Restoration of Pottery and Clay Figures

Gangoji Institute for Research of Cultural Property,
A Public Interest Incorporated Foundation

Earthenware Restoration Unit,
Conservation Study Group for Cultural Properties

At the Gangoji Institute for Research of Cultural Property's Earthenware Restoration Unit, we often work on the disassembly and restoration of excavated artefacts such as pottery and *haniwa* figures. The subjects of this disassembly and restoration include objects designated as National Important Cultural Properties, or objects often displayed or lent out to museums, in which the adhesives and restoration materials used in previous restorations have degraded.

Here, we will demonstrate the process, using as an example the disassembly and restoration of a deep earthenware bowl unearthed from the Mizukida archaeological site in Yamagata Prefecture.

Disassembly

The adhesive at the joins is swollen (softened) by using an organic solvent such as acetone. In order to prevent accidents, such as the pot disintegrating, the work is performed while holding it in place with clamps or similar. If necessary, x-ray photography is used to check adhesion between the fragments and, if present, the condition of any gypsum or other restoration materials covering them when carrying out the work.

Photo 1: Disassembly

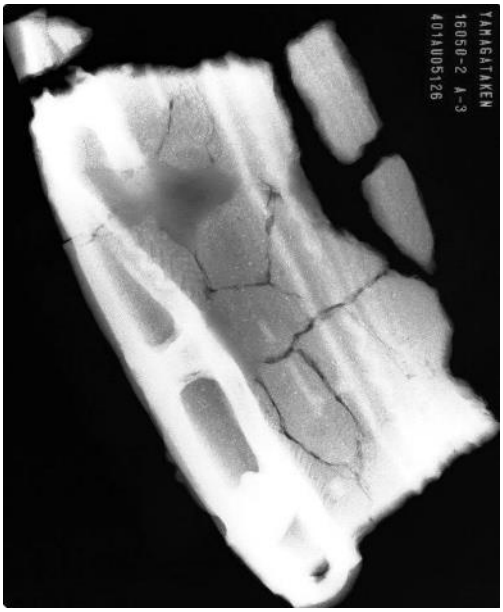

Photo 2: X-ray photo

Photo 3: The fragments after disassembly

Cleaning, Reinforcing, and Laying Out the Fragments

The fragments of the disassembled bowl have adhesive and restoration plaster stuck to the outer surface and cross-section. These are removed (cleaned) with an organic solvent such as acetone. Then, the fragments are reinforced by either painting them with, or immersing them in, an acrylic resin solution.

Following this, the cleaned and reinforced fragments are laid out, and the assembly procedure is planned.

Photo 4: Reinforcing fragments by immersion in an acrylic resin solution

Photo 5: Laying out the fragments

Adhesion and Assembly

The pieces are adhered together using an acrylic resin solution as an adhesive. First, groups of several fragments are adhered together to form larger fragments. Assembly is then carried out using clamps, elastic straps and other aids to hold the large fragments in place. Repeating this process, assembling from the rim and then from the base, while checking the overall shape, improves the accuracy of the adhesion.

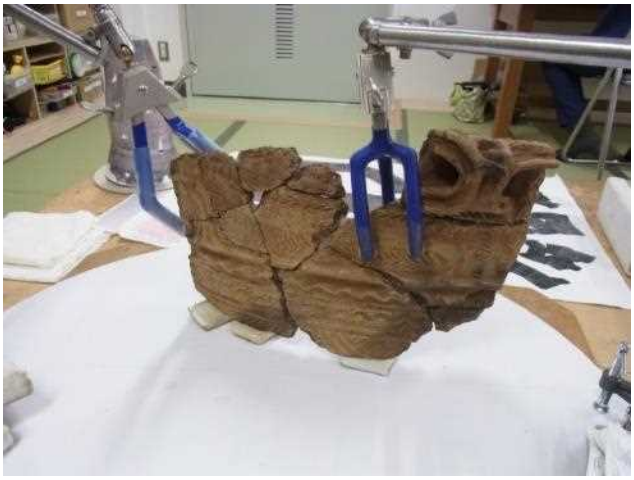

Photo 6: Adhering groups of fragments together

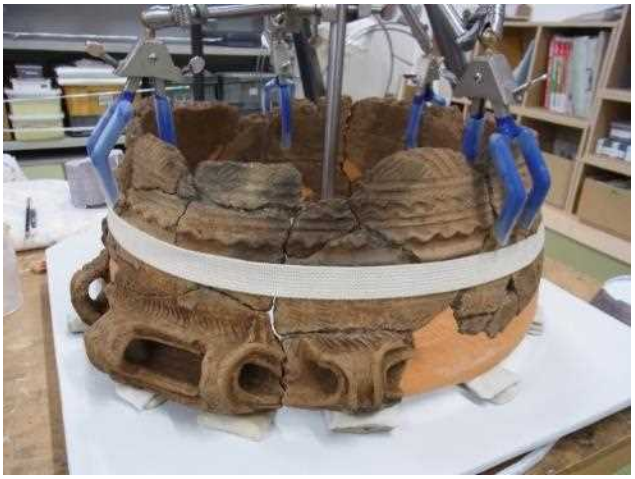

Photo 7: Assembly using clamps and elastic straps

Photo 8: Assembly from the rim

Photo 9: Assembly from the base

Reconstruction (Filling in Missing Parts)

Missing parts are filled in with epoxy resin. An epoxy resin with a long pot life (the length of time it takes to harden after mixing) is used for reconstruction of the missing parts. This allows reconstruction of even the smallest details. For large pieces of pottery, the work is performed in sections to allow assembly of the inner surface.

Photo 10: Reproducing a rope pattern

Photo 11: Rope-patterning tools (tools made by twisting fibers)

Photo 12: Work being performed in sections

Photo 13: Reconstruction of the inner surface

Photo 14 Reconstruction of the protrusions (decorative parts) on the rim

Finishing and Retouching

The whole piece is adhered together, and the reconstructed parts made of resin are finished. Then, the reconstructed parts have their colour retouched using acrylic resin paint.

Photo 15: Adhering together the whole

Photo 16: Finishing the reconstructed parts

Photo 17: Retouching the reconstructed parts