this and all the other beam engines in the district were removed many years ago. The light gauge railway from Snailbeach to Minsterley was not constructed until the late 'seventies, when the mine was entering the last stage of its useful life. A name plate seen a few years ago on a piece of old machinery at Snailbeach and bearing this inscription: "Patent Applied For. T. Williams and Sons, Aberystwyth" indicated that the fortunes of other local industries were once closely linked up with the mines.

Sketch-map of Shropshire Lead District

With the closing of the mines and the passing of time, the history of such enterprises often becomes more and more a matter of statistics, with the human aspect receding into the background. Those whose memories carry them back to the later days of activity in the mines are usually ready enough to talk, but unfortunately make little or no permanent record of their knowledge and experiences.

An incident may be related which illustrates the lighter side of lead mining. About forty years ago, at the White Grit Mine, while the pump worked by the beam engine was being repaired, a workman unknowingly left his hammer on the flange of the pipe some way down the shaft. As the upper portion of the pipe was lowered for reassembly it dislodged the hammer, which fell down inside the lower pipe. When the engine, was started the hammer became wedged in the valve, and prevented the pump from functioning. By now the water had risen above the
level of the valve, and the services of a diver had to be obtained. A number of candles were placed as near the water level as possible, to light up the shaft, and the diver was lowered into the water. By removing an inspection plate from the pipe, he was fortunately able to retrieve the hammer.

The diver was supplied with air by means of a hand pump operated at the surface. When he was hauled up again he congratulated those working the pump for maintaining such a steady supply of air, and told them that on another occasion, after he had been hurriedly hauled to the top owing to faulty air supply, he had found that those in charge of the pump had ceased pumping and were engaged in a heated argument.

The closing of the mines in the 'nineties was mainly due to the difficulty of obtaining the ore from the greater depths at a cost which, with falling market prices, left a margin of profit, and not due to exhaustion of the mineral. During the war and just after it, owing to better prices prevailing, it seemed as though the mining industry in this district might once again he made to pay. Much money was then spent in constructing the Leigh Level to unwater some of the mines and to facilitate working. But subsequent falls in the price of lead put an end to this project, and the lead mining industry in Shropshire has come to a standstill after almost two thousand years of activity with little prospect of a revival.