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Article

Presencing Echoes in the Archive: Material Voices Through Space and Time

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Abstract

This article presences the material entanglements of analog and digital archives through a workshop-based inquiry titled "Collaging Echoes and Resonances Across Space/Time", which applied Annie Goh's question of whether echoes can claim a voice of their own to objects. In this session, participants collectively collaged with imprints of meaningful objects diffracted through materials like paint, tape, etc., and with the objects themselves. Group discussions yielded key considerations that we examine in the context of archiving. These include understanding materials in relation to the structures that shape the formation of their echoes; tracing how echoes may evolve into unrecognizable forms; and how iterative threads of meaning across ongoing interactions act upon each other in non-linear time. As the digital archive becomes increasingly prominent, these questions help to frame implications across archival formats to better understand the relationships between iterations of an item and the containers in which it is held, furthering the conceptualization of a posthuman archive. This paper applies new materialist perspectives of knowledge to history and archiving through an arts-based approach, offering a novel entry point to understanding archival echoes. It will interest scholars and/or practitioners in history, curation, and museum studies, enriching criticality in how knowledge is enacted in the material.

Keywords: archiving; materiality; entanglement; arts-based methods; collaging; echoes; posthuman knowledge; interdisciplinary studies; posthuman archive

Academic Editor: Nadezhda Stanulevich

Received: 30 October 2025
Revised: 10 December 2025
Accepted: 22 December 2025
Published: 12 January 2026

1. Introduction

Arguably originating with the philosophical criticism of Michel Foucault (1972, 2002) and Jacques Derrida (1996), the debate on archives has greatly grown over the last decade. Engaging with questions of archiving and historical research necessitates an examination of power that is already being addressed across a number of innovative methodologies and important considerations in the field. Scholars are adapting queer theory, post-coloniality, and embodiment to their work with archives (Caswell et al. 2017; Lee 2022). Notably, Saidiya Hartman is known for her development of critical fabulation to address archival gaps, foregrounding creative writing as a responsive methodology that resounds across space and time (Hartman 2008). Verne Harris applies Derrida's "hauntology" (later discussed) to push for archival justice through a deconstructive praxis (Harris 2022). Recent academic literature also sits with a long history of living Indigenous archives that draw from distinct epistemologies to bring forth vibrant futures (Thorpe 2025). The rising field of Critical Archival Studies examines the topic through a decolonial, feminist, and queer lens (Caswell et al. 2017). However, it is worth noting that literature on the archive is primarily

developed by archivists and experts of archival curation, rather than by scholars who use the archive as historians, art historians, and academics from other humanities departments. Researchers engaging with archives have extensively written about the effect of digitalization in their studies; the workflows of research have deeply changed, from looking for sources to sharing the findings, raising pressing concerns. For instance, Ian Milligan's "The transformation of historical research in the digital age" (Milligan 2022) shows how digital tools fundamentally shape historical research, implicating every historian. Scholars like Lara Putnam (2016) or Alexandra Walsham (2016) have published on similar matters, but these publications tend to be isolated rather than part of a coherent debate, given that researchers who rely on archives are not typically specialists in archiving. Their intellectual focus, along with their time and publication efforts, lie in other subjects, rather than in archiving itself.

This article is written from the point of view of scholars experiencing the archive and applying posthumanist epistemologies to our understanding. We offer the model of a collective collage as an arts-based method of conceptualizing the issues and relationships at stake in entering a relationship with an archive as a researcher. We are, however, drawn not only to questions of academic choices and researcher agency but also to how materials can claim their own voices in a posthuman understanding of the archive—analog and digital—wherein multiple subjectivities, agencies, and intra-actions are constantly in play.

We rely first on the framing of echoes, found in Annie Goh's "Echoes of Elsewhere," in which she interrogates whether echoes might claim a voice of their own (Goh 2024). Goh stresses the potential of echoes to disrupt binaries: self/other, here/there, past/present. Is an echo the same sound delayed or a different sound altogether? Can agency be exercised in this repetition "to subvert and transform" (Goh 2024, p. 33) the so-called original sound? In these elsewheres and in-betweens, Goh suggests, opportunities to re-story can emerge, alongside questions of what stories we want to tell and what futures we want to enact. The echo thus becomes a site where epistemic injustice can be reclaimed.

In the context of archives in particular, the term "echoes" is no longer solely contained in the sonic. They might also refer to the reverberations of memory and meaning that arise from archival materials. Such echoes are non-linear, troubling the temporal, spatial, and subject/object binaries that Goh discusses: they move between past, present, and future in unexpected, evolving motions. These materials echo past stories, fragments of life. What objects, documents, or videos have been kept to hold memories? What memories have been selected to echo, by who, and why? Crucially, what else might have slipped in? Through what structures? Archive echoes exist equally in future narratives extrapolated from these materials. What stories will continue to resonate and be honored? Which ones will fade into silence or noise? Here, we suggest that archives should not be understood with a clear-cut division among pasts, archive materials, and futures. By considering archival echoes, we acknowledge the relationality among these moments, the constant dialogue that brings them to shift and transform, diffracting through one another in a Baradian interpretation of intra-activity (Barad 2014, p. 168) (discussed further in Section 2.2).

In this article, we offer a material way to conceptualize these questions through a collective collaging and assemblage workshop titled "Collaging Echoes and Resonances Across Space/Time " with the Cambridge Posthuman Network, co-hosted by the authors in June 2025. The workshop was intended to act as a means of inquiry into our two distinct fields of research: 19th-century Mediterranean history in the case of Russo--, and posthuman epistemology, in the case of Nguyễn. Initially, the session was prompted by several opening questions that interested us for the purposes of our independent research projects, namely, (a) how love, belonging, and identity act as portals through space/time, and (b) how individual and intersecting identities shape collective space. A more personal

https://doi.org/10.3390/arts15010015

archive, constructed of personal materials, was chosen for that reason. However, the takeaways gathered post-workshop applied less to the original questions proposed and more to archiving and historical research at large—itself, an example of how a response can claim its own voice and life beyond the initial queries that prompted it.

In this workshop, participants—primarily doctoral and post-doctoral researchers at the university—were asked to revisit a meaningful location prior to attending the session and bring along an object from this visit with which to collage. Examples included business cards, rocks, foliage, train tickets, and the like. The co-authors provided art supplies, such as charcoal, coloured pencils, tape, Play-Doh, string, and paint, for attendees to interact with/through their objects on large sheets of flipchart paper shared per table (example in Figure 1). Approximately three participants worked together per collage, with varying levels of intentional interactivity across the groups; some preferred to stick with their own objects, in their own corners of the page, while others borrowed objects and materials and blended their images with others in the group. As the play process was designed to facilitate unplanned emergence, no instructions were given as to what shapes or images to create. Following the activity, discussions ensued, focused on the material interactions, the shaping of space/time, and the formation of "echoes" (Goh 2024) in the resulting collages and beyond.

Figure 1. An assemblage featuring a person-shaped gummy stuck onto the white page, surrounded by tape, scribbles, and a Play-Doh structure.

In total, four large assemblages were created. The one-time session lasted two hours and attracted around ten participants from disciplines ranging from education to physics. No registration was required; in fact, several people dropped in to collage or contributed to the group discussions casually. Approximately two-thirds of the group were familiar with arts-based methods and posthumanist thinking prior to attending, with the remaining researchers engaged in more traditional academic methods. The setting was largely informal, as many (though not all) attendees knew each other as well as us co-authors,

having joined other arts-based, interactive, and reading group sessions together (hosted by people at different levels within the university). Overall, the workshop acted as a joint space of inquiry and provocation that could be widely applied across contexts and fields, depending on how participants chose to diffract it (Bozalek and Zembylas 2017).

The proliferation of "echoes" was nonetheless foundational and carried throughout the workshop's entirety, beginning to end, as we were highly intrigued by the concept of active iterations in memory, identity-building, and historical research. This article focuses primarily on the latter field, applying Goh's question of whether echoes might claim a voice of their own (Goh 2024) to the context of historical research (one of the co-authors' disciplines). The participants' chosen objects for collaging were material echoes of a feeling or experience (and the "revisiting" of their meaningful moment or place also an echo in itself), opening engagements with the implications of "new meanings created by echoes" (Goh 2024, p. 26), particularly in how an echo might assume agency "beyond its dominant conceptualization in patriarchal Eurocentric histories, and instead be realized as a feminist and decolonial material-semiotic sonic figuration" (Goh 2024, p. 25). In other words, what other/ed stories can emerge in the iterations and re-iterations that echoing enables? Applied to the praxis of historical methodology and archiving, such concerns lead to questions like, how do echoes abound in these spaces? How do we meaningfully engage with them as researchers? What responsibilities can/should we assume? Finally, in a posthuman archive, how can material echoes claim this voice of their own?

The disciplines that we straddle as co-authors have seen limited interaction thus far, which makes this workshop a noteworthy site of interdisciplinary inquiry, especially in its potential for furthering arts-based research (ABR) methodology across research areas. Collage as ABR has an established record of practice wherein "by juxtaposing disparate visual elements, new associations and meanings arise" (Leavy 2018, pp. 355–56). As Vaughan (2005) highlights, collage as inquiry offers the opportunity for cultural critique and transformation to people who would otherwise be intimidated by more seemingly official arts practices. This premise served the casual drop-in setting we wanted to cultivate, wherein mess was encouraged. In other words, collaging creates an accessible space for participants' feelings, ideas, and memories to organically emerge, echoing non-linearly in the collaging process. Art therapists Chilton and Scotti (2014) argue that "collage enabled (a) integration of layers of theoretical, artistic, and intersubjective knowledge; (b) arts-based researcher identity development; and (c) embodied discoveries" (p. 166), enabling theory and practice to co-emerge as participants co-created and shared in the space. As methods of data generation, analysis, and representation, these arts have been widely recognized as conducive to "foster[ing] sensory and embodied knowing" (Leavy 2018, p. 361) to convey half-formed, sometimes contradictory, thoughts or unconscious and semi-conscious experiences, which we treat as fluid and contextual instances to critically examine.

Given the three-dimensional nature of certain materials, such as the objects brought by participants, many ended up collaging with "assemblage"-like features. Similar to collage, "assemblage" creates a dimensional object, usually a sculpture, by combining various parts to create a new whole (Weingrod 1994). Assemblages are composed of found materials, such as natural objects (wood pieces, rocks, leaves) and human-made objects (broken toys, plastic objects, cloths), merged (Atkinson et al. 2004). These are not materials intended for art, but in the assemblage are repurposed, creating ontological echoes between their original intended use and their new lives (Leavy 2018, pp. 356–57). In this session, participants freely moved between collage and assemblage forms. Already, the tactile experience of collaging as a research practice facilitated embodied insights and meaning. Then, having participants explore through tridimensionality and a wider range of objects enhanced the materiality of the collaging experience: "[s]nipping, gluing, writing, taping, and other

activities were how we enacted or 'performed' our learning while we simultaneously transformed the materials into art" (Chilton and Scotti 2014, p. 169), gesturing to the layers and echoes of a personal archive transformed and integrated into a more collective piece.

Applying these workshop implications in a public archive thus requires no great leap, given the initially personal nature of many objects that we still consider in the archives today. Certainly, the same questions concern the objects' materiality and iterations. Aligned with a post-qualitative mode of inquiry, whereby the separation of data from the body is challenged (St. Pierre 2021, p. 6), this workshop and article maintain methodological consistency by presenting our practice and implications not as concrete, scalable products but as questions worth staying with when working with materials in archival processes and spaces across projects. Scalability itself has been criticized as an outcome given its tendency to erase crucial histories of contamination that every being and object carries, at the risk of losing all meaning (Tsing 2015, p. 27). We will engage with the emergence of three main takeaways from the workshop discussion: understanding materials in relation to the structures that shape the formation of their echoes; tracing how an object's echoes may evolve into unrecognizable forms; and how iterative threads of meaning across ongoing interactions act upon each other in non-linear time. We then consider how these points manifest across analog and digital archives to better understand their implications toward enacting a posthuman archive.

2. An Original Wholeness

Archival materials, which include documents, objects, and media intentionally preserved for memory, are affected by, and echo through, everything with which they are entangled, both human and non-human. The relationality between archival materials modifies the echoes. Long catalogues suggest themes between objects (though exceptions to any categorization abound in the "miscellaneous" sections), and materials also interact with each other in unexpected ways. What new connections can be noticed when we begin to regularly account for these entanglements? Archives are not empty rooms, though human presence is often overlooked. Archivists, researchers, staff members, and ordinary people are active forces in the archive: living, modifying, and echoing with it. Space, such as where sources are stored or consulted, frames these echoes. Is it an imposing national archive, or a smaller private collection? How is the light: old yellow lamps, white neon, or natural lighting? Is the room cold in the winter, or unbearably hot on a summer day? Dust makes for constant company in the archives; after consulting the materials, a light layer settles on the tables. Its stale smell, mixed with the punchy odor of latex gloves, accompanies the long hours spent consulting documents. Bacteria and mold live in the archive and shape it, a disliked presence among archivists, and yet ever-present. All these elements alter the archive, creating new caverns and echoes across time.

New materialist knowledge-making is deeply concerned with this very entanglement and treats it as epistemologically crucial—from the "compost" that Haraway envisions us all being part of (Haraway 2016, p. 101) to Tsing's "contamination" (Tsing 2015, p. 27). That we are not only inextricable from but also critically connected to our encounters in ongoing processes of meaning-making has been lengthily discussed across posthumanist literature; collective collaging offered examples of what these encounters might enact, prompting the question: how do iterations of an object or encounter emerge amidst its entanglements? As one participant pointed out in the group discussion, an echo cannot exist on its own; it requires a particular holding structure(s)—a mountain, a tunnel, a cavern, in short, a specific relation to time and space—to produce the outcome that we (along with our own entanglements) perceive.

To better outline the entanglements in this workshop practice, we must first highlight the materiality of the art supplies presented that actively shaped what began to form on the sheets of white paper. As any artist knows, the availability of certain colours and the texture of paints naturally impacted the quality of brushstrokes and shades that emerged in tandem with the intention of the participant. The smiley sponge making smiley faces is perhaps the most obvious example (Figure 2).

Figure 2. A collage/assemblage featuring a painted smiley face made from a sponge.

However, these cross-material entanglements quickly disrupted the initial significance assigned to the participants' personal objects upon entering the workshop. In one example, a roll of Washi tape with words like "DESTINY" and "HAPPINESS" printed on it began to angle the nearby collage towards themes of "LOVER" (spelled in beads) and "HEART" (in cut-out letters) even as four people worked with different objects and materials alongside each other in a diffractive process. Their interactions furthered the creation of new caverns and echoes along the way. Soon, multiple people were making multi-registered heart shapes, interlaced with quips about relationships made in charcoal, Play-Doh, and paint, spelling phrases like "LIVING SMALL HAPPINESS" or "THERE IS NO IDEAL MAN" (see Figure 3 below). As one participant put it, "the tape has a lot to say."

Our selection of art supplies as workshop organizers, in addition to the choice of white paper as backdrop, acted as the container for the activity—the cavernous structure that enabled these particular echoes to form. Though our decisions were limited by the materials readily available to us (a matter of convenience), they nonetheless held intended and unintended consequences in shaping the stories that emerged out of the collaging. This role is worth highlighting in reference to Haraway's edict:

> It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It

matters what stories make worlds, what worlds make stories. (Haraway 2016, p. 12)

Figure 3. A collage/assemblage with pink Play-Doh dots around heart-shapes made from charcoal, train tickets, Play-Doh, and tape. The above words and phrases are taped in block letters.

To take the implications of those words beyond this collage, any act of creation, selection, or classification is an act of storying: an "agential cut" that offers a temporary resolution within an original wholeness that we are all part of (Barad 2007, p. 384). This provisional cut is dependent on the phenomena it is in relation to, otherwise understood as the specific echoing structure where the story-making—and thus, world-making—plays out. We must then ask ourselves: what matters are we promoting in the creation of other matters? What stories are we furthering? What worlds are enacted in the availability of certain materials over others? More importantly, what do the materials of these structures themselves have to say? Le Guin's "The Carrier Bag Theory of Fiction" reminds us how—while stories are an inevitable technology for organizing and making sense of our experiences—narrative structures can either uphold standards of patriarchy or offer a feminist alternative (Le Guin 1989, p. 165). The shape of a cave, bag, classroom, archive, etc., is the shape of the phenomena it makes; it matters how an echo is held. As such, our positionalities as curators, alongside those of the materials we made on offer, are the eventual outcomes.

As this paper deals with the implications of entanglements in both analog and digital archives, it is important to note that while similar results might have been achieved in a digital space with adequate tools for cutting and pasting, any relationships with the material would have been significantly affected; applying pressure on a keyboard or (for the purposes of this collage) toggling the features of a digital paintbrush could not produce the strokes made by hand. In a lecture earlier this year, Tim Ingold critiqued this normalized extraction of information from the material, despite infrastructures of technologies still being bound to webs of relationality (Ingold 2025). In our consideration of the cavernous

structures in which echoes are made, we must acknowledge that a digital cavern is wholly distinct from the analog. Accounting for its contaminants, therefore, requires different sensitivities and methodologies that are nonetheless critical to consider alongside any data researchers engage with.

Put otherwise, the form in which historical memories are held, and thus the structure where the echoes reverberate, shapes the echoes themselves. These entanglements are critical to consider as working with an archive is a fundamental moment for many scholars, and often still an in-person journey. A trip involves far more than looking at documents. It could also mean discovering a new city or country, learning a language, experiencing different smells and foods: a novel encounter, but familiar to the researcher who has spent countless hours studying (and dreaming) about it. Every archive then holds its distinct particularities: navigating catalogues, badgering archivists with questions, such as, how many boxes can one consult in a day? Are pictures allowed? Are gloves needed to handle the material? Researchers must then study page after page, examining intricate details of a single object, hoping to find a spark that stands out. Being in the field "invites us to achieve a textured and embodied knowledge of place". It makes "researcher[s] vulnerable to history. [. . .] When one reads in the field, one is constantly being scripted, being made the object of a countergaze, and is thereby forced to confront not only one's geographical but also one's historical location" (Puri 2013, p. 70). A single footnote in an academic's final paper contains traces of all the above lived experiences. What, then, do we do about it? How do we respond to such an expansive understanding of what an archive can mean?

Turning back to the digital, the most noteworthy distinction between archival formats is how they are experienced; as a digital archive is a set of data stored in a hard drive, they are typically encountered by researchers or archivists as webpages or folders that need to be consulted from a laptop. Scholars have criticized the loss of a particular experientiality due to the digital turn (Putnam 2016). However, a digital archive arguably offers a different way to engage. Working in front of an office laptop might be less romantic than sitting in a national archive in a foreign country but nonetheless holds entanglements that echo alongside the archival materials. For example, what changes with the position(s) of the researcher? Are they home? With children? Do they have a designated working space? What is the time of day (or night)? Everything that surrounds us, and that we are in relation to, connects with our work and emerges in unexpected configurations. To recall Haraway's words, these are the matters shaping and creating other matters (Haraway 2016, p. 12). In what ways is our relationship to archives then changed by that knowledge, and what does that do to the definition of an archive itself?

Another difference between digital and analog archives is the 'hidden' structure of the digital, which tends to be ignored. A digital archive may appear more democratic and accessible than a physical one, but a platform's algorithms can be difficult to track (Milligan 2022). In visiting a national archive with an imposing building and a long history, researchers are more readily prompted to consider the implications of who and how the archive was made. If catalogues were listed in the post-war period, we could assume that they would be aligned with nationalist propaganda, with little attention paid to marginalized groups. However, who made a digital archive and why is frequently ignored? What website are we examining? Who pays for it? How does the search system work? What terms have been chosen as keywords? Which algorithms run behind the scenes? How accessible is the digital archive? Is there a paywall? Digitalization perpetuates the same patterns and problems of a pre-digital era, for instance, having more material from the Global North and privileged communities (Milligan 2022, p. 2) and being more accessible from wealthy universities. Data show that the institution of provenance highly changes accessibility to privatized archives, such as newspaper databases, again advantaging

institutions from the Global North (Tworek 2024). While adding an increased diversity of archival data and improving accessibility is a start, we also support these concerns being addressed in more radical ways that re-examine what an archive can look like or do.

Another underexamined aspect of the digital space involves the workers who digitized the material. Google Book Library Project, a service that most academics have used at least once, was reported to have been digitized by "invisible" workers. In a Silicon Valley Google campus, contractors underpaid employees (largely Black and Latino women), granting them fewer rights than average workers and scheduling them in 4 a.m.–2 p.m. shifts, furthering existing racial, class, and gender inequalities (Goldsmith 2013; Wen 2014). Questioning who digitized the data found online is another factor in accounting for the structures that make up echoes in research.

The format of a digital archive is less transparent than an analog one, as we are less educated to question it; much remains that we cannot comprehend. Research in digital forms is highly dictated by algorithms, following logics that historians are not trained to be aware of. As Milligan warns, this could lead to the homogenization of materials used in our research (Milligan 2022, p. 3), creating an echo chamber of sorts. Engaging with Goh's concept of echoes, therefore, invites us to intimately consider the echoes' impact, as well as the design, effects, and gaps of the echoing structures, to better identify how archival materials relate and make themselves heard.

2.1. An Ontological In-Betweenness

In the words of historian Alexandra Walsham, researchers work with archives, and increasingly with digital archives, as they are "neutral and unproblematic reservoirs of historical fact" (Walsham 2016, p. 9). By engaging with the concept of echoes in the archives, we suggest interpreting these data not as a static collection of sources, but as moving organisms affected not only by social, political, and cultural dynamics but also by the personal and material: interacting bodies, sounds, buildings, bacteria, dust, molds (fungi), and more. A posthuman perspective invites us to re-understand what an archive can be. In other words, while a traditional view of archives sees it as phenomenologically enacted, it is worth moving away from that humanist centering to question how different aspects of the archive hold power.

This challenge brings us back to the workshop, designed as an open-ended inquiry that encouraged the proliferation of emergent echoes not only from the materials but also from the objects and iterations themselves. To facilitate this emergence, participants were encouraged to follow "what feels good" in embodied processes grounded in pleasure (Brown 2019, p. 122). The interactions between the objects and the art supplies were unexpected: using foliage as a paintbrush, spelling words with tape, sticking candy (gummies) onto the paper (seen previously in Figure 1). Noticing how objects took on vastly different forms through their interactions with other materials, often resulting in unrecognizable shapes, raised the question of when something ceases to be an echo and claims a voice of its own. How can such a boundary be defined, and how can that connection be recognized?

In one collage that one of the co-authors) worked on, the chosen object began as a dead leaf (seen in Figure 4 below) that had been taken off a side street in Cambridge: a location of nostalgia at a time of leaving the city after finishing her master's. Attempts to trace it in red marker and charcoal (evoking the initial nostalgia) steadily evolved into the shape of a fish, even after the original leaf remained static (glued onto the page). The appearance of these fish, which became defined by scales and eyes, then encouraged the inclusion of flowing lines of waves that surrounded the images like moving water. Should knowing that these depictions originated from the same source change our interpretation

of either or both data? Do traces of nostalgia remain in the distorted forms? How should it be accounted for?

Figure 4. Sketches of a leaf transform through the collage into a fish drawn in charcoal, surrounded by wave-like patterns.

Derrida's "hauntology" allows us to understand all occurrences as situated and iterative, connected to an ever-present past: "Repetition *and* first time, but also repetition *and* last time. Each time is the event itself, a first time is a last time. Altogether other. Staging for the end of history" (Derrida 2012, p. 10). This blurring of space and time is precisely where echoes offer an opening to question the relations at play and "blur the boundaries set by the hegemonic orders of patriarchy and coloniality" (Goh 2024, p. 35). In the previous section, we focused on the criticality of honouring relationality in the material (resisting disentanglement) because such a framing challenges empiricist epistemologies that perpetuate colonial harm (Smith 2012, p. 49). In foregrounding our "ontological inseparability", Barad emphasizes how ongoing multiplicities counter a static or binary view of the world, historically tied to Western imperialism (Barad 2007, p. 384). Recognizing complexity in phenomena "cut together-apart" instead of old/new (Barad 2014, p. 168) is perhaps how echoes can both be haunted as well as claim a voice of their own.

Unresolvedness as opportunity. The fish as echo and an event itself. This both/and state invites the question of "what kind of elsewhere one might want to deploy it for" (Goh 2024, p. 35) as well as who/what does the deployment. Do the iterations tell a different tale? To build on Haraway's point of what matters create other matters, what stories tell other stories, etc., is to consider in each instance how difference and relation—the self/other, here/there, past/present—are accounted for in the "ontological in-betweenness" (Goh 2024, p. 34) where these echoes live.

Additionally, a complication was introduced by a participant who brought a paper train ticket, used and expired, to collage with as her personal object. Her tracing of the ticket in a similar shade of bright orange (that then connected to make the shape of a train) raised the question of "LEGITIMACY?" scrawled in marker (as seen in Figure 5 below).

She accompanied the image with a rough sketch of the ticket before tearing up the original and gluing the pieces nearby. As she explained in the discussion, who confers legitimacy upon each of these iterations? Was the original printed train ticket, at the time of collaging, equally valid to its drawn and traced forms, given that it had served its intended purpose? Does its validity change when ripped apart? What does each iteration have to say for itself, and in what way?

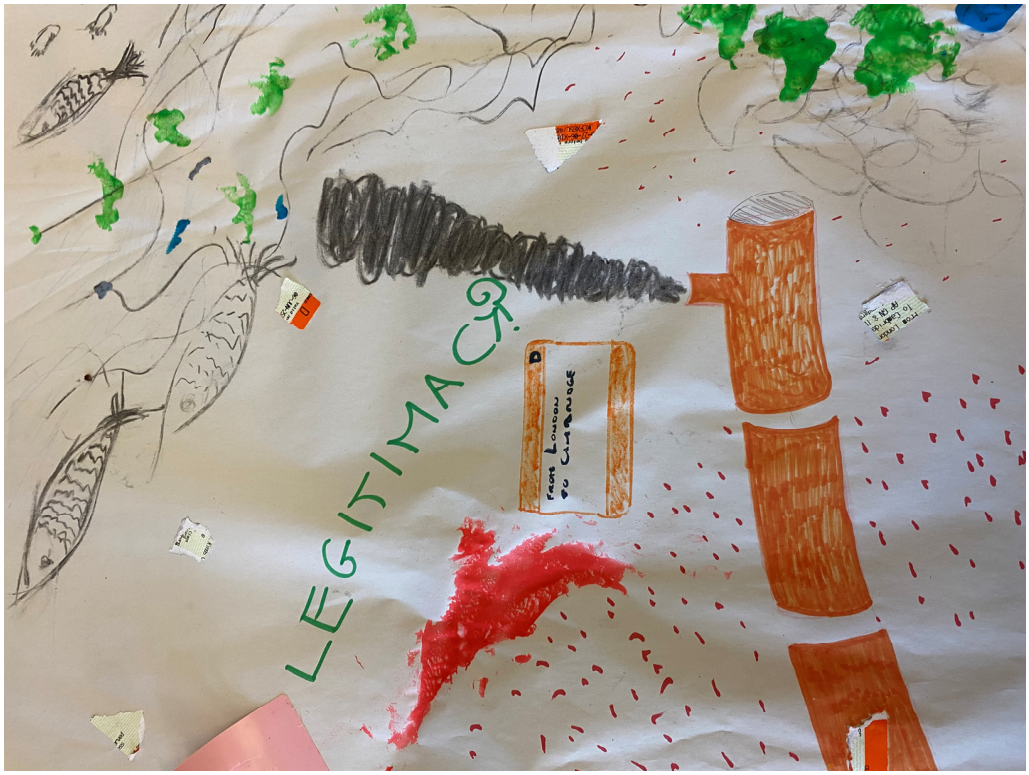

Figure 5. Collage with the word "LEGITMACY?" spelled in block letters next to a sketch of a train ticket and orange train.

Many archival materials overlap with these personal ones, and questions of their legitimacy abound. The format and/or iterations of a picture, a newspaper clipping, an oral recording, a postcard, or a box of government documents change the potential historical interpretations. Which formats and iterations to choose in sourcing data is core to whose history can be reconstructed. Then, if the structures holding echoes change the echoes themselves, what happens when the archive is digital, and materials are mainly accessed in a digital form? The archival source appears to users as a picture or a 3D scan, but what are we actually archiving (Story et al. 2020)? Digitally, we are looking at a representation of the object—yet another echo of it—stored as a file in several possible formats, including JPEG, PDF, or TIFF. The files are saved as binary codes, patterns of 1s and 0s, physically stored on data storage systems (servers that contain multiple hard drives that work together). The archives, therefore, take on a different material form through digital means. How do these materials speak? Is the digital an additional echo of the physical archive? How do we consider its connection to material pasts/futures? Which forms, imitations, and versions are legitimized, and by whom?

2.2. A Non-Linear Enacting

Certain participants in the session bypassed the revisiting of a place pre-workshop and simply brought along a meaningful object with which to collage—a childhood toy, a token, a reminder of a loved one now passed. Figure 6, for example, shows a portrait of a lost grandmother, depicted with red veins in a Baradian process of re-membering:

> Remembering is not a process of recollection, of the reproduction of what was, of assembling and ordering events like puzzle pieces fit together by fixing where each has its place. Rather, it is a matter of re-membering, of tracing entanglements, responding to yearnings for connection, materialized into fields of longing/belonging, of regenerating what never was but might yet have been. (Barad 2015, p. 407)

Figure 6. Red lines surround a centre of charcoal lines around clumps of yellow Play-Doh.

Very quickly, the issue of non-linear time came into question with the non-linear unfolding of memory. As one participant said, "little me is an echo of me; I was once that thing", the problem of which is the echo emerged. Is present-me an echo of an original past self, or has the echo travelled back in time? Given the blurring of boundaries and ontological wholeness previously discussed, the answer is somewhat of a both/and. The implication, however, is how to honour these ongoing enactments as researchers.

In the same way that memory re-materialized is a re-configuring of entanglements—a storying process—an extraction of data has the potential to resonate in any number of ways. Barad reminds us that:

> Diffraction is not a set pattern, but rather an iterative (re)configuring of patterns of differentiating-entangling. As such, there is no moving beyond, no leaving the 'old' behind. There is no absolute boundary between here-now and there-then. There is nothing that is new; there is nothing that is not new. (Barad 2014, p. 168)

In intra-acting with data as researchers, how do we then account for such non-linear relationality, knowing that materials change us and are changed by every encounter across space/time? As historians working with archives, we must engage with both these points, foremost by treating archives themselves as change and changeable based on the questions posed. Furthermore, we can begin to ask, what differences are enacted between digital and analog data and their echoing structures? Between our relationships with the material? These questions are necessarily entangled with a closer consideration of methodology (Milligan 2022, pp. 60–62) and methodological consistency. In the same way as creating a collective collage, what do methods of engaging with a specific archive enable? What stories does it tell? What worlds does it make? Who is talking? What is left aside?

3. A Posthuman Archive

This article invites us to look at the archive holistically, understanding archival materials in relation to the structures that shape the formation of their echoes, much like the creation of a collective collage. Studies produced from the materials in archives are not the inevitable result of a handful of documents but one outcome of the researcher's entanglements with the archive and how they interact with everything else around.

Undeniably, the digital turn changed how history and related subjects are developing. Every historian, not only Digital Humanities experts, is implicated, having worked with digitized material at least once. One example of this change came with the 1990s transnational turn, which widened the use of transnational approaches. This trend was not only due to the international mindset of a new generation of historians, but also to the increased availability of sources through digitalization. International research became less expensive and time-consuming, furthering more transnational projects. Today, many scholars are still trying to understand the consequences of digitalization in historical research (Hitchcock 2013; Jordanova 2019; Milligan 2019, 2022; Putnam 2016). While publications have explored evolving relationships between the digital and history as a subject, more work needs to be done in the critique of archival digitalization with regard to its structure and impacts on the material—as well as how the material responds in return.

In recognizing the many sites of posthuman power in play, we suggest challenging our own subjectivities as researchers. Though many historians consider the use of archives as a unilateral relationship between researcher and archive material, we advocate for an entangled approach that goes beyond the imposition of authorial intent by acknowledging how materials intra-act upon each other, in the Baradian sense of how they create "agential cuts" and thus "marks on bodies" (Barad 2007, p. 348). It is first crucial to re-evaluate a definitive 'I' subject to examine "questions beyond well-known ideas of subjectivity. Self and other are brought into question by the echo" (Goh 2024, p. 35). This posthumanist troubling of subjectivities (Braidotti 2019, p. 40) does not inspire a universal answer but a "staying with the trouble" (Haraway 2016)—a situated engagement with the question of, what is a posthuman archive?

Author Contributions: Conceptualization, L.S.N. and E.R.; methodology, L.S.N. and E.R.; formal analysis, L.S.N. and E.R.; writing—original draft preparation, L.S.N. and E.R.; writing—review and editing, L.S.N. and E.R. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The research followed established principles of good research practice and institutional ethics guidance. Formal ethical approval was not required due to the minimal-risk nature of the study.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding authors.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviation

The following abbreviation is used in this manuscript:

ABR Arts-Based Research

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