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Extended Abstract

PROJECT TITLE: *Architectural Interpretation: Philosophy, Technology, Embodiment*

INTRODUCTION

Taken together, this collection of publications offers an original contribution to an emerging field of 'embodied architectural hermeneutics'. It is my contention that a theory of architectural interpretation must be grounded in a thorough understanding of the role of the body in the experience of space. As the French phenomenologist Maurice Merleau-Ponty famously described, our 'primordial encounter' with the world inevitably takes place through the medium of the lived body. I believe this observation has profound implications for architectural theory and criticism but until now these have remained under-explored and poorly understood.

The studies are presented here in two groups. In Part I the primary objective is to critically review the possibilities and limits of the currently dominant interpretive frameworks mainly drawn from philosophy, cultural theory and literary criticism. In Part II the aim is to outline a new embodied approach to architectural criticism based on the philosophical legacy of phenomenology - including its recent resurgence and re-evaluation within the disciplines of cognitive psychology, the computer sciences and the philosophy of technology.[1] The phenomenological analysis of the embodied experience of technology highlighted in Part I is developed and applied in Part II in the context of two distinct areas of architectural production: buildings and exhibitions. These studies employ a variety of research methods, including written analysis and practice-led 'research by design', in order to explore a range of possible applications of the embodied approach to architectural interpretation. They also begin to address the broader implications of architectural experience in contributing to our 'sense of self' and the extent to which the designed environment could be seen as both an extension or projection of the self into the

world, and likewise as an extension of the social and cultural world towards the self.

Part I begins with the single-authored book *Building Ideas* [Pub. 1] which provides a critical survey of contemporary hermeneutic practices in the field of architectural theory and criticism. The book describes and analyses the major interpretive frameworks employed in the field during the second half of the twentieth century and also presents their key historical and philosophical sources. A series of recent buildings are referred to as examples of how these approaches might be employed as interpretive strategies in architectural criticism, highlighting their possibilities and limitations, together with areas of conflict or complementarity. Based on the model of other recent texts in literary and cultural theory, geography and material culture,[2] the book makes an original contribution to the field in calling for a stronger engagement with debates in related disciplines in developing a more rigorous and theoretically informed approach to architectural criticism and design.

The book *Ends Middles Beginnings* [Pub. 2] is a critical interpretation of the work of Edward Cullinan Architects, covering built and unbuilt projects from the early days of the practice in the 1960s to the present, focussing especially on work completed in the last ten years which has not been published previously in book form. The book also makes an original contribution in its thematic analysis of the Cullinan design approach, and is structured around phenomenological and technological themes such as 'Territories', 'Place Making', 'Cave and Horizon', and 'The Art of Making Buildings'. It concludes by situating the work of the practice in a broader theoretical context, drawing out the relationships between their approach to the handling of form and material (based on the physical and sensory enjoyment of the process of construction) and the political implications of their concern with sustainability, participation and user engagement.

The co-edited publication *Rethinking Technology* [Pub. 3] provides a survey of architectural literature published over the last 100 years on the impact of technology on the making and meaning of buildings. Focussing especially on the writings of architects - plus a number of urban and cultural theorists – it includes several essays and extracts that specifically address the relationship between technology and the body, drawing on the phenomenological analysis of technology developed by Martin Heidegger.[3] Both Heidegger and Merleau-Ponty describe the traditional hand-tool as an extension of the body and I believe this notion can usefully be expanded to the scale of equipment, furniture and

buildings. I go on to argue in the publications included in Part II that this embodied understanding of technology has implications in architecture at two distinct levels: during the process of construction and also in the act of inhabitation.

Each of the publications in Part II makes an original contribution to the field of 'embodied architectural hermeneutics', by focussing on the ways in which meaning emerges from the various relationships between architecture and the body. In addition to the links between buildings and their makers (evidenced when the traces of the construction process are expressed in the finished building), and the encounter between buildings and their users (recorded in the gradual erosion caused by repeated patterns of movement and occupation), the body also plays a significant role in the way in which buildings are represented: firstly in the embodied act of drawing carried out during the design process and secondly in the ways in which buildings are 'reproduced' and interpreted through the medium of architectural photographs, publications and exhibitions.

PART I – Hermeneutic Practices

1. Building Ideas: An Introduction to Architectural Theory

The book *Building Ideas* provides a wide-ranging survey of contemporary hermeneutic practices in the field of architectural theory and criticism. Based on the model of Terry Eagleton's *Literary Theory: An Introduction*,[4] the book describes and analyses the major schools of twentieth century philosophy and draws out their relevance for the theory and practice of interpretation in architecture.

The major motivation for embarking on this study arose from the context of architectural design and debate in the 1990's which had seen a huge rise in publishing activity and the emergence of an influential new figure – the 'architect-theoretician.' Through the combined activities of drawing, designing, lecturing and publishing, a new industry was developing around these notable individuals based on a new intellectual currency: architectural ideas that seemed to flow freely between philosophers, cultural theorists, designers and critics. On the one hand this seemed like a positive development as it meant that architectural phenomena were being discussed and debated by a much broader interdisciplinary community. On the other hand the downside of this new-found

fluency was the gradual detachment of these debates from the everyday realities of architectural practice – as if a self-contained and self-referential world of theoretical constructions had cut itself off from any application to buildings.

Another major source of inspiration for the work in *Building Ideas* was the appearance of an influential group of anthologies of architectural writings which were published in the period from 1996-98.[5] One of these, *Rethinking Architecture: A Reader in Cultural Theory*, edited by Neil Leach, was a key reference for several chapters of *Building Ideas*, which could also be seen as a 'companion volume' in the sense that it provides a road-map to the complex terrain of philosophical discourse covered in *Rethinking Architecture*. In broad terms, *Building Ideas* set out to apply some of these relatively new theoretical tools to the critical analysis of buildings, in the hope of reconnecting some of the more arcane philosophical discussions with the everyday concerns of designers, critics and building users.

The first part of the book includes two chapters that set out contrasting views on the fundamental question of meaning in architecture. Chapter One takes issue with the definition of 'architecture as engineering' proposed by Le Corbusier in the first few pages of *Vers une Architecture*, where the claim is made that: "We no longer have the money to erect historical souvenirs. At the same time we have got to wash! Our engineers provide for these things and they will be our builders."[6] This suggests that questions of 'meaning' and cultural significance are no longer relevant in a modern world of utility, economy and function. A few pages later in the same book Le Corbusier makes virtually the opposite claim: "Architecture is a thing of art, a phenomenon of the emotions, lying outside questions of construction and beyond them. The purpose of construction is to make things hold together; of architecture to move us."[7] This second passage hints at a *rapprochement* between the two positions, suggesting that without 'art' architecture as pure construction is meaningless. Despite this, the idea of a neutral and technologically-driven architecture of functional economy has been surprisingly persistent, exemplified in much of the discourse around late twentieth century British high-tech architecture. This approach has often tried to present itself as a straightforward – and hence deterministic – application of the latest technology to the solution of functional requirements, without any pretence towards cultural expression or symbolic significance.

One of the major sources for this reductive approach to design is the rise of the modern scientific world-view and its anchoring in the principles of objectivity and

rationality. In the second half of Chapter 1 this line of thinking is traced back from the nineteenth century philosophers Hegel and Comte towards the 'birth' of modern science and philosophy in the seventeenth century work of Francis Bacon and René Descartes. By considering the historical conditions and contingencies out of which these various ideas emerged, it becomes possible to identify and question the basic tenets of the functionalist approach in architecture. By presenting modern science as just one among a whole range of available 'narratives' capable of offering meaningful descriptions of the world – as the philosopher Ernst Cassirer does in the *Essay on Man*[8] – architecture can again be seen as a meaningful language of cultural expression.

By way of contrast, Chapter 2 examines this alternative view – the idea of architecture as both a cultural as well as a technical activity. This analysis highlights a schism at the heart of the modern movement in architecture, which as Le Corbusier's text suggests was founded on two distinct sources of inspiration. The first has been described above, and for Le Corbusier was exemplified by the new technologies of transport, energy and mass-production. The second - of equal interest to Le Corbusier – was the early twentieth century development of Cubism and abstraction in painting, which alongside advances in the sciences offered the promise of a new way of seeing and understanding the world by challenging historical preconceptions about the basic fabric of space and time.

Again, the broader question of the role and significance of art in contemporary society is addressed by tracing the history of aesthetics in philosophy alongside the various sources and supports for the understanding of architecture as an artistic activity. Borrowing from Hans-Georg Gadamer's definitions of art as 'play, symbol and festival',[9] examples of buildings are shown to illustrate these potential cultural roles. The Expressionist tradition within modern architecture is discussed - alongside examples of what became known in the 1990s as the Deconstructivist approach - to demonstrate the ability of buildings to challenge expectations and open up new possibilities for spatial experience. These two chapters therefore act as a preamble for the second part of the book by establishing the unavoidable presence of *meaning* in architecture: the idea that the activities of designing and making are always inextricably bound up with issues of representation. In other words, the impossibility of creating a 'meaningless' building because even a designer's outright ignorance of expression and signification cannot fail to communicate something to an attentive user, client or critic.

From Chapter 3 onwards the book presents a further series of philosophically informed methodologies for the interpretation of meaning in architecture, based on the insights provided by the three major schools of twentieth century 'continental' philosophy: phenomenology, structuralism and Marxism/critical theory. These philosophies are selected partly because of their already significant impact in the area of literary and cultural studies, and partly from my own personal belief in their effectiveness as tools for architectural interpretation and criticism.

As phenomenology forms the basis for much of the work that follows, I will deal firstly with the latter two philosophies. Initially a philosophy of language, structuralism involves an attempt to apply the insights of the early twentieth century Swiss linguist Ferdinand de Saussure to the interpretation of a wider field of cultural phenomena. Saussure's division between the 'deep structure' of language (the system of linguistic signs and grammatical rules that precedes any individual act of communication) and the surface effects of everyday speech was developed into a powerful explanatory tool by a number of philosophers and cultural theorists. Most significant among these was the French anthropologist Claude Lévi-Strauss who applied Saussure's binary model to the analysis of kinship relationships and mythological narratives. He identified what he believed to be a number of universal 'structural' principles that appeared to invisibly determine - and thus also predict – the visible pattern of individual behaviour, social grouping and symbolic expression. In architecture these ideas have appeared in a number of apparently contradictory guises. One being the late-modernist 'modular' approach to design proposed by Aldo van Eyck and Herman Hertzberger and the other being the literal preoccupation with architecture as a system of explicitly visual – and often historical – signs, advocated by Robert Venturi and Michael Graves among others.

Lévi-Strauss claimed to have been inspired by the examples of geology, psychoanalysis and Marxism, which he saw as three distinct illustrations of the principle of unseen forces determining visible surface effects. Chapter 5 of *Building Ideas* takes up the last of these examples as a further tool of architectural analysis. It begins by tracing back the lineage of twentieth century Marxist cultural criticism (exemplified by the writers of the Frankfurt School) to Marx's original concerns with improving the plight of factory workers under the conditions of nineteenth century industrial capitalism. The exposure of the injustices of the political and economic structures operating at the time Marx and

Engels were writing inspired a school of cultural criticism in the twentieth century that has focussed on the social contexts and economic conditions out of which cultural work is produced. Notable recent examples of this approach include John Berger's *Ways of Seeing*[10] and Michael Baxendall's *Painting and Experience in Fifteenth Century Italy*.[11] These tools have also been applied by several major writers on architecture and the city, including Henri Lefebvre,[12] Manfredo Tafuri[13] and Fredric Jameson[14] as well as in a number of influential recent anthologies.[15]

Finally, returning to Chapter 3 and the philosophy of phenomenology, this section develops an approach to architectural interpretation based on the individual's 'primordial encounter' with the environment – the fundamental perceptual experience of space, form and material. Beginning with the work of Edmund Husserl - usually taken as the founder of the phenomenological school - the first part of the Chapter looks in detail at the key ideas of two philosophers he directly inspired: Martin Heidegger and Maurice Merleau-Ponty. Both were responding to Husserl's call for philosophy to go 'back to the things themselves', as evidenced in Heidegger's writing on tools and technologies in his major early work *Being and Time*. While Heidegger's later thinking on the concept of place has exerted a powerful impact in architectural theory and practice, his ideas on the embodied experience of technical equipment have so far been less influential. Likewise with Merleau-Ponty who – inspired by that earlier French philosopher of embodiment Henri Bergson – developed a more detailed philosophical account of bodily experience and its impact on our understanding of the world around us.

These latter themes will be developed in more detail through the publications included in Part II of this collection but the key point to note here is the broader relevance of this conceptual framework to the experience of buildings and landscapes. With reference to the work of the philosopher Gaston Bachelard, as well as the architectural writings of Christian Norberg-Schulz, these ideas are applied in Chapter 3 *Building Ideas* to the interpretation of a number of projects by Frank Lloyd Wright, Louis Kahn, Carlo Scarpa and Tadao Ando. The analyses attempt to draw out the potential for architecture to act as a means of heightening spatial awareness – in terms of the experience of the place, site and setting of the building; its formal, spatial and tectonic qualities, plus a deeper sense of the body itself engaged in the ongoing act of experience.

2. Ends Middles Beginnings: Edward Cullinan Architects

The second publication included in Part I is a monograph on the work of Edward Cullinan Architects. The book applies some of the key insights of phenomenology – among other philosophical approaches - as part of an implicit critical framework for analysing and contextualising a selection of projects from the practice's influential 40-year output.

Chapter 1, entitled "Territories: Architecture as Place-making," sets out the Cullinan approach to locating buildings in the landscape in a meaningful way. This can be usefully understood in terms of Norberg-Schulz's elaboration of Heidegger's thinking: the building is seen as a means of concentrating or 'condensing' the character or *genius loci* ('spirit of the place') of the site through a subtle manipulation of routes, boundaries, landmarks and vistas.

The Fountains Abbey Visitor Centre completed in 1992 is perhaps the clearest illustration of this approach, where the new intervention is carefully integrated into the spectacular 18th-century landscape. By laying out a new half-mile access road according to the established pattern of axial routes and vistas, the visitor is introduced to the historic character of this World Heritage Site before arriving at the new building. The mainly single-storey section draws attention to another key theme in Cullinan's work – as highlighted in Chapter 3 of the book - the articulation of space through the manipulation of roof-forms and the dramatic use of top-lighting. In many projects an expressive section is indicative of a passive solar energy strategy, but this can also be interpreted as a formal interest in the symbolic value of the roof as a primal shelter. In the book *The Poetics of Space* Bachelard describes the elements of an 'ideal house', one that would inspire the reverie of the daydreamer or poet through its references to archetypal forms of dwelling. Alongside the primary metaphor of the 'primitive hut' Bachelard refers to other organic forms such as caves, nests and shells, all spaces with characteristic cross-sections that many of Cullinans' 'inhabited roof' buildings clearly recall. These spaces are intended to heighten the experience of dwelling as Heidegger had described, and in a similar spirit Cullinans' work also suggests that this process of dwelling should be seen as an extension of the process of building.

Another key chapter in the book is entitled "The Art of Making Buildings" and it begins with a description of the origin of the Cullinan practice in the early

sequence of self-built houses. Enjoyment of the hands-on experience of construction has led to a remarkable and sustained preoccupation with the tectonic dimension of buildings. Heightening the user's awareness of the normally 'invisible' processes of construction gives Cullinan buildings an experiential richness and sense of human presence that also encourages the user's active inhabitation. Evidence of the embodied activities of making reveal a narrative of the building's own history, and alongside this the materials are allowed to weather and age naturally, accumulating further layers of temporal depth.

This chapter also presents some of the practice's larger scale 'system buildings' - including the recent Weald and Downland gridshell - which demonstrate a similar tectonic sensibility transferred to a more industrial scale of production. One of the key characteristics of these buildings is the way in which they present a story about the processes of their own making through the medium of their materials and technologies. In the final part of the book the ideas of the 19th-century German architect and writer Gottfried Semper are applied to an analysis of the Cullinan approach to materiality. In his essay "The Four Elements of Architecture" Semper provides a proto-Heideggerian analysis of the construction of a 'primitive hut', describing the form as the result of four archetypal tectonic processes. The base, or stone-paved platform with its central brick or ceramic fireplace is enclosed with a timber-framed roof canopy and hung with woven textile walls. The expressive potential of each of these technologies is used to tell the story of the making of the building - a narrative of the encounter between the bodies of its makers and the locally sourced materials. A double bond with the spirit of the place is created through both the fabricators and the fabric, and thus a connection is established with the future users of the building on a deeply embodied level.

3. Rethinking Technology: A Reader in Architectural Theory

From the research undertaken for the two publications described so far, two distinct illustrations of the importance of embodiment in architecture have begun to appear. The first involves a particular understanding of the technologies and materials of construction and the expressive potential of tectonic articulation to create spaces with a 'human dimension'. The second concerns our understanding of architecture itself as a form of technology - or as Heidegger suggested, 'equipment for residing'[16] – and the ways in which buildings can act as

'extensions' of the body or even as 'living organisms' in their own right. In an attempt to gain a stronger grasp of these embodied aspects of technology and their relevance to contemporary architectural interpretation, the third publication in Part I comprises an edited selection of extracts and essays on technology written by architects and philosophers between 1901 and 2004.

The broader purpose of the book is to bring together a collection of writings on technology as a resource for teachers and researchers in architecture. As set out in the introduction one of the major editorial objectives is to chart a shift in the understanding of technology that has taken place during the 20th century. This involves the modern tendency to replace the idea of technology as a tool which can be picked up and manipulated by hand – such as suggested by the embodiment model outlined in Heidegger's work (and discussed in more detail in Part II of the PhD) – towards the idea of technology as an all-encompassing system of production in which the worker is reduced to a component of the machine. Peter McCleary's essay "Some Characteristics of a New Concept of Technology"[17] provides a useful analysis of this development in terms of the impoverished experience afforded by many contemporary technologies. Drawing on Heidegger's model, as well as the American philosopher of technology Don Ihde, the essay describes the gradual erosion of embodied experience in a world increasingly dominated by semi-automated 'black box' devices. Phenomenological analysis of the experience of a range of technologies is shown to provide a useful critical framework for evaluating the productive role of technology in architecture.

Several of the essays take up the theme of the biological analogy in architecture and by implication suggest a more constructive sense of continuity between the realms of the organic and the mechanical. Felix Guattari addresses the idea that technologies extend human capabilities by blurring the boundaries between the body and the device.[18] This new category of phenomena that Guattari labels the 'machinic phylum' is related to the more familiar contemporary metaphor of the cyborg – a hybrid 'posthuman' entity which emerges from the coupling of body and machine. On a more down to earth level the essay by Bruno Latour - a French philosopher of science and technology – describes an everyday example of the ways in which technologies can take on the characteristics of human agency.[19] The humble pneumatic door-closer is seen as a surrogate for the traditional doorman, and this sets off a far-reaching analysis of the complex relations - and convoluted boundaries - between human and non-human 'actors'. A number of essays also deal with other areas of architectural theory and

practice in which new technologies have had an impact. In computer aided design and representation another kind of erosion has taken place as the traditionally embodied act of drawing by hand has been replaced by a new screen-based interface to representations in the digital realm.[20]

In summary the book challenges the recent dominance of technology as an agent of innovation and change and the often detrimental impact this has had in a number of important areas of architectural experience. These include a general erosion of the sensory and experiential richness of buildings, their relationship to place and locality, along with their broader social status as meaningful cultural signifiers. A phenomenological approach to interpretation and analysis is seen to hold the promise of a more positive reassessment of the role of technology in architecture in relation to the fundamentally embodied experience of space, form and materiality.

PART II – Interpretive Innovations

Each of the publications in Part II makes an original contribution to the field of 'embodied architectural hermeneutics', by focussing on the ways in which meaning emerges from the various relationships between architecture and the human body. The phenomenology of technological engagement highlighted in Part I is further elaborated through a series of interpretive studies in two distinct areas of architectural production: buildings [Pubs. 4 & 5] and exhibitions [Pubs. 6 & 7].

In each of the articles in Part II phenomenology is used as the key source for a detailed analysis of the ways in which a fully embodied experience of tectonically and functionally articulated spaces might contribute to the 'construction of the self': the sense of self-awareness that emerges through an engagement with the 'affordances' offered by the built environment.

4. Signs of Resistance: Re-Membering Technology

The first publication in Part II draws on the work of several philosophers from the phenomenological tradition in order to develop a framework through which to explore the narrative potential of tectonic expression in architecture. One of the limitations of existing tectonic theory has been its focus on the self-

referential quality of buildings. This is the view that tectonically articulated forms refer only to themselves as objects, as if they are merely celebrating their own materiality as a purely abstract formal or decorative indulgence. By contrast the position expressed here is that these forms have a much deeper potential purpose: they can reveal the interactions, both prior and future, between buildings and human bodies. Beyond this, the claim is also made that this interaction has a double resonance in that it can also reveal something fundamental about the role of the body in human perception.

As Henri Bergson wrote in *Matter and Memory*, published in 1896: "The objects which surround my body reflect its possible action upon them."[21] The implication of this statement is that the world around us acts as a 'store of knowledge', both about ourselves and the objects in it. If as Bergson suggests (echoing Immanuel Kant's description of perception structured through cognitive 'categories'[22]) the body itself poses limits on what we can know about the 'external' world, the only way we can gain knowledge of these limits is through our bodily engagement with it. The necessity of our interaction with the things around us as a means of generating meaningful information and knowledge about the world is further developed in Merleau-Ponty's later work through his concept of the 'Flesh'. Merleau-Ponty posits here a fundamental continuity between the body and the world, through a similar mechanism to Heidegger's engagement with the tool which opens up an in-between body-technology realm. It is here at the interface between the body and the world that an 'exchange of information' is able to take place – in fact this is the only means we have to gather knowledge about the world:

> "It is that the thickness of flesh between the seer and the thing is (as) constitutive for the thing of its visibility as (it is) for the seer of his corporeity; it is not an obstacle between them, it is their means of communication… The thickness of the body, far from rivalling that of the world, is on the contrary the sole means I have to go unto the heart of things, by making myself a world and by making them flesh."[23]

The nature of this interface or zone of interchange between the body and the world has also been explored in the interpretation of art by the American philosopher John Dewey. Alongside a discussion of the way in which a living organism exists in a continuous exchange of energies with its environment, Dewey also highlights the importance of the way in which our environment actively resists our appropriation.[24] It is actually only through the experience of

resistance that the tectonic qualities of materials are revealed, evidenced in the way in which the traces of the working process remain visible in the finished product. As the sculptor Richard Long has described, the completed work of art thus becomes a 'portrait of the body in the world'.[25]

A brief case-study of Long's sculptural work is included in the essay to demonstrate this idea in action. The examples also highlight the artist's concern with the ethical dimension of his encounter with the natural environment. His wish is not to dominate but to work in harmony with his surroundings, a point that also recalls Heidegger's critique of the direction of contemporary technology. In the essay "The Question Concerning Technology" Heidegger condemned the modern tendency to reduce nature to a stock of fuel or raw material for industry - what he called the 'standing reserve'.[26] Heidegger's essay is also important here for drawing attention to the original meaning of the word technology. The conjunction of the Greek terms *techne* and *logos* has traditionally been read as simply meaning the 'knowledge of making', but Heidegger claims that history has neglected the fact that *techne* is actually interchangeable with the word *poiesis*.[27] This allows him to claim a poetic origin for technology in what he calls the 'revealing of truth' about the world and he thus elevates the status technology to the level of art and poetry precisely for its profound revelatory potential.

This analysis is echoed in the recent work of the architectural theorist Marco Frascari who performs a similar dissection of the word technology based on a reversal of its two components. Alongside the 'knowledge of construction' Frascari claims the word also implies the 'construction of knowledge', and thus he also reinvests the term with the kind of double meaning suggested above.[28] The conclusion of the essay reinforces this connection between perception and action, and highlights the role of embodied experience in the creation – or construction – of the self.

5. Gottfried Semper's Primitive Hut as an Act of Self-Creation

This essay begins as the previous one ended with a quotation on the idea of 'self-creation' taken from the early 20th century writings of Paul Valéry.[29] The notion that in contemplating something beautifully made: "one feels oneself becoming an architect" suggests the kind of projection of the viewer into the object described in the previous essay.

The main topic of the paper is the writing of the 19th century architect and theorist Gottfried Semper on the tectonic processes involved in the building of an idealised 'primitive hut'. The novelty in Semper's approach to what is one of the oldest motifs in architectural writing is his emphasis on construction and materiality, which he privileges over the then conventional understanding of the hut as a generative spatial type. His concern lies instead with the craft processes involved in what he describes as the 'four elements of architecture' – the base, hearth, roof and walls that made up the elemental enclosure and for Semper formed the basis of an architectural 'origin myth.'[30] The most radical of his suggestions involves the idea that the wall originated in woven textiles – a kind of proto curtain-wall screen hung from the eaves of the timber roof. If the first architectural enclosures were actually made of textile, this allows Semper a further dramatic speculation – the idea that weaving might be the earliest craft technique and that the knot is the archetypal human product. This insight contains an echo of nineteenth century evolutionary theory in the notion that all subsequently complex tectonic forms are derived in some way from this simple building-block. In fact Semper's early work was strongly influenced by his friendship with Georges Cuvier, then director of the Jardin des Plantes - the Parisian equivalent of London's Natural History Museum.[31]

The relevance of Semper's thinking for the broader theme of 'self-creation' mentioned at the beginning of this essay is the constructive – and predictive - quality suggested by the idea that forms 'unfold' out of tectonic processes. The temporal dimension of Semper's analysis also anticipates a theme of phenomenological philosophy and the essay here goes on to make a connection with a key source for some of these later ideas in the writings of Henri Bergson. Bergson was likewise inspired by evolutionary theory and went on to write an influential book on the subject,[32] although his earlier work on the concept of time as *duration* is more specifically useful here. I argue that Bergson's ideas might help to draw out an undeveloped aspect of Semper's thinking – the notion that the temporal dimension of his tectonic analysis suggests a theory of architectural narrative.

Bergson coined the term duration to describe a new understanding of 'lived' time – the idea that we should think of time as an experience of continuous flow rather than broken up into measured units. The self in Bergson's philosophy is likewise a continuous work-in-progress – a perpetual project of self-construction that takes place in the medium of lived time. The present moment in time is

conceptualised as the interpenetration of past and future and this gives to the present a certain richness or 'thickness' that Bergson was intending to capture in the concept of duration. I claim in the essay that Semper's hut has a similar quality of temporal thickness, its tectonic articulation suggesting the unfolding of a series of constructive processes taking place in time, and its contemplation involving the re-enacting of these processes by the viewer. This is the undeveloped narrative dimension implied in Semper's analysis, which I believe also has a dual aspect operating at both micro and macro scales: the first relates to the way in which individual observers can 'read themselves into' the building fabric – identifying directly with the actions of the maker revealed in the traces of the making process; the second involves Semper's claim that these regular and patterned processes reveal an underlying cosmological order – allowing observers to visualise otherwise 'invisible' structuring principles and thus orientate themselves within a larger system.[33] Semper's thinking thus involves an important double aspect here in showing how a static object is determined by a dynamic process - and at the same time showing how this static form provides an image of a dynamic cosmos.

Semper goes on to imply the necessity of the designer deliberately working to express this underlying order, either by adding a layer of 'representational' cladding or by a metaphorical overlay of surface pattern. One can see a parallel here in the work of Louis Kahn or Tadao Ando and their articulation of day-work joints in an in-situ concrete wall, where the overlaid grid of discrete panels makes visible the temporal process of casting. These examples suggest a means to transcend a problem discussed by Kenneth Frampton in an essay from 1990: the temptation to make a simplistic division between 'ontological' and 'representational' buildings.[34] I argue here (as in the book *Building Ideas*[35]) that buildings cannot escape an element of both: they are at the same time themselves as well as signifying something other – buildings, like all objects, will always refer to things outside themselves.

What the paper has tried to draw out of Semper's work – with additional inspiration from Bergson's concept of duration - is the central importance for architectural interpretation of the narrative dimension of bodily movement: the movement of the maker's body and its encounter with materials - as played out in the tectonic qualities of the constructed object - and the movement of the users recorded in the traces of use that accumulate over the life of the object.

6. Architecture and the Body: Materiality, Movement and Meaning

This essay focuses on the links between the two aspects of bodily movement in architectural experience considered in the previous paper, and further develops the elements of an 'embodied architectural hermeneutics.'

The essay begins with a quotation from the Book of Genesis: "In the sweat of thy face shalt thou eat bread until thou return unto the ground, for out of it wast thou taken; for dust thou art and unto dust shalt thou return."[36] The statement suggests a physical continuity between the human body and the material world which, apart from its poetic appeal, could also be said to be scientifically accurate: all the objects in the environment around us can only have been produced – naturally or artificially – from materials that originated in the ground. This idea of continuity also implies a blurring of the boundary between body and world, an idea that has appeared recently in the work of several artists and cultural theorists preoccupied with a redefinition of the body. This interest has also been inspired by the impact of new technologies on our traditional understanding of the relations between the self and the environment. As described already (in Part I above [Pub. 3]), this understanding has been challenged recently by the metaphor of the cyborg, which, through technological appendages, effectively extends the body out into the world.

Of specific relevance here is the particular instance of the relationship between architecture and the body, which I claim provides the grounding for all our efforts to perceive, understand and interpret the built environment. The alternative interpretive strategies outlined in Part I [Pub. 1] – including structuralism/semiotics and Marxism/critical theory – must themselves be based on a clear understanding of the role of the 'lived body' in the dynamic and organic activity of spatial perception and cognition. The first section of this essay describes the double sense in which we identify with and find meaning in the arrangement of objects, forms and materials around us. The first involves a connection with the 'absent bodies' of the makers of a building – as described in the first two essays in Part II above – evidenced in the traces of the construction process which remain visible after completion. The second emerges from the ways in which our built spaces are designed to meet specific functional requirements and hence are deliberately shaped for future human activity and occupation. More importantly, as research in psychology has shown, our understanding of the world around us is based on the fact that our primary

(evolutionary) perceptual apparatus equips us to 'read' our surroundings in terms of opportunities and threats – what J.J. Gibson described as the 'affordances' and obstacles presented by the environment.[37]

The essay then presents the idea suggested by Bergson and developed by Merleau-Ponty regarding the knowledge produced through our bodily encounter with the world around us. As John Dewey described in the book *Art as Experience*, living organisms are constantly engaged in an exchange of information with the environment, as goals are achieved and we experience the satisfaction of resistance overcome. In architectural terms this could also be related to the idea that spatial experience may even be heightened by the fact that some buildings actively resist or obstruct certain conventional or predictable patterns of use. The recent results of the drive for 'flexible space' and the 'long-life-loose-fit' approach to office planning provide ample illustration of the kind of neutral and characterless buildings that can often result when designers set out to create spaces that meet all possible requirements. By contrast, other recent architects and theorists – working under the rubric of Deconstructivism - have even celebrated the effort to challenge traditional functional expectations. Peter Eisenman for example has spoken of his attempt to disrupt conventional spatial arrangements in order to 'extend the possibilities of occupiable form'.[38]

The final part of the essay describes a piece of 'research by design' which emerged from a design-and-build teaching project with postgraduate students at the University of Nottingham. The research question addressed in the project is clear and direct: 'How do we curate buildings?' Beyond this the brief also set out to challenge the conventional format of museum and gallery exhibitions, reliant as they usually are on photographs, drawings and scale-models of buildings. One of the most interesting studies to emerge from the project focussed on the New Art Gallery Walsall designed by Caruso St. John, a practice well known for their interest in the tectonic qualities of materials and equally concerned with the activities of artists, curators and visitors. The students were encouraged to explore the relationships between the processes of making and using the building – to highlight the points of 'encounter' between the building and its users and to draw parallels between this process and the construction of the building. Inspired by the work of the sculptor Richard Long – in particular the early work *Line Made by Walking* – the students recorded the traces of activity left behind by the building's visitors. They also photographed evidence of the activities of the builders: some direct, such as footprints left in the concrete floor

finish, and others indirect, such as the timber board-marks in the surface of the concrete walls.

This parallel study of both the construction and occupation of the building led to the design of an exhibition centred on a free-standing gallery seat. This simple rectangular bench was constructed from some of the same materials as used in the building, including concrete, timber, leather and a minimal stainless-steel frame. A video showing the bench in the process of construction was combined with alternating shots of visitors using the building – with both sets of images focussed in close-up on the points of physical contact between body and material. A final twist was added at the video editing stage by reversing the footage of the bench being built, and thus both sequences revealed a process of 'erosion' or dismantling suggesting a correlation between making and using. As if the building is gradually being worn away to dust by a combination of the repeated movements of visitors and the external forces of weathering – completing the 'life-cycle' of materials suggested by the opening quotation from *Genesis*.

As well as highlighting the 'symmetry' between making and using, both of these activities – construction and occupation - are seen to produce an implicit 'portrait of the body in the world,' or more precisely a portrait of the body *experiencing* the world. Here, and in combination with the two essays above [Pubs. 4 & 5], the emphasis has been on drawing attention to the ways in which architectural experience itself might even shed some light on what is still often referred to as the 'mystery of consciousness'[39] – how the peculiar faculty of human self-awareness emerges from our ability to experience the body itself in the act of experience.

7. Moving City: Curating Architecture on Site

At the end of the previous essay, "Architecture and the Body", a case-study described the design of an architectural exhibition involving both a physical installation and an interpretive video. The limitations of conventional exhibitions – particularly their reliance on two-dimensional representations of buildings in drawings and photographs – are further explored in a paper presented at a conference on architecture and curatorship in 2007.

This paper describes an ongoing interdisciplinary research project that applies the concept of 'augmented reality' developed in the computer sciences to the task of communicating and interpreting architectural ideas to a museum audience, beyond the confines of the conventional gallery setting. By exploiting the potential of mobile and interactive digital technologies to overlay interpretive information onto the experience of the buildings themselves - using a handheld computer displaying text, graphics, audio and video - the project develops a new approach to curating architectural exhibitions which involves the fully embodied experience of moving in real architectural spaces. Most architectural exhibitions conform to one of three well-worn typologies: the 'book on the wall'; the 'salvage yard'; or the recreation of the 'office/studio/workshop'. What all of these approaches lack is the fully embodied spatial and temporal experience of moving through and around the buildings being presented. Recent advances in the cognitive neurosciences – echoing the philosophical speculations that emerged from within the tradition of phenomenology – suggest crucial connections between the visual and motor areas of the brain, confirming the central role of bodily movement in the development of spatial perception and cognition.

The precise mechanisms by which movement and vision may be related are still not fully understood, although a key experimental benchmark is provided by the work of Richard Held and Alan Hein who in 1963 published a paper describing their observations of animals brought up in a specially adapted environment.[40] A further demonstration of the centrality of bodily movement to the processes of perception and cognition in general is provided by the recent discovery of the 'mirror-neuron' system by researchers in the neurosciences using new visualisation technologies such as Functional Magnetic Resonance Imaging (fMRI).[41] Mirror-neurons appear to constitute a matching system within the brain whereby the observation of a particular bodily movement triggers a similar pattern of neuronal activity to that which occurs during the actual performance of the movement itself. These findings suggest that our understanding of the actions of others is based on an empathic process of self projection – when observing goal-directed human or animal movements we effectively 'imagine' ourselves carrying out the same tasks. Vittorio Gallese among others has written extensively on the application of this discovery to the understanding of phenomena as seemingly diverse as social empathy, gestural communication, imitative learning and tool-use.[42]

It may still require a cognitive leap to accept that we might also understand the designed environment via a similar neural mechanism, but the possibility is

certainly suggested by these experimental findings that we may be constantly and unconsciously - through the mirror-neuron system - 'enacting' the affordances offered by the objects, equipment and spaces that surround us. If this mechanism does in fact form a core component of our cognitive system, then it would make sense to exploit the multiple 'channels' of sensory awareness in the attempt to achieve more engaging forms of architectural communication.

The second part of the published paper presents a case-study describing an ongoing collaborative project carried out with the Mixed Reality Lab of the School of Computer Sciences at the University of Nottingham. Beginning with the paper-based mobile exhibition/guided-walk entitled *Andorak* presented at the Broadway Media Centre in Nottingham in 2000, the second phase (2003) incorporated a hand-held computer (PDA) as a guide, using a combination of visual images, text, sound-effects, voice-overs, animations and video clips. This version, entitled *Moving City*, presented a series of student design proposals for public art installations around the centre of Nottingham. In 2006 the *Future Garden* project included an additional collaboration with Vienna-based artist and choreographer Cie. Willi Dorner, presented as part of the NottDance06 festival of contemporary dance and performance.[43] In April 2008 a new project with the same artist funded by a major grant from the Arts Council was presented as part of the *Digital Broadway* programme for new technology arts in Nottingham. This event explored the more abstract theme of hidden spaces within the city and offered viewers a more interactive experience using an adapted mobile phone interface. The final section of the *Moving City* paper includes a preliminary evaluation of the previous phases of the project. Feedback from visitors to the 2006 event was generally very positive - most enjoyed the video-follow navigation approach and found the more interactive elements provided a much richer, more powerful and memorable experience of the city.

CONCLUSION

Taken together the publications described in Parts I and II above offer an original contribution to a broad and still emerging field of 'embodied architectural hermeneutics'. While calling for a stronger interdisciplinary engagement with debates in related areas such as philosophy, psychology and critical theory, the work highlights the implications of an embodied philosophy of technology for understanding the relationships between architecture and the body. The phenomenology of technological engagement is used to extend the discussion of

architectural materiality and tectonic expression to encompass issues of spatial appropriation and inhabitation – alongside questions of perception and interpretation in architectural design, exhibitions, and criticism. The combined works thereby offer an original insight into the ways in which architectural meaning can be analysed and interpreted by paying closer attention to the fundamental levels of engagement between architecture-as-technology and the perceptual and cognitive apparatus of the body.

FUTURE RESEARCH

Questions inevitably remain to be addressed and a number of future research directions are already apparent. Current projects in progress or awaiting funding decisions include: A monograph on the philosophy of Maurice Merleau-Ponty to be published as part of the Routledge book series *Thinkers for Architects*. This book will address the broader relevance of the philosopher's work on perception and embodiment for students, designers, theorists and teachers. Continuing the work on architectural exhibitions, a grant application has recently been submitted to the AHRC for a project based on the new building for the Centre for Contemporary Art Nottingham designed by Caruso St John. This will involve collaborating with a photographer to record both the process of construction and the first six months of occupation, highlighting the connection between making and using as suggested in the earlier project on the Walsall Art Gallery [Pub. 6].

Notes:

[1] A supplementary bibliography on the theme of embodiment including relevant recent work from across this range of disciplines is attached to this abstract.

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[17] Peter McCleary, "Some Characteristics of a New Concept of Technology," *Journal of Architectural Education* 42, Fall, 1988, pp4-9.

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[19] Bruno Latour (Jim Johnson), "Mixing Humans and Nonhumans Together: The Sociology of a Door Closer," *Social Problems* 35, June 1988, pp298-310.

[20] See the Introduction to Part 2 entitled "Emergent Realities" (written by the present author) in the collection of papers from the 2nd AHRA Annual International Conference on architectural representation held at the University of Nottingham in November 2005: *From Models to Drawings – Imagination and Representation in Architecture*, edited by Marco Frascari, Jonathan Hale and Bradley Starkey, Abingdon: Routledge, 2007, pp127-128.

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