

Early Furnaces: Slag from the Imasayayama Site

These chunks of slag (a byproduct of the smelting process) were excavated from the Imasayayama archaeological dig site in Ōnan, Shimane Prefecture. Dating from the late Kofun period (ca. 250–552), the slag is some of the oldest evidence of ironmaking in the region.

Early open-air *tatara* furnaces were stoked by bellows made of animal skin. Research suggests that some of the oldest smelting sites used iron ore as a base material, but the ore was scarce, and the technology was later adapted to use iron sand, which was more readily available.

Ironmaking diorama

The nearby diorama depicts what ironmaking may have looked like at the Imasayayama site. The primary product of the smelting was pig iron, which drained out from the furnace through holes at its base, while slag and smaller clumps of iron amassed inside. As molten slag accumulated inside the furnace, it created a mold of the furnace's interior dimensions. Today, solidified hunks of slag can be used to estimate the shapes and sizes of the furnaces that produced them.

Iron Sand from the Imasayayama Site

The iron sand in these bottles was excavated from the Imasayayama dig site. The comparatively rounded shape of the grains indicates that the sand was likely gathered from a riverbed. It is high-quality iron sand, containing roughly 60 percent iron, 5 percent titanium dioxide, and 0.2 percent vanadium.