

Visualization of Twin & Kármán Vortices on the Ancient Pottery, Jomon-doki, made 4500 Years Ago

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Fig.1. Jomon-doki



Fig.2. Pollen of cedar coming from cedar forest

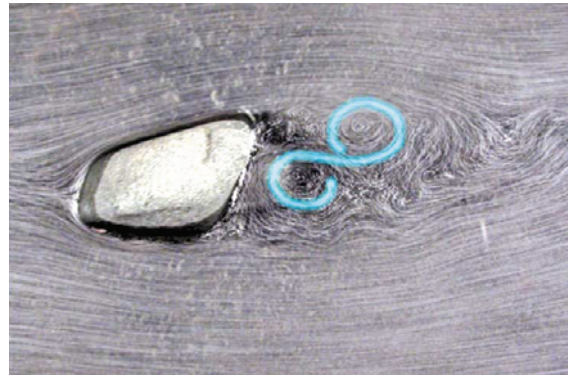


Fig.3. Twin vortex (left) and Kármán vortex (right) behind a rock of river (Surface floating method using pollen of cedar tree and aluminum power)

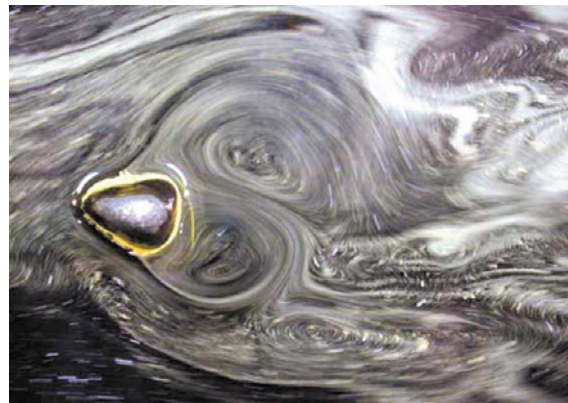


Fig.4. Twin vortex (left) and Kármán vortex (right) behind a rock of river (Surface floating method using pollen of pine tree)

It is said that the Jomon-age in Japan began 16,000 years ago and continued till 2,500 years ago. The earthenware made in this age is called Jomon-doki. Among them, two potteries shown in Fig.1 were discovered in Niigata Prefecture and have very nice pattern. It is said that these potteries were made about 4,500 years ago. The pattern on the side wall consists of two kinds of vortex. One is so-called twin vortex each rotating in the opposite direction and the other that is observed under the twin vortex is the plastic art of Kármán vortex rotating in one direction and presenting reversal S-shaped vortex. It can be easily assumed that Jomon people watched the twin vortex and Kármán vortex created by tracers such as the pollen of the cedar (Fig. 3) and pine (Fig. 4) trees, fallen leaves and petals, and copied the pattern on the earthenware.