The 18th-century Sheffield saw industry: its origins and relationship to crucible steel making

Simon Barley

ABSTRACT: The saw-manufacturing industry in Sheffield was of world-wide importance throughout the 19th century and until its decline late in the 20th century. Its origins have been little documented in a town well-known for its cutlery but lacking any saw industry until the 1750s. Analysis of contemporary business documents and foreign travellers’ diaries shows that a combination of factors unique to Sheffield enabled the establishment of the industry by local entrepreneurs, at first using skilled labour imported from older centres of sawmaking in London and Birmingham. By about 1830 these centres were in steep decline, and by 1841 Sheffield contained almost 80% of the nation’s sawmakers. This paper provides quantitative data on the use of local crucible cast steel in saws and other tools, emphasising the close relationship of the saw industry with the manufacture of this early form of special steel. The changing methods of producing saw plate by forging and rolling are compared.

Introduction: making a hand saw

Making a woodworker’s hand saw has been described as technically the most complex of any tool manufacture for the 18th century metal-worker (Gaynor and Hagedorn 1993, 80). The blade of an English-pattern saw, which was up to eight inches wide and which cut on the push stroke, needed qualities of hardness, stiffness, springiness and smoothness so balanced as to stay sharp, bend but not break, and work easily through the wood. Depending on the intended quality of the blade, the metal was put through at least 12 separate processes, beginning with a bar of cemented (blister) steel, or an ingot of crucible steel. To understand how the handsaw blade of this period was made, the processes will be briefly described. The stages are set out in the order given in the 20th century (Tyzack 1921), but earlier documents indicate that sometimes the sequence was slightly changed, with some filing of the teeth done with the blade in its annealed state.

1. The first stage of producing saw plate was to thin out the steel bar or ingot, either by hammer forging or by rolling. The prevalence of these methods changed during the 18th century (see below). Although Moxon (1703, 96) described the use of iron for some saws, by the second half of the 18th century steel was almost always the preferred material. The records of Joseph Wilson, a Sheffield saw manufacturer from 1768 to 1775 (Wilson and Co archive), show him selling only saws of steel, in qualities he described as ‘common’, ‘german’ and ‘cast’, terms which are discussed further below. The last of these, the developing steel pioneered by Benjamin Huntsman (Barracough 1984b), was available to Wilson’s sawmakers in standardised ingots suitable for producing saw plate of various dimensions. The nature of the first two steels is not precisely known, but it is likely that both were grades of blister steel, subjected to further forging treatments to improve the homogeneity of the material.

2. The roughly rectangular sheet was pared to shape and the teeth cut with a punch and die of appropriate size. While the steel was still in this unhardened state the name of the maker might be struck on the blade or on the back of the saw (Fig 1).

3. The steel sheet was hardened and tempered. No contemporary methods were described in the 18th century, but by the 1920s, when saw manufacture in Sheffield...