“Undoing a failed restoration work- conservation of a Jingle”

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The object:
Bronze Jingle from Anyang, Henan Province, China.
Shang Dynasty, 1300-1050BC
H9 W32.5 Depth 4 cm

What is it really?
The Jingle is an object with two openwork spheres with each containing a small bronze bell. The sphere is fixed on an open arched shaft rising from each of a bow-shaped bronze mount. The exact purpose of the Jingle is unknown, but it was likely fixed to the front of a chariot as a guide for the reins.

Condition of the Jingle:
The bronze Jingle came with a broken arched shaft at one end. After inspecting the two broken edges closely, it was obvious that the Jingle was previously restored by using steel and brass dowels to hold and support the two detached parts together. White plaster, together with an unknown epoxy resin, was later used as filling materials. The restored area was then painted to match the original surface colour. However, this also showed that the previous restoration materials were unsuitable and had failed. The epoxy resin had deteriorated with time and the plaster filler was not strong enough to hold the bronze structure. The steel and brass dowels were found to be too short.


← The broken arched shaft.


← A closer view of the resin, plaster and dowels.

A Conservator's decision:

Based on the bronze Jingle's current condition, it was decided that the Jingle required conservation treatment in order for it to be safe and stable enough for display in the museum or for storage purpose. In addition, by conserving the Jingle, there would be no worry that the broken and detached arched shaft might go missing or misplaced.

The Conservation treatment and procedures:

The conservation treatment began first with the removal of old restoration materials.

↑View of the old resin and plaster after been removed mechanically using scalpel.

↑A view of the short steel dowel.

↑ A view of a broken brass dowel.

Once all of the old restoration materials were removed, the edges were cleaned.

↑ Here, the previous dowel holes were re-used. Brass dowels were chosen as brass was less likely to corrode and cause problems in the future. The brass dowels were glued and positioned in place using ‘Araldite Rapid’ high performance epoxy adhesive.

↑ A piece of art modeling wax was used to take the shape of the arch in order to obtain a balance size and shape. This art modeling wax is used for moulding purpose.

↑ Above, the detached arched shaft was attached together with ‘Araldite Rapid’ high performance epoxy adhesive and supported by the modeling wax. The equal balance in size and width of the two arched shafts was achieved in this way. Sandbags were used to support and hold the attached shafts in position during the drying process.

Below shows the re-attached shaft holding on its own with the supporting wax mould removed. Take a closer look and you would be able to see the brass dowels in place supporting the shaft.
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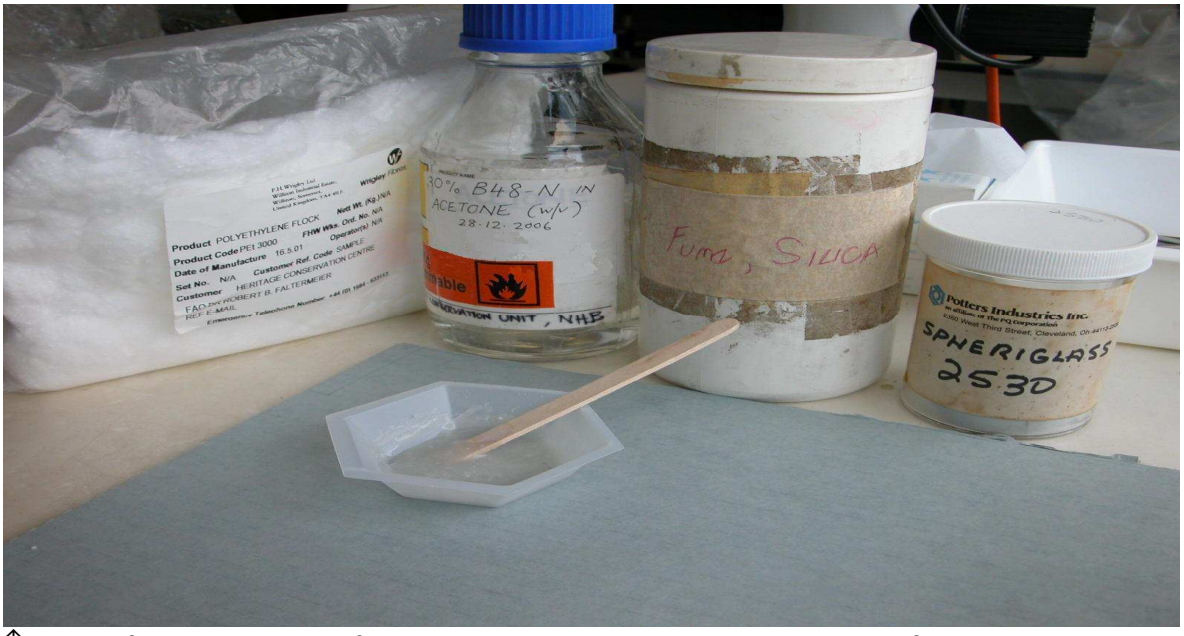

↑ A new filler was used to fill the structural void at the re-attached shaft area. It was made by mixing polyethelene fibers, fume silica, Spheriglass micro-balloons with 30% Paraloid B48 Acrylic resin in Acetone (acrylic adhesive). This filler is a good working material as it would start to dry within minutes, yet soft enough to work a shape out of it by simply adding some acetone to soften it. Within 48 hours, the filler would be concrete hard, thus matching the strength of the bronze Jingle structure.

Here, we can see that the filler was applied to the void area where the new joint was. It was further worked and smoothened to get the shape right using scalpel and micro-mesh. Micro-mesh is a high end sandpaper made from diamond particles and was said to have been used in polishing aircraft windows. The filled area was then ready for in-painting using acrylic paints. In-painting is the process of applying the correct mix and tones of colour on the reconstructed surface in order to blend in well with the original.
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↑ Above is the conserved bronze Jingle. The time taken to conserved the Jingle was 13 hours.

Can you spot the conserved area?