

Separating Iron and Steel

The *tatara* ironmaking method used at Sugaya Ironworks resulted in a mass of iron, steel, and slag that formed within the clay furnace. At the end of the process, the furnace was dismantled to expose the still-glowing lump of metal and slag (called a “bloom”). Workers dragged the bloom out of the *takadono* smelting workshop and submerged it in a nearby pond to cool.

Although the arduous, multiday process of smelting ended when the bloom was removed, the roughly three-ton mass of metal was not a finished product ready for market. Only a small fraction of the bloom consisted of *tamahagane*, a valuable low-carbon steel that was ideal for making swords. Other portions consisted of irons with higher carbon content, such as pig iron, which required additional refining before they could be sold. In order for these different metals to be extracted and processed, the bloom needed to be broken apart and sorted.

Once cooled, the bloom was moved from the pond to the mill beside the katsura tree. There, a drop hammer weighing more than 1 metric ton was hoisted into the air using a waterwheel-powered tackle and dropped onto the bloom to break it into smaller chunks.

The pieces were then transported to this workroom attached to the manager’s residence, and the crushing process was repeated using a smaller drop hammer. While the mechanism for dropping the weight has since been removed, the channel for the waterwheel remains outside the building. Once the bloom was broken into workable chunks, trained specialists performed the final separation using handheld hammers.