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2 Attachment to older or historic places

Relating what we know from the perspectives of phenomenology and neuroscience

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Introduction

Place attachment is a well-known concept in humanistic geography, environmental conservation, environmental psychology and urban planning, but is largely absent from built heritage conservation (or historic preservation in the USA). In this latter field, the use of the term 'sense of place' or 'spirit of place' is much more common, but these concepts are also less well defined and often applied in vague ways. Even spirit of place (or 'spirit and feeling'), which is used as part of UNESCO's World Heritage nomination process (UNESCO, 2017), is ill defined – especially in terms of how one should assess the phenomenon. The Québec Declaration (ICOMOS, 2008), an international heritage conservation charter, defines spirit of place as 'the tangible (buildings, sites, landscapes, routes, objects) and the intangible elements (memories, narratives, written documents, rituals, festivals, traditional knowledge, values, textures, colours, odours, etc.), that is to say the physical and the spiritual elements that give meaning, value, emotion and mystery to place'. As defined in this charter, spirit of place is actually much closer to sense of place, the latter of which implies that one must experience a specific place to understand it; conversely, spirit of place assumes an innate set of characteristics independent of experience (Brook, 2000).

To be sure, place attachment is rather explicitly defined in environmental psychology through concepts such as place identity, rootedness and place dependence (Proshansky, Fabian, & Kaminoff, 1995; Tuan, 1980; Vaske & Kobrin, 2001). There is also a related concept – place disruption – that describes what happens when the attachment is destroyed (Brown & Perkins, 1992). Concomitant with place attachment is the understanding that 'attachment' refers to an *emotional* experience associated with a specific place – usually a positive one. While the place may be associated with objective qualities (e.g., size, orientation, massing, colour), what is most important for the individual is their feelings about the place which results in this emotional attachment (Low & Altman, 1992). One reason why place attachment is not often associated with built heritage conservation or historic preservation is that these fields have long been based on objective (non-emotional) criteria promulgated by rules and regulations, leaving little or no room for the feelings that people have for historic or older places (Wells & Baldwin, 2012).

In this chapter, I will therefore review research on the emotional attachment to older or historic places through a phenomenological perspective, which will then inform an exploratory inquiry into the use of neuroscience concepts and research to elucidate the emotional experience of being in historic places. I use phenomenologies to start this investigation primarily because of their widespread adoption in understanding people's emotional attachment to specific places; I end with neuroscience because of its great potential in uncovering the biological reasons for attachment to places. Unlike phenomenologies, which are often criticised for introducing cultural biases, neuroscience promises the potential of a universal concept of place attachment that is common across humanity: a fundamental, biological reason why people become attached to places.

Before I begin, however, it is important to contextualise my discussion within the field of environment/behaviour research (EBR), which has a long history of attempting to understand the relationship between people and place using social science research methods. These methods include phenomenologies and neuroscience, among many other possibilities. Environmental psychologists and sympathetic architects established EBR as a field of inquiry in the 1960s. EBR's aims were to use evidence from the social sciences to help design better places for people. The concern was that 'good' design was simply associated with what an architect personally liked or did not like; there were no objective criteria (or evidence) through which 'better' design could be articulated and then used to improve design (Rapoport, 2008). While there was great hope that EBR would revolutionise the design fields, it never became ubiquitous, although it is now well established in health care facilities design. The field, however, does present some of the most well-developed theories and research to explore people, place and emotional affect.

Phenomenologies: radically empirical, qualitative, pre-reflective inquiry into people and older places

Is it possible to experience the world without your body? Obviously, the answer is 'no', yet many built environment researchers and practitioners fail to consider the embodied experience in relationship to the design and conservation of places (Howett, 1993; Pallasmaa, 2011: 119; Wells, 2011). To help the reader understand how critically important the embodied experience is, think of where you are right now, as you are reading this text. How do you feel? Cold? Hot? What do you hear? What do you smell? Is it dark? Bright? Are you comfortable? Uncomfortable? These sensations are the inescapable result of the embodied experience; moreover, the design and character of the built environment has the power to make a person *feel* a certain way. On a larger scale, the embodied experience facilitates or impairs overall quality of life.

Within built environment research and environmental psychology, the phenomenology, or more specifically a phenomenological reduction, is a methodology used to access pre-reflective meanings associated with the embodied experience. The 'lifeworld' is a term that describes this embodied experience, especially in relation to its focus on perception (pre-reflective) rather than

higher-level cognition that might explain why and how things are perceived. In other words, a phenomenology does not attempt to explain *why* a particular perception exists; instead, it focuses on a 'radically empirical' description of this pre-reflective experience (Seamon, 1982). One achieves this radically empirical state through immensely thick, abundant and qualitative descriptions of a specific phenomenon. This description must be done through bracketing, in which the researcher attempts, to the highest degree possible, to understand and experience the phenomenon as if it is fresh and entirely new. In this way, natural attitudes and biases are (ideally) extinguished, which, if present, could taint the collected data (Moustakas, 1994). In sum, a phenomenology seeks the polar opposite of a detached, objective description of reality though a focus on feeling, emotions and perceptions before they are changed though any kind of reflective process.

Humanistic geography is widely credited as the first field to connect the embodied experience to specific places, and in the process, help define sense of place (Cresswell, 2011: 33–39). It was in the 1970s that researchers from this field, such as Yi-Fu Tuan (1974), used phenomenological reductions to understand people's embodied experiences, including emotional attachments, in various geographical contexts. Within humanistic geography, a phenomenology is one of the few methodological approaches capable of revealing and understanding some of the deepest, most subjective human experiences. If one were to create a spectrum of research methodologies and, on one extreme, place purely quantitative methods, the other extreme would be represented by phenomenologies. This spectrum therefore represents the continuum between extreme objectivity and extreme subjectivity. In between these polar opposites would be other social science methods, such as grounded theory and ethnographies. The capacity to explore extremely subjective experiences is one reason why phenomenologies are also used in nursing research to understand people's experience of pain (Munhall, 2007). Pain is one of the most profound (or disturbing) emotions possible and much would be lost by ignoring the deeply personal, subjective qualities of the embodied experience in this context.

Given this usefulness of phenomenologies in understanding the emotional relationship between people and place, why do they remain relatively rare, even after many decades of research on this topic? A fundamental reason for this situation is that there is no consensus on a definition, nor is there agreement on what, exactly, a phenomenology is supposed to be and how it should be used to answer research questions (Shīrāzī, 2016). Considering that phenomenology originates in structuralist philosophical traditions – chiefly Husserl (1962) and Heidegger (1962) – it should not be surprising that a definition has always been a constantly moving target. To be sure, post-structuralist philosophers dismiss phenomenologies while embracing pervasive relativism and, in the process, deny researchers some kind of applied method to understand the relationship between people and place (e.g., Derrida, 1973; Foucault, 1972). One is therefore forced to 'choose sides' between structuralist (e.g., phenomenological) and post-structuralist (e.g., relativist) approaches (Visker, 1999). Today, in some disciplines, choosing a phenomenology as a research methodology may result in being branded as naïve or old-fashioned and out of touch with contemporary philosophical thought (Sheridan, 1997). In architectural

theory, in particular, the lead thinker in phenomenology, Christian Norberg-Schulz (1980) has been the subject of much criticism in the twenty-first century, especially for his supposedly failed attempt to make architectural design 'ahistorical' through a phenomenological method (Otero-Pailos, 2010). Van Gerrewey (2012) claims that Norberg-Schulz failed to consider the embodied experience of place because of this focus, but there is simply insufficient scholarly literature on the topic to know if these criticisms can be broadly substantiated. Regardless, in the second decade of the twenty-first century, phenomenologies are often considered passé in the fashion-driven world of architecture, as Gregory Wharton, a practising architect, epitomises in his observation that 'Architectural phenomenology is so [19]90s' (Archinet, 2014).

Similarly, the field of humanistic geography, especially in the United States, has undergone a significant decline in the past few decades from its heyday in the 1970s and 1980s. Since the 1990s, faculty lines for such specialists have simply not been maintained. Some of this change has been due to an increased emphasis within geography on quantitative methods and post-structuralist and Marxist perspectives, but also on research that has more applied outcomes. David Seamon (2015: 39) notes that this lack of application is, in part, what 'exiled' humanistic geography from the broader discipline of geography because of its 'seeming unwillingness to deal with broader societal and structural forces'. Other criticisms include the dominance of first-person accounts by male academics which could not properly represent the diversity of human experience; the 'essentialism' that a phenomenological reduction seeks was therefore illusory. As Seamon refutes, however, these criticisms are hardly universal and only apply to specific, narrow instances. There are many cases of published work in which the use of a phenomenology probes specific lived experiences (e.g., Masberg & Silverman, 1996; Stefanovic, 1998; Wells & Baldwin, 2012). Moreover, there are also third-person accounts that can gather data, via a phenomenology, from a diverse array of people; in this sense the raw method used to access data – e.g., interviews – is no different than, for instance, what ethnographers employ.

But while the use of phenomenologies has languished within geography proper, this approach has actually grown since the 1990s in other, allied fields and disciplines such as anthropology, architecture, and media studies (see Askland & Bunn, 2018; Casey, 2007; Champion, 2018; Kogl, 2008; Malpas, 1999; Mugerauer, 1994; Stefanovic, 2000). Specific examples include Kusenbach's (2003) 'go along street phenomenology' used to supplement ethnographies and the use of concepts associated with place attachment in sociological research (Gieryn, 2000). But one area from which the phenomenology is largely absent is historic preservation/built heritage conservation, albeit with some notable exceptions. Considering the emphasis on sense of place often touted as the desirable outcome of built heritage conservation (e.g., Ford, 1974; Rowntree, 1981; Datel, 1985; Lew, 1989; Benton, 2001; Dedek, 2014), this absence may seem odd, but perhaps explainable given that the disciplines that are most often associated with this work – history, archaeology, applied architectural design and construction management – do not use phenomenologies either.

There are significant exceptions, however, to this lack of research combining phenomenologies and the historic environment to produce empirical evidence. Since the mid-1980s, this work has addressed nostalgia, spontaneous fantasies, understanding the visitor's experience at an historic site, a 'sense of sacrality' in relation to religious heritage places and the authenticity of virtual heritage. In total, there are only about 15 authors from a wide variety of disciplines over the past 35 years who have conducted a phenomenology that addressed some kind of built heritage topic and that produced novel data. In this period of time, a few additional authors have explored built heritage and phenomenologies from a purely theoretical basis (i.e., no production of data for analysis), which are useful forays into understanding the relationship between smell and historical authenticity (Tošić, 2016) and ways to understand how sense of place can be retained in historic waterfronts (Mohamed & Salim, 2018). Smell, in particular, is undervalued in heritage conservation work. Using an experiential phenomenology to explore people's experiences of heritage areas in Norway, Swensen and Saeter (2011) revealed that memorable heritage places are not only associated with personal biographies, but also with sensory experiences, such as smells and sounds. Swensen and Saeter's research, and other empirical research like theirs, is especially useful because it grounds theory, which is essential for applied conservation practice. It is for this reason that this review on the application of phenomenology to built heritage will specifically focus on research that has produced this kind of novel empirical data.

Johannus Hofer, a Swiss medical student, is credited with the invention of the term 'nostalgia', which he defined as a kind of 'homesickness' with specific, physical symptoms. The word is a combination of two Greek words, *nostos* (a return to a native land) and *algos* (suffering or grief). When Hoffer created his neologism in 1688, he was attempting to understand why some soldiers exhibited psychosomatic symptoms such as stomach pain, anxiety and headaches upon leaving home (Anspach, 1934). In a contemporary context within phenomenology, nostalgia is understood as a kind of romantic yearning for an imagined past, although in most cases, personal experiences are involved in its conception (Casey, 1987). Using an existential phenomenology, Adams and Larkham (2016) studied the nostalgia people held for specific places in Birmingham and Coventry (UK) erased by post-World War II development. They concluded that while the nostalgia resulting from these losses was painful (especially when coupled with personal and/or violent experiences), the study's participants also expressed optimism for potentially positive affects brought by these changes. To be sure, evidence from psychology indicates that the overall impact of nostalgic experiences is indeed positive; from their literature review on the subject, Sedikides et al. (2008) conclude that nostalgia 'generates positive affectivity', improves how individuals regard themselves and strengthens social bonds.

Related to nostalgia is the experience of the spontaneous fantasy, a phenomenon that I discovered in my work comparing residents' experiences of two urban areas whose design was nearly identical, but whose age was significantly different (Wells & Baldwin, 2012; Wells, 2017). Historic Charleston (South Carolina, USA) is the location of the first historic district in the United States – this was

the first case in my study. In historic Charleston, the majority of buildings were constructed before the American Civil War (before 1861). The second case was I'On, a new urbanist development in Mount Pleasant (South Carolina, USA). The majority of I'On was built in the twenty-first century. The architectural design of the houses as well as the urban design (e.g., building setbacks, density, urban street pattern) were nearly identical. By conducting an existential phenomenology and interviewing residents using photo-elicitation techniques, a pattern arose whereby only residents of historic Charleston described a phenomenon unique to their experiences. While walking in their neighbourhood, a typical participant would look at a specific element of the landscape (e.g., stairs, balconies, paving stones) and immediately, without any pre-cognition, a vignette of the past would pop into the person's mind. Because this experience was entirely spontaneous and often not related to any objective, factual past, I called this experience a 'spontaneous fantasy'. Residents of I'On did not report this kind of experience. Through binary logistic regression, I was able to establish a correlation between the appearance of patina (i.e., signs of decay/age) in a neighbourhood and the likelihood of a resident experiencing a spontaneous fantasy. Moreover, residents who experienced spontaneous fantasies had a higher degree of place attachment to their neighbourhoods than residents who did not experience this phenomenon.

It is important to clarify the differences between spontaneous fantasy and daydreaming. The former phenomenon is not under the direct conscious control of the individual who experiences it, unlike the latter phenomenon. In this way, the spontaneous fantasy appears to be more deeply connected with pre-reflective experience than daydreaming. According to an overview on daydreaming from a psychological perspective, Stawarczyk et al. (2011) conclude that daydreaming (or mind wandering) is predominantly future-oriented. This is quite different from a spontaneous fantasy, which is clearly past-oriented.

Other researchers conducting existential phenomenologies report participants having experiences similar to spontaneous fantasies, as with Farmer and Knapp's (2008) study of historic site interpretation at West Baden Springs Hotel (Indiana, USA). For instance, one participant in this study reported that 'you could visualise and in your own mind go back and see the people in their finery, imagining people in their old time garb, wandering around the premises with their parasols and frilly dresses' (ibid.: 352). As with my research, it appears that participants in Farmer and Knapp's study did not premediate this fantasy (i.e., it was not a daydream). Similarly, Ingrid Stefanovic's (1998) phenomenological research on Cavtat (Croatia), revealed the quality of 'oneiric visions' that seemed to be catalysed by the sense of spontaneity and mystery inherent to this ancient environment.

Phenomenologies are useful tools to understand the visitor's experience at an historic site, as with Farmer and Knapp's (2008) examination of interpretation programmes at the West Baden Springs Hotel (Indiana). This study also used a questionnaire (the phenomenology was used to follow up on experiences from the survey instrument). They discovered that visitors remember more about the history of site if they can experience it directly through immersion. Without this immersion, and an associated emotional response, visitors did not retain

long-term information from the site tour. Literature in critical heritage studies supports the association of historic site visitation with social activities, including cathartic ones, rather than pedagogical purposes (Smith & Campbell, 2015). In an existential phenomenology, Masberg and Silverman (1996) uncovered the same phenomenon, as well as support for many of the stereotypes the public holds for heritage sites, such as their association with old buildings, history and 'famous people'.

Many historic sites have religious associations with, for example, churches and shrines. For the people who use and experience these places, authenticity is not merely historical, but religious as well (Stefanovic, 1998; Levi & Rio, 2019). Using a first-person phenomenology, A. Rajapakse (2018) examined the experience of being in the city of Anuradhapura (Sri Lanka), which is well known for its sacred sites associated with Buddhism. He was interested in understanding what a 'sense of sacrality' is in relation to the city – a phenomenon that attached residents emotionally to these places. A sense of sacrality is related to the ability of these places to feel as if they are conveying power to those who experience them as well as a sense that these places will fulfil prophecy. By understanding this sense of sacrality, it is possible to develop a conservation plan that conserves this sense and thus maintains the importance of these historic sites for the public.

Lastly, Ghani, Rafi and Woods (2017) used an existential phenomenology to understand the perceived authenticity of a virtual heritage environment (projected using a head-mounted display). This appears to be one of the few studies of this type, and the only one that used a phenomenology to understand authenticity. The environment was a virtual representation of Kampung Hulu Mosque (Melaka, Malaysia). Twenty people participated in interviews using a 'think aloud' method to reveal their experience of this virtual environment. In analysing the collected data, the authors concluded that the environment was 'incomplete', especially in terms of missing proper environmental context, including sound. It is also important to note that the materials represented in this virtual environment also lacked the normal patina or decay of surfaces that would normally be present in an historic place.

Questions, methods and analysis in phenomenology

There are many methodological approaches in phenomenology, the most important of which, for this specific inquiry, include transcendental (Stein & Batzdorff, 1990; Bruzina, 2004) and hermeneutical (Gadamer, 1976; Ricoeur, 1967). Transcendental phenomenology is mainly found in philosophical discourses and is purely descriptive in nature. Christopher Tilley's (2004) work on stone in landscapes is a good example of this approach; his texts contain many detailed measurements of stone and detailed descriptions of colour and texture, but there is no interpretation of these features and what they mean or how they might make a person feel. When a researcher is interested in the interpretation of meaning, which in a phenomenological context is the pre-reflective exploration of meanings the moment they arrive in our consciousness, a hermeneutical methodology is used. But if the goal is to mix the two approaches – transcendental and hermeneutical – in an environmental

context where we are interested in how the richness of the embodied experience generates meaning and affect, the approach is existential. Maurice Merleau-Ponty (1962, 1963) is credited with exploring the foundations of this methodological approach.

It is also worth mentioning experiential phenomenologies, which can be conceptualised as a kind of 'applied' phenomenology. Binswanger (1963) conducted some of the earliest examples of this applied approach by adapting the ideas of Husserl and Heidegger into the practice of psychiatry. Work in nursing that explores the nature of the kind of pain patients feel, with the goal of mitigating this experience, is an example of this approach (Munhall, 2007). Theoretically, one can take any tradition in phenomenology and transform it into an experiential phenomenology if the context is to use the collected and analysed data to answer a real-world problem. In this sense, an experiential, existential phenomenology holds promise as a technique that conservation practitioners who work in the historic environment could employ.

Research questions that are uniquely suited for an existential phenomenology relate to personal affect and perceptions within specific environmental contexts. How do certain environments make people feel? What are the specific elements of an environment that engender feelings in people? How do people perceive specific places? What do they notice? What do they ignore? All of these questions explore the embodied experience, which is a focus on how the body senses, feels and is affected by what is around it. There is always an emphasis on pre-reflective, pre-cognitive meanings. Data from a phenomenological reduction might consist of statements such as 'feels cold', 'too bright' or more detailed description of meanings that arise without direct conscious control, such as memories or images in the mind's eye. 'Data' in this sense would not, therefore, include a reflection on *why* something feels cold or *why* an image appeared suddenly in the mind's eye. Again, the goal, is to get as close to the initial point of perception and feeling as possible and not focus on causality.

Within an existential phenomenology, one can use a first-person or third-person orientation. In a first-person existential phenomenology, one examines one's own pre-reflective, embodied experiences; data collected can consist of written notes, reflections and substantial raw description of feelings and perceptions related to specific environments. A third-person phenomenology attempts to access the pre-reflective, embodied experiences of other people. The most common method to accomplish this goal is the interview; much like a first-person approach, collected data consists of written notes along with audio recordings. It is common for photo-elicitation methods to be used to help assist in connecting people to specific experiences during interviews.

The analysis of data collected in either a first- or third-person phenomenology is similar to the coding process used in other types of qualitative research, such as ethnographies (c.f., Auerbach & Silverstein, 2003). Clark Moustakas (2010) is one of the few authors who has attempted to describe a phenomenological 'method', a task that is deceptively difficult. The reason why so few method guidebooks exist for phenomenologies is that one of the first steps in conducting this kind of study is to bracket your own personal experiences, biases and

preconceived notions prior to collecting data. The goal is to have an imposed naivety to all experiences, such that even experiences that are well known to the researcher become fresh and novel. Going into this context with a pre-defined method has the potential to destroy this naivety. Moustakas describes this issue in detail and treads a fine line between avoiding too many preconceived, rigid steps associated with a traditional method and the need to have some kind of structure to a research protocol. He also advocates novel approaches to qualitative data coding unique to a phenomenology, such as listing every expression related to a specific experience, but the overall way in which themes are created and meanings clustered is, again, similar to other methods for qualitative data analysis.

While the phenomenology – especially the existential phenomenology – has long been important in understanding people's emotional attachment to places, newer technology allows us to actually peer inside people's heads and see which part of their brains activate given certain external environmental stimuli. This can help us understand psychological commonalities between people and the relationship between historical environments, behaviour and cognition. I will now discuss neuropsychological and neurobiological research in relation to place attachment with specific reference to historic environments.

Neuropsychological and neurobiological evidence for how people perceive and experience place

To date, researchers have had little interest in applying other methods from EBR to questions that address the historic environment, such as behavioural mapping, environmental attitude measurement, visual preference studies, simulated environments, post-occupancy evaluations and neuroscience. Where extant, most of the published scholarly literature in this area uses visual preference studies, in which participants are shown photographs of older cultural landscapes and asked to complete a survey based on their perception (e.g., Ahn, 2013; Askari, Dola, & Soltani, 2014; Herzog & Gale, 1996; Levi, 2005). The collected quantitative data are then analysed using statistical methods. To be sure, many other visual preference studies, while not directly addressing older buildings or the older built environment, nonetheless provide useful insight, including indications that people prefer complexity in building design to simplicity (Stamps, 2000). Because more complex (or ornamental) design is emblematic of pre-modern, pre-World War II building design, this lends empirical support as to why people may prefer 'historic' environments.

While most of these EBR methods have been used to investigate place attachment in many contexts – especially natural environments (e.g., Blake, 2002; Gosling & Williams, 2010; Beery & Jönsson, 2017) – the use of methods from neuroscience is largely absent from research in this area (Lengen & Kistemann, 2012). As opposed to other methods, neuroscience seeks an understanding of the relationship between the physical brain, behaviour and cognition; as such, there is a focus on the biology inherent in the brain and nervous system as well as specific areas of the brain and their function. In broad terms, neuroscience can be divided into neuropsychological and neurobiological research. Neuropsychological

research is based on experiments (e.g., measurement of reaction time in controlled settings), standardised tests (card sorting, questionnaires), electrophysiology (e.g., EEG, MEG) and neuroimaging (e.g., fMRI, PET, CAT). Neurobiological research typically involves experimental designs using animals as subjects; when people are involved, the focus is usually on how brain lesions and electrostimulation affect cognitive and behavioural function. Unlike neuropsychology, neurobiology is invasive, requiring direct access to the brain and nervous system.

To be sure, neuroscience research has provided fundamental insights into the perception and coding of environmental stimuli, orientation, attention and emotion as well as place memory. We know that the most important areas of the brain that address this process are the temporal lobe (specifically, the limbic system) and parts of the occipital lobe (specifically the right lingual gyrus) (see Figure 2.1). These areas of the brain are associated with lower-level psychological processes not directly under our control that focus on perception and emotion as opposed to the frontal lobe, which is responsible for higher-order cognition and analytical reasoning, including language, learning and the expression of personality traits. In this sense, the phenomenologist's focus on pre-reflective (i.e., pre-analytical) description is supported by neuroscience research, in that most aspects of sense of place and place attachment do not appear to happen in the frontal lobe of the brain. Therefore, a rejection of interpreted, reflective, or analysed experience is an attempt to get closer to the parts of the brain that are not under direct conscious control. This is not to say that areas of the frontal lobe, such as the prefrontal cortex, do not play a

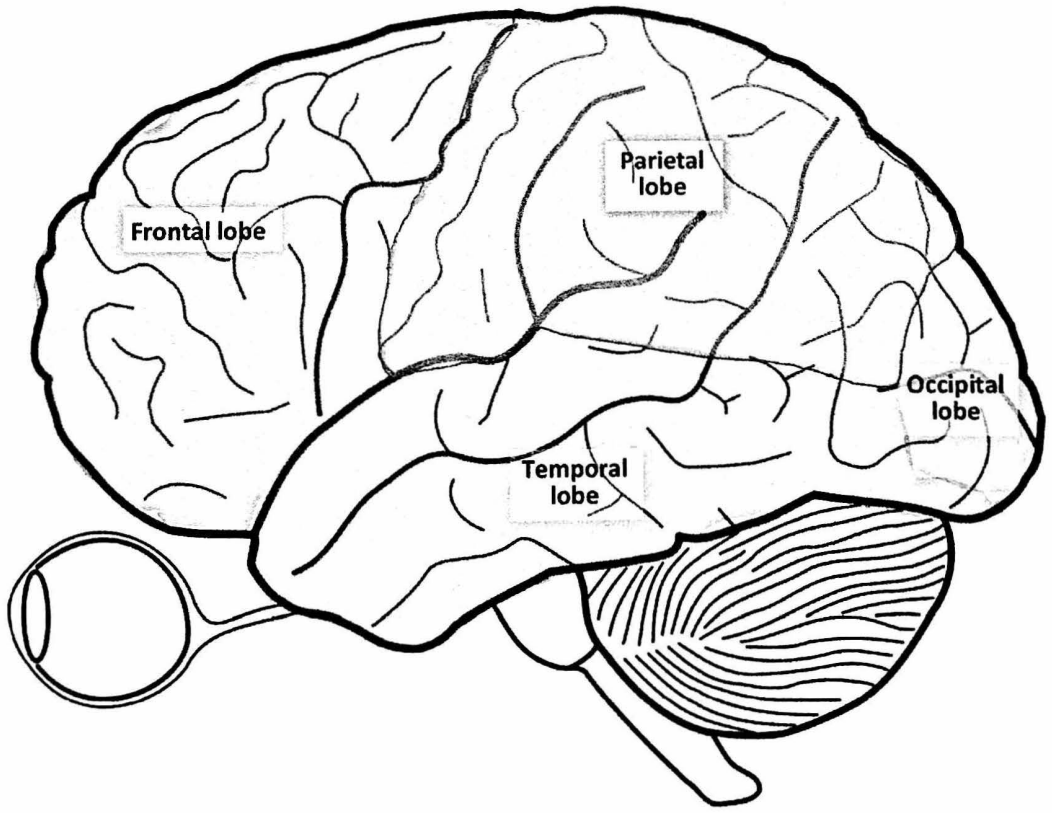

Figure 2.1 The neocortex and its associated lobes (Illustration by the author).

role in place attachment and perceptions associated with sense of place, but research in this particular area is less definitive. Limited evidence for frontal lobe activation demonstrates that the medial prefrontal cortex appears to be most involved with spatial environments (Kensinger & Schacter 2006).

Even though there is currently disagreement on whether or not the limbic system is a valid grouping of different functional areas of the brain, its common use as category of processes continues (see Figure 2.2). Functionally, it is understood as a kind of screening interface between incoming, raw sensory information and the cerebral cortex (the part of the brain with higher functions). It plays a critical role in emotions and memory, including spatial memory (Champney, 2016: 236–242). In terms of the processing of stimuli (especially visual) closely related to place attachment, it appears that the following structures associated with the limbic system are most important: the hippocampus, parahippocampal cortex, the retrosplenial cortex and the entorhinal cortex.

The hippocampus is unique in that it has 'place cells' which are neurons that fire only on encountering a specific place and other cells that fire only upon encountering a certain element of a specific place (Georges-Francois, Rolls & Robertson, 1999). Researchers think that the hippocampus is therefore responsible for spatially mapping the environment, which is critical for navigation

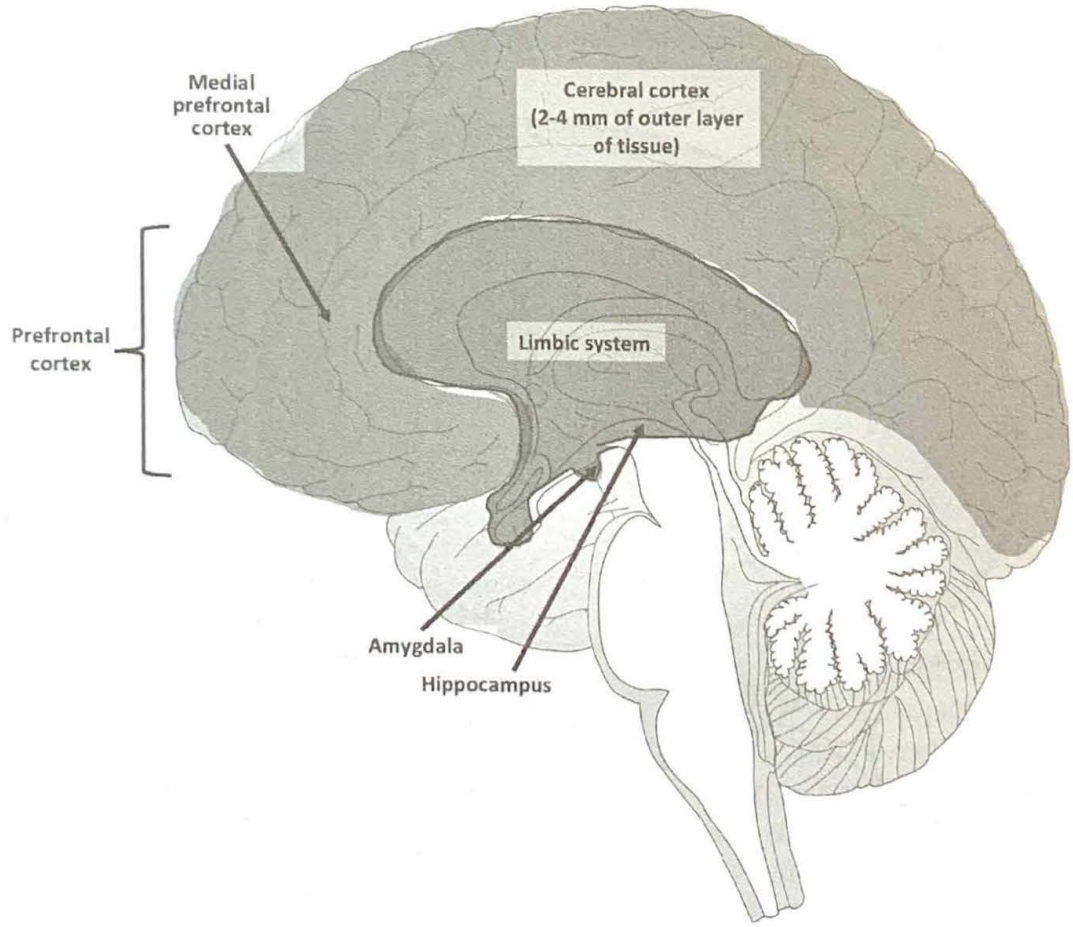

Figure 2.2 The cerebral cortex and limbic system (Illustration by the author).

(Moser & Moser, 2009); perhaps not surprisingly, taxi drivers, who need to be especially good with spatial navigation, have been found to have unusually large hippocampi (McHugh & Bannerman, 2010: 279). A major interface between the hippocampus and the neocortex (area of higher cognition) is the entorhinal cortex which has specific cells that seem to encode the environment as Euclidian space (grid cells) (Hafting et al., 2005), cells that detect borders (Solstad et al., 2008), and cells that are attuned to the orientation of the head (Sargolini et al., 2006). The entorhinal cortex is therefore understood to contain neural maps of specific environments (Vann & Albasser, 2011). Near the hippocampus, in the temporal lobe, is the occipitotemporal sulcus, which seems to be involved in analysing shapes, including texture, and the overall grouping of items (Bar et al., 2001). Refer to Figure 2.3 for locations of these structures.

An area associated with the hippocampus, the parahippocampal place area, uniquely responds to visual stimuli associated with rooms and landscapes in deference to individual objects, such as buildings (see Figure 2.3). Notably, the PPA does not appear to react at all to human faces, which means that this region of the brain is uniquely attuned to landscape cues (Epstein & Kanwisher, 1998). What appears to be clear from research is that the neocortex does not seem to store direct, visual representations of environments, a task in which the PPA seems to specialise. In addition, the PPA may have a potential role in spontaneous fantasies. Mégevand et al. (2014) were able to elicit immediate visual scene 'hallucinations' on the direct electrical stimulation of the PPA in a subject. On stimulation, random visual memories from the subject's past flashed into their mind's eye, such as a scene from a train station or a closet. Remarkably, the stimulation also

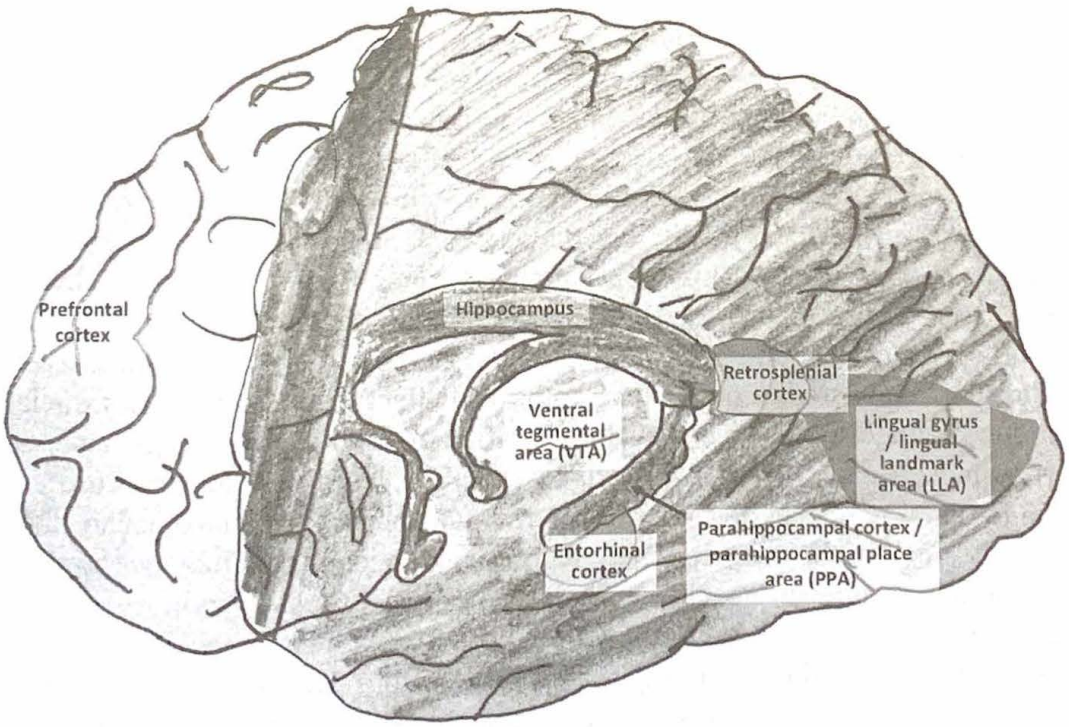

Figure 2.3 Detail of medial temporal lobe, limbic lobe and occipital lobe showing location of specific structures (Illustration by the author).

resulted in a combination of a visual memory together with visual aspects of the current environment in which the subject was situated, such as when the subject described how they saw the researchers in their room spontaneously become 'Italians working in a pizzeria' (ibid.: 5402). The subject also reported feelings of 'déjà vu' with some scenes. Although artificially provoked, this experience is remarkably similar to the way that subjects describe spontaneous fantasies; regardless, it would be reasonable to theorise that the PPA, because of its fundamental role in place memory, should be involved in this process. Similar visual hallucinations have also been reported by other researchers.

Very near the PPA, in the occipital lobe, is the lingual gyrus, which contains the lingual landmark area (LLA) (see Figure 2.3). This is a particularly interesting part of the brain because its function seems to be the recognition of environmental landmarks, including buildings (Aguirre et al., 1998). In this sense it seems to be attuned to specific objects in a landscape (micro focus) as opposed to a complete landscape (holistic focus), which the PPA encodes. Indeed, Aguirre et al. (1998) are confident that no other area of the brain responds more strongly and specifically to buildings, although the reason why such a place exists in the human brain is not clearly understood, at least from an evolutionary perspective.

An issue with neuroscience and similar research is that many of the studies tend to over-represent Western subjects. We do know, however, that the PPA's selectivity and function for place recognition and memory in East Asian subjects appear to be identical to Western subjects. This result is in contrast to facial recognition, which has been shown to activate slightly different areas of the brain in the same groups (Goh et al., 2010). Research on other cultural groups has also shown a lack of correlation between cultural identity and the way the PPA and the LLA activate when processing spatial environmental stimuli (Gutchess et al., 2006).

Lastly, while the amygdala is considered to be central in emotional responses and overall mental states, little research exists linking the amygdala to essential areas of the brain related to landmarks and places, such as the PPA and LLA. This omission is important because emotional attachment to places is a fundamental component of place attachment theory and empirically represented in many quantitative and qualitative studies from environmental psychology and humanistic geography. This situation may be due, in part, to the difficulty psychologists have had in understanding positive emotional states, which lack the kind of specific biophysical markers that negative states, such as fear, have. In addition, many studies on positive emotional affect tend to centre on artificially induced euphoric states via the administration of mind-altering drugs rather than focusing on naturally occurring lived experiences. In addition, because emotional states tend to evolve over time rather than occurring spontaneously, fMRI, which is one of the most common neuroimaging techniques, may not be able to accurately resolve the specific areas of the brain that support emotional states (in this case, PET may be a better imaging tool). Some tentative research, however, seems to support the possibility that positive emotional states are more broadly processed in the limbic system rather than centring in the amygdala. Indeed, the amygdala may have little influence on positive emotional states (Burgdorf & Panksepp, 2006). A meta-analysis of 385 PET and fMRI studies addressing

emotion and the amygdala seems to support this premise because activation of this part of the brain was more closely associated with negative rather than positive emotions (Costafreda et al., 2008).

Rather than being centred in the limbic system, positive emotional affect may therefore be more closely associated with the basal ganglia, which is considered to be the most 'primitive' part of the brain. Induced euphoric states have been achieved through direct stimulation of the nucleus accumbens, an area of the brain that has also been linked to addiction (Heath, 1954, 1972; Okun et al., 2004). The ventral tegmental area (VTA) is also associated with intensely positive affect, including romantic love (Fisher, Aron & Brown, 2005), pleasure from music (Blood & Zatorre, 2001) and orgasm (Holstege et al., 2003). It is interesting to note that an animal-based study found that the entorhinal cortex significantly modulated the VTA within a well-defined neural circuit, which shows that these brain areas appear to be in close communication with each other (Todd & Grace, 1999). An fMRI study by Bunzeck and Düzel found that when subjects were exposed to novel visual stimuli, both the PPA and the VTA activated, suggesting that the positive affect from this kind of experience resulted from VTA activation (Bunzeck & Düzel, 2006). There does not appear to be any literature that addresses associations of the nucleus accumbens or the VTA with broader concepts in place attachment or sense of place, however.

Lastly, it is useful to mention that while there does not appear to be any refereed scholarship directly linking neuroscience to place attachment, the UK's National Trust funded a research project to 'understand the depth of people's connection to place', released as the report *Places that Make Us* (National Trust, 2017). As part of this work, Bertram Opitz, Professor in Neuroimaging and Cognitive Neuroscience at the University of Surrey, was retained to conduct fMRI scans on subjects while showing them images of ten places and ten objects that were particularly meaningful to each subject. Opitz reported that the following three areas of the brain activated only when shown these images associated with places, but not objects: the left amygdala, the medial prefrontal cortex and the PPA. The latter two aspects are supported by other research. Activation of these areas did not happen with the images of objects or control images of common places. What these results show is the possibility that the amygdala may indeed be associated with positive place affect as well as the central role the PPA appears to play in place attachment.

Questions, methods and analysis in neuropsychology and neurobiology and an example

Methodologically, neuropsychology and neurobiology are usually quantitative in their approach, following the scientific method. The goal is to collect measurable data that are then subjected to multivariate statistical analysis, including various types of regression, correlational tests and non-parametric tests. Specific to the analysis of fMRI image data are coherence analysis and Granger causality tests (Ashby, 2019). Some kinds of research are observational and rely on raw description – such as when determining what part of the brain activates upon a subject

being subjected to a certain stimulus – but statistical methods are often employed to answer these kinds of seemingly facile research questions.

Research questions in neuropsychology and neurobiology are usually reductive in the sense that the phenomenon being explored needs to be narrowly defined. Examples of research questions include differences in how long certain reactions take when lying versus telling the truth (e.g., Suchotzki et al., 2017); psychological tests that are used to understand if there is a relationship between mindfulness and neuroticism (e.g., Iani et al., 2017); measuring differences in electrical activity in the brain to determine how people process real and modelled 3D images (e.g., Grima Murcia et al., 2019); which areas of the brain activate upon viewing certain landscape images (e.g., Tang et al., 2017); and testing how electroconvulsive therapy physically and chemically changes the brain in animal models (e.g., Singh and Kar, 2017).

Specific methods used in neuroscience might include:

- survey instruments (dependent and independent variables, sometimes with open-ended questions). Data are analysed via multivariate statistical methods;
- electroencephalography (EEG), which records electrical activity in the brain. Data consists of waveforms representing electrical activity that is interpreted visually. In some cases computer software that can perform quantitative electroencephalography is used;
- functional magnetic resonance imaging (fMRI), which uses very high-power magnetic fields to image where more and less oxygen is being used in the brain; high oxygen levels in a certain area of the brain equates to more brain activity at the cellular level in that particular area;
- experiments on animals to determine how various stimuli and environmental conditions affect the brain physically and chemically. Normally, the animals must be killed in order to examine their brains microscopically as well as to conduct various analytical tests on brain tissues.

There are many other possible methods beyond those listed here, but these should provide a sense of what is possible.

In order to help elucidate how research in neuropsychology is conducted, I will use the National Trust's (2017) study mentioned earlier, which used the fMRI method to answer questions related to people's emotional attachment to places.

This study had an unusually broad research question, which was to explore the 'emotional connection between people and place'. The study specifically looked only at places that people knew well and with which there was a long-term, intimate, personal connection. Although not explicitly stated, the guiding research questions appeared to be:

1. What areas of the brain activate when a subject views a meaningful, environmental scene for which he/she has great familiarity?
2. What stories do people have about places that are particularly meaningful to them?

3. What are the correlations between specific places that are meaningful to people, the kinds of emotions they feel and if they thought these places were worth protecting?

The researchers answered question 1 using an fMRI study, question 2 through qualitative interviews and question 3 through a survey instrument.

For the purposes of this example, I will only focus on the fMRI portion of the study, in which the brains of 20 people were scanned. While being scanned, subjects viewed photographs of ten places and ten objects that were particularly meaningful to them. To provide a comparison, subjects also viewed images of ten common places and objects along with 20 control images that had previously been tested to generate known emotional responses. The design of the study was based on the hypothesis that the images that were well known to the subjects should elicit a stronger emotional reaction that should be readily identifiable in the fMRI scans.

During an fMRI scan, a computer takes a picture of a certain region of the brain around once every one-half second to three seconds. The machine's operator needs to be aware of the specific area of the brain to be targeted prior to conducting the scan. In the case of the National Trust study, because they were expecting emotional responses in their subjects, the scans targeted the brain's temporal lobes. The actual time that a subject stays in the scanner is usually relatively short – around 15 minutes – although the researchers did not report the length of time subjects were in the scanner for this particular study. The collected scan images then need to be pre-processed to correct for timing errors and head motion. The last step in the analytical process requires a statistical analysis on the images in order to make useable conclusions about which areas of the brain were activating upon seeing certain images.

The results of the fMRI portion of the National Trust study was that the left amygdala, medial prefrontal cortex (mFPC) and parahippocampal place area all uniquely activated in subjects that viewed images of places that were familiar to them. The amygdala is responsible, in part, for the emotional intensity of an experience; the conclusion was that subjects did, indeed, have a more deeply emotional experience with places that were familiar to them versus generic images of other places. The researchers concluded that 'Activity in the mFPC to meaningful places suggests that the positive memories and feelings we associate with that place are accessed and become conscious' (National Trust 2017: 15). Activation in the PPA was expected from previous studies that have shown this particular area of the brain uniquely reacts to places versus buildings.

Conclusion

This investigation began with an introduction to the basic concepts associated with place attachment and the disciplines and methods used to understand this phenomenon, and ended with a foray into neuroscience. But why does any of this really matter in the context of built heritage conservation? The answer is that the field of built heritage conservation lacks both appreciation for and the use of research methodologies that access psychological perceptions, experiences and

feelings that increasingly appear to be fundamental to *why people value historic places*. Archival research and oral history, while useful in the right context, are ill suited to address questions related to heritage psychology. This knowledge deficit needs to be addressed on two levels: (1) applied research tools that can be used by a practitioner; and (2) primary research that informs practice.

While phenomenologies can address both the applied and primary research needs, it is the former that has the most promise. In conservation practice, we already use the interview method for oral histories and ethnographies to help achieve a more people-centric emphasis on what makes historic places important (as opposed to a focus based on historical facts and aesthetics that would be more useful for an architectural historian or an architect). With a phenomenology, the method is the same, but the *methodology* is different. Instead of stories about the past or insight into *emic* meanings from certain cultures, imagine how useful it would be to inform which places are worthy of conservation based on people's emotional attachment to them. Or, in a more direct sense, perhaps we should consider prioritising saving the places for which people have the strongest feelings. Thus, we switch from a search for cultural meanings to psychological ones that then inform practice. But, before this can happen, we need to translate existential phenomenologies into the kind of experiential phenomenologies used in other fields, such as nursing, so that practitioners can readily perform this kind of work. Requiring someone who works in the conservation field to be an expert in Heidegger and Merleau-Ponty is not practical, nor is it essential to access people's feelings and emotional attachments for certain places.

While phenomenologies are well established and have long been used to understand the emotional relationship people have with specific places, their application is not without controversy. Long abandoned by their birth discipline – geography – existential phenomenologies are now used across many disciplines as a useful tool to reveal the pre-reflective qualities of lived experience. Human interpretation is always necessary in a phenomenology, which is a kind of double-edged sword: if the goal is to understand a profoundly emotional experience in the greatest and fullest richness of meaning and depth, a human will always be required to gather and interpret data. But this human intervention also means that a failure to properly bracket experience could introduce biases – especially cultural biases – into the results. While phenomenologists have long sought a kind of universal interpretation of human experience through their work, this goal is likely difficult to achieve because of inevitable bracketing failures, no matter how diligent a researcher is in the conduct of their work. On the other hand, neuroscience does have this potential for a universal interpretation of human experience.

While neuroscience likely has less pragmatic import for day-to-day conservation practice, it should be useful in informing practice more broadly and more universally. Until now, historic environment practitioners have used culturally bound meanings to help inform concepts of significance and authenticity in association with conventional art/historical values; to be sure, in this frame, we assume that these meanings will change depending on the cultural context. But what if there might exist some kind of universal human meanings associated

with old places? What if certain kinds of environmental patina catalyse the same feelings in the same regions of the brain in most human beings, independent of cultural context? If this hypothesis proves true, it might fundamentally change how we approach significance and authenticity in the historic environment. Currently, we do not have any evidence to confirm or refute these hypotheses, but the lack of knowledge in this area *should be* driving the need for primary research in the psychological aspects of people and heritage. Perhaps this line of inquiry will not be particularly useful for practice or perhaps it could totally upend the field of heritage conservation – we cannot know unless these questions are answered using new methodologies and methods from neuroscience.

Neuroscience, while obviously not capable of the depth of meaning of a phenomenology, does offer the tantalising possibility of describing a universal human experience related to places. This result is possible because specific regions of the brain specialise in processing environmental stimuli in specific ways in all people, regardless of their geography. The role of the limbic system in spatial environmental processing and memory is now well established. The PPA seems particularly intriguing as the possible area of the brain that may play a central role in place attachment. The key here is that if this hypothesis is indeed true, then the PPA will likely play this role for all people across all cultures, thus achieving a kind of universal process that could potentially inform a kind of universal conservation policy. In other words, if the accepted goal for heritage conservation is to retain the experiential authenticity of an historic place, then a conservation *process* could be developed to maximise this authenticity using neuropsychological and neurobiological evidence.

But before such an outcome is even remotely feasible, researchers need to address the fundamental lack of primary neuroscience research that addresses place attachment. The National Trust's research paper is an intriguing result in this direction that will hopefully inspire others to follow, especially in terms of producing refereed scholarship. Ideally, the connection between conservation policy and research in this area may also inspire additional funders, without whom such research could not happen. To date, nearly all funded research on place attachment has only focused on public health; this overly narrow focus needs to expand to address all potential human environments, whether they are natural or cultural, in broader planning and policy contexts. If these kinds of changes are able to happen over the next decade, research that overlaps neuroscience, built heritage conservation and place attachment holds the promise of radically revising conservation policy and practice for the good of humanity.

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