

THE AUGMENTATION OF CRAFT



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An exploratory discussion on the evolution
of craft and authenticity in the digital age.

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ABSTRACT

This dissertation aims to explore how the nature, and thereby the definition, of craft is evolving during the digital revolution, and the potential cultural implications of this paradigm shift on the authenticity and authorship of the work of craftspeople.

Micro-experiments have been conducted using 3D scanning and 3D printing to draw first-hand observations and form reflective writings within the work, utilising the authors positionality as a Maker to understand the shifting attitudes surrounding the practices.

The discussion and restoration proposals surrounding the destruction of Notre Dame Cathedral in the catastrophic fire of April 2019 will be used as a vehicle to explore the digital technologies and fabrication methods being used (predominantly in architecture) to preserve or restore historic buildings, to question our approach heritage crafts.

The ground is set by exploring how qualities of both buildings and crafts are benchmarked as “heritage” by organisations in position of authority, in order to ascertain who is making the decisions of what is to be protected, and to whom this may in fact be detrimental.

Recent applications of 3D scanning to preserve is demonstrated with the roof of Notre Dame, and the work of Andrew Tallon, and the wider efforts of organisations such as CyArk preserving culturally important sites. The creation of these digital replicas allows accurate restoration, but the nature of the objects as they transition from reality into simulation, and the values that they either lose or maintain is more problematic than supposed. This interrogation of the nature of authorship in digital work is contrasted to the works of artists such as Cosmo Wenman, and the difficulties of the concept of cultural copyright.

Evolving from the “real” to “virtual” draws similarities in its reverse, with the application and advancement of digital fabrication and 3D printing. The proposal of Concr3de to reprint the gargoyles of Notre Dame leads to a deeper questioning of the nature of authenticity of digital crafts, in the creation of these skeuomorphic replicas – echoing the calls of John Ruskin and William Morris in response to the industrial revolution - resulting in the devolution of skill.

The conclusion of this research has shown that this is a field that is still in flux, with these benchmarking authorities, and ultimately the craftspeople themselves, trying to form new, and yet simultaneously traditional, identities in the twenty-first century.



INTRODUCTION

On the 15th of April 2019, the world watched aghast as ‘Our Lady of Paris’ was engulfed by flame.¹ Four hundred firefighters rushed to protect the twelfth century stonework of Notre Dame from the inferno. However, the wooden structure supporting the roof (known as “the forest”) was entirely consumed, resulting in the total collapse of the oak framework and destruction of the iconic spire.² Extensive damage to the interior was mainly prevented by the vaulted stone ceilings beneath, which acted to protect the majority of the interior decoration from the cascade of burning timber.

As the smoke cleared, the dust settled, the work could begin to assess the severity of the damage to the UNESCO site, and to what extent the cultural heritage of France had been destroyed in the blaze. Donations poured in to aid in the restoration works that would be needed for the structure (which prompted a significant outcry in its own right), but alongside this a debate formed on the nature of the work that should be undertaken to repair and protect the cathedral.³

Essentially, two contrasting opinions were vocalised – those who believe that Notre Dame was a cultural icon and as such should be restored exactly to the state it was in before the fire, and those who vehemently exclaimed such rebuilding would be a betrayal of the core values of those who first built the cathedral. The later claim this as a rare opportunity to add to the story of the building in its continued existence.⁴

Be it a faithful twelfth century reconstruction or a twenty-first century regeneration, for either scenario it is clear is that Notre Dame will never be the same. The state of the building is much akin to the state of the crafts that would be needed to restore it – many are in danger of extinction, and like those who wish to see Notre Dame restored to its original state, seemingly threatened by the march of innovation and technology impinging on tradition.

What is unavoidably raised is a question of authenticity in this modern evolution of the understanding of heritage and crafts. Developments in digital technologies such as CAD/CAM, 3D scanning and 3D printing are beginning to reach a point that they may even be verging on being considered crafts within themselves.

Subsequently, by using Notre Dame as a framework, the aim of this dissertation will be to explore the concept of value in this augmentation of traditional craft.

1 De La Hamaide, S. and Carriat, J. *Fire guts Notre-Dame Cathedral in Paris; Macron pledges to rebuild* [Online] <https://www.reuters.com/article/us-notredame-fire/fire-guts-notre-dame-cathedral-in-paris-macron-pledges-to-rebuild-idUSKCN1RR1UO> [10th October 2019]

2 Prior, R. ‘The entire wooden interior of Notre Dame Cathedral has been lost’ [Online] <https://edition.cnn.com/style/article/notre-dame-fire-oak-wood-trnd/index.html> [26th February 2020]

3 Williams, O. *Why Notre Dame Donations Are Provoking A Backlash Against Billionaires* [Online] <https://www.forbes.com/sites/oliverwilliams1/2019/04/17/why-notre-dame-donations-are-provoking-a-backlash-against-billionaires/> [27th January 2020]

4 Johnson, S. *Should France rebuild Notre Dame exactly as it was?* [Online] <https://bigthink.com/culture-religion/notre-dame-rebuild/> [22nd September 2019]; Pinto, J.S. *Why Notre Dame Should Not Be Rebuilt as It Was* [Online] <https://www.forbes.com/sites/juansebastianpinto/2019/04/18/why-notre-dame-should-not-be-rebuilt-as-it-was/#3aa35d6527e7> [22nd September 2019]

For this purpose, the definitions of these terms of heritage, authenticity, and indeed craft must be understood.

The definition and by extension opinion of “craft” which will fundamentally inform the position of this writing is mainly based on that of Glenn Adamson – “Craft only exists in motion. It is a way of doing things, not a classification of objects, institutions or people” - and David Pye – “Workmanship is the application of technique to making, by the exercise of care, judgement and dexterity”.⁵

The importance here is that craft is seen less as reliant on tradition, but more upon the act – distinctly different to the restrictive opinions of the Arts and Crafts movement writers such as John Ruskin.⁶

5 Adamson, G. *Thinking through craft* Oxford, UK: Berg, 2007; Pye, D. *The nature and art of workmanship*, Revised Edition. Great Britain: The Herbert Press, 1995. p 51

6 Sennett, R. *The Craftsman*. London, UK. Penguin Group, 2009. p 84.

LITERATURE REVIEW

The state of craft has been in turmoil since the late 19th century, with the industrial revolution sparking debate amongst key writers such as John Ruskin and William Morris, which came to form the fundamentals of the Arts and Crafts movement. Prior to, the power and skill of manufacture lay with the artisans and guilds of Master Craftsmen, producing small-batch, handcrafted products. The advent of mechanisation, leading to the division of labour and mass production lead to modern manufacturing scales as we currently know it. Yet this resulted in a reactionary uprising of those who felt as if the introduction of machines was detrimental, both to the craftspeople that were displaced and to the culture of crafts as a whole.⁷

Similarly, through the twentieth into the twenty-first century, the advancing pace of innovation and technology has promised an upheaval or ‘disruption’ to manufacturing, which has once again brought forth comparable arguments. The scale of manufacture has begun to swing from “economies of scale” back to “economies of one”, allowing techniques such as rapid prototyping and digital manufacturing to return to producing small batches or one-off items efficiently, disrupting the mass-production cycle.⁸ Yet the term ‘craft’ has not followed suit in the same manner of re-empowerment - it remains in a diminutive, sometimes even derogatory position, that came about in the early twentieth century with its divergence from design in the early days of modernism.⁹ It is relegating to, as David Pye describes, the realms of association with “hairy cloth and gritty pots”.¹⁰

Key theorists and writers have emerged to discuss the place of crafts (and craftsmanship) in modern culture, including those mentioned previously, but also importantly the writings of Stephen Hoskins, Malcolm McCullough, and Howard Risatti.

Much of what is spoken of surrounding craft is based upon a comparison between modern techniques opposed to those of heritage and tradition. Heritage has been defined as “features belonging to the culture of a particular society, such as traditions, languages, or buildings, that were created in the past and still have historical importance”.¹¹ It is remnants of the past, inherited by the present, to be passed on to the future. In terms of crafts, it may refer to the preservation of techniques, processes, and practices which may be used in conjunction with traditional materials.

Robert Hewison derisively describes the creation of a “heritage industry” in the United Kingdom, which critiques the development of the current framework governing heritage, emanating from the period of the Gothic Revival, reaching a

7 Petrick, I.J. & Simpson, T. ‘3D Printing Disrupts Manufacturing’ in *Research-Technology Management*, Volume 56, Issue 6, 2013. pp 12-16

8 Ibid.

9 V&A Museum, ‘*Arts and Crafts: An Introduction.*’ [Online] <https://www.vam.ac.uk/articles/arts-and-crafts-an-introduction> [26th February 2020]

10 Pye, D. ‘*The nature and art of workmanship*’, Revised Edition. Great Britain: The Herbert Press, 1995. p133

11 Uncredited, ‘*Heritage*’, *Cambridge Advanced Learner’s Dictionary & Thesaurus* [Online] <https://dictionary.cambridge.org/dictionary/english/heritage> [27th December 2019]

fervour in post-war Britain. Written in a time of post-industrial decline, Hewison argues that the obsession with nostalgia is distorting the view of the past, to the point of stifling creative development of the present and future.¹²

David Lowenthal supports this viewpoint, discussing that there are clear differences between History and Heritage, but also a co-dependent relationship with each informing and creating the other. Lowenthal goes on to concur further with Hewison, that Heritage is potentially a tool of political and economic gain for an elite subgroup of the state, rather than for its people and their culture. By extension, through manipulation heritage can rewrite the cultural past to a more agreeable position, depending on current contexts.¹³

This concept of a selected, controlled heritage determined in western culture by experts and elites is labelled by LauraJane Smith as the “Authorised Heritage Discourse”.¹⁴ Smith describes the material-based bias of heritage in the west towards tangible artefacts, with an onus on the authenticity of age, monumentality, and location.¹⁵ This discourse implies control over the past, and as such over the values that affect the notions of authenticity.

As mentioned above, the work of David Pye is instrumental in beginning to understand the concept of craftsmanship in a modern, mass-manufactured age. Pye proposes that the discerning factor between the two is the notion of the ‘workmanship of risk’, whereby it is the potential of a hand-worked object to fail at any moment, compared to the almost certainty of manufacture using a machine, which results in the enhancement of hand-crafts and a key signifier of their value.¹⁶ Inherent to value is the associated concept of authenticity, which is brought into question with the nature of these emerging digital crafts.

Howard Risatti builds upon the aforementioned work of Berger on how the replication of the signifier can, if so successful in the deception, become the object signified –

*“When the work of fine art is mistaken for the actual thing it is meant to represent, it disappears as a visual sign and inevitably returns to the world as the thing it represents”.*¹⁷

Risatti also comments on the work of the hand being an important factor in value – a notion shared by Malcolm McCullough. In ‘Abstracting Craft’, McCullough describes that the hand is what renders an object a tool, and through reasoned argument he describes a computer as just that - a tool - and a “means for combining the skilful hand with the reasoning mind”.¹⁸

12 Hewison, R. *The Heritage Industry: Britain in a climate of decline*. Great Britain: Methuen London Ltd, 1987.

13 Lowenthal, D. *The Heritage Crusade and the Spoils of History*. Great Britain: Cambridge University Press, 1998.

14 Smith, L. *Uses of Heritage*. Oxon: Routledge, 2006. p 4.

15 *Ibid.* p 3.

16 Pye. *The nature and art of workmanship*. p 4.

17 Risatti, H. *A Theory of Craft – Function and aesthetic expression* United States of America: The University of North Carolina Press, 2007. p 136.

18 McCullough, M. *Abstracting Craft*, Cambridge, MA: The MIT Press, 1996. p 81

Much of what is discussed regarding the nature of craft also stands true for the nature of art, and so applicable concepts can be translated across from one to the other. The traditional standpoint of Walter Benjamin regarding the reproducibility of art is that once reproduced, the work loses the value of which is gained through the ritual of the creation of the original, an intangible essence Benjamin describes as the 'Aura' – which may be construed as a measure of its authenticity.¹⁹ This view is the basis for the opinion of John Berger, who proposes that what is being lost through technological means (in this case, a camera imaging an artwork) is an intimate connection with its author, its context and its timing. In its place, Berger postulates, what expands is the sense of value of the original to the point of 'bogus religiosity', a deification of the old traditions from a fear of the present, leading to a 'mystification' of the past.²⁰

This could compare to the threat of technology over heritage crafts, resulting in an idolisation of the past processes and techniques to the point of dismissal of the new. What then is raised is the value of the traditional, which has led to what Sandra Alföldy describes as "craftwashing", the manipulation of this perceived value in the marketing of objects through the monetisation and commercialisation of the signifiers of craft.²¹ This is akin to the ideas and issues of "Greenwashing" – whereby corporations inflate sustainability claims in order to win over public opinion, whilst simultaneously diverting attention from unsustainable practices.²²

And yet, this fear of the new technologies is at odds with the original definition of the word, as explored by Heidegger, as stemming from the ancient Greek 'Technē' – whereby it is defined in essence as a mode of revealing.²³ Furthermore, Heidegger also talks of the essence of technology, which could be comparable to Benjamin's 'Aura' – arguing that our societal preoccupation with technology is, in fact, limiting our understanding of the essence itself – adding to the mystification spoken of by Berger.²⁴

Initially, Stephen Hoskins agrees that 3D printing can cause such a degradation of tacit knowledge by those who utilise them for making, presenting the case that there is a two-fold disconnect between the maker and the artefact – once in the digitisation process taking place in the virtual, and then compounded by the removal of the maker's influence in the manufacture. Hoskins goes on to remark that this is potentially due to the use of digital craft by early adopters in a very literal way and that these new technologies require craftspeople to adjust their view to employing digital crafts as tools in a toolkit that require time for familiarisation and acceptance.²⁵

19 Benjamin, W. *The work of art in the age of mechanical reproduction*. London: Penguin Group, 2008.

20 Berger, J. *Ways of Seeing*. London: British Broadcasting Corporation Harmondsworth, Penguin Group, 1972.

21 Helland, J. 'Sandra Alföldy (August 1, 1969-February 24, 2019): a Reflection', *The Journal of Modern Craft*, Vol.12 Issue 2, 2019. pp.141-145

22 Watson, B. *The troubling evolution of corporate greenwashing* [Online] <https://www.theguardian.com/sustainable-business/2016/aug/20/greenwashing-environmentalism-lies-companies> [6th January 2020]

23 Heidegger, M. 'The Question concerning Technology' in Heidegger, M. 'Basic Writings. From Being and Time (1927) to The Task of Thinking (1964)', Krell, D.F. (ed). Oxon: Routledge, 2011. Pg222

24 Ibid. p 238

25 Hoskins, S. *3D Printing for Artists, Designers and Makers*, 2nd Edition. London, UK: Bloomsbury Publishing PLC, 2018.

Therefore, for the purposes of this dissertation, the focus will be on proposals for certain digital crafts to be used in the restoration effort of Notre Dame – namely 3D Scanning and 3D Printing – as the basis for the exploration of the cultural impacts of these new technologies. These will also provide a gateway to interrogating the understanding of authenticity in craft in particular, if the digital is indeed credible of the title in its own right. What has become apparent from the research, interestingly, is that the use of digital technologies in the creative realm is seen as mainly a positive development – potentially signifying an apparent shift in thinking over time.

METHODOLOGY

In this exploration, analysis has primarily been conducted to establish what role the agency of the crafted object plays in its perceived value, for instance with 3D printed artefacts, supported by a semiotic analysis of the outputs of these digital crafts to ascertain their cultural identity. This has been sustained by select experimental analysis through workshop method reproduction of the aforementioned digital technologies, fundamental to the case studies.

The semiotic analysis is directed according to the Saussure model, chosen for its focus on the shared external reality of a given object, through the combination of the signified and signifier in a particular social context.²⁶ The imagery was selected from appropriate sources related to the themes identified in the literature review, via online searches (including Google, Primo, and EThOS).²⁷

Coding for each theme was identified prior to analysis, drawing from the description of traditional craft in the essay by Bruce Metcalf ‘Craft and art, culture and biology’, contained in ‘The Culture of Craft’ edited by Peter Dormer. These key codes are Traditional Material, Context and Technique.²⁸ The analysis however also remains open, allowing new codes to be discovered through interpretation.

26 Fiske, J. *Introduction to communication studies*, 2nd Edition. Great Britain: Routledge, 1991. p 43.

27 Key themes here referring to: Heritage, 3D Scanning, 3D Printing, and Authenticity.

28 Metcalf, B. ‘*Craft and art, culture and biology*’, in Dormer, P. (ed) ‘The Culture of Craft’, Manchester: Manchester University Press, 1997. p 71

Code	Denotive Meaning	Connotive Meaning
Traditional Material	Physical Materiality Appearance	Value Wealth Status Practicality Aesthetics Durability Historical Tradition Geographical Heritage Authenticity Consumerism
Context	Social Context Physical Context Location	Interpretation Essentialism Historical Factors
Technique	Skill(s) Process(s)	Elitism Value Time Culture Knowledge Heritage Tradition

The experimental research is documented within chapters two and three as reflective writings of studio practice. Focussing less on the technical aspects of the processes, the writings instead form an investigation into my personal perceptions of the digital crafts, utilising the positionality of my own perspective as a developing digital craftsperson.²⁹ This positionality is important to note, as the critical use of tacit knowledge was key to this research methodology.

²⁹ Bennett, J. *Vibrant Matter - A Political Ecology of Things*, Durham: Duke University Press, 2010.



THE CONSTRUCT
OF HERITAGE
AND CRAFT



When talking of cathedrals and traditional crafts, it is inevitable that the discussion will turn to the concept of heritage, what these buildings and skills protect and preserve from the past, and the alleged difference between this and the recorded history. These are linked but have very key differences in how they are both perceived by varying interpretations.

Heritage potentially can be, as David Lowenthal explains, “[...] not an inquiry into the past but a celebration of it, not an effort to know what happened but a profession of faith in a past tailored to present-day purposes”.³⁰ The description of a tailored past is telling, as it implies that the authenticity of heritage can be a variable one. For instance in the local setting of Plymouth, during a 1988 celebration of the defeat of the Spanish armada at the National Maritime Museum, the role of Sir Francis Drake did not play a large part in the retelling of the story. Plymouth locals were outraged, claiming of the insistence of accuracy overriding local tradition (and tourism draw) – likening it to the removal of Mickey Mouse from Disneyland.³¹

As the saying goes –

*“What is history but a fable agreed upon?”*³²

It is important when trying to understand the notion of heritage to make clear an understanding that for the most part, this is synonymous with the term ‘sanctioned’ or ‘authorised heritage’. This is described as the ‘Authorised Heritage Discourse’ (AHD), a phrase set forth by LauraJane Smith to map the framework of ‘Heritage’ from a western perspective.³³

“One of the consequences of the AHD is that it defines who the legitimate spokespersons for the past are”.³⁴

The custodianship for the inherited cultural knowledge on a worldwide scale falls in the hands of organisations such as UNESCO (The United Nations Educational, Scientific, and Cultural Organization) World Heritage Centre, and ICOMOS (International Council on Monuments and Sites). Comprised of heritage experts and authority figures, international agreements on the preservation, conservation and restoration of both tangible and intangible heritage objects and practices are agreed upon and monitored.

30 Lowenthal, D. *The Heritage Crusade and the Spoils of History*. Great Britain: Cambridge University Press, 1998. p X.

31 Lowenthal, D. *The Timeless Past: Some Anglo-American Historical Preconceptions*, *The Journal of American History*, Vol. 75, No. 1989. p 1274.

32 Raub, O. *Historical Quotes* [Online] <https://sites.psu.edu/interestinghistory/2014/04/26/historical-quotes/> [10th January 2020]

33 Smith, L. *Uses of Heritage*. Oxon: Routledge, 2006. p 4.

34 *Ibid.* p 29.

At the ‘Second International Congress of Architects and Technicians of Historical Monuments’ held in 1964, thirteen resolutions were compiled to form the Venice Charter, a key benchmarking document in the governing and protection of heritage sites.³⁵ It was described by the (then) President of ICOMOS Roland Silva, when speaking in 1983, as “a Magna Carta for the safeguarding of the monumental heritage of mankind for the sake of the generations of the present and the future”.³⁶ Supplementary documents have been added to support the charter in order to maintain definitions in a changing contemporary cultural landscape, such as the Nara Document of Authenticity, adopted in 1994.³⁷ This cements the idea of the current generation as custodians or stewards of history.³⁸

To gain the label of ‘heritage’, criteria must first be met by the object, place, building, culture, or structure that is to be considered to be worthy of passing on to future generations. On a national level, the state government may set initial criteria of which the sites must conform to. After this, nominations are recommended to a deciding panel at UNESCO, and assessed by their own criteria (guided by the principles of the Venice Charter) - only after which can the site be given the prestigious title of “world heritage”.³⁹

Nevertheless, even the inscription of a site onto the UNESCO world heritage list does not deem that it shall remain there in perpetuity. Bagrati Cathedral was constructed in Georgia during the eleventh century and consecrated as a place of worship for 600 years, until it was destroyed in 1691 by an explosion during the Ottoman-Persian war. The cathedral sat for a further 300 years, whereupon in 1994 it was inscribed on the UNESCO world heritage list as a ruin (see figure one).⁴⁰

35 Jokilehto, J. *The context of the Venice Charter (1964)* in Conservation And Management Of Archaeological Sites, Volume 2, 1998. p 229; For a full list of the Charter resolutions, see Appendix 1; It is worth also noting here that the Venice Charter was drawn up in the presence of twenty three representatives of various countries and organisations. Of those, seventeen officials represented countries within Europe, the remaining three representing Tunisia, Peru and Mexico - Erder, C. *The Venice Charter under Review*, 1977 [Online] <https://www.icomos.org/venicecharter2004/erder.pdf> [19th December 2019]

36 Silva, R. *The Significance of the Venice International Charter for the Conservation and Restoration of Monuments and Sites, with Special Reference to Eastern Countries*, Basel, 1983. [Online] <https://www.icomos.org/venicecharter2004/silva.pdf> [19th December 2019]

37 Uncredited, ICOMOS, *The Nara Document On Authenticity (1994)*, 1994 [Online] <https://www.icomos.org/charters/nara-e.pdf> [19th December 2019]

38 Smith. *Uses of Heritage*. p 29.

39 Uncredited, UNESCO, *The Criteria for Selection* [Online] <https://whc.unesco.org/en/criteria/> [10th January 2020]; Jokilehto, J. *The context of the Venice Charter (1964)* in Conservation And Management Of Archaeological Sites, Volume 2, 1998. p 230

40 Long, M. *Collaboration, confrontation, and controversy: the politics of monument restoration in Georgia and the case of Bagrati Cathedral* in Nationalities Papers: The Journal of Nationalism and Ethnicity, Volume 45, Issue 4, 2017. Pp 669-686



Figure 1: Georgian Journal, Bagrati Cathedral before undergoing revitalization, 2017. Photograph. Georgian Journal. Web. 25th February 2020.



Figure 2: Georgian Journal, *Bagrati Cathedral, post-restoration*, 2017. Photograph. *Georgian Journal*.
Web. 25th February 2020.

In 2009, the then-President Mikheil Saakashvili together with the Georgian Orthodox Church embarked upon an extensive and controversial restoration project to rebuild and re-consecrate Bagrati, as a symbol of the reunification of the country (the result seen in figure two).⁴¹ While potentially a political act of patriotism for Georgia and its citizens, enacted by its ruling party, on the global stage the restoration of the ruins was met with outcry. UNESCO protested vehemently to the works, and placed Bagrati to the List of World Heritage in Danger, citing the reasoning being due to “irreversible interventions as part of major reconstruction of the structure of Bagrati Cathedral”.⁴² Despite numerous warnings by officials, the level of intervention reached a point that UNESCO ruled the restorative works ruined the authenticity of the site, electing therefore to remove it from the World Heritage List altogether.⁴³

This exemplifies the thoughts of Dr. Rodney Harrison, that there can exist states of “competing heritage” whereby local and global interests can be in competition for acceptance by the official authorities.⁴⁴ Within discussion surrounding the AHD, it is remarked on how the ideas of heritage and supposed “global” ownership of sites of cultural importance could be potentially damaging to the localised cultures from which they are claimed.⁴⁵ This is where the AHD begins to break down – it relies on a structuralist approach of categorisation and ‘official meaning’, when in reality it is by no means that clear cut.

This particularly comes into play with the rapid replication afforded by new digital fabrication techniques, exemplified by the arguments surrounding the unveiling of a “new” CNC-machined one-third scale replica of the Arch de Triumph from Palmyra, Syria.⁴⁶ The 2000-year-old original was destroyed by ISIS forces in 2015 as part of their iconoclastic campaign, yet it was able to be resurrected through a collaboration between the Institute for Digital Archaeology and Tor Art, shown at its 2016 Trafalgar Square unveiling by London Mayor Boris Johnson in figure three.⁴⁷

41 Long, ‘*Collaboration, confrontation, and controversy*’ .p 670

42 UNESCO, ‘**Decision: 34 COM 7B.88 Bagrati Cathedral and Gelati Monastery (Georgia) (C 710)**’, 2010 [Online] <https://whc.unesco.org/en/decisions/4196> [4th December 2019]

43 Uncredited, ‘*UNESCO Removes Bagrati Cathedral from Cultural Heritage List*’ [Online] <http://www.tabula.ge/en/story/121907-unesco-removes-bagrati-cathedral-from-cultural-heritage-list> [26th February 2020]; Bagrati Cathedral does however to this day remain on the World Heritage in Danger list.

44 Harrison, R. ‘*What is heritage?*’, Adapted from ‘AD218 Understanding global heritage’ [Online] <https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=1929&printable=1> [7th January 2020]

45 Smith, L. ‘*Discourses of heritage : implications for archaeological community practice.*’ [Online] https://www.academia.edu/2011183/Discourses_of_heritage_implications_for_archaeological_community_practice [26th February 2020]

46 Taylor, A. ‘*The problem with rebuilding a Palmyra ruin destroyed by ISIS – does it simply help Assad?*’ [Online] <https://www.washingtonpost.com/news/worldviews/wp/2016/04/20/the-problem-with-rebuilding-a-roman-ruin-destroyed-by-isis-does-it-simply-help-assad/> [11th December 2019]

47 Uncredited, The Institute for Digital Archaeology, ‘*Building the Arch*’ [Online] <http://digitalarchaeology.org.uk/building-the-arch> [11th December 2019]



Figure 3: Tallis, J. *London Mayor Boris Johnson attends the unveiling of a replica of Palmyra's Arch of Triumph in Trafalgar Square on April 19, 2016.* Photograph. London. *The Washington Post*. Web. 25th February 2020.

The suited white male figure of Boris Johnson stands clearly in the foreground of the image. The reconstructed arch stands behind on a marked safety dais, the carvings clear on the yellow stonework. To the right, musicians and equipment from the ceremony are visible. Immediately behind the arch is a wall of metal barriers, holding back an assembled crowd of onlookers. All is taking place in front of a large, grey-white stone building – columned entrances are visible, as well as a large dome atop. Scaffolding covers the right-hand side of the roof of the background building.

The prominence of the suited white male figure holds connotations of a western essentialist force of authority in the foreground, and therefore of higher importance over everything seen behind. The suit can signify power, control, and wealth – supported by the fact that this is the London Mayor, in a position of eminence in an affluent cultural city, in stark contrast to cities in Syria. This could be linked to notions of the white saviour complex (an issue facing increased public awareness, such as the recent argument between MP David Lammy and Stacey Dooley over videos made for Comic Relief featuring young African children and white celebrities). Here, western countries could potentially be criticised for stepping in to rebuild and preserve cultures that are not theirs to interfere with.⁴⁸ This is supported by the comments of Joseph Willits from the Council of Arab-British Understanding –

*“Few would suggest that the digitally created replica of Palmyra’s Arch of Triumph did not look glorious in the London sunshine when it was erected on 19 April. It would also be churlish to deny the significant achievement and skill that it took to replicate such a magnificent and symbolic piece of Syria’s heritage. However, I cannot help feeling that this project plays a role in cementing the idea that Syria’s monuments and heritage are far more important than its people”.*⁴⁹

The barrier-restricted crowd forms an inferred split between the elite in authority who can touch, and the general populous who are held at a marked distance – be it from their own culture, or from others. The scene takes place in front of the National Art Gallery – a western museum. French philosopher François Dagognet in an essay titled *‘Le Musée sans fin’* (The Endless Museum) describes these institutions as a building of separation and confinement, of the same ilk as a hospital or a prison.⁵⁰

48 Taylor, L. *‘Star humanitarian or white savior? Celebrities in Africa spark online furor’* [Online] <https://www.reuters.com/article/us-britain-aid-whitesaviour/star-humanitarian-or-white-savior-celebrities-in-africa-spark-online-furor-idUSKCN1QI4YJ> [28th December 2019]

49 Willits, J. *‘Syria’s human losses and London’s replica of Palmyra’s arch’* [Online] <https://www.caabu.org/news/blog/syrias-human-losses-and-londons-replica-palmyras-arch> [26th February 2020]

50 Sirois, K. *‘Dagognet’s Critique of the Museum as a “Machine of Deceit”: The Protest that calls for Radical Metamorphosis’* [Online] <https://wrongwrong.net/artigo/dagognets-critique-of-the-museum-as-a-machine-of-deceit-the-protest-that-calls-for-radical-metamorphosis> [9th January 2020]

Crucially, the scale replica Arch was unveiled to the world, not at the original site, but in London. Mayor Johnson stated that he was keen for London to hold this honour, to reflect the efforts taken to rebuild the city after the blitz in World War Two.⁵¹ The reconstruction then proceeded on a “world tour”, including a stop in New York, where it was installed at City Hall Park adjacent to the 9/11 memorial.⁵² Deputy Mayor of New York, Alicia Glen, remarked “What could be more appropriate than to have this symbol of freedom in front of City Hall, so close to where we had our own challenges?”.⁵³ However, Paige Foley draws the conclusion that the Syrian artefact serves here only to reinforce the story of the 9/11 attacks, as a symbol of freedom used by those who are free and taken from those who are not – the Syrian people.⁵⁴

Alexy Karenowska, Director of the Institute of Digital Archaeology (based at Oxford University, those responsible for this recreation), has admitted that the Syrian Government was not involved in the creating of the replica – it could, therefore, be interpreted as the work of western ‘world’ heritage goals, not necessarily Syrian.⁵⁵

To understand the context, it is important to view the arch in its original site, shown in figure four before the destruction, as well as to appreciate to what degree the replica has succeeded or failed in reproducing the artefact.

51 Lusher, A. ‘*Destroyed by Isis, Palmyra’s Arch of Triumph rises again - in London*’ [Online] <https://www.independent.co.uk/news/uk/palmyra-arch-of-triumph-london-traffic-square-isis-daesh-a6990591.html> [28th December 2019]

52 Jalabi, R. ‘*Replica of Syrian Arch Destroyed By ISIS Unveiled in New York City*’ [Online] <https://www.theguardian.com/us-news/2016/sep/20/palmyra-arch-syria-new-york> [28th December 2019]

53 Potenza, A. ‘*Syrian Arch Razed By Isis And Re-Created With 3d Technology Arrives In New York City*’ [Online] <https://www.theverge.com/2016/9/19/12972504/palmyra-arch-of-triumph-isis-3d-replica-new-york-city> [28th December 2019]

54 Foley, P. ‘*The (In)Authenticity of 3D Printed Heritage*’ [Online] https://www.academia.edu/31453322/The_In_Authenticity_of_3D_Printed_Heritage [28th December 2019]; It is worth noting that while Foley talks of 3D Printed Heritage in her title, the works included in her paper are not entirely, if at all, 3D Printed. However, when viewed as speaking about Digital Crafts in a physical world, the arguments provided are still valid.

55 Taylor. ‘*The problem with rebuilding a Palmyra ruin*’ [Online].





Figure 4: PHAS, *Portico of Colonnade in Palmyra*, dating back to the 3rd century, 18th April 2016.
Photograph. *The Telegraph*. Web. 25th February 2020.

The genuine Arch sat in the desert of Palmyra, surrounded by the ruins of the rest of the colonnade at which it sat at the forefront, leading up to the remains of the Temple of Baal.⁵⁶ Archaeologist Michal Gawlikowski, who studied the monuments in Palmyra between 1965 and 2011, was critical of the replica, warning in an interview of a 'Disneyland effect' through reconstructions both in and out of context of their original site.⁵⁷ This 'Disneyfication' could result in the site losing its original story and cultural context, and instead becoming a tourist attraction and commodity.

It can certainly be seen in the construction and use of the replica, particularly in the manner in which this, a relic of what would have been part of a sacred site in Palmyra, is being paraded around the world – unveiled in London, onto New York, Dubai, and then with the intention of it residing finally in Syria. This grand tour implies a spectacle for entertainment.

Like Bagrati Cathedral, the site was inscribed onto the World Heritage List in 1980 as a ruin, subsequently to the World Heritage in Danger list in 2013.⁵⁸ Unlike Bagrati, both the media and authorities seem to be keen on restoring the site back to its 'authentically ruined' state. It has been labelled as an act of defiance rather than of desecration.⁵⁹

Each change to a building or a site throughout history forms something of a palimpsest – damage overwriting damage tells the story of its survival. By choosing to deliberately (and artificially) roll the clock back to a pre-ISIS version of the site, those utilising the AHD are rewriting the history of the site in an act of effective censorship, akin the very event they are trying to undo. Abhorrent though the actions of ISIS were, and in direct breach of the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict, the result now forms a critical moment in the timeline of the heritage of the structure.⁶⁰

Official benchmarking is one way of setting forth criteria of what may be deemed heritage and therefore worth protecting, which in the case of Palmyra could be said to have been undermined, however there are other more flexible ways of forming this definition. Heritage, in a western sense of the concept, is tied to materiality.⁶¹

56 Jalabi, R. *Replica of Syrian Arch Destroyed By ISIS Unveiled in New York City* [Online] <https://www.theguardian.com/us-news/2016/sep/20/palmyra-arch-syria-new-york> [28th December 2019]

57 Bacchi, U. *'Palmyra Arch in London: 'Unethical' reconstruction of 'Disneyland' archaeology criticised'* [Online] <https://www.ibtimes.co.uk/palmyra-arch-london-unethical-reconstruction-disneyland-archaeology-criticised-1555659> [29th December 2019]

58 UNESCO, *'Site of Palmyra'* [Online] <https://whc.unesco.org/en/list/23/> [29th December 2019]

59 Shea, C. D. *'Palmyra Arch Replica Is Unveiled in Trafalgar Square in London'* [Online] <https://www.nytimes.com/2016/04/20/arts/international/replica-of-palmyra-arch-is-unveiled-in-trafalgar-square.html> [29th December 2019]

60 UNESCO, *'1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict'* [Online] <http://www.unesco.org/new/en/culture/themes/armed-conflict-and-heritage/convention-and-protocols/1954-hague-convention/> [12th January 2020]; Bacchi, U. *'Palmyra Arch in London: 'Unethical' reconstruction of 'Disneyland' archaeology criticised'* [Online] <https://www.ibtimes.co.uk/palmyra-arch-london-unethical-reconstruction-disneyland-archaeology-criticised-1555659> [29th December 2019]

61 Smith, L. *'Uses of Heritage'*. Oxon: Routledge, 2006. Pg 3.

To explore what may constitute a materialistic craft object in a traditional sense (heritage or otherwise), Bruce Metcalf names a triad of identifying features that can form a description of a craft object:

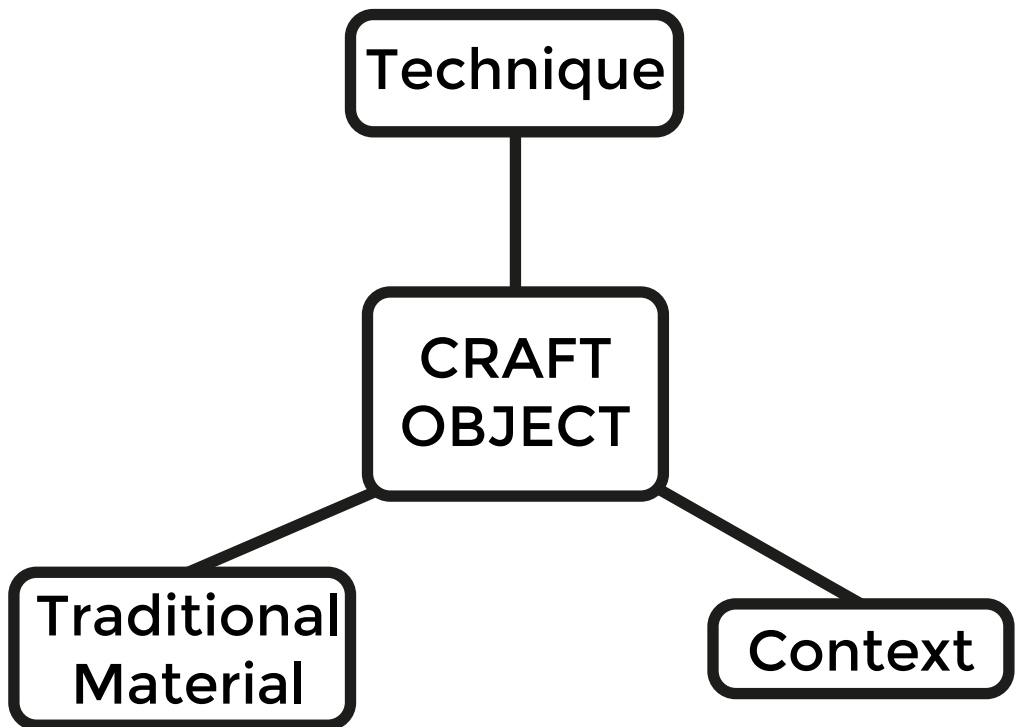


Figure 5: Holmes, M. *Triad of Craft*, 2020. Diagram. Based on Metcalf, B. 'Craft and art, culture and biology', in Dormer, P. (ed) 'The Culture of Craft', Manchester: Manchester University Press, 1997. p71.

Metcalf goes on to explain how an object labelled as “craft” is required by current cultural standards to possess at least one, but potentially a combination, of these three signifiers to be deemed a craft object. However, unlike the formal and rigid benchmarking of ‘heritage’, simply possessing one or more of these qualities does not automatically grant the object craft status (in the same way applying paint to a surface does not necessarily result in art).⁶²

‘Technique’ is primarily used to refer to traditional methods of manufacture, which purists may describe as handicrafts. However, this is not as clear cut as first appears. David Pye goes to great lengths to attempt to define what it means for an item to be hand made, arriving at the conclusion that “‘handicraft’ and ‘hand-made’ are historical or social terms, not technical ones”.⁶³ Woodworkers can use numerous power tools, such as bandsaws, power drills, jointers and so on, to create furniture socially accepted as hand made, - similarly a potter can use a powered wheel to throw hand-crafted ceramic ware, and it is still accepted as a craft.⁶⁴

The etymology of technique has a similar origin to that of Technology, which is explored by Martin Heidegger as stemming from the ancient Greek word ‘Techne’. It draws its meaning from “the activities and skills of the craftsman, but also for the arts of the mind and the fine arts”.⁶⁵ Technology, Heidegger says, is a mode of revealing – and thus technique could be said to be the application of revealing.⁶⁶ ‘Traditional Material’ is an equally challenging concept to quantify, particularly for heritage buildings and crafts alike.

62 Metcalf, B. ‘*Craft and art, culture and biology*’, in Dormer, P. (ed) ‘The Culture of Craft’, Manchester: Manchester University Press, 1997. p 71

63 Pye, D. ‘*The nature and art of workmanship*’, Revised Edition. Great Britain: The Herbert Press, 1995. pp 25-26

64 Ibid.

65 Heidegger, M. ‘*The Question concerning Technology*’ in Heidegger, M. ‘Basic Writings. From Being and Time (1927) to The Task of Thinking (1964)’, Krell, D.F. (ed). Oxon: Routledge, 2011. p 222

66 Ibid. pp 222-223



Figure 6: Francisco Lim,K. *San Sebastian Basilica*. From Wordpress blog published December 19th 2011. Photograph. Web. 25th February 2020.

The Minor Basilica of San Sebastian (Manila, Philippines), bears many of the outward architectural hallmarks of a traditional neo-gothic-style cathedral – however, the material chosen by the architects was not stone, but steel (after three previous masonry cathedrals were demolished by earthquakes).⁶⁷ Manufactured in Belgium and shipped to Manila in pieces to be assembled, San Sebastian was completed in 1891 and is the only example of an all-steel cathedral in Asia.⁶⁸ This is important as it forms a break from the traditional materials for church construction, and yet steel is potentially is a traditional material for crafts – which would be accepted by the Metcalf definition. Interestingly, however, those who originally built the cathedral chose to paint the steel walls in a faux imitation of stonework, shown in figure seven.



Figure 7: Alvin Villar, E. *Wall mural inside San Sebastian Cathedral, Manila, Philippines*. 2016. Photograph. Web. 25th February 2020.

67 Leggio, C. *Investigation Of The Deterioration Of The Trompe L'oeil Interiors Of San Sebastian Basilica, Manila, Philippines* University of Pennsylvania, Thesis. 2012. Available at https://repository.upenn.edu/hp_theses/192/

68 Uncredited, '*San Sebastian Church*' [Online] <https://web.archive.org/web/20150323202626/http://whc.unesco.org/en/tentativelists/518/> [27th November 2019]

Stone, as a building material, denotes values of strength, durability, and solidity. Therefore, by choosing to represent stonework, the painted steel appears to try to convey the same traditional significations to the viewer. Steel is a utilitarian material, in modern architecture, it may be utilised as a more industrial aesthetic. The decision to paint the steel and thus render it in a facsimile of more acceptable materials for the context is poignant – it suggests that the original designers and artists did not value the material for its intrinsic aesthetic. The choice to conform to the aesthetic of traditional stone churches and cathedrals may have been an attempt to convey authenticity as a place of worship – inferring that the stonework is as of itself a signifier of a religious place.

The world of crafts has similar benchmarking authorities that hold the ideals of tradition in place, to maintain their contextual relevance. Livery Companies in London are the direct descendants of the medieval guilds – some such as the Weaver’s Company having been in recorded existence since the Twelfth Century.⁶⁹ Their role since their inception has been to safeguard the knowledge of their skills and to ensure the training is passed on to the highest of standards.⁷⁰ The Heritage Crafts Association emulates the work of UNESCO by producing and publishing a “Red List of Endangered Crafts”, highlighting those traditional practices which are in danger of becoming “extinct” in the UK.⁷¹ Interestingly, the list includes what could be perceived as relatively modern crafts, such as Neon Bending as endangered, but also includes a case study of the resurrection of Sieve and Riddle making. The craft was initially listed as “Extinct”, yet was downgraded in 2018 to “Critically Endangered” after two makers undertook the training to begin commercial manufacture once more.⁷² This is particularly interesting, as it demonstrates that even crafts that are deemed lost are still recoverable, despite what the evocative labelling may suggest.

In all of these cases, what is being explored and analysed is a tangible object which has a quantifiable physical presence. The situation changes however when these artefacts make the transition from the ‘real world’ into the ‘digital world’ and are stripped of their physicality.

69 Uncredited, City of London, ‘*Livery Companies*’ [Online] <https://www.cityoflondon.gov.uk/about-the-city/history/Pages/livery-companies.aspx> [29th January 2020]

70 Ibid.

71 Carpenter, D. ‘*The Heritage Crafts Association Red List of Endangered Crafts*’, 2019 edition. [Online] <https://heritagecrafts.org.uk/wp-content/uploads/2019/03/HCA-Red-List-optimised.pdf> [29th January 2020]

72 Ibid.



ABSTRACTING
THE REAL

This is somewhat the case with Notre Dame – the physical entity that existed and had been understood for centuries, now no longer remains.

Very few documents exist from the twelfth century construction of the ‘original’ Notre Dame, documentation from that era was either simply not made, or not valued enough at the time to warrant keeping.⁷³ However, during the nineteenth century restorations, many detailed drawings and plans were created by Eugene Viollet-de-Luc. Entrusted to the MAP historical document archives are blueprints, watercolour paintings, and maps, including some that are even colour coded to the very stone as to which were worked on during the renovations.⁷⁴ These will no doubt be of exceptional value to the restorers who will need to piece together the ruined Cathedral, however, recent technologies will be able to take this one step further. Where documents of the past relied on the marks of a pencil, the documents of the future increasingly are reliant on the records of a laser.

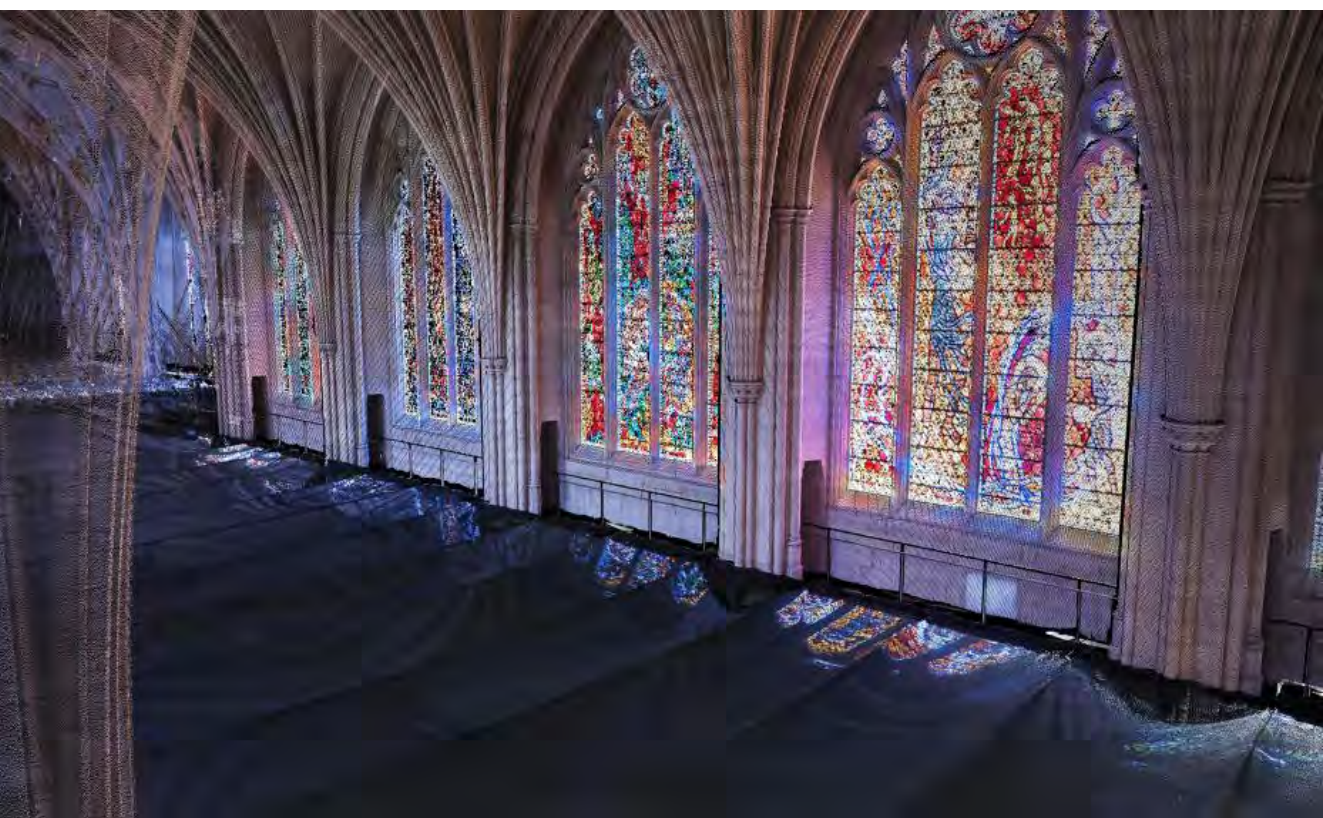


Figure 8: Tallon, A. *3D Scan of Notre Dame Cathedral, interior*, 2019. Render. *National Geographic*. Web. 25th February 2020.

73 Smith, K. N. 'Notre Dame Cathedral will never be the same, but it can be rebuilt' [Online] <https://arstechnica.com/science/2019/04/notre-dame-cathedral-will-never-be-the-same-but-it-can-be-rebuilt/> [29th December 2019]

74 Casert, R. 'Architect Who Died 140 Years Ago Left Detailed Guide for Rebuilding Notre Dame' [Online] <https://www.insurancejournal.com/news/international/2019/04/24/524531.htm> [29th December 2019]

Figure eight shows the representation of the work of Andrew Tallon, an art historian who conducted significant detailed scans of Notre Dame Cathedral.⁷⁵ A row of bright stained glass windows is visible, including the stonework which surrounds them. The light casts coloured light onto the walls, creating shadows in the top of the arches. Reflections/projections of the stained glass appear below on a net which is visible strung across the bottom on the image. Individual stones can be picked out in detail from the column on the very right-hand side, subtle dark lines can be seen to border each piece. In the leftmost foreground is a translucent section of an arch, still in colour but with sections of the cathedral clearly visible through the stonework.

The translucency of the arch reveals what this image truly is – a point cloud of data containing information such as colour and location in space, coalesced into the form of the cathedral. This is an image of a collection of tiny photographs, each of a specific location, and creating a picture of the whole. It could be compared to a three-dimensional pointillist painting. Only when viewed from a distance do the furthest areas approach a resemblance of solidity, due to the density of the data. Stone can denote strength and rigidity, and yet the transparency of the stone on the left instead subverts these qualities and instead invokes a sense of the opposite. It appears insubstantial and fragile, almost ethereal – a ghost of the building. It shows also that this is merely a surface, the scans only collect data from the outermost faces of the objects, the internal is lost.

The casting of the shadows and projection of the stained glass would suggest that there is some form of illumination source (implied sunlight). This light suggests warmth, and perhaps a grounding in the real world. Likely there was sunlight at the time of the scan – but what is not visible in this image is how the scans exist within the digital space, better illustrated by figure nine.

75 Shea, R. H. *'Historian uses lasers to unlock mysteries of Gothic cathedrals'* [Online] <https://www.nationalgeographic.com/news/2015/06/150622-andrew-tallon-notre-dame-cathedral-laser-scan-art-history-medieval-gothic/> [31st December 2019]



Figure 9: Tallon, A. *3D Scan of Notre Dame Cathedral, exterior*, 2019. Render. National Geographic. Web. 25th February 2020.

The scans exist in a void of nothingness, completely isolated from their contextual surroundings. While the shadows and light capture some of the aura of the edifice on the day of scanning, they are now only echoes of the context. The scan exists separately from the real world within the computer as a digital skeuomorph, retaining the features of the original but abstracted from the purpose – it is a simulation of the structure.

The concept of simulation, suggested by Jean Baudrillard, plays an enormous part in both the digital and the physical realms of digital manufacture. Baudrillard postulates how modern society has become disengaged from the real world which used to be mapped and modelled, instead now further maps and models are created based on the previous iteration in an ever-continuing cycle – the precession of simulacra. The distinction between real and imitation becomes blurred with the loss of the reference points in reality from which the artificial is measured.⁷⁶ If nothing is truly real, then there can be no replicas.

“It is no longer a question of imitation, nor duplication, nor even parody. It is a question of substituting the signs of the real for the real.”⁷⁷

76 Felluga, D. *Modules on Baudrillard: On Simulation.* [Online] <https://cla.purdue.edu/academic/english/theory/postmodernism/modules/ baudrillardsimulation.html> [9th January 2020]

77 Baudrillard, J. Translation by S. F. Glaser. *Simulacra and Simulation*, USA: The University of Michigan Press, 2006.

Baudrillard lays out three Orders of Simulacra:

First Order: The replica image is clearly discernable as being an imitation

Second Order: The lines between real and artificial become blurred to the point that the underlying reality is becoming hard to reveal, but still retrievable through close inspection.

Third Order: The imitation precedes and determines reality – pure simulation.⁷⁸

In the case of Notre Dame, there now exists a duality to the 3D scans - that which still exists in situ at the site (such as the majority of the stonework), and that which has now been destroyed in the fire (such as the spire and timber roof structure). The pieces that still exist are digitally twinned, yet those that are lost now exist only in the simulation. If a reconstruction were to take place, then they would likely be based on the digital copy – which could be interpreted as a creation of second to third-order simulacra.

When an object is 3D scanned, the original is unaltered, and yet a duplicate is taken away by the person undertaking the scan. There is then a dilemma of which, if any, ownership rights are transmittable too and accompany the scan.

This is exemplified by the case of the Nefertiti Statue, with the original statue held by the Berlin Neues Museum. In 2015, two artists purported to have entered the museum with a concealed 3D scanner, assembled from a Microsoft X-Box Kinect device, and collected enough digital data to create a 3D printable model, which they subsequently released on the internet free to download as “The Other Nefertiti”.⁷⁹ Closer examination by experts however raised doubts on the genuineness of the claims that this was collected by the pair, as the scan quality seemed vastly greater than what would be expected from the limited technology apparently utilised. The suspicion of artist Cosmo Wenman was that this was, in fact, a data leak of one of the museums own 3D scans undertaken by TrigonArt.⁸⁰

Wenman pursued the museum for access to their held digital data, under the provisions of the freedom of information act, and as a public institution, they were obliged to respond. This however resulted in a lengthy legal battle between Wenman and the Museum over the operational copyright of the bust. While the Museum claimed ownership of the 3,000-year-old original (which was taken from Egypt in the 1920s by German archaeologists, presenting another cultural theft argument akin to the issues surrounding the Elgin Marbles in the British Museum), ownership of the 3D file was more contentious.⁸¹

78 Felluga. ‘Modules on Baudrillard’ [Online]

79 Wilder, C. ‘Swiping a Priceless Antiquity ... With a Scanner and a 3-D Printer’ [Online] <https://www.nytimes.com/2016/03/02/arts/design/other-nefertiti-3d-printer.html> [16th January 2020]

80 Wilder, C. ‘Nefertiti 3-D Scanning Project in Germany Raises Doubts’ [Online] <https://www.nytimes.com/2016/03/11/arts/design/nefertiti-3-d-scanning-project-in-germany-raises-doubts.html> [16th January 2020]

81 Harris, B. and Zucker, S. ‘Who owns the Parthenon Sculptures?’ , Youtube Video.

The overseeing body, the Stiftung Preußischer Kulturbesitz (SPK), initially refused Wenman’s request on the grounds of potential damage to commercial interests - the “gift shop defence”. After significant chasing, the SPK allowed the viewing of the data under strict guidelines at a consulate building in Los Angeles, then at the offices of a large law firm. The SPK treated the data, in Wenman’s words, as though they were a state secret. The offered copy for inspection proved poor, and so Wenman pursued further, until he finally received a copy of the scan on a USB drive. The scan was the full quality digital image that was asked for, however, the SPK had seen fit to attach Creative Commons copyright license to the model (shown in figure ten).⁸²



Figure 10: Wenman, C. ‘Copyright label upon Nefertiti Scan’, 2019.

SmartHistory, Youtube, 2018. Available at: https://www.youtube.com/watch?v=QRH105_ztAw [16th January 2020]

82 Wenman, C. ‘A German Museum Tried To Hide This Stunning 3D Scan of an Iconic Egyptian Artifact. Today You Can See It for the First Time’ [Online] <https://reason.com/2019/11/13/a-german-museum-tried-to-hide-this-stunning-3d-scan-of-an-iconic-egyptian-artifact-today-you-can-see-it-for-the-first-time/> [16th January 2020]

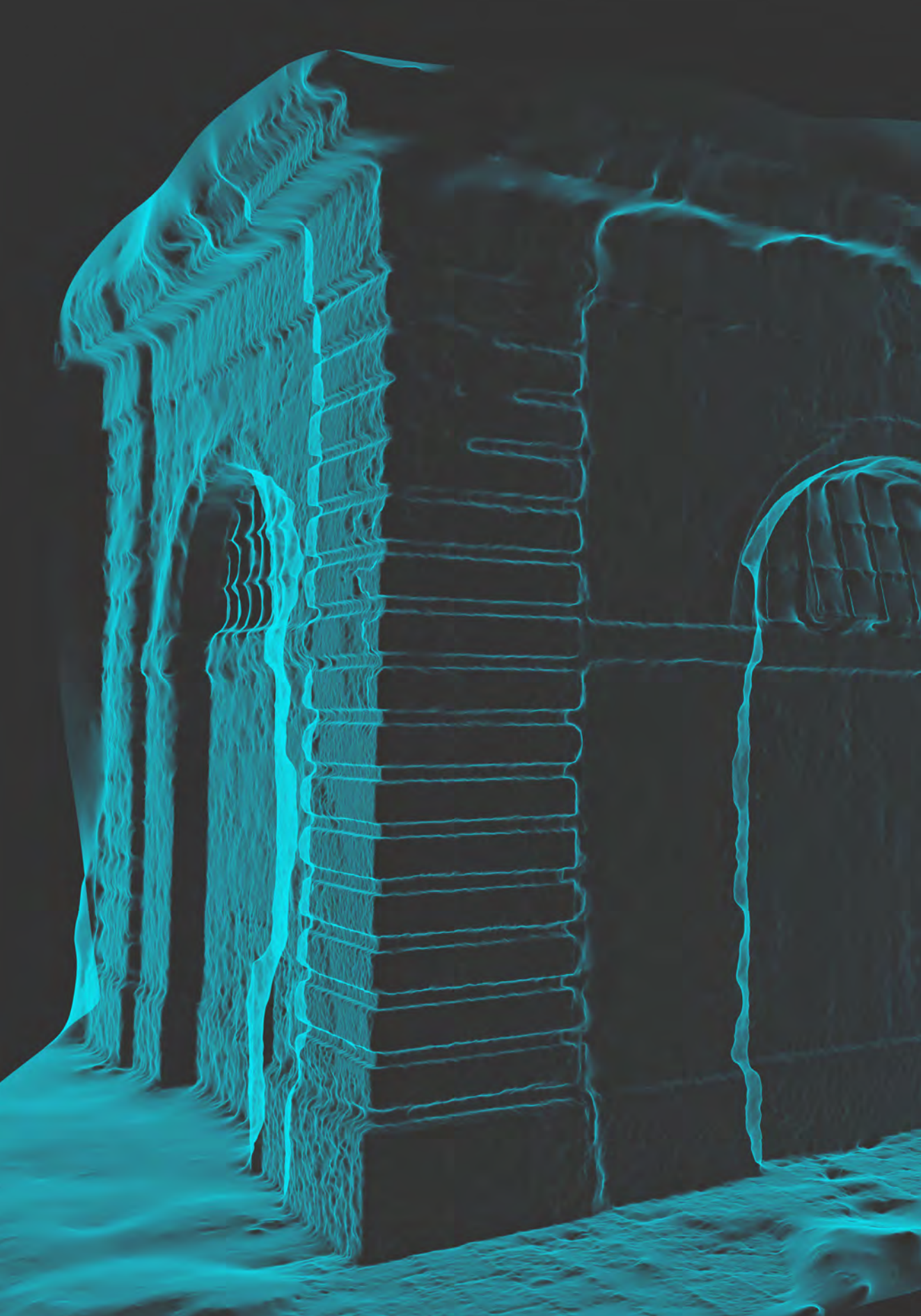
The inclusion of the copyright notice on the underside of the scanned bust, in particular the creative commons licence, implied that the museum was claiming copyright protection on a 3,000-year-old work of art, not just the digital version. Under Article 14 of the EU Copyright Directive, public works of art are no longer under the remit of copyright law – and so the Neues Museum’s attempt to protect the work is fundamentally flawed, and it may even verge on ‘Copy Fraud’ – whereby the claim of copyright is made without any being applicable with works in the public domain.⁸³

Arguably, the Neues Museum was overstepping the bounds of its role as an institution entrusted with protecting cultural history for future generations, and instead they are acting as gatekeepers. What can be expressed is a reasonable preference, for the museum to ask that scans are not used for commercial purposes – though this is unenforceable.⁸⁴

These claims of ownership are challenging when applied to a digital realm when the link to the real is broken and abstracted - this situation is only exacerbated when the digital representation transitions back into the real world through methods such as digital manufacture.

83 Charr, M. ‘*Legal Case Concerning a 3D Scan of a Museum Artefact May Impact on All Institutions*’ [Online] <https://www.museumnext.com/article/legal-case-concerning-a-3d-scan-of-a-museum-arteifact-may-impact-on-all-institutions/> [17th January 2020]; Weinberg, M. ‘*The Nefertiti Bust Meets the 21st Century*’ [Online] <https://slate.com/technology/2019/11/nefertiti-bust-neues-museum-3d-printing.html> [17th January 2020]

84 Weinberg. ‘*The Nefertiti Bust Meets the 21st Century*’ [Online].





REFLECTIVE
WRITINGS ON 3D
SCANNING

To understand the interaction between the building and the person conducting a 3D scan, I took two trips on the 10th of November 2019 and 7th of December 2019 to Royal William Yard, Plymouth, to collect data through photogrammetry. This method of scanning was chosen for a number of reasons – it is the easiest method for model capture without requiring specialist tools (so therefore potentially available to all), and it is the least intrusive.

The intrusiveness played a key part in my experience of taking the scans. Royal William Yard is technically owned privately, and I did not seek the permission of the site owners, and so by certain definitions, I could potentially have been “stealing” a digital copy of their physical possessions. Photography is allowed (note: not explicitly signed to suggest the contrary), yet I did not wish to disclose the nature of the photography I was undertaking.⁸⁵

For effective scans to be compiled, the photographs have to be taken from a range of angles to make as much of the object visible in a number of images, which creates reference points through parallax. For larger scans, this meant I was required to slowly walk back and forth over the same section of the object being scanned, holding my phone at various heights with each pass. It certainly may have looked suspicious to onlookers as I walked around the corners of buildings, holding my phone high above my head taking photos.

85 See earlier discussed works regarding ‘The Other Nefertiti’ heist. p 31



Figure 11: Dinning, L. *Another date turns into an opportunity to photograph brickwork*, 2019. Photograph

Despite all that I physically was doing was taking photographs, the intention to create a 3D model for printing caused a slight sense of guilt, as though I was stealing something from the place that did not belong to me. I did not hold the authority over the object, and therefore by extension over the scanned object. In opposition to the thoughts of Benjamin, I did not sense any loss of authority of the scan – what was ever-present was the authority of the original.⁸⁶

I did not feel at the time as though the act of scanning and creating a 3D Model created any disconnect between the two. However, once in the software and devoid of context, I realised that much of what had signified the aura of the building had indeed been removed – it was only once I was out of the location that this began to take hold. It was most apparent when manipulating the models to prepare for 3D printing – I could move the structures in unnatural and impossible ways, so even universal constants of gravity no longer applied.

⁸⁶ Robinson, A. 'An A to Z of Theory | Walter Benjamin: Art, Aura and Authenticity' [Online] <https://ceasefiremagazine.co.uk/walter-benjamin-art-aura-authenticity/> [7th January 2020]



Figure 12: Holmes, M. *RWY Corner Scan 2, compilation of captured images*, 2019. Photograph.



Figure 13: Holmes, M. *RWY Corner Scan 2, 3D model*, 2019. Render.

Figure twelve shows a composite image of the frames taken by myself on location – by reading the images left to right on each row an indication of the motion that I had to follow can be seen, passing around the corner multiple times and at multiple heights. The resulting 3D model, created using Autodesk ReCap Photo, is seen in figure thirteen. This is the raw data, pre-cleanup and any form of manipulation.

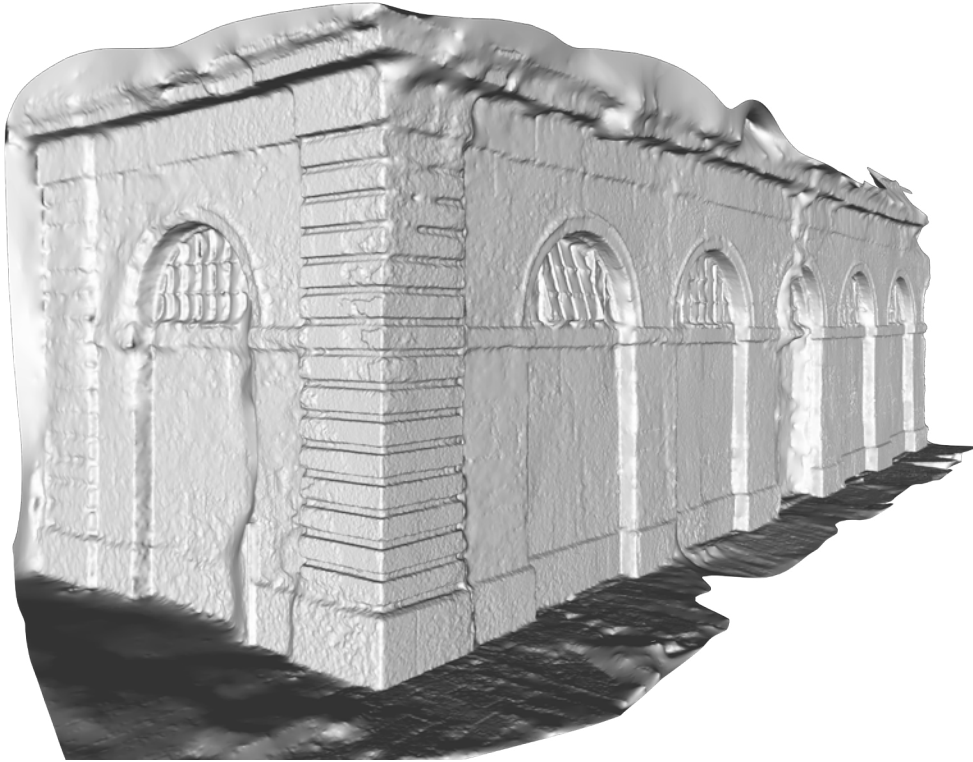


Figure 14: Holmes, M. *Royal William Yard – The Gatehouse full wall scan model*, 2019. Render.

Figure fourteen shows the compiled, unedited model of a full wall scan of The Gatehouse. With this model, in particular, the loss of object authority was apparent, due to the extended visual context the larger model afforded. While the corner scan in figure thirteen has few identifiers to denote scale and material, the larger scan contains signs of the intended size and purpose of the object – it looks like the side of a building, complete with architectural decorations, windows, and floor. To be able to alter, move and adjust the building placed power in my hands as a creator.

Therein lies the potential issue - alteration is easy, and almost happening invisibly. Even at the point of import, the computer begins to make assumptions and 'best guesses', fundamentally changing the data in the background without the users knowledge. Joining and smoothing algorithms run, reducing the sharpness and quality. I certainly feel that, regardless how good my scanning techniques, there will always be some form of degradation, which calls into question the accuracy of the scans, and by extension any work made from it.



REMASTERING THE
REAL

When using the 3D scan data to rebuild and recreate, the question is what is transferred back into the physical world that either existed in the scan, or the model regains in the real. These can be concepts such as ownership, authorship, originality – all of which serve to alter the perception of the object in comparison to the original.

When looking at historic buildings constructed from natural stone - castles, churches, and cathedrals – it may suggest to the viewer a sense of permanence of the structures. The material weight and inherent strength in conjunction with the sheer age of many of these buildings suggest almost an invulnerability. However, this is far from the reality—especially in the case of a substantial fire.

Notre Dame, like many other historic cathedrals of that era in France, was constructed mainly from a form of limestone. When subjected to intense heat, the stone can be both physically and chemically deteriorated, often permanently and irreparably. At increasing temperatures, colour changes can form in the stone as processes such as calcination occurs, until at roughly 800-1000°C the stone is reduced to a white powder.⁸⁷ Thermal expansion and contraction can cause stonework to shatter and flake in a process known as spalling (shown in figure fifteen), which can in a sadly ironic twist be exacerbated by the very efforts of firefighters to extinguish the flames -as the flow of cold water can create a thermal shock resulting in further weakening.⁸⁸ These changes irreversibly affect the structural integrity and aesthetic quality of the stonework – much of which would have to be assessed and replaced in the following conservation efforts.



Figure 15: Uncredited, *Spalling due to thermal shock in stonework from a monastery in Lobenfeld, Germany*. Photograph. Undated. Image sourced from Hajpal, M. *Fire Damaged Stone Structures in Historical Monuments. Laboratory Analyses of Changes in Natural Stones by Heat Effect*. Web. 25th February 2020.

87 Chakrabarti, B., Yates, T. and Lewry, A. 'Effect of fire damage on natural stonework in Buildings'. In 'Construction and Building Materials', Vol. 10, No. 1, 1996. pp. 539-544
, Gomez-Heras, M., McCabe, S., Smith, B.J. and Fort, R. 'Impacts of Fire on Stone-Built Heritage an overview' in 'Journal of Architectural Conservation', Number 2, Volume 15, July 2009. Pp47-59.

88 The suggestions of Donald Trump to use a flying water tanker to douse the flames of the roof fire at Notre Dame could well have likely resulted in the total destruction of the cathedral – hence why officials were quick to dismiss his 'help'; Morris, C. *French Officials Slam Trump's Proposed Solution to Notre Dame Fire* [Online] <https://fortune.com/2019/04/15/notre-dame-fire-trump-french-reply/> [30th January 2020]

This lost stonework could prove difficult to replace in an authentic fashion (at least in a material sense) to the lost originals – the vast majority of Notre Dame are carved from Lutetian limestone, extracted from the very bedrock of Paris itself from long-abandoned underground quarries. These stretch far below the city, and are now covered as a result of urban sprawl over the many centuries.⁸⁹



Figure 16: Concr3de, *3D printed Le Stryge Gargoyle*, 2019. *Dezeen*. Web. 26th February 2020.

89 Shea, N. 'Under Paris' [Online] <https://www.nationalgeographic.com/magazine/2011/02/paris-catacombs/> [17th November 2019]

One company has proposed an interesting methodology for reconstructing some of the architectural detailing that has been lost, through additive manufacturing.⁹⁰ Concr3de, based in Rotterdam, is a digital manufacturing company that specialises in the printing of stonework with genuine stone-based materials.⁹¹ In the Medium blog post by co-founder Eric Geboers (which was later picked up by several design media sites such as Dezeen), what could potentially set apart the printing for Notre Dame different to their normal commercial stone printing would be that the extruded material could be formed from the remnants of the destroyed structure itself.⁹²

Figure sixteen shows an example of a grotesque, printed in Parisian limestone mixed with ash as a direct simulation of using Notre Dame wreckage as a material.

The ability to print the Lutetian limestone and ash with this method has a distinct effect on the appearance of the grotesque, but also of its perception. On the surface, the image shows a distinct variance of colour, tone and seemingly texture.

David Pye comments -

“Painted marble or a waxwork figure look as good as real at a distance, but seen close-by they are insipid because their diversity falls short of that in real marble or skin”⁹³

While not a painted representation of stone, the print is still arguably a facsimile of the true material (due to the inclusion of a binding agent), and yet there is a discrete amount of what could be described by Pye as diversity in the visual appearance of the grotesque – the uneven streaks of grey, the patchiness of the overall cream-white colour - all in the usual context could signify and denote variations in the carved stone and the effect of aging to the material over centuries of weather. Neither statement is true – they are falsities created through the material, simulating such effects. By creating such an effective mimicry, to the reader this could now be construed as reality – as Howard Risatti remarks -

“When the work of art is mistaken for the actual thing it is meant to represent, it disappears as a visual sign and inevitably returns to the world as the thing it represents.”⁹⁴

The effect would not be the same without the recycled material. Were the surface to bear the marks of the 3D printing process, then the object may be interpreted

90 It is worth noting the 3D Printing in this dissertation is used to denote many different varieties of additive manufacture. The process used by Concr3de is Binder Jetting, whereby a powder in a vat is solidified using an inkjet style nozzle which dispenses a binding agent. At each layer, powder is raked over the object, and the process repeats to build the artefact. A detailed explanation of binder jet printing can be found at: <https://www.3dnatives.com/en/powder-binding100420174/>

91 Uncredited. ‘Materials’ [Online] <https://concr3de.com/all-materials/> [16th November 2019]

92 Goebers, E. ‘Rebuilding Notre Dame: a phoenix rising from the ashes’ [Online] https://medium.com/@eric_geboers/rebuilding-notre-dame-a-phoenix-rising-from-the-ashes-f087bf89f5ed [27th September 2019]

93 Pye, D. ‘The nature and art of workmanship’, Revised Edition. Great Britain: The Herbert Press, 1995. p.67.

94 Risatti, H. ‘A Theory of Craft – Function and aesthetic expression’ United States of America: The University of North Carolina Press, 2007. pg136.

primarily by its manufacturing technique, rather than the overall aesthetic and meaning it was created to show and represent. If the colour were to be uniform, again the illusion would be broken, and a sense of uneasiness in the reader may be apparent, which disconnects signifier from signified.

Parallels could be drawn to the work of Masahiro Mori in the field of developing lifelike humanoid robotics, in a situation coined as the “uncanny valley”. Mori hypothesised that as the appearance of humanlike robots approached that of a perfect human likeness, affinity with the robot would rise to a point, then dive quickly into uneasiness and repulsion, before reverting back to higher levels of empathy (see figure seventeen).⁹⁵ This instinctual feeling of “something is wrong” could easily apply to the replication of historic or visually familiar artefacts, should the senses detect an incongruity in the expected experience. If an object looks obviously fake, then it will likely be accepted, as will something that carried accepted markers that would define it as authentic. The middle ground, where the object is either a reasonably good forgery, or an altered original, there is likely to be doubt cast in the viewers’ mind as to the originality of the piece, and therefore likely result in a loss of value and dismissal.

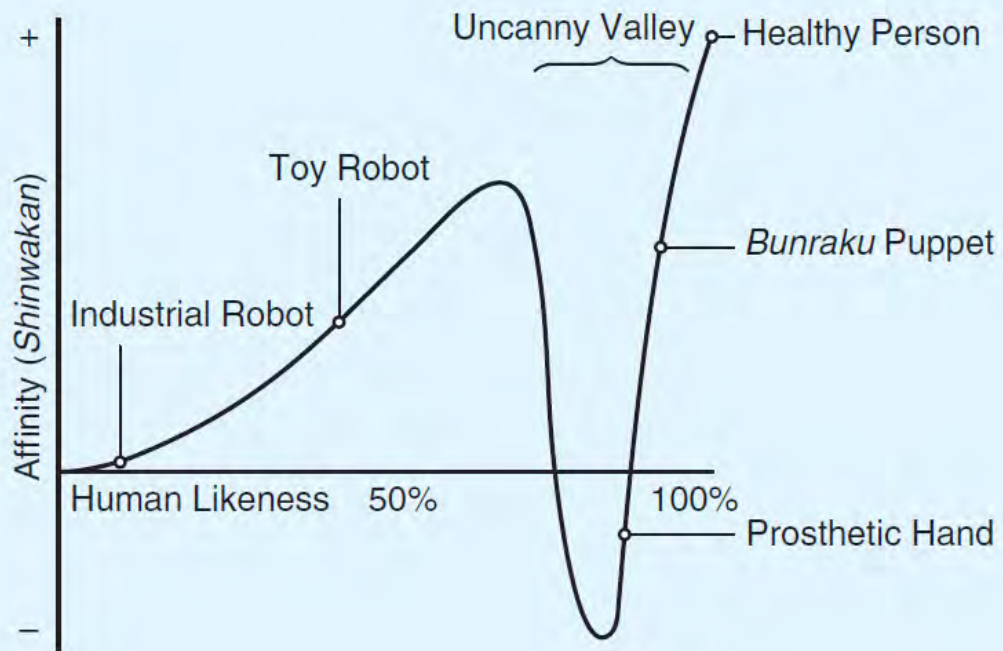


Figure 17: Mori, M. *Affinity vs Human Likeness* from *The Uncanny Valley*, in IEEE Robotics & Automation Magazine, Volume 19 Issue 2, 2012. p 99

⁹⁵ Mori, M. Translated by MacDorman, K and Kageki, N. *The Uncanny Valley* in IEEE Robotics & Automation Magazine, Volume 19 Issue 2, 2012. Pp98-100

What is noticeable on the grotesque is the overall lack of material layer lines which would normally signify an object of 3D printed manufacture.⁹⁶ The smoothness of the surface of this statue acts to mask the process behind its construction, so much so to the point that it could conceivably be mistaken for a carved object, like the original that it is simulating in potentially a 3rd-order simulacra fashion.⁹⁷ Stephen Hoskin comments, current issues with 3D printed objects is that the digital craftspeople utilising the techniques are making ‘obvious’ objects – that is to say that they strongly resemble, and thus are bound by, the process which created them.⁹⁸ What is not clear from the image is whether the reproduced stonework retains any marks of the hand of the original maker – any irregular chisel cuts, layout marks, mistakes – which on the original iconify its human-crafted origin.

This raises a number of interesting situations. If the marks are no longer present - presumably through lack of detail in either the 3d scan mesh, the resolution of the 3d print, or even post-scan model manipulation - then this act of reproduction has erased the original maker from the physical history of the object, akin almost to plagiarism. If the marks remain, then the tangible link to the memory of the unknown stonemason is preserved in the recorded marks of his or her chisel, but what is lost is the intangible link which lies, in part, with the knowledge of the reader. If the replica is indistinguishable from the original, and the reader knows not of the replacement, the intangible link may remain in a false state of assumption that the artefact is indeed the real thing. If the reader knows it is a replica, they may see the marks of the hand of the maker, but know their hand never really touched the stone, severing the intangible empathetic human link to the past.

“Since the thing is made by human hands, the crafts object preserves the fingerprints – be they real or metaphorical – of the artisan who fashioned it. These imprints are not the signature of the artist; they are not a name. Nor are they a trademark.”⁹⁹

“Through the hand in craftsmanship, craft objects capture the efforts of their makers and make these efforts visible and palpable for us to comprehend”¹⁰⁰

Should then the replica carry a notice to reveal that it is not genuine, bracketing it in a manner suggested by Risatti as a means of isolating it clearly from that which is truly real, so as to avoid confusion in the mind of the viewer.¹⁰¹ This, however, is also problematic as, therefore, it creates the assumption that the 3D printed replica has no agency as a genuine artefact of its own right.

96 My positionality as a digital craftspeople working with 3D printing gives me insight into looking for key signifiers in a piece which would denote the manufacturing technique, beyond that of a ‘traditional’ craftspeople.

97 See chapter 2, p31.

98 Hoskins, S. *3D Printing for Artists, Designers and Makers*, 2nd Edition. London, UK: Bloomsbury Publishing PLC, 2018. Pp78

99 Paz, O. *Use and Contemplation*, cited in McCullough, M. ‘Abstracting Craft’, Cambridge, MA: The MIT Press, 1996. p10.

100 Risatti, H. *A Theory of Craft – Function and aesthetic expression* United States of America: The University of North Carolina Press, 2007. p196

101 Ibid. p136

To ascertain the genuineness, if the grotesque manufactured by Concr3de is scrutinised with the criteria set out by Metcalf in chapter one, then the statue possesses both context and, technically, traditional material.¹⁰² The reproduction exists in the same context as the destroyed original – the location, purpose, and meaning is not affected. The material forms an interesting grey area – while not 100% the true original stonework, as it is created from a processed form of said stonework mixed with a binding agent, then a high percentage of the object is, in fact, the original stone (potentially even the stone from the ‘genuine’ grotesque).¹⁰³ If this percentage invalidates the claim of the authenticity of the work from a material view, then it is unclear at what threshold would it be acceptable – if any.

There is a risk, from a metaphysical standpoint, of a Ship of Theseus paradox scenario.¹⁰⁴ Thomas Hobbes would argue that there is an opinion that, for Theseus’ ship, the act of replacing, repairing, or simply moving a plank alters the identity of the original irrevocably.¹⁰⁵ Michael Rea in his paper “The problem with material constitution” tackles this paradox and concludes the answer to lie in the importance of the ‘continuity of matter’ versus the ‘continuity of form’.¹⁰⁶ Although for this case, it appears to be a continuation of both manifested in the same physical embodiment.

The same paradox could then encompass the entire Cathedral of Notre Dame - both of the edifice before the 2019 fire, and of any future reconstruction. If the parts of the whole must all be authentic to a predetermined (or “sanctified”) original, then even the nineteenth century restorations by Viollet-le-Duc, such as the iconic wooden spire which so dramatically collapsed in the blaze, could be argued to render the pre-fire cathedral as unoriginal. Of all the versions of the Cathedral that have existed throughout time, it appears that the decision of which (if any, or indeed all) could be deemed ‘authentic’ and worth restoring is a matter of perception, guided by the AHD.

102 See chapter 1, p25.

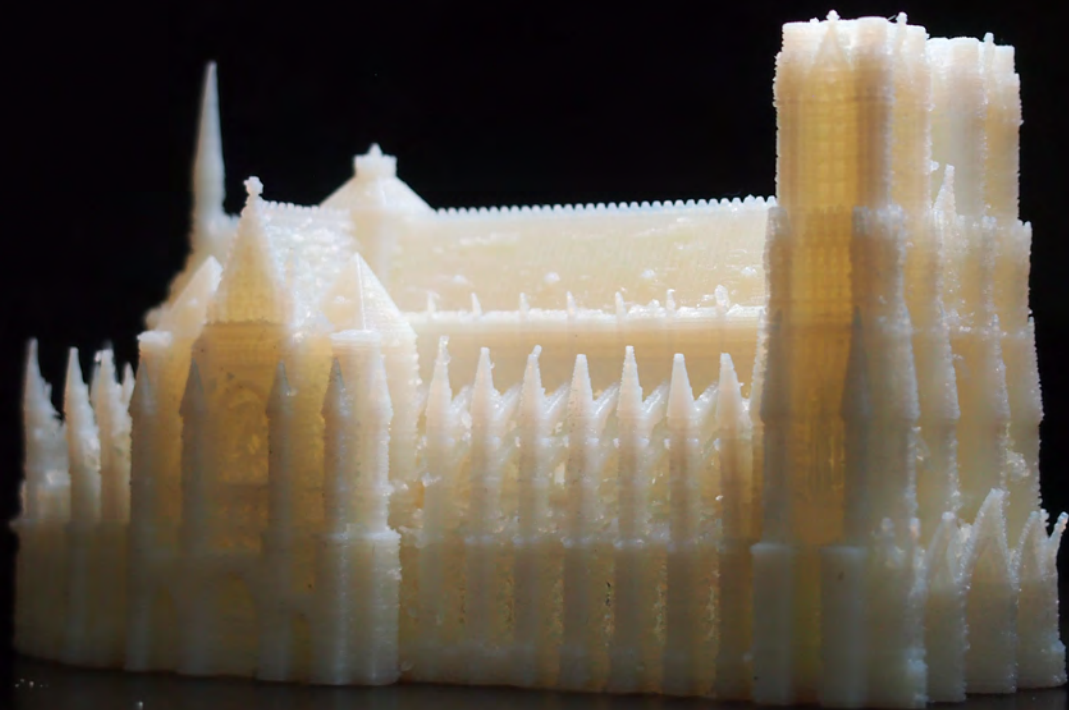
103 It is perhaps interesting to note that the grotesque Le Styрге, arguably one of the most famous grotesques of Notre Dame, is not part of the original 12th century cathedral – it was an addition by Eugène Emmanuel Viollet-le-Duc during the 19th Century renovations – see Uncredited, DigitalGeorgetown ‘*Notre Dame Cathedral Grotesque Le Styрге*’ [Online] <https://repository.library.georgetown.edu/handle/10822/554232> [30th December 2019].

104 “The ship wherein Theseus and the youth of Athens returned had thirty oars, and was preserved by the Athenians down even to the time of Demetrius Phalereus, for they took away the old planks as they decayed, putting in new and stronger timber in their place, insomuch that this ship became a standing example among the philosophers, for the logical question of things that grow; one side holding that the ship remained the same, and the other contending that it was not the same.” Plutarch, ‘*Vita Thesei*’ 22-23, in Cohen, M. ‘*Identity, Persistence, and the Ship of Theseus*’ [Online] <https://faculty.washington.edu/smcohen/320/theseus.html> [27th November 2019]

105 Hobbes, T. and Molesworth, W. (ed) ‘The English Works of Thomas Hobbes of Malmesbury’, 1839. p 137. Available at: https://www.humanities.mcmaster.ca/~rarthur/phil6A03/thomas_hobbes_the_english_w.pdf [26th February 2020]

106 Rea, M.C. ‘*The Problem with Material Constitution*’ in *The Philosophical Review*, Vol. 104, No. 4. 1995. pp 525-552

REFLECTIVE
WRITINGS ON 3D
PRINTING



Working with the 3D scans I took of a wall segment, I attempted to reproduce the scanned meshes through 3D printing in PLA.

I began 3D printing as a hobby over 3 years ago, and I have amassed a certain amount of tacit knowledge of the materials and processes involved – in a very similar way to my woodworking skills – through repeated trial and error. Far from being a print-and-forget solution that many seem to believe 3D printing is, there is a large amount of work that goes into getting a printer to operate well. Much as I know when my chisels are losing their cutting edge by the feel and the sound of the tool as it slices through the grain of timber, I feel a comparable connection with my printers. A number of issues can be diagnosed by sight – extrusion flow rate inconsistencies, unlevel build plate – but still more can be diagnosed by sound, such as aberrant vibrations, snagging nozzle, tangled material spool, and bed adhesion failure. I can tell when a print is finished on the machines from another room, entirely by the sound the end-stop mechanical switches ‘click’ in the final homing sequence. While the sense of touch has maybe been restricted and removed by the printer (unless you want a burnt and potentially trapped finger), other senses are heightened.

The response and control of the printer, as well as the models that I create or manipulate which are destined for this type of manufacture, rely now a significant amount of tacit knowledge. No two printers are the same due to mechanical differences and assembly inconsistencies, even on printers of the same make and model, which results in a more exploratory, play-like work process. The tacit knowledge personally works to remove for me the fear of failure, allowing a more in-depth and fluid work flow connecting to the medium.

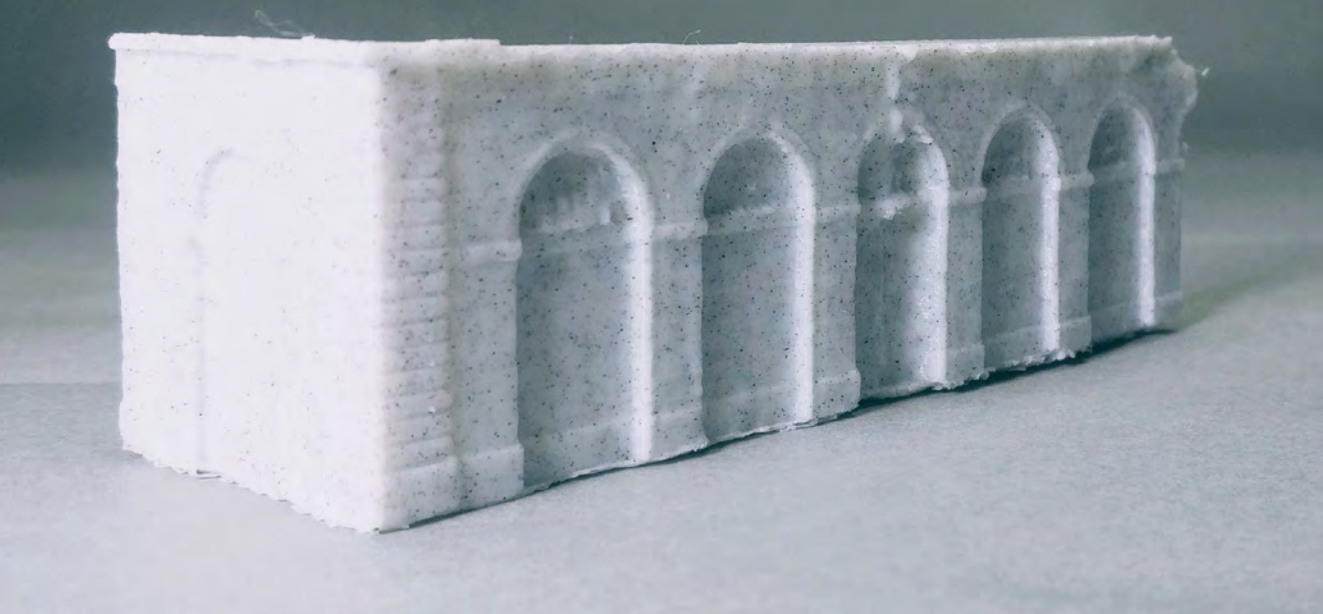


Figure 18: Holmes, M. *Section of Gatehouse 3D Model*, 2019. Photograph.

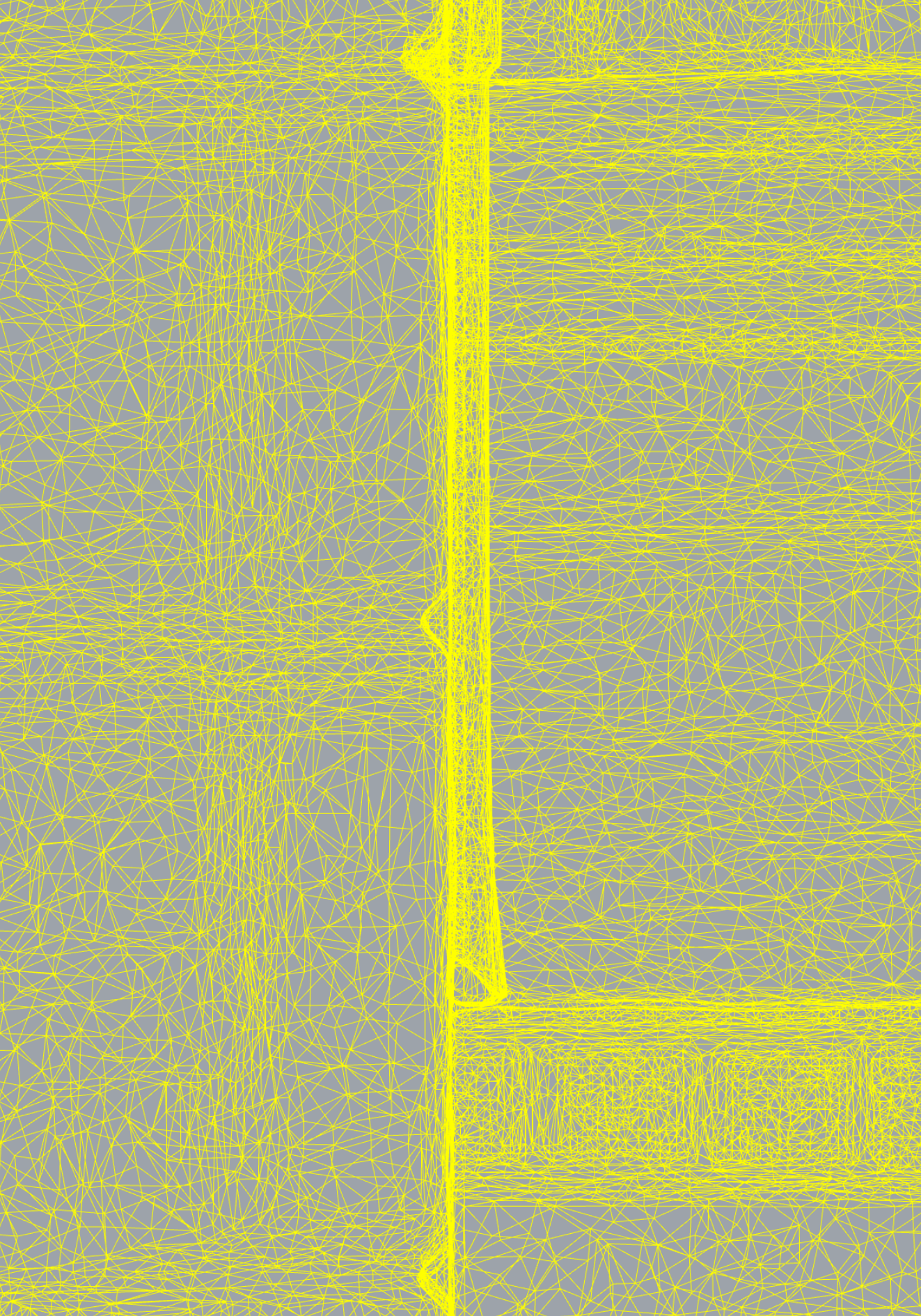
The print of Gatehouse section seen in figure eighteen is a solidified model based on the scan from the 3D Scanning reflective writings, figure fourteen. The detail of the corner stonework is visible, as are a number of the architectural mouldings around each of the 5 five arches along the right-hand stretch. Distortions are visible in the windows of all archways. The bottom level is uneven and sharp.

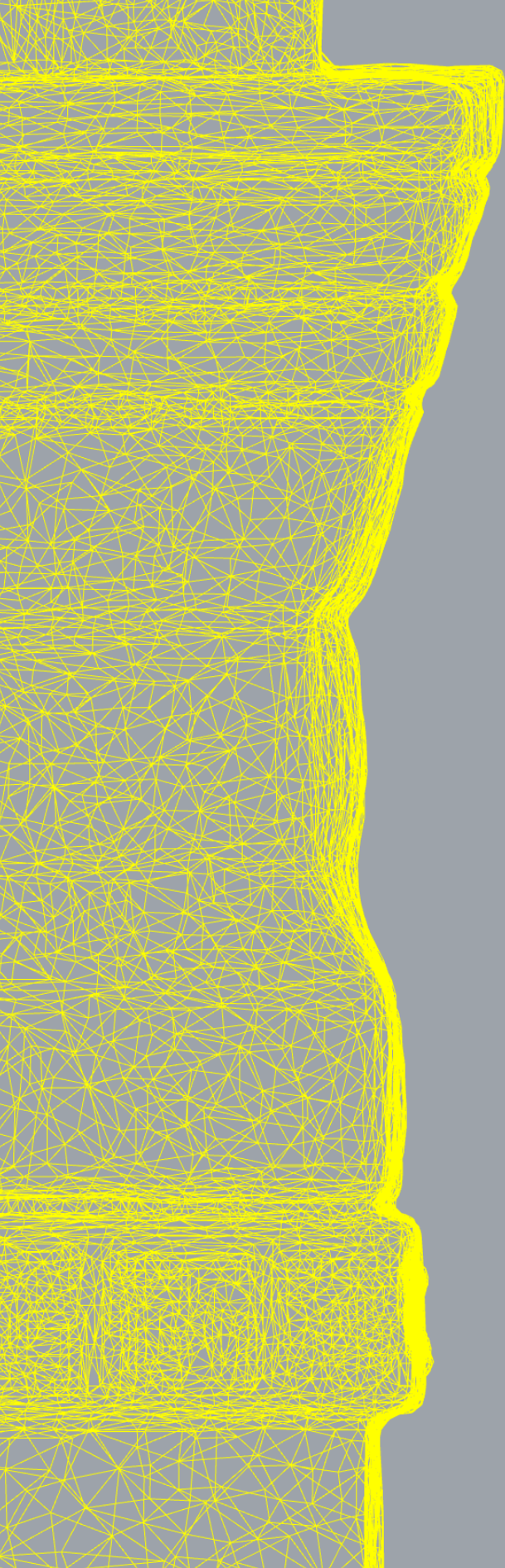
A vast amount of detail has been lost in the print, partly due to scale but partly also down to the resolution of the printer. While the layer lines are difficult to make out, they are still present, and serve to reassert to the viewer that this is a 3D printed artefact. The marble-effect PLA plastic that I chose to represent the model in works well to hide most of the marking, but has an unexpected secondary effect. The model when viewed has an aura of weight (perhaps instilled by the glossy stone-effect), yet when handled it is incredibly - and somewhat disappointingly - lightweight. As David Pye would say, it could fall into being “insipid”.¹⁰⁷

The effectiveness of the choice of the material, in that it creates the surface effect and finish is, I feel, important. It has the power to signify to the viewer almost the deception spoken of by Risatti, and discussed with the Concr3de model earlier, but the illusion is more easily broken as it is only a visual representation, lacking other attributes that would assert genuineness.¹⁰⁸

107 Pye, D. *The nature and art of workmanship*, Revised Edition. Great Britain: The Herbert Press, 1995. p.67.

108 See p46.





THE MYTH OF
AUTHENTICITY

In the postmodern era, concepts of authenticity and author have increasingly contested definitions, and this has been exacerbated by digital fluidity in the twenty-first century. Lines drawn between the tangible and the intangible are becoming progressively blurred, resulting in a questioning of the very fabric of the understanding of what makes an object valued as “real”.

Authenticity is a value for a place or object that can be gained, can grow over time, or indeed be lost – yet it is not a concept that can be transferred.

While western concepts place high value on the physical nature of an object, it is not necessarily the case for all cultures or indeed all artists. The Shinto temple of Ise Jingu in Japan has occupied alternating adjacent sites at the same location in the Mie Prefecture since the seventh century - yet each building is never more than twenty years old.¹⁰⁹ In a vicennial tradition called *Shikinen Sengu*, the temple is torn down and reconstructed to the same design with fresh timber, including the remaking of all treasures and furnishings.¹¹⁰ While the building is immensely valuable, both monetarily and to the Shinto religion, what is valued vastly more culturally is the cyclical transference of knowledge and skills to each successive generation of craftspeople that become invested in its reconstruction.¹¹¹

While each temple may not be “authentic” by western ideas of the original construction of the first temple on the site, the ideas encapsulated in the traditional knowledge passed on and inherited most certainly is. Where Pierre Nora may describe a preserved castle in the English countryside a *lieux de mémoire* – a site of memory - the temple in Japan instead forms a *milieux de mémoire* – an environment of memory.¹¹²

In 2001, artist Sol Lewitt created a work of art titled ‘Irregular Progression (Griesdorn)’ – a collection of 111 stacked rectangular concrete blocks, forming a number of towers of varying heights.

109 Valley, P. ‘History in the making: An unprecedented visit to Ise Jingu, Japan’s holiest shrine, to see it rebuilt under the beliefs of the Shinto religion’ [Online] <https://www.independent.co.uk/news/world/asia/history-in-the-making-an-unprecedented-visit-to-ise-jingu-japan-s-holiest-shrine-to-see-it-rebuilt-9555482.html> [22nd December 2019]; Interestingly, due to this alternating site building pattern, the temple can and has technically exist in two places at once – evoking again the Ship of Theseus paradox spoken of in Chapter 3, p49 – see also Lewbank, ‘Ise Grand Shrine’ [Online] <https://www.atlasobscura.com/places/ise-grand-shrine> [22nd December 2019]

110 Uncredited. ‘Rituals and Ceremonies’ [Online] <https://www.isejingu.or.jp/en/ritual/index.html> [22nd December 2019]

111 Edahiro, J. ‘Rebuilding Every 20 Years Renders Sanctuaries Eternal -- the Sengu Ceremony at Jingu Shrine in Ise’ [Online] https://www.japanfs.org/en/news/archives/news_id034293.html [22nd December 2019]

112 Nora, P. ‘Between memory and history: Les Lieux de Memoire’ in *Representations* No. 26, Special Issue: Memory and Counter-Memory. University of California Press, 1989. Pp 7-24



Figure 19: Uncredited, Sol Lewitt, *Irregular Progression (Griesdorn)* 2011, 2011. Photograph.

Depicted in figure nineteen is, at best, a representation of the artwork, for what is possessed by the owner of the piece is a certificate of authenticity and a set of precise instructions for how to assemble the concrete blocks. If and when the artwork is sold, the physical representation per instruction must be destroyed by the previous owner, to then be remade by the new possessor.¹¹³ What persists is the authentic concept and intention of the artist – the physical materiality (not here referring to the specified construction materials) is not the value. This piece is but one of many by LeWitt whereby the hand of the artist is disconnected from the physical representation of the concept. Initially starting as a collection of wall drawings, created through a series of exacting instructions, the inclusion of a signed certificate to accompany these directions began in the 1980s after a string of low-quality reproductions.¹¹⁴

113 Uncredited, 'Sothebys: American Sculpture; Beyond Limits – Sol Lewitt – Irregular Progression (Griesdorn)' [Online] <http://www.sothebys.com/en/auctions/catalogue/2017/beyond-limits-117010/lot.16.html> [23rd December 2019]

114 Angel, J. 'Sol LeWitt "Wall Drawings" and the set of instructions that constitute the body of his work' [Online] <http://jessica-angel-notes.blogspot.com/2012/10/sol-lewitt-wall-drawings-set-of.html> [23rd December 2019]

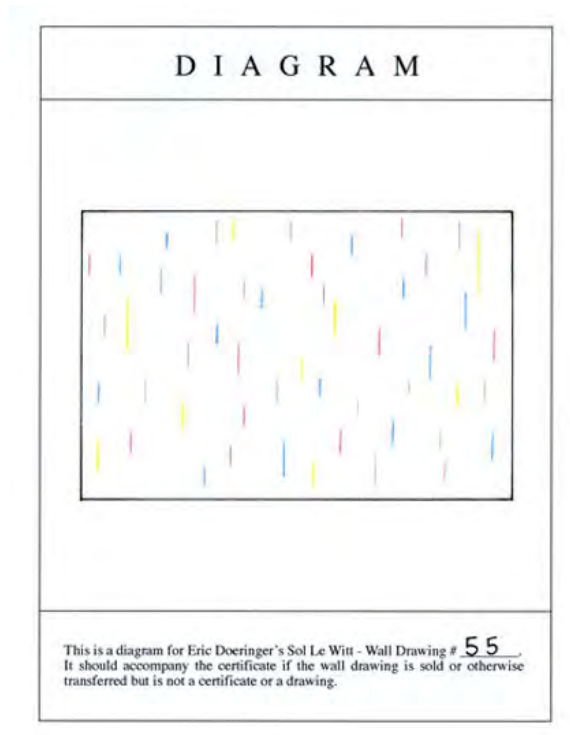


Figure 17: Uncredited, 'Diagram of Wall Drawing #55 by Sol LeWitt', 2010. Web.

Lewitt started by installing the drawings himself, however in the late 1960s the demand for the drawings outstripped his ability to create them – and so the implementation of his instructions was passed to a team of authorised technicians who could recreate the drawings to LeWitt's standards.¹¹⁵ Figure seventeen depicts part of the instruction set for Wall Drawing #55 includes a caption which states clearly that the depiction included is a diagram, not a drawing – this implies that the artist wishes for the diagram to carry no intrinsic value other than to impart the information with which to create the 'real' artwork.

This practice of technician-led installation continues today, even after the death of the artist in 2007. Although no 'new' LeWitt drawings are created, new depictions from the instructions are still freshly installed in galleries and exhibitions by the technical teams.¹¹⁶ By making the important factor of the work the idea, not the physical object, then the works can still be deemed authentic to the artist.

115 Lovatt, A. 'Ideas in Transmission: LeWitt's Wall Drawings and the Question of Medium' [Online] <https://www.tate.org.uk/research/publications/tate-papers/14/ideas-in-transmission-lewitt-wall-drawings-and-the-question-of-medium> [26th February 2020]

116 Willis, E. 'Installation in Progress—Sol LeWitt: Wall Drawing #370' [Online] <https://www.metmuseum.org/blogs/now-at-the-met/2014/sol-lewitt-installation> [26th February 2020]

“When an artist uses a conceptual form of art, it means that all of the planning and decisions are made beforehand and the execution is a perfunctory affair. The idea becomes a machine that makes the art.”¹¹⁷

This stands in contrast however to the work underway at the Basilica de La Sagrada Familia. Initially in the hands of architect Francisco de Paula del Villar y Lozano, control and the design was taken over by Antoni Gaudi in 1883. From 1914 onwards, Sagrada Familia became Gaudi’s sole project, living and working beside his workshop where he created plans, blueprints, and scale models for the advancing work on the Basilica until he was struck by a tram and killed in 1926. Construction was overseen from this point by Domènec Sugrañes, working from the drawings left by Gaudi. Disaster struck again when, as the result of fighting during the Spanish Civil War between 1936 and 1939, the workshop, as well as the large majority of the plans and models, were destroyed by deliberate fires.¹¹⁸ Despite this, construction according to Gaudi’s vision continued, and still does so to this day – though not without opposition.

In an open letter published on January 9th, 1965 in the newspaper La Vanguardia, objections were raised by a number of notable figures of the day, including renowned architects Le Corbusier and Alvar Aalto, calling for the construction to be halted.¹¹⁹

“It is a work of Gaudi, it is a work of art, and some people want to see it finished. But, is it possible to finish a building? Nobody would ever finish a painting or a sculpture, but can a building be completed without the architect who designed it?”¹²⁰

Their objection stood on the grounds that the building formed a piece of creative work by Gaudi, and without the direct instructions in the form of the plans and models which were regrettably lost, any continuation would be based on speculation and interpretation of the original artists intent. A deviation from the idea of the artist would render the piece as inauthentic – it should look as they wanted it to look.

This opinion would seem to support the ideals of restoration and renovation, yet as in the case of the restorative works undertaken at Chartres Cathedral, it is not so clearly accepted.

117 LeWitt, S. *‘Paragraphs on Conceptual Art’*, cited in Broeckmann, A. *‘Machine Art in the Twentieth Century’*, Cambridge, MA: MIT Press, 2016. p 157

118 Uncredited, *‘History of Basilica’* [Online] <https://sagradafamilia.org/historia-del-temple> [31st December 2019]

119 Sutton, B. *‘The Tortured 136-Year History of Building Gaudi’s Sagrada Familia’* [Online] <https://www.artsy.net/article/artsy-editorial-tortured-136-year-history-building-gaudis-sagrada-familia> [31st December 2019]

120 Letter to the Editor, *‘Construction Works at the Church of Sagrada Familia’*, translation by Pablo Alvarez Funes [Online] <https://www.aaronrenn.com/2015/07/30/a-manifesto-against-completing-sagrada-familia-church/> [31st December 2019]



Figure 20: Frankenberg, R. *The contrast between the restored and untouched sections of the cathedral is stark*, 2017. Web. *The New York Times*, 25th February 2020.

Figure twenty shows a section of the ceiling during restoration works undertaken to strip clean centuries of grime, dirt and candle soot from the stonework.¹²¹ The right-hand section shows the pre-restoration colouration – a dark grey/black, which provides a brooding, overcast, sultry presence to the gothic structure. The left-hand side shows the true colour of the limestone, as it would have looked to the original designers' intent during construction – bright, open and uplifting. Considering the connotations of religious interpretations of light vs. dark – sacred and sin, holy vs. unholy – the original view of the architect in creating a place of worship is perhaps understandable. Yet however, there was consternation from many, including the viewing public.

This was met succinctly and defensively by the lead architect of the restoration, Patrice Calvel, who remarked –

*“I’m very democratic, but the public is not competent to judge.”*¹²²

121 Ramm, B. ‘A Controversial Restoration That Wipes Away the Past’ [Online] <https://www.nytimes.com/2017/09/01/arts/design/chartres-cathedral-restoration-controversial.html> [22nd August 2019]

122 Penketh, A. & Willsher, K. ‘US architecture critic sparks row over Chartres Cathedral restoration’ [Online] <https://www.theguardian.com/artanddesign/2014/dec/19/us-architect-sparks-row-chartres-cathedral-restoration-paul-calvel> [11th January 2020]

This opinion is again the voice of the AHD, spoken of in Chapter one – the architect here infers that they are the authorised and designated spokesperson, and therefore competent to make the decisions. The inclusion of the declaration of being “democratic” stands at odds to this but alludes to the overall idea that the ADH is primarily of a political agenda.

The difference in the colour alters the perception of the age of the structure – the left-hand side appears newer as if cleanliness connotes newness, and yet the underlying structure itself is unaffected. The opinions of the alteration show how the derivation of authenticity is based on social mythology created around a perceived aesthetic.

Art Historian Erwin Panofsky commented on the social context of the viewer of the stonework of Chartres:

“We cannot help enjoying their mellowness and patina as an aesthetic value; but this value, which implies both the sensual pleasure in a particular play of light and color and the more sentimental delight in the age and genuineness has nothing to do with the objective, or artistic, value with which the sculptures were invested by their makers. From the point of view of the gothic stone carvers the processes of aging were not merely irrelevant, but positively undesirable [...].”¹²³

The arguing back and forth between the two schools of thought is, at its centre, an argument between the ideas of structuralism and post-structuralism. Those believing that authenticity stems from certain definable qualities imply that authenticity can be codified into a notation, quantifiable and measurable. On the other hand, it could be seen that authenticity is a concept that defies notation – it is itself an intangible quality that is beholden to the interpretation of the viewer, and indeed the creator.

123 Panofsky, E. cited in Risatti, H. ‘A Theory of Craft – Function and aesthetic expression’ United States of America: The University of North Carolina Press, 2007. pp 81-82.





CONCLUSIONS

If the crafted object itself is made the focus, through these definable and descriptive qualities that structuralists may say crafts possess, and not down to the craftsperson at the heart of the process, then it invokes the work of Roland Barthes ‘*The Death of the Author*’ -

*“We know now that a text does not consist of a line of words releasing a single “theological” meaning (the “message” of the Author-God), but a multi-dimensional space in which a variety of writings, none of them original, blend and clash. The text is a tissue of quotations drawn from the innumerable centres of culture. [...] the writer can only imitate a gesture that is always anterior. Never original. His power is to only mix writings [...] he ought to at least know that the inner ‘thing’ he thinks to ‘translate’ is itself only a ready-formed dictionary, its words only explainable through other words, and so on indefinitely [...]”*¹²⁴

Barthes here is commenting on how no writing truly is a work of authentic originality – instead, it is a collection of previously established themes, tropes, genres, etc. which have come before. As such, the author is no creator, and is instead more curator of ideas and concepts which assemble in an original way.¹²⁵

The craftsperson as the author behind the work, draws upon a range of skills, processes, techniques, and methods from a range of sources, assembling and curating them into a craft object. For instance, the dovetail joint is not attributable to one person, yet is an attribute utilised by many as part of a greater whole to become the artefact. It is part of the ‘dictionary’ of the craft, which is drawn upon by the creative to design (or curate) an original object - for instance, graphic designers may utilise a font that is not their own to communicate their message.¹²⁶

As an idea is fundamentally intangible, the line between authentic and fake becomes blurred when forming a reproduction. This is explored in terms of comparing music and painting by Nelson Goodman, and the creation of two categories: Autographical and Allographical art.¹²⁷

Painting is referred to as autographical, described by McCullough as the unification of author and execution, thus rendering duplicates inauthentic as they lack this defining combination – the artefact is the work, which can exist only once. Music is a form of allographical art, where multiple instances of the work are permitted to exist simultaneously:¹²⁸

*“[...] the composer’s work is done when he has written the score, even though the performances are the end products, while the painter has to finish the picture.”*¹²⁹

124 Barthes, R. translated by Heath, S. ‘*Image Music Text*’. London: Fontana Press, 1977. p 146

125 *The Death of the Author: WTF? Roland Barthes’ Death of the Author Explained* | Tom Nicholas, YouTube Video, Tom Nicholas, YouTube, 2019. Available at: <https://www.youtube.com/watch?v=B9iMgtfp484> [13th January 2020]

126 Lisefski, B. ‘*The Best Designers Are Both Creators and Curators*’ [Online] <https://modus.medium.com/the-best-designers-are-both-creators-and-curators-7fb8178962d9> [26th February 2020]

127 Goodman, N. ‘*Languages of Art*’ Brighton, Sussex: The Harvester Press Limited, 1981. p 113

128 McCullough, M. ‘*Abstracting Craft*’, Cambridge, MA: The MIT Press, 1996. pp 93-94

129 Goodman. ‘*Languages of Art*’, p 114

This informs Goodman's argument that there can be no forgery of a music score, each performance is as original as another. If copies of the score are made, each is genuine despite even of inaccuracies, and even in the instance of a forgery of the original manuscript, the score contained within the fake will still be genuine.¹³⁰ McCullough extends this idea to architecture, though notes that although the ideas of the architect are represented by intermediary drawings, these are not considered the work – it is the building.¹³¹

McCullough explores this further by relating it to traditional crafts, and remarks on an interesting situation that takes place when analysing to which category the work may fall. While one-off works can be described as autographic, the work of a craftsman in a likely scenario of producing a batch of objects results in an allographical collection. Each piece may have individual differences due to the hand of the maker, but when viewed as a whole each piece is, in McCullough's opinion, essentially interchangeable.¹³²

When applied to the digital technologies of 3D scanning and 3D printing, at first these digital crafts would appear to be allographical. Duplicate copies of the digital scan, or to produce through computer-controlled manufacturing techniques identical physical objects, are all as real as the original instance of that file or model – each technically interchangeable. However, if this is broken down into the basic notation that forms the basis of the digital models, then these notes cannot be changed without damaging the form of the object scanned or printed. To carry on the analogy of music, the role of the digital craftsman is now taking the form of the composer.¹³³

In the reconstruction of Notre Dame, the many composers that will come together to rebuild the cathedral will have to strike a harmonious relationship between the past, the present, and the future. This dissertation has shown that there will be many hurdles that will shape the nature of the restoration, and many of these are intrinsically tied to the crafts that will form the foundations of the rebuilding efforts. 3D scanning is changing the way that artefacts are viewed, and challenging the nature of authorship, while 3D printing is pushing this uncertainty back into the real world, provoking questions of what an authentically manufactured object really is.

From the research throughout this dissertation it is clear that while some opinions are starting to form a positive shift in thinking towards a more hybridised future, there is much left to be resolved - including the answer to the essential question –

Does the augmentation of craft fundamentally change its nature?

130 Ibid. p 112

131 McCullough. 'Abstracting Craft'. p 93

132 Ibid. p 94

133 Ibid. p 109

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BIBLIOGRAPHY

ACADEMIC

Adamson, Glenn. *Thinking through craft*. Oxford, UK: Berg, 2007.

Barroso, Diego Zamora. *Bending technology: a collaborative approach towards digital fabrication*. PhD Thesis. University of Edinburgh, 2019. Available at: <http://hdl.handle.net/1842/36111> [21st September 2019]

Barthes, Roland. Translated by Heath, Stephen. *Image Music Text*, London: Fontana Press, 1977.

Baudrillard, Jean. Translation by Sheila. F. Glaser. *Simulacra and Simulation*, USA: The University of Michigan Press, 2006.

Bennett, Jane. *Vibrant Matter - A Political Ecology of Things*, Durham: Duke University Press, 2010.

Berger, John. *Ways of Seeing*. London: British Broadcasting Corporation Harmondsworth, Penguin Group, 1972.

Broeckmann, Andreas. *Machine Art in the Twentieth Century*, Cambridge, MA: The MIT Press, 2016.

Chakrabarti, Birbhushan, Yates, Tim. & Lewry, Andrew. *Effect of fire damage on natural stonework in Buildings*. In 'Construction and Building Materials', Vol. 10, No. 1, 1996.

Dormer, Peter. *The Salon de Refuse?* in Dormer, Peter (ed.), *The Culture of Craft*, Manchester: Manchester University Press, 1997.

Fiske, John. *Introduction to communication studies*, 2nd Edition. Great Britain: Routledge, 1991.

Fuller, Peter. *Seeing Berger - A Revaluation of Ways of Seeing*, 2nd Edition, London: Writers and Readers Publishing Cooperative, 1982.

Gomez-Heras, Miguel. McCabe, Stephen. Smith, Bernard .J. & Fort, Rafael. *Impacts of Fire on Stone-Built Heritage an overview* in 'Journal of Architectural Conservation', Number 2, Volume 15, July 2009.

Goodman, Nelson. *Languages of Art*, Brighton, Sussex: The Harvester Press Limited, 1981.

Greenhalgh, Paul. *The History of Craft*, in Dormer, Peter (ed.), *The Culture of Craft*, Manchester: Manchester University Press, 1997.

Greenhalgh, Paul. *'The Progress of Captain Ludd'*, in Dormer, Peter (ed.), *The Culture of Craft*, Manchester: Manchester University Press, 1997.

Hajpal, Monika. *'Fire Damaged Stone Structures in Historical Monuments. Laboratory Analyses of Changes in Natural Stones by Heat Effect'*. [Online] <https://www.irbnet.de/daten/iconda/CIB18738.pdf> [26th February 2020]

Heidegger, Martin. *'The Question concerning Technology'* in Heidegger, Martin. *'Basic Writings. From Being and Time (1927) to The Task of Thinking (1964)'*, Krell, D.F. (ed). Oxon: Routledge, 2011.

Helland, Janice. *'Sandra Alfoldy (August 1, 1969-February 24, 2019): a Reflection'*, *The Journal of Modern Craft*, Vol.12 Issue 2, 2019.

Heslop, Thomas Alexander. *'How strange the change from major to minor: heirarchies and medieval art'*, in Dormer, Peter (ed.), *The Culture of Craft*, Manchester: Manchester University Press, 1997.

Hoskins, Stephen. *'3D Printing for Artists, Designers and Makers'*, 2nd Edition. London, UK: Bloomsbury Publishing PLC, 2018.

Jokilehto, Jukka. *'The context of the Venice Charter (1964)'* in *Conservation And Management Of Archaeological Sites*, Volume 2, 1998.

Leggio, Christine. *'Investigation Of The Deterioration Of The Trompe L'oeil Interiors Of San Sebastian Basilica, Manila, Philippines'* University of Pennsylvania, Thesis. 2012. Available at https://repository.upenn.edu/hp_theses/192/ [26th February 2020]

Long, Michael. *'Collaboration, confrontation, and controversy: the politics of monument restoration in Georgia and the case of Bagrati Cathedral'*, *Nationalities Papers: The Journal of Nationalism and Ethnicity*, Volume 45, Issue 4, 2017.

Lowenthal, David. *'The Heritage Crusade and the Spoils of History'*. Great Britain: Cambridge University Press, 1998.

Marshall, Justin. (1999) *'The Role and Significance of CAD/CAM Technologies in Craft and Designer-Maker Practice; with a Focus on Architectural Ceramics.'* PhD Thesis. University of Wales Institute Cardiff. [23rd October 2019]

McCullough, Malcolm. *'Abstracting Craft'*, Cambridge, MA: The MIT Press, 1996.

Metcalf, Bruce. *'Craft and art, culture and biology'*, in Dormer, P. (ed) *'The Culture of Craft'*, Manchester: Manchester University Press, 1997

Mori, Masahiro. Translated by MacDorman, Karl and Kageki, Norri. *'The Uncanny Valley'*, *IEEE Robotics & Automation Magazine*, Volume 19 Issue 2, 2012.

Panofsky, Erwin. cited in Risatti, Howard. *'A Theory of Craft – Function and aesthetic expression'* United States of America: The University of North Carolina

Press, 2007.

Paz, Octavio. *'Use and Contemplation'*, cited in McCullough, M. *'Abstracting Craft'*, Cambridge, MA: The MIT Press, 1996.

Pye, David. *'The nature and art of workmanship'*, Revised Edition. Great Britain: The Herbert Press, 1995.

Rea, Michael C. *'The Problem with Material Constitution'* in *The Philosophical Review*, Vol. 104, No. 4. 1995.

Rees, Helen. *'Patterns of Making: Thinking and Making in Industrial Design'*, in Dormer, Peter (ed.), *The Culture of Craft*, Manchester: Manchester University Press, 1997.

Risatti, Howard. *'A Theory of Craft – Function and aesthetic expression'* United States of America: The University of North Carolina Press, 2007.

Risner, Isabelle. *'The Integration of Digital Technologies into Designer-Maker Practice: a Study of Access, Attitudes and Implications.'* PhD Thesis. University College Falmouth. Available at: <https://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.650327> [23rd October 2019]

Smith, LauraJane. *'Discourses of heritage : implications for archaeological community practice.'* [Online] https://www.academia.edu/2011183/Discourses_of_heritage_implications_for_archaeological_community_practice [26th February 2020]

Smith, LauraJane. *'Uses of Heritage'*. Oxon: Routledge, 2006.

Nora, Pierre. *'Between memory and history: Les Lieux de Memoire'*, *Representations*, No. 26, Special Issue: Memory and Counter-Memory. University of California Press, 1989.

McCullough, Malcolm. *'Abstracting Craft'*, Cambridge, MA: The MIT Press, 1996.

Sporton, Gregory. *'Digital Creativity'*. Hampshire, UK: Palgrave Macmillan, 2015.

ARTICLES (NON-ACADEMIC)

LeWitt, Sol. *'Paragraphs on Conceptual Art'*, *Artforum* Vol.5, No. 10, 1967.

Lowenthal, D. *'The Timeless Past: Some Anglo-American Historical Preconceptions'*, *The Journal of American History*, Vol. 75, No. 1989.

Petrick, Irene & Simpson, Timothy. *'3D Printing Disrupts Manufacturing'*, *Research-Technology Management*, Volume 56, Issue 6, 2013.

BOOKS

Benjamin, Walter. *'The work of art in the age of mechanical reproduction'*. London: Penguin Group, 2008.

Bennett, Karen. and Calder, Julian. *'A Celebration of British Craftsmanship'*, London: Impress, 2018.

Hobbes, Thomas. and Molesworth, William. (ed) *'The English Works of Thomas Hobbes of Malmesbury'*, 1839. Available at: https://www.humanities.mcmaster.ca/~rarthur/phil6A03/thomas_hobbes_the_english_w.pdf [26th February 2020]

Johnson, Lucy. *'Digital Handmade: Craftsmanship in the New Industrial Revolution'*, 2nd Edition, London: Thames & Hudson Ltd, 2017.

Sennett, Richard. *'The Craftsman'*. London: Penguin Group, 2009

PODCAST

Mars, Roman. *'Episode 178: The Great Restoration'*, 99% Invisible. 21th May 2019. Web. [22nd September 2019]

Mars, Roman. *'Episode 281: La Sagrada Familia'*, 99% Invisible. 21th May 2019. Web. [6th August 2019]

WEB RESOURCES

Angel, Jessica. *'Sol LeWitt "Wall Drawings" and the set of instructions that constitute the body of his work'* [Online] <http://jessica-angel-notes.blogspot.com/2012/10/sol-lewitt-wall-drawings-set-of.html> [23rd December 2019]

ATG Reporter, *'18th century Meissen revived via 21st century technology'* [Online] <https://www.antiquetrade gazette.com/news/2014/18th-century-meissen-revived-via-21st-century-technology/> [14th January 2020]

Bacchi, Umberto. *'Palmyra Arch in London: 'Unethical' reconstruction of 'Disneyland' archaeology criticised'* [Online] <https://www.ibtimes.co.uk/palmyra-arch-london-unethical-reconstruction-disneyland-archaeology-criticised-1555659> [29th December 2019]

Bandarin, Francesco. *'New law regarding Notre Dame says restoration must preserve its 'historic, artistic and architectural interest'* [Online] <https://www.theartnewspaper.com/analysis/it-s-official-the-new-notre-dame-will-look-like-the-old-notre-dame> [14th January 2020]

Bandarin, Francesco. *'Notre Dame should be rebuilt as it was'* [Online] <https://www.theartnewspaper.com/comment/notre-dame-should-be-rebuilt-as-it-was-says-a-former-director-of-unesco-s-world-heritage-centre> [22nd August 2019]

Barnes, Austin. *'Design by fire: Could a Kansas City company 3-D print the Notre Dame spire?'* [Online] <https://www.startlandnews.com/2019/05/dimensional-innovations-notre-dame-spire/> [14th January 2020]

Bayley, Stephen. & Thurley, Simon. *'Debate: Should Notre-Dame be rebuilt in the mould of the original or reimagined for the modern age?'* [Online] <https://>

www.telegraph.co.uk/news/2019/04/17/debate-should-notre-dame-rebuilt-mould-original-reimagined-modern/ [22nd August 2019]

Burkhardtsmeier, Derek. 'Assisting woodworkers with AR' [Online] <https://medium.com/@derekb12r/assisting-woodworkers-with-ar-e49816141aef> [14th January 2020]

Cai, Zeyu. & Li, Sibe. 'Paris Heartbeat' [Online] <https://www.designnotredame.com/design-submissions/10253> [22nd August 2019]

Capps, Kristan. and O'Sullivan, Feargus. 'Amid Notre-Dame's Destruction, There's Hope for Restoration' [Online] <https://www.citylab.com/design/2019/04/notre-dame-cathedral-fire-paris-gothic-architecture-history/587191/> [14th January 2020]

Carpenter, D. 'The Heritage Crafts Association Red List of Endangered Crafts', 2019 edition. [Online] <https://heritagecrafts.org.uk/wp-content/uploads/2019/03/HCA-Red-List-optimised.pdf> [29th January 2020]

Casert, Raf. 'Architect Who Died 140 Years Ago Left Detailed Guide for Rebuilding Notre Dame' [Online] <https://www.insurancejournal.com/news/international/2019/04/24/524531.htm> [14th January 2020]

Casert, Raf. 'Notre Dame fire was a warning bell. But will Europe listen?' [Online] <https://apnews.com/9d791857100b4eabb9f63a32a1c4cdaf> [14th January 2020]

Charr, Manuel. 'Legal Case Concerning a 3D Scan of a Museum Artefact May Impact on All Institutions' [Online] <https://www.museumnext.com/article/legal-case-concerning-a-3d-scan-of-a-museum-artefact-may-impact-on-all-institutions/> [17th January 2020]

Chi, Grace. 'Modern Ornamental - A New Form of Digital Sculpture' [Online] <https://archinect.com/firms/release/53511492/modern-ornamental-a-new-form-of-digital-sculpture/150063267> [26th August 2019]

Cohen, M. 'Identity, Persistence, and the Ship of Theseus' [Online] <https://faculty.washington.edu/smcohen/320/theseus.html> [27th November 2019]

De Feydeau, Bertrand. in Uncredited, 'The frame of Notre-Dame de Paris is "not rebuildable": the trees that made it came from the primary forest' [Online] https://www.francetvinfo.fr/culture/patrimoine/incendie-de-notre-dame-de-paris/la-charpente-de-notre-dame-de-paris-n-est-pas-reconstituable-les-arbres-qui-la-constituaient-provenaient-de-la-foret-primaire_3400799.html [27th August 2019]

De La Hamaide, Sybille. and Carriat, Julie. 'Fire guts Notre-Dame Cathedral in Paris; Macron pledges to rebuild' [Online] <https://www.reuters.com/article/us-notredame-fire/fire-guts-notre-dame-cathedral-in-paris-macron-pledges-to-rebuild-idUSKCN1RR1UO> [10th October 2019]

Edahiro, Junko. 'Rebuilding Every 20 Years Renders Sanctuaries Eternal -- the Sengu Ceremony at Jingu Shrine in Ise' [Online] https://www.japanfs.org/en/news/archives/news_id034293.html [22nd December 2019]

Erder, Cevat. *'The Venice Charter under Review'*, 1977 [Online] <https://www.icomos.org/venicecharter2004/erder.pdf> [19th December 2019]

Felluga, Dino. *"Modules on Baudrillard: On Simulation."* *Introductory Guide to Critical Theory.* Purdue U. [Online] <<http://www.purdue.edu/guidetotheory/postmodernism/modules/ baudrillardsimulation.html>>. [24th September 2019]

Ferello, Jamie. *'EDG creates customizable 3D-printed concrete molds'* [Online] <https://archpaper.com/2018/05/edg-creates-customizable-3d-printed-concrete-molds/#gallery-0-slide-0> [27th August 2019]

Gilbert, Ben. *'As France rebuilds Notre-Dame Cathedral, the French studio behind 'Assassin's Creed' is offering up its 'over 5,000 hours' of research on the 800-year-old monument'* [Online] <https://www.businessinsider.com/notre-dame-fire-assassins-creed-maxime-durand-ubisoft-interview-2019-4?r=US&IR=T> [3rd September 2019]

Goegers, Eric. *'Rebuilding Notre Dame: a phoenix rising from the ashes'* [Online] https://medium.com/@eric_geboers/rebuilding-notre-dame-a-phoenix-rising-from-the-ashes-f087bf89f5ed [27th September 2019]

Harrison, Rodney. *'What is heritage?'* [Online] <https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=1929&printable=1> [7th January 2020]

Hass, Alex. *'1.2 William Morris and the Arts & Crafts Movement'* [Online] <https://opentextbc.ca/graphicdesign/chapter/chapter-2/> [14th January 2020]

ICOMOS, *'International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter 1964)'*, 1964 [Online] https://www.icomos.org/charters/venice_e.pdf [27th February 2020]

ICOMOS, *'The Nara Document on Authenticity (1994)'*, 1994 [Online] <https://www.icomos.org/charters/nara-e.pdf> [27th February 2020]

Jalabi, Raya. *'Replica of Syrian Arch Destroyed By ISIS Unveiled in New York City'* [Online] <https://www.theguardian.com/us-news/2016/sep/20/palmyra-arch-syria-new-york> [28th December 2019]

Johnson, Stephen. *'Should France rebuild Notre Dame exactly as it was?'* [Online] <https://bigthink.com/culture-religion/notre-dame-rebuild> [22nd August 2019]

Jones, Ann. *'Just following instructions'* [Online] <https://imageobjecttext.com/2014/02/05/just-following-instructions/> [14th January 2020]

Lamoreaux, Janelle. *'BAUdrillard and the "Three Orders of the SIMulaCRA'* [Online] <http://it.stlawu.edu/~global/glossary/simulacra.jl.html> [14th January 2020]

Letter to the Editor, *'Construction Works at the Church of Sagrada Familia'*, translation by Pablo Alvarez Funes [Online] <https://www.aaronrenn.com>

com/2015/07/30/a-manifesto-against-completing-sagrada-familia-church/ [31st December 2019]

Lewbank, 'Ise Grand Shrine' [Online] <https://www.atlasobscura.com/places/ise-grand-shrine> [22nd December 2019]

Lisefski, Benek. 'The Best Designers Are Both Creators and Curators' [Online] <https://modus.medium.com/the-best-designers-are-both-creators-and-curators-7fb8178962d9> [26th February 2020]

Lovatt, Anna. 'Ideas in Transmission: LeWitt's Wall Drawings and the Question of Medium' [Online] <https://www.tate.org.uk/research/publications/tate-papers/14/ideas-in-transmission-lewitt-wall-drawings-and-the-question-of-medium> [26th February 2020]

Lusher, Adam. 'Destroyed by Isis, Palmyra's Arch of Triumph rises again - in London' [Online] <https://www.independent.co.uk/news/uk/palmyra-arch-of-triumph-london-traffic-square-isis-daesh-a6990591.html> [28th December 2019]

Mictlan, Monsieur. 'Le Stryge' [Online] <https://www.atlasobscura.com/places/le-stryge> [14th January 2020]

Moore, Rowan. 'Sagrada Familia: Gaudí's cathedral is nearly done, but would he have liked it?' [Online] <https://www.theguardian.com/artanddesign/2011/apr/24/gaudi-sagrada-familia-rowan-moore> [3rd September 2019]

Morris, Chris. 'French Officials Slam Trump's Proposed Solution to Notre Dame Fire' [Online] <https://fortune.com/2019/04/15/notre-dame-fire-trump-french-reply/> [30th January 2020]

Pailliez, Caroline. and Baker, Luke. 'Debate over future Notre-Dame spire fuels French divisions' [Online] <https://www.reuters.com/article/us-france-notredame-restoration/debate-over-future-notre-dame-spire-fuels-french-divisions-idUSKCN1RU255> [14th January 2020]

Penketh, Anne. & Willsher, Kim. 'US architecture critic sparks row over Chartres Cathedral restoration' [Online] <https://www.theguardian.com/artanddesign/2014/dec/19/us-architect-sparks-row-chartres-cathedral-restoration-paul-calvel> [11th January 2020]

Pierre-Davis, Bonnie. 'The future of craft in a digital age: Re-Master by Sabina Weiss' [Online] <https://www.wgsn.com/blogs/future-craft-digital-age-re-master-sabina-weiss/1> [27th September 2019]

Pinto, Juan Sebastian. 'Why Notre Dame Should Not Be Rebuilt As It Was' [Online] <https://www.forbes.com/sites/juansebastianpinto/2019/04/18/why-notre-dame-should-not-be-rebuilt-as-it-was/#3aa35d6527e7> [22nd September 2019]

Potenza, Alessandra. 'Syrian Arch Razed By Isis And Re-Created With 3d Technology Arrives In New York City' [Online] <https://www.theverge.com/2019/04/18/16211111/syrian-arch-re-created>

com/2016/9/19/12972504/palmyra-arch-of-triumph-isis-3d-replica-new-york-city [28th December 2019]

Prior, Ryan. 'The entire wooden interior of Notre Dame Cathedral has been lost' [Online] <https://edition.cnn.com/style/article/nortre-dame-fire-oak-wood-trnd/index.html> [26th February 2020]

Ramm, Benjamin. 'A Controversial Restoration That Wipes Away the Past' [Online] <https://www.nytimes.com/2017/09/01/arts/design/chartres-cathedral-restoration-controversial.html> [22nd September 2019]

Raub, Olivia. 'Historical Quotes' [Online] <https://sites.psu.edu/interestinghistory/2014/04/26/historical-quotes/> [10th January 2020]

Ravenscroft, Tom. 'Notre-Dame must be restored to "last known visual state" says French Senate' [Online] <https://www.dezeen.com/2019/05/29/restore-notre-dame-cathedral-french-senate/> [14th January 2020]

Ravenscroft, Tom. 'Viollet-le-Duc would not hesitate to build a new roof and spire' [Online] <https://www.dezeen.com/2019/04/30/notre-dame-new-spire-roof-viollet-le-duc/> [14th January 2020]

Renn, Aaron. 'A Manifesto Against Completing Sagrada Família Church' [Online] <https://www.aaronrenn.com/2015/07/30/a-manifesto-against-completing-sagrada-familia-church/> [3rd September 2019]

Robinson, Andrew. 'An A to Z of Theory | Walter Benjamin: Art, Aura and Authenticity' [Online] <https://ceasefiremagazine.co.uk/walter-benjamin-art-aura-authenticity/> [7th January 2020]

Rogers, Adam. 'The Notre Dame Fire and the Future of History' [Online] <https://www.wired.com/story/the-notre-dame-fire-and-the-future-of-history/?verso=true> [22nd August 2019]

Saunders, Sarah. 'New York Architecture Firm Uses 3D Printing to Create Beautiful Concrete Molds for Building Restoration' [Online] <https://3dprint.com/214974/edg-3d-printed-concrete-molds/> [27th September 2019]

Shea, Neil. 'Under Paris' [Online] <https://www.nationalgeographic.com/magazine/2011/02/paris-catacombs/> [14th January 2020]

Shea, Rachel Hartigan. 'Historian uses lasers to unlock mysteries of Gothic cathedrals' [Online] <https://www.nationalgeographic.com/news/2015/06/150622-andrew-tallon-notre-dame-cathedral-laser-scan-art-history-medieval-gothic/> [22nd September 2019]

Silva, Roland. 'The Significance of the Venice International Charter for the Conservation and Restoration of Monuments and Sites, with Special Reference to Eastern Countries', Basel, 1983. [Online] <https://www.icomos.org/venicecharter2004/silva.pdf> [19th December 2019]

Smith, Kiona. N. *'Notre Dame Cathedral will never be the same, but it can be rebuilt'* [Online] <https://arstechnica.com/science/2019/04/notre-dame-cathedral-will-never-be-the-same-but-it-can-be-rebuilt/> [29th December 2019]

Sutton, Benjamin. *'The Tortured 136-Year History of Building Gaudi's Sagrada Família'* [Online] <https://www.artsy.net/article/artsy-editorial-tortured-136-year-history-building-gaudis-sagrada-familia> [31st December 2019]

Taylor, Adam. *'The problem with rebuilding a Palmyra ruin destroyed by ISIS – does it simply help Assad?'* [Online] <https://www.washingtonpost.com/news/worldviews/wp/2016/04/20/the-problem-with-rebuilding-a-roman-ruin-destroyed-by-isis-does-it-simply-help-assad/> [29th December 2019]

Taylor, Lin. *'Star humanitarian or white savior? Celebrities in Africa spark online furor'* [Online] <https://www.reuters.com/article/us-britain-aid-whitesaviour/star-humanitarian-or-white-savior-celebrities-in-africa-spark-online-furor-idUSKCN1QI4YJ> [28th December 2019]

Thomas, Leigh. *'City of lights' plunged into dark sorrow as Notre-Dame burns'* [Online] <https://www.reuters.com/article/us-france-notredame-scene/city-of-lights-plunged-into-dark-sorrow-as-notre-dame-burns-idUSKCN1RR270> [20th December 2019]

Uncredited, DigitalGeorgetown. *'Notre Dame Cathedral Grotesque Le Styрге'* [Online] <https://repository.library.georgetown.edu/handle/10822/554232> [29th December 2019]

Uncredited, DW, *'French Parliament approves Notre Dame restoration bill'* [Online] <https://www.dw.com/en/french-parliament-approves-notre-dame-restoration-bill/a-49614561> [14th January 2020]

Uncredited, EDG, *'Design | Restore'* [Online] https://issuu.com/edgnyc/docs/edg_digital_portfolio?fr=sYmJmZTU0NDI2 [14th January 2020]

Uncredited, EnglishSummary *'The Death of the Author by Roland Barthes'* [Online] <https://englishsummary.com/death-of-the-author-barthes-summary/> [14th January 2020]

Uncredited, Passerelles, translated by Google Translate, *'The restoration by Viollet-le-Duc'* [Online] http://passerelles.bnf.fr/dossier/cathedrale_nd_paris_03.php [14th January 2020]

Uncredited, Phaidon, *'Gombrich Explains William Morris'* [Online] <https://uk.phaidon.com/agenda/art/articles/2014/october/16/gombrich-explains-william-morris/> [14th January 2020]

Uncredited, Sothebys, *'American Sculpture: Beyond Limits'* [Online] <http://www.sothebys.com/en/auctions/ecatalogue/2017/beyond-limits-117010/lot.16.html> [14th January 2020]

Uncredited, Study.com, 'What is the meaning of the quote "What is history but a fable agreed upon?"' [Online] <https://study.com/academy/answer/what-is-the-meaning-of-the-quote-what-is-history-but-a-fable-agreed-upon.html> [14th January 2020]

Uncredited, Tabula, 'UNESCO Removes Bagrati Cathedral from Cultural Heritage List' [Online] <http://www.tabula.ge/en/story/121907-unesco-removes-bagrati-cathedral-from-cultural-heritage-list> [26th February 2020]

UNESCO, 'Chartres Cathedral' [Online] <https://whc.unesco.org/en/list/81/> [14th January 2020]

UNESCO, 'Concept of Digital Heritage' [Online] <https://en.unesco.org/themes/information-preservation/digital-heritage/concept-digital-heritage> [14th January 2020]

UNESCO, 'The Criteria for Selection' [Online] <https://whc.unesco.org/en/criteria/> [14th January 2020]

Sirois, Katherine. 'Dagognet's Critique of the Museum as a "Machine of Deceit": The Protest that calls for Radical Metamorphosis' [Online] <https://wrongwrong.net/artigo/dagognets-critique-of-the-museum-as-a-machine-of-deceit-the-protest-that-calls-for-radical-metamorphosis> [9th January 2020]

Valadares, Henrique. 'Tradition vs modernity: Debate over future Notre-Dame spire sparks controversy' [Online] <https://www.france24.com/en/20190511-france-notre-dame-fire-fast-reconstruction-law-macron-controversy-modern-architecture-mps> [14th January 2020]

Vallely, Paul. 'History in the making: An unprecedented visit to Ise Jingu, Japan's holiest shrine, to see it rebuilt under the beliefs of the Shinto religion' [Online] <https://www.independent.co.uk/news/world/asia/history-in-the-making-an-unprecedented-visit-to-ise-jingu-japan-s-holiest-shrine-to-see-it-rebuilt-9555482.html> [22nd December 2019]

V&A Museum, 'Arts and Crafts: An Introduction.' [Online] <https://www.vam.ac.uk/articles/arts-and-crafts-an-introduction> [26th February 2020]

Watson, Bruce. 'The troubling evolution of corporate greenwashing' [Online] <https://www.theguardian.com/sustainable-business/2016/aug/20/greenwashing-environmentalism-lies-companies> [6th January 2020]

Weinberg, Michael. 'The Nefertiti Bust Meets the 21st Century' [Online] <https://slate.com/technology/2019/11/nefertiti-bust-neues-museum-3d-printing.html> [17th January 2020]

Weiss, Sabina. 'RE~MASTER' [Online] <https://sabinaweiss.info/RE-MASTER> [27th August 2019]

Wenman, Cosmo. 'A German Museum Tried To Hide This Stunning 3D Scan of an Iconic Egyptian Artifact. Today You Can See It for the First Time' [Online] <https://reason.com/2019/11/13/a-german-museum-tried-to-hide-this-stunning-3d-scan-of-an-iconic-egyptian-artifact-today-you-can-see-it-for-the-first-time/> [16th January 2020]

Wenman, Cosmo. 'Category: 3D Scanning' [Online] <https://cosmowenman.com/category/3d-scanning/> [14th January 2020]

Wilder, Charly. 'Nefertiti 3-D Scanning Project in Germany Raises Doubts' [Online] <https://www.nytimes.com/2016/03/11/arts/design/nefertiti-3-d-scanning-project-in-germany-raises-doubts.html> [16th January 2020]

Wilder, Charly. 'Swiping a Priceless Antiquity ... With a Scanner and a 3-D Printer' [Online] <https://www.nytimes.com/2016/03/02/arts/design/other-nefertiti-3d-printer.html> [16th January 2020]

Williams, Ollie. 'Why Notre Dame Donations Are Provoking A Backlash Against Billionaires' [Online] <https://www.forbes.com/sites/oliverwilliams1/2019/04/17/why-notre-dame-donations-are-provoking-a-backlash-against-billionaires/> [27th January 2020]

Willis, E. 'Installation in Progress—Sol LeWitt: Wall Drawing #370' [Online] <https://www.metmuseum.org/blogs/now-at-the-met/2014/sol-lewitt-installation> [26th February 2020]

Willits, Joseph. 'Syria's human losses and London's replica of Palmyra's arch' [Online] <https://www.caabu.org/news/blog/syrias-human-losses-and-londons-replica-palmyras-arch> [26th February 2020]

Zarrelli, Natalie. 'The Forged 'Ancient' Statues That Fooled the Met's Art Experts for Decades'. [Online] <https://www.atlasobscura.com/articles/etruscan-forgeries-met-museum-art> [26th February 2020]

VIDEO

'The Death of the Author: WTF? Roland Barthes' Death of the Author Explained | Tom Nicholas', YouTube Video, Tom Nicholas, YouTube, 2019. Available at: <https://www.youtube.com/watch?v=B9iMgtfp484> [13th January 2020]

Harris, Beth. and Zucker, Steven. 'Who owns the Parthenon Sculptures?' , Youtube Video. SmartHistory, Youtube, 2018. Available at: https://www.youtube.com/watch?v=QRH105_ztAw [16th January 2020]

APPENDIX: THE VENICE CHARTER & NARA DOCUMENT ON AUTHENTICITY

The Venice Charter 1964

Sourced from: https://www.icomos.org/charters/venice_e.pdf [30th January 2020]

INTERNATIONAL CHARTER FOR THE CONSERVATION AND RESTORATION OF MONUMENTS AND SITES (THE VENICE CHARTER 1964)

IInd International Congress of Architects and Technicians of Historic Monuments, Venice, 1964.

Adopted by ICOMOS in 1965.

Imbued with a message from the past, the historic monuments of generations of people remain to the present day as living witnesses of their age-old traditions. People are becoming more and more conscious of the unity of human values and regard ancient monuments as a common heritage. The common responsibility to safeguard them for future generations is recognized. It is our duty to hand them on in the full richness of their authenticity.

It is essential that the principles guiding the preservation and restoration of ancient buildings should be agreed and be laid down on an international basis, with each country being responsible for applying the plan within the framework of its own culture and traditions.

By defining these basic principles for the first time, the Athens Charter of 1931 contributed towards the development of an extensive international movement which has assumed concrete form in national documents, in the work of ICOM and UNESCO and in the establishment by the latter of the International Centre for the Study of the Preservation and the Restoration of Cultural Property. Increasing awareness and critical study have been brought to bear on problems which have continually become more complex and varied; now the time has come to examine the Charter afresh in order to make a thorough study of the principles involved and to enlarge its scope in a new document.

Accordingly, the IInd International Congress of Architects and Technicians of Historic Monuments, which met in Venice from May 25th to 31st 1964, approved the following text:

DEFINITIONS

Article 1.

The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a

particular civilization, a significant development or a historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time.

Article 2.

The conservation and restoration of monuments must have recourse to all the sciences and techniques which can contribute to the study and safeguarding of the architectural heritage.

Article 3.

The intention in conserving and restoring monuments is to safeguard them no less as works of art than as historical evidence.

CONSERVATION

Article 4.

It is essential to the conservation of monuments that they be maintained on a permanent basis.

Article 5.

The conservation of monuments is always facilitated by making use of them for some socially useful purpose. Such use is therefore desirable but it must not change the lay-out or decoration of the building. It is within these limits only that modifications demanded by a change of function should be envisaged and may be permitted.

Article 6.

The conservation of a monument implies preserving a setting which is not out of scale. Wherever the traditional setting exists, it must be kept. No new construction, demolition or modification which would alter the relations of mass and colour must be allowed.

Article 7.

A monument is inseparable from the history to which it bears witness and from the setting in which it occurs. The moving of all or part of a monument cannot be allowed except where the safeguarding of that monument demands it or where it is justified by national or international interest of paramount importance.

Article 8.

Items of sculpture, painting or decoration which form an integral part of a monument may only be removed from it if this is the sole means of ensuring their preservation.

RESTORATION

Article 9.

The process of restoration is a highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of the monument and is based on respect for original material and authentic documents. It must stop at the point where conjecture begins, and in this case moreover any extra work which is

indispensable must be distinct from the architectural composition and must bear a contemporary stamp. The restoration in any case must be preceded and followed by an archaeological and historical study of the monument.

Article 10.

Where traditional techniques prove inadequate, the consolidation of a monument can be achieved by the use of any modern technique for conservation and construction, the efficacy of which has been shown by scientific data and proved by experience.

Article 11.

The valid contributions of all periods to the building of a monument must be respected, since unity of style is not the aim of a restoration. When a building includes the superimposed work of different periods, the revealing of the underlying state can only be justified in exceptional circumstances and when what is removed is of little interest and the material which is brought to light is of great historical, archaeological or aesthetic value, and its state of preservation good enough to justify the action. Evaluation of the importance of the elements involved and the decision as to what may be destroyed cannot rest solely on the individual in charge of the work.

Article 12.

Replacements of missing parts must integrate harmoniously with the whole, but at the same time must be distinguishable from the original so that restoration does not falsify the artistic or historic evidence.

Article 13.

Additions cannot be allowed except in so far as they do not detract from the interesting parts of the building, its traditional setting, the balance of its composition and its relation with its surroundings.

HISTORIC SITES

Article 14.

The sites of monuments must be the object of special care in order to safeguard their integrity and ensure that they are cleared and presented in a seemly manner. The work of conservation and restoration carried out in such places should be inspired by the principles set forth in the foregoing articles.

EXCAVATIONS

Article 15.

Excavations should be carried out in accordance with scientific standards and the recommendation defining international principles to be applied in the case of archaeological excavation adopted by UNESCO in 1956. Ruins must be maintained and measures necessary for the permanent conservation and protection of architectural features and of objects discovered must be taken. Furthermore, every means must be taken to facilitate the understanding of the monument and to reveal it without ever distorting its meaning. All reconstruction work should however be ruled out "a priori". Only anastylosis, that is to say, the

reassembling of existing but dismembered parts can be permitted. The material used for integration should always be recognizable and its use should be the least that will ensure the conservation of a monument and the reinstatement of its form.

PUBLICATION

Article 16.

In all works of preservation, restoration or excavation, there should always be precise documentation in the form of analytical and critical reports, illustrated with drawings and photographs. Every stage of the work of clearing, consolidation, rearrangement and integration, as well as technical and formal features identified during the course of the work, should be included. This record should be placed in the archives of a public institution and made available to research workers. It is recommended that the report should be published.

The following persons took part in the work of the Committee for drafting the International Charter for the Conservation and Restoration of Monuments:

Piero Gazzola (Italy), Chairman
Raymond Lemaire (Belgium), Reporter
José Bassegoda-Nonell (Spain)
Luis Benavente (Portugal)
Djurdje Boskovic (Yugoslavia)
Hiroshi Daifuku (UNESCO)
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Mario Matteucci (Italy)
Jean Merlet (France)
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Gertrud Tripp (Austria)
Jan Zachwatowicz (Poland)
Mustafa S. Zbiss (Tunisia)

THE NARA DOCUMENT ON AUTHENTICITY

Sourced from: <https://www.icomos.org/charters/nara-e.pdf> [30th January 2020]

THE NARA DOCUMENT ON AUTHENTICITY

Preamble

1. We, the experts assembled in Nara (Japan), wish to acknowledge the generous spirit and intellectual courage of the Japanese authorities in providing a timely forum in which we could challenge conventional thinking in the conservation field, and debate ways and means of broadening our horizons to bring greater respect for cultural and heritage diversity to conservation practice.

2. We also wish to acknowledge the value of the framework for discussion provided by the World Heritage Committee's desire to apply the test of authenticity in ways which accord full respect to the social and cultural values of all societies, in examining the outstanding universal value of cultural properties proposed for the World Heritage List.

3. The Nara Document on Authenticity is conceived in the spirit of the Charter of Venice, 1963, and builds on it and extends it in response to the expanding scope of cultural heritage concerns and interests in our contemporary world.

4. In a world that is increasingly subject to the forces of globalization and homogenization, and in a world in which the search for cultural identity is sometimes pursued through aggressive nationalism and the suppression of the cultures of minorities, the essential contribution made by the consideration of authenticity in conservation practice is to clarify and illuminate the collective memory of humanity.

Cultural Diversity and Heritage Diversity

5. The diversity of cultures and heritage in our world is an irreplaceable source of spiritual and intellectual richness for all humankind. The protection and enhancement of cultural and heritage diversity in our world should be actively promoted as an essential aspect of human development.

6. Cultural heritage diversity exists in time and space, and demands respect for other cultures and all aspects of their belief systems. In cases where cultural values appear to be in conflict, respect for cultural diversity demands acknowledgment of the legitimacy of the cultural values of all parties.

7. All cultures and societies are rooted in the particular forms and means of tangible and intangible expression which constitute their heritage, and these should be respected.

8. It is important to underline a fundamental principle of UNESCO, to the effect that the cultural heritage of each is the cultural heritage of all. Responsibility for cultural heritage and the management of it belongs, in the first place, to the cultural community that has generated it, and subsequently to that which cares for it. However, in addition to these responsibilities, adherence to the international charters and conventions developed for conservation of cultural heritage also obliges consideration of the principles and responsibilities flowing from them. Balancing their own requirements with those of other cultural communities is, for each community, highly desirable, provided achieving this balance does not undermine their fundamental cultural values.

Values and authenticity

9. Conservation of cultural heritage in all its forms and historical periods is rooted in the values attributed to the heritage. Our ability to understand these values depends, in part, on the degree to which information sources about these values may be understood as credible or truthful. Knowledge and understanding of these sources of information, in relation to original and subsequent characteristics of the cultural heritage, and their meaning, is a requisite basis for assessing all aspects of authenticity.

10. Authenticity, considered in this way and affirmed in the Charter of Venice, appears as the essential qualifying factor concerning values. The understanding of authenticity plays a fundamental role in all scientific studies of the cultural heritage, in conservation and restoration planning, as well as within the inscription procedures used for the World Heritage Convention and other cultural heritage inventories.

11. All judgements about values attributed to cultural properties as well as the credibility of related information sources may differ from culture to culture, and even within the same culture. It is thus not possible to base judgements of values and authenticity within fixed criteria. On the contrary, the respect due to all cultures requires that heritage properties must be considered and judged within the cultural contexts to which they belong.

12. Therefore, it is of the highest importance and urgency that, within each culture, recognition be accorded to the specific nature of its heritage values and the credibility and truthfulness of related information sources.

13. Depending on the nature of the cultural heritage, its cultural context, and its evolution through time, authenticity judgements may be linked to the worth of a great variety of sources of information. Aspects of the sources may include form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling, and other internal and external factors. The use of these sources permits elaboration of the specific artistic, historic, social, and scientific dimensions of the cultural heritage being examined.

Definitions

CONSERVATION: all operations designed to understand a property, know its history and meaning, ensure its material safeguard, and, if required, its restoration and enhancement.

INFORMATION SOURCES: all physical, written, oral, and figurative sources which make it possible to know the nature, specificities, meaning, and history of the cultural heritage. The Nara Document on Authenticity was drafted by the 35 participants at the Nara Conference on Authenticity in Relation to the World Heritage Convention, held at Nara, Japan, from 1-6 November 1993, at the invitation of the Agency for Cultural Affairs (Government of Japan) and the Nara Prefecture. The Agency organized the Nara Conference in cooperation with UNESCO, ICCROM and ICOMOS.

This final version of the Nara Document has been edited by the general rapporteurs of the Nara Conference, Mr. Raymond Lemaire and Mr. Herb Stovel.

