

## Anatomical Models Treatment Report

<b>Owner: Museum of Archaeology</b>	<b>Acc. No: DURBIO.2015.489, DURBIO.2015.487, DURBIO.2015.453, DURBIO.2015.486, DURBIO.2015.485</b>	<b>Conservator: S. Goel</b>
<b>Date: 12/08/21</b>		<b>Lab no: 3783</b>
<b>Object: 5 Anatomical Model Skulls</b>		<b>Material: Acrylic-painted PVC</b>

### Description:

These plastic anatomical models were originally part of the Durham Biology collection. They have since come into the care of the University's Museum of Archaeology. All five vary in size and form, demonstrating the visages of the predecessors of *Homo Sapiens*. These skulls are hollow cast thermoplastic (most likely PVC based on manufacture style, time period, and physical characteristics), as evidenced by the holes in the base in the majority of the skulls. Several have tags from the *Deutsches Hygiene Museum Dresden* which made anatomical models for teaching purposes starting in the 1960s (Davidowski). These styles of model are no longer produced by the museum. All five skulls have paper labels adhered towards the back, denoting the type of skull and the manufacturing number.

#### Cro Magnon (DURBIO.2015.489)

The Cro Magnon skull is painted a greenish grey with black detailing on the lower half. The mandible piece of this skull is separate. There is an opening at the foramen magnum demonstrating the hollow interior. On the top of the skull there is "x189" written in black ink. The label on the back of the cranium reads: "*Deutsches Hygiene Museum Dresden P752 Cro Magnon Reg.-Nr. 3729 Kat.-Nr. 07 1602 89*"

#### Rhodesier (DURBIO.2015.487)

Rhodesier is painted light yellow and brown, with grey on the inside of the eye sockets and the side of the cranium, denoting areas that were missing on the original skull the model is based on. Black paint was also used on the nose socket and reverse, along with red paint on the palate and teeth. This skull is hollow, with an opening at the foramen magnum. On the top of the skull, "x179" is written in black ink. The label on the back of the cranium reads: "*P 754 Rhodesier*" and demonstrates the same eyeball design as the matching tag (see below).

This skull retains its original paper tag from the *Deutsches Hygiene Museum Dresden*, with an eyeball logo. This tag is attached to the zygomatic bone of the cranium.

#### Shimpanse (DURBIO.2015.453)

*Shimpanse* is German for chimpanzee. This skull is painted off white with white teeth. The skull is two distinct pieces, with a hole at the foramen magnum demonstrating that the cranium is hollow. The mandible is a solid piece attached to the cranium using two springs drilled into the inside mandible and attaching just behind the eye sockets. These springs allow the mouth to open and close.

On the top of the skull "x3412" is written in black ink. The label for this skull is on the inside of the mandible and reads: "*Deutsches Hygiene Museum Dresden P760 Shimpanse Reg.-Nr.3731*"

#### Steinheim (DURBIO.2015.486)

This skull is painted in tonal browns, light towards the maxilla and getting progressively darker over time. The base of this skull does not have an opening like the others; however, it still appears to be

hollow based on weight and sound when tapped. On the top of the skull "x177" is written in black ink.

The label at the base of the cranium reads: "*Deutsches Hygiene Museum Dresden, P753, Steinheim, Reg.-Nr.3940*".

*La Chapelle* (DURBIO.2015.485)

This model is painted dark brown with black accenting to demonstrate missing areas in the original skull. Other areas are painted green, potentially to represent areas of thin or delaminated bone of the original skull, though this is not clear as it is not presented on other models. This skull is hollow with an opening at the foramen magnum and has "x180" written in black ink on the top of the cranium.

The label at the back of the cranium reads: "*Deutsches Hygiene Museum Dresden P 751 La Chapelle Reg.-Nr.37730 Kat.-Nr.07 1603 89*"

This skull retains its original paper tag from the museum, demonstrating the eye logo. The tag is attached to the zygomatic bone of the skull.

#### Condition:

In general, all of the models demonstrated gaseous degradation, denoted by a strong odour. Unfortunately, this cannot be remedied.

*Cro Magnon* (DURBIO.2015.489)

On the inside of the cast, degradation of the plastic can be seen as dark spots on the plastic. Furthermore, there is a light scratching or crazing on the cranium of the skull. Both the base of the skull and the mandible demonstrate discolouration attributed to iron staining, probably from being exposed to iron shelving for an extended period of time (Garlick, pers. Comms). In order to keep the mandible and cranium together, Sellotape was wrapped around the skull. However, this was proven to be ineffective as the mandible fell loose in the box. Furthermore, there is no accession number on either piece, making them difficult to keep track of through the system, and ensure the two pieces can be kept together. The skull is also determined to be an unnatural colour, which is distracting and limits the model's use as a teaching device.

*Rhodesier* (DURBIO.2015.487)

Some degradation of the plastic can be seen on the inside of the cast in the form of dark spots. However, this is one of the lesser cases of degradation within the group. There is minimal soiling in the orbital sockets and grey paint has flaked off the back of the skull, which was also deemed to be distracting to the eye. The manufacturer's tag has yellowed but is still legible.

This skull also demonstrates iron staining discolouration at the base of the skull.

*Shimpanse* (DURBIO.2015.453)

The *Shimpanse* skull is twice wrapped in severely yellowed Sellotape, which was intended to keep the jaw closed, potentially protecting the springs. There is some black streaking soiling on the top of the cranium, as well as minimal soiling in the eye sockets. The springs demonstrate some degraded plastic between the coils and are soiling and slightly discolouring the plastic where they attach. There is a large amount of iron staining at the base of the skull and a minimal amount of plastic degradation visible on the interior of the cranium.

Steinheim (DURBIO.2015.486)

Plastic surrounding eye sockets, maxilla, and zygomatic bone has degraded, which is visible through light white scratching or crazing on the surface. Adhesive residue, likely from Sellotape, is visible on both sides of the cranium.

La Chapelle (DURBIO.2015.485)

Originally, this model did not demonstrate any accession number, which had to be investigated. Beyond this, yellowed Sellotape was wrapped loosely around the skull and mandible to keep pieces together. Whilst the adhesive has failed over time, the tape was still adhered to the top of the cranium. There was some paint delaminating around the base of the skull and around the teeth. The colour of this skull was determined to be distracting and unnatural, which would not be suitable for the teaching purposes it was required for. The label was peeling slightly off the reverse of the cranium and the manufacturer's tag has yellowed but is still legible.

#### Conservation Treatment:

The aims in conserving these anatomical models included the removal of all tape and residues from the skulls, as they could damage the plastic and are extremely unsightly (American Institute of Conservation, 2021). Following this, any soiling needed to be removed and it was determined that DURBIO.2015.489, DURBIO.2015.485, DURBIO.2015.487 required repainting in order to go on display. Furthermore DURBIO.2015.489 and DURBIO.2015.487 demonstrated the need to attach the crania and mandibles to lessen issues of dissociation.

First, all Sellotape was manually removed from DURBIO.2015.489, DURBIO.2015.487, and DURBIO.2015.453. This was done using scissors and by hand. This process left a layer of sticky residue on the models. The residue was not an issue for DURBIO.2015.489 and DURBIO.2015.487, as this residue would mostly be covered by another layer of paint. However, DURBIO.2015.453 and DURBIO.2015.486 required adhesive removal. This was primarily achieved through the use of a bamboo skewer, however not all of the residue could be removed, in fear of scratching the paint surfaces which would leave the plastic exposed for further degradation.

All general soiling was removed with the use of a large soft bristle brush and a rubber eraser. Although there was an attempt at removing the degraded plastic from between the springs of DURBIO.2015.453 using a dental pick and a scalpel, this was deemed to not be possible, and would not lead to any serious degradation. All iron staining was deemed to not be of high priority as it is not visible and would likely require painting over.

Following this, all peeling labels were re-adhered using a small amount of HMG Paraloid B72.

DURBIO.2015.489 and DURBIO.2015.485 had dark areas taped off with masking tape before being airbrushed with Golden High Flow Acrylic Paint in Titan Buff. This allowed for quick and full coverage of the skulls in two layers. During this process, the labels were protected using a small amount of mylar plastic sheeting, ensuring their retention. After this, details were added by hand using acrylic paints in order to create definition in the surfaces and delineate areas of loss from the original skulls. DURBIO.2015.489 and DURBIO.2015.485 were then airbrushed 6% Paraloid B72 in acetone in order to protect the paint layers. The flaking grey area of DURBIO.2015.487 was repainted in a more neutral tone using Golden High Flow Acrylic Paint in Titan Buff as a base. The recolouring allows the skulls to look more natural, assisting in their use as teaching materials.

Accession numbers were then applied to the base of each cranium and mandible in black Indian ink between two layers of 6% Paraloid B72 in acetone. This ensure that if the mandibles and crania are separated once again, their accession information is not lost. Furthermore, for DURBIO.2015.489

and DURBIO.2015.485, the “x” numbers written in black ink at the top of the skulls prior to painted were readed to the bases in order to retain the information they may present.

The stands for DURBIO.2015.489 and DURBIO.2015.485 were built out of 1.0mm thick Merriway galvanised steel wire partially wrapped in bare aluminum whire from Scientific Wire Co. (0.56mm gauge). The stands werecoated with several layers of 10% Paraloid B72 in acetone in order to limit the interaction between the metal and the plastic and the ends were coated with conservation grade hot glue to protect the plastic from any scratching. These stands were then partially inserted into the casting hole of the skulls, extending out and wrapping around the mandibles so as to hold them in place. This presents an easily reversible, non-invasive method of keeping these pieces together in their anatomically correct state for display, as well as limiting possible disassociation issues.

#### Storage Recommendations:

These models should not be displayed or stored in contact with metal objects, as they are actively off-gassing. This could cause deterioration in surrounding materials within an enclosed space. Light and UV should be limited as much as possible in order to limit further degradation. Ideally, plastics should be kept in anoxic conditions below 10°C and 50% RH.

#### Handling Requirements:

Gloves should be worn whilst handling degraded plastics, however the coating layers and acrylic paint should limit the need for this.

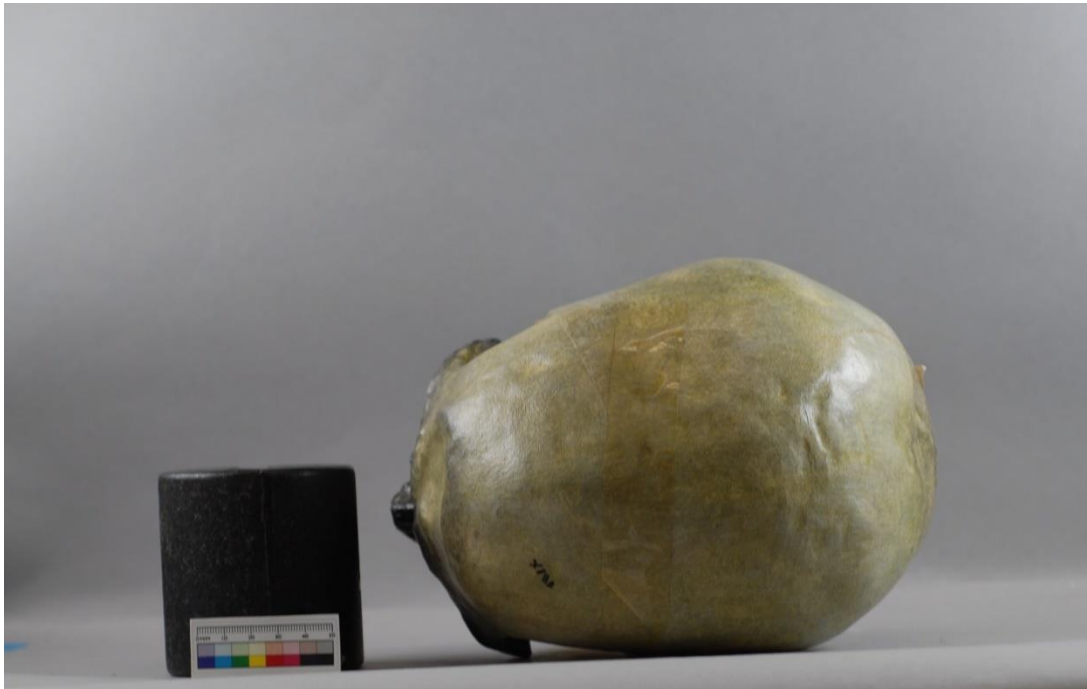
When DURBIO.2015.489 and DURBIO.2015.485 have their mandibles attached, they should be handled with one hand supporting the mandible and stand, and one hand on top in order to ensure the pieces stay together and do not come out of place.

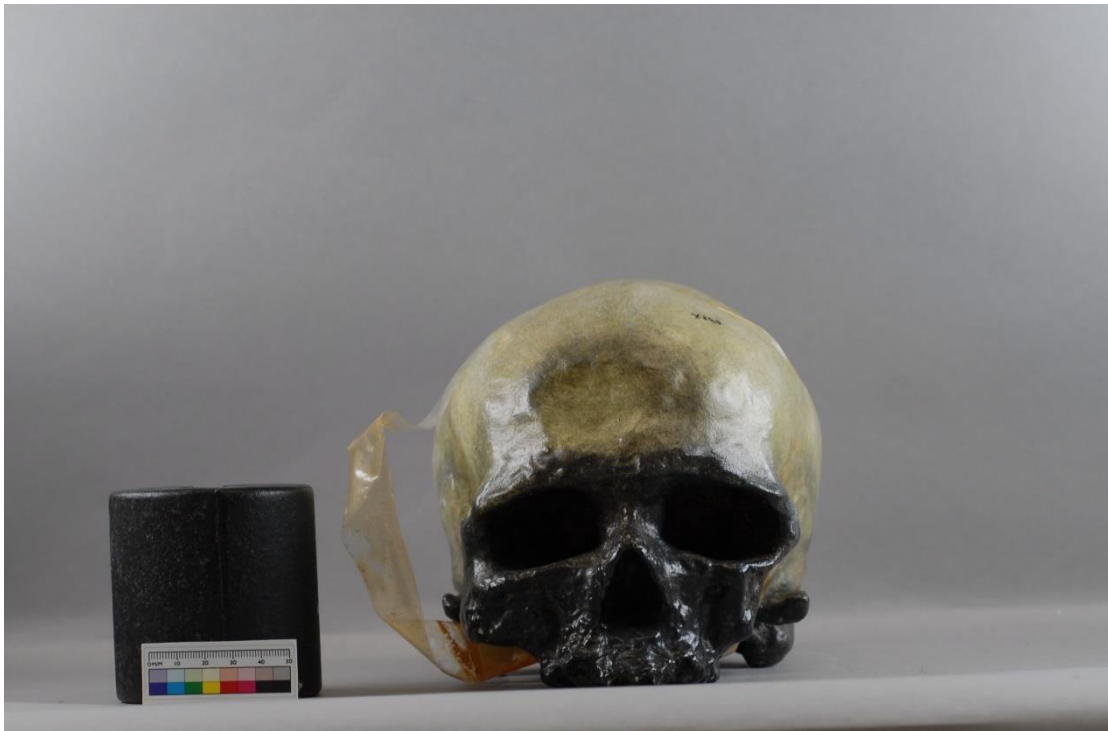
#### Bibliography

Davidowski (n.d.) *Anatomical Teaching “Skull” Model*. [Online]. Davidowski. Available at:

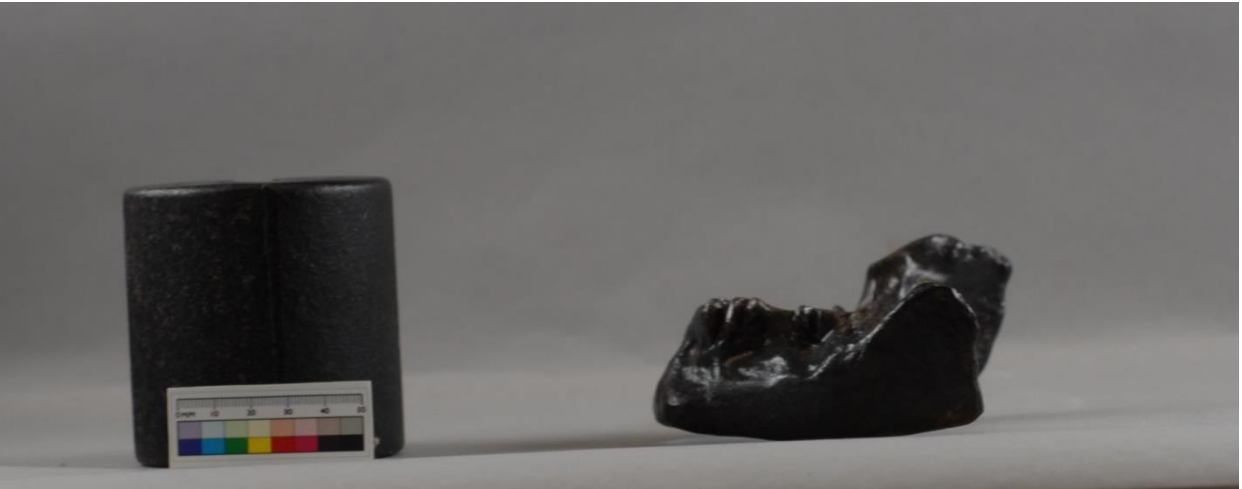
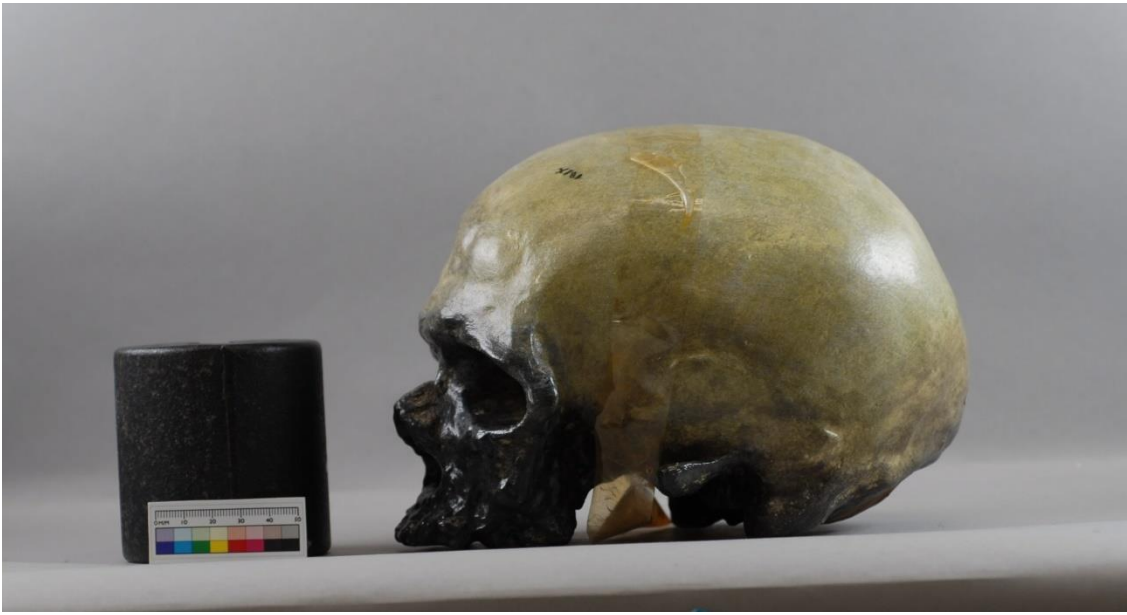
<https://www.davidowski.nl/collections/objects/scientifics-and-biology/anatomical-teaching-skull-model-made-from-plaster-and-plastic-germany-1960s-deutsches-hygiene-museum-dresden-small-damages-and-repairs-but-overall-great-shape-size-w-6-x-h-5-x-d-9-inch-mid-20th-century-1625875>  
(Accessed: 15 June 2021).

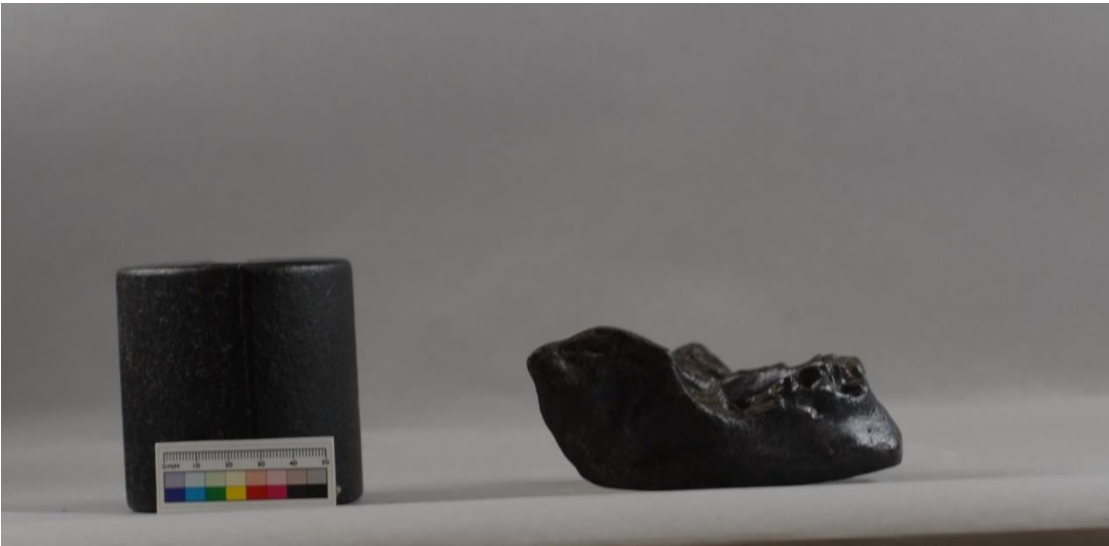
Before Treatment:  
Cro Magnon (DURBIO.2015.489)







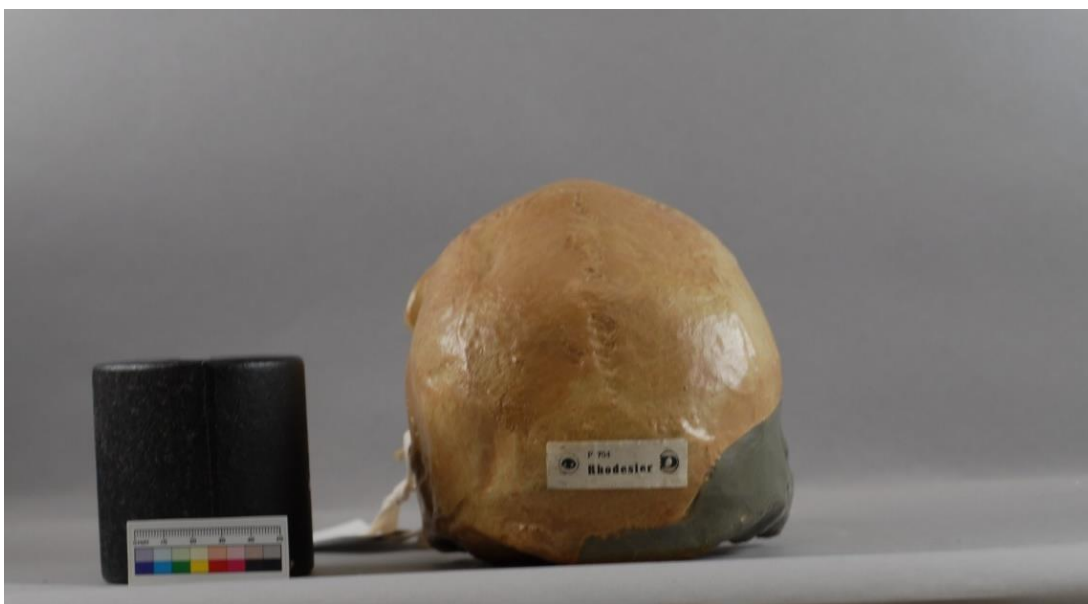








Rhodesier (DURBIO.2015.487)

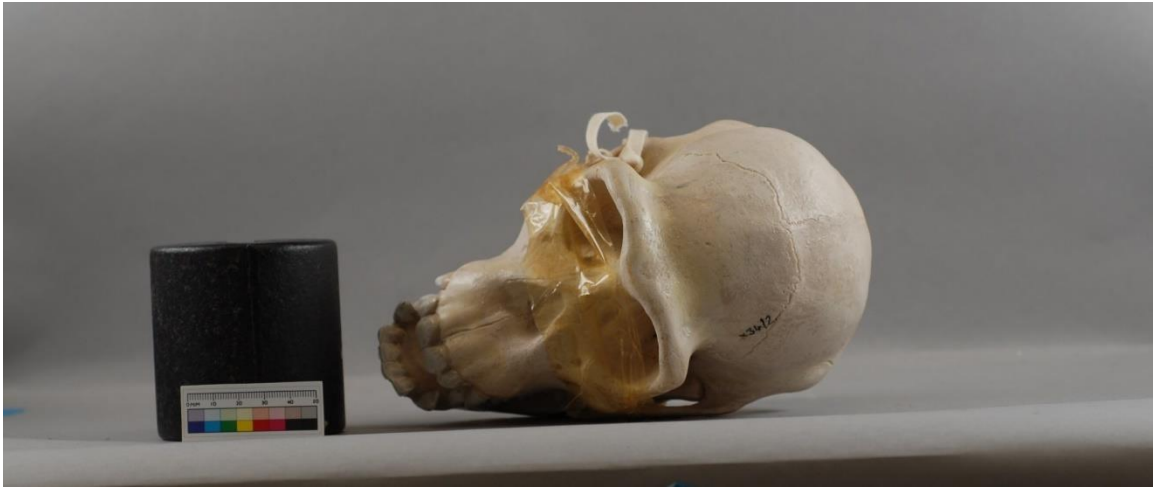




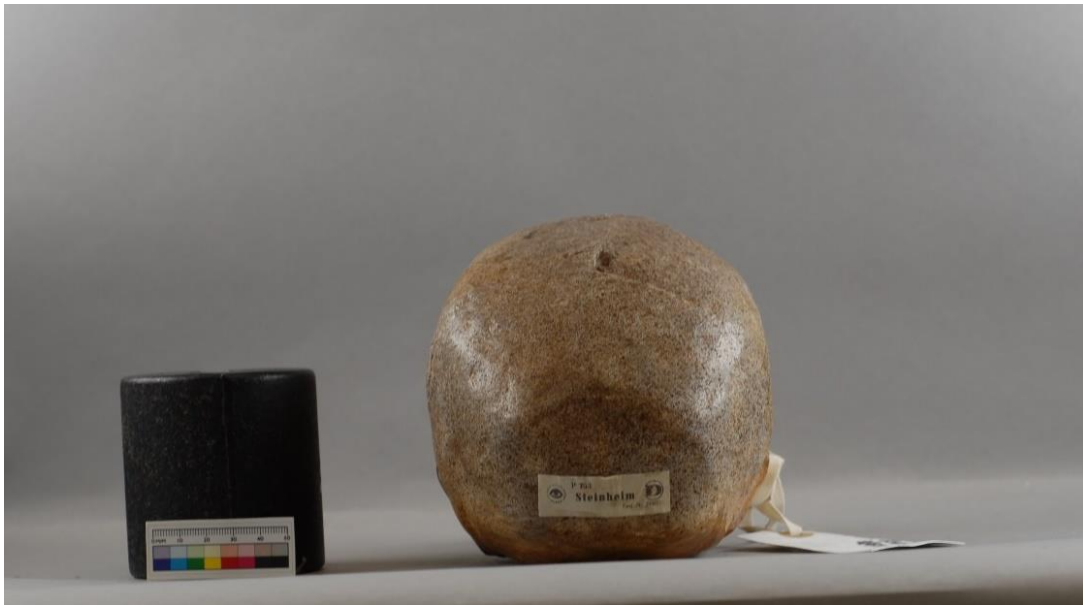
*Shimpanse* (DURBIO.2015.453)







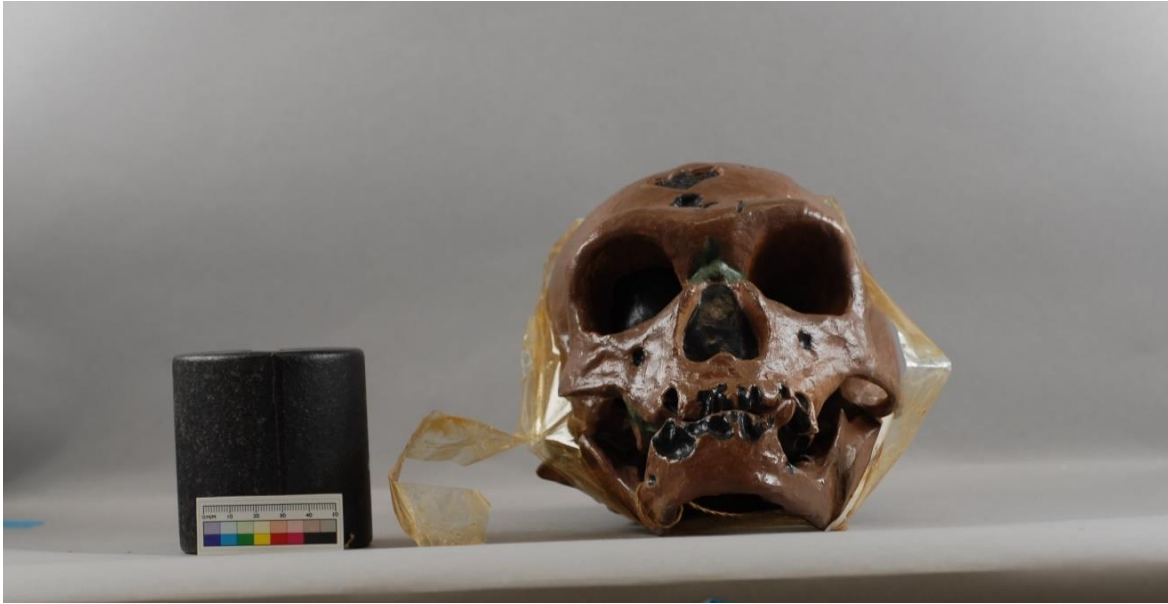
Steinheim (DURBIO.2015.486)

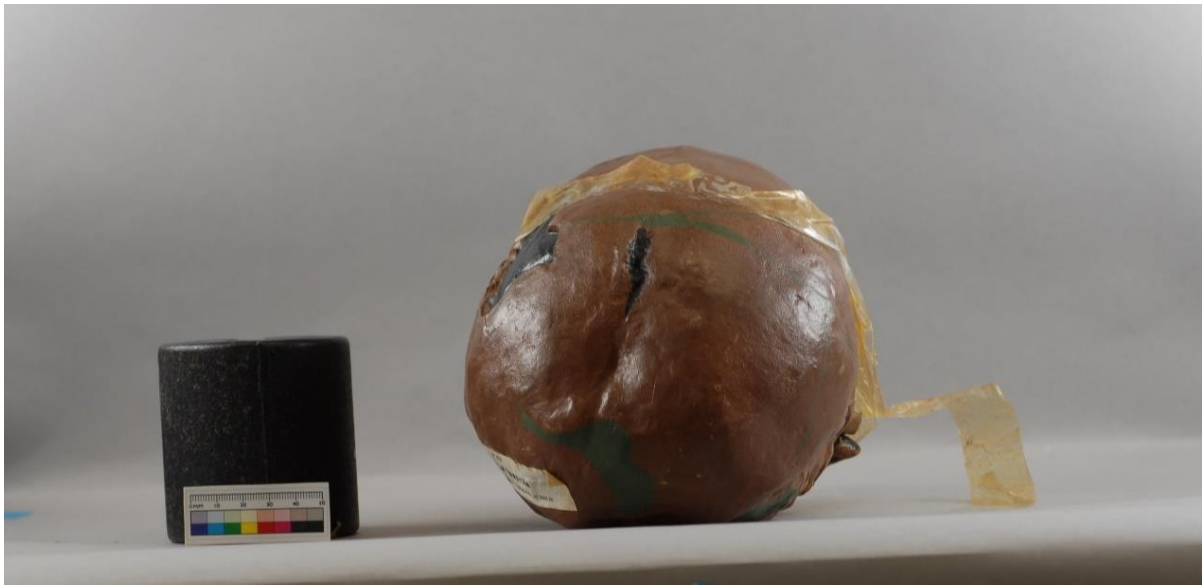






La Chapelle (DURBIO.2015.485)





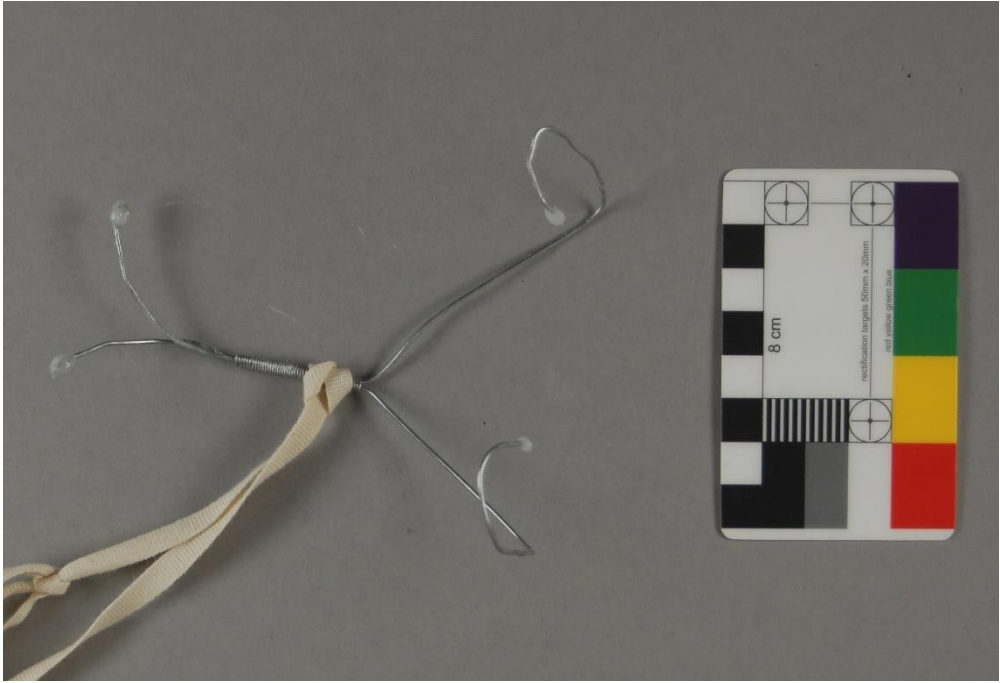
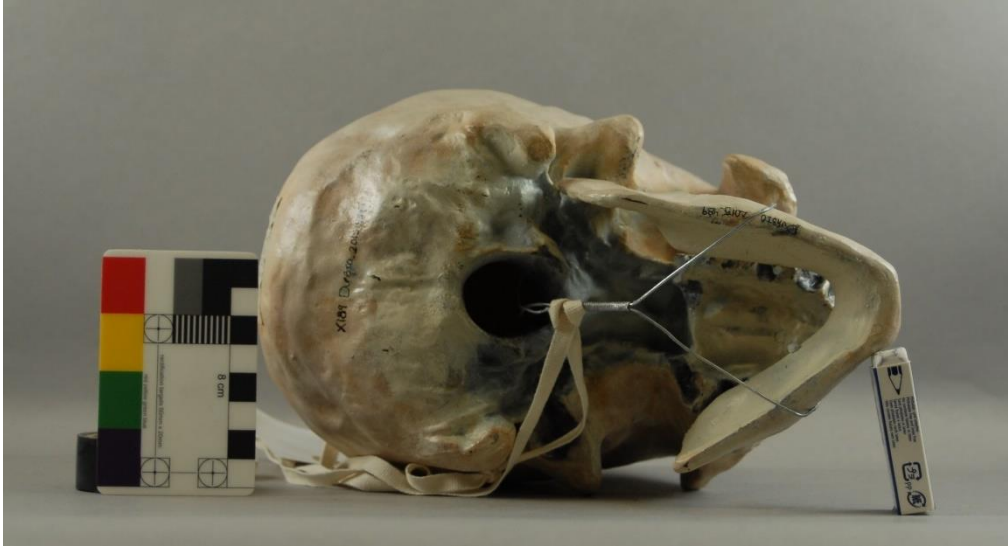
After Treatment:

Cro Magnon (DURBIO.2015.489)





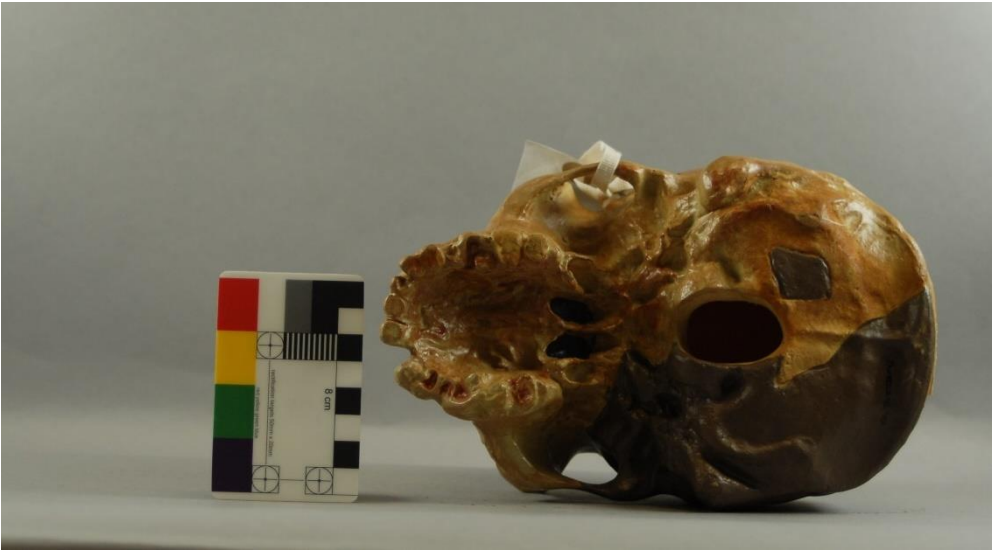






Rhodesier (DURBIO.2015.487)





DURBIO.2015.453







Steinheim (DURBIO.2015.486)







La Chapelle (DURBIO.2015.485)





