

types has been used in paper conservation for hundreds of

taxidermy specimens in the last decade or so (e.g. Moore,

2007). However, not much has been published about the

use of this material in the conservation of osteological

specimens even though it has several applications. For

appropriate conservation adhesive, it can help to add

example when used in the repair of breaks in bone with an

greater strength to the join than adhesive alone. It can also

be used as a gap-filling medium, for modelling-in small

support. Adhesives that have been used successfully with

Example 1: Repairing a broken orangutan skull. The rear

labels removed from specimens to provide long term

Japanese tissue paper include Paraloid B72, polyvinyl

alcohol and neutral pH PVA adhesive (all reversible).

of this skull had been badly broken and although the

pieces were wired together, many were still loose and

meant that the weight of the skull was taken by the

one large piece was detached. Also, the skull attached to

the rest of skeleton simply by being placed on the end of

the vertebral rod from which it dangled precariously. This

broken pieces that were loosely wired together. The skull

was repaired with Japanese tissue paper and neutral pH

PVA adhesive, applying it within the breaks and to the

were missing were filled with the Japanese tissue and

Significant gaps were filled in this way. This made the

out as it was such a similar colour to the bone.

inside of the skull across the joins. Gaps where fragments

adhesive and when this dried it did not need to be painted

years and has gained some popularity in the repair of

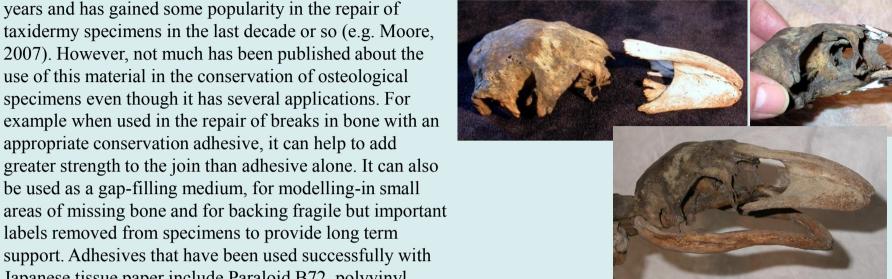
## Japanese tissue paper: some uses in osteological conservation

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Example 2: *Gap-filling and modelling to join pieces of a Moa skull*. This Moa skull (above) was in two pieces without any clear join (in fact

possibly from two different individuals). The two halves were attached together using Japanese Gampi tissue with neutral pH PVA to join the pieces and then the missing areas of bone were modelled-in using the tissue. The tissue was then painted with artists acrylic paints to blend in The mandible was partially broken at the symphysis and this was repaired with Paraloid B72 and gap-filled with a small amount of the same tissue and Paraloid B72 adhesive to ensure a good bond.

Example 3: Rebuilding a large Aepiornis egg. Consisting of over 120 fragments from more than one original shell this specimen (right) had collapsed and many pieces were separate. It was previously held together with photocopy paper and old brown parcel paper glued to the inside of the shell. These materials were removed and the egg completely rebuilt, backing the pieces internally with Japanese tissue and neutral pH PVA adhesive with thin wooden skewers inside for extra support.

> Left, the orangutan skull before and after repair. Below, gap filling holes in the orang-utan skull (before & after). Right, Aepiornis egg before and after reconstruction. Above, the Moa belonged to an individual. skull before, during and after joining together the bones and modelling-in missing areas.





**Discussion and Conclusions** Japanese tissue paper is a very versatile medium used in a variety of ways with a range of adhesives in art and paper conservation, taxidermy conservation and now increasingly in osteological and palaeontological conservation and preparation. Some palaeontological preparators use Japanese tissue impregnated with Paraloid B-72 as a temporary or permanent strengthening facing or backing to fragile bone (as a 'bone bandage') or as a heat-adjustable armature for a repair (Vital et al, 2013). Many different 'gap filler' materials have been used over the years but different fillers are suited to different tasks and some comparative studies have been undertaken (e.g. Larkin and Makridou 1999). It would be safe to assume that gaps filled with Japanese tissue paper and adhesive should not be relied upon to take a great deal of weight until specific weight-bearing tests have been undertaken. However, Japanese tissue impregnated with adhesive and then pulped for use as a gap fill or used in sheet form to structurally support small or wide gaps including where there is limited or no contact between joins – or both techniques, as required – can make a very strong repair. Adhesives regularly used include: neutral pH PVA adhesive; polyvinyl alcohol and Paraloid B72 adhesive (the latter at 10 to 50% in ethanol or acetone solutions.)





**Acknowledgements** The conservation of the orangutan was part of the Grant Museum of Zoology's 'Bone Idols' Project (funded by NatSCA, Arts Council England's Museum Development Fund and various members of the public); the Moa conservation was for Leeds Museums & Galleries; and the egg

## References

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