

Open Data: Replica Revolutions in Rock Art: From Physical Replicas to Virtual Reality Libraries via Contemporary Art.

David Robinson, University of Lancashire

Nathan Jones, University of Lancaster

This project examines the utility of replicas in interdisciplinary approaches to rock art sites. It includes examining physical and virtual replicas. Data provided here in Table 1 summarises observations made from visiting original sites, physical replicas, or using virtual replicas. The approach allows us to compare original sites, physical replicas and VR replicas without treating them as equivalent. Original sites arguably offer the closest indexical relation to the past, but their use is necessarily restricted by conservation and access. Physical replicas expand public access and preserve aspects of scale, sequence and surface, but often retain guided and controlled modes of encounter. VR replicas can increase freedom and interactivity while weakening material, atmospheric and haptic presence. The point of the analysis is to identify what each form makes possible, what each form constrains, and what a future VR Library would need to add if replicas are to function as living research environments rather than one-off visitor experiences. While our focus is on replicas, our research included visiting original rock art sites in southern France for comparative purposes. Following is summary of our evaluation followed by qualitative data derived from both original sites and replicas.

Field Reflections: three Palaeolithic sites in Southern France.

In order to establish how replicas could be evaluated, we deemed it necessary to visit original Palaeolithic rock art sites to apply the same set of criteria to then consider the replicas. Of course, we could not visit the original sites such as Lascaux and Chauvet, so we chose proxy sites in Southern France. These sites were readily available to the public and included Rouffignac, Pech Merle, and L'abri du Cap-Blanc in Southern France.

Freedom of Movement

In all of the cases of visiting the original sites, freedom of movement was severely restricted. In order to protect the site itself, plus the visitors themselves, this is to be expected. For Pech Merle and L'abri du Cap-Blanc, much of the art was separated by barriers, keeping a distance from the art. At Rouffignac (Fig 1), a rail journey into the cave system kept us in seats for most of the experience, keeping us from viewing the art very closely. Walk-ways at Pech Merle controlled our access, while the entire site at L'abri du Cap-Blanc was enclosed within a confined structure. Even so, some movement was possible. We would move along the railings to get different views, and look across the cave interior (Pech Merle) or rock shelter (L'abri du Cap-Blanc). Importantly, when the train ride reached the interior we were able to get out and walk about unrestricted under the Grand Plafond, or Grand Ceiling. In all cases, our movements and time spent viewing were facilitated but also restricted by the tour guides.



Fig 1: Rouffignac entrance. Photograph by Nathan Jones.

Narrative exposure:

All of the experiences entailed visiting the sites with a tour guide. Information given was almost entirely dependent upon the individual guide. In some instances, the guides gave only descriptive accounts concerning the pigments used, the way the paintings were made, and the dating of them. In others, some interpretation of role of the art and possible symbolic interpretations.

Interactivity:

Being taken into the Palaeolithic sites and seeing rock art in situ and in context is a highly interactive event. The creative use of lighting to direct views helps to give a kind of drama to the experience. The atmosphere of each cave is also part of the interactions: temperature and humidity change as one passes through, giving a bodily interaction including the sense of smell. In some cases, such as at Rouffignac and L'abri du Cap-Blanc, information sheets help to engage with the art complementing the narrative. Also, the train ride at Rouffignac, while distancing from the art, also provided a fun, unique experience to travelling into the cave system. However, there are few other opportunities to experience the art other than looking at it in its present state of preservation.

Indexicality

The original sites index deep time, natural formation processes, and the behaviours of the prehistoric humans who created the artworks. Every surface, mark, and environmental cue connects directly to a remote cultural and ecological context, making these spaces more than sources — they are referents in their own right. Their indexical force lies not in resemblance to something else, but in their role as grounding points for any subsequent act of replication, interpretation, or virtualisation.

From an archaeological perspective, the question the original sites pose is: what do they carry forward that replicas must find ways to preserve? Scale, surface texture, image placement, spatial sequence, acoustic properties, the relation of marks to cave morphology — these are the features against which any replica's indexical fidelity will ultimately be measured.

From an artistic perspective, the original sites open indexical links in a different direction: outward, toward the contemporary contexts in which they are encountered. At Rouffignac, for instance, the experience was strongly inflected by locality — the Frenchness of the heritage framing, the particular character of this corner of the Dordogne — set in resonant tension with the deep ancestral distance between that present identity and the people who actually moved through and marked that space. The cave indexes both deep time and the long history of human presence in a specific place, while the modern framing of that place as French national heritage quietly suppresses the profound discontinuity between those two things.

Crucially, the indexicality of the original sites is not static. The caves are not only records of their making — they are records of everything since: humidity, bacterial growth, seismic movement, the breath of modern visitors. They continue to change, to record, to degrade. This ongoing inscription of time and entropy is itself deeply indexical, and it is something no replica shares. A replica can be preserved, restored or remade; the original quietly continues to index the passage of time in its own substance.

The original sites as research environments

The original caves were knowledge-producing spaces for their makers, and they remain so. They continue to allow questions about image-making, spatial organisation, embodied perception, and more-than-human relations to be thought through in ways that no secondary encounter fully replicates. Our own experience bore this out: the journey to each site, and the quiet descent into the earth, provided space for contemplation and dialogue — between artist and archaeologist, between the present and the deep past — that was inseparable from the bodily sensation of being inside the earth and seeing it from within. Restricted freedom and guide-controlled narrative shaped the mode of enquiry rather than foreclosing it. Of course, we were limited to visitation: if we were to apply for access to conduct specific research on site, we would be able to pursue a range of questions.

Yet the original sites are frozen in one important respect: their status as heritage experiences was fixed at the moment of their modern discovery, or when they were first conceived as museums, and that framing can become static. The interpretive frameworks, tour formats, barriers and lighting belong to a particular moment in heritage thinking. The caves

themselves, meanwhile, are anything but frozen — they are degrading, accumulating the traces of every subsequent encounter, indexing time and entropy in their own fabric.

Table 1: **Qualitative data from all sites in study.**

	Freedom	Narrative	Interactivity	Indexicality
L’abri du Cap-Blanc	Art separated by barriers, keeping distance from the art. Entire site was enclosed within a confined structure. Able to move along the railings to get different views, and look across the cave interior.	Visit site with a tour guide	Restricted to viewing from distance. Information sheet provides extra content. Dialogue with tour guide and others in group.	Index deep time, natural formation processes, and the behaviours of prehistoric humans which created the artworks.
Pech Merle	Walk-ways controlled access. Able to move along railings to get different views, and look across the cave interior	Visit site with a tour guide	Restricted to viewing from distance. Dialogue with tour guide and others in group. Lighting is used to draw ones attention to particular panels	Index deep time, natural formation processes, and the behaviours of prehistoric humans which created the artworks.
Rouffignac	Rail journey kept us in seats for most of the experience, unable to view art very closely. When train reached the interior we were able to get out and walkunrestricted	Visit site with a tour guide	Restricted to viewing from distance (except Grand Plafond). Lighting is used to draw ones attention to particular panels Information sheet provides extra content.	Index deep time, natural formation processes, and the behaviours of prehistoric humans which created the artworks.

	under the Grand Plafond		Dialogue with tour guide and others in group.	
Chauvet 2	Movement controlled by railings and designated walk areas.	Visit site with a tour guide	Restricted to viewing from distance. Dialogue with tour guide and others in group. Lighting is used to draw ones attention to particular panels	Original morphology, but an altered cave system. Original artworks, and modern making of replica. Discovery of cave. Modern heritage ideals.
Cosquer II	Ride on automated 'exploration modules'	Headphones with scripted narration.	Restricted to exploration modules. No interactivity with recording.	Original morphology. Original artworks, and modern making of replica. Discovery of cave. Modern heritage ideals.
Lascaux IV	Access controlled by railings and designated walk areas. Workshop room contains tear away reproductions, suspended in sections, allowing time at specific panels albeit disattached from the overall cave itself.	Visit site with a tour guide.	Restricted to viewing from distance. Dialogue with tour guide and others in group. Lighting is used to draw ones attention to particular panels. Digital tools in adjoining galleries.	Original morphology. Original artworks, and modern making of replica. Strong indexing towards discovery of cave. Modern heritage ideals.
<i>Memoria: Stories of La Garma,</i>	Narrative tour with little opportunity to explore specific artworks.	Professionally produced recorded narration, high quality sound and visuals.	Ambient sounds of the cave: archaeological objects can be handled.	Original morphology. Original artworks, and modern making of immaterial virtual replica.

<i>PleitoVR</i>	Enables complete movement. Can get as close as possible to paintings, even entering the rock it-self.	No narrative content.	Ambient sounds of the environment and Native American singing. Archaeological objects can be handled and dStrech textures allow views of different light spectrums.	Original morphology. Original artworks, and modern making of immaterial virtual replica including contemporary Native American singing.
<i>Dawn of Art: A Journey Through Chauvet Cave,</i>	Guided narrative followed by the opportunity to look at a selection of panels.	Professionally produced recorded narration, high quality sound and visuals.	Able to view individual panels closely.	Original morphology. Original artworks, and modern making of immaterial virtual replica.