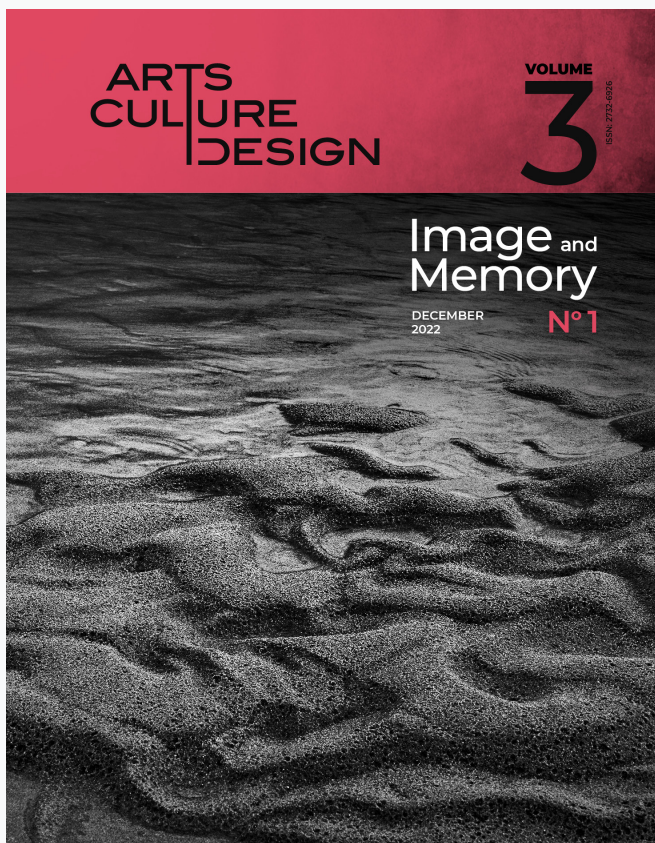


Design/Arts/Culture

Vol 3, No 1 (2022)

Image and Memory



MEMORY AND OBLIVION: TANGIBLE IMAGES AND UTOPIA

Luiz Oosterbeek

doi: [10.12681/dac.33699](https://doi.org/10.12681/dac.33699)

Copyright © 2023, Design/Arts/Culture



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/).

To cite this article:

Oosterbeek, L. (2023). MEMORY AND OBLIVION: TANGIBLE IMAGES AND UTOPIA. *Design/Arts/Culture*, 3(1), pp. 7–15. <https://doi.org/10.12681/dac.33699>

ARTICLE

MEMORY AND OBLIVION: TANGIBLE IMAGES AND UTOPIA

Luiz Oosterbeek



Luiz Oosterbeek

Polytechnic Institute of Tomar, Geosciences Centre, Estrada da Serra, 2300-313 Tomar, Portugal

loost@ipt.pt

Professor at the Polytechnic Institute of Tomar. President of the International Council for Philosophy and Human Sciences and UNESCO-IPT chair holder "Humanities and Cultural Integrated Landscape Management". Member of the Portuguese Academy of History. Pursues research in archaeology, heritage and landscape management in Portugal, Africa and South America. Invited Professor in several Universities in Europe, Africa, Brazil and China. Vice-President of HERITY. Vice-Director of the Geosciences Centre of Coimbra University.

Prizes and awards: European Commission, Brazilian Lawyers Bar, Portuguese Ministry of Culture, Gulbenkian Foundation, Foundation for Science and Technology among others. Author of over 300 papers and 70 books.

ORCID: <https://orcid.org/0000-0003-3303-5958>.

MEMORY AND OBLIVION: TANGIBLE IMAGES AND UTOPIA

Abstract

The thesis of W. Benjamin on the concept of History echoes as almost an anti-postmodernism manifesto: the approach to the past is structured through images, not narratives.

Indeed, in the tension between history (the universal past rooted in agreed replicable methodologies for a human archetype) and memory (the ego or sociocentric past rooted in individual experiences), egos design narratives and try to fit evidence into them, whereas the historical past is constantly reconstructed through zooming in details that generate new images.

The image in history, as the mental image in individuals, is not a layer of arrival, nor even a point of departure, but a vehicle of transformation of how space is perceived (as Kant argued) or constructed (following Bachelard), the phenomenological process of performing tasks in space being the driver of such construction (as argued by Ingold).

The design of history through images is, in this sense, the process of social construction of cultural landscapes, i.e., of the poetics of space.

This is a process that encompasses four mechanisms of change: identification (based on senses and, primarily, on touch and sound), adaptation (the Kantian perception of the space as the scenario of human aptitude), transformation (the poetics of the making, creating new landscapes by changing their core images) and method (namely the dialectics of tangible and intangible dimensions).

The tension between image and narrative is, ultimately, the root of the tension between ego/socio-centered memories and the anthropic-rational history. In such a process, history builds from memories, by overcoming their narratives and preserving basic units of information that may be recombined, to create novel images of the past, but also of the present and the future. In such a process, history considers memory oblivion and an indicator of reliability or not of those memories.

In this paper we discuss how material culture is the backbone of mental images and why it has a much more plastic and transformative nature than intangible narratives, which are expressions of the consolidation (and conservation) of understandings.

The keyword in such a memory process is oblivion: images allow us to forget fossil narratives and to move into new utopias.

Keywords

history

memory

oblivion

adaptation

transformation

HISTORY BEYOND MEMORIES

The thesis of W. Benjamin on the concept of History (Benjamin, 1940) echoes as almost an anti-postmodernism manifesto: the approach to the past is structured through images, not narratives. Benjamin reaches to this assessment through a series of parallel reflections.

First (thesis II), the notion that the present (where one lives) does not 'envy' either the past (because it feels like being the accomplishment of past expectations, so nothing to envy because lesser than the present), nor the future (which is the present's redemption, so nothing to envy but to wish for).

Then (thesis III), by explaining that redemption is, in the end, assuming the whole of the past, in all its details and contradictions (an idea that converges with the UNESCO utopia of a 'World Heritage' or the notion of 'inscription of the past' proposed by José Gil, 2007).

Thirdly (thesis IV), and most essentially, by explaining that the present (i.e., the future of the past) is not a redemption of the past because it corresponds to the past's utopia, but because it inscribes the past materialities into an explanatory framework that renders them to become triggers of the present.

As a result, the past is not a narrative of events, but a syncretic image that encapsulates all those events. This is also the sense of thesis V: "The past can be seized only as an image which flashes up at the instant when it can be recognized and is never seen again." and thesis VI, arguing that the past is not "what it really was" but a response to critical moments (dangers).

This is further explained in thesis VIII: history dissolves "unexpected surprises", by framing them within a long term assessment of the past that builds from the present, the same way the understanding of causality builds from the consequences to enquire about causes, rather than the other way around.

In Benjamin's reference to the Angelus Novus (thesis IX), that inspires this volume, the present is fundamentally about moving into the future without any clear agenda (the future will never be what is imagined in the present) but animated by a comprehensive image of the past.

The whole approach of Benjamin, clearly influenced by Hegel (1837) and Marx (1858), is to focus on past materialities as items that may either become part of an integral understanding of the present through a comprehensive image of the past or, alternatively, a collection of loose items that become, in a sense, reified, i.e., considered as the essence of the real but, in fact, are extracted from the flow of time that can only be approached from the present. This, one could read, is the distinction between History (a logical assessment of the past building a comprehensive image – Febvre, 1952) and Memory (a collection of scattered fragments of past features and events, allegedly disconnected, or reconnected through a narrative – Pérez Baquero, 2020).

Indeed, in the tension between history (the universal past rooted in agreed replicable methodologies for a human archetype) and memory (the ego or sociocentric past rooted in individual experiences), memories design narratives and try to fit evidence into them, whereas the historical past is constantly reconstructed through zooming in details that generate new images. This is why Benjamin's concept of history directly challenges postmodern relativist and memorialist histories.

But, beyond this important distinction, Benjamin's thesis brings forth an important argument: the past, i.e., the present understandings of it, is not a tale (a narrative, or a story), but a global image from which its future (the present) may be read. In this, Benjamin's approach offers an important contribution for prehistoric art, and for art history in general: how do 'artistic' features (paintings, carvings, sculpture, literature) interfere with the creation of a mental image of a society in the past? Are they mere indicators of a mindset or actors of it? And what does "contextual study of past evidences" mean, once the context, itself, is part of the present construction of the past, through the methods of History?

This relates to the notion of mental image, its drivers and how it relates to sociocultural performance and transformation.

IMAGE AND IDENTIFICATION

The image in history, as the mental image in individuals (Piaget & Inhelder, 1966), is not a layer of arrival, nor even a point of departure, but a vehicle of transformation of how space is perceived (as Kant, 1802, argued) or constructed (following Bachelard, 1958), the phenomenological process of performing tasks in space being the driver of such construction (as argued by Ingold, 1993), this leading to the notions of time (through continuities, discontinuities and transformation) and causality (through logically connecting items that, otherwise, would remain a loose collection of isolated features, or memories – Oosterbeek, 2019). The design of history through images is, in this sense, the process of social construction of cultural landscapes, i.e., of the poetics of space.

This is a process that encompasses four mechanisms of change: identification (based on senses and, primarily, on touch and sound - Tarçın & Tunçok, 2022), adaptation (the Kantian perception of the space as the scenario of human aptitude – Kant, 1802), transformation (the poetics of the making, creating new landscapes by changing their core images) and method (namely the dialectics of tangible and intangible dimensions).

The mechanism of identification, i.e., of assigning diverse identities, clustering and ranking some units of information, in order to build the grounds of a mental image, goes far beyond sight. It first builds from sound, which sits at the ontogenesis of space, allowing for a first framework of reference: composition (the unity of the image), diversity (the specificities or details of the image), intensity (the understanding that not all features within the space have the same relevance or impact) and cycle (the notion that discontinuities are succeeded by stages resuming past equilibrium – a notion that triggers the idea of an eternal return – Eliade, 1949). The experience of hearing allows, in any case, to formulate the abstract notion of landscape as a web of materialities that, even when unknown, generate sounds (Francl & McDermott, 2022).

To touch is, in the ontogenesis, the second major sensitive source of space, as it no longer builds from the global (sound – one mental image, based on listening as a deductive form of reasoning), but from the particularities: each touch considering a limited surface – several isolated surfaces and materials that then trigger, through inductive reasoning, the creation of more complex notions, both tangible (e.g., the identification of resources, techniques and their manipulation) and intangible (accumulated knowledge, or traditions, and procedures to use it in a creative way). Touching simultaneously disaggregates space into a set of places and reconstructs its unity (image) through the materiality of rituals and the intangible web of beliefs and performances related to them (Lévi-Strauss, 1971). One illustration of this is human motricity, which exposes bodies to new sets of tangible interactions, but also creates new logical trans-border frameworks of reference (Brender, 2017). Smell is a crucial sense for constructing space, as it brings to the mental image shaped through the previous notions of unity (sound) and diversity (touch), the radical dimensions of exclusion and appropriation (Bierling et al., 2021), through the notions of identification/identity/otherness, belonging and key-resources (relating these to the logistics of bridging the gap between perceived needs and available resources).

The mental image, once predominantly anchored in materiality (through sound) and then to intangible processes (through touch), resumes its predominantly material ground, using senses to exclude features that provoke discomfort to individuals. And it is within the tangible web of connections that taste becomes such a relevant sense: it is also limited in space distances, but it builds from the close interactions between cultural entities that eat together or eat each other (sometimes literally – Højlund, 2015). Initially experienced as an individual performance (just like smell), it rapidly evolves into a tangible, abstract and shared ground for appropriation, domestication and transformation (eating becoming a digestion of cultural diversity – Nadeau, 2010). These four senses are the basic foundations of a mental image of the world, and its past, which is primarily perceived through materialities. In this sense, they promote a network of related notions that are tested against material evidences and then proven true or false. This is not the case of sight, which integrates the capacities to observe (at distance), interpret (through the unique capacity of zooming in and out, thus integrating the global and the particularisms), represent (through visual images), predict (imagining futures) and transform (deforming existing images or designing new ones).

Sight offers such plasticity, namely in integrating objects, places and landscapes (Gheorghiu, 2020), but this is also its weakness, as it is the one sense that sits more apart from materialities. In doing so, sight generates less flexible images (because it shares images through the form of pictures, not concepts) and opens the path for anchoring interpretation not in history (a never ending reconstruction of the past through shared methodologies) but in memories (a series of reified pictures). Paradoxically, in this process, sight tends to replace the construction of a mental image by the building of a narrative.

The tension between image and narrative is, ultimately, the root of the tension between ego/socio-centered memories and the anthropic-rational history (Poole, 2008). In such process, history builds from memories, i.e., perceptions of the past informed by present mindsets and interests, but overcomes their narratives by taking them as basic units of information that may be recombined through set rational, i.e., abstract, methods, to then create novel images of the past, but also of the present and the future. In such a process, history makes extensive use of memories oblivion as an indicator of reliability, or not, of those memories. Such tension directly relates to the second mechanism of change: adaptation and its ground, the perception of space.

IMAGE AND ADAPTATION

Senses provide a wide range of information on context, but they are insufficient to properly build an interpretative matrix. This will be the result of framing them through human performance, namely adaptation (Moran, 2013). It is behavior, the interaction with the context mediated by senses but performed through gesture and the whole body, that triggers the cognitive construction of space as 'the stage' of existence. It is by doing, i.e., by experimenting the interaction of the body with the context and related changes in terms of distance and orientation, that the notion of space is structured, including the dichotomy between metaphoric concepts and images on one hand, and interaction of the senses on the other. And, within behavior, it is the movement required to achieve specific objectives and meeting given needs that leads to a perception of space as a landscape or, in the phrasing of Tim Ingold, a set of taskscapes.

The kinesthetic construction of space establishes both the notion of distance and that of scale, structured through a series of dichotomies that will be progressively considered: close and distant, small and big, slow and fast. But, also, gesture and thought shape other dichotomies a step away from senses: physiology and identity, gesture and thought, present and past or future.

As a kinesthetic and rational construct, the perception of space is first informed by the senses and conditioned by cultural tradition (values, priorities), and encompasses several properties: aesthetics (or the appeal of homeostasis – Damásio, 2021), identification (imitation), meaning (narrative), poetics (creation), metaphysics (reason), pragmatics (harmony between needs and resources) and dynamics (assimilation, adaptation and transformation).

These properties are by no means exempt of contradictions and conflicts (Oosterbeek, 2017), from the divide between perceptions informed by contradictory narratives (e.g., in border conflicts) to the clash between different mindsets (e.g., the notion of cultural identities attached to specific spaces). Subjects and societies create specific mental images by administrating these divides and based on their recognition they adapt to contextual changes.

Adaptation implies adjusting behavior to newly identified contextual constraints that cannot or can no longer be assimilated (Piaget, 1957). The adaptation does not imply a change in the perception of space, i.e., on the landscape, but it requires new tasks, thus changing a fundamental dimension of the landscape, even if still perceiving its future as a continuation of the present. Changes in the tasks do aggravate tensions, though, namely between inherited narratives (myths) and new performances (rituals).

This adaptive process is primarily driven by common sense, engaging the majority of a society, or close to that, to acknowledge and empirically describe landscapes. However, description itself is insufficient to fully adapt and to transform mindsets. Specialized knowledge, in terms of science reasoning, allows not only to assimilate contextual changes but to adapt to them. Successful adaptation is fundamentally dependent on a robust analytical capacity, and science offers the best approach in this regard.

Adaptation builds from analysis and combines it with economy (the cultural process of bridging needs and resources) within a logical reasoning; the whole adaptive mechanism proceeds then through verification, confirming or not certain deducted interpretations of data through the observation of consequences of adaptive undertaken strategies. This does not imply any major change in mindset, values or fundamental understandings on how societies can or should run, as the purpose of adaptation is to adjust details to preserve continuity.

IMAGE, TRANSFORMATION AND OBLIVION

Adaptation is, in turn, insufficient to imagine, i.e., to create a new image of the past, transforming it, this allowing us to anticipate an image of the future (utopia): such a role implies the contribution of humanities and arts (Howels, 2014). The transformation of the past does not strictly relate to retrieved scientific data, even if this is a main driver of it, but from the wider mindset that directs attention and sets an hierarchy of values, which largely depends upon social and cultural interactions in each given moment. Transformation relates rather to a serendipity mechanism, in which we may identify some major components, but from which we may not deduct mechanical consequences. Transformation tends to occur when the tension between observed phenomena and mindset (the image of the present and its past) precludes from inferring a viable future (Redecker, 2021).

Heritage plays a central role in transformative processes, since it corresponds to the fraction of remains from the past that any given society identifies as a reference to preserve, so that everything else be allowed to change without losing a sense of continuity and incorporation. Heritage, hence, illustrates the prevailing mindset in a given moment; for instance, the shift of focus on monuments and sites (second half of the 20th century – Laurent, 2016) towards a focus on landscapes and intangible heritage corresponds to a reassessment of the past, diverting from “achievements” (objects) to privilege ‘performance’ (human agency and territories – Kryder-Reid, 2014), which itself changes the image of the past. The Post-modern Past has emerged as a narrative of traumatic processes affecting communities (each projecting its own image of the Past), rather than an image of Humankind achievements (recognized as a common Past, despite its contradictions).

Tensions in societies are framed within Heritage through this divide between materialities and agency, expressed in the relation with the arts and in the interaction between material and intangible Heritage. Heritage results from the image of the past that a society has, whereas the arts are insights of that society into the future; like Janus, cultures look into these two opposite directions, one influencing the other and conditioning the present. In the second half of the 20th century, the dominance of a “sites and monuments” (immovable) Past compensated a growingly disruptive artistic focus on de-construction, even if it did not consider the whole of contradictions of the past, thus precluding the design of a Future as redemption of the present, in the sense given by W. Benjamin [also because, in the aftermath of WWII, the experience of the traumatic agendas of redemption of previous decades (Hobsbawm, 1994) triggered a rejection in that direction]. Since the turn of the century, though, the prevailing attention to intangible dimensions of Heritage and their related narratives opened the room for questioning the preservation of at least some material remains (e.g., removing or even vandalizing disputed statues in public spaces, as means to destroy the previous image of the Past), which may be perceived as a compensation of the wider attention to conservation for sustainability: such attention is still an adaptive mechanism that refuses transformation, as it extensively uses selected memories, or oblivion, and not the integration of contradictions as an integral image of the Past (Sjursen & Oosterbeek, 2023).

The intangible dimension of Heritage has the unquestionable importance of integrating the diversity of scattered material remains into a cultural, live, coherence. This is its major strength, although also its major risk: as cultures are disparate, intangible Heritage may foster ethnocentric approaches that break the unity of Heritage as a human, rather than only a ethnocentric Heritage.

The image of the past is a construct that also depends on the degree of appropriation/identification with past remains, which is more difficult with living expressions (intangible and performative) than with material remains (observable and more open to reinterpretation).

This is one reason why materialities better serve the purpose of global mindset transformation. The main reason, though, is that the purpose of an image, as of a myth, is to offer a stable background for change and transformation to occur (Fraassen, 1970): the core of the image, as a horizon, is to act as an invariant, not as a changing feature itself. Intangible heritage, as it relates to living performances, does not possess this characteristic.

On the contrary, as it is about preserving a transformative performance, it actually calls for balancing it with ... the rejection of transformation beyond its own. This is an expression of the third action-reaction law of Newton (Watkins, 1997), which actually applies to humans as societies and their expressions do not escape such tangible dimension. The image of the past anchored in its material remains, in this sense, offers not a mere continuity and preservation of inherited knowledge, but the acknowledgement of transformations occurred through time, which allows one to imagine (i.e., to create an image of) a different future, or an utopia. Art often expresses and announces this movement of transformation, as evidenced (Coelen & Lammertse, 2019) in the distance between the bourgeois utopia portrayed in the paintings of Bruegel the elder (anchored in the renaissance image of the past structured around the notion of transformation from praised material remains of classical civilization into rejected medieval society, destined to be overcome in utopia) and those of Hieronymus Bosch (anchored in the image of the past structured around intangible everlasting medieval beliefs, thus incapable of generating a new utopia).

This is also, in Prehistory, the distance between art generated as a moment of a performance (e.g., most of Paleolithic art - Feruglio et al., 2019) and the art conceived to remain as a permanent feature in the landscape (such as megalithic constructions – Scarre et al., 2011): in the former, transformative drives are channeled into the performance and do not require generating a different image of the future; in the later, they express a statement of transformation beyond the performance, shaping new landscapes that encapsulate the utopia of a different future (anchored in the ancestors or any other tangible remain of the past).

Material culture is the backbone of mental images and has a much more plastic and transformative nature than intangible narratives, which are expressions of the consolidation (and conservation) of understandings. The keyword in such a memory process is oblivion, not of features but of interpretations: images allow us to forget fossil narratives and to move into new utopias. In an opposite direction, preserving the intangible dimension of Heritage requires preserving the sequence of gestures, knowledge and beliefs generated in inherited mindsets, thus contributing for their perpetuation without major change, let alone oblivion.

In Benjamin's thesis, the future is anchored in a comprehensive image of the past and offers itself as a redemption utopia. Resuming Saint Augustine's assessment of time (Manning et al., 2013), the key moment is the present and its redemption requires assuming all the past (as in Augustine's Confessions – Rothfield, 1981) and that in each moment a syncretic image of such whole past is built, so that the movement towards the future becomes possible. The expansion of heritage beyond sites and monuments, encompassing whole landscapes and the evidences of their transformations in the past, expresses the building of an image of the Past that calls for a reflection on future different landscapes, i.e., scenarios of transformation of human performance in the territory of the planet (rather than narratives of ethnic local adaptations, that trigger debates on how to resume past patterns of behavior). This is the tension of all societies in transition.

ACKNOWLEDGEMENTS

This research has been undertaken in the framework of the Geosciences Centre of Coimbra University (contract UIDB/00073/2020 with the Foundation for Science and Technology, Portugal).

Reference List

- Bachelard, G. (2014) *The Poetics of space*. London: Penguin Books.
- Benjamin, W. (2009) *On the concept of history*. New York: Classic Books America.
- Bierling, A.L., Croy, I. et al. (2021) "Olfactory Perception in Relation to the Physicochemical Odor Space", *Brain Sci*, 28, 11(5), p. 563.
- Brender, N.M. (2017) "On the nature of space: getting from motricity to reflection and back again", in Jacobson K. and Russon J. (eds.) *Perception and its development in Merleau-Ponty's phenomenology*. Toronto: University Press.
- Coelen, P. van der, Lammertse, F. (2019) "Bosch to Bruegel: Uncovering Everyday Life", *Journal of Historians of Netherlandish Art*, 11(1).
- Damásio, A. (2021) *Feeling & knowing: making minds conscious*. New York: Pantheon Books.
- Eliade, M. (2018) *The myth of the eternal return*. Princeton: University Press.
- Febvre, L. (1992) *Combats pour l'histoire*. Paris : Armand Colin.
- Feruglio, V., Bourdier, C., et al. (2019) "Rock art, performance and Palaeolithic cognitive systems. The example of the Grand Panel palimpsest of Cussac Cave, Dordogne, France", *Journal of Anthropological Archaeology*, 56 (101104).
- Fraassen, Bas C. van (1970) *An introduction to the philosophy of time and space*. New York: Random House.
- Francl, A., McDermott, J.H. (2022) "Deep neural network models of sound localization reveal how perception is adapted to real-world environments", *Nat Hum Behav*, 6 (111-133).
- Gheorghiu, D. (2d. 2020) *Art in the Archaeological Imagination*. Oxford: Oxbow Books.
- Gil, J. (2007) *Portugal, hoje. O medo de existir*. Lisboa: Relógio D'Água.
- Hegel, G.W.F. (1975) *Lectures on the philosophy of world history. Introduction, reason in history*. New York, NY: Cambridge University Press.
- Hobsbawm, E. (1994) *The age of extremes*. New York: Vintage books.
- Højlund, S. (2015) "Taste as a social sense: rethinking taste as a cultural activity", *Flavour*, 4(6).
- Howels, R. (2014) "The aesthetics of Utopia: Creation, creativity and a critical theory of design", *Thesis Eleven*, 123(1), pp. 41-61.
- Ingold, T. (1993) "The Temporality of the Landscape", *World Archaeology*, 25(2), pp. 152-174.
- Kant, Imm. (1802) *Géographie*. Paris: Aubier.
- Kryder-Reid, E. (2014) "Heritage Landscapes", in C. Smith (ed.) *Encyclopedia of Global Archaeology*. New York: Springer.
- Laurent, X. (2016) *Grandeur et misère du patrimoine; d'André Malraux à Jacques Duhamel*. Paris: Ministère de la Culture et de la Communication.
- Lévi-Strauss, C. (1971) *L'homme nu. Mythologiques*. Paris: Plon.
- Manning, L., Cassel, D., Cassel, J.C. (2013) "St. Augustine's Reflections on Memory and Time and the Current Concept of Subjective Time in Mental Time Travel", *Behav Sci*, 25; 3(2), pp. 232-243.
- Marx, K. (1993) *Grundrisse: foundations of the critique of political economy*. London: Penguin Books.
- Moran, D. (2013) "Edmund Husserl and phenomenology", in A. Bailey (ed.) *Philosophy of the mind: the key thinkers*. London: Bloomsbury.
- Nadeau, R. (2010) *Les manières de table dans le monde greco-romain*. Paris: Presses Universitaires de France.
- Oosterbeek, L. (2017) "From Heritage into the Territory: agendas for an unforeseeable future", *Territori della Cultura*, 29, pp. 58-69.

Oosterbeek, L. (2019) "Persona: From Unrest into Adaptation", *Plastir*, 56, pp. 1-15.

Pérez Baquero, R. (2020) "Memory, narrative, and conflict in writing the past: when historians undergo ethical and political strains", *História da Historiografia*, 13(32), pp. 47-81.

Piaget, J. (1957) *Construction of reality in the child*. London: Routledge & Kegan Paul.

Piaget, J., Inhelder, B., et al. (1997) [1966] *Mental imagery in the child: a study of the development of imaginal representation*. London: Routledge.

Poole, R. (2008) "Memory, history and the claims of the past", *Memory Studies*, 1(2), pp. 149-166.

Redecker, von E. (2021) *Praxis and revolution: a theory of social transformation*. New York: Columbia University Press.

Rothfield, L. (1981) "Autobiography and perspective in the Confessions of St. Augustine", *Comparative Literature*, 33 (3), pp. 209-223.

Scarre, C., Oosterbeek, L. and French, C. (2011) "Tombs, landscapes and settlement in the Tagus hill-country", in *From the origins: the prehistory of the inner Tagus region*. Oxford: Archaeopress, pp. 83-91.

Sjursen, H., Oosterbeek, L. (2023) "Materialities, perceptions and ethics", in G. Di Capua, L. Oosterbeek (eds.) *Bridges to Global Ethics*. Berlin: Springer

Tarçın T.Z., Tunçok S.M. (2022) "The Role of the Senses in Children's Perception of Space", *ICONARP International Journal of Architecture and Planning*, 10(1), pp. 70-96.

Watkins, E. (1997) "The laws of motion from Newton to Kant", *Perspectives on Science*, 5(3).