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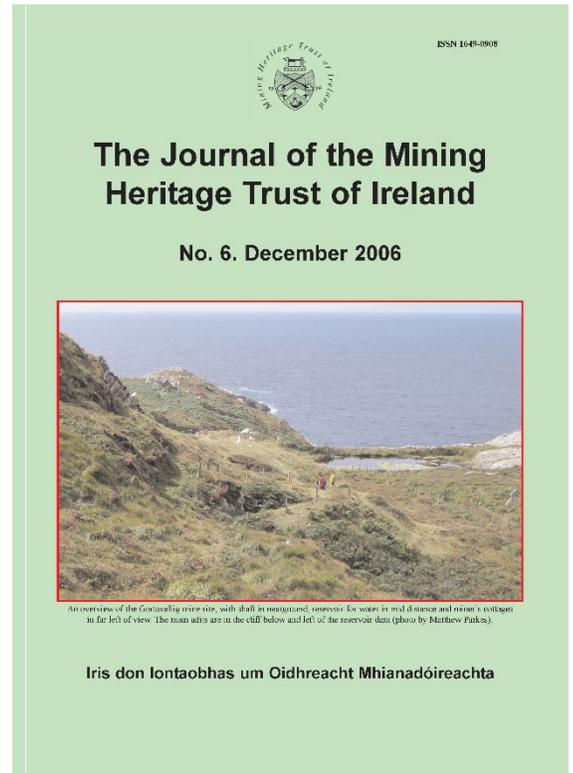
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THE BALLYCORUS LEADWORKS

By Paul Normoyle

Abstract: On a modest hilltop overlooking much of south Dublin stands a curious piece of 19th-century industrial archaeology. The Ballycorus chimney stack is a remnant of a forgotten period of lead mining, smelting and manufacturing here. However, a surviving set of old photographs and plans gives an idea of the scale of operations that once existed. *Journal of the Mining Heritage Trust of Ireland*, 6, 2006, 11-16.

MINING BACKGROUND

Lead mining began at Ballycorus, on the west side of the hill, around 1806. Initially it was a small open cast or surface working of two veins of galena discovered at the Leinster granite's edge. But by 1820 mining operations had extended deep into the hillside, and the ore raised was being locally smelted to extract the metallic lead (Weaver 1819; Griffith 1828). In 1825 the then newly-formed Mining Company of Ireland (MCI) took over operations at Ballycorus (MCI Reports 1825-1891 for most of what follows). It sank several new exploratory shafts, but invested mainly in upgrading the smelter works to cater for the output from its other mines in Wicklow, Wexford and Donegal.



Figure 1. Ballycorus chimney circa 1905. Photo: Geological Survey of Ireland.



Figure 2. Ballycorus chimney in 2002. This photo and all other photos copyright of the author unless otherwise stated.

SMELTER AND MANUFACTURING OPERATIONS

The smelter was situated in the valley about 1km from the mine on the bank of the Loughlinstown River. At the time the MCI took it over, the site included reverberatory and refining furnaces, slag hearths, a blast engine, stamps, and a mill pond. A water-powered rolling mill was added in 1829 along with a shot



Figure 3. Interior of furnace house (number 4) circa 1910.

making facility (above the mine) to produce the small spheres of lead used in shotguns. An additional smelting house with two furnaces was added in 1836, with the noxious fumes being directed along a 300 metre long subterranean flue to a tall chimney. A casting house was added in 1839. The furnaces would have operated around the clock with the ore arriving in horse-drawn trucks.

One description of the smelter (Kane 1845) states that in 1843 dressed ore from the mines at Lughnure (Co. Wicklow) and Caime (Co. Wexford) was producing about 72% lead, as in that year 817 tons of ore produced 588 tons of lead. This was being manufactured into shot, litharge, as well as the lead water pipes and roof sheeting being used in the Dublin construction industry. For the latter half of that year the works showed a profit of £348. Twenty years later in 1863, when the Lughnure mines were at their most productive, the latter half-year works profit reported was £2041 (roughly equivalent to \square 1.6 million today). During the 1850s and 1860s the company invested in rebuild-

ing and upgrading the works, setting up a special "Ballycorus Improvement Fund". This period of expansion saw the erection of a new shot manufactory further up the hillside complete with a fine shot tower surmounting a vertical mine shaft. Also approved was additional stamping machinery (1854); a new flue and chimney (1858); workmen's cottages, and a millpond and water wheel at the shot manufactory (1860); additional smelting house and furnaces (1861), and a managers house (1863). The company sponsored a new national school to serve its works community (opened 1862), and also contributed to the cost of a new road linking the Ballycorus Road with Shankill.

Up to this time the Ballycorus mine was only being worked



Figure 4. The Ballycorus shot manufactory 1955. Photo: Paddy Healy.



Figure 5. A general view of the Ballycorus shot manufactory in May 2005.



Figure 6. General view of main gate area circa 1905. Photo: Geological Survey of Ireland.



Figure 7. General view of main gate area May 2005.



Figure 8. Main gate from yard May 2005.

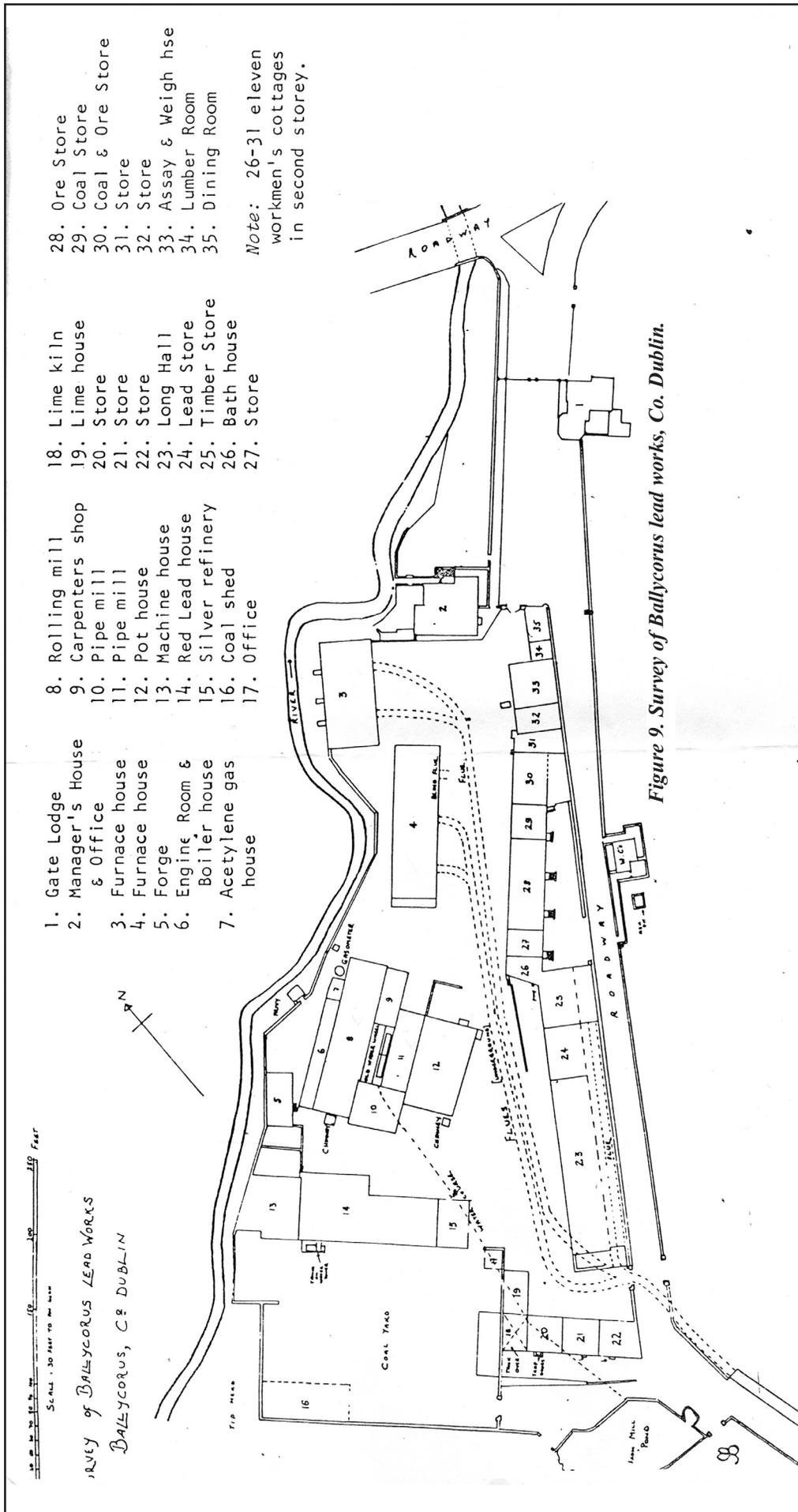


Figure 9. Survey of Ballycorus lead works, Co. Dublin.

intermittently as the price of lead fluctuated. In real terms it was never very productive, and was abandoned as worked-out by 1860 (Cairns 1994). The smelter continued mostly processing ore from the Luganure mines up until the late 1880s, which from 1862 was being transported from Rathdrum by train to a special siding at Shankill station. When that source ran out the works kept going with ore imported from the Isle of Man and elsewhere until operations ceased sometime around 1913. At its peak, there were well over 100 people employed at Ballycorus, many of them highly skilled. During its history the works produced lead in pigs, ingots, sheets, pipes of all sizes, as well as litharge (used in glass making), red lead (used as a rust inhibitor), shot of all sizes, and large quantities of silver.

In making shot precise quantities of arsenic and antimony were first added to the lead to enhance its properties. The resulting "poisoned lead" ingots were then remelted at the top of the shot tower, poured through a copper sieve and allowed to free-fall into a vat of water up to 150ft (45.7m) below. The lead cooled into perfect spheres which were then polished, graded and bagged for the domestic and export markets.

The early 20th-century plan (Fig 9) gives a rare insight into the works layout. Arriving ore was tipped into bunkers (numbers 28 and 30) before being taken to the furnace houses (3 and 4) where the ore was smelted with the lead running into moulds and cooling to form pigs. Silver was extracted from the lead in the pot house (12) using the Pattinson process, and purified in the silver refinery (15). Approximately 7 1/2 ounces per ton was obtained. In 1843 some 4261 ounces (121.3 kg) extracted from the ore was sold for £1157. A 30-foot (9.1 m) diameter water wheel originally



Figure 10. Smelter works yard area May 2005.

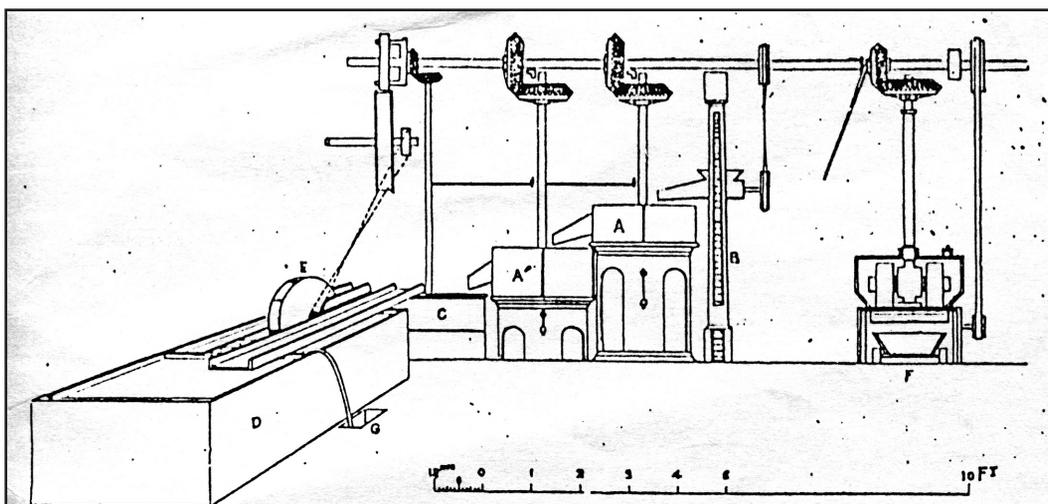


Figure 11. Now vanished shot tower, circa 1905.
Photo: Geological Survey of Ireland.



Figure 12. Ballycorus smelter works circa 1905. Photo: Geological Survey of Ireland.

Figure 13. Diagram of the interior of the Ballycorus works showing the machinery used in grinding and levigating.



A. Two pairs of millstones

B. Endless belt with small tin buckets attached which revolves on pulleys and carries up the stuff to the hopper of the stones A. a small stream of water is allowed to trickle into the centre of the stones whilst in motion, by which means grinding is facilitated, and the ground stuff, escaping in the state of mud from stones A, is carried into the second pair of stones A', from these into the bran-tub C and finally into the settling vat or depositing vat D, both previously filled with water.

C. A round tub, having a vertical spindle rotating in the centre

To this spindle arms are attached with chains hanging from them, the dragging movement of which keeps the water in constant agitation. At the Holywell Works, Mr Keates states that a piece of stone was fitted into the bottom of the bran-tub, upon which another piece of stone was made to revolve by means of an upright shaft, whereby the dross was kept in agitation.

D. A long rectangular vat into which water, with mechanically suspended matter, flows from the bran-tub C by a small Persian wheel E so that the water is kept in constant circulation.

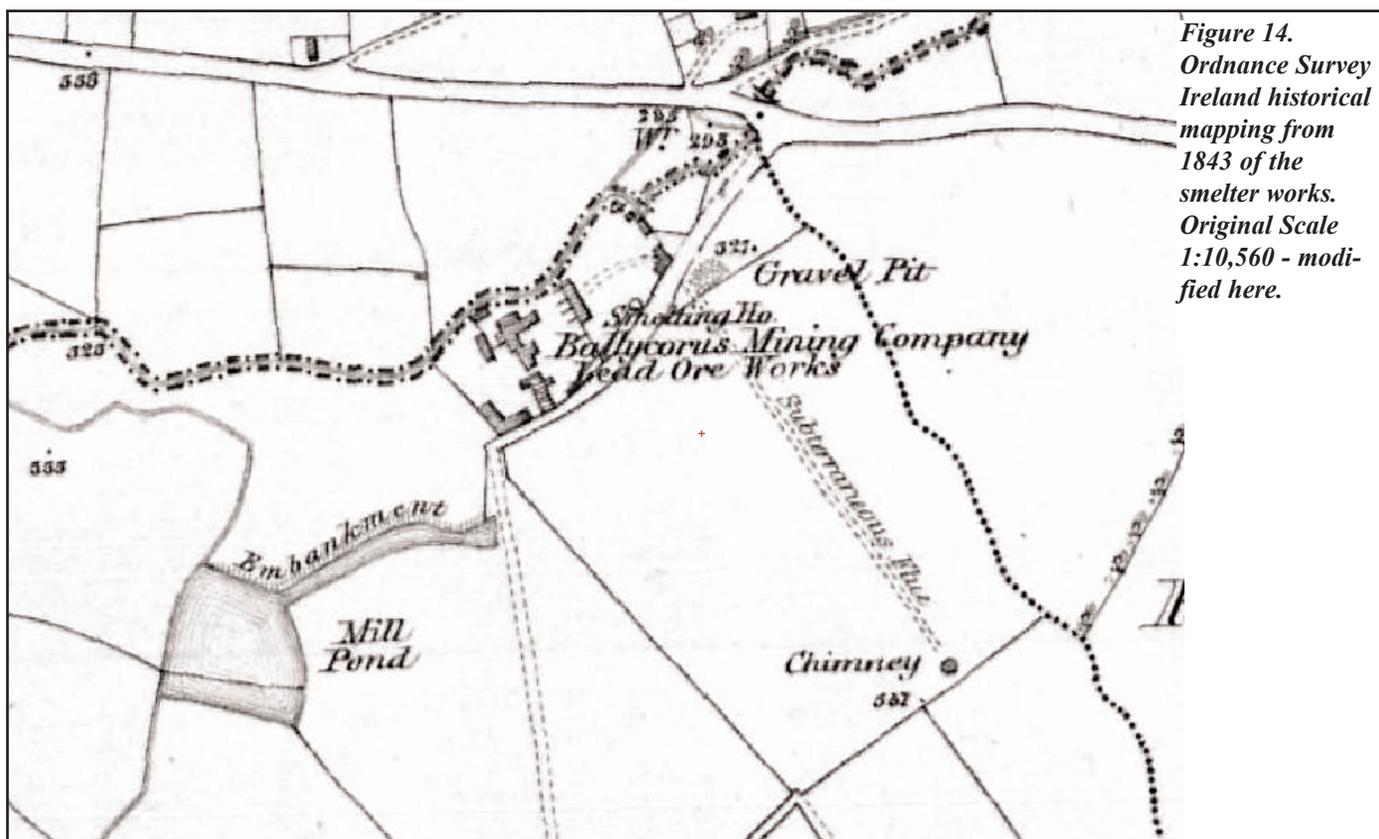


Figure 14. Ordnance Survey Ireland historical mapping from 1843 of the smelter works. Original Scale 1:10,560 - modified here.

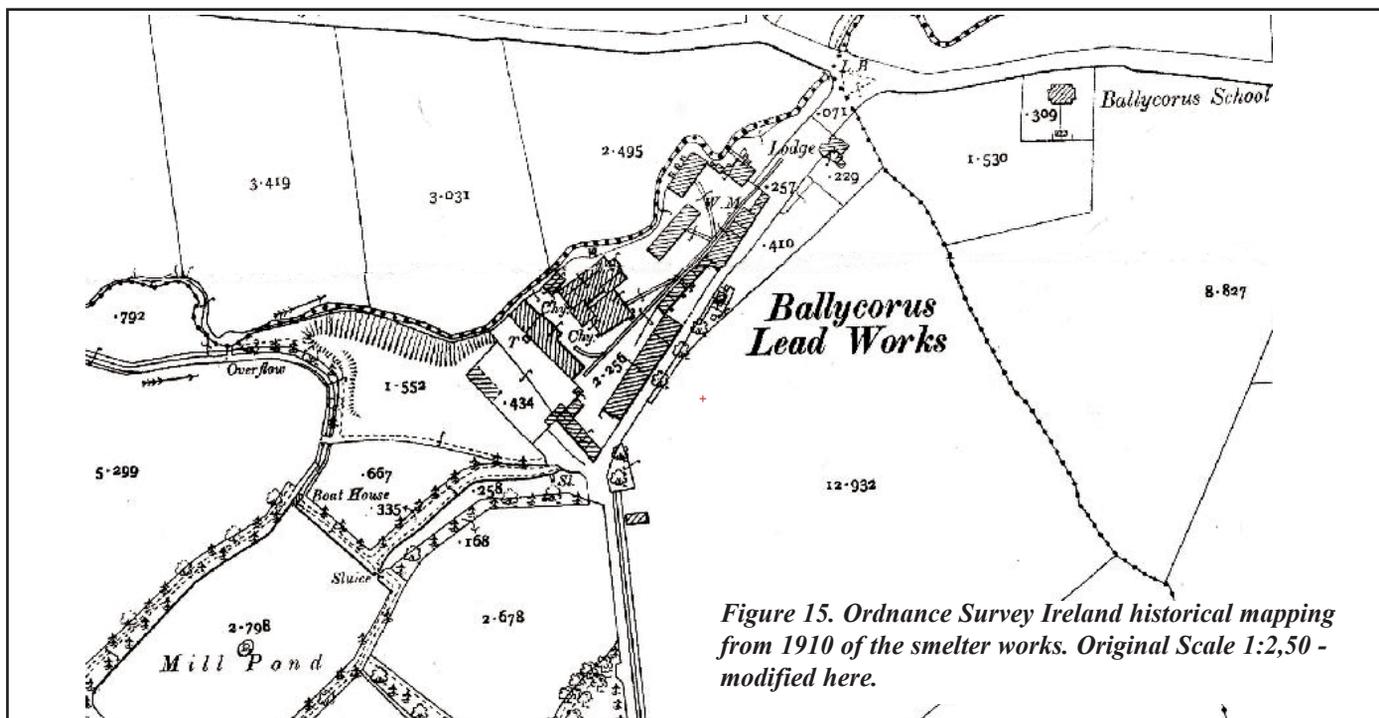


Figure 15. Ordnance Survey Ireland historical mapping from 1910 of the smelter works. Original Scale 1:2,50 - modified here.

powered the mill machinery for rolling (8) and for drawing out pipes (10, 11), - later it was engine driven, and a new boiler was added in 1863. These mills dated from 1828, but were replaced in 1876. A new furnace was installed at the red lead house (14) in 1875, adjacent to the lime kiln and store (18, 19). A mini railway permitted the easy movement of coal, ore and lead products between the various buildings.

Some of the features mentioned are visible in the photographs taken in 1905 and make interesting contrasts with those taken fifty and a hundred years later.

THE CHIMNEY AND FLUE

The hilltop landmark chimney - about 26m tall and 235m above sea level - is shown on old photographs as being about one third higher prior to its top brick section, along with parts of the external spiral granite staircase and veranda, being removed for safety reasons. It replaced the (long vanished) 1836 chimney much lower down the hill which was allegedly affecting local livestock. The erection of the 1858 chimney coincided with the construction of Ballycorus's unique feature - a 2 metre high above-ground granite and brick arched flue which connected the works underground flues to the chimney - a run of some



Figure 16. Mine Hill Lane looking south May 2005.



Figure 17. Accessible section of flue, May 2005.

Figure 18. Right. Ballycorus hill open-cast area, August 2004.



1.4km. As well as disposing of the fumes, the long length allowed the hot gasses to cool and valuable lead "dust" to deposit on the interior brickwork. To facilitate its recovery there were metal doors at 50 yard (45.7 m) intervals along its length. The recycled sweepings were reported to be worth £1016 in May 1860 - a return which allowed the MCI to recover the £4,000 cost of its construction very quickly. A report in the *Dublin Builder* from July 1863 states that it is being cleaned for the third time with an expected return of "£2,000 worth of arsenic and other matter".

THE SITE TODAY

At the works site the many individual buildings are now converted for modern industrial use, derelict or gone altogether, but the extent of the original complex is discernable, and two distinctive granite pillars still guard the main entrance. The attractive granite manager's house survives, as do a row of cottages, the old gate lodge, and the mill pond.

From the smelter works area one can walk up Mine Hill Lane following a long straight stretch of overgrown flue with its access apertures still visible (fig 16). The shot manufactory buildings are now private residences. The shot tower was demolished about 70 years ago, but a tall free-standing granite chimney survives. Beyond the end of Mine Hill Lane the flue traced a wide arc as it ran up the hillside to the chimney. Some intact sections can still be found in the gorse, but in the vicinity of the chimney it has been removed.

ACKNOWLEDGEMENT

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