The slags from Piercebridge

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The slags from various areas excavated in Piercebridge were examined at the Bowes Museum and classified. The types of material found are described below and their mode of formation is explained. There were no particular concentrations of slag associated with hearths or furnaces so most of it is effectually residual although it may be contemporary with the deposits in which it was found.

The two most frequently found slag types were smithing slag and fuel ash slag. Smithing slag is dark brownish-black in colour, fairly dense and vesicular. It is formed when iron is forged in a hearth. If a crude bloom of iron from a smelting furnace is forged down into a compact metal bar, large amounts of slag are squeezed out of it and collect in the hearth, usually in a plano-convex bun at the bottom of the fire. These hearth bottoms were relatively small and infrequent among the smithing slag from Piercebridge which suggests that the slags found there were more likely to have been produced by a later stage in the iron-working process, the fabrication of objects from bars or lumps of forged iron.

Fuel ash slags are formed by the fluxing action of ash on silicarich materials (eg clay and sand) at high temperatures. They are often produced as by-products of metal-working but can be formed in any fire that is hot enough for long enough. They are very variable in colour and texture but are normally paler and less dense than smithing slags. The fuel ash slags from Piercebridge are rather darker coloured than is often the case but this is probably just a reflection of the natural iron content of the silicate material, although it may also be due in part to iron picked up in smithing hearths. Some of the pieces were lumps of shaley material, fluxed on the outside. This could indicate that coal was used as a fuel, the shale getting into the fires along with the coal. (Question: Is shale one of the rocks found naturally on site? If so, ignore the comment above.) Some pieces of hearth lining were also found. This is a special form of fuel ash slag, the siliceous lining of the hearth being fluxed on one side from contact with the fire. A few of these bits had traces of circular holes of about 2-3 cm diameter in them. These would have been the tuyeres - where the bellows nozzle was put to blow up the fire.

In addition to the above there were a few very small pieces of possible tap slag, which is the form the iron slag takes when it is tapped out of a smalting furnace, and one other piece of possible smalting slag. The quantity found is too small to support a suggestion of smelting at Piercebridge, at least in the areas excavated.

The evidence of the slags suggests small scale iron smithing which is an activity one would expect to find in any settlement of reasonable size during the Roman period.