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CONSERVATION OF A LEATHERBACK TURTLE SKELETON and the use of solvent gels to reduce fat staining from bone

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Background

The Leatherback Turtle *Demochelys coriacea* is unusual in that its carapace of boney plates is not fused to the vertebrae and ribs and is contained within a leathery skin.

The Cambridge Museum of Zoology specimen is a complete articulated skeleton. The bone has retained lipids within the porous structure and over time these oils have wicked out and caused staining and stickiness at the bone surface. The off gassing of the fats also caused stickiness on the inside of the case.

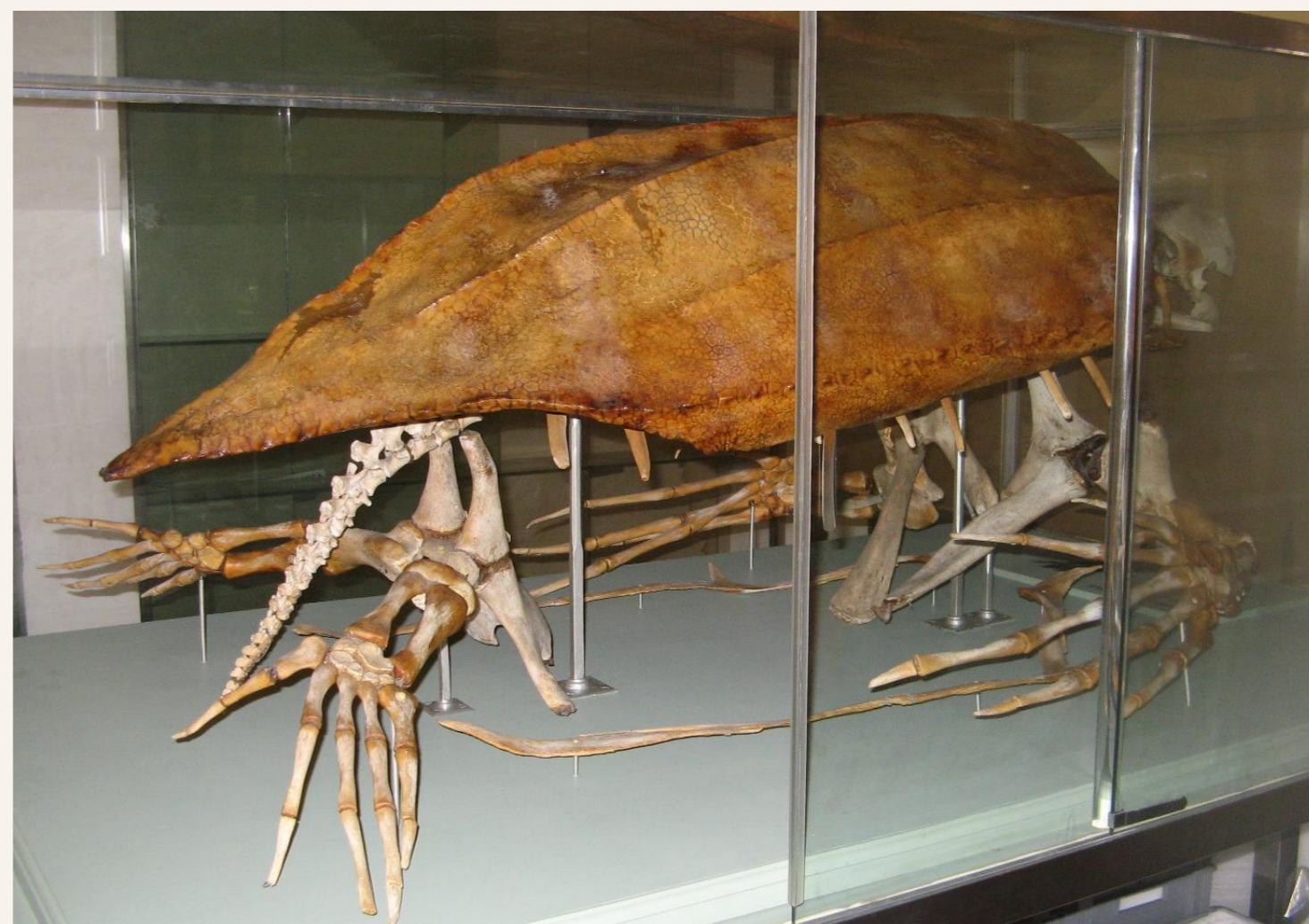
Condition

The specimen was greasy and sticky with dust embedded in the leaching fat.

The carapace had several cracks and three areas of loss that had been filled with a dark brown gypsum based fill material. The carapace was particularly greasy with dark sticky areas of oxidized fats. Pale stripes were visible where fat had wicked from the carapace into the ribs.

Several of the ribs were broken and the bone was brittle.

The 3rd and 4th phalanges of the front left flipper had detached.



Leatherback turtle (R.3036) before conservation and the commission of a new case as part of the museum redevelopment project.

Treatment

All the bones were dry cleaned with brushes and smoke sponge, followed by wet cleaning with 1% Synperonic A7 and rinsed with RO water and IMS.

The scutes of the carapace were cleaned individually, retaining the definition of the plate boundaries and the brown fill material was reduced by softening with acetone and removing with dental tools.

The ribs were re-adhered with Mowlith 50 1:1 in IMS/Acetone and given extra support around the breaks by backing with Japanese tissue.

The fat staining on the porous bone of the skull and vertebrae was reduced through the use of Synperonic A7 suspended in Laponite gel.



Our fantastic volunteers swab cleaning the scutes of the carapace.

Laponite RD

Laponite is a clay based synthetic silicate. The presence of sodium, silicon magnesium and lithium within its structure make it an ionic gelling agent that introduces a slightly alkaline pH to the gelling system (Warda, et al., 2007). Laponite will gel at a concentration of 5% with water or at lower concentrations with the addition of a salt.



Before, during and after the application of Laponite RD solvent gel to reduce the fat staining on the skull.

Further Reading

Scott, C. L., 2012. The use of agar as a solvent gel in objects conservation. *Objects Specialty Group Postprints*, Volume 19, pp. 71-83.

Stulik, D., 2004. *Solvent Gels for the Cleaning of Works of Art: The Residue Question*. Los Angeles: Getty Publications.

Warda, J., Bruckle, I., Bezur, A. & Kushel, D., 2007. Analysis of agarose, carbopol, and laponite gel poultices in paper conservation. *Journal of the American Institute for Conservation*, 46(3), pp. 263-279.

Wolbers, R., 2000. *Cleaning Painted Surfaces: Aqueous Methods*. London: Archetype Publications.