

## The Decline of *Tatara* Ironmaking

In the late 1800s, the Japanese government began actively importing Western technologies. This included Western architecture and rail transportation, both of which required large quantities of iron and steel. Reverberatory furnaces and the latest advancements in iron-ore-mining techniques were also imported to meet this demand.

Reverberatory furnaces are more efficient than traditional *tatara* furnaces, and they were widely adopted at sites such as Yawata Steelworks (Kitakyushu, Fukuoka Prefecture) and Kamaishi Ironworks (Kamaishi, Iwate Prefecture).

Data from 1921 shows the differences between the two technologies: to produce 1 metric ton of pig iron, a *tatara* furnace required 8 metric tons of iron sand, but a reverberatory furnace required only 2 metric tons of iron ore. Although a *tatara* furnace could produce prized *tamahagane* steel and the reverberatory furnaces could not, it was quantity, not quality, that mattered at that time.

Throughout the early years of the Taishō era (1912–1926), owners of *tatara* ironworks attempted to improve on the traditional methods by creating tall, square *kakuro* furnaces out of brick. Unlike clay furnaces, these *kakuro* furnaces did not need to be rebuilt after every operation and could be used continuously. The arrival of *kakuro* marked the end for the traditional clay furnaces that had been used for centuries, and the last *tatara* furnace in Okuizumo was closed in 1923.