Sheffield Hallam University

Curatorial insecurity : the impact of 3D scanning and printing on curatorial practice

KNOWLSON, Amelia

Available from the Sheffield Hallam University Research Archive (SHURA) at:

http://shura.shu.ac.uk/25579/

A Sheffield Hallam University thesis

This thesis is protected by copyright which belongs to the author.

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the author.

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given.

Please visit http://shura.shu.ac.uk/25579/ and http://shura.shu.ac.uk/information.html for further details about copyright and re-use permissions.

The Practice-Based Submission For Curatorial Insecurity: The Impact of 3D Scanning and Printing on Curatorial Practice.


P8.2
P8.3



The Practice-Based Submission works as an 'exhibition catalogue' offering a visual insight into the numerous 3D scans, curatorial interventions and exhibitions created during the research process. The catalogue is designed to be read in tandem to the written thesis, as combined, they show the breadth of work undertaken for the Ph.D. The practical submission is presented in chronological order showcasing how the work has progressed through the three phases of research.

The catalogue begins with The Acclimatisation Study, which presents excerpts of the research diary, to show the thought processes of curators and my own personal reflections. These pages contain musings, questions and recorded conversations regarding the introduction of 3D scanning and printing within the museum. The diary pages are supported by photographs of failed and successful 3D scans. The failed scans are included in this catalogue as there is value in the imperfection, they inspire questions around loss, materiality, authority and meaning.

The Museums Sheffield Residency, follows The Acclimatisation Study and showcases the 3D scans of the museums ivory collection. The scans are presented alongside the curatorial interventions, which were specifically designed for The Museums Sheffield Residency. The interventions are supported by a research diary, that contains musings around the use of 3DSP, curatorial making and the challenges of introducing 3DSP to curatorial practice. Combined, the diary pages, 3D scans and curatorial interventions, start to reveal how 3DSP can both support and frustrate the practices of curators and the museums they work for. The section documenting The Museums Sheffield Residency concludes with images of the co-curated exhibition 'Stories from the East: The Grice Ivories'.

The British Museum Residency is the final section in this catalogue, it provides a visual record of the curatorial interventions, 3DSP projects and research diary. The British Museum Residency section concludes with the processes I undertook to make and design the exhibitions 'An Object in Transition' and 'Frustrating the Linear'.

I like many before me started my museum career in a very traditional way. I trained in museum studies and as a student I curated group shows on British Modernism, Serialism and 19th century pottery. I volunteered and eventually worked in the Decorative Arts department of a regional 18th and 19th century gallery. I was driven by the desire to explore and play with my collection, but my time and practice was framed by standards and frameworks and over time I became frustrated with how museum objects, particularly digital objects, are used, treated and labelled within the museum. I began to question how the ordering process of the museum affected how I and fellow curators curated such objects.

The introduction of 3D scanning and printing into museum provides the opportunity to explore the questions outlined above, as such objects have never before been seen in the sphere of the museum. Their form, data and relationship to other objects in the collection provides new

challenges to the museum. Curators have never before had to curate and work with objects that are made from their core collections and by mechanical means. At the same time 3D scanned and printed museums objects are perceptually part of the museum, through their relationship to the museum and the history of replicas in the museum.

The above reveals a complex relationship that has roots in the personal processes of curation as well as the systems and policies of the museum

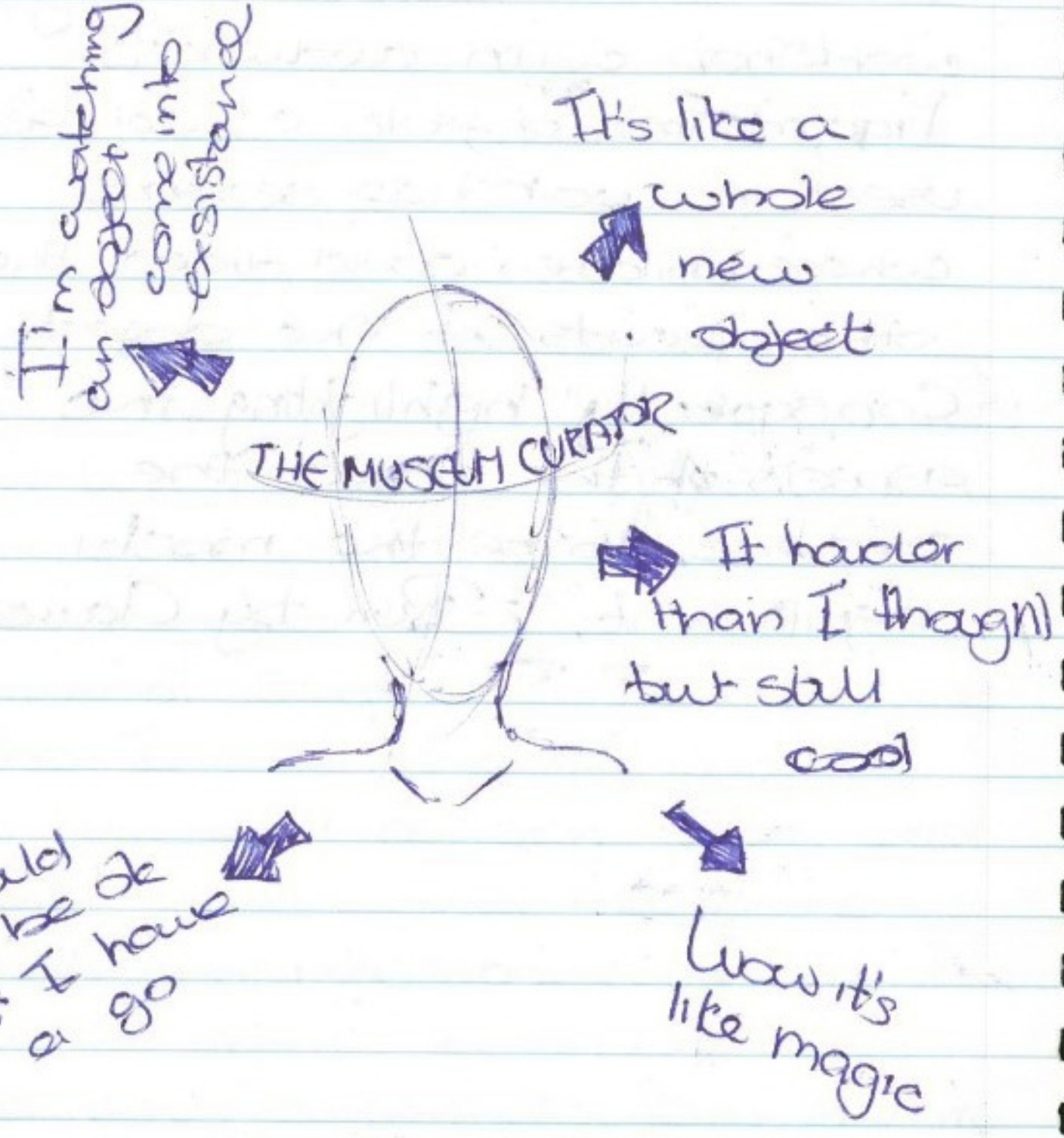
The Acclimatisation Study

The

A photograph from ‘Aesthetics of Manufacture’, a group show at The Butchers Works, which explored how manufacturing processes change our understanding of objects. The piece of work produced for this show contained two 3D printed bronze-age pots printed in different resins and a 3D printed vase. They were displayed along side images of the actual museum objects, to show how the manufacturing process changed the objects both perceptually and physically.



Working with curators now!



Compared to the past few seasons my curators are far more interested in having ago at 3D scanning.

Back to fragmented objects

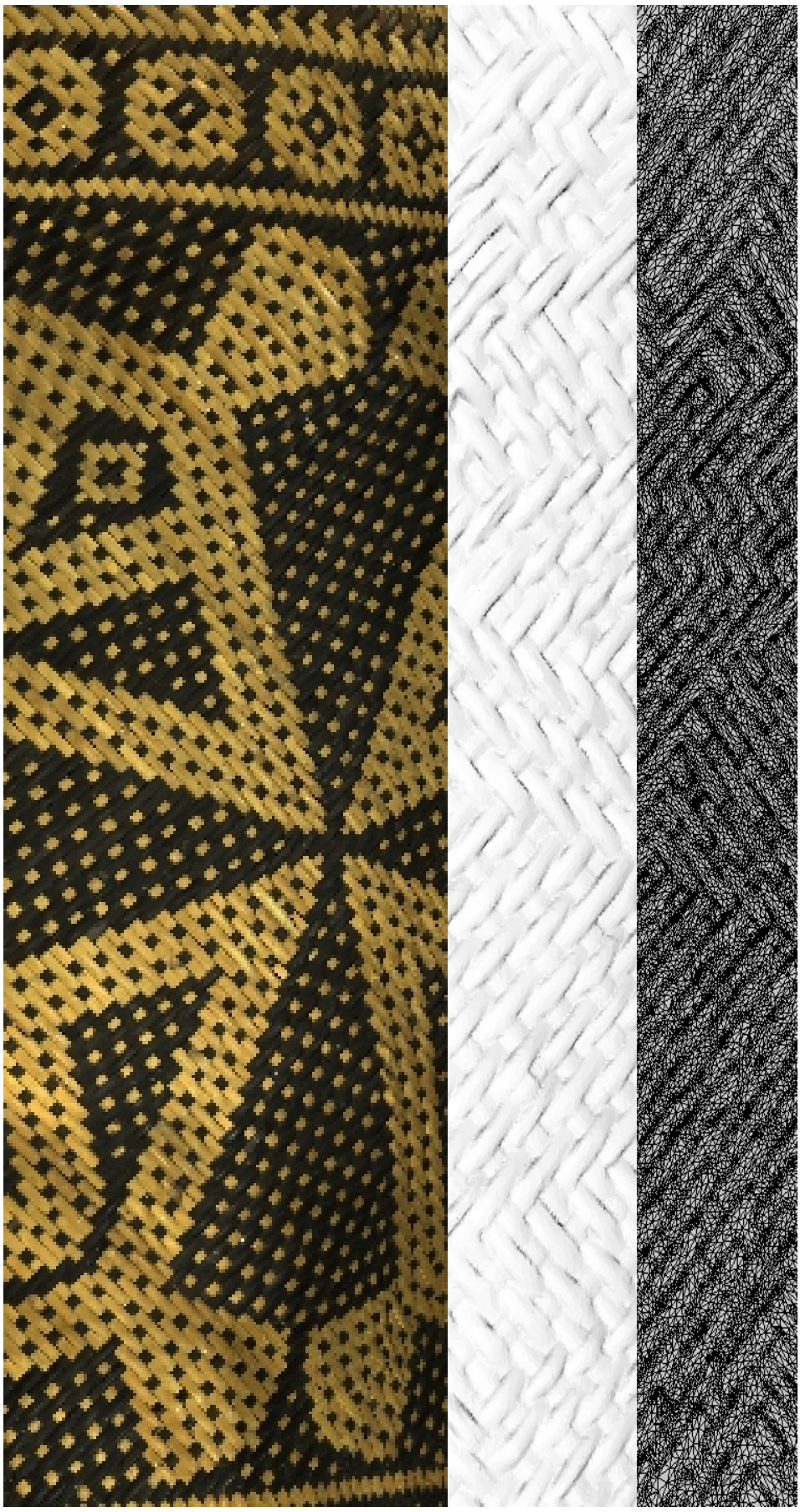


How do audiences formulated meaning around fragment objects without the remaining object to act as usual stimuli, proving context the viewer relys on their past experience From a museum prespective, This allow audiences to form curate and manage their own intrepretat Creating an indepth experiental learning encounter but what happens when this does not meet with the aims of the museum

A completed 3D scan of a woven reed basket from Museums Sheffield.



The wire frame, fused mesh and surface texture of the 3D scanned woven basket. The combined images show some of the processes and changes objects go through when they are 3D scanned. Revealing these processes made curators become aware of what 3DSP does to objects. Seeing these processes in action made curators question where these objects would sit within the museum, their own curatorial making and if such objects would have a cultural authenticity.



Visual Translations of ancient heritage

How we relate and interpret any objects depends on our cultural background.

How much neutrality can they claim when interpreting objects.

asethics - interaction - performance - construction - meaning

Conservation Curators → English Heritage vs Critical histories.

Stopped communication to understanding objects.

The design vs the gut shop asethics.
How can the visual process of production effect perception.

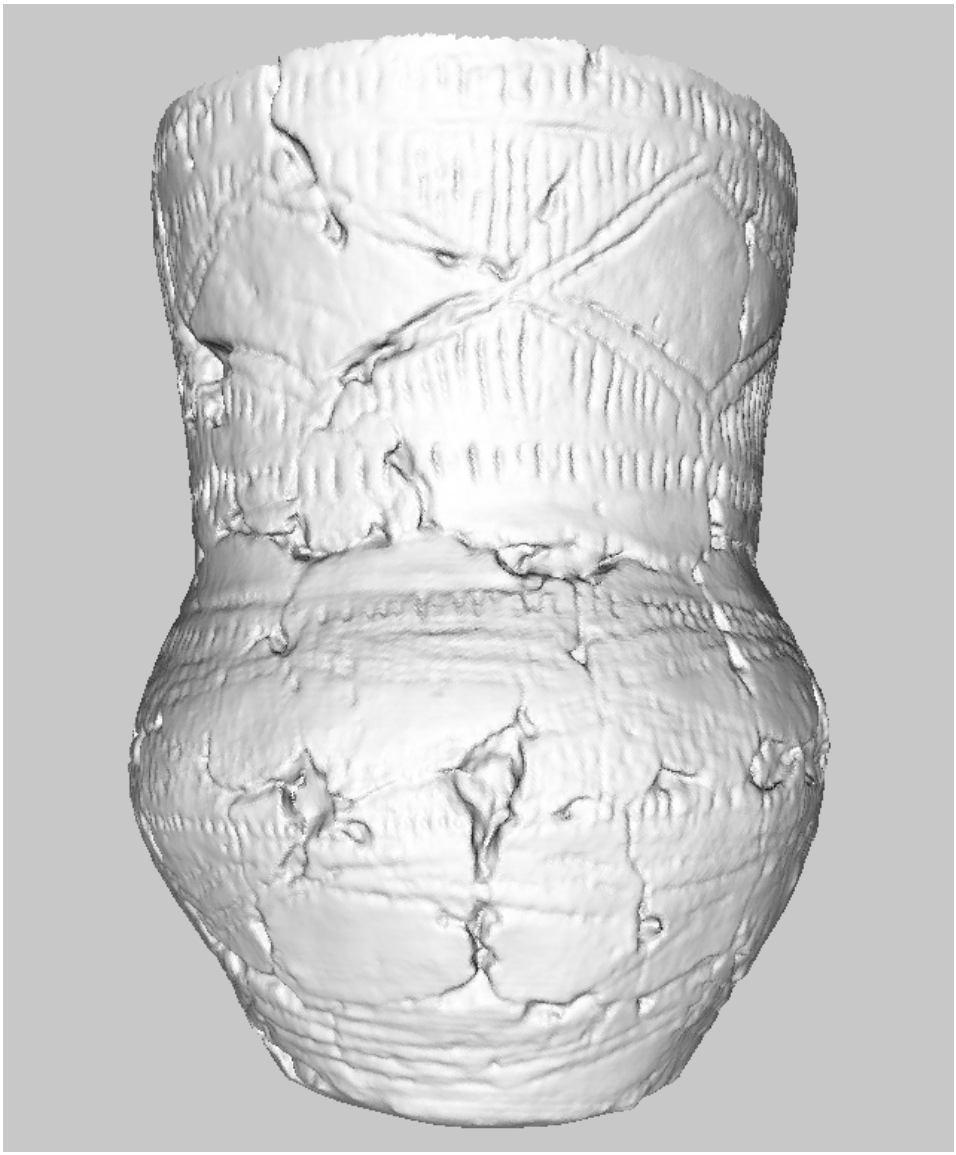
To what extent does recontextulisation can be allowed to undermine the authenicity of the soure object

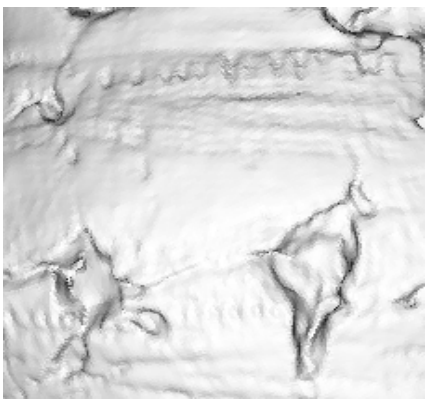
For 3DP does the 3DP object undermine the historical authority of the object. This is what curators are worried about or is it the 3DP undermining their



Block painting/ printing with the Ivory.

A 3D scan of a bronze-age burial pot without is texture. Curators commented on how removing the texture made the object seem less real, yet at the same time it allowed them to see more clearly how the passage of time had affected the object.







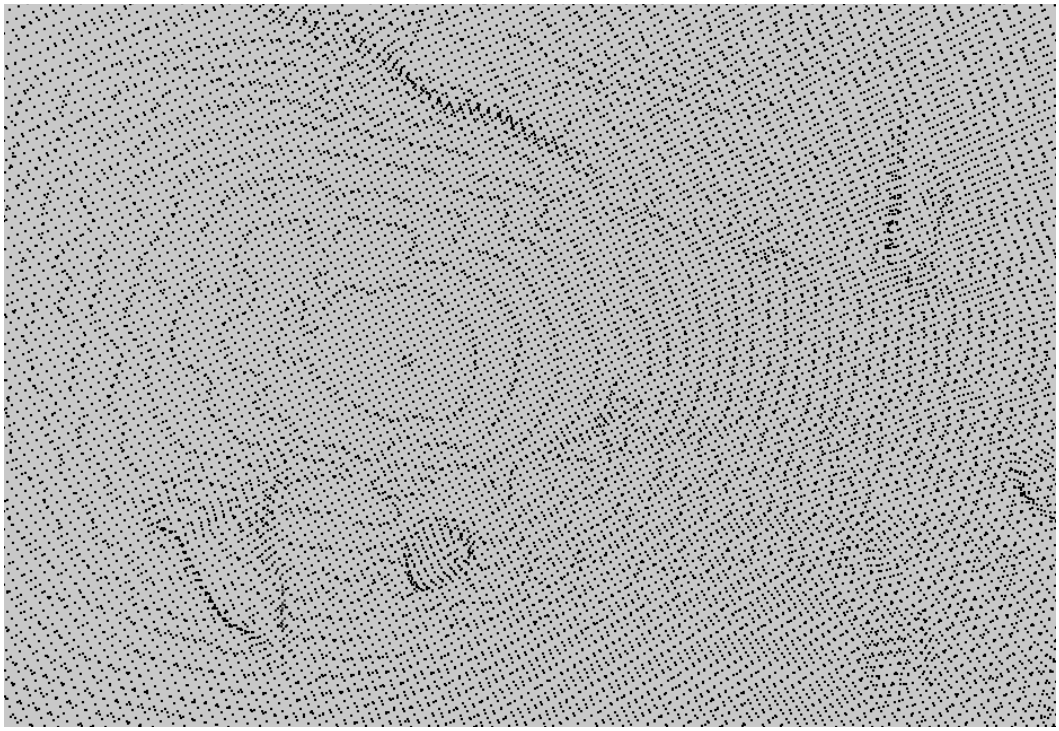
A 3D scan of a bronze-age burial pot with texture. Curators at Museums Sheffield commented on how the black patches, applied by the software when the missing data is present, shielded the viewer from the story of the pots past. By concealing part of the objects history, the embedded processes of the software are effectively distorting how the object is perceived. Curators stated the speciality of the object had been lost.







A photograph showing the point cloud formation of the bronze-age burial pot.



A photograph showing the wire frame formation of the bronze-age burial pot.



A photograph showing a bronze-age burial pot and its 3D printed counterpart. Comparing the two objects allowed curators to see how the objects differed. The 3D scanner was unable to capture the internal depth of the pot and as a result curators questioned where the ‘false’ data started and ‘read’ data ended.



The 3D printed bronze-age burial pot seen in the photograph on the right shows how the internal structures differ between the 3D printed pot and its museum counterpart.

Clare would smell the 3D printed Bronze-age Burial Pot I brought into the museum forming new curator-object behaviours.



A photograph showing a 3D printed burial pot inside the museum archive. This particular experiment caused a visual juxtaposition that caused curators to think about the material properties of 3DSP objects.



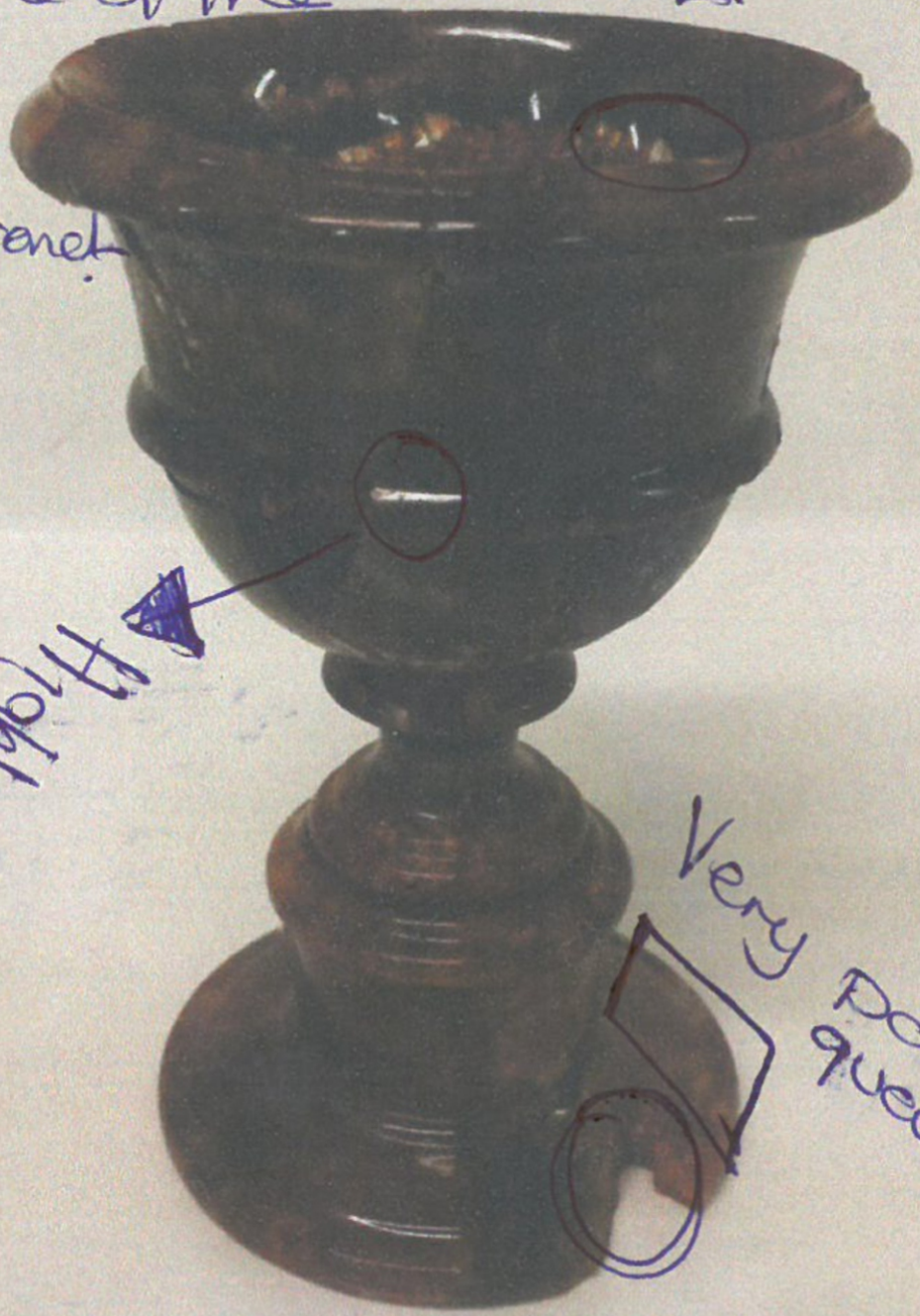
‘3D scans and objects don’t look nice enough to be objects in the own right, because they’re too plastic’

The image below is of the original bronze-age pot from Museums Sheffield

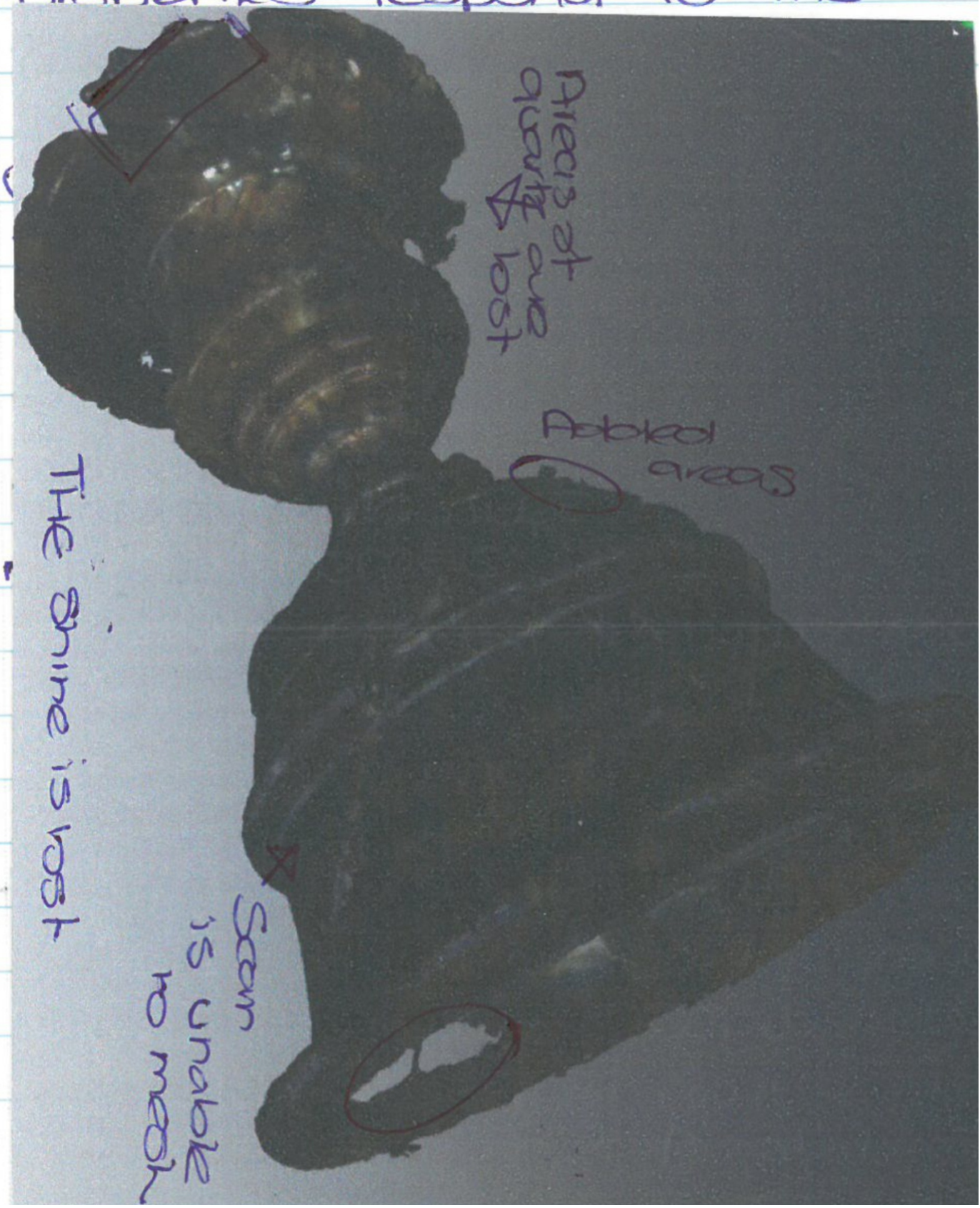




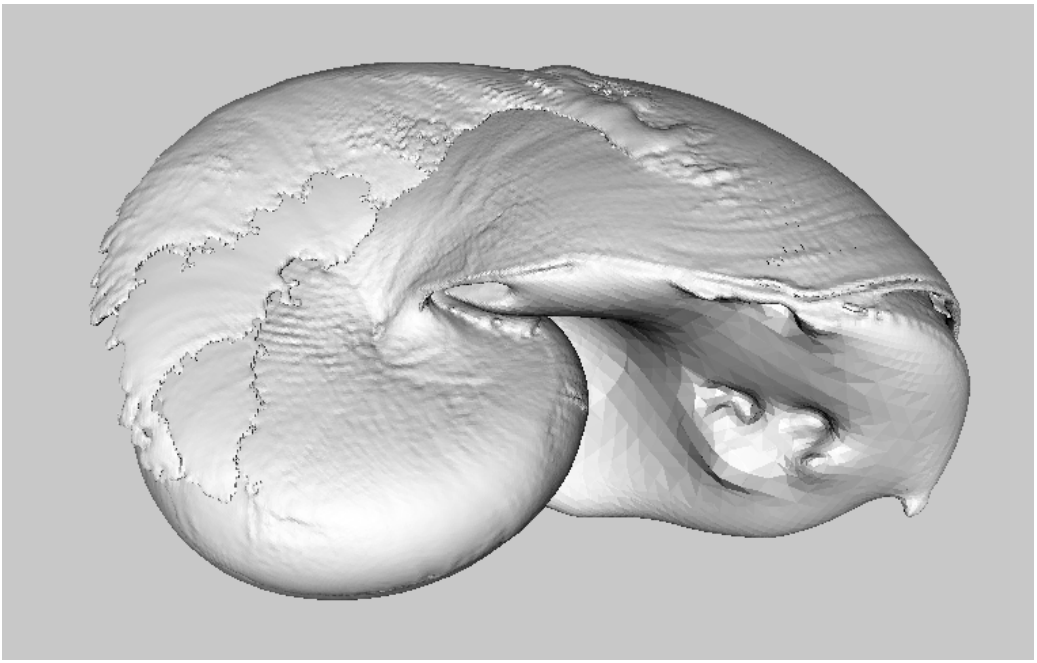
This is an interesting object to scan as some of the areas of translutenet.

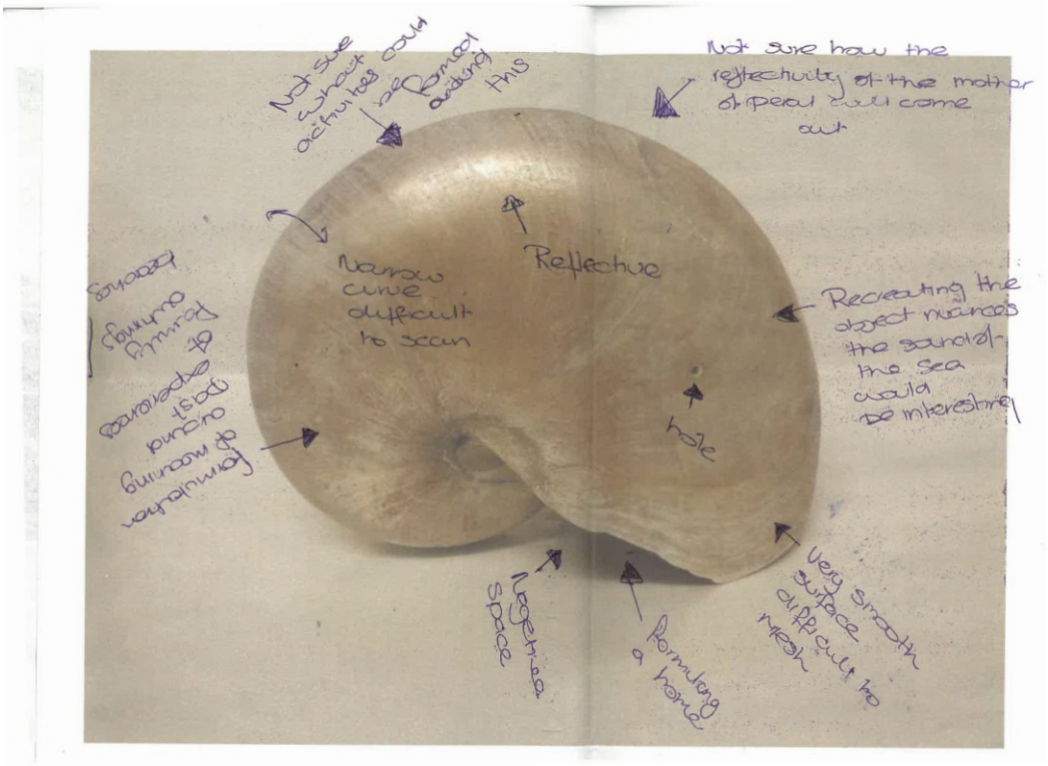


My curators seem really confident around 3D scanning and seem to be asking questions around how certain object properties respond to the



The two photographs explore how curators perceived the outcomes of 3D scanning the shell. Embedded within these images are questions about how difficult the object would be to 3D scan, the loss of nuances such as the sound of the sea and the recreation of negative space.





A photograph of a 3D scanned Blue John Vase from Museums Sheffield. The left vase shows how the software added data points augmenting the form of the object and rendering it a visually unfunctional object. The right 3D scan has had its texture added and illustrates how the addition of texture can obscure some of the missing data.

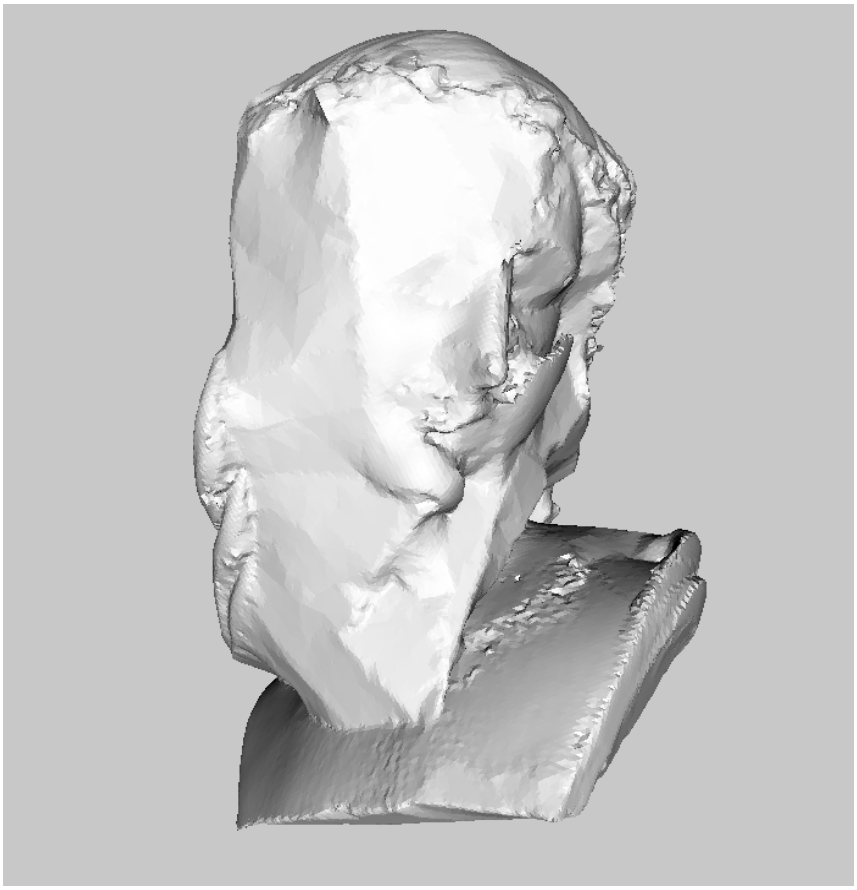


Missing data and failed scans gave raise to questions around loss and in particular how much data could be lost before object was no longer recognisable as both a museum object and an object in general. The museum provided a unique opportunity to explore this notion which was raise my curators.

The curators at Museums Sheffield seemed confident around 3D scanning and as a result asked questions around how object properties effected the 3D scanning process.

The questions so far include:
‘How would iridescent show on the scan?’
‘I know glass doesn’t work but what about the something mineral based or translucent?’

A failed 3D scan of a marble bust. The polished surface and complex form made it difficult to 3D scan. The resulting scan contains additional geometry and missing details that do not relate to the physical object.





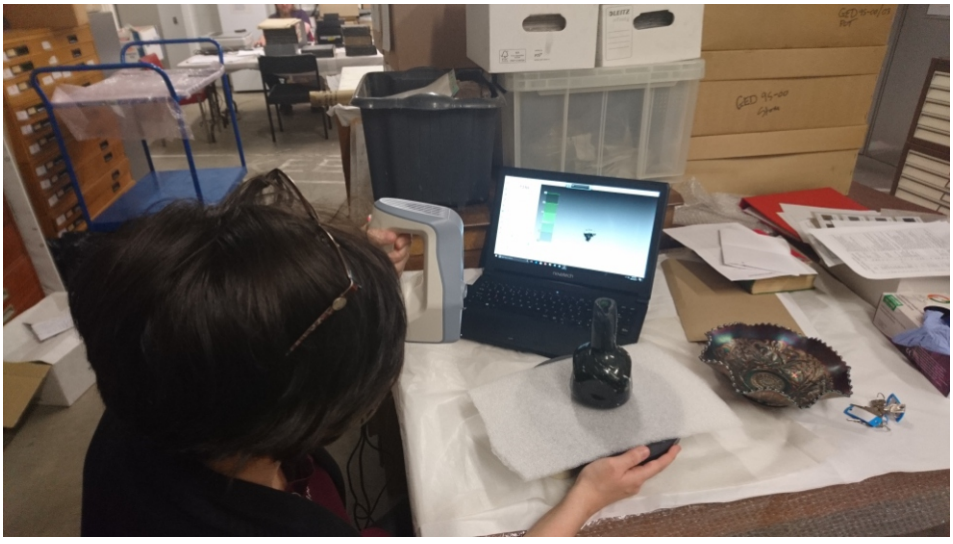


The image above is of the actual silver jug currently in the Metal Work collection at Museums Sheffield.

Two photographs showing myself 3D scanning a hand blown vase. The vase was difficult to scan, as evidenced by the lack of captured data, because light from the scanner went straight through the object.



The scan on the left is a failed scan of a silver jug. The patina of the silver made it extremely difficult to 3D scan.





Humanistic object - Here I played with different levels of sharp fusions to bring out the detail. A standard fusion will smooth over a lot of textural surface detail. Here I can create different versions of the same object with varying degrees of degraded detail and use them to ascertain the formulation of meaning.

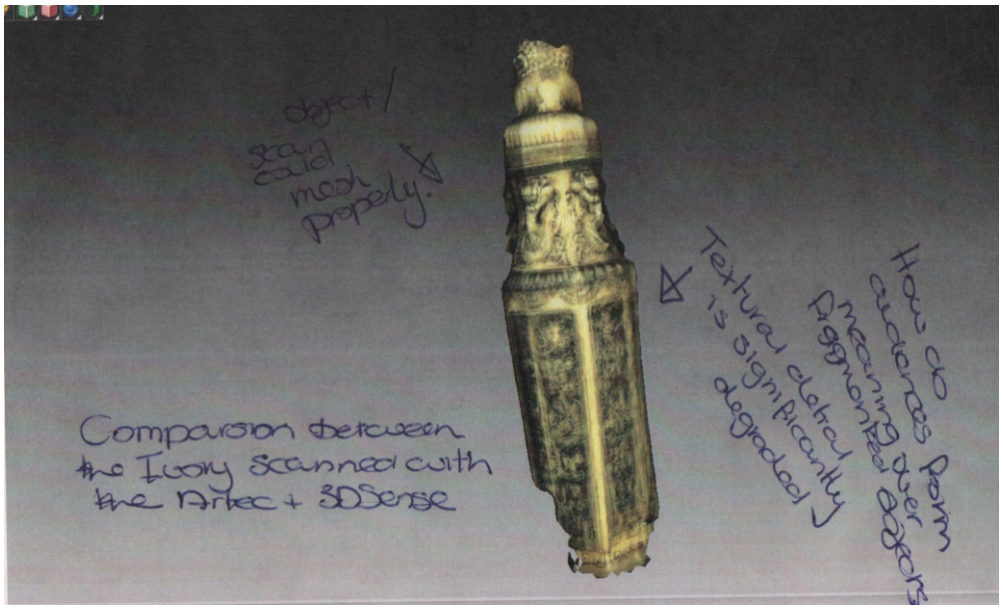
Had really interesting chat with the Senior curator of Natural history today. He believes museums are a form of media and funding a form of media that give an extact no bias truth is extremely difficult. In terms of museums and audiences. 3DP museum objects allow people to form there own interpretation, but how far can that ~~actual~~ accurate "truth" be distorted untill the 3DP museum object no longs represent the past.

How much detail can I take away untill the object no longer represents a museum object

A photograph of a 3D scanned Ivory vase. Even with the high resolution of the Artec Spider some object properties are lost, including the ability to use the object as a vase as the top and bottom have been fused.



A photograph of a failed 3D scan made using a 3D Sense. The scan contains missing data points and only half of the actual vase's form. In addition all the symbols and iconography are missing.



‘Museums Musings’ is a section from the research diary where I muse upon the production of high and low quality scans for Museums Sheffield.

The image below is of the ivory vase currently in the Ivory Collection at Museums Sheffield.



Museum Musings.

Spending time in the museum has been great, together we have produced so many exciting scans and the curators at Museums Sheffield have made me feel like a member of staff. I have spent time wandering the museum’s store and endlessly observing objects in the cases. I have pondered upon what they all mean.

Until recently I have produced mutually beneficial research around how 3D scanning and printing affects curatorial practice, but as we come to start of exploring loss, I am worried this will come to a halt. In order to explore loss in objects, I need to produce low resolution scans. I don’t really want to send them failed scans, as it may seem like I can’t 3D scan. I am interested in how the loss of object properties, or the addition of geometry affects the meaning making process. But does tidying up poor quality scans mean I am hiding results from curators?



Thinking about how scanning is a performance



How does this interaction effect how the scanning process is presented.



What happens when the fps is slow or the intensity is set to maximum

Can we really seperate the scanner and the person scanning. The scanner is controlled by the [redacted] person. The results are determined by the person and the knowledge of the object

A photograph of the point cloud for a 3D scanned ivory vase. Each point represents a single piece of data, the points can be linked together to form a wire mesh.



The sparsity of data points around the base and the middle of the lion means false data is more likely to appear on the fused mesh. However, the lion and base are small resulting in the software successfully inputting correct object geometry.

An illustration showing the combined non textured and textured ivory vase. It shows the level of detail captured and how 2D details such as the painted brick are only present when the texture has been reapplied to the object.



The image below is of the actual ivory vase currently in the ivory collection at Museums Sheffield.



The Museums Sheffield Residency

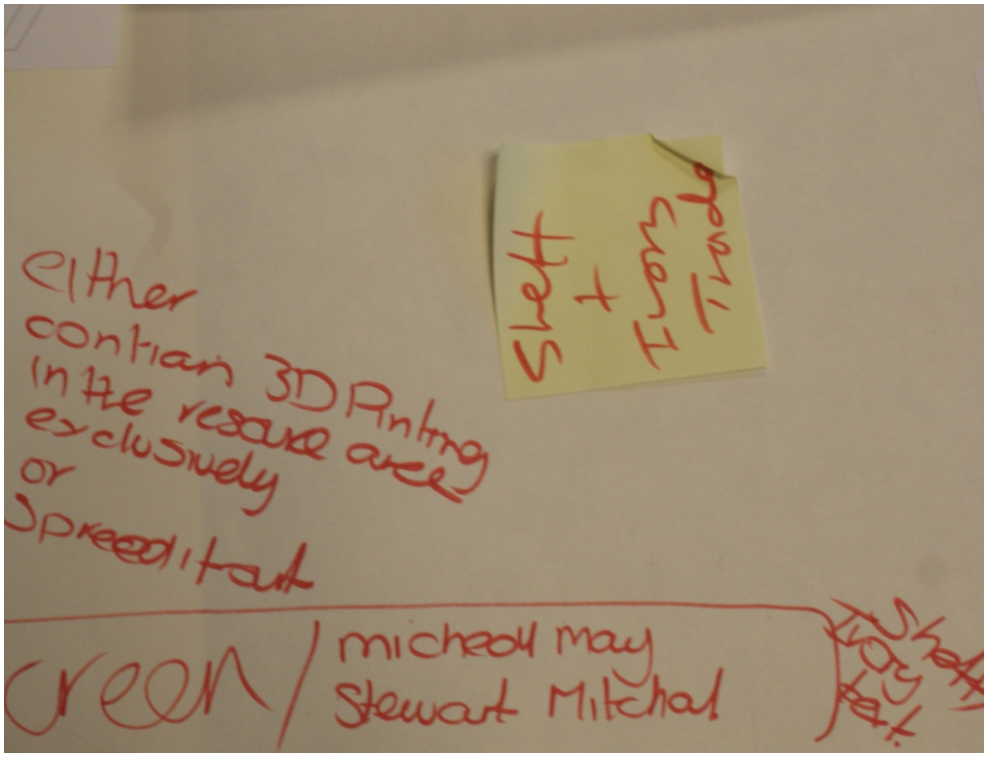
A photograph of myself cleaning an enlarged 3D printed section, scanned from an ivory plaque. The 3D printed section was mounted as an incase detail so audiences could see read the craved calligraphy.



A photograph taken during the planning stage of curating ‘Stories from the East: The Grice Ivories. Small images of the objects going in the exhibition where used to play with space and layout.



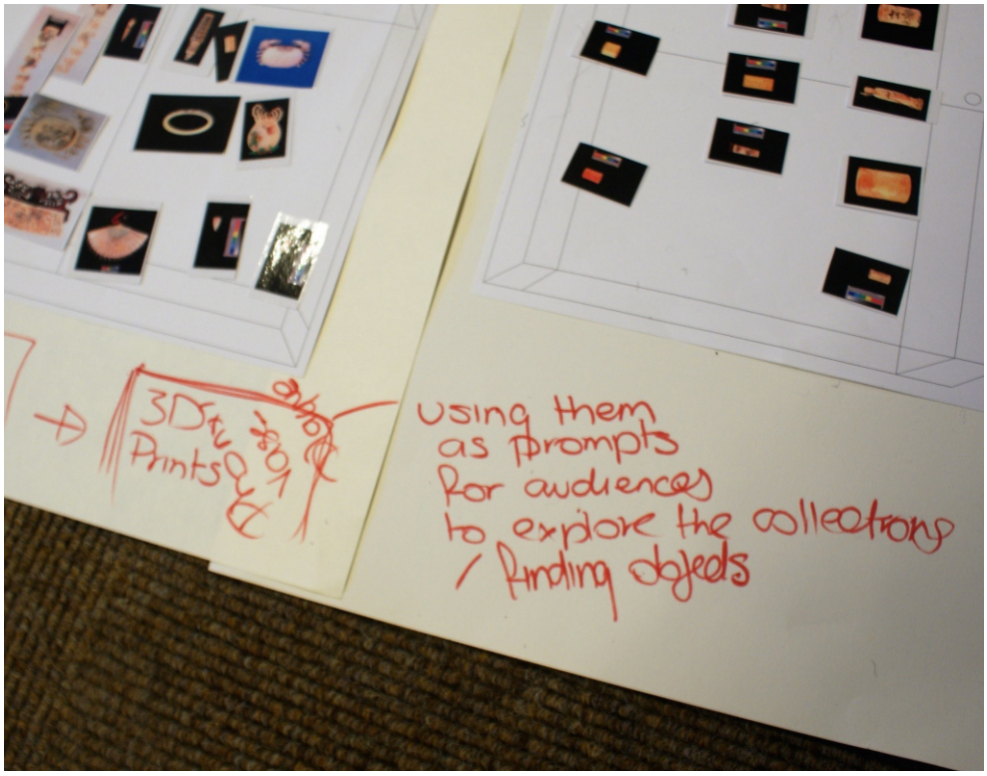
A photograph of a reference questioning where 3DSP should be placed in the exhibition. The note was written during the planning stage of curating the exhibition and highlights how opening up 3DSP, as seen in the Acclimatisation Study, allows curators think critically about how the technology can be used within their practice.



A photograph showing one iteration of where 3DSP incase objects would be in the exhibition. It is important to mention that at this point in the planning stage, the focus on small object details had not yet been conceived and the objects being scanned where chosen because they were part of an interesting story.



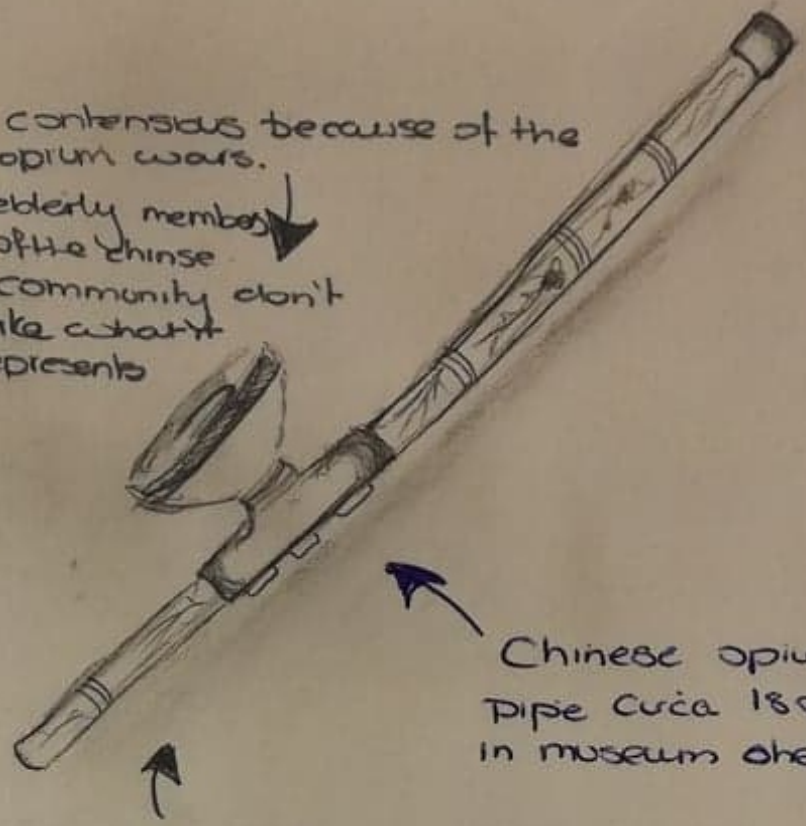
A photograph showing how during the planning stage, Clare and I started to think about how 3DSP could be used to prompt audiences to think about the wider collection and even find object details within objects.



Day 2.
- We got all the objects out and went through wcant could be 3D Printed the conversation focused more on the presentation of display rather than the objects. We talked about how Ivory is really difficult to display as each angle has been carved. Displaying the objects lying down hiddes the underneath or sides.

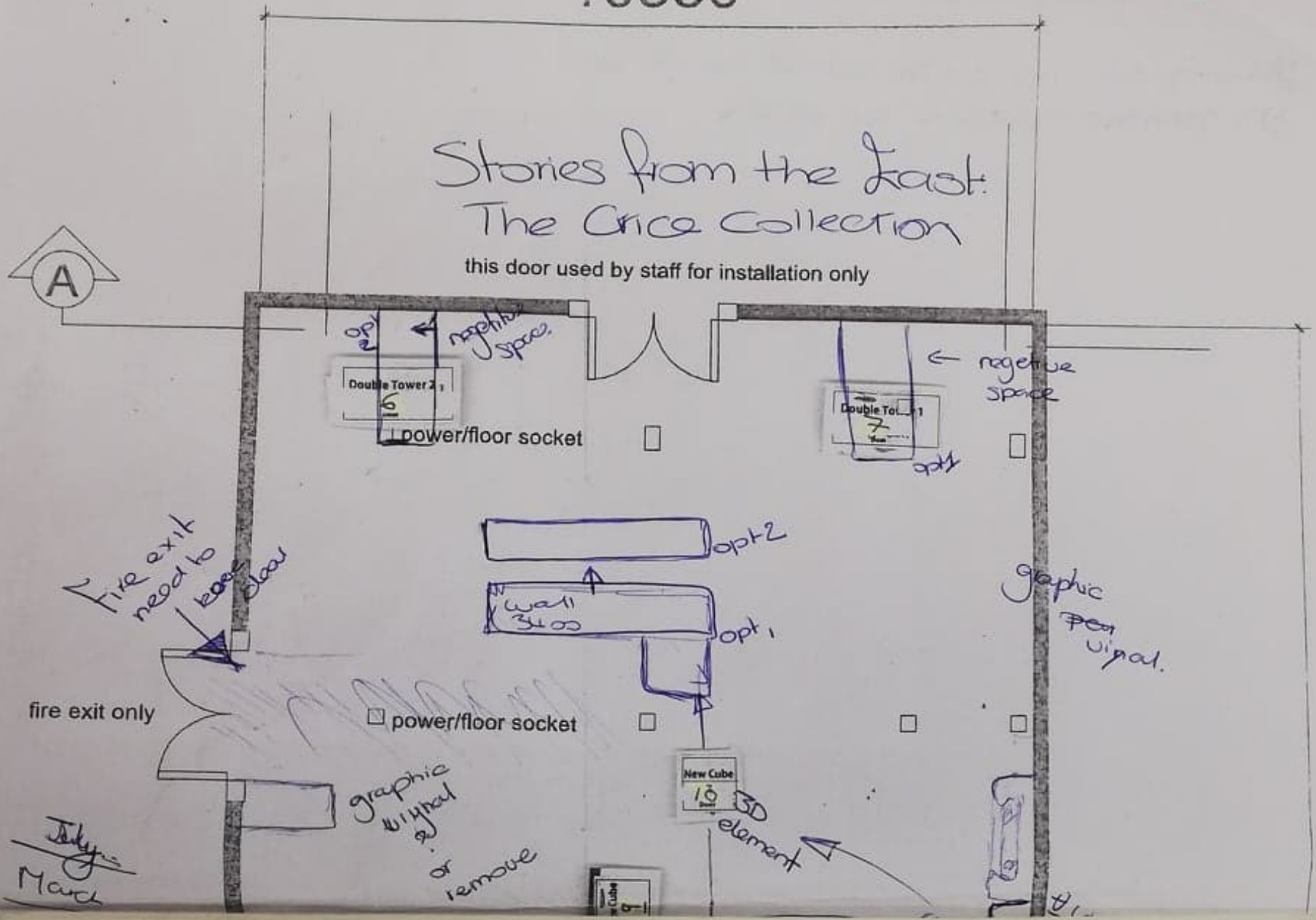
We had an idea about 3D printing the reverse of objects and having them next to the objects in side the case.

- Clare - "I think if your going to talk about something contested then it is best to have thev orginal objects in front of you otherwise it could be seen as disprispectful."
In this sense the significance of the orginal is important such a significance



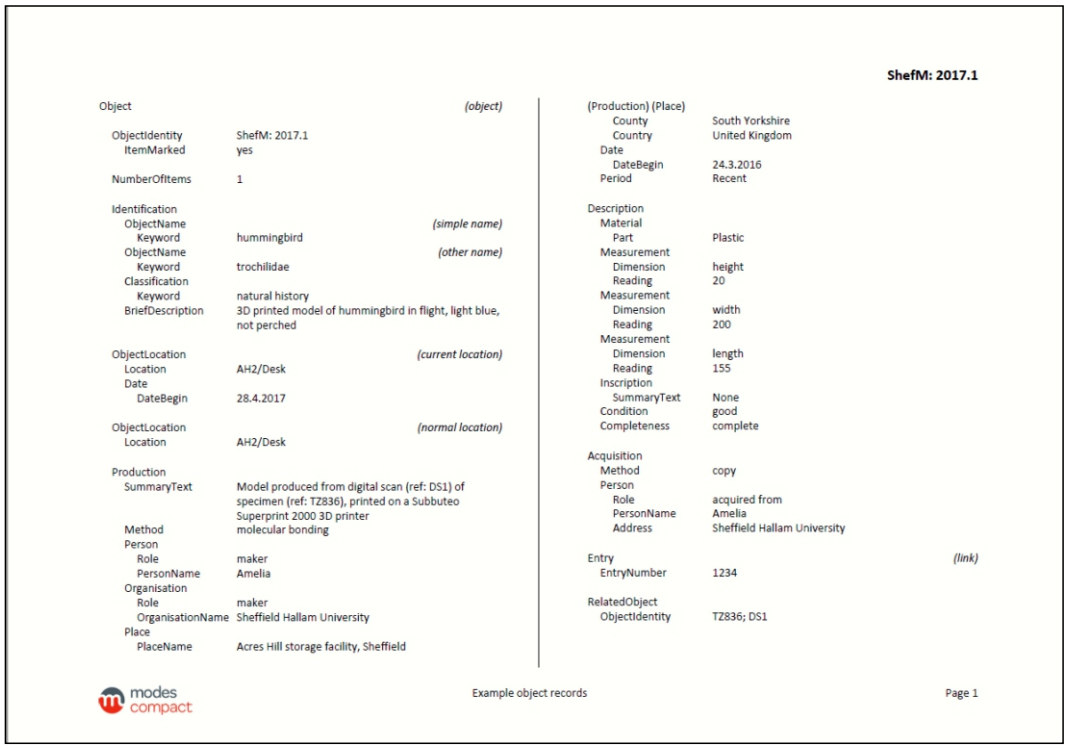
Stories

10350



may be figment of misinterpreted in a replica.

Alister's accession record. He accessioned his object as a copy moving away from the standard labels used to create object records. He was also the only curator to mark his object with its corresponding accession number, although this number was made up.



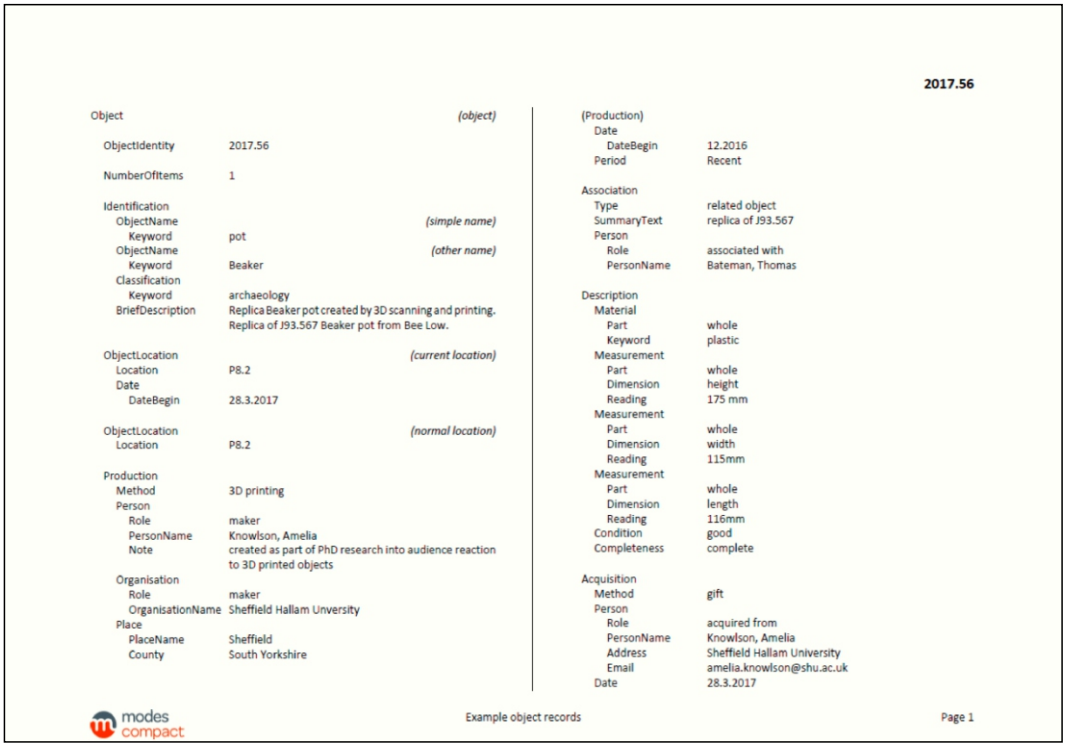
ShefM: 2017.1

Object		*(object)*
ObjectIdentity	ShefM: 2017.1	
ItemMarked	yes	
NumberOfItems	1	
Identification		
ObjectName		*(simple name)*
Keyword	hummingbird	
ObjectName		*(other name)*
Keyword	trochilidae	
Classification		
Keyword	natural history	
BriefDescription	3D printed model of hummingbird in flight, light blue, not perched	
ObjectLocation		*(current location)*
Location	AH2/Desk	
Date		
DateBegin	28.4.2017	
ObjectLocation		*(normal location)*
Location	AH2/Desk	
Production		
SummaryText	Model produced from digital scan (ref: DS1) of specimen (ref: TZ836), printed on a Subbuteo Superprint 2000 3D printer	
Method	molecular bonding	
Person		
Role	maker	
PersonName	Amelia	
Organisation		
Role	maker	
OrganisationName	Sheffield Hallam University	
Place		
PlaceName	Acres Hill storage facility, Sheffield	

(Production) (Place)		
County	South Yorkshire	
Country	United Kingdom	
Date		
DateBegin	24.3.2016	
Period	Recent	
Description		
Material		
Part	Plastic	
Measurement		
Dimension	height	
Reading	20	
Measurement		
Dimension	width	
Reading	200	
Measurement		
Dimension	length	
Reading	155	
Inscription		
SummaryText	None	
Condition	good	
Completeness	complete	
Acquisition		
Method	copy	
Person		
Role	acquired from	
PersonName	Amelia	
Address	Sheffield Hallam University	
Entry		*(link)*
EntryNumber	1234	
RelatedObject		
ObjectIdentity	TZ836; DS1	

modes compact Example object records Page 1

Martha's accession record. She accessioned the 3D printed pot as a gift and with a correct accession number. She also lists the method of production as 3D printing.



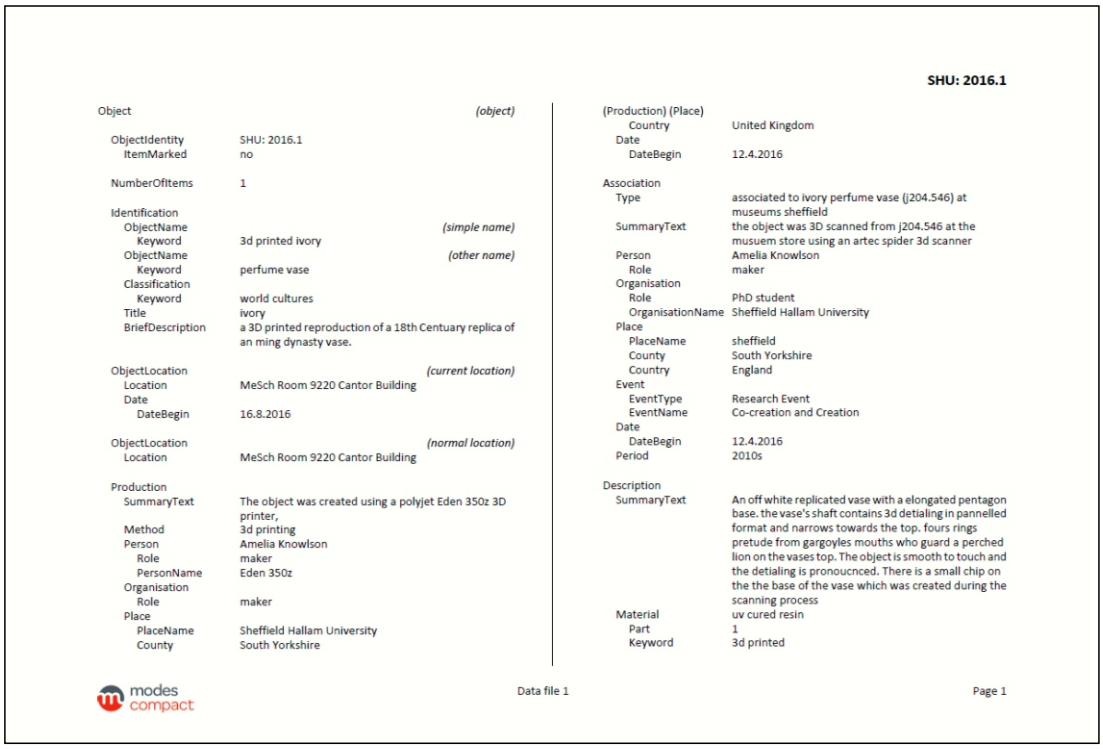
2017.56

Object		*(object)*
ObjectIdentity	2017.56	
NumberOfItems	1	
Identification		
ObjectName		*(simple name)*
Keyword	pot	
ObjectName		*(other name)*
Keyword	Beaker	
Classification		
Keyword	archaeology	
BriefDescription	Replica Beaker pot created by 3D scanning and printing. Replica of J93.567 Beaker pot from Bee Low.	
ObjectLocation		*(current location)*
Location	P8.2	
Date		
DateBegin	28.3.2017	
ObjectLocation		*(normal location)*
Location	P8.2	
Production		
Method	3D printing	
Person		
Role	maker	
PersonName	Knowlson, Amelia	
Note	created as part of PhD research into audience reaction to 3D printed objects	
Organisation		
Role	maker	
OrganisationName	Sheffield Hallam University	
Place		
PlaceName	Sheffield	
County	South Yorkshire	

(Production)		
Date		
DateBegin	12.2016	
Period	Recent	
Association		
Type	related object	
SummaryText	replica of J93.567	
Person		
Role	associated with	
PersonName	Bateman, Thomas	
Description		
Material		
Part	whole	
Keyword	plastic	
Measurement		
Part	whole	
Dimension	height	
Reading	175 mm	
Measurement		
Part	whole	
Dimension	width	
Reading	115mm	
Measurement		
Part	whole	
Dimension	length	
Reading	116mm	
Condition	good	
Completeness	complete	
Acquisition		
Method	gift	
Person		
Role	acquired from	
PersonName	Knowlson, Amelia	
Address	Sheffield Hallam University	
Email	amelia.knowlson@shu.ac.uk	
Date	28.3.2017	

modes compact Example object records Page 1

Clare's accession record. She gives an incorrect accession number and gives no accession method. She also lists the location of the 3D printed vase as a University Building and not in a museum store or gallery.



SHU: 2016.1

Object		*(object)*
ObjectIdentity	SHU: 2016.1	
ItemMarked	no	
NumberOfItems	1	
Identification		
ObjectName		*(simple name)*
Keyword	3d printed ivory	
ObjectName		*(other name)*
Keyword	perfume vase	
Classification		
Keyword	world cultures	
Title	ivory	
BriefDescription	a 3D printed reproduction of a 18th Centuary replica of an ming dynasty vase.	
ObjectLocation		*(current location)*
Location	MeSch Room 9220 Cantor Building	
Date		
DateBegin	16.8.2016	
ObjectLocation		*(normal location)*
Location	MeSch Room 9220 Cantor Building	
Production		
SummaryText	The object was created using a polyjet Eden 350z 3D printer,	
Method	3d printing	
Person	Amelia Knowlson	
Role	maker	
PersonName	Eden 350z	
Organisation		
Role	maker	
Place		
PlaceName	Sheffield Hallam University	
County	South Yorkshire	

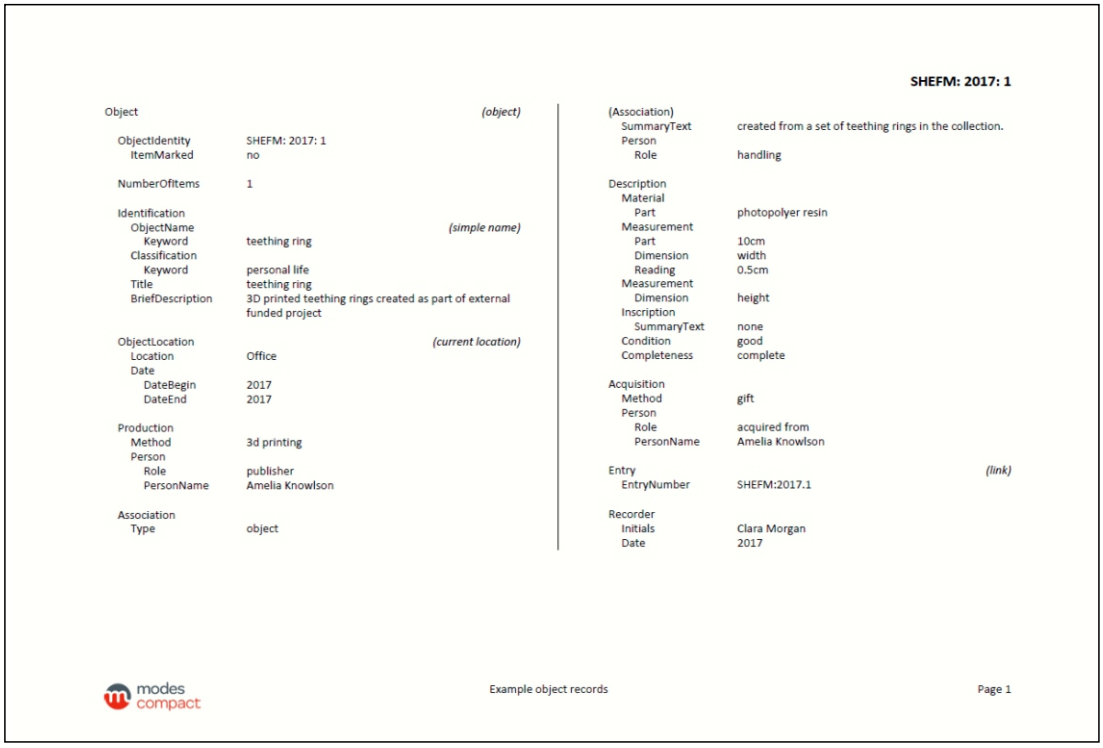
(Production) (Place)	
Country	United Kingdom
Date	
DateBegin	12.4.2016
Association	
Type	associated to ivory perfume vase (j204.546) at museums sheffield
SummaryText	the object was 3D scanned from j204.546 at the musuem store using an artec spider 3d scanner
Person	Amelia Knowlson
Role	maker
Organisation	
Role	PhD student
OrganisationName	Sheffield Hallam University
Place	
PlaceName	sheffield
County	South Yorkshire
Country	England
Event	
EventType	Research Event
EventName	Co-creation and Creation
Date	
DateBegin	12.4.2016
Period	2010s
Description	
SummaryText	An off white replicated vase with a elongated pentagon base. the vase's shaft contains 3d detialing in pannelled format and narrows towards the top. fours rings pretude from gargoyles mouths who guard a perched lion on the vases top. The object is smooth to touch and the detialing is pronoucnced. There is a small chip on the the base of the vase which was created during the scanning process
Material	uv cured resin
Part	1
Keyword	3d printed

modes compact

Data file 1

Page 1

Clara's accession record. Clara has accessioned the 3D printed teething rings as a gift and lised the location of the object as 'Office' she does not state whether this office is a curatorial office located in the museum.



SHEFM: 2017: 1

Object		*(object)*
ObjectIdentity	SHEFM: 2017: 1	
ItemMarked	no	
NumberOfItems	1	
Identification		
ObjectName		*(simple name)*
Keyword	teething ring	
Classification		
Keyword	personal life	
Title	teething ring	
BriefDescription	3D printed teething rings created as part of external funded project	
ObjectLocation		*(current location)*
Location	Office	
Date		
DateBegin	2017	
DateEnd	2017	
Production		
Method	3d printing	
Person		
Role	publisher	
PersonName	Amelia Knowlson	
Association		
Type	object	

(Association)		
SummaryText	created from a set of teething rings in the collection.	
Person		
Role	handling	
Description		
Material		
Part	photopolyer resin	
Measurement		
Part	10cm	
Dimension	width	
Reading	0.5cm	
Measurement		
Dimension	height	
Inscription		
SummaryText	none	
Condition	good	
Completeness	complete	
Acquisition		
Method	gift	
Person		
Role	acquired from	
PersonName	Amelia Knowlson	
Entry		*(link)*
EntryNumber	SHEFM:2017.1	
Recorder		
Initials	Clara Morgan	
Date	2017	

modes compact

Example object records

Page 1

A photograph of a full colour 3D printed ivory vase and its museum counterpart inside the museum archive. The photograph shows how the 3D printed vase is an exact copy except of its colour.



This provocation was designed to highlight the visual differences between museum and 3DSP objects. It sought to get curators to think critically about why they were concerned about integrating 3DSP into the museum.

A photograph from the same visual experiment. The image shows the museum's ivory vase alongside its 3D printed counterpart, although this time the objects identifying tag has been placed on the 3D printed version, to prompt curators to think about whether 3DSP objects should be considered as part of the museum collection. Here 3DSP is being used as a provocation to encourage curators to think about how technology can and does impact on their practice.




2007.317




Does colour related to accuracy or is it more related to form and physical properties?
Mistake in colour!
The residency has progressed with no mention of colour
2007.317



Curators at Museums Sheffield saw colour the difference in colour as a lack of accuracy, that may or may not mislead audiences.

It raises questions about accuracy and whether the origins of this concept lie in the form of the object or its physical properties and not how it is visually perceived.





A photograph of a 3D scanned statue showing the damage to the statues back.

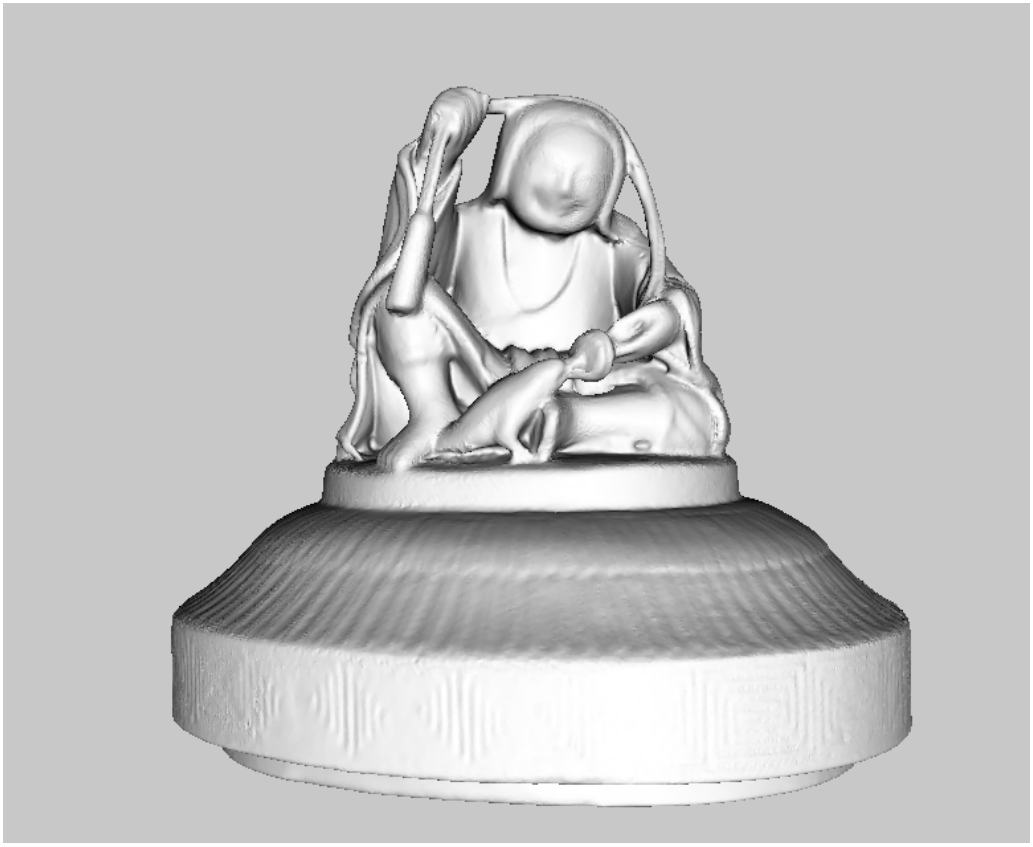


A side view of the statue showing scratch marks to the face.



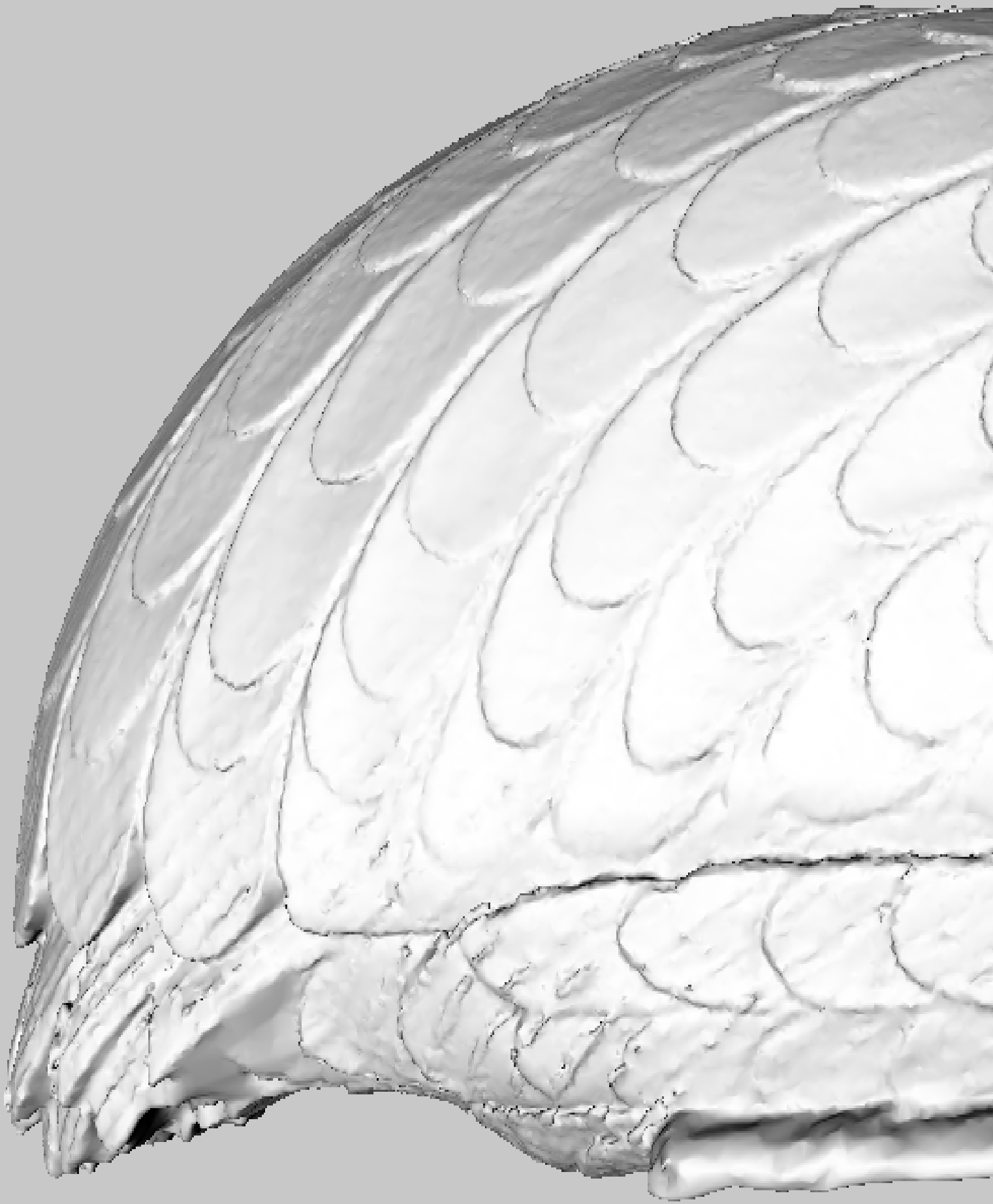


A 3D scan of the God of Wealth, which was used in the exhibition ‘Stories from the East: The Grice Ivories’. The scanned object is actually a topper for a larger object designed to allow people to place money inside, as an offering to the God of Wealth. The decision to scan the top was so a 3D printed version could go inside a donations box along with a label explaining the story behind the God of Wealth.

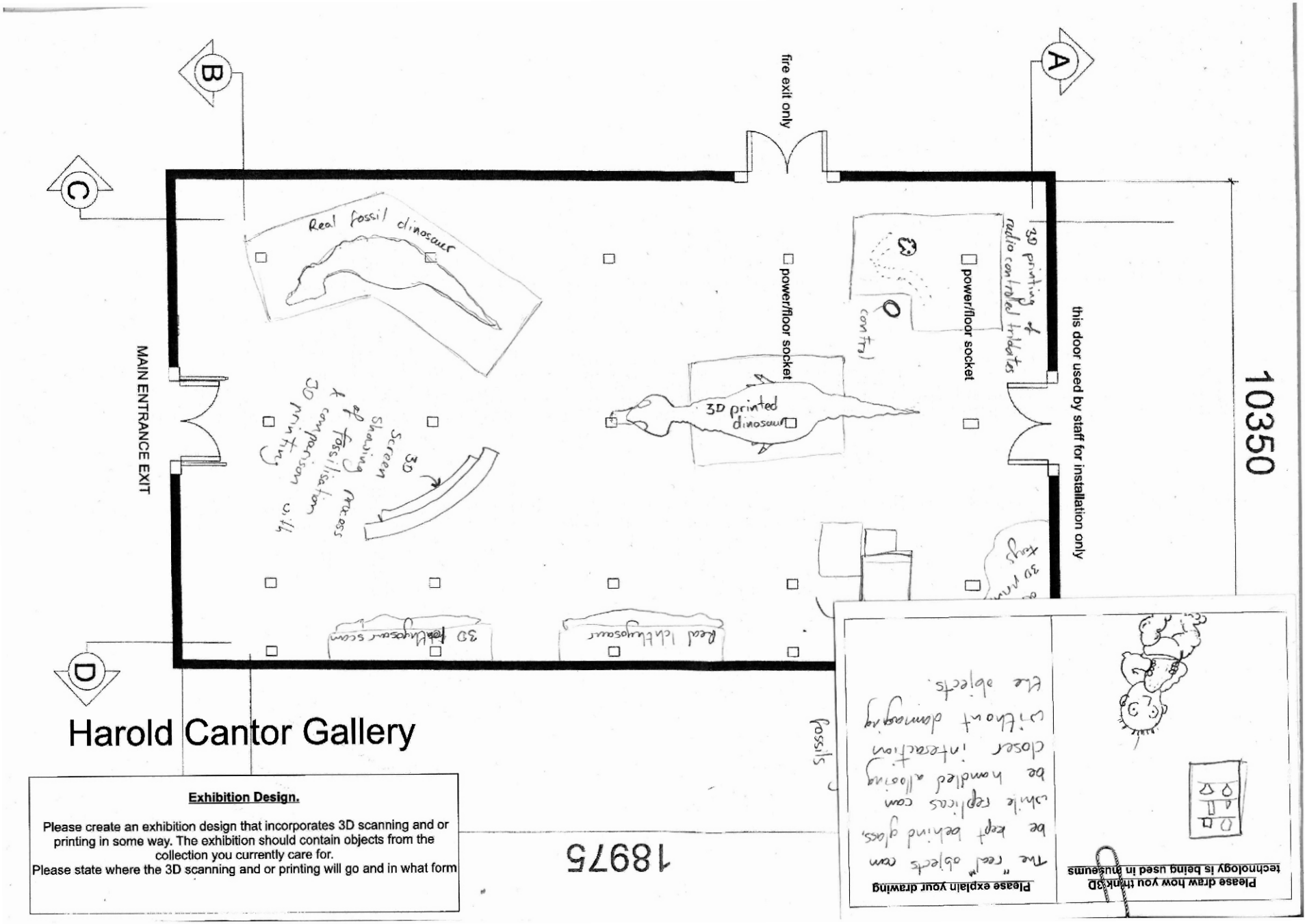


A photograph of the complete museum object with the God of Wealth on the top.

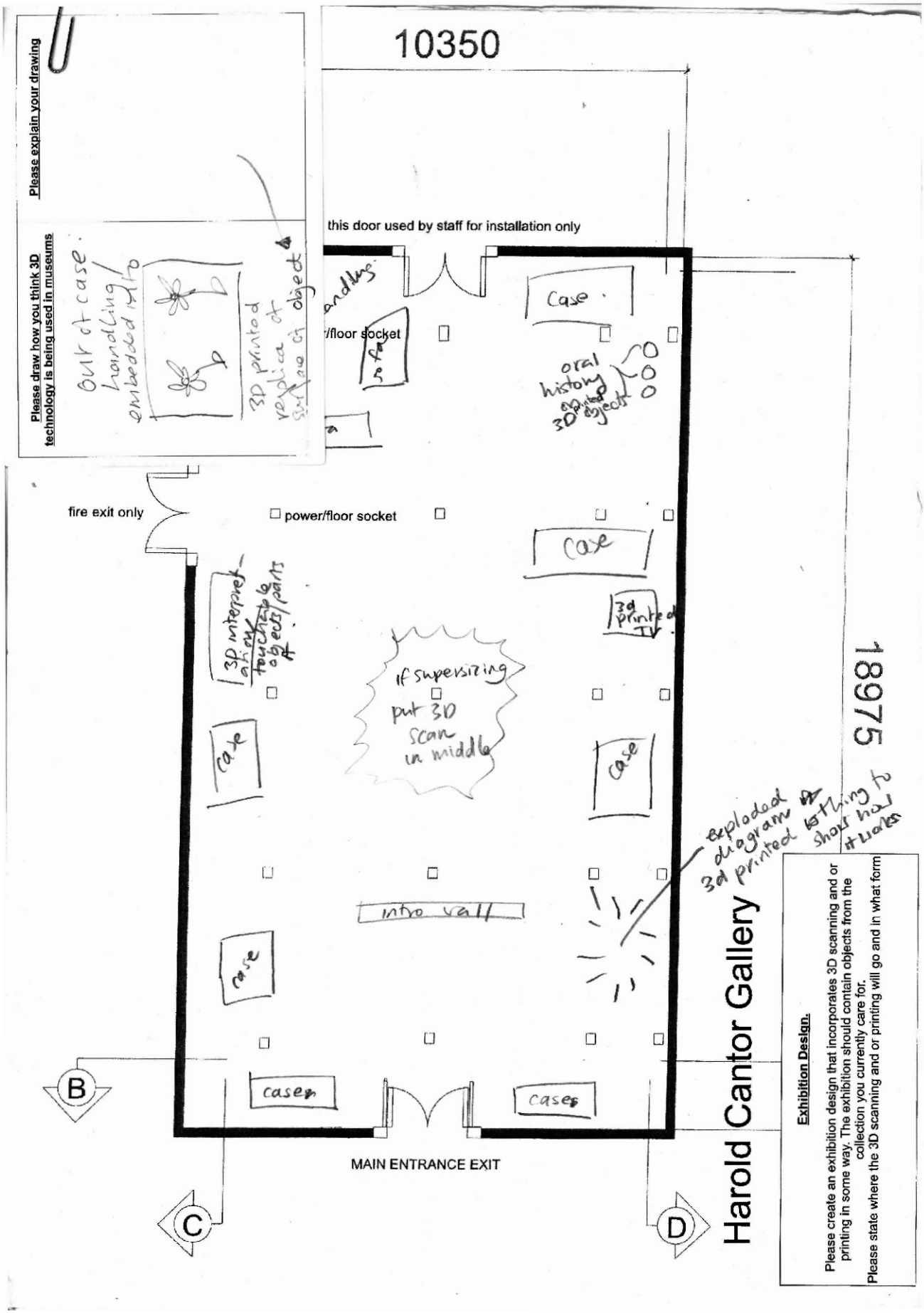




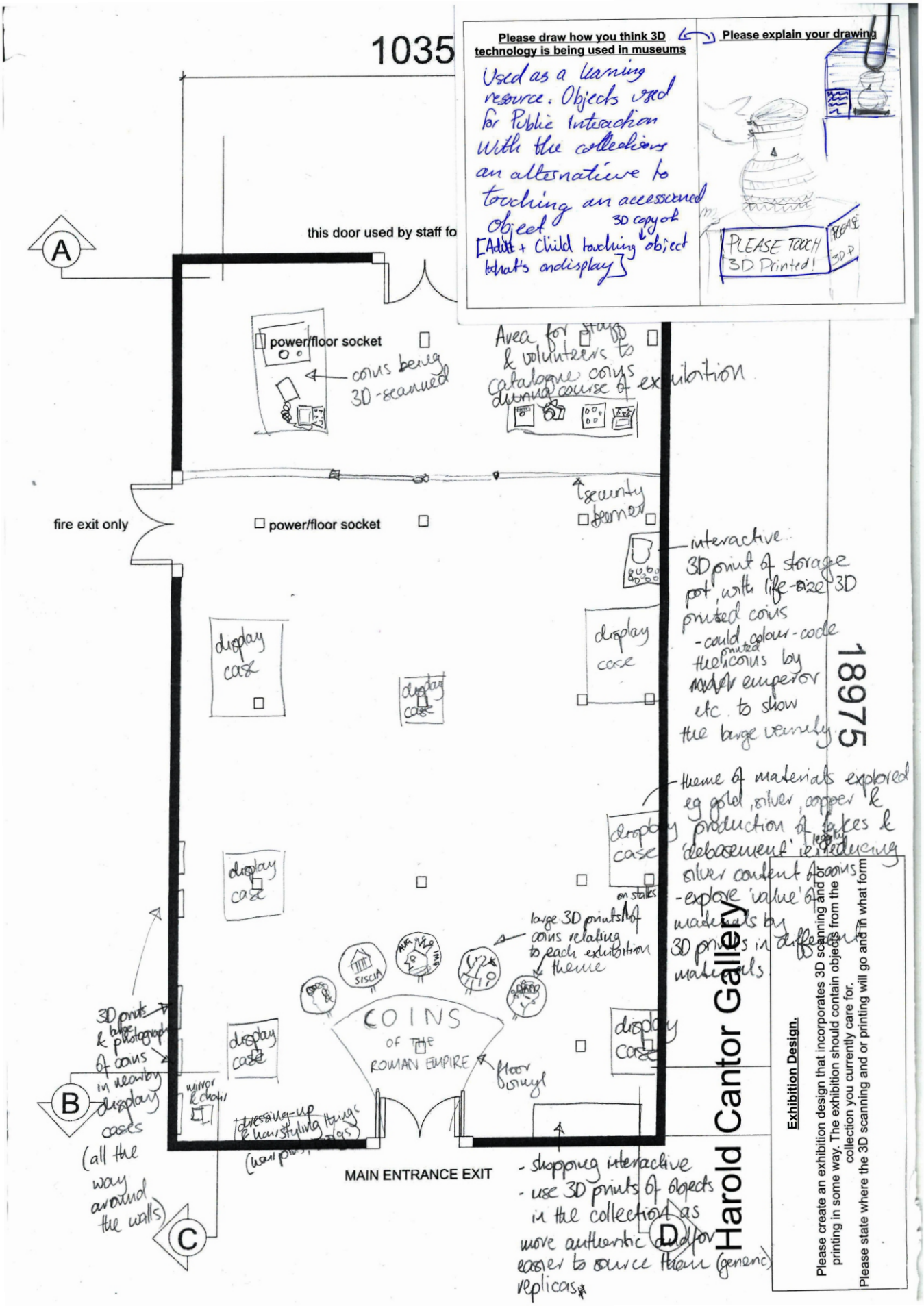


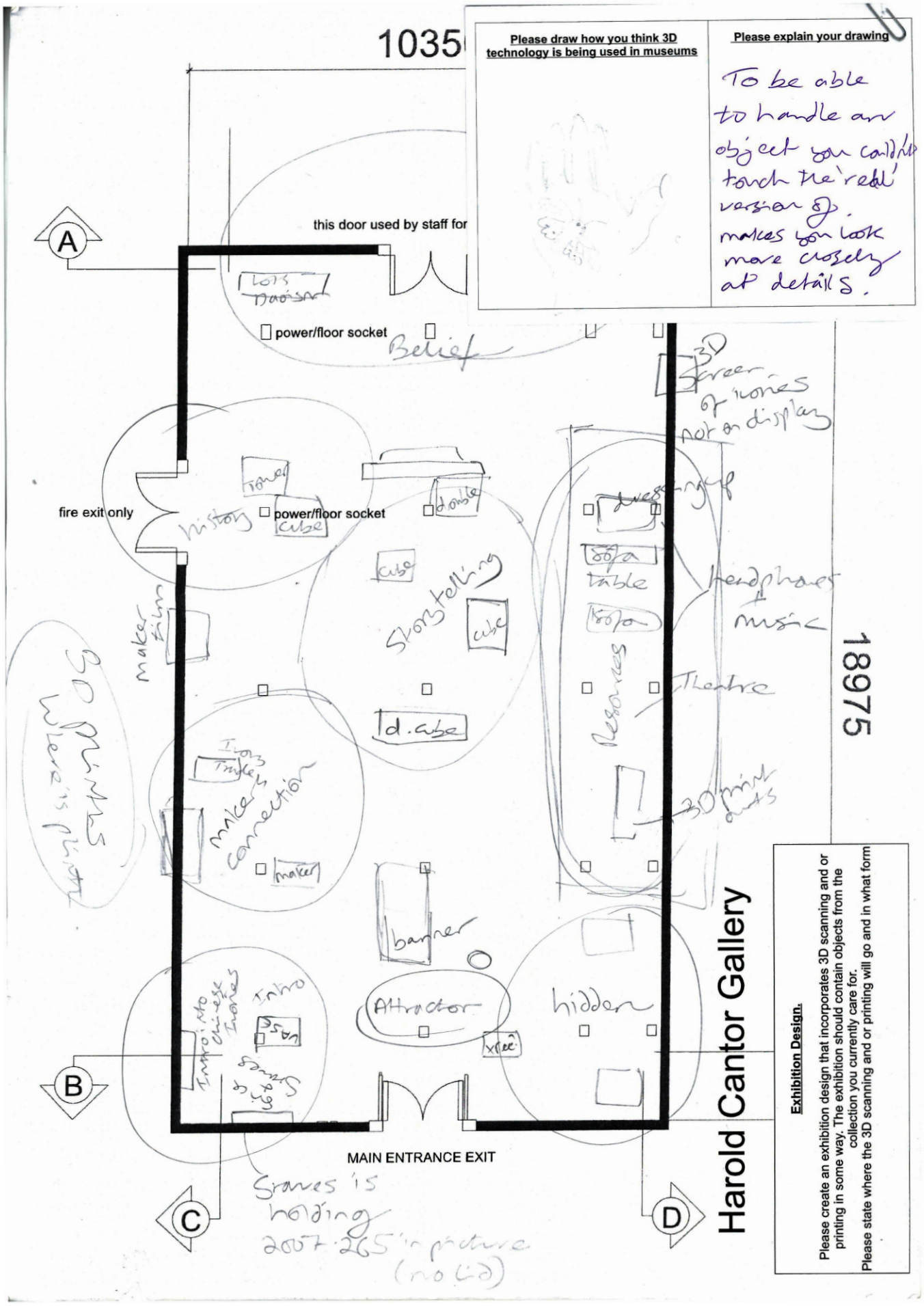


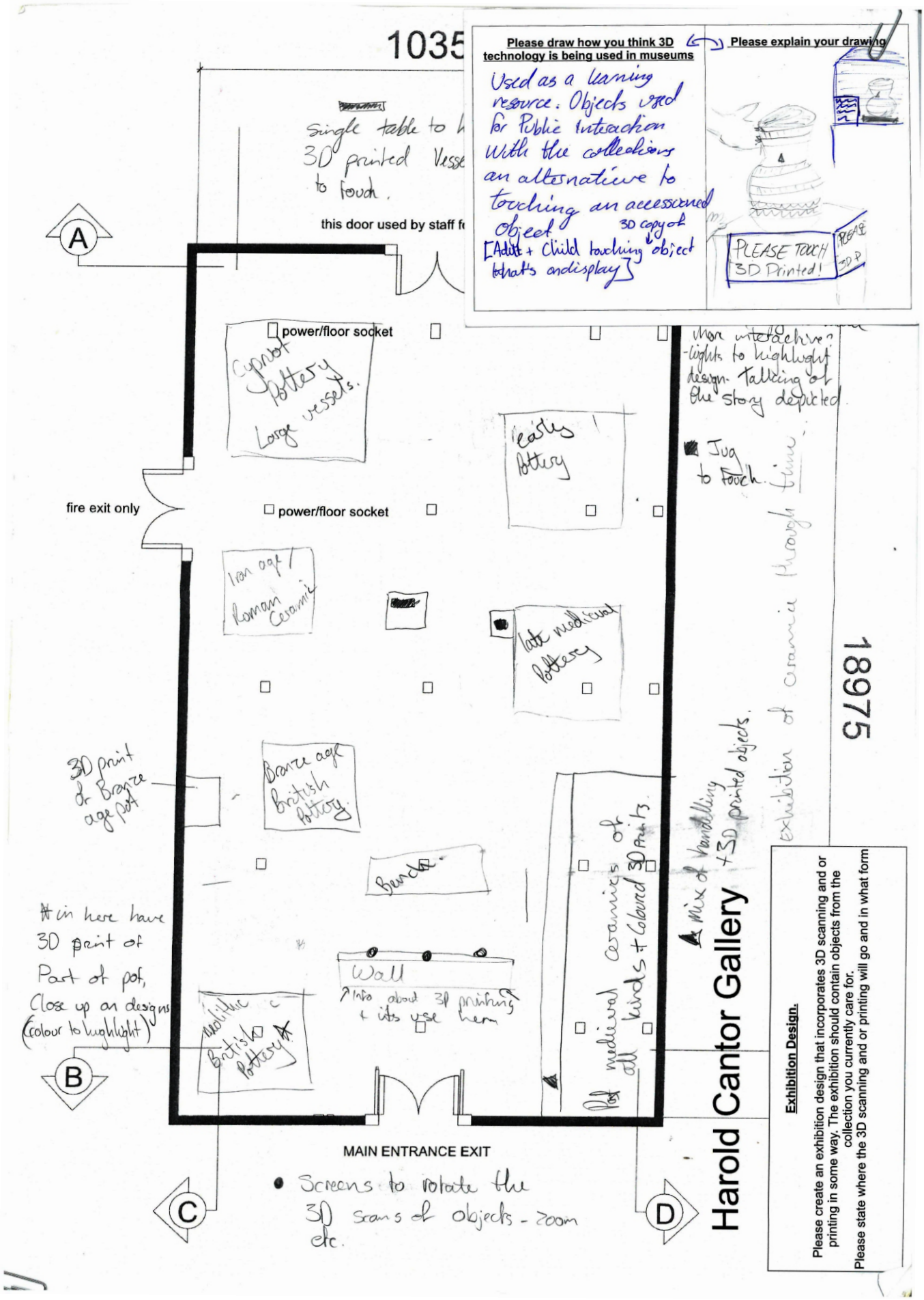
A
B
C
D
fire exit only
MAIN ENTRANCE EXIT
power/floor socket
power/floor socket
this door used by staff for installation only
Real fossil dinosaur
3D printing of radio controlled tridates
control
3D printed dinosaur
3D screen showing process of fossilisation & comparison with 3D printing
3D ichthyosaur scan
Real Ichthyosaur
fossils
10350
18975
Harold Cantor Gallery
Exhibition Design.
Please create an exhibition design that incorporates 3D scanning and or printing in some way. The exhibition should contain objects from the collection you currently care for.
Please state where the 3D scanning and or printing will go and in what form
Please draw how you think 3D technology is being used in museums
Please explain your drawing
The "real" objects can be kept behind glass, while replicas can be handled allowing closer interaction without damaging the objects.



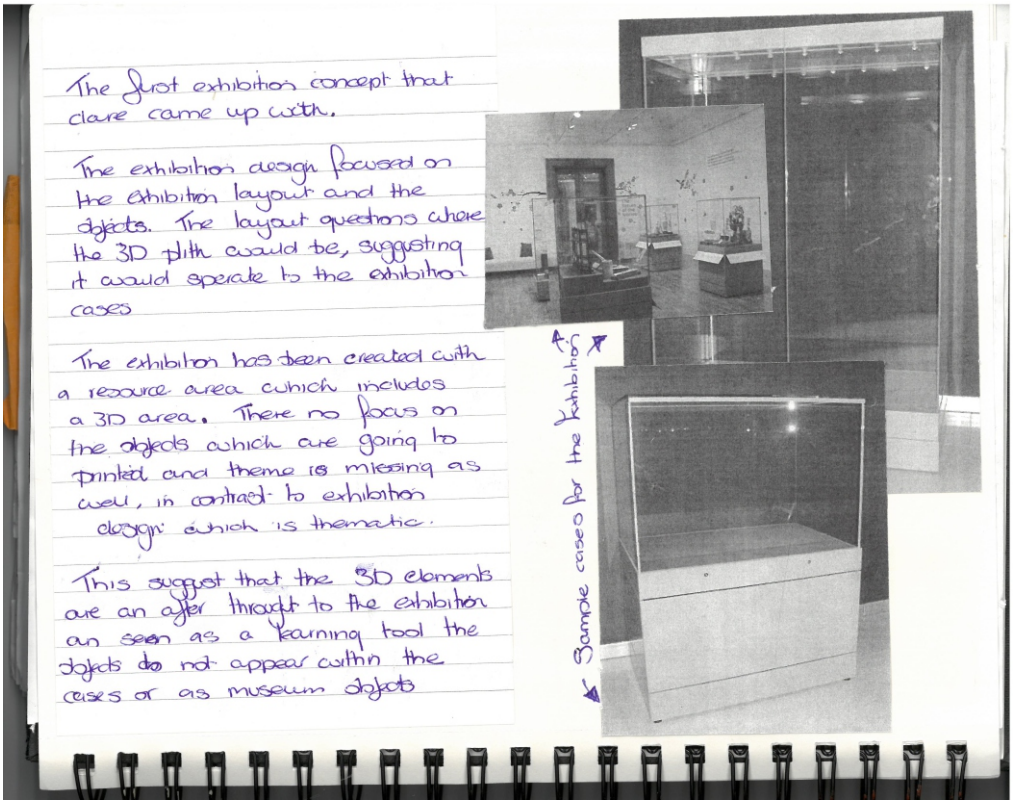
Please explain your drawing
Please draw how you think 3D technology is being used in museums
out of case handling/ embedded info
3D printed replica of surface of object
10350
this door used by staff for installation only
/floor socket
Case
oral history
3D printed objects
fire exit only
power/floor socket
case
3D interpretation touchable objects/parts
3d printed TV
if supersizing put 3D scan in middle
case
case
exploded diagram 3d printed thing to show how it works
intro wall
case
case
cases
cases
MAIN ENTRANCE EXIT
B
C
D
Harold Cantor Gallery
18975
Exhibition Design.
Please create an exhibition design that incorporates 3D scanning and or printing in some way. The exhibition should contain objects from the collection you currently care for.
Please state where the 3D scanning and or printing will go and in what form

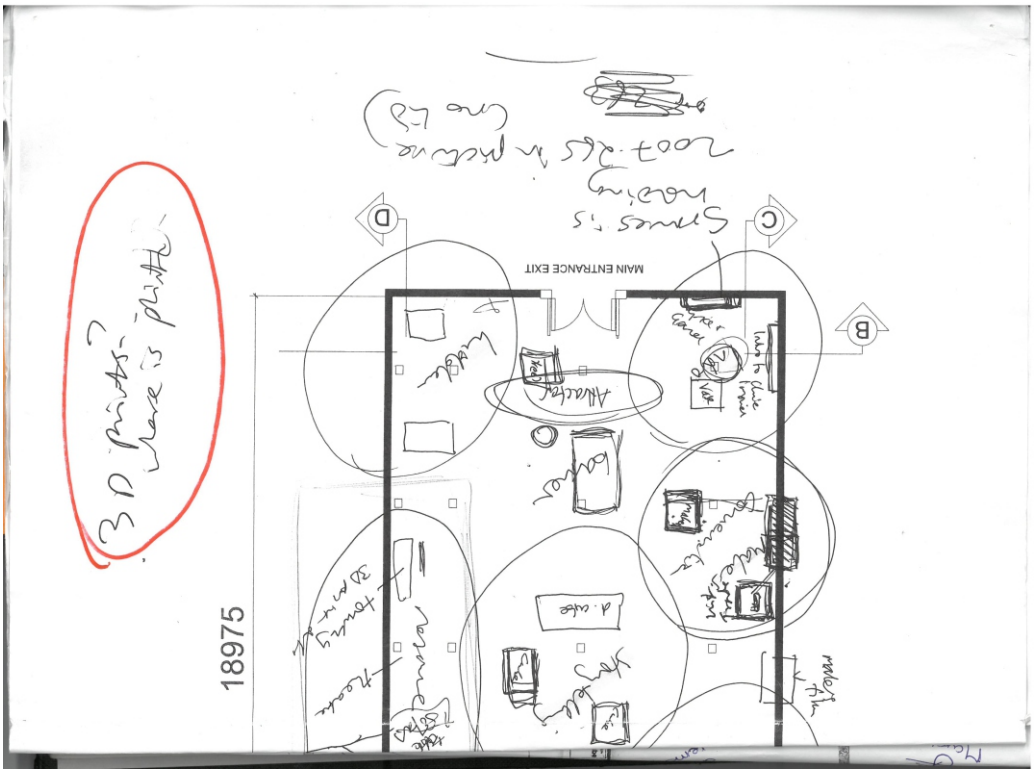

1035
Please draw how you think 3D technology is being used in museums
Please explain your drawing
Used as a learning resource. Objects used for Public interaction with the collections an alternative to touching an accessioned object
[Adult + Child touching 3D copy of object that's on display]
PLEASE TOUCH 3D Printed!
this door used by staff fo
A
power/floor socket
coins being 3D-scanned
Area for staff & volunteers to catalogue coins during course of exhibition
fire exit only
power/floor socket
security barrier
interactive: 3D print of storage pot with life-size 3D printed coins
- could colour-code the coins by emperor etc. to show the large variety
display case
theme of materials explored eg gold, silver, copper & production of fakes & 'debasement' ie reducing silver content of coins
- explore 'value' of materials by 3D printing in different materials
large 3D prints of coins relating to each exhibition theme
COINS OF THE ROMAN EMPIRE
floor vinyl
3D prints & large photographs of coins in nearby display cases (all the way around the walls)
B
C
D
MAIN ENTRANCE EXIT
- shopping interactive
- use 3D prints of objects in the collection as more authentic and/or easier to source than (generic) replicas
Harold Cantor Gallery
1897 5
Exhibition Design.
Please create an exhibition design that incorporates 3D scanning and or printing in some way. The exhibition should contain objects from the collection you currently care for.
Please state where the 3D scanning and or printing will go and in what form

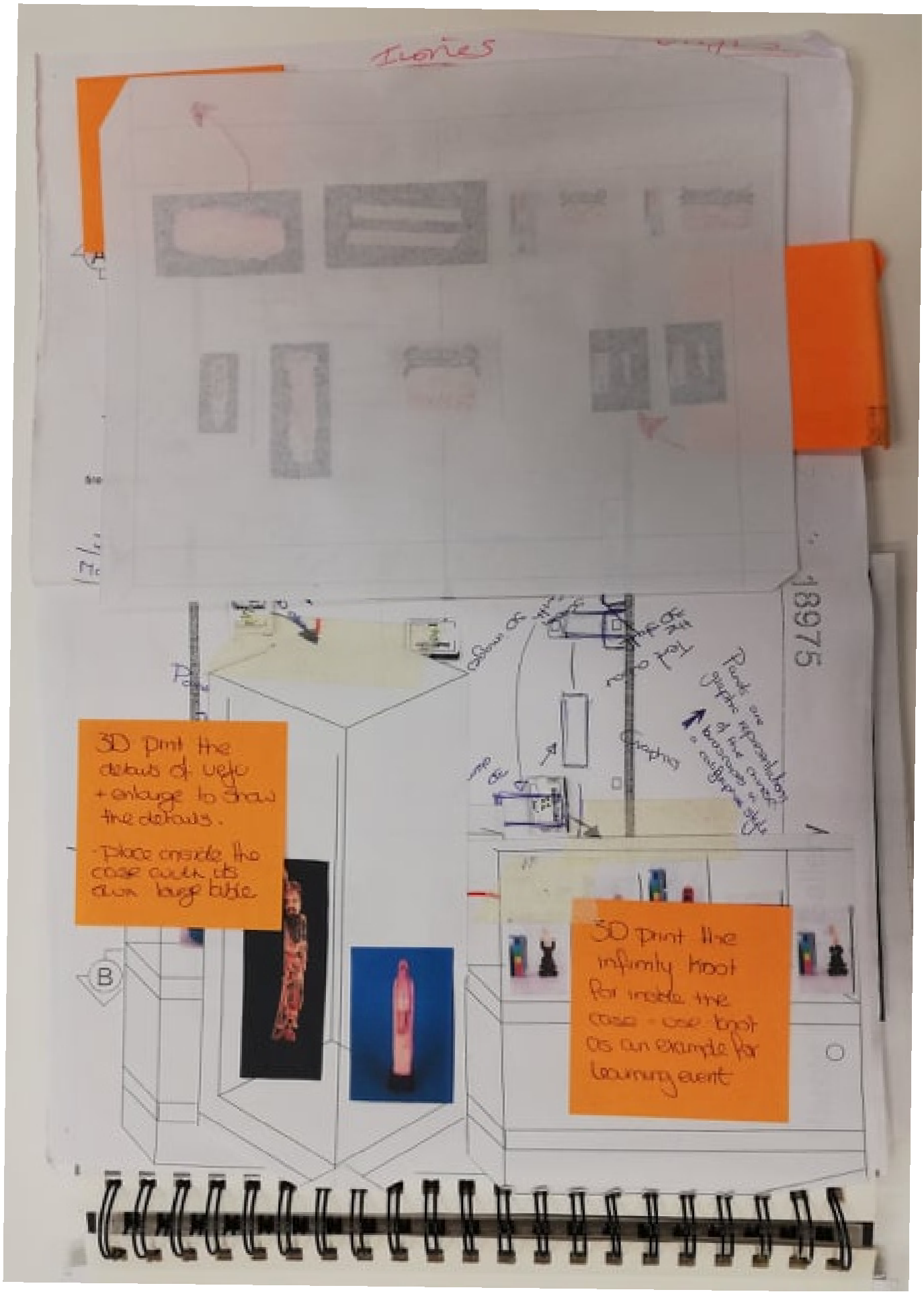

1035
Please draw how you think 3D technology is being used in museums
Please explain your drawing
To be able to handle an object you couldn't touch the 'real' version of. makes you look more closely at details.
this door used by staff for
A
B
C
D
power/floor socket
Belief
3D screen of icones not on display
fire exit only
power/floor socket
history
tower
cube
double
cube
storytelling
cube
d.cube
dressing up
sofa
table
sofa
headphones + music
Resources
Theatre
3D print outs
maker film
3D printing where is printing
Icons Trade
makers connection
maker
banner
Attractor
hidden
Intro into Chinese Icones
Intro
vase
Graves
MAIN ENTRANCE EXIT
Graves is holding 2007.265 in picture (no lid)
18975
Harold Cantor Gallery
Exhibition Design.
Please create an exhibition design that incorporates 3D scanning and or printing in some way. The exhibition should contain objects from the collection you currently care for.
Please state where the 3D scanning and or printing will go and in what form

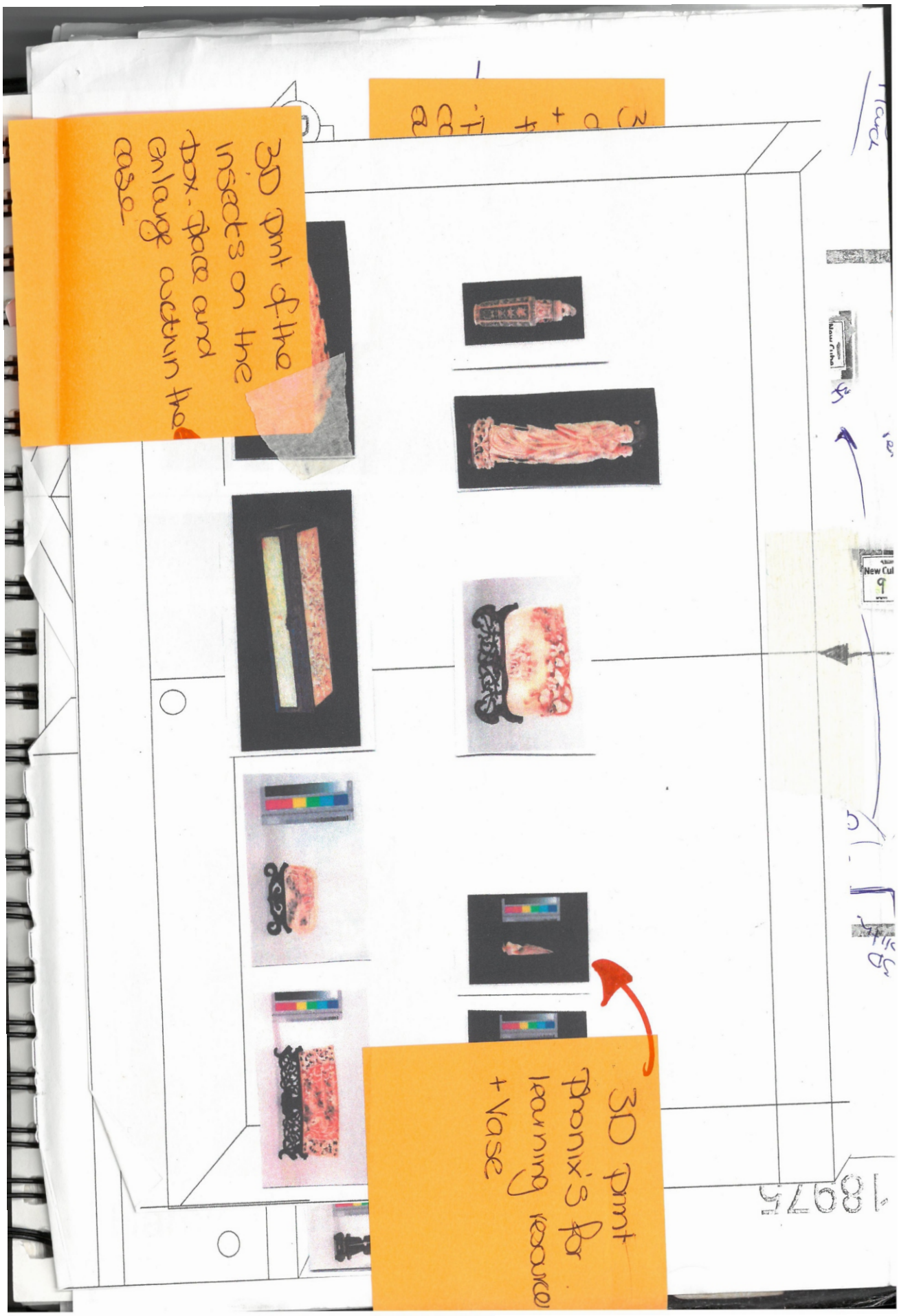

1035
Please draw how you think 3D technology is being used in museums
Used as a learning resource. Objects used for Public interaction with the collections an alternative to touching an accessioned object
[Adult + Child touching 3D copy of object that's on display]
Please explain your drawing
PLEASE TOUCH 3D Printed!
Single table to h
3D printed Vesse
to touch.
this door used by staff f
A
power/floor socket
Cypriot Pottery Large vessels.
Early Pottery
More interactive? -lights to highlight design. Talking of the story depicted.
Jug to touch.
fire exit only
power/floor socket
Iron age / Roman Ceramic
late medieval Pottery
18975
3D print of Bronze age pot
Bronze age British Pottery
Bench
Wall
Info about 3D printing + its use here
Post medieval ceramics of all kinds + Coloured 3D Prints
mix of handling + 3D printed objects.
exhibition of ceramics through time
Harold Cantor Gallery
Exhibition Design.
Please create an exhibition design that incorporates 3D scanning and or printing in some way. The exhibition should contain objects from the collection you currently care for.
Please state where the 3D scanning and or printing will go and in what form
* in here have 3D print of Part of pot, Close up on designs (colour to highlight)
Medieval British Pottery
B
MAIN ENTRANCE EXIT
C
D
• Screens to rotate the 3D scans of objects - zoom etc.

These example diary page explore my thoughts and ideas relating to the first exhibition concept conceived by Clare and I.





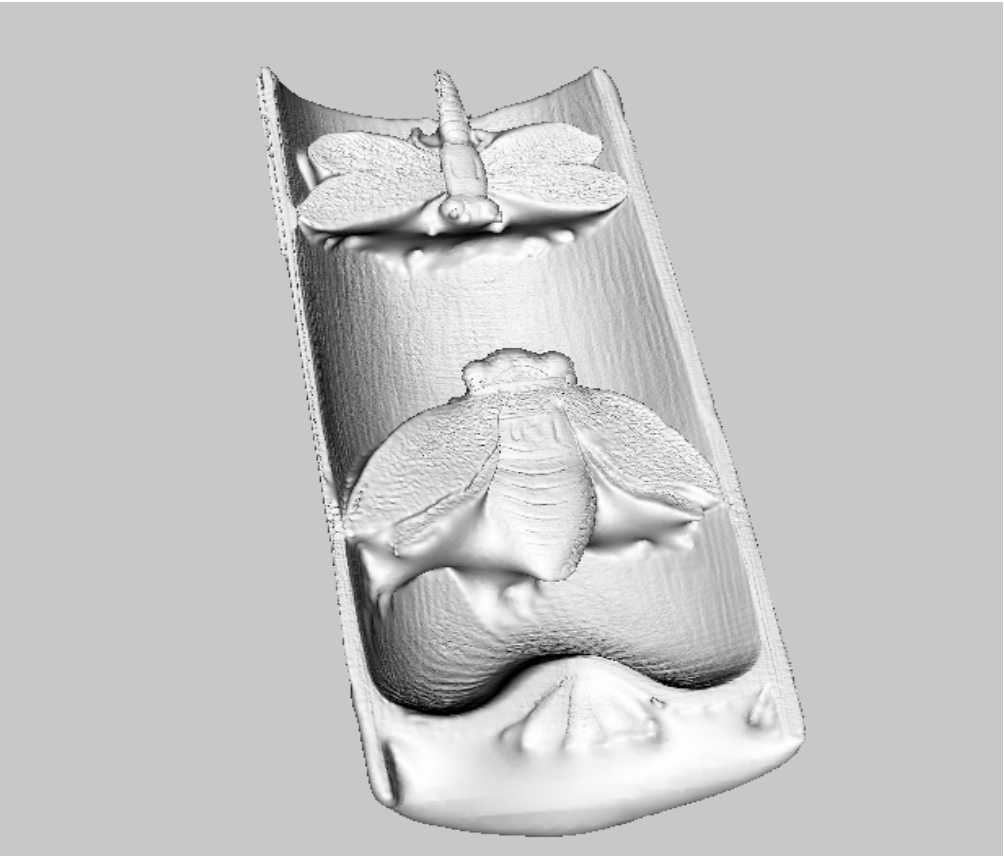

Ivories
18975
3D print the details of vefo + enlarge to show the details.
- place inside the case with its own large table
3D print the infinity knot for inside the case - use knot as an example for learning event
B


3D Print of the insects on the box. Place and enlarge within the case
3D Print Phonix's for learning resource + Vase
18975

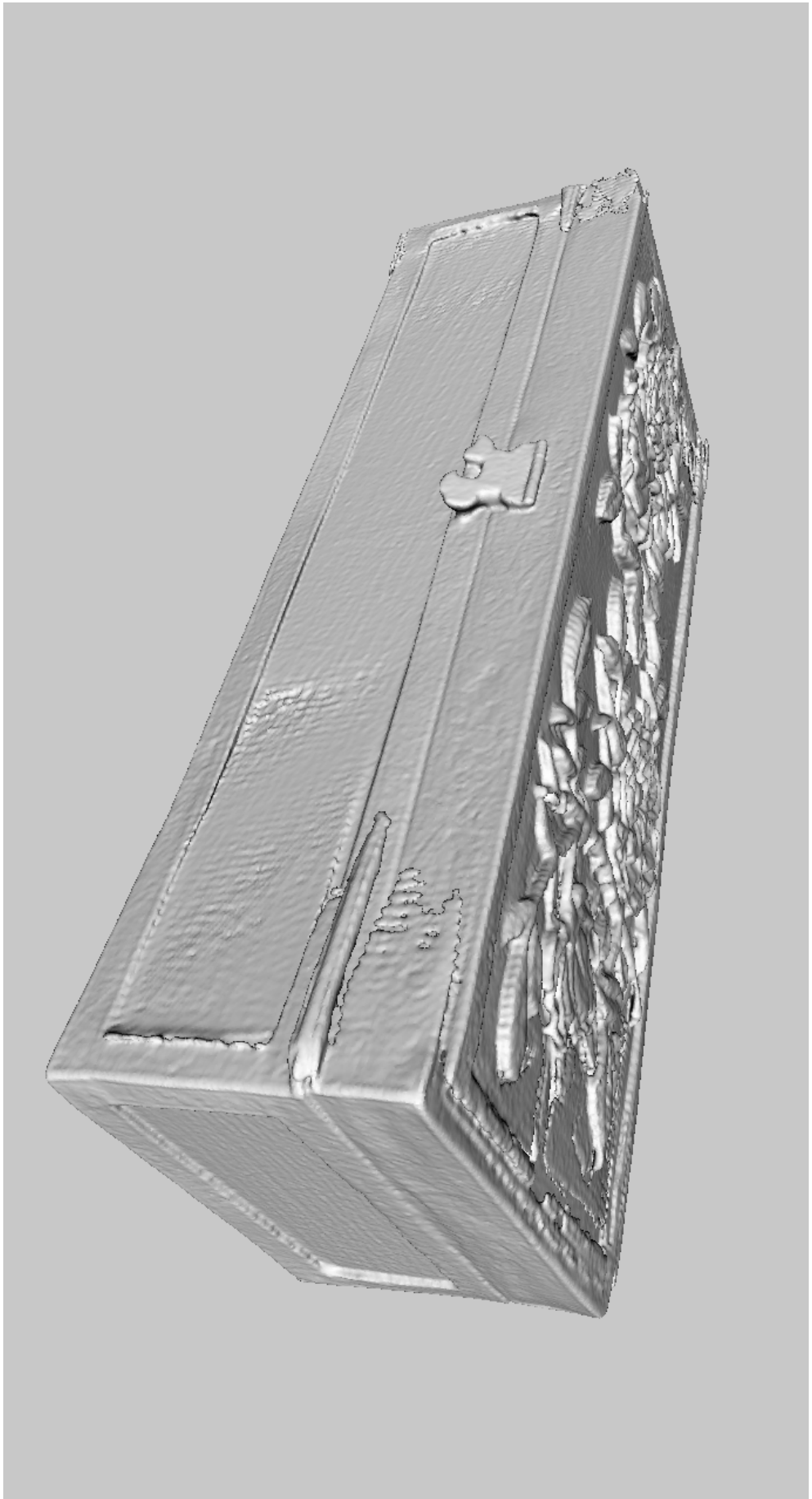
A photograph showing a failed 3D scan of an arm rest. The ivory arm rest had a concave surface at the base and carved insects with negative space underneath. The 3D scanner struggled to capture this negative space, as the concave geometry was greater than the scanners range. As a result bulbous geometry has been added by the software.



The texture has been removed from the failed 3D scan of the arm rest to show how inaccurate the added data is. Curators were concerned about this added data, resulting in the object not being included in the exhibition.



This 3D scan of an ivory and wooden box, is an example of how scan data has become layered creating addition geometry, as evidenced on the bottom left corner.



A photograph of the 3D scanned Handmaiden for the Royal Lady of the West. The original museum object is made from Ivory, wood, malachite, turquoise and coral.

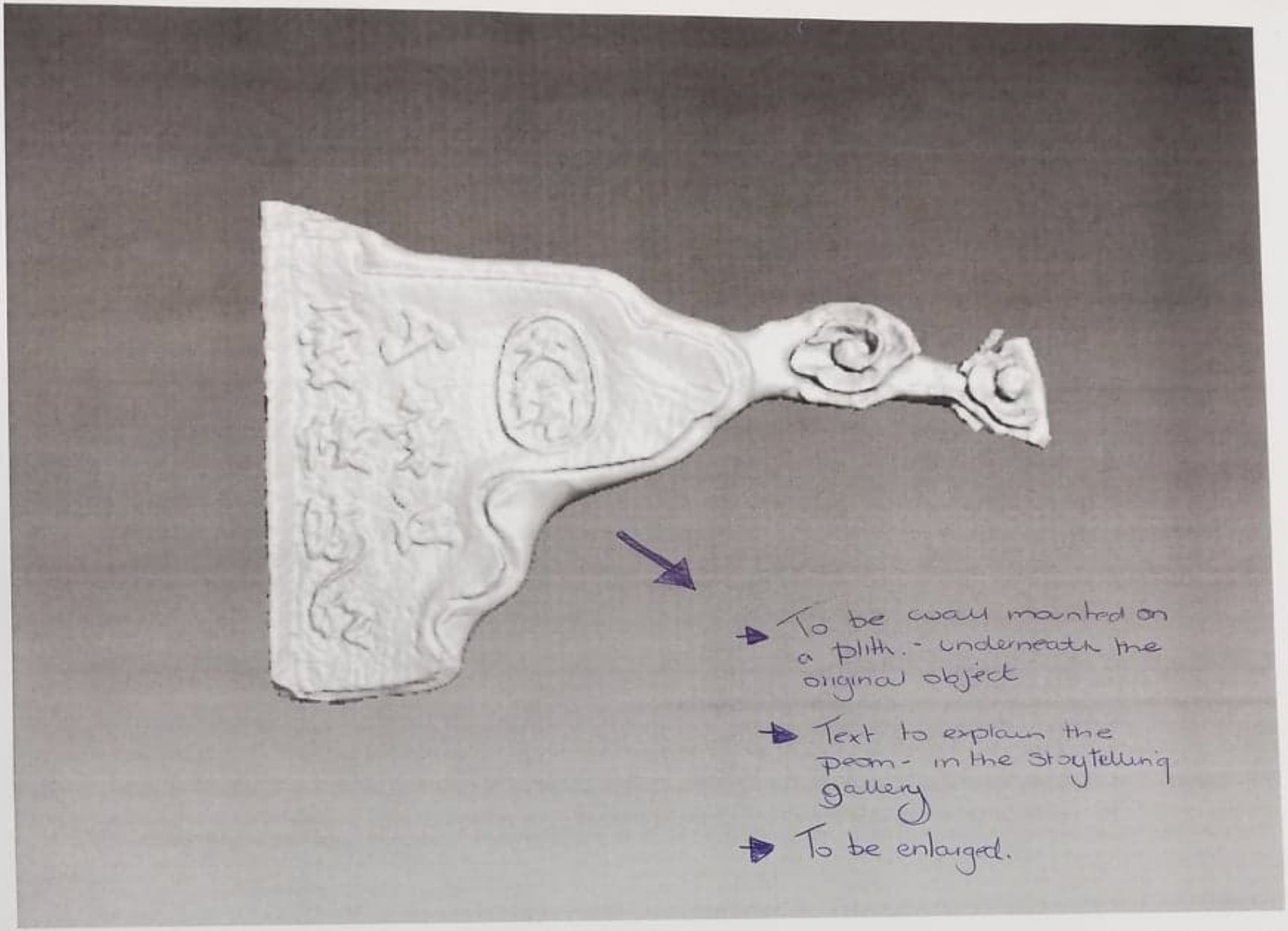
The image below is of the original museum object.

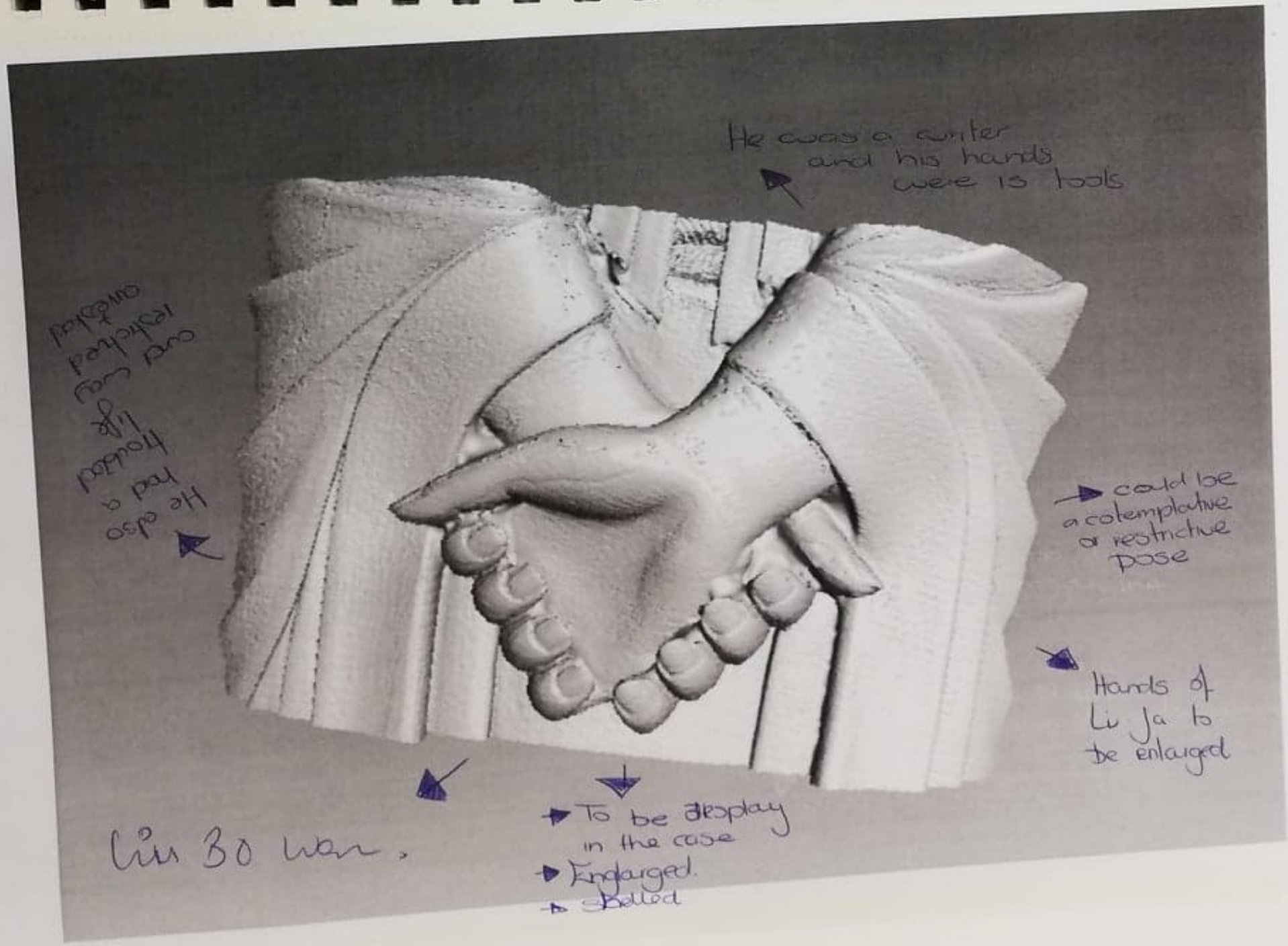


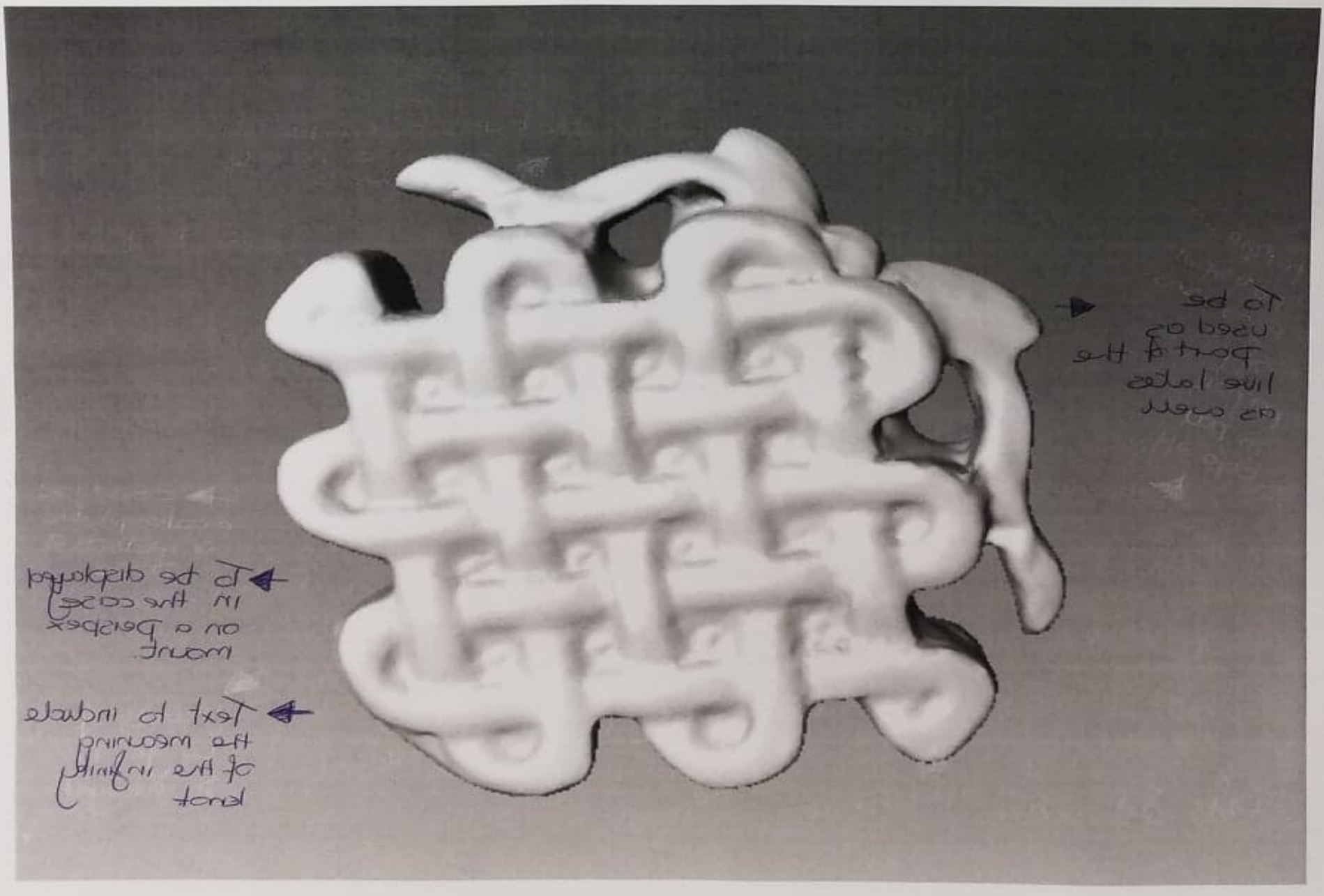


A photograph of the 3D scanned Handmaiden for the Royal Lady of the West with full texture. When compared with the photograph of the actual museum object it is clear how much the scanning process changes the colour of the applied to the 3D scan. For curators at Museums Sheffield this was particularly an issue, they came to understand the limits of the technology and stated they would never place an 3DSP object in the gallery without interpretation.




To be wall mounted on a plith. - underneath the original object
Text to explain the poem - in the Storytelling gallery
To be enlarged.


He was a writer and his hands were is tools
He also had a troubled life and was restricted + arrested
could be a cotemplative or restrictive pose
Hands of Liu Ja to be enlarged
To be display in the case
Enlarged.
Shelled
Liu Bo Wan.


To be used as part of the live lates as well
To be displayed in the case on a perspex mount.
Text to include the meaning of the infinity knot

A photograph depicting an untextured 3D scan of a mother and child craved in Ivory. The object was scanned not because it had a significant or interesting story but because curators where interested in the level of detail the scanner could capture. The museums statue is intricately carved with folds of fabric and the detail even extends to the carved fingernails on the mothers hand.





A photograph depicting a textured 3D scan of the mother and child statue. Several attempts were made to manipulate the colour of the texture, but it was extremely difficult to reproduce an exact colour. Curators at Museums Sheffield wanted to have a reference object with accurate texture applied to the object. However, this was not the case when it came to displaying the 3D printed object in the gallery, as they could distinguish the museum and 3DSP object though interpretation labels.







The 3D scan on the right is another example of experimentati ons to see how much detail the scanner could capture and where detail would be lost. The scan revealed the delicate carved chain mail, fingernails and scale pattens on the figures robes but struggled to capture the complete geometry of the looping head dress, which during the fusion phase of processing, has resulted in the form of the head dress becoming bulbous.



A textured 3D scan of an ivory statue. The texture seems to hide some of the inaccurate data forms and in the case of a large texture file, the software has struggled to map correctly onto the object. All of these factors work on the curatorial perception when considering 3DSP in audience facing museum practices.

The image below is of the museum statue currently in the ivory collection at Museums Sheffield.





Exhibition 3DP Panel

A1 Foamex panel

Words: 151 -140.

3D printing the Grice Collection

As part of her research project at Sheffield Hallam University, PhD student Amelia Knowlson scanned and 3D printed objects from the Grice Collection.

The project explores the use and application of 3D printing, a technology new to museums, so its applications have yet to be fully realised. Working in collaboration with curators at Museums Sheffield, Amelia co-selected some objects, focussing on some of their intricate details. By exploring the meaning of individual elements of the ivories, ~~she~~ we hope~~s~~ to gain a better understanding of the stories behind them. The project also aims to investigate how visitors feel about these 3D 'copies' and how museums could use them in their work.

Throughout the 'Stories from the East' exhibition you will see 3D printed fragments of objects alongside the originals. You are also invited to touch some copies of completed objects and explore some of the scans on the screen to your right.

This project is funded by the Arts and Humanities Research Council and hosted by the Arts and Design Research Centre ~~as part of the Cultural Communication and Computing Research Institute~~ at Sheffield Hallam University.

Logos: Sheffield Hallam Uni

Plans for the plith.
the curators were concerned about the security of the objects, how would we attach the objects
· They didn't want to glue them with aloidite. they would only be one use.
· Attaching them on an extendable cord would probably led to children hitting each other with the objects.
- Drilling them with a bolt would leave with a 5mm bolt sticking out.
- Print the phoniex but suspend the the bud in the air using a wooden Rod and bolt.

Potential Plith design





8.5cm



8.5cm



Object interpretation

664mm

2.


The Grice Ivories
11 March –
9 July 2017






Please touch


bar to open




4
5



This photograph was taken during the final installation of ‘Stories from the East: The Grice Ivories’. It depicts a 3D printed section of the plaque, the whole plaque is displayed above it. The 3D printed section has been enlarged to allow audiences to read or observe the calligraphy.



A photograph depicting 3D printed and enlarged symbol of Buddhism. The symbol was 3D scanned and printed to allow audiences to observe the intricacies and story of the endless knot.



A photograph of Liu Ji's 3D printed hands. Liu Ji is an important figure in Chinese history, his poetry, storytelling and skills as a war general were famous across the dynasty. Yet despite this, he was falsely accused of treason and murdered, today he is known as a martyr. His hands were literally the tools of his trade and by 3D printing and upscale them by x2 we can show the importance of this otherwise unassuming feature.



A photograph of enlarged 3D printed insect and fish details which appear on the top of an ivory box.



The British Museum Residency

A photograph of me 3D scanning the Cornell-Cael Bell cover with its curator Naomi. As she watches the captured data appear on the screen and comments on how its like watching and object being brought to life. Curators from both Museums Sheffield and The British Museum spoke of similar things as they watched or engaged with the 3DSP process.




Start
Will your object be displayed ?
Y N
In a glass case?
Y N
What other objects Will be in the case? Why?
As a handling object?
Y N
Will the object have its own label Why?
Is it part of a research project?
Y N
Experimentation?
Y N
Other?
How do you think 3D printing adds audiences and curators understanding of collections and o ts?
These diary pages
Start
Will your 3D scan be displayed?
Y N
In an exhibition?
Y N
How will your object be displayed Why?
What platform will it be uploaded to
Online?
Y N
Other?
Is it part of a research project?
Y N
Experimentation?
Y N
Other?

Photographs showing ‘The Curators Box’ before and after the residency.

Photographs of the 'The Curators Box’ made for The British Museum Residency. ‘The Curators Box’ went through several iterations and designs before it was considered ready for the residency. The design of the box was based on museum boxes and draws found in the museum archive. Curators were allowed to add to, personalise and keep their box for the duration of the residency.

Each box related to a real life project at the museum and as a result the data recorded inside the box related to real-world circumstances, objects and questions curators had about introducing and using 3DSP with their practice.





Day: 24th August 2017

Today, I met Dan O'Flynn the X ray specialist he took me too see his X-ray lab where they conduct CT and X-ray research on a range of objects in the museum. He was X-raying a Carian Stela tombstone and sculpture of ~~both~~ Horus that depicted both egyptian and greek imagery. The scientist who is working on the polychromey embedded within the sculpture. She (Jonne Dyer) was really keen to 3D scan the objects using the Artec because we could then over lay the imagery map she has of the original colours to create a digital model of the what the original would have looked like

I spent the rest of the day in Dan's X ray lab scanning Horus and the Carian Stela, we also desided to use photogrammetry as a comparison to the light scanning I was doing.

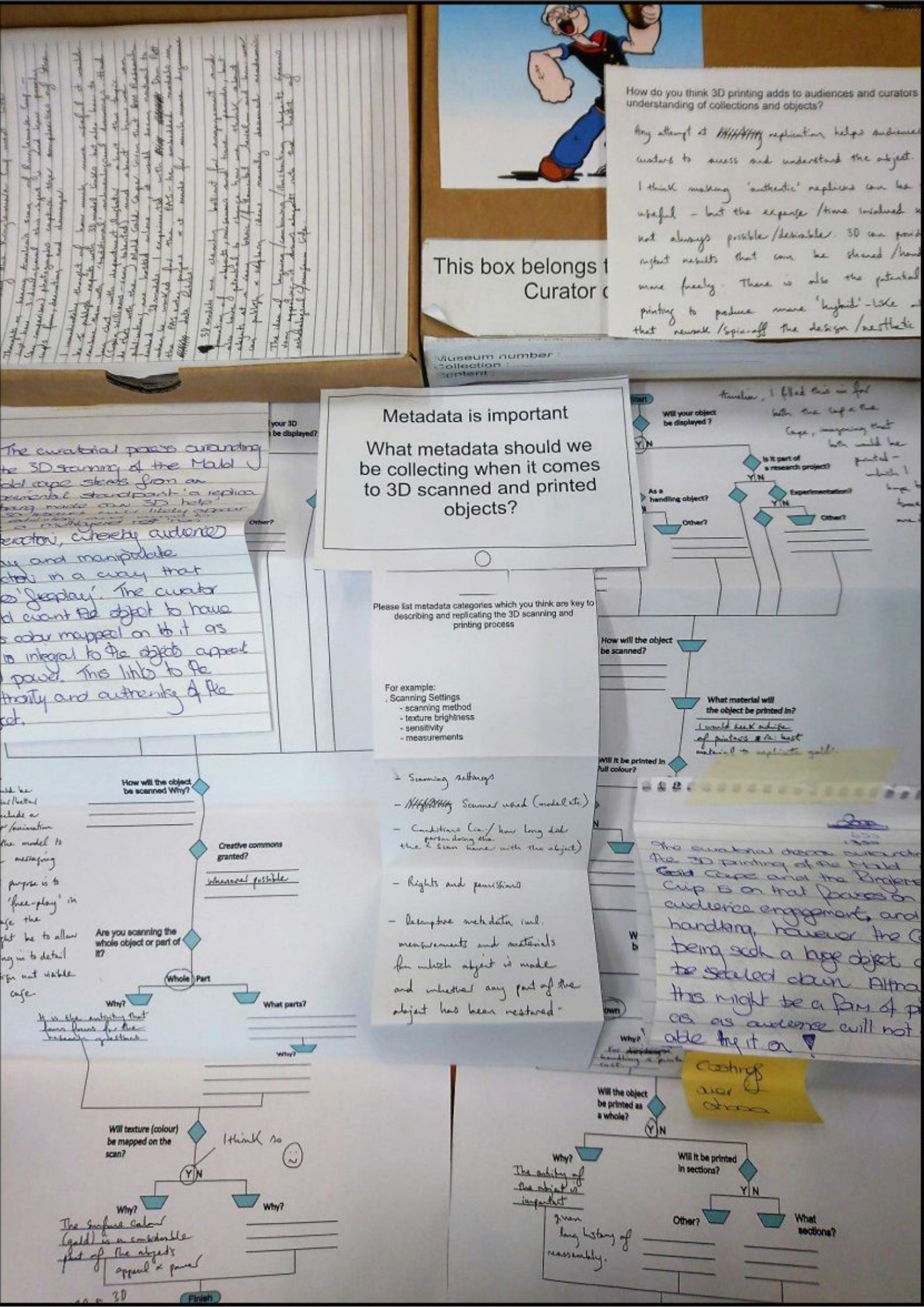
Dan taught me to operate his turn table which we placed both the Horus and Carian Stela one. The equipment he has is really cool and at the moment they are working on ~~scanning~~ X-raying soild metal objects to see how they have been constructed, it was amazing to see inside the Gayer Anderson Cat which on the outside look like its in prefect condition but on the X-ray it has be consoildated and patched up multiple of times

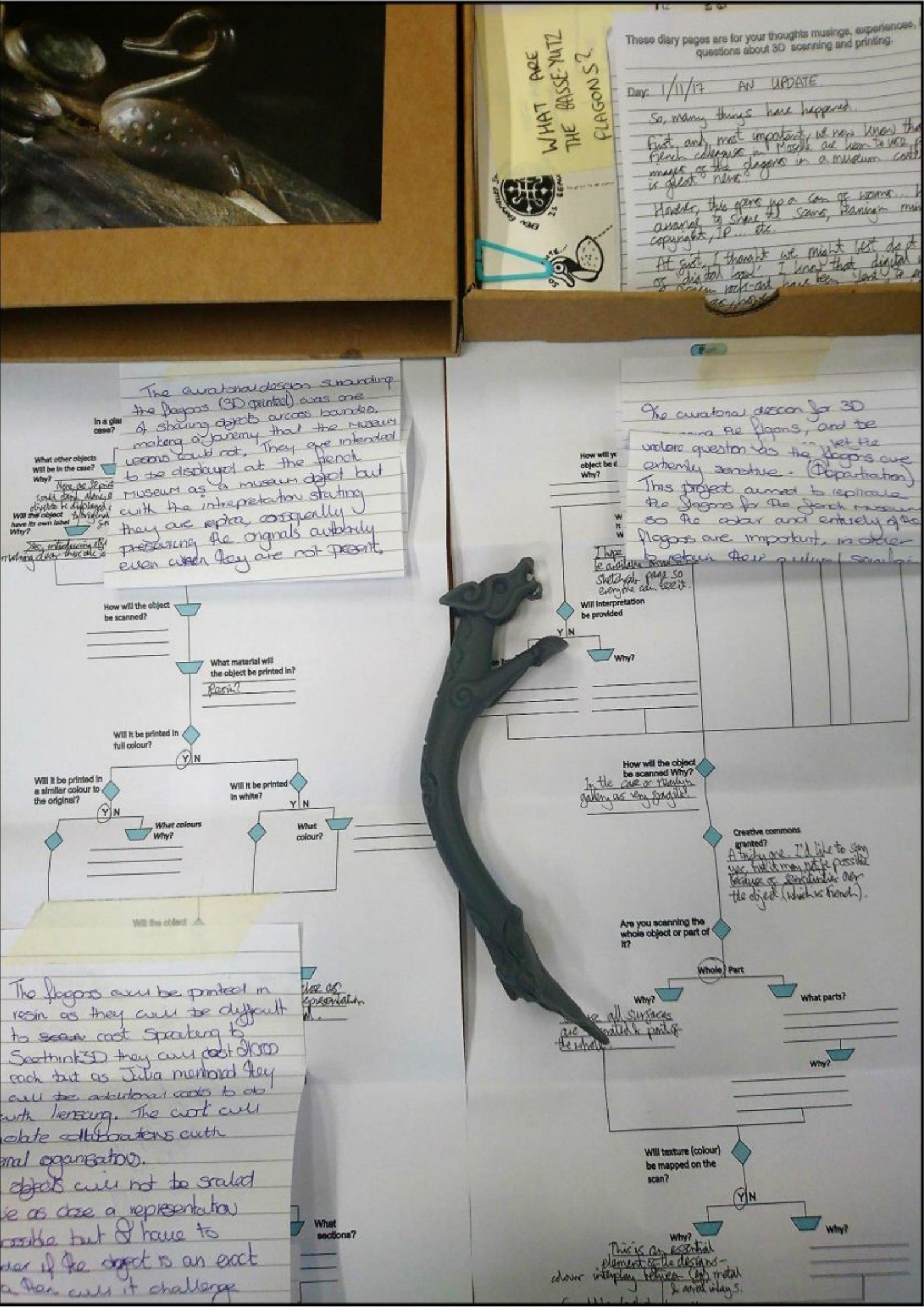
Day: 06 September 2017.

Today was predominately a paperwork day. I spent the morning catching up with my curators and making sure they were feeling out their boxes. Jules one is amazing. I can't wait to see it officially.

In the afternoon I continued working on the scans and started to teach myself capture reality or high power photogrammetry software, that the BM use quite abit. Dan and Jen are not here today with Dan at a conference and Jen working from the rock art office.

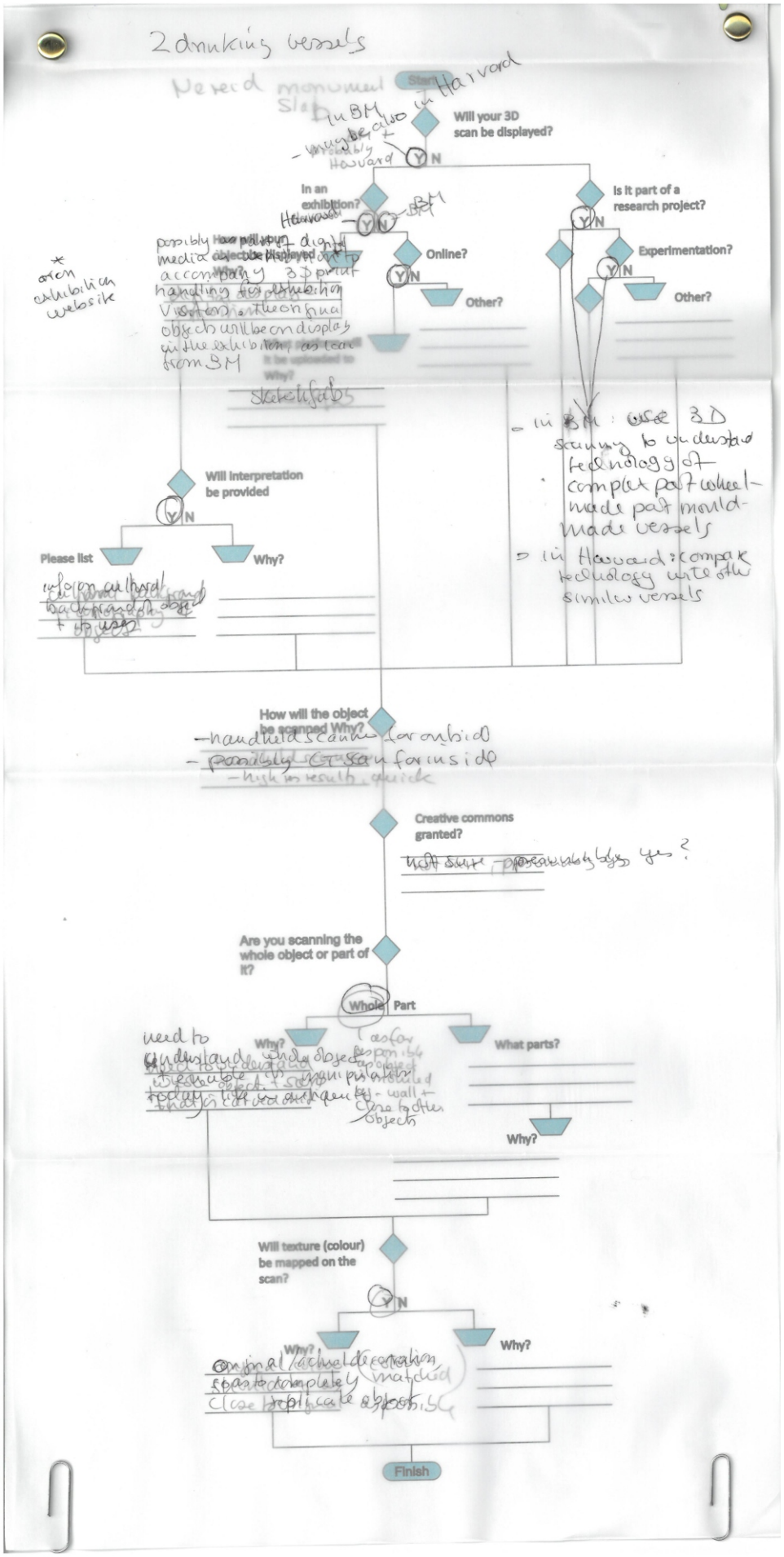
In the ~~ate~~ afternoon (late afternoon) I was joined by Polly Mills we were meant to 3D scan her abodishonist model for an upcoming touring exhibition, however after 3D scanning it using both the artec and photogrammetry, Polly said that she was unsure that I could use the copyright. I tried to explain that it was part of my project but she said that the exhibition was funded externally and I had to sign over all copyright which is mental. It seems there is still some person out who has copyright over 3D scans and images. I will need to talk to Dan about this when he comes back on Monday.


How do you think 3D printing adds to audiences and curators understanding of collections and objects?
This box belongs t
Curator
Museum number
Collection
Content
Metadata is important
What metadata should we be collecting when it comes to 3D scanned and printed objects?
Please list metadata categories which you think are key to describing and replicating the 3D scanning and printing process
For example:
. Scanning Settings
- scanning method
- texture brightness
- sensitivity
- measurements
+ Scanning settings
- Scanner used (model etc.)
- Conditions (i.e. how long did person doing the scan have with the object)
- Rights and permissions
- Descriptive metadata (incl. measurements and materials from which object is made and whether any part of the object has been restored)
Will your object be displayed?
Is it part of a research project?
As a handling object?
Experimentation?
Other?
How will the object be scanned?
What material will the object be printed in?
Will it be printed in full colour?
How will the object be scanned? Why?
Creative commons granted?
Are you scanning the whole object or part of it?
Whole
Part
Why?
What parts?
Will texture (colour) be mapped on the scan?
I think so
Will the object be printed as a whole?
Will it be printed in sections?
What sections?
Finish

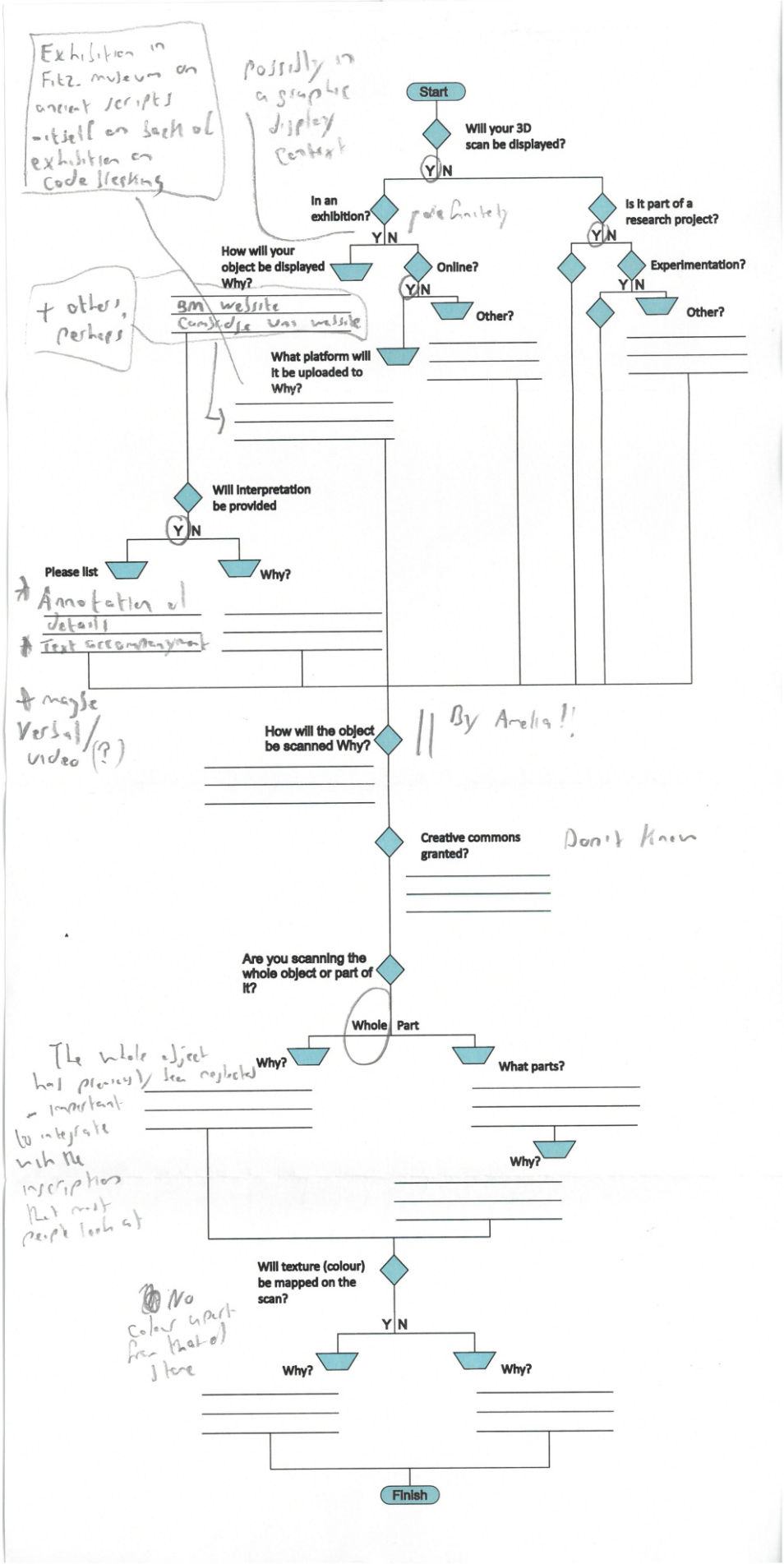

WHAT ARE THE BASSE-YUTZ FLAGONS?
These diary pages are for your thoughts musings, experiences, questions about 3D scanning and printing.
Day: 1/11/17 AN UPDATE
So, many things have happened.
First and most important, we now know that French colleagues in Moselle are keen to use
images of the flagons in a museum
is great news.
However, this opens up a can of worms
arrange to share the scans, reaning
copyright, IP... etc.
At first, I thought we might best do it
of 'digital loan'. I know that digital
The curatorial decision surrounding the flagons (3D printed) was one of sharing objects across boundaries, making a journey that the museum versions could not. They are intended to be displayed at the French museum as a museum object but with the intrepretation stating they are replica, consequently preserving the originals authority even when they are not present.
In a glass case?
What other objects Will be in the case? Why?
Will the object have its own label Why?
How will the object be scanned?
What material will the object be printed in?
Resin?
Will it be printed in full colour?
Y N
Will it be printed in a similar colour to the original?
Y N
What colours Why?
Will it be printed in white?
Y N
What colour?
Will the object
The flagons will be printed in resin as they will be difficult to cast. Speaking to Seethink3D they will cost 21000 each but as Julia mentioned they will be additional costs to do with lensing. The work will
olate collaborations with
nal organisations.
objects will not be scaled
e as close a representation
ssible but I have to
der if the object is an exact
a then will it challenge
What sections?
The curatorial decision for 3D
the flagons, and be
undone question as the flagons are
extremly sensitive. (Repartiation)
This project aimed to replicate
the flagons for the French museum
so the colour and entirety of the
flagons are important, in order
to retain their
How will yo
object be d
Why?
I hope
be available
sketchpad page so
everyone can see it.
Will interpretation be provided
Y N
Why?
How will the object be scanned Why?
In the case of nearly
gallery as very fragile.
Creative commons granted?
A tricky one. I'd like to say
yes, but it may not be possible
because of sensitivities over
the object (which is French).
Are you scanning the whole object or part of it?
Whole Part
Why?
What parts?
Why?
Will texture (colour) be mapped on the scan?
Y N
Why?
Why?
This is an essential
element of the designs -
colour interplay between (eg) metal
& coral inlays.

These example curatorial flow charts where completed by curators at The British Museum, they show how curators would curate 3DSP and the comments they added to their flow charts interventions.

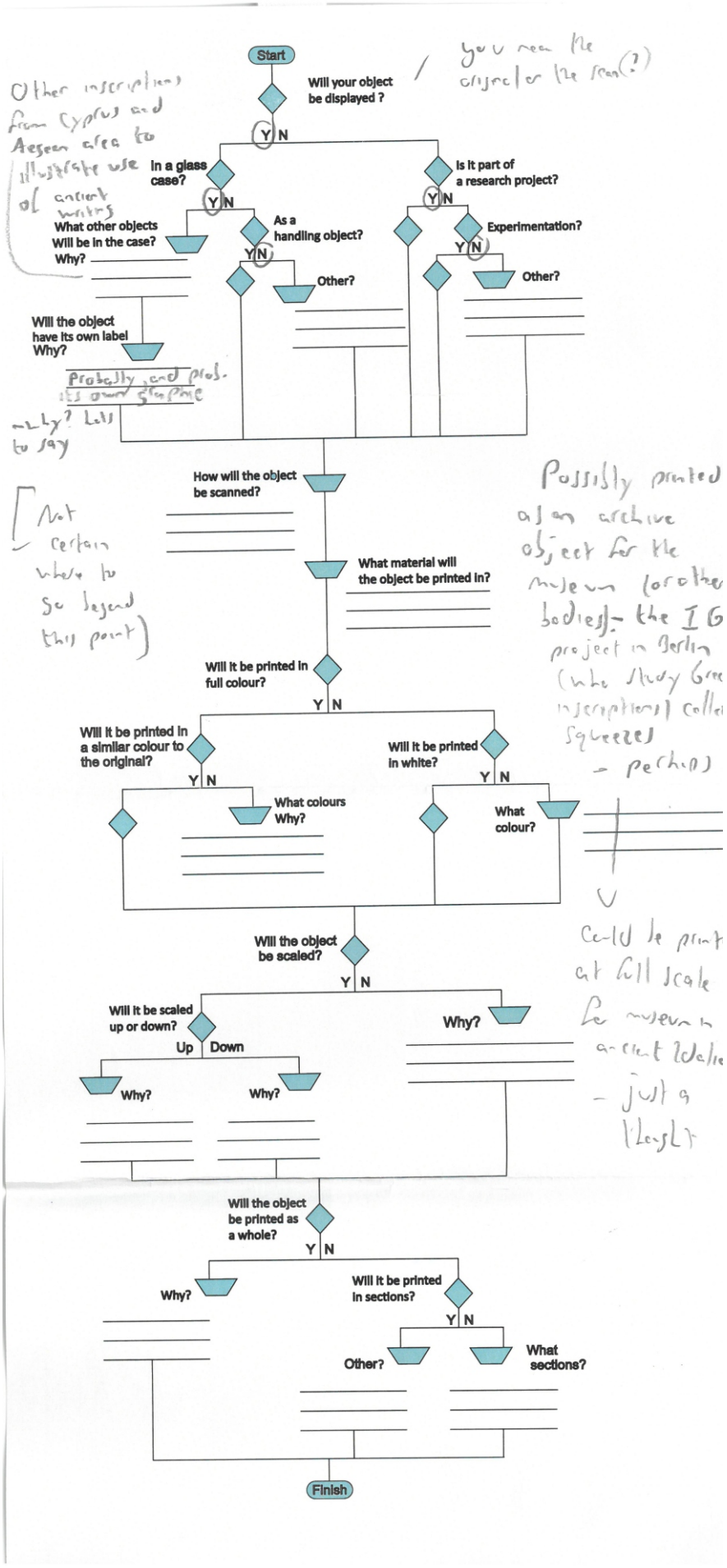
Alexandra used tracing paper to add additional comments to her intervention. Highlighting there is more than one way to curate 3DSP objects. Her flow chart relates to the curation of 2 3D printed drinking vessels destined for an exhibition in Harvard.



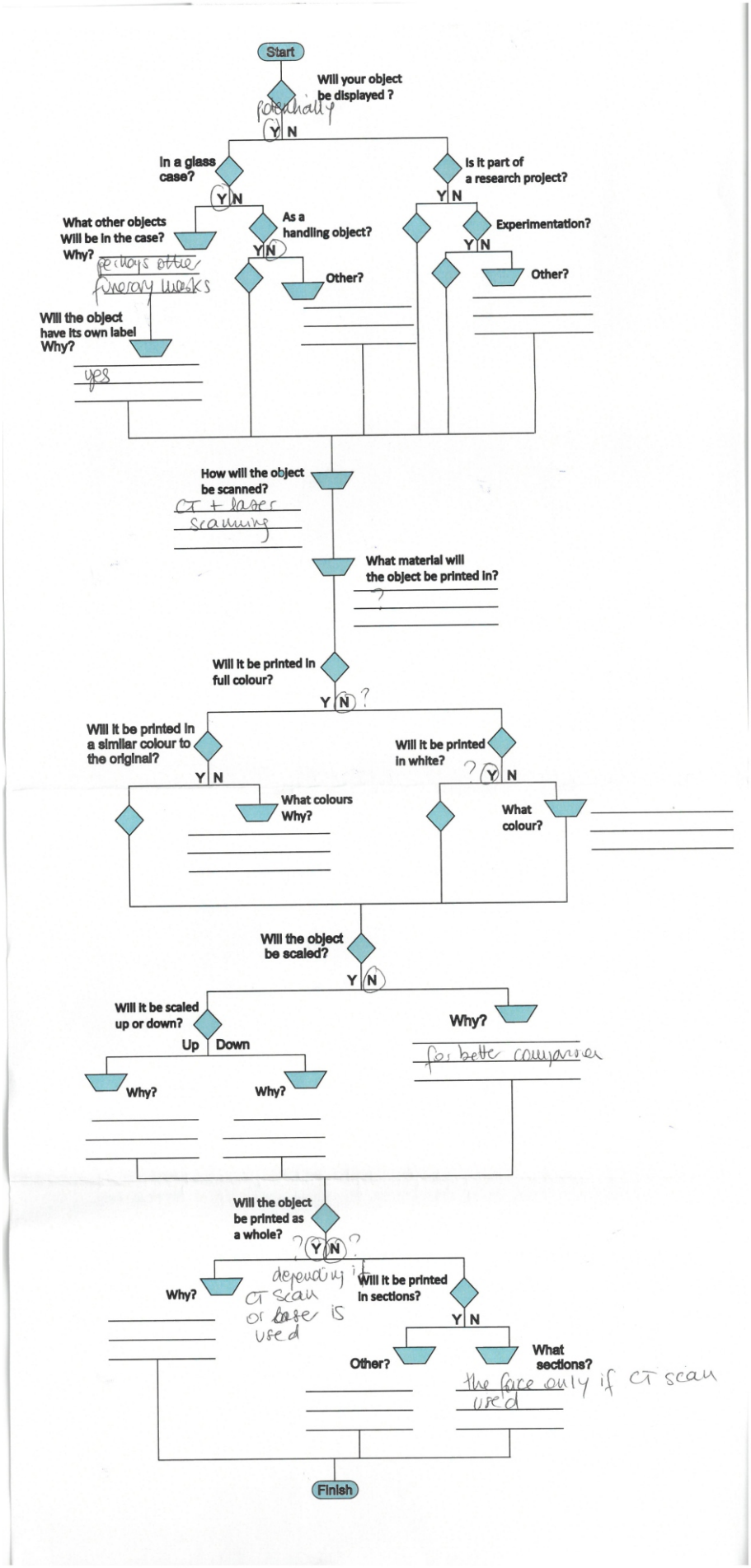
Thomas's curatorial flow chart includes references to the other museum interpretation strategies. His comments also allude to uncertainties over creative commons and the need to print the entirety of the object



The curatorial flow charts relating to the 3D print revealed perceived relationships between 3DSP artefacts and museum objects.



The curatorial flow chart interventions also show the how curators question the processes of curating with 3DSP. The flow chart interventions on the right contains question marks, which show how curators can be unsure of some of the 3DSP processes especially given the novelty of the technology.



A collection of 3D scans completed during The British Museum Residency. Scans 4,7 and 9 are of the metopes and Parthenon friezes scanned to help and support the Greek team in the their own scanning project.

Scan 6 is a treasures find and had not yet been accessioned into the collection. It was 3D scanned to help scientists examine the twist work.

The 3D scans displayed here represent the breadth of the objects scanned from The British Museum. The research conducted and scans produced span several sub-collections, curatorial departments.

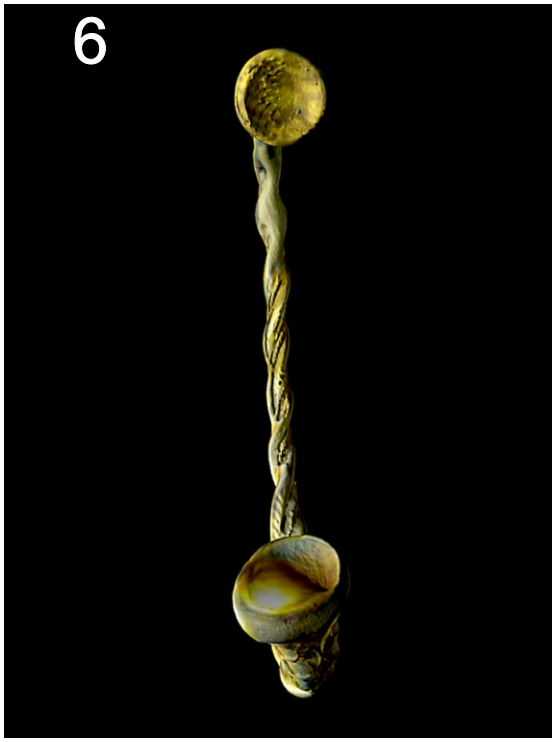












Scan 8 is one of seven scans produced as part of a joint project with The British Museum and The Victoria and Albert Museum (V&A). The project sought to develop a digital resource for curators at The British Museum and The V&A Museum as the collection of 7 objects is split across the two museums.

Scan 12 is of the Votive Offering, a stone inscribed with several historical languages. The object was 3D scanned because its curator was interested in exploring multi-layered interpretation using the 3D visualisation platform SketchFab.













An image of the 3D scanned Gayer-Anderson Cat. This project used both CT, X-ray and laser scans to explore the production of the cat as both as 1st century BC object and a 1930s object due to its extensive repair during this period. The multiple scans were layered to provide a complete CT type scan including texture.



The 3D scan of the Gayer-Anderson cat on the left is how the colour came out on the first try. Its hue makes the cat appear as if it is made of a copper-based material rather than bronze and its vastly different to the original cat seen below. The cat on the left has a more accurate colour and was achieved by manipulating the hues, saturation and contrasts of the base, middle and highlight tones on the texture map.









Basse-Yutz Flagons project sought to recreate accurate 3D replicas for the Moselle Museum. The project is tied to discussions round authenticity and authority as currently the museum is debating how these 'loans' will be managed and who will have access to the physical and digital objects.

Capturing accurate geometry was extremely important for this project as any ‘false data’ would appear in the 3D print. The extra data appearing on the flagons stem and base had to be re-scanned and digitally removed or fixed.

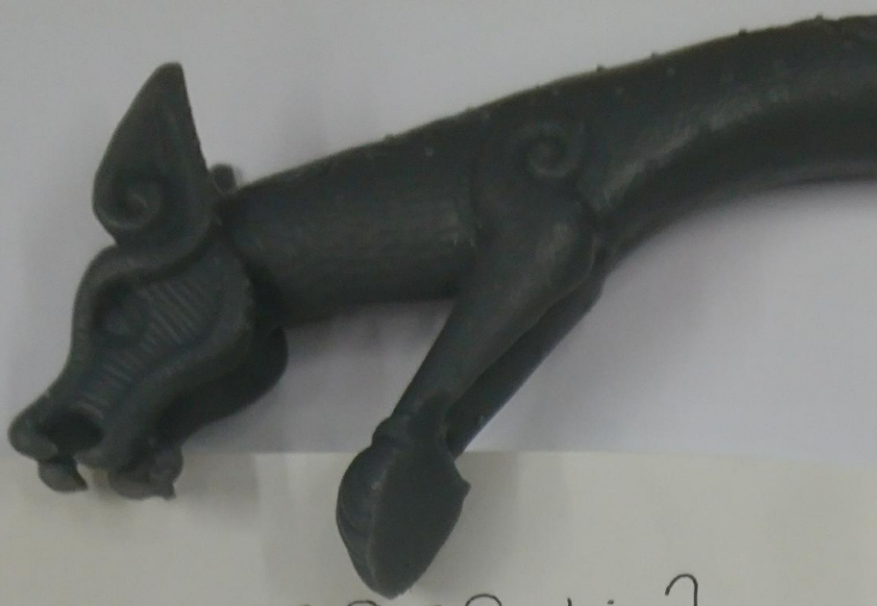


The completed 3D scan of the Basse-Yurtz Flagon. The yellow shapes appearing on the stem and spout are inlaid coral and the only thing keeping them in place is pressure. The delicacy of the object is one of the main reasons why loan requests for the object are denied.

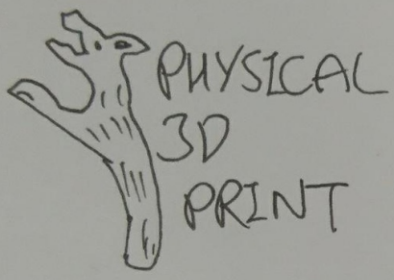


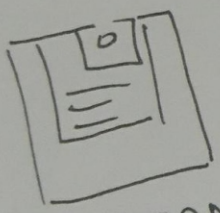
The image below is a photograph of the actual museum object.





Where does OWNERSHIP lie?





3D SCANS
DATA.



PHYSICAL P

LOCAL/
CULTURAL
IMPORTANCE

CURATORIAL
KNOWLEDGE

W

Do many 'versions' dilute 'uniqueness' of the 'original'?

IDEA OF THE FLAGON

OBJECTS INSPIRED BY THE FLAGON



LAGON

IMAGES OF THE FLAGON

TECHNICAL IMAGING/PHOTOGRAPHY EXPERTISE

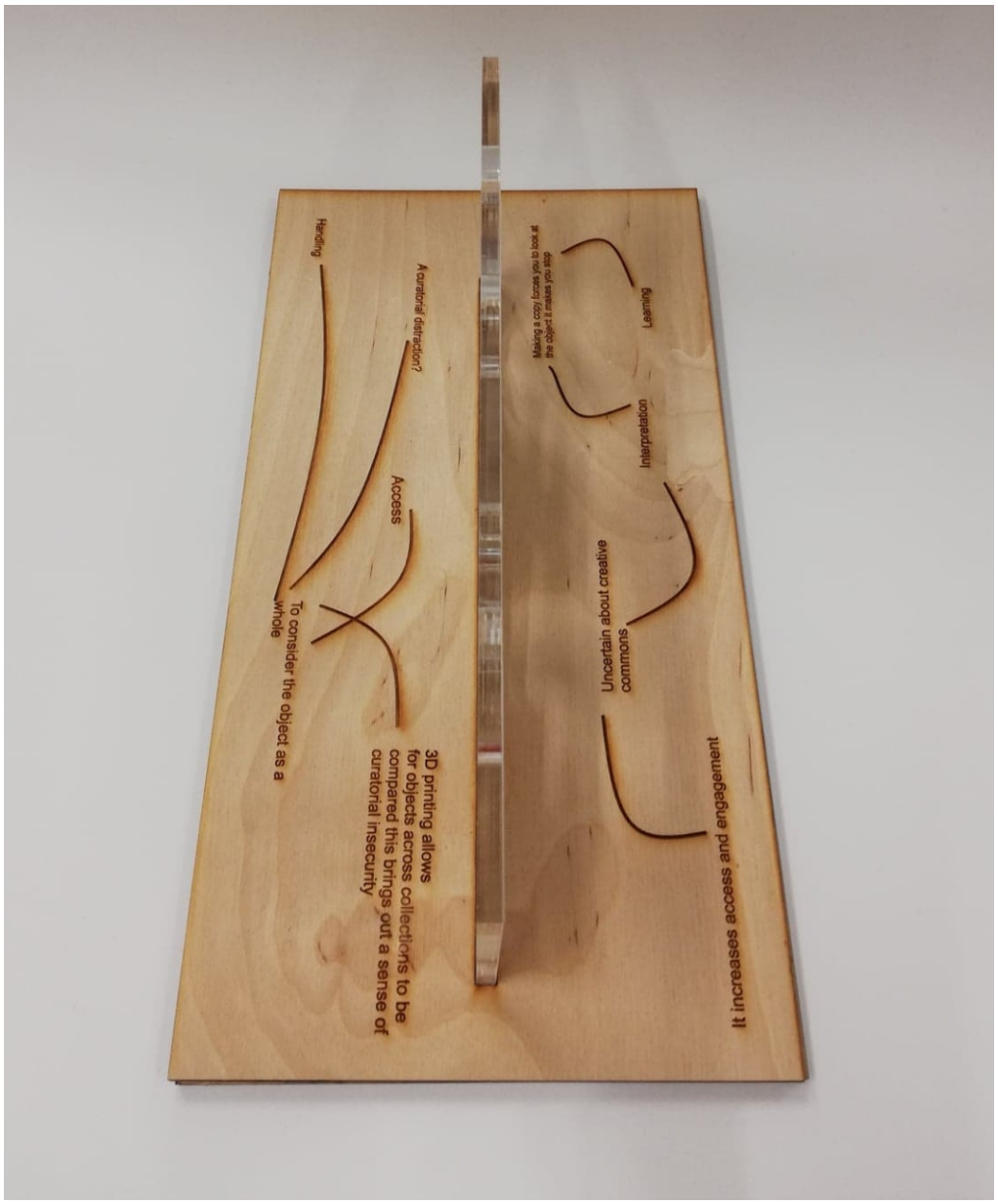
INSTITUTIONAL 'OWNERSHIP' OF ORIGINAL

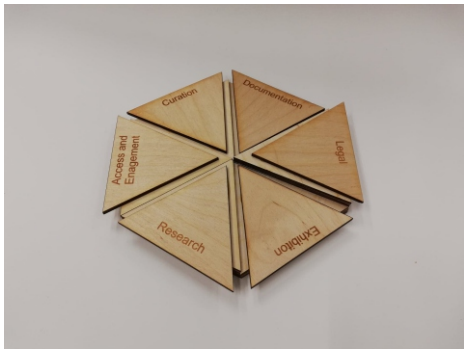
here does authority lie?

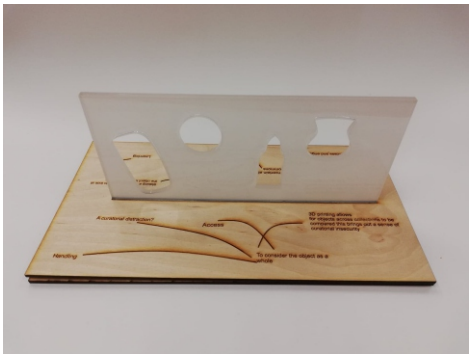




These images represent the design phase of the exhibition ‘An Object in Transition’. I was interested in exploring how 3DSP moved through the museum space, their changing meaning and perceived value. I was keen to play with the idea of space, so I could explore, question and bring new ideas to the surface. For me the process of designing and staging the exhibition was part of my research process. I was able to draw upon my curatorial background as well as play with the concept of museum curation.



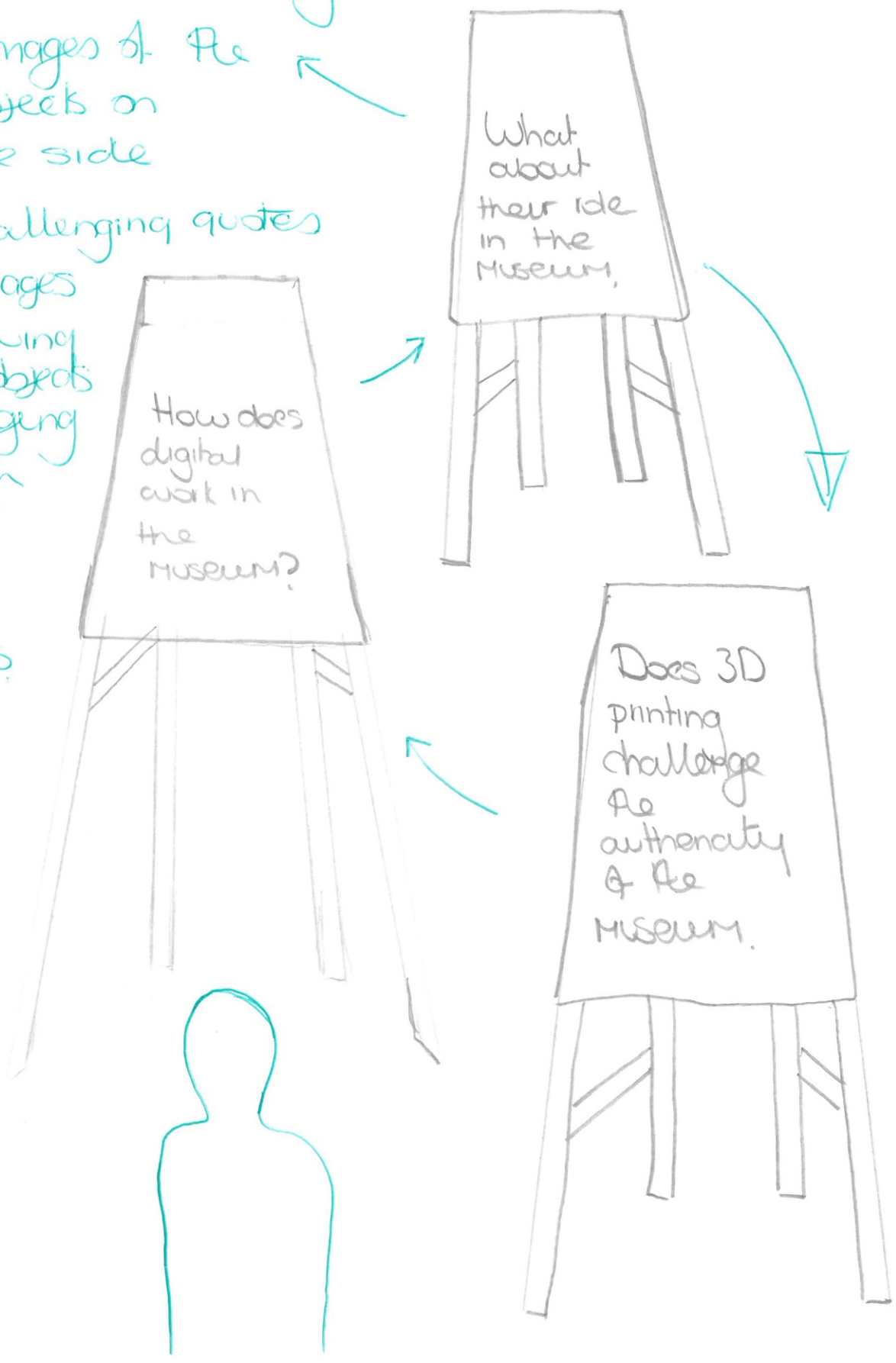






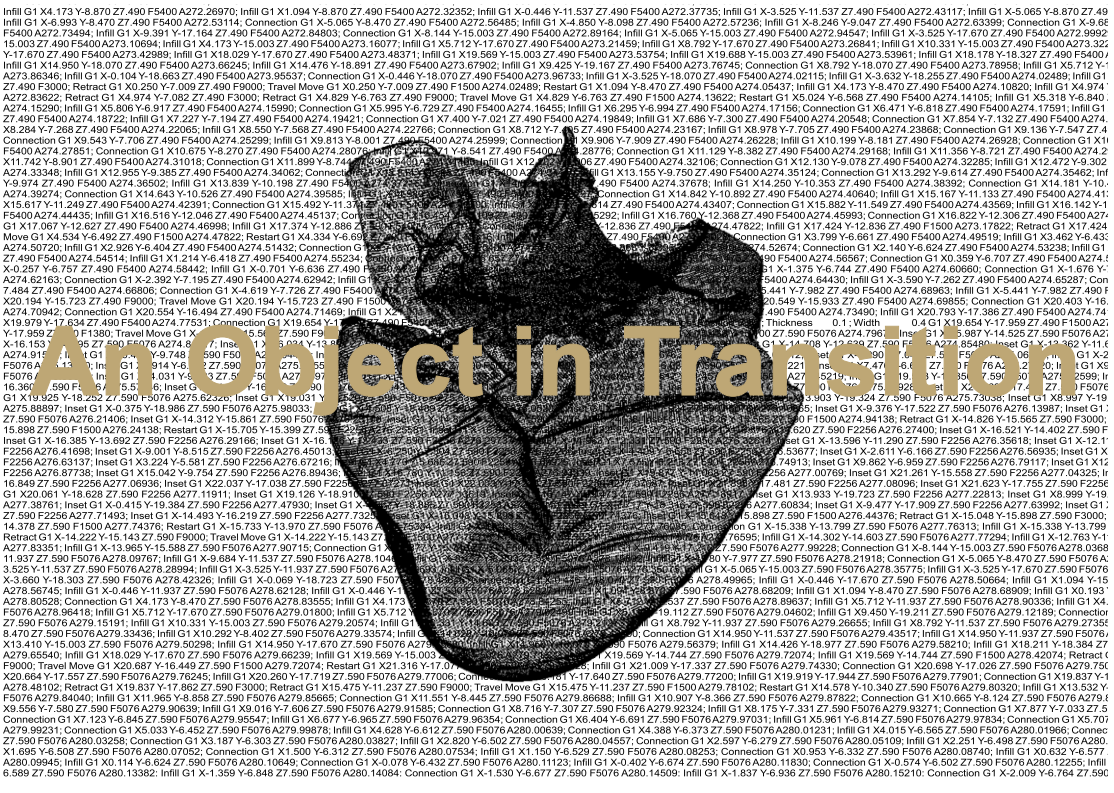
A work in progress for Exhibition

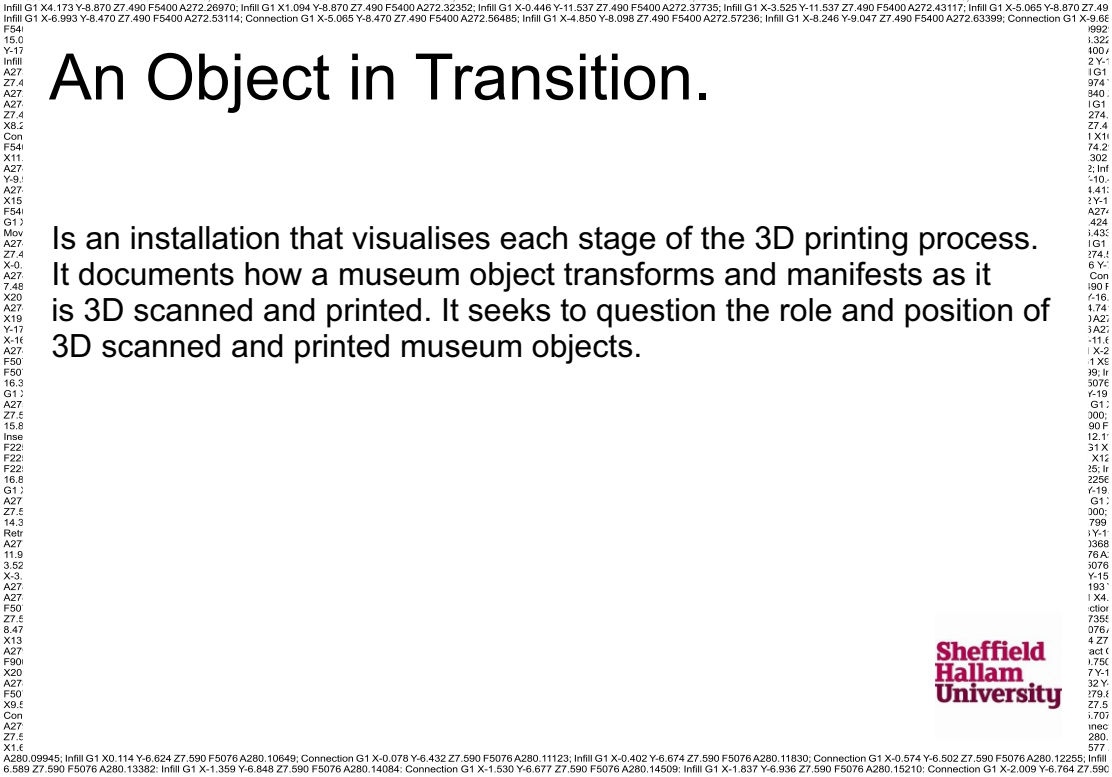
- A row or collums of A Hames for audiences to wonder thrugh.
- Images of the objects on one side
- Challenging quotes
- Images showing the objects changing thrugh the 3DSP process



The exhibition information cards were given to audiences before entering the gallery space. The statements on the front (top) and back (bottom) aimed to serve as a prompt for audiences to think about what 3DSP museum objects are and the transitions they go through we move them through the museum space.

The image on the left is a work in progress design for ‘An Object in Transition’. I used these rough designs to explore space, layout and movement. Here I am interested in how audiences will move between the depictions of the 3D prints and quotes.



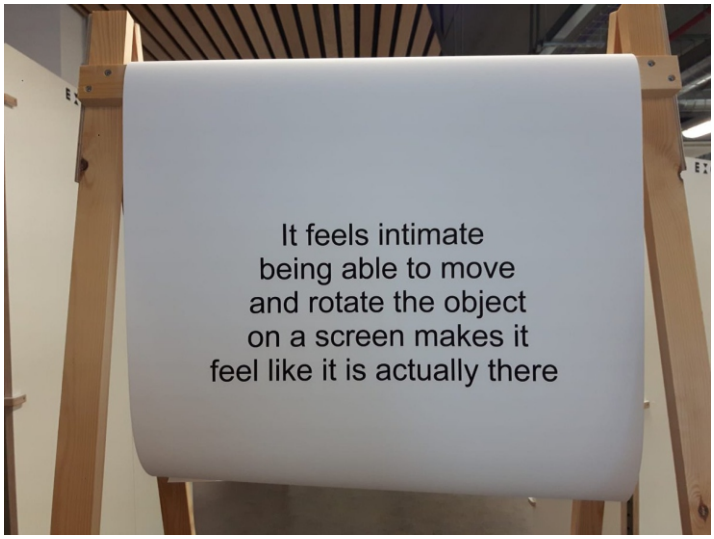



And yet... something about this modern technology brings out a sense of curatorial insecurity
Is scanning separate or should it be an extension of the online collection?

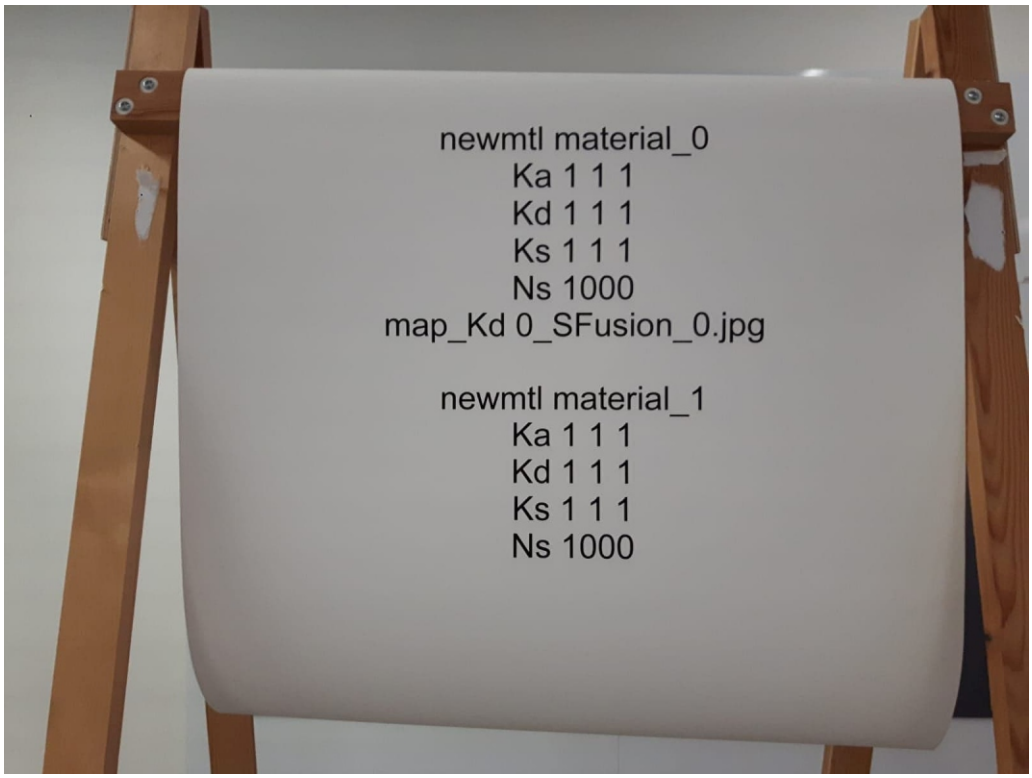
Photographs from ‘An Object in Transition’ an exhibition devised to examine how the 3DSP process changes museum objects both perceptually and physically. The exhibition made the 3DSP process visible and visualised each stage of the 3DSP process and posited each process as a museum object alongside quotes from curators. The exhibition sought to challenge people to think about what could be a museum object and how technology changes our understanding of this concept.







As the design of the exhibition progressed, I became interested in how these object transformations affected our understanding of the ‘museum object’. For example how do we respond when digital processes, maps and instructions are posited as or part of a museum object.



The images on the right are digital instructions, including the co-ordinates the 3D printer used to create a copy of The Ringlemere Cup. By positioning such data as part of the museum object, and alongside quotes from curators, the exhibition seeks to question what a museum object can be as well as the value theses ‘new’ objects have.

124.79452; Infill G1 X14.316 Y-16.866 Z4.590 F3700 A124.80217; Connection G1 X14.120 Y-16.670 Z4.590 F3700 A124.80700; Infill G1 X13.800 Y-16.915 Z4.590 F3700 A124.81406; Connection G1 X13.726 Y-16.842 Z4.590 F
13.282 Y-16.963 Z4.590 F3700 A124.82502; Infill G1 X13.282 Y-16.963 Z4.590 F1500 A123.52502; Retract G1 X13.282 Y-16.963 Z4.590 F3000; Retract G1 X14.175 Y-16.327 Z4.590 F9000; Travel Move G1 X14.175 Y-16.327 Z4.5
13.410 Y-14.603 Z4.590 F3700 A124.85874; Infill G1 X13.614 Y-14.251 Z4.590 F3700 A124.86585; Infill G1 X8.792 Y-11.692 Z4.590 F3700 A124.96127; Connection G1 X8.792 Y-11.937 Z4.590 F3700 A124.96554; Infill G1
125.02635; Infill G1 X8.933 Y-11.425 Z4.590 F3700 A125.07524; Infill G1 X5.564 Y-17.413 Z4.590 F3700 A125.13412; Connection G1 X4.173 Y-15.003 Z4.590 F3700 A125.18277; Infill G1 X4.173 Y-14.603 Z4.590 F3700 A125.18
3700 A125.25057; Infill G1 X5.223 Y-10.689 Z4.590 F3700 A125.26768; Infill G1 X0.202 Y-10.415 Z4.590 F3700 A125.35559; Connection G1 X-0.446 Y-11.537 Z4.590 F3700 A125.37823; Infill G1 X-0.446 Y-11.937 Z4.590 F3700 A
4.590 F3700 A125.44604; Infill G1 X-0.052 Y-16.988 Z4.590 F3700 A125.48609; Infill G1 X-4.314 Y-16.303 Z4.590 F3700 A125.56155; Connection G1 X-5.065 Y-15.003 Z4.590 F3700 A125.58779; Infill G1 X-5.065 Y-14.603 Z4.5
525 Y-11.537 Z4.590 F3700 A125.65560; Infill G1 X-3.780 Y-11.094 Z4.590 F3700 A125.66452; Infill G1 X-8.998 Y-13.124 Z4.590 F3700 A125.76238; Connection G1 X-8.144 Y-14.603 Z4.590 F3700 A125.79224; Infill G1 X-8.144 Y
69 ; Thickness 0.1 ; Width 0.4 G1 X-8.144 Y-14.904 Z4.590 F1500 A124.49750; Retract G1 X-8.144 Y-14.904 Z4.590 F3000; Retract G1 X-8.144 Y-14.904 Z4.690 F1380; Travel Move G1 X-11.312 Y-14.236 Z4.690 F900
3.953 Z4.690 F4020 A125.80473; Inset G1 X-11.657 Y-13.868 Z4.690 F4020 A125.80640; Inset G1 X-11.651 Y-13.835 Z4.690 F4020 A125.80698; Inset G1 X-11.501 Y-13.643 Z4.690 F4020 A125.81124; Inset G1 X-10.773 Y-13.094
1 X-7.594 Y-11.402 Z4.690 F4020 A125.89017; Inset G1 X-5.957 Y-10.753 Z4.690 F4020 A125.92095; Inset G1 X-4.690 Y-10.357 Z4.690 F4020 A125.94416; Inset G1 X-2.598 Y-9.851 Z4.690 F4020 A125.98178; Inset G1 X-0.489
set G1 X2.326 Y-9.366 Z4.690 F4020 A126.06843; Inset G1 X4.815 Y-9.597 Z4.690 F4020 A126.11213; Inset G1 X6.911 Y-10.009 Z4.690 F4020 A126.14946; Inset G1 X8.637 Y-10.546 Z4.690 F4020 A126.18107; Inset G1
126.26399; Inset G1 X14.844 Y-13.951 Z4.690 F4020 A126.30523; Inset G1 X15.878 Y-14.801 Z4.690 F4020 A126.32863; Inset G1 X16.620 Y-15.532 Z4.690 F4020 A126.34683; Inset G1 X16.805 Y-15.795 Z4.690 F4020 A126.3
4.690 F4020 A126.35970; Inset G1 X16.704 Y-16.350 Z4.690 F4020 A126.36323; Inset G1 X16.108 Y-16.693 Z4.690 F4020 A126.37524; Inset G1 X15.342 Y-16.992 Z4.690 F4020 A126.38963; Inset G1 X14.619 Y-17.183 Z4.6
8.918 Y-17.804 Z4.690 F4020 A126.50304; Inset G1 X5.960 Y-17.792 Z4.690 F4020 A126.55474; Inset G1 X-0.099 Y-17.346 Z4.690 F4020 A126.66093; Inset G1 X-4.556 Y-16.655 Z4.690 F4020 A126.73978; Inset G1 X-6.835 Y-1
set G1 X-9.592 Y-15.263 Z4.690 F4020 A126.83126; Inset G1 X-10.396 Y-14.871 Z4.690 F4020 A126.84689; Inset G1 X-11.312 Y-14.236 Z4.690 F4020 A126.86636; Inset G1 X-11.312 Y-14.236 Z4.690 F1500 A125.56636; Retract
ove G1 X-11.564 Y-14.548 Z4.690 F1500 A126.86636; Restart G1 X-11.938 Y-14.197 Z4.690 F1787 A126.87534; Inset G1 X-12.074 Y-13.930 Z4.690 F1787 A126.88056; Inset G1 X-12.028 Y-13.668 Z4.690 F1787 A126.88523; In
1787 A126.90938; Inset G1 X-10.196 Y-12.274 Z4.690 F1787 A126.92580; Inset G1 X-9.458 Y-11.907 Z4.690 F1787 A126.94019; Inset G1 X-9.228 Y-11.755 Z4.690 F1787 A126.94502; Inset G1 X-8.812 Y-11.574 Z4.690 F1787
1.037 Z4.690 F1787 A126.97368; Inset G1 X-6.091 Y-10.376 Z4.690 F1787 A127.00500; Inset G1 X-4.797 Y-9.972 Z4.690 F1787 A127.02870; Inset G1 X-2.677 Y-9.459 Z4.690 F1787 A127.06682; Inset G1 X-0.539 Y-9.112 Z4.690
-8.966 Z4.690 F1787 A127.15516; Inset G1 X4.872 Y-9.201 Z4.690 F1787 A127.19957; Inset G1 X7.009 Y-9.621 Z4.690 F1787 A127.23763; Inset G1 X8.776 Y-10.170 Z4.690 F1787 A127.26998; Inset G1 X11.301 Y-11.264 Z4.6
15.085 Y-13.631 Z4.690 F1787 A127.39617; Inset G1 X16.146 Y-14.504 Z4.690 F1787 A127.42019; Inset G1 X16.927 Y-15.272 Z4.690 F1787 A127.43933; Inset G1 X17.175 Y-15.626 Z4.690 F1787 A127.44690; Inset G1 X
127.46047; Inset G1 X16.947 Y-16.672 Z4.690 F1787 A127.46717; Inset G1 X16.282 Y-17.054 Z4.690 F1787 A127.48059; Inset G1 X15.466 Y-17.373 Z4.690 F1787 A127.49590; Inset G1 X14.705 Y-17.574 Z4.690 F1787 A127.
4.690 F1787 A127.61124; Inset G1 X5.944 Y-18.192 Z4.690 F1787 A127.66349; Inset G1 X-0.144 Y-17.744 Z4.690 F1787 A127.77020; Inset G1 X-4.630 Y-17.048 Z4.690 F1787 A127.84956; Inset G1 X-6.932 Y-16.539 Z4.690 F1
-15.631 Z4.690 F1787 A127.94257; Inset G1 X-10.599 Y-15.217 Z4.690 F1787 A127.95908; Inset G1 X-11.564 Y-14.548 Z4.690 F1787 A127.97960; Inset G1 X-11.564 Y-14.548 Z4.690 F1500 A126.67960; Retract G1 X-11.564 Y
).990 Y-14.096 Z4.690 F1500 A127.97960; Restart G1 X-9.669 Y-12.776 Z4.690 F4020 A128.01224; Infill G1 X-8.919 Y-12.592 Z4.690 F4020 A128.02574; Connection G1 X-8.521 Y-12.193 Z4.690 F4020 A128.03559; Infill G1 X-7.
128.05868; Infill G1 X-6.833 Y-11.637 Z4.690 F4020 A128.06844; Connection G1 X-6.454 Y-11.258 Z4.690 F4020 A128.07781; Infill G1 X-5.957 Y-11.326 Z4.690 F4020 A128.08659; Connection G1 X-5.605 Y-10.974 Z4.690 F40
753 Y-10.688 Z4.690 F4020 A128.11296; Infill G1 X-4.325 Y-10.826 Z4.690 F4020 A128.12082; Connection G1 X-3.996 Y-10.497 Z4.690 F4020 A128.12896; Infill G1 X-3.530 Y-10.597 Z4.690 F4020 A128.13728; Connection G
128.15223; Connection G1 X-2.527 Y-10.159 Z4.690 F4020 A128.15912; Infill G1 X-2.124 Y-10.322 Z4.690 F4020 A128.16672; Connection G1 X-1.854 Y-10.052 Z4.690 F4020 A128.17339; Infill G1 X-1.442 Y-10.206 Z4.690 F4
774 Y-10.103 Z4.690 F4020 A128.19517; Connection G1 X-0.526 Y-9.856 Z4.690 F4020 A128.20130; Infill G1 X-0.145 Y-10.040 Z4.690 F4020 A128.20871; Connection G1 X0.089 Y-9.806 Z4.690 F4020 A128.21448; Infill G1 X
128.22749; Infill G1 X1.069 Y-9.957 Z4.690 F4020 A128.23477; Connection G1 X1.311 Y-9.716 Z4.690 F4020 A128.24074; Infill G1 X1.656 Y-9.935 Z4.690 F4020 A128.24790; Connection G1 X1.937 Y-9.655 Z4.690 F4020 A128.2
4.690 F4020 A128.26901; Infill G1 X2.737 Y-9.986 Z4.690 F4020 A128.27606; Connection G1 X2.950 Y-9.774 Z4.690 F4020 A128.28131; Infill G1 X3.274 Y-10.015 Z4.690 F4020 A128.28838; Connection G1 X3.481 Y-9.808 Z4.69
3.982 Y-9.873 Z4.690 F4020 A128.30546; Infill G1 X4.290 Y-10.130 Z4.690 F4020 A128.31248; Connection G1 X4.560 Y-9.861 Z4.690 F4020 A128.31915; Infill G1 X4.788 Y-10.198 Z4.690 F4020 A128.32627; Connection
128.33945; Connection G1 X5.478 Y-10.073 Z4.690 F4020 A128.34468; Infill G1 X5.745 Y-10.372 Z4.690 F4020 A128.35168; Connection G1 X5.935 Y-10.182 Z4.690 F4020 A128.35636; Infill G1 X6.224 Y-10.459 Z4.690 F4020 A1
.572 Z4.690 F4020 A128.37666; Connection G1 X6.933 Y-10.316 Z4.690 F4020 A128.38299; Infill G1 X7.129 Y-10.685 Z4.690 F4020 A128.39030; Connection G1 X7.305 Y-10.510 Z4.690 F4020 A128.39465; Infill G1 X7.5
128.40635; Infill G1 X7.985 Y-10.961 Z4.690 F4020 A128.41343; Connection G1 X8.168 Y-10.778 Z4.690 F4020 A128.41796; Infill G1 X8.412 Y-11.100 Z4.690 F4020 A128.42502; Connection G1 X8.644 Y-10.868 Z4.690 F4020 A1
1.257 Z4.690 F4020 A128.44239; Infill G1 X9.219 Y-11.424 Z4.690 F4020 A128.44995; Connection G1 X9.390 Y-11.253 Z4.690 F4020 A128.45419; Infill G1 X9.617 Y-11.591 Z4.690 F4020 A128.46131; Connection G1 X9.781 Y-
onnection G1 X10.172 Y-11.602 Z4.690 F4020 A128.47832; Infill G1 X10.414 Y-11.926 Z4.690 F4020 A128.48338; Connection G1 X10.623 Y-11.717 Z4.690 F4020 A128.48853; Infill G1 X10.797 Y-12.109 Z4.690 F4020 A128.49602
4.690 F4020 A128.50851; Connection G1 X11.177 Y-12.294 Z4.690 F4020 A128.51263; Infill G1 X11.558 Y-12.479 Z4.690 F4020 A128.52003; Connection G1 X11.729 Y-12.308 Z4.690 F4020 A128.52427; Infill G1 X12.084
128.53548; Infill G1 X12.277 Y-12.891 Z4.690 F4020 A128.54270; Connection G1 X12.438 Y-12.731 Z4.690 F4020 A128.54666; Infill G1 X12.792 Y-12.942 Z4.690 F4020 A128.55388; Connection G1 X12.633 Y-13.101 Z4.690 F
13.146 Y-13.153 Z4.690 F4020 A128.56893; Infill G1 X13.479 Y-13.387 Z4.690 F4020 A128.57603; Connection G1 X13.320 Y-13.545 Z4.690 F4020 A128.57995; Infill G1 X13.652 Y-13.779 Z4.690 F4020 A128.58705; Connection
128.59791; Connection G1 X13.985 Y-14.012 Z4.690 F4020 A128.60156; Infill G1 X14.289 Y-14.273 Z4.690 F4020 A128.60857; Connection G1 X14.459 Y-14.103 Z4.690 F4020 A128.61278; Infill G1 X14.790 Y-14.338 Z4.690 F
14.880 Y-14.814 Z4.690 F4020 A128.63190; Connection G1 X15.134 Y-14.560 Z4.690 F4020 A128.63819; Infill G1 X15.445 Y-14.815 Z4.690 F4020 A128.64522; Connection G1 X15.155 Y-15.104 Z4.690 F4020 A128.65237; I
4.690 F4020 A128.66932; Infill G1 X15.979 Y-15.412 Z4.690 F4020 A128.67642; Connection G1 X14.472 Y-16.919 Z4.690 F4020 A128.71368; Infill G1 X13.947 Y-16.878 Z4.690 F4020 A128.72289; Connection G1 X13.784 Y-1
etract G1 X13.784 Y-17.042 Z4.690 F3000; Retract G1 X15.231 Y-16.726 Z4.690 F9000; Travel Move G1 X15.231 Y-16.726 Z4.690 F1500 A128.72693; Retract G1 X16.306 Y-15.650 Z4.690 F4020 A128.75352; Infill G1 X16.54
128.76846; Infill G1 X16.229 Y-16.293 Z4.690 F1500 A127.46846; Retract G1 X16.229 Y-16.293 Z4.690 F3000; Retract G1 X-8.265 Y-15.331 Z4.690 F9000; Travel Move G1 X-8.265 Y-15.331 Z4.690 F1500 A128.76846; Restart
128.77745; Connection G1 X-8.726 Y-15.226 Z4.690 F4020 A128.77944; Infill G1 X-9.006 Y-14.941 Z4.690 F4020 A128.78644; Connection G1 X-9.177 Y-15.112 Z4.690 F4020 A128.79068; Infill G1 X-9.538 Y-14.908 Z4.690 F40
682 Y-14.486 Z4.690 F4020 A128.80889; Connection G1 X-9.961 Y-14.765 Z4.690 F4020 A128.81578; Infill G1 X-10.305 Y-14.543 Z4.690 F4020 A128.82293; Connection G1 X-10.015 Y-14.253 Z4.690 F4020 A128.83011; Infill G1
4020 A128.84822; Infill G1 X-10.665 Y-14.337 Z4.690 F1500 A127.54822; Retract G1 X-10.665 Y-14.337 Z4.690 F3000; Retract G1 X-9.072 Y-12.997 Z4.690 F9000; Travel Move G1 X-9.072 Y-12.997 Z4.690 F1500 A128.84822; R
4020 A128.93448; Infill G1 X-3.525 Y-11.937 Z4.690 F4020 A128.98830; Infill G1 X-0.446 Y-11.937 Z4.690 F4020 A129.04212; Infill G1 X1.094 Y-14.603 Z4.690 F4020 A129.09595; Infill G1 X4.173 Y-14.603 Z4.690 F4020 A129.149
4020 A129.25742; Infill G1 X10.331 Y-14.603 Z4.690 F4020 A129.31125; Infill G1 X13.410 Y-14.603 Z4.690 F4020 A129.36507; Infill G1 X13.672 Y-14.150 Z4.690 F4020 A129.37423; Infill G1 X14.256 Y-16.469 Z4.690 F4020 A129
5.003 Z4.690 F4020 A129.49943; Infill G1 X8.880 Y-17.517 Z4.690 F4020 A129.55018; Infill G1 X5.602 Y-17.479 Z4.690 F4020 A129.60747; Connection G1 X4.173 Y-15.003 Z4.690 F4020 A129.65744; Infill G1 X1.094 Y-15.003 Z4
,251 Y-16.413 Z4.690 F4020 A129.82630; Connection G1 X-5.065 Y-15.003 Z4.690 F4020 A129.85475; Infill G1 X-8.144 Y-15.003 Z4.690 F4020 A129.90857; Infill G1 X-8.172 Y-15.052 Z4.690 F4020 A129.90956; Infill G1 X-3.8
130.02440; Infill G1 X-0.446 Y-11.537 Z4.690 F4020 A130.07823; Infill G1 X0.273 Y-10.291 Z4.690 F4020 A130.10337; Infill G1 X5.149 Y-10.560 Z4.690 F4020 A130.18872; Connection G1 X5.712 Y-11.537 Z4.690 F4020 A130.20
69 ; Upper Position 4.79 ; Thickness 0.1 ; Width 0.4 G1 X8.732 Y-11.537 Z4.690 F1500 A128.96121; Retract G1 X8.732 Y-11.537 Z4.690 F3000; Retract G1 X8.732 Y-11.537 Z4.790 F1380; Travel Move G1 X-11.486 Y-14.2
1 X-11.806 Y-13.957 Z4.790 F3782 A130.26897; Inset G1 X-11.847 Y-13.871 Z4.790 F3782 A130.27064; Inset G1 X-11.617 Y-13.586 Z4.790 F3782 A130.27704; Inset G1 X-11.269 Y-13.300 Z4.790 F3782 A130.28492; Inset G
130.35796; Inset G1 X-6.070 Y-10.681 Z4.790 F3782 A130.38689; Inset G1 X-3.824 Y-10.012 Z4.790 F3782 A130.42786; Inset G1 X-2.158 Y-9.652 Z4.790 F3782 A130.45766; Inset G1 X0.330 Y-9.304 Z4.790 F3782 A130.5015
3782 A130.55550; Inset G1 X4.841 Y-9.480 Z4.790 F3782 A130.58064; Inset G1 X6.906 Y-9.885 Z4.790 F3782 A130.61742; Inset G1 X8.292 Y-10.297 Z4.790 F3782 A130.64271; Inset G1 X9.529 Y-10.765 Z4.790 F3782 A130.6
4.790 F3782 A130.72003; Inset G1 X14.990 Y-13.928 Z4.790 F3782 A130.77641; Inset G1 X16.069 Y-14.814 Z4.790 F3782 A130.80082; Inset G1 X16.800 Y-15.542 Z4.790 F3782 A130.81885; Inset G1 X16.971 Y-15.795 Z4.7
17.032 Y-16.179 Z4.790 F3782 A130.83105; Inset G1 X16.907 Y-16.355 Z4.790 F3782 A130.83483; Inset G1 X16.175 Y-16.789 Z4.790 F3782 A130.84970; Inset G1 X14.901 Y-17.212 Z4.790 F3782 A130.87317; Inset G1
130.97212; Inset G1 X9.052 Y-17.828 Z4.790 F3782 A130.97615; Inset G1 X8.842 Y-17.859 Z4.790 F3782 A130.97987; Inset G1 X6.620 Y-17.873 Z4.790 F3782 A131.01870; Inset G1 X3.960 Y-17.749 Z4.790 F3782 A131.06525;
3782 A131.21481; Inset G1 X-8.132 Y-15.884 Z4.790 F3782 A131.27950; Inset G1 X-9.659 Y-15.345 Z4.790 F3782 A131.30781; Inset G1 X-10.461 Y-14.951 Z4.790 F3782 A131.32342; Inset G1 X-11.486 Y-14.264 Z4.790 F3782 A
-14.264 Z4.790 F3000; Retract G1 X-11.737 Y-14.577 Z4.790 F9000; Travel Move G1 X-11.737 Y-14.577 Z4.790 F1500 A131.34499; Restart G1 X-12.135 Y-14.196 Z4.790 F1681 A131.35462; Inset G1 X-12.273 Y-13.910 Z4.790
1.875 Y-13.269 Z4.790 F1681 A131.37360; Inset G1 X-11.760 Y-13.209 Z4.790 F1681 A131.37588; Inset G1 X-11.510 Y-12.979 Z4.790 F1681 A131.38181; Inset G1 X-9.840 Y-11.967 Z4.790 F1681 A131.41594; Inset G1 X
131.48596; Inset G1 X-3.923 Y-9.624 Z4.790 F1681 A131.52750; Inset G1 X-2.228 Y-9.256 Z4.790 F1681 A131.55782; Inset G1 X0.293 Y-8.905 Z4.790 F1681 A131.60231; Inset G1 X1.721 Y-8.839 Z4.790 F1681 A131.62730; Ins

The quotes listed on the right are a small sample of the quotes used in the exhibition.

The curators quotes were used as a means of prompting both myself and audiences to think critically and reflect upon the how 3DSP museum objects impact on our understanding of the 'museum object'.

The quotes I chose represented political, linguistic, social, and philosophical questions raised by curators.

3D is a form of free play that breaks the linear nature of the museum

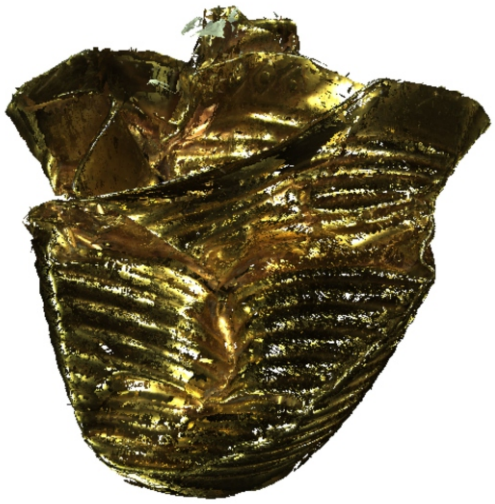
We don't have any problem with saying a photocopy... so like 3D printer copy? I wonder if language has to catch up?

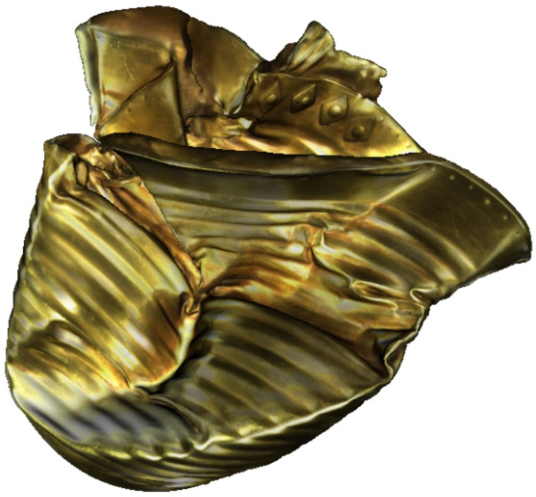
It feels intimate being able to move and rotate the object on a screen makes it feel like it is actually there



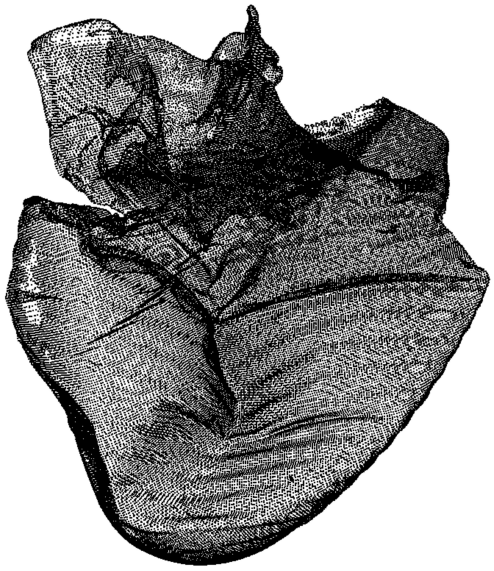


The aim of visualising each stage of the 3DSP process was to see the changes these objects go through and explore the impact this has on our understanding of museum objects. Here I am employing curation as a research method, visually reinterpreting data in order to tell and explore a story in more detail.





The separation and staging of each 3DSP process positioned theses data forms as objects in their own right. It caused audiences and myself to think critically about what museum objects can be, as well the impact these new 'museological objects' have on the museum.



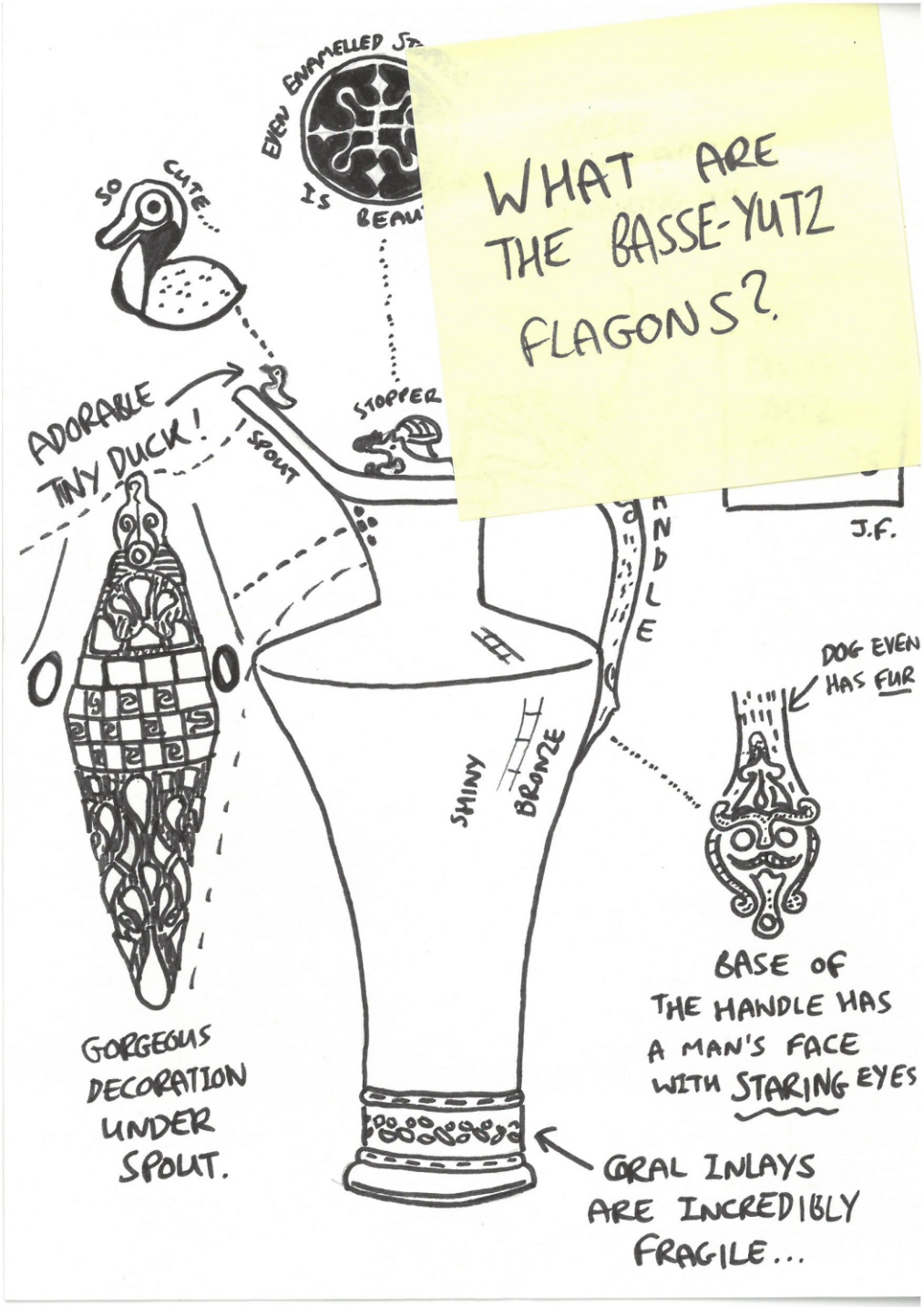
The exhibition ‘Object in Transition’ allowed me to explore complex questions relating to my research.

I remember walking through the exhibition asking questions about data, version control, and reproducibility to myself. In essence curating the exhibition allow me to examine the impact 3DSP has the curatorial role, while the actual exhibition served as a sounding board for me to ponder, discuss and question new ideas.

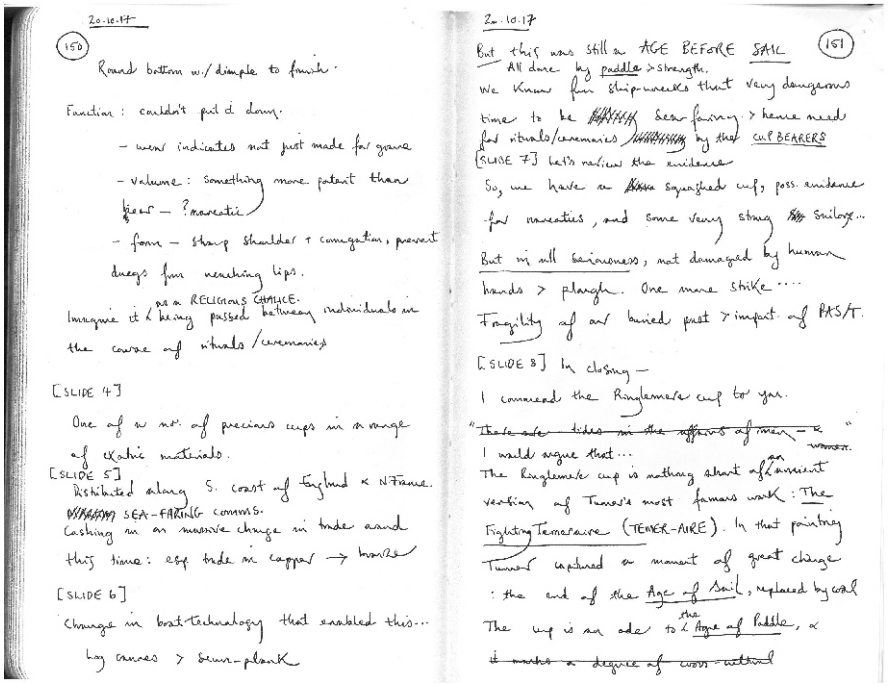


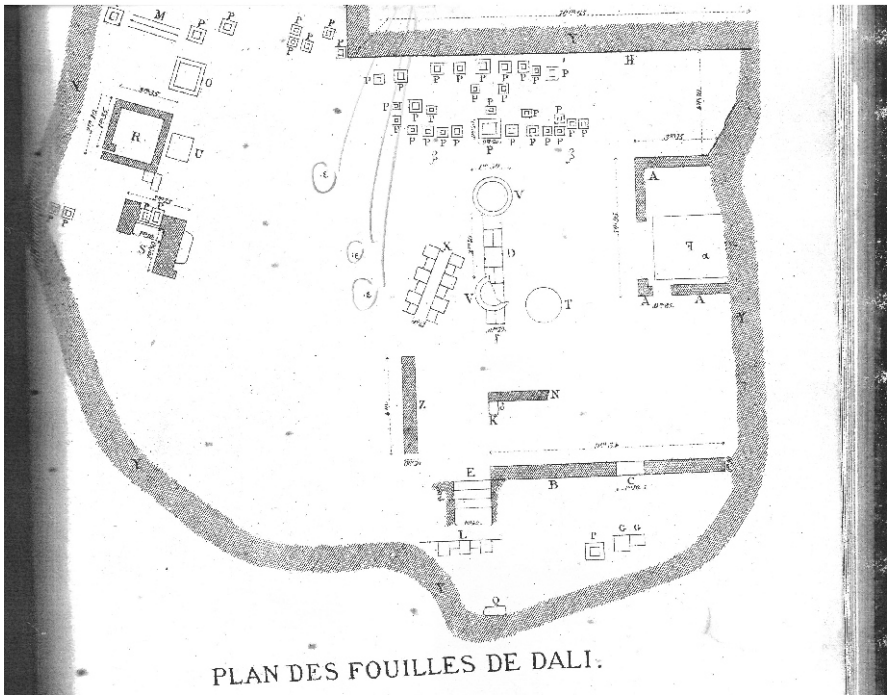
These images represent some of the drawings and extra information added by curators to ‘The Curators Box.

Julia created a number of drawings, including one where she illustrates what the Basse-Yurtz Flagons are. Her drawings are not just factual but show how much she admires these objects.

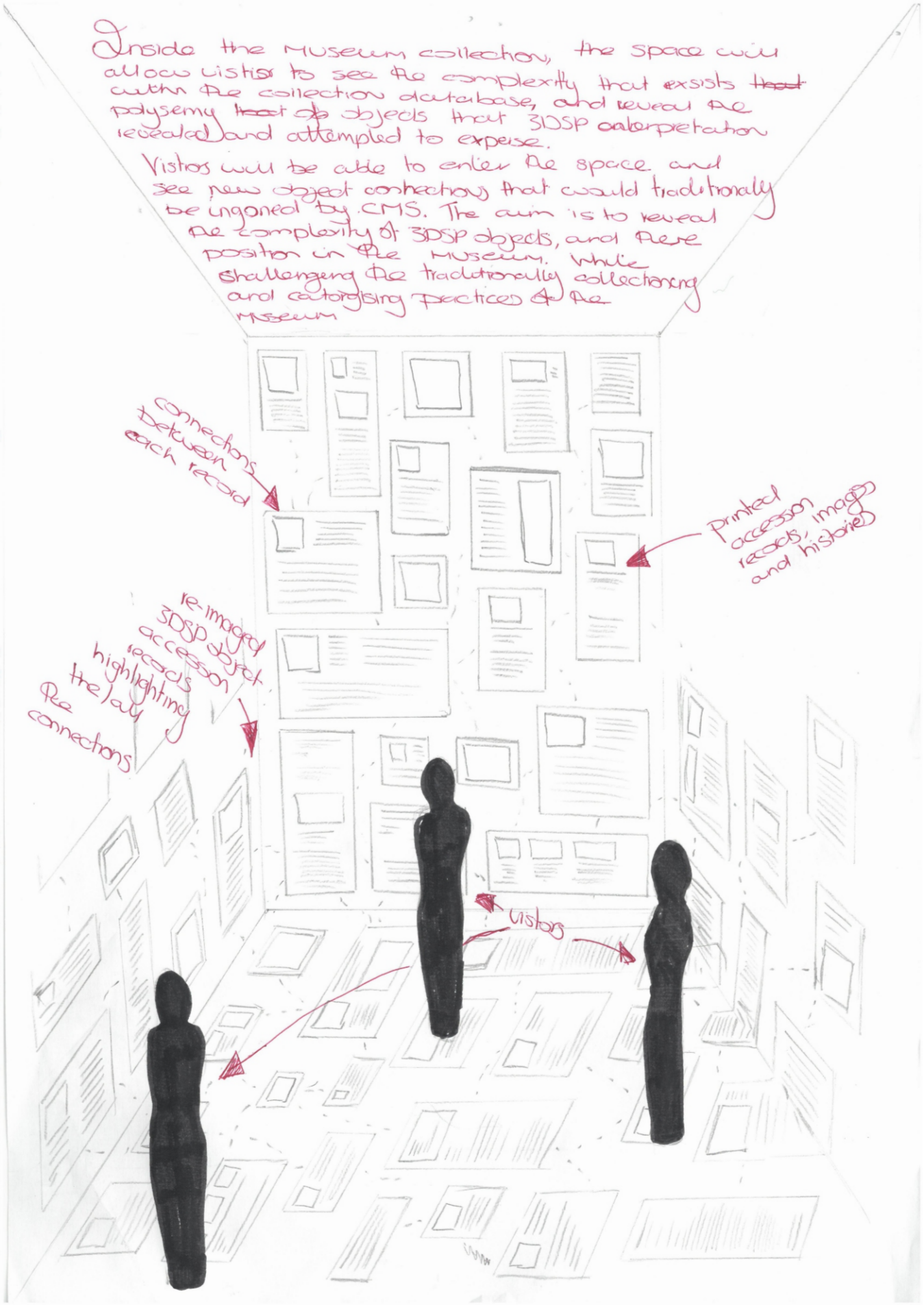


Neil photocopied and added his own notes and reflections to his ‘Curators Box’. The addition of this type of information reveals new insights to not only how to work with 3DSP but also the associated information for documenting 3DSP objects.



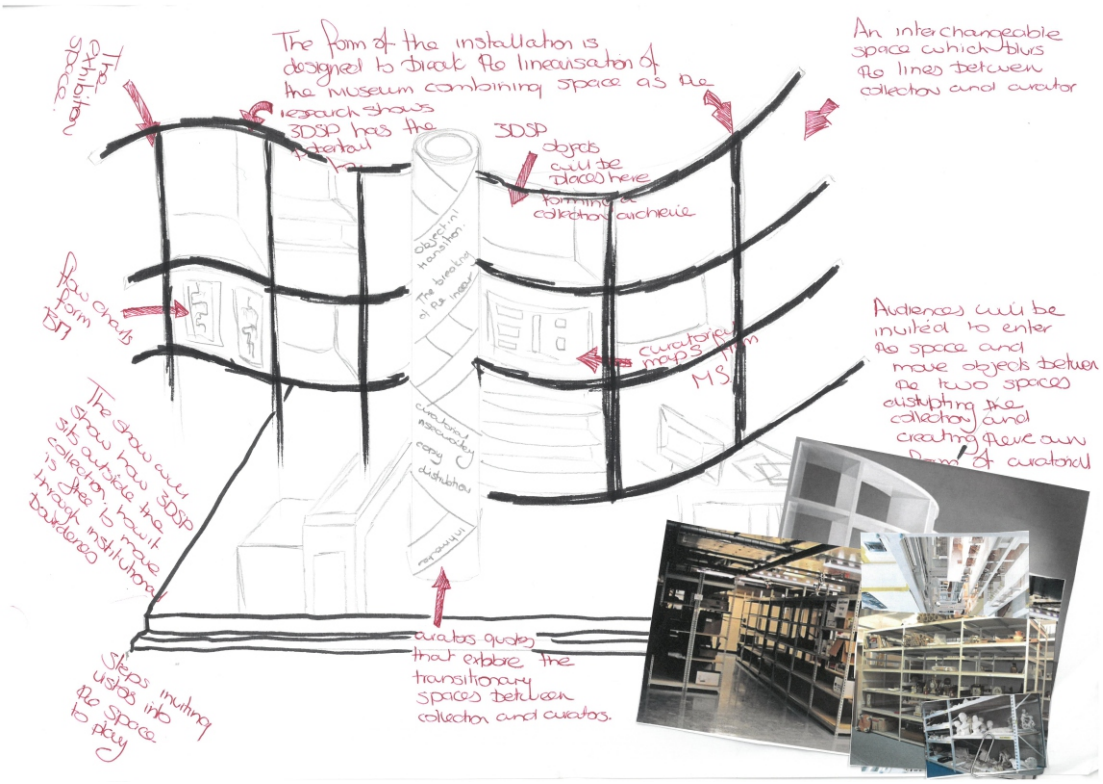


Thomas was keen to explore how 3DSP could help to reveal the polysemy of the Votive Offering and added maps, translations and inscriptions to his ‘Curators Box’ to show the kind of information he wished to add to the interpretation points on the 3D scan of the Votive Offering.


Inside the Museum collection, the space will allow visitor to see the complexity that exists within the collection database, and reveal the polysemy of objects that 3DSP interpretation revealed and attempted to expose.
Visitors will be able to enter the space and see new object connections that would traditionally be ingored by CMS. The aim is to reveal the complexity of 3DSP objects, and there position in the Museum. While challenging the traditionally collectioning and cataloging practices of the Museum
connections between each record
Printed accession records, images and histories
re-imagined 3DSP object accession records highlighting the lay the connections
visitors

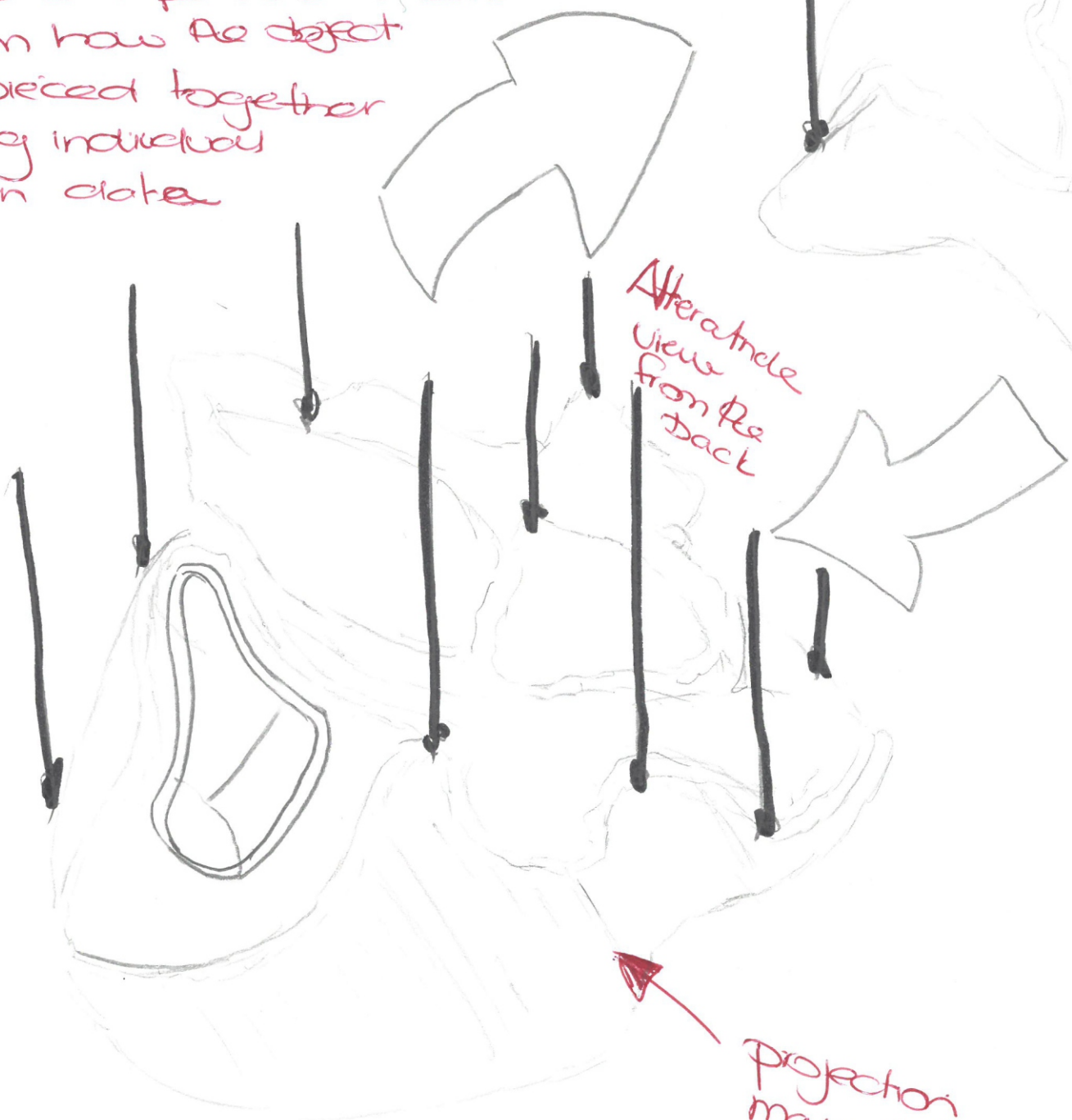
The design phase of ‘Frustrating the Linear’ involved designing multiple exhibition concepts that explored and made visible the archive. I was interested in examining how the archive structures data. I wanted to create an exhibition that allowed me to present my findings from The British Museum whilst also progressing my understanding of the findings.

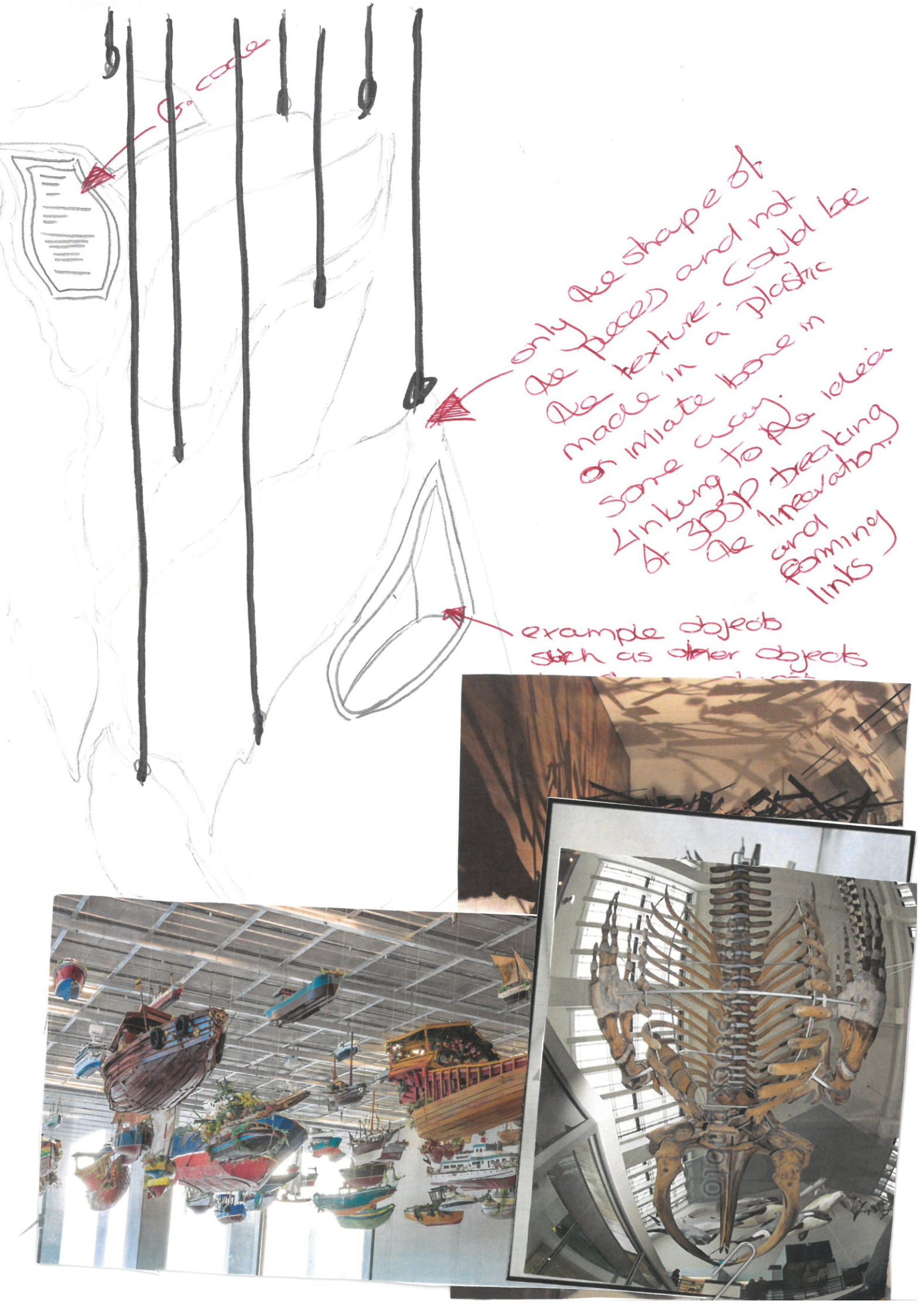


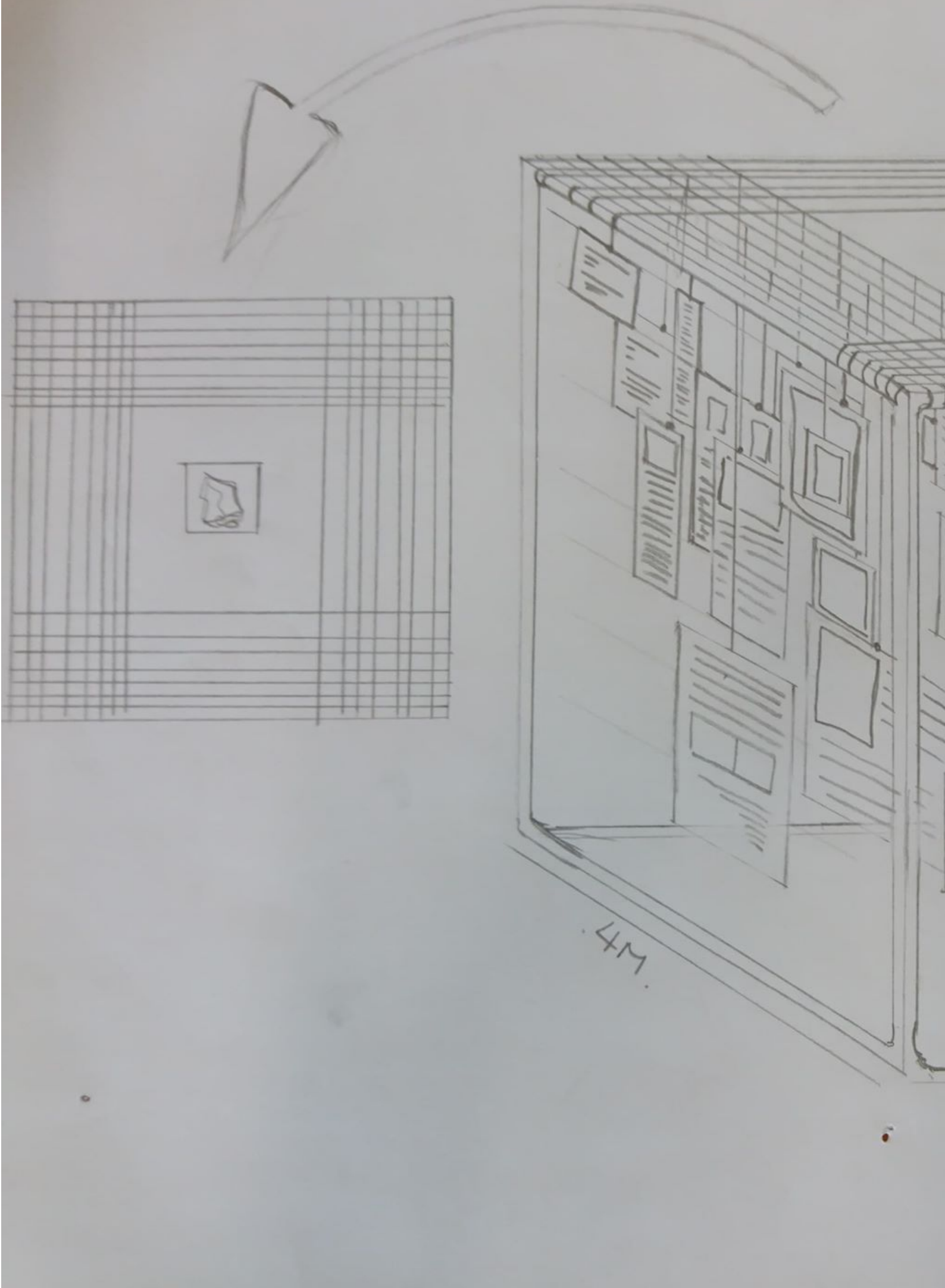


Broken apart object (Ringlemere cup used as an example) with museum information, interpretation and accession records showing the transition of 3D SP and its use.

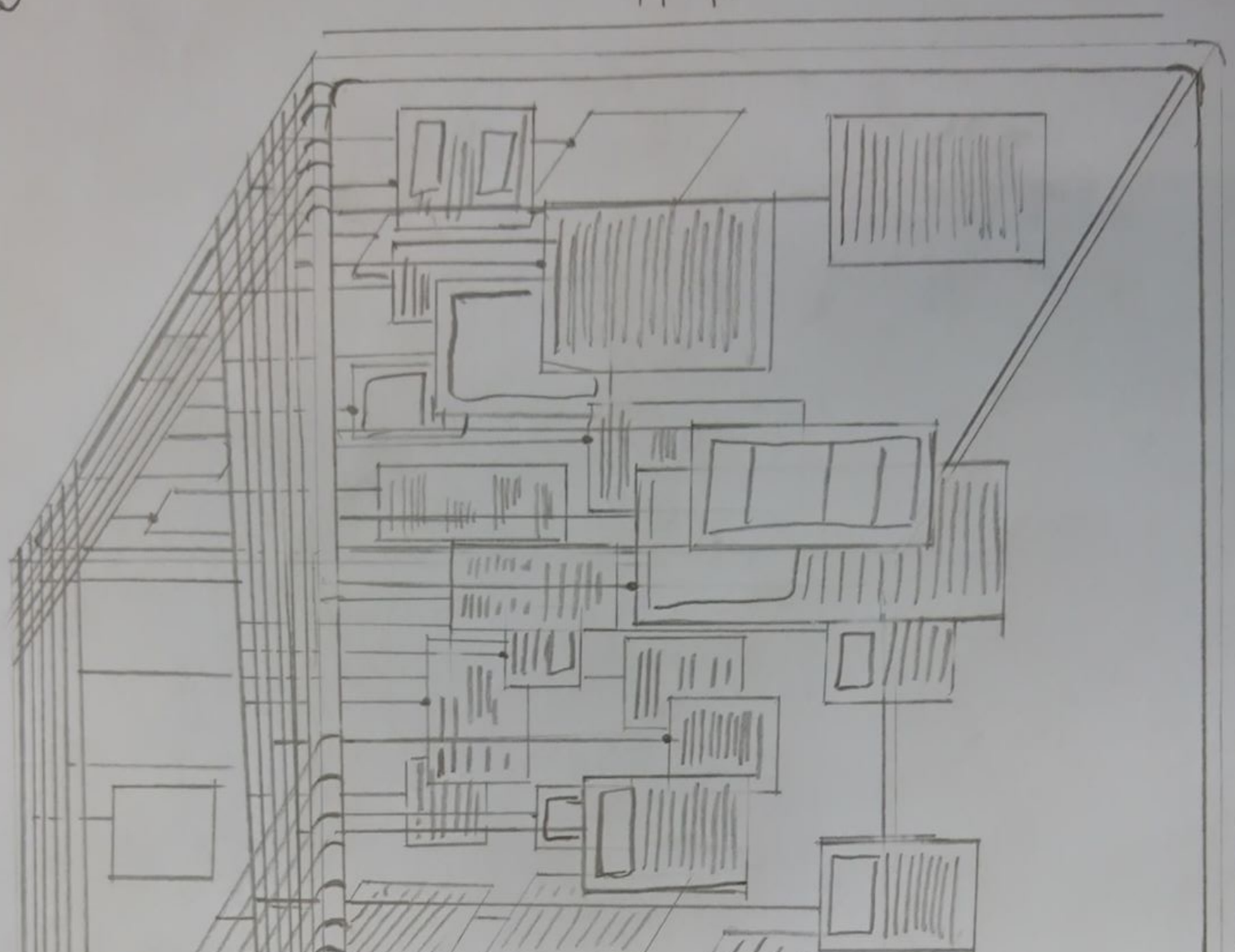
The shape cue taken from how the object is pieced together using individual scan data.




only the shape of the pieces and not the texture. Could be made in a plastic or imitate bone in some way. Linking to the idea of 3D3P breaking the innovation and forming links
example objects such as other objects

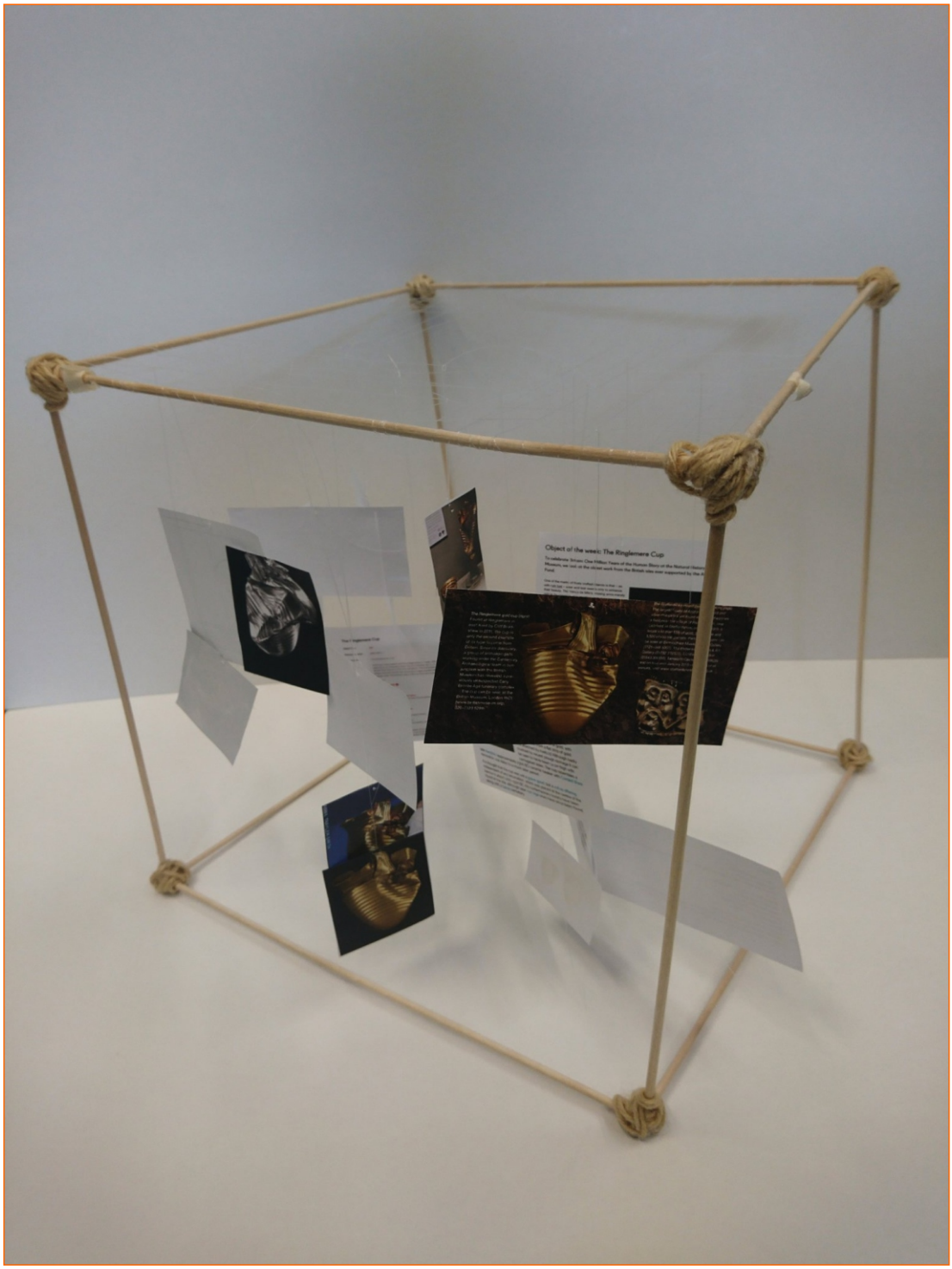

4m.

Final Concept



The image overleaf is a rough design for the final concept for ‘Frustrating the Linear’. The aim of the exhibition was to explore the relationship, categorisations and connections between museum data. In the initial stages of curation it was thought that by visually layering data outside of the museums systems new understandings could be made.

Prior to installing the exhibition, I experimented with layering images from The British Museum’s database. The act of layering and re-layering images served as a method of finding relationships between data sets. I presented this exploration in a physical form by creating a prototype of the exhibition concept. It was through this process that the idea of treating the hanging of work as an act of curatorial performance came about.





Frustrating the Linear
A exhibition examining

9th -24th November 2018
Hallam Post Office

'Frustrating the linear' is a performance-based work that aims of reveal the frustrations, revelations and impact 3D scanning and printing have on the museum to archive. Images, datasets, histories and objects that are normally hidden in the digital archive are visualised to reveal the relationships often hidden by the structures of the digital archive.

The act of hanging is deemed a mode of curation as images, datasets, histories and objects relating to one museum artefact are visualised in the confines of the museum 'box'.

The British Museum

Visiting
What's on
Research
Learning

Membership
Support us
› About us
Blog

Search the website

British Museum shop ›

About us › Past exhibitions ›

Archive: Kazari Archive: Medicine Man Archive: Museum of the Mind Archive: Buried Treasure Archive: Tibetan Legacy Archive: John Maine

Buried Treasure:
Finding Our Past

21 November 2003 – 14 March 2004
Free

This exhibition is now closed

Room 35

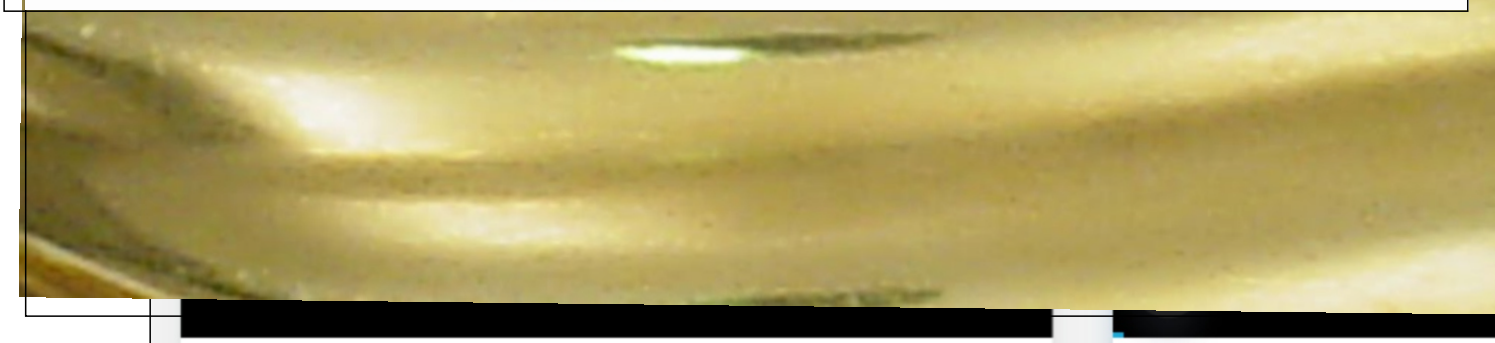
Sponsored by Anglo American and Tarmac

The first major national exhibition of British archaeology in over 20 years, *Buried Treasure: Finding Our Past* will show how much chance archaeological discoveries have revolutionised our understanding of our past. The exhibition is a result of a unique collaboration between The British Museum and four other major UK museums in Cardiff, Manchester, Newcastle and Norwich. The exhibition will travel to each venue after London to allow people across England and Wales to view some of the most spectacular finds of British history.

The exhibition will feature some of the country's most important British treasures such as the magnificent Mildenhall tableware, which will be shown in its entirety and will tour the country for the first time and the iconic Lewis Chessmen which featured in the first Harry Potter movie. But the key aim of the exhibition is to celebrate the enormous contribution that the public has made in uncovering history as well as the success of the Treasure Act and the Portable Antiquities Scheme.



A hoard of Iron Age torcs from Snettisham, Norfolk.



The Luzira Head 403 0 4

Ringlemere Cup



Nereid Frieze 83 0 10

Rhyton

odels/8aabf3ab39b44d0b9a96f7a16167ae77





photography has confirmed that there are extensive buried archaeological landscapes across the District that are especially visible on the Transc under Histor the 19 substa Distri photo has de amou has nc the ae illustra compl site.

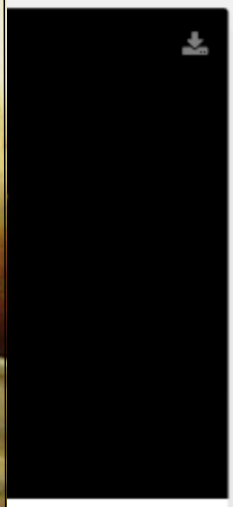
11.16 inform detect Distri Antiqu volunt leads t distrib well as 4,000 schem

archaeology that remains to be discovered across the rural parts of the District is evident from two particular sources. Aerial

Figure 9 *Bronze Age Gold Cup found at Ringlemere Farm in 199*



EMBED SHARE



195 0 8

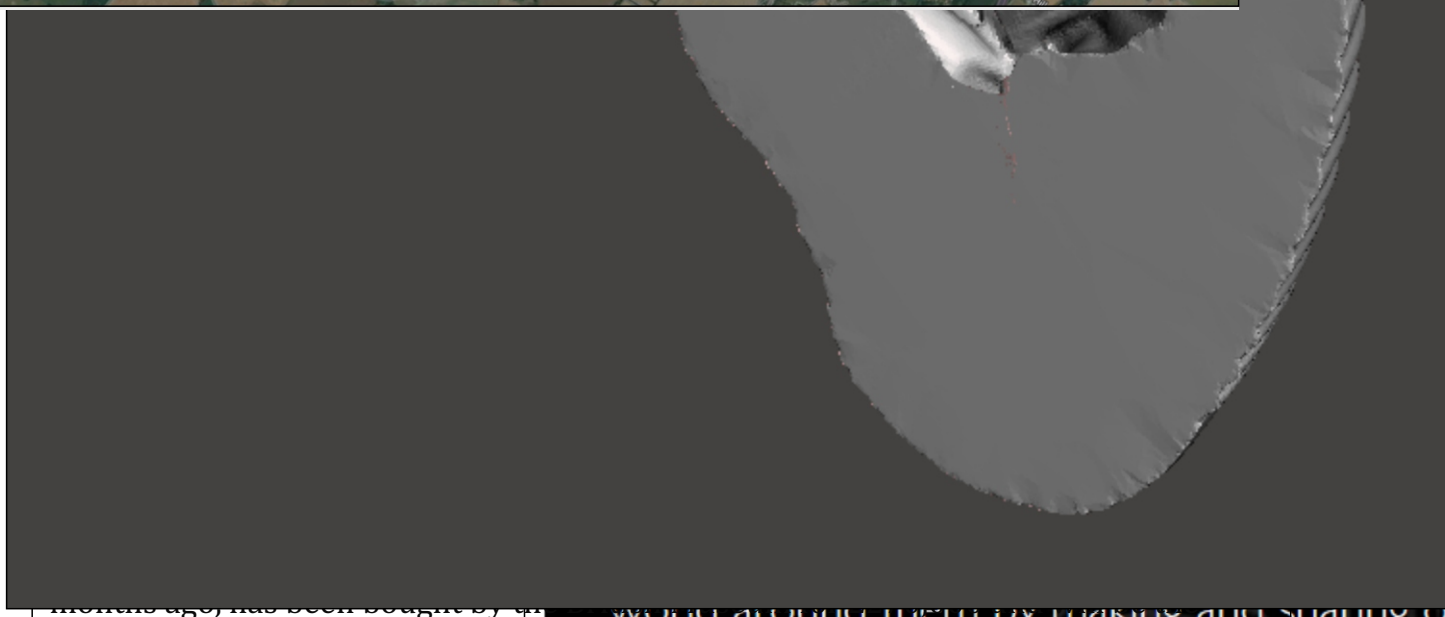


208 0 9

Mummy Mask Comparison

465 0 9





months ago, has been bought by a
star of a spectacular touring exhibition.

The cup is still crumpled, mangled by plugging [illegible]
mound where it was hidden around 1600.

However, a 3D computer reconstruction has revealed its sensuous beauty. It is taller
and more shapely than the archaeologists assumed, with a narrow waist.

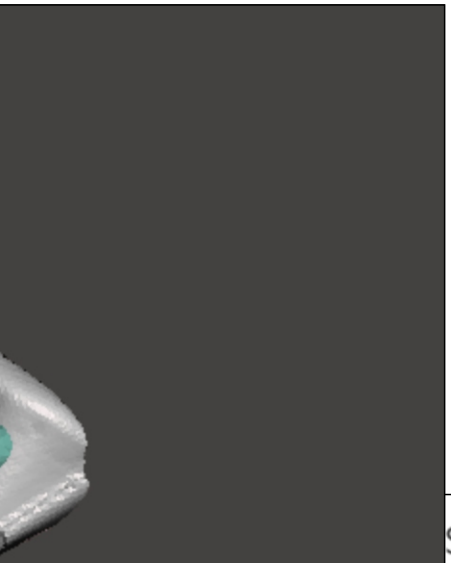
The Ringlemere Cup is one of only five [illegible]. They are
believed to have been intended for practical use, beaten from single sheets of gold.
The cup was found in 2001 by Cliff Bradshaw, an amateur metal-detector enthusiast.
He will share the money paid by the museum with the landowner.

The cup has been described as a find which rewrites history. Yesterday the British
Museum's director, Neil MacGregor described it as "a remarkable birthday present"
for the museum's 250th anniversary.

world around them by making and sharing o
Stonehenge, curated in partnership with the
of these changing prehistoric connections th
stone, chalk, gold and bronze. The exhibition
12 October 2018 until 21 April 2019.

Explore some of the star objects from the e
they can tell us, below.

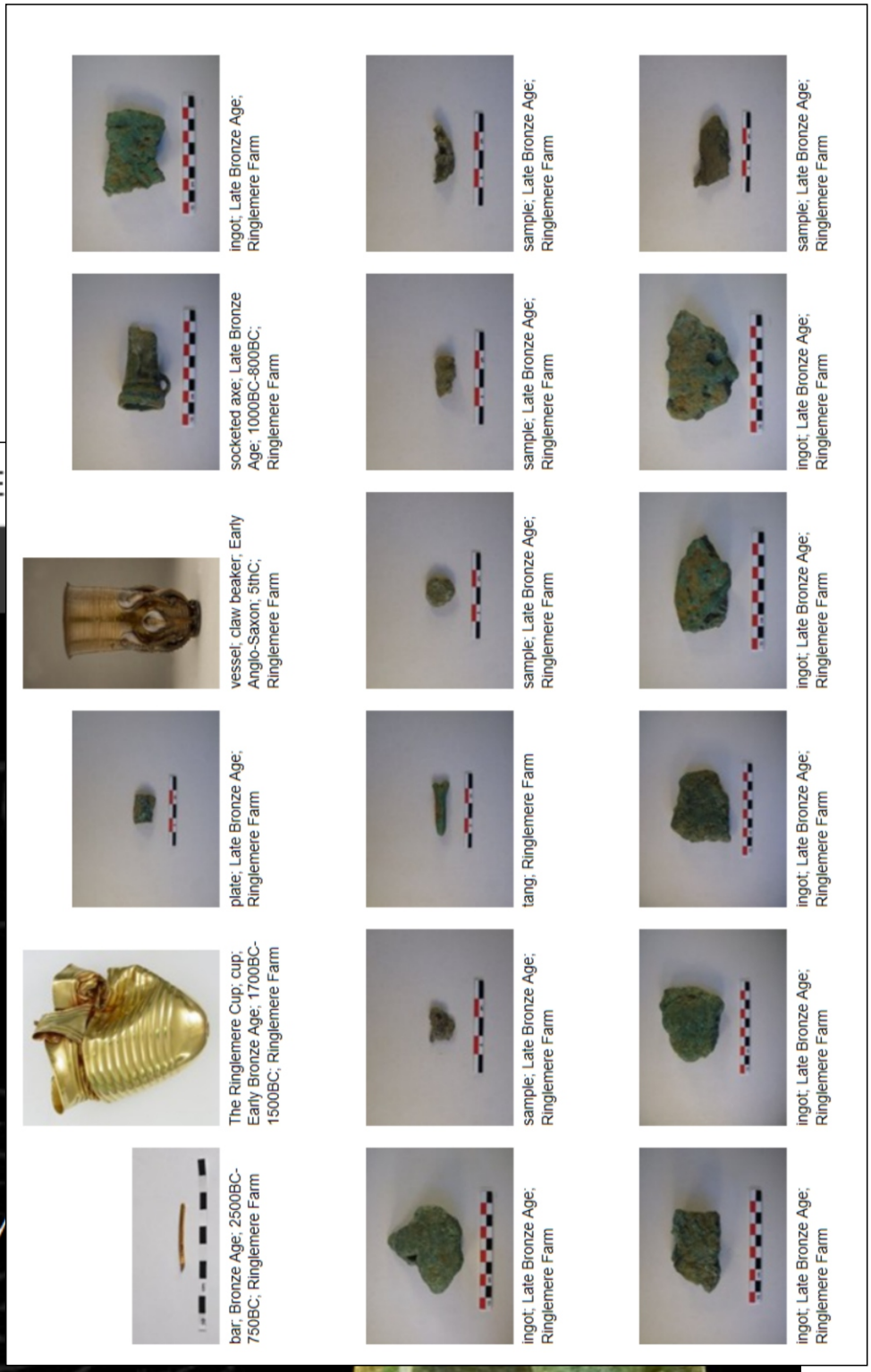
BOOK NOW



S | LE

the
bjects. A special exhibition at
British Museum, tells the story
rough precious objects of
n is open daily and runs from

xhibition, and discover what



PRESS OFFICE

COMPETITIONS

PRESS RELEASES

IMAGES

BRANDING AND LOGOS

Press Releases

Buried Treasure: Finding our Past

Date: 2004-05-17

What is treasure? Is it gold, silver or precious jewels that glitter and glimmer, or can it be objects that tell us extraordinary stories about our ancestors lives?

14 May - 5 September
National Museum & Gallery, Cardiff

Opening Friday 14th May at the National Museum & Gallery, Cardiff *Buried Treasure: Finding our Past* – a major archaeological exhibition – showcases some of Britain's most spectacular treasures some on display for the first time in Wales.

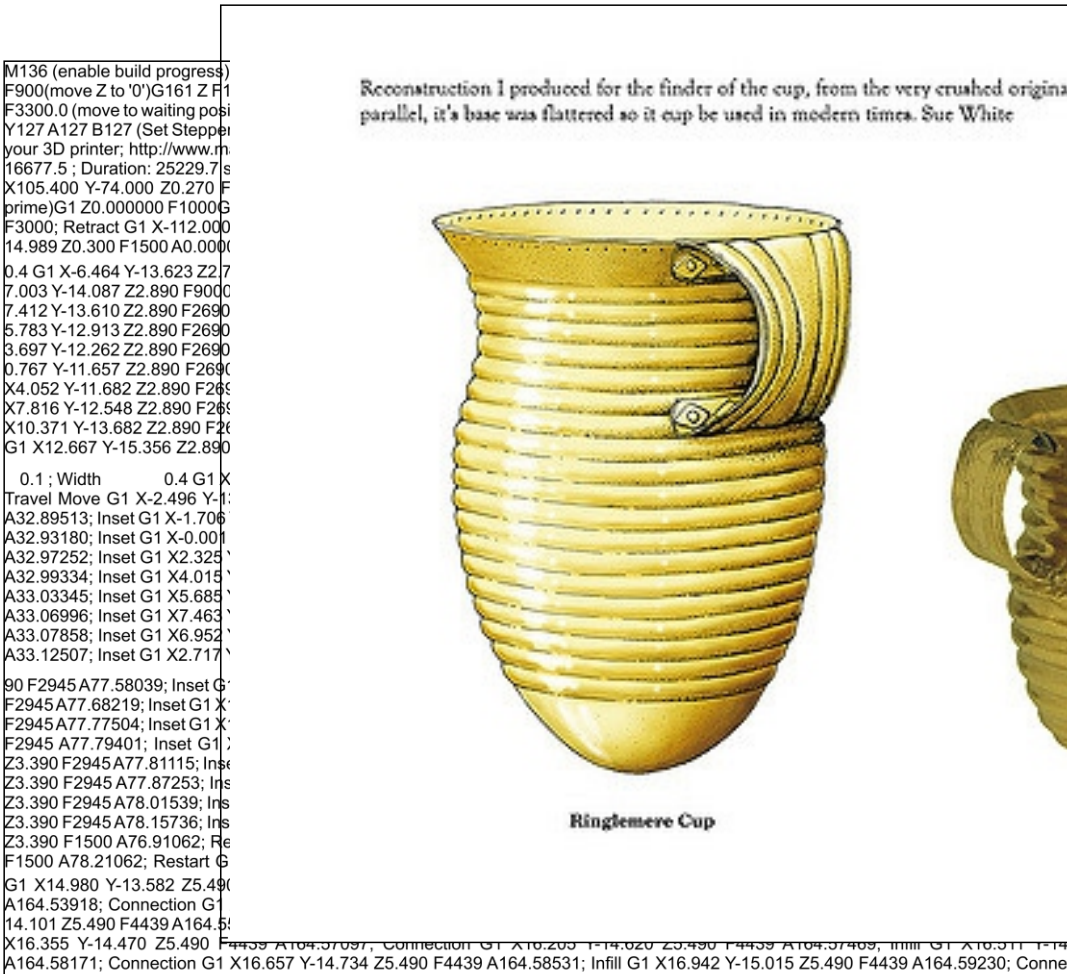
The exhibition aims to demonstrate the important public role in treasure finds and how chance discoveries by farmers, labourers and metal detector users have revolutionised our understanding of the past. Celebrating the success of the Treasure Act 1996 and the Portable Antiquities Scheme the exhibition also highlights the role of the National Museums & Galleries of Wales and the British Museum in the treasure process including research and further archaeological investigation at the location of the finds.

The exhibition at the National Museum & Gallery will additionally feature some of Wales' most significant finds. Discovered near Abergavenny in 2002, the Roman bronze cup is one of finest Roman vessels ever found in Wales. The handle is in the form of a leopard and further analysis revealed that the leopard spots are silver and that the eyes are inlaid with amber. The cup had been placed upside down in a small pit containing human remains and is believed to have been a burial site in a cemetery lying beside the Roman road.

In 1918, Ifor Lewis, a workman digging for manganese, near Llanbedr, Gwynedd found a remarkable hoard from the late medieval period. The hoard contained items made of copper, alloy and iron including an ewer, a cauldron, two skillets and a hand tray, domestic items that would have been found in the kitchen of a wealthy household. The earliest object, a late thirteenth century or early fourteenth century 'aquamanile', in the form of a stag was a vessel for holding liquid and would have been used for ceremonial hand–washing in a church, monastery or at the feast table. An Iron Age wooden weaving sword was found during excavations at the Breiddin Hillfort, Powys and is a unique find as ancient wood rarely survives.

Finds from Scotland and England include the magnificent Mildenhall treasure, a 34 piece Roman silver tableware set will be on display in its entirety and the iconic Lewis Chessmen, featured in the first Harry Potter movie. Found on the Isle of Lewis, Outer Hebrides, Scotalnd, the elaborate chess pieces made from walrus and whales teeth is the only single surviving group of objects from the eleventh century made for recreational purposes.

The images overleaf and on this current page represent my attempts of layering museum data for the Ringlemere cup. The system for choosing which images to layer was an organic one, I selected an images based on colour, form, layout, and content, placing images next to, on top off and underneath to create networks of previously unrelated data. I added in data that was not in the museums systems, such as my own images and exhibitions and positioned them alongside 'approved museum data' in an attempt to disrupt our notions of value with the systems of data catagorisation





l. The Rillaton Cup is the nearest



Rillaton Cup

ction G1 X16.781 Y-
A164.61100; Infill G1
.845 Z5.490 F4439
ction G1 X15.756 Y-
etract G1 X17.496 Y-
074; Infill G1 X18.001

G1 X-8.144 Y-8.470
G1 X-9.684 Y-11.937
G1 X-9.602 Y-17.529
605; Infill G1 X-3.525
386; Infill G1 X-3.525
850; Infill G1 X-5.065
584; Connection G1
17.17100; Infill G1 X-
17.23881; Infill G1 X-
A317.31911; Infill G1

00 A470.36189; Inset
F5400 A470.45198;
241 Z10.190 F5400
68 Y-12.683 Z10.190
G1 X22.335 Y-13.953
02; Inset G1 X22.741
.470.73004; Inset G1
F5400 A470.77092;
.077 Z10.190 F5400
1 X22.437 Y-19.375

G1 X8.792 Y-17.670
3; Infill G1 X4.297 Y-
A510.93130; Infill G1
00 A511.04594; Infill
400 A511.11375; Infill
00 A511.21233; Infill
803 Z10.590 F5400
.537 Z10.590 F5400
94 Y-15.003 Z10.590
G1 X0.805 Y-20.237

006 Y-2.667 Z10.890
l G1 X1.982 Y-2.821
7443; Connection G1
F5400 A540.59186;

OUTH CAPE COINS

QUALIFIED BY EXPERIENCE

asure: Ringlemere Cup







just over 11lb of gold, 3lb of silver and
cloisonné garnets. Parts of the hoard can
en at Birmingham Museum & Art Gallery
-348 8007), The Potteries Museum & Art
ry (01782 232323), Lichfield Cathedral
3 306100), Tamworth Castle (01827 709626)
n tour until January 2015—for details of all
es, visit www.staffordshirehoard.org.uk




Frustrating the Linear

These photographs show different perspectives of ‘Frustrating the Linear’, including a working curators desk and the physical museum archive.





This page left blank.