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Article

Photogrammetry: Dwelling amongst the Artefacts

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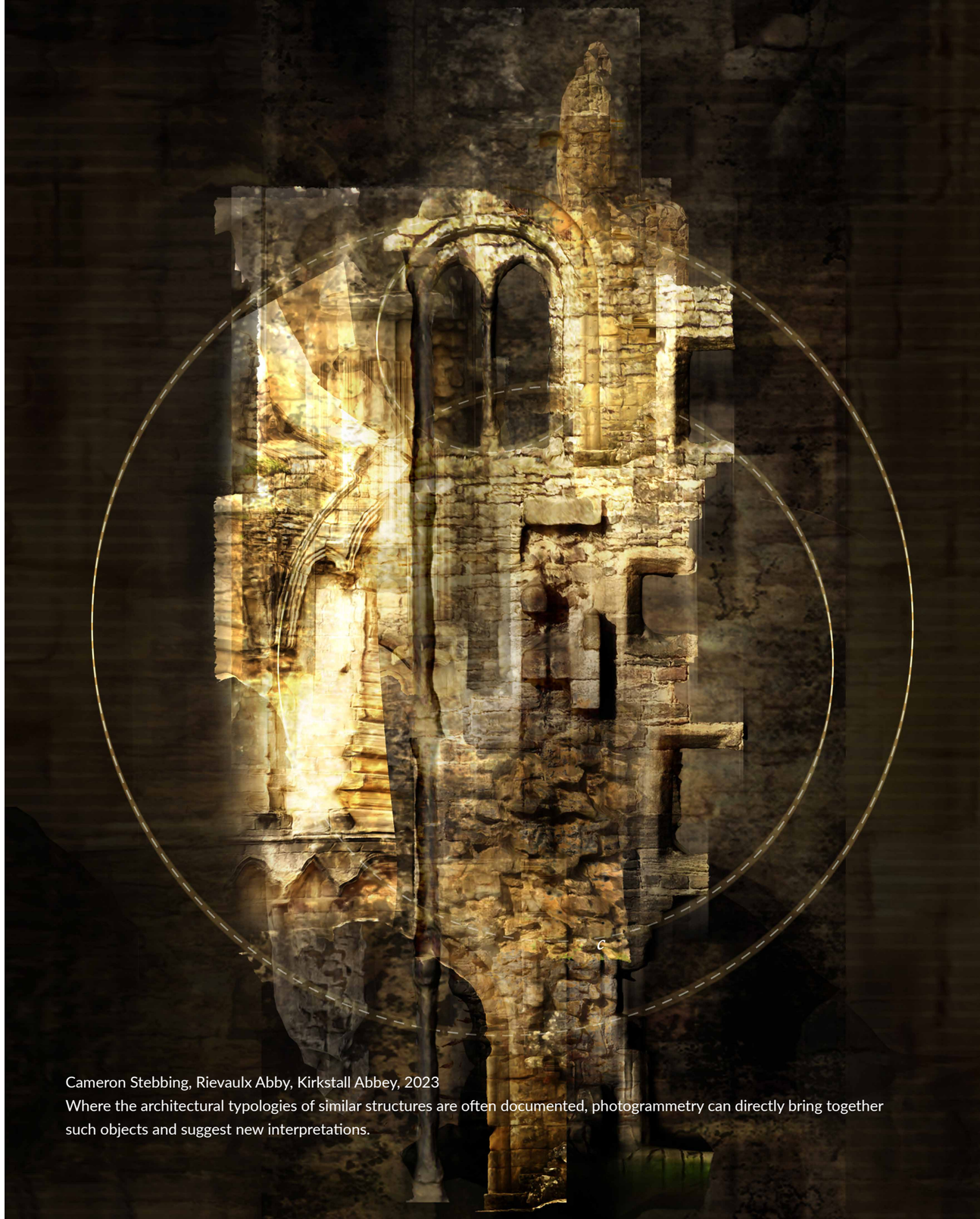
Abstract
This paper explores the ontology of photogrammetry beyond its role as an analytical process to accurately record places. It identifies photogrammetric scans as hybrid artefacts, which can capture a wide array of spatial and temporal information upon their surfaces. Such traces are explored through the work of Object Oriented Ontology philosopher Timothy Morton, with cues also taken from the work of John Ruskin who places emphasis on the stained surface as the site of a building's value. Presented alongside these propositions are a series of photogrammetric studies where antagonistic and disruptive data is maintained in the outcome to allow the manifestation of these concealed relationships. The awareness of these syncopated chronologies questions the futurity of a recorded object, accommodating both its presence and absence. What is argued here can allow the scan to become a site for speculation and proposition beyond the deferral to a real-world object.

Key Words
Photogrammetry; Temporality; Spectrality; Hybrid Artefacts; Speculative Scanning

As an analytical process with applications ranging from the cultural arts to archaeology, photogrammetry could be said to strip an object bare and render it within the cool light of intelligibility. Utilisations of the process often defer to the underlying scanned subject, seeking to assess and understand its qualities, be they material or spatial. Scans disclose characteristics of their subjects, aiming to produce sanitary digital facsimiles for conservation, interpretation or monitoring. In a sterile environment, which is subsidiary to the 'real' objects caught within its gaze, the role of photogrammetry is viewed as an operational process to produce accurate verisimilitude.

But, peeking beneath the surface of this seemingly neutral process, where photons captured upon the sensors of a digital camera are magically rendered as virtual artefacts, reveals the strange machinations of algorithm and machine, promiscuously combined with viewer and subject. Photogrammetry software filters and discards data contained within photographs in pursuit of believable reconstructions. Suspending this goal reveals the photogrammetric artefact as a spectral and ephemeral condition where previously unforeseen qualities are stratified as rich and stained surfaces. They are artefacts of hybridity and mediation, where multitudinous conditions play out in unforeseen manners[1].

1 - The word artefact is also the term used to refer to unwanted fragments and elements erroneously manifested and removed as part of the process of reconstructed digital meshes.



Cameron Stebbing, Rievaulx Abby, Kirkstall Abbey, 2023
Where the architectural typologies of similar structures are often documented, photogrammetry can directly bring together such objects and suggest new interpretations.

Cameron Stebbing, Fountains Abbey, Chapel of the Nine Altars, 2023
Distortion and stretching were created due to the oblique angles used in the photographic data.

Cameron Stebbing, Rievaulx Abbey, 2023
A heavy presence of artefacts formed by clouds present within the image set impinges on the clarity of the ruins.

Presented here are scrawling and dislocated scans, uncannily different from the objects they record. They are identified for their richly populated surfaces and juxtaposition of architectural beauty with cultural detritus. From some angles, it is easily legible, whilst from others, this illusion is shattered. Through these objects, the relationship between the photogrammetric process and its subject reveals elements previously concealed in a newfound hybridity. They are the productive site for propositions and, perhaps, a seductive context for future occupation. This conception invites the opportunity to analyse the subject being recorded and explore the strange ontology of the photogrammetric scan itself.

Hybrid Artefacts

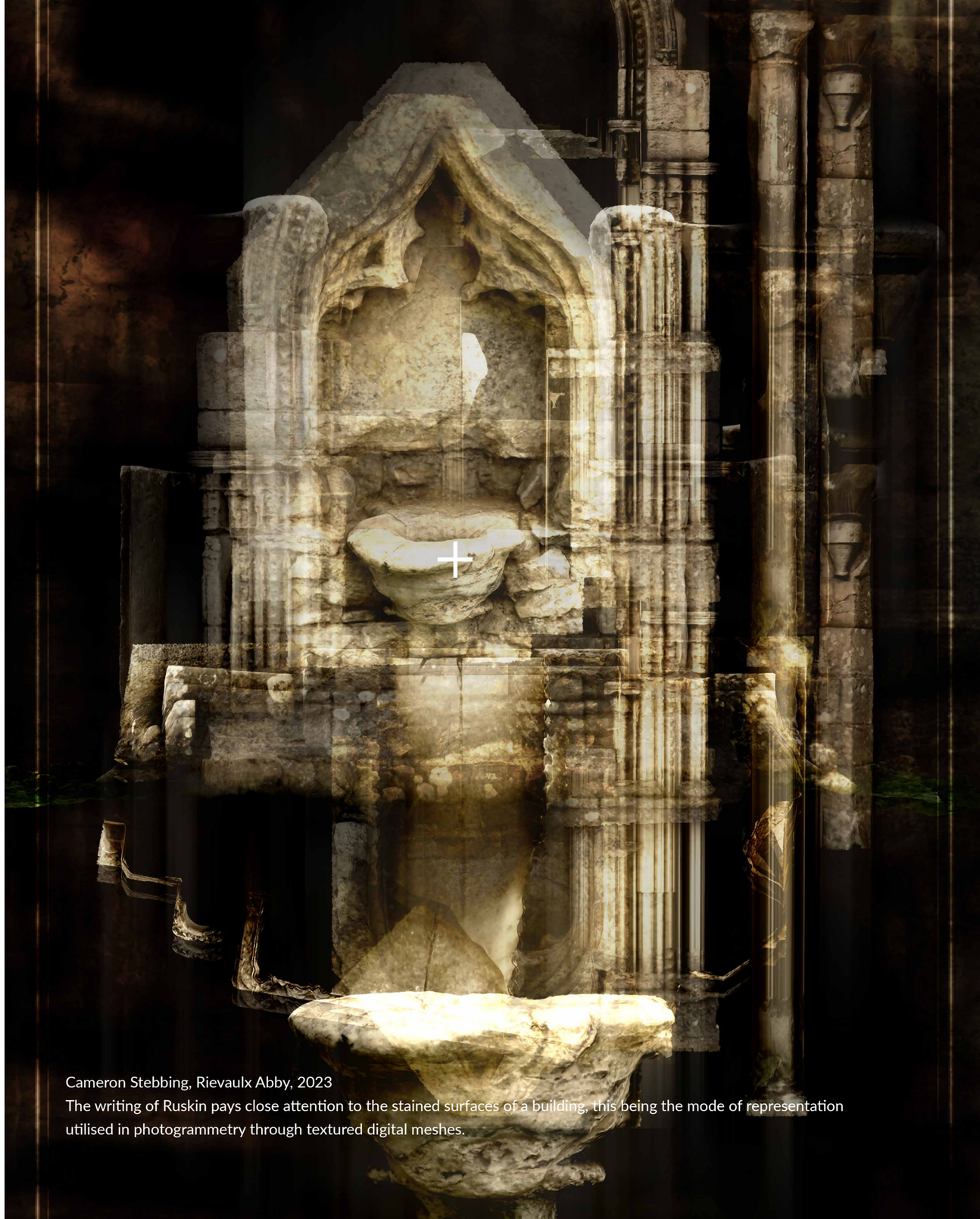
With the now undisputed position of digital techniques in fields such as architecture, the opportunity to reconstruct portions of the world true to their actual spatial properties is a tantalising prospect. Where measured surveys such as LIDAR enhanced by photogrammetry have been commonplace for several decades, the more recent rapid increase in processing power and storage capacity of handheld devices has made this previously professional technique accessible to a wider audience. Apps used to process data for photogrammetry rarely offer a glimpse into their inner workings, with the ability to see a three-dimensional representation of a visited place that is something of a novelty. Behind the curtain, whirring algorithms carefully filter photographic data for common spatial references and omit outlying points, known as noise, to ensure the illusion of a seamless transition from the actual to the virtual is maintained. However, by suspending this requirement for technical and visual accuracy, questions arise about what is recorded within a scan. Where do these digital objects begin and end?

Do these excluded data points not constitute an inherent part of the reconstructed object? The inclusion and exclusion of data within scanned space challenged preconceptions regarding their object's interiority and exteriority. Data supportive of the accurate representation of an object is included within the reconstruction, prioritised over antagonistic and disruptive artefacts, which obfuscate this aim. The studies presented here do not exorcise such data, instead feeding upon the discrepancies to exacerbate the erroneous artefacts. Floating elements created from thin mullions drift about their parent, and flattened landscape conditions mix surreally with the ruins of the foreground, maintained as constituent parts of the artefact. Breaks occur in unexpected places, spurred on as the software seamlessly wrestles with constituting images into smooth models. The model will converge from one angle with its subject, while others see it diverge unrecognisably.

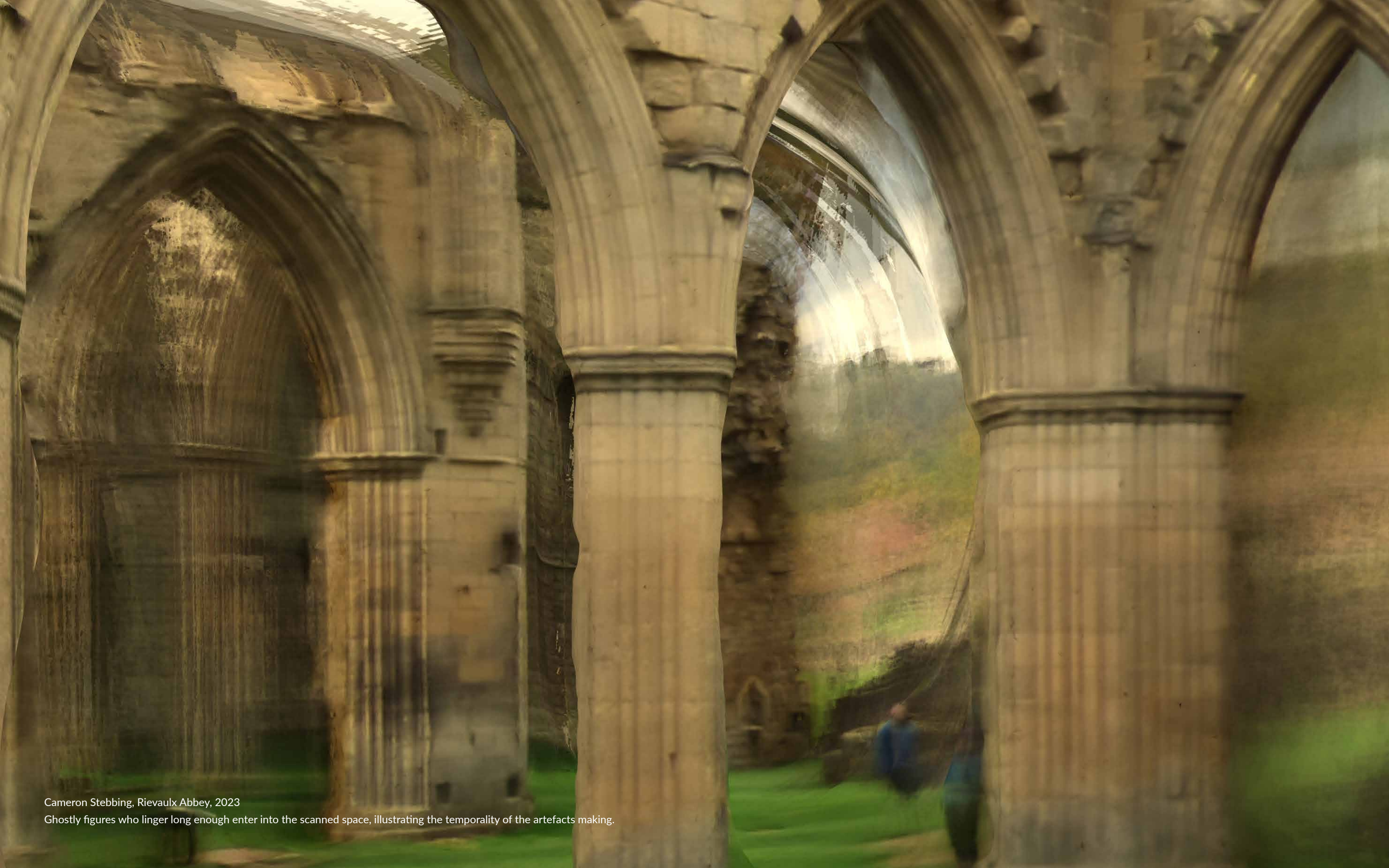
Object Oriented Ontology catalogues the depth and strangeness of objects, advocating their ungraspable nature. No representation can fully exhaust an object, with some part of it always withdrawn[2]. Documented portions of a scan with good photographic coverage are rendered in sharp clarity, whereas others are indistinguishably mutilated. The idea that the reconstruction is based upon a neat, discretely defined object is challenged by this algorithmic space. That is not to say that digital tools entirely take over; after all, any reconstructed mesh is in direct communion with the photographic data input for its creation. However, they are no longer in total service to a more real underlying subject, building instead a hybrid artefact existing within a mediated space between the actual and virtual.

In this reading, the artefacts can be seen as micro-cosmologies. Causal expressions where the process of their creation is an inherent part of the manifested mesh. These small, contained artefacts respond to the limits and laws of the information used in their construction. The distinction between figure and ground is broken as all information becomes subsumed within this hybrid space. Signage, barriers, and even fiducial markers used to orient scans become constituent parts of photogrammetric artefacts. Temporary spaces of event and occupation are levelled with the monumental backdrops upon which they play out.

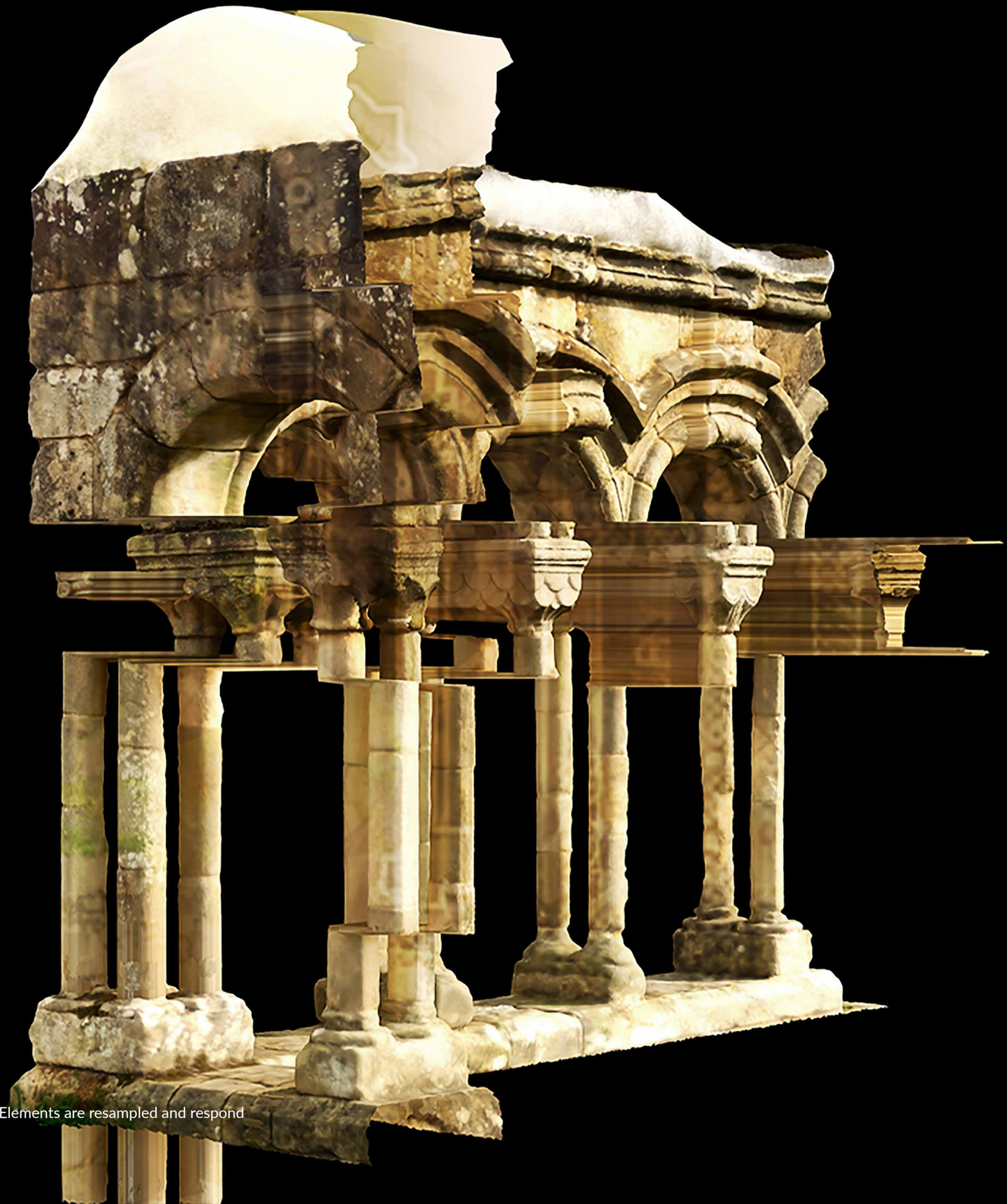
2 - For a discussion of temporality in Object Oriented Ontology and Hyper Objects see Morton (2013).



Cameron Stebbing, Rievaulx Abby, 2023
The writing of Ruskin pays close attention to the stained surfaces of a building, this being the mode of representation utilised in photogrammetry through textured digital meshes.



Cameron Stebbing, Rievaulx Abbey, 2023
Ghostly figures who linger long enough enter into the scanned space, illustrating the temporality of the artefacts making.



Cameron Stebbing, Rievaulx Abbey, 2023
Exploration of architectural tectonics utilising the disruptions and laws of scanned space. Elements are resampled and respond to the newly revealed dimensions of the objects.

This interiority of the scan, from which nothing captured can entirely escape, paradoxically vastly expands its context to encompass more than traditionally material objects. Climate and weather manifest as blue or white walls, and clouds and the sky become conflated with material subjects. Such artefacts can appear as a great undulating ceiling hung over perforated ruins or bulbous glazing filling skeletal fenestration. These elements rush forth as tangible objects. Massive spatial-temporal entities are defined by Timothy Morton (2013) as hyper-objects, radically filling the frame, though only ever perceived as localised effects. The climate feels very close here, almost as if you can reach out and touch it.

Stained Surfaces

A transcription occurs between the nebulous hyper-object climate and the elusive photogrammetric object. Environmental conditions of the documented site are translated as surface conditions onto a digital mesh. Photogrammetry is defined by the impossible digital thinness of the mesh, a surface formed from discrete data points in a point cloud. Photographic imagery is then etched onto this mesh to form its textured surface. Where controlled environments are used for evenly lit objects, this appears as a direct correlation between materiality and appearance; however, when harsh rays of sun filter through a building's windows, the environment becomes baked as part of the texture.

John Ruskin was a keen advocate of architectural surface, identifying this as a site of truth and value for buildings, and though his writings are distant from contemporary documentary technologies, he wrestled with newly emergent photography and how to best capture the qualities he saw[3]. Victorian thinkers struggled to place the enigmatic nature of photography, fluctuating between its images as natural or cultural artefacts. For Ruskin, there was a seductive nature to a device that could meticulously record the details of crumbling facades in Venice, unable to falsify what it saw. Here was a method to preserve the factures and wrenches of time littering a facade. He did not promote a controlled reconstruction of images tempered by classical perspectival but a manic and excited documentation of walls: a manifesto of the surface and its ability to speak something of the truth of a building.

Sedimented in the mesh is something of this truth. It is not a complete rendition but a fragmentary flickering one. Photogrammetry, in this sense, is aphoristic, just as the aphorisms that litter the pages of *'The Seven Lamps of Architecture'* (Ruskin, 1989). Soot blackened facades stain the stones of architecture with the discarded products of industrial society; patterns of weathering and decay speak to the 320-million-year geology of the stones; peeling billboards and litter tell of the detritus of the age of late capitalism. Painterly and etched surfaces are not superimposed layers which can be peeled back to reveal a pure object beneath (the thinness of a digital mesh prevents this anyway) but traces of a stained superposition teetering between multitudinous stains.

A Temporal Menagerie

An analogy can be drawn between the staining of the photogrammetric surface and the stains of time, which Ruskin identifies in the Lamp of Memory[4]. Within the scan, however, they are not smooth timeframes but syncopated chronologies, dislocated and withdrawn from one another. The making and decay of human carvings cannot be grasped on the same terms as the erosive forces of rock and stone. Exacerbated degradation from carboniferous acid in the rain is not just a localised phenomenon on building facades but a manifestation of the anthropocene where human influence has geological implications. Ruskin observed the truth of objects is just as much in what has been lost 'half an inch down' as the extant physical remains, an expression of the causality of work lost to time. The photogrammetric artefact sees these superposed temporal frames temporarily stabilise, creating a ghostly interplay between the presence and non-presence of the object simultaneously.

3 - Arrhenius discusses John Ruskin's use of early photography in the preservation of buildings in 'The Authentic' in Arrhenius (2012) pp54-81.

4 - See the Lamp of Memory in Ruskin (1989) pp176-198

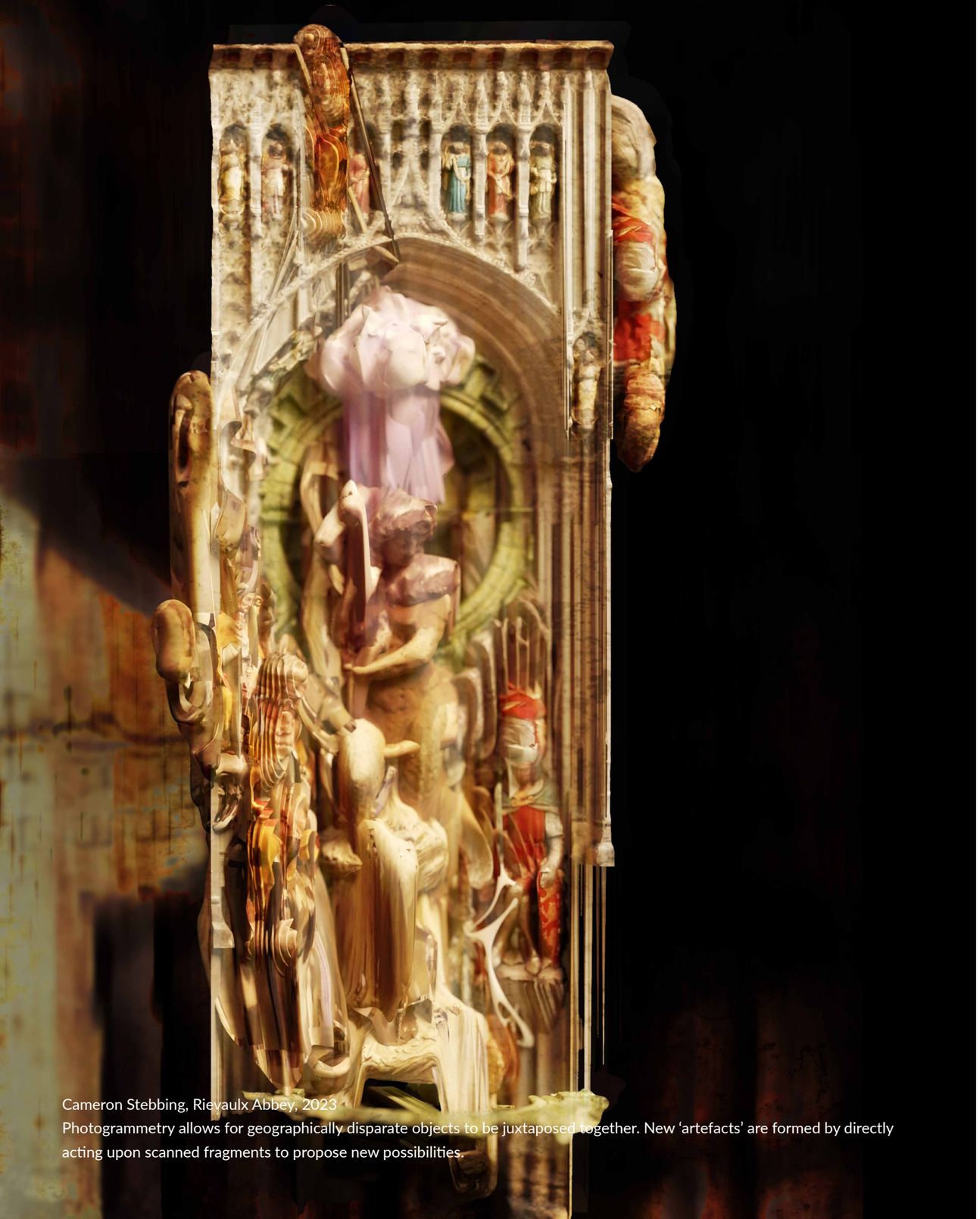
Cameron Stebbing, Rievaulx Abby, 2023
Exposition of the data nominally discarded from complete artefacts, including environmental traces, stretched landscapes and the position and route of the documenter.

1.

3.

"I mean, to which Polity owes its stability, Life its happiness, Faith its continuance,—Obedience. acceptance, Creation its Nor is it the least among the sources of more serious satisfaction which I have found in the pursuit of a subject that at first appeared to bear but slightly on the grave interests of mankind, that the conditions of material perfection which it leads me in conclusion to consider, furnish a strange proof how false is the conception, how frantic the pursuit, of that treacherous phantom which men call Liberty" - RUSKIN, The Lamp of Obedience

Cameron Stebbing, Rievaulx Abbey, 2023
Occupying the scanned contexts. Speculative proposition for a future entrance to the ruined chapter house at Rievaulx, occupying the site of a scan focused on the shrine of Abbot William.



Cameron Stebbing, Rievaulx Abbey, 2023
Photogrammetry allows for geographically disparate objects to be juxtaposed together. New ‘artefacts’ are formed by directly acting upon scanned fragments to propose new possibilities.

Just as the earliest photography prototyped by Daguerre in the mid-19th century, owing to prolonged exposure times, reduced moving figures to ephemeral blurs, so too do the inhabitants of photogrammetric objects emerge, only if they linger long enough, becoming conflated with the surfaces of the scan. This ‘exposure time’ of photogrammetry ensures the chronology of its capture is inherent to its reconstruction, bringing to the forefront an often-overlooked element in analytical documentation: the active gaze of the recorder. Transcribed via the operation of the camera, it is a final experiential dimension to this hybridised artefact. Where Ruskin lamented the impossibility of a photograph to lie, he also scolded its inability to tell the ‘truth’ in the way artistic endeavours can. Stretching, appearing where the eyes of the recorder cannot land, could be said to embody some of the truth that Ruskin felt was mutilated by the photograph.

Speculative Documentation

The exposition of hybridity in these artefacts also refers to a potential criticality beyond scanning as a subsidiary to its subject, shifting the focus to the process of photogrammetry as a novel site for proposition and speculation. Expanded temporal frames imply an absence inherent within scanned objects. Where will a structure ruined in five hundred years be in ten thousand? When talking of spectrality, Derrida (2013) notes the uncanny nature of any recording, its return implicated in the act of documentation and the realisation that we may not be around when this occurs. The future to which this speaks, then, is radically unknowable; a site of speculation. Photogrammetry can be conceived as a site for future occupation long after the physical place has decayed.

Such an architecture would occupy interstitial zones between the actual site of documentation and the digital space of reconstruction. To operate here is to adhere to the rules of hybridity, distorted and warped at the edges and abutting climactic forces rendered as tangible surfaces. These would be strange new architectures of strangely familiar places. Resampling multitudinous meshes and occupying the parallax space beyond the gaze. Structures which can grasp onto the horizon and skirt around the skies.

References

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