

## The Underground Structure of a *Tatara* Furnace

Moisture is one of the greatest enemies of *tatara* ironmaking. Excess moisture lowers the internal temperature of the furnace, making it more difficult to smelt iron and steel. The underground structure reproduced here was developed to prevent moisture from reaching the area beneath the furnace.

The underground structure consists of three stone-lined compartments. A deep trench in the center is flanked on the left and right by two smaller cavities. The trench is filled with charcoal and compacted ash, creating a layer of dry materials directly underneath the furnace, but the cavities on either side are left empty to help insulate the heat from the furnace and to allow moisture to dissipate.

To build these three compartments, workers excavated the middle of the *takadono* workshop. Depending on the size of the furnace, they dug anywhere from 3 to 5 meters into the ground. Once the *murage* (foreman) at the site verified that everything had been constructed properly, the underground structure was covered with earth to create a flat surface for the furnace and bellows.

This underground structure was semi-permanent and only required occasional maintenance, as opposed to the furnace itself, which was destroyed and rebuilt between each operation. A sign on the main floor of the museum describes the aboveground structure.