

## Characteristics of the modern stone industry and the regional context in each granite production areas in Japan

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Japanese stone industry has been thought to have developed to supply materials for the western architectures that were introduced in Japan in the late 19th century. It is also thought that it simply reduced because the imported stone materials became inexpensive. They are true, in a way, but the fact is more intricate, according to the interview survey carried out in several granite production areas. It is important to learn and record the complexity in the industrial history of one of the Japanese underground resources. Characteristic Japanese manner in the stone industry is described in this article. Difference in the industrial structure and history between several production areas are then documented.

Modern quarrying and stone manufacturing industry in Japan was established shortly after the introduction of western architecture, which used stones. Before that, stone was not popular in architectures. Therefore, stone was accepted in Japanese construction as decorating or finishing material. As the result, the standard manner of stone panelling in Japan became very elaborate, which only allowed beautifully designed stone panels with perfect colors and patterns, without any irregularities. The tradition has lead to low yield ratio (high rate of waste). Japan is also unique in its market of large granite tombstone which became popular after the world war II. Religious monuments are also popularly produced in stones. Stone materials in Japan therefore had two different markets, one for building stones, another for tombstones and religious craftworks.

Grain size, number density and orientation of cracks seems to determine the use of the stone, for building stone or for tombstone. Coarse grained granite with less cracks and veins yields large sized blocks, which is more favorable for architectural use. Some of those granites are used in famous historical buildings in Tokyo (e.g. Shodoshima stone, Kitagi stone). Fine grained granites with greyish colors are favored for tombstones in Japan (e.g. Aji stone, Oshima stone). Those quarries tend to have cracks with high number density and very low yield ratio, resulting in very expensive tombstone products.

Another factors that made difference between the granite production areas are the location of the quarry. Quarries on islands had advantage when principal transportation was seaborne. The transportation however shifted onto land and the islands lost their advantage. The relation between the quarry and the town sometimes restricted the activity of the quarry, concerning the noise or the disturbance on the landscape. Ownership of the mining area seemed to affect the sense of community in the production area.

The scheme and the unique manner of the stone industry in Japan are described. The interview survey revealed the context of each several granite production areas in Japan, and demonstrated how they corresponded to the decrease of stone production in Japan.

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