

The lens of landscape: Ancient experience, and landscape as a way of seeing architecture

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ABSTRACT

It appears tenable and historically valuable to understand the experience of architecture as similar to the experience of landscape, and thus to discuss architecture in terms of landscape aesthetics. Archaic experience of landscape predates and underlies our experience of architecture; landscape appears to have framed aspects of human evolution. Appleton's prospect-refuge theory assumes an inherited biological basis for aesthetic response to landscape, and his theory establishes landscape as a valid paradigm for reflection on architecture. Landscape, a discourse with potential to connect contemporary attitudes to archaic roots, provides a paradigm for discussion of modern and recent architecture which engages with site and topography. Emotional response to environmental conditions, a once-vital survival necessity, is argued as an underpinning of architectural aesthetics; a sense of beauty and satisfaction in selected architecture is seen as connected to landscape. Related to landscape aesthetics, the lens of landscape is able to present fresh insight into architecture.

INTRODUCTION

In a 2004 essay, 'Earthwork as Framework', historian David Leatherbarrow discusses various significances of the architectural site, referring to a conversation published in 1999 between architect Peter Zumthor, and Billie Tsien and Tod Williams of Williams Tsien Architects.¹ The notion of happiness is discussed with reference to architectural settings described as beautiful, even 'transcendent'.² The conversation returns to interwoven concerns of landscape, aesthetics and pleasure, prompting two questions about architectural experience and landscape: What fresh insights arise from understanding the experience of architecture as similar to the experience of landscape? And how does landscape offer a means of understanding architectural aesthetics? This paper considers these questions by arguing that aesthetic response to architecture may derive partly from inherited human experience of landscape. Commentary on experience of Alvar Aalto's 1953 Muuratsalo summer house, and Williams Tsien's 1995 Neurosciences Institute at La Jolla, California, is used to illustrate the discussion.

In the long duration of human existence, landscape experience underlies relatively recent experience of architecture and urban space; emotional responses to ancient natural environments predate perception of contemporary landscape and architectural space. Landscape architect Ann Whiston Spirn has argued that humans have, as a species, acquired and inherited what she calls the 'language of landscape':

Landscape was the original dwelling; humans evolved among plants and animals, under the sky, upon the earth, near water.

Everyone carries that legacy in body and mind.³

Of interest here is less Spirn's 'language' than the idea that humans bear the imprint of primeval environments, in the form of inherited behavioural responses to landscape. Spirn points out that landscape was humankind's original 'home' for millions of years, and that our 'landscape literacy' is part

of human physical and mental makeup, universally inherited through contact with, and survival in, landscape.

Canadian biologist Valerius Geist, answering the hypothetical design question, 'Consider that you were asked to ensure human survival; where would you start?' sought a biological theory of human health as a basis for environmental design.⁴ Geist argued, in his 1978 book *Life Strategies*, that a sequence of natural settings was responsible for framing human evolution.⁵ From actual and deduced knowledge of the settings of development of *Homo sapiens*, Geist hypothesized detailed causal links between environmental conditions and the evolution of human anatomy, physiology and behaviour.⁶ Geist traced a four- to six-million-year path through evolutionary landscapes, from savannah, to steppe grasslands, to cold periglacial zones, to deserts, to the final dispersal of modern *Homo sapiens*, over the last ten to twenty thousand years, through artificially-created environments of settlement and agriculture.

Geographer Jay Appleton combined aspects of a behavioural and an atavistic approach in putting forward his prospect-refuge theory as a key notion of landscape aesthetics in 1975.⁷ Appleton acknowledged the essential similarity between hu-

- 18 Dirk van den Heuvel, Max Risselada (editors), *Alison and Peter Smithson – from the House of the Future to a house of today*, 010: Rotterdam, p.9.
- 19 Hazel de Berg, Recorded interview with Robin Boyd, August 1962, National Library of Australia, p.2.
- 20 Robin Boyd, 'Architecture in Australia', *RIBA Journal*, vol. 78, January 1971, pp.12-20.
- 21 Conrad Hamann, 'Envoie 1962-71', *Transition*, No.38, RMIT, 1992, p.109.
- 22 Hamann, 'Envoie 1962-71', p.109.
- 23 Philip Goad, 'Progress and Reform: Robin Boyd and the Australian City 1944-1971', Annual Conference of the Society of Architectural Historians of Australia and New Zealand. Sydney, Australia, 2003, p.125.
- 24 Jennifer Taylor, *Australian Architecture Since 1960*, Sydney: Law Book Company Limited, 1986, p.78.
- 25 See the following drawings in the GRB archive MS 13363 Conservation No 2001/7756.
- 26 Another scheme whose plan is very similar to the Latrobe towers, but only nine stories high, are the hotel units which Boyd proposed as a part of the Mitcheltown winery in July 1970. These were to be around nine stories and in plan and like Boyd's first scheme for Menzies College feature—in this case 6—residential units or suites surrounding a stair and services core. See GRB archive Box 111/1.
- 27 GRB Archive Box 98/2 November 1966
- 28 A number of other notable schemes in the GRB archive are also of this height, but by virtue of their volume and plan configuration cannot be regarded as towers. These include the 9-story Erin street community centre designed in 1963 and another scheme from 1963 the lozenge shaped 6-story Balzac restaurant development.
- 29 'An Electric City', GRB Archive Box 109.
- 30 Hamman, 'Envoie 1962-71', p.115.
- 31 60 Clarendon street, Sketch elevations, January 1971 drawn PLW, Drawing no 3 GRB archive plan file) (Box 110/2)
- 32 See, Hans Aregger and Otto Glaus *Highrise Building and Urban design*, p.100.
- 33 #40-342 Albert Street development studies. January 1970 drawn BGH, Typical Apt-floor section Study B sheet two.
- 34 GRB archive PA 95/128 Box 58.
- 35 Development at East Melbourne Drawing no 1 March 1971 Drawn PIW GRB archive box
- 36 Robin Boyd, *The Puzzle of Architecture*, Melbourne: Melbourne University Press, 1965, p.2.
- 37 Boyd, *The Puzzle of Architecture*, p.2.
- 38 Boyd, *The Puzzle of Architecture*, p.2.
- 39 The first phase Boyd split into two streams: the 'Functionalist' and the 'Organic'. The functionalist component was related to the machine and had its sources in the work of European architects. In contrast the Organic was related to the work of Wright. For Boyd both of these streams were related to 'an analytical ap-

proach to structure and to function. Both were the architecture of parts—related and composed but separate parts.' The second phase was related to the 'single glass box'. In this phase Boyd remarked that 'everything was packed into the one trunk—ideally a trunk offering such technologically-perfected shelter that any function would consider itself lucky to be packed there.' However, in this phase there was also a drive 'towards succinct, meaningful, unified or as they said, 'significant form.' Boyd, *The Puzzle of Architecture*, p. 50.

- 40 For Boyd, 'The excesses of the second phase hastened a third phase by sparking a reaction back to the "ten fingered grasp of reality" which Louis Sullivan sought.' Boyd, *The Puzzle of Architecture*, p. 50.
- 41 Boyd, *The Puzzle of Architecture*, 1965, p.51.
- 42 Macarthur, 'Brutalism, Ugliness and the Picturesque Object', p.263.

man and animal environmental behaviours, assuming that humans have inherited,

many millions of years of architectural experience, and the houses in which we live and raise our families are the nesting-places of our own species, the descendants of a phenomenon of immense antiquity.⁸

An aesthetic sense of landscape is survival-related for humans as for other animals; both the mouse seeking shelter and outlook in a tussock, and the hunter approaching game in a forest, rely upon a combination of senses and emotions to guide their actions.⁹ Appleton argued that landscape elements with survival value for humans or other creatures in a natural environment tend to be recognized, emotionally, as pleasing or beautiful. Prospect-refuge theory was Appleton's summary of this proposition. Aesthetic response to architecture can be understood as similar to aesthetic response to landscape. American architect Grant Hildebrand has used prospect-refuge theory to argue that the popularity of Frank Lloyd Wright's domestic architecture is partly due to its rich symbolism of landscape elements of prospect and refuge.¹⁰

Evolutionary biologists Judith Heerwagen and Gordon Orians, in a 1993 essay 'Humans, Habitats, and Aesthetics', maintained that our ancestors' needs were similar to ours, 'to find adequate food and water and to protect themselves from the physical environment, predators, and hostile conspecifics'.¹¹ Biologist Edward O. Wilson, who developed the theory of sociobiology - defined as 'the systematic study of the biological basis of all social behaviour'¹² - maintains the important role of instinct in the survival of early humans, who lived by 'instinctive responses that sustained survival and reproductive success'.¹³ Wilson suggested a biological basis for aesthetics, whereby landscape and instinct intersect; *Homo sapiens* is seen as,

a biological species dependent on certain natural environments until very recently in its evolutionary history [for which] what we call aesthetics may be just the pleasurable sensations we get from the particular stimuli to which our brains are inherently adapted.¹⁴

Anthropologist Donald E. Brown, writing on universal human attributes, argues that we (humans) seem to have 'an innate tendency to prefer, seek out, and construct certain kinds of settings because we feel good in them'.¹⁵ While aesthetics seems to connect humans to natural and artificial places, scientists argue this biological basis of behaviour only as a general behavioural substrate for environmental preference; this is not biological determinism. Heerwagen and Orians have been careful not to overstate Wilson's claims:

Wilson does not claim that there is a hereditary program hard-wired into the brain, but he does suggest that our responses and learned reactions are biased in certain directions by our evolutionary history.¹⁶

This biological underpinning is argued as a substrate to, rather than a substitute for, learning and culture.

A clear problem of the evolutionary or biological argument remains its essential unprovability: unlike the anatomy of our ancient human forebears, their behaviours can only be inferred or deduced.¹⁷ Scientists nonetheless hypothesize a biological basis for human behaviour, and work on the basis of such hypotheses.¹⁸ Evolutionary hypotheses may be useful for thinking about the aesthetics of landscape and architecture; neuroscientist Steven Pinker has focused on the link between emotion and habitat selection:

Some places are inviting, calming, or beautiful; others are depressing or scary. The topic in biology called 'habitat selection' is, in the case of *Homo sapiens*, the same as the topic in geography and architecture called 'environmental aesthetics': what kinds of places we enjoy being in.¹⁹

Pinker refers to Jay Appleton for capturing the essence of landscape aesthetics, or 'what makes a landscape appealing: prospect and refuge, or seeing without being seen'.²⁰ Hildebrand has hypothesized that the pleasure of experiencing architecture has its roots in just such archaic human landscape experience.²¹

Finnish architect and theorist Juhani Pallasmaa has acknowledged Appleton's theory:

Many unconscious reactions of biological origin control our behaviour and preferences in the environment. An environment considered pleasant will also be in harmony with these archaic instinctive reactions.²²

Pallasmaa holds that Wright in particular had a powerful intuitive understanding of 'the archaic reactions hidden in the human mind and instincts';²³ he connects these landscape-related insights to the work of Alvar Aalto, arguing that a 'strong bio-cultural and archaic background can also be felt in Alvar Aalto's architecture'.²⁴ Pallasmaa's use of the term 'felt' implies that Aalto's architectural content is experienced through the senses and the emotions, a basic tenet of this landscape way of understanding architecture. Landscape is a key element of Aalto's appeal, as shown by recent writing on his architecture;²⁵ his 1953 Muuratsalo summer house is recognized by historian Richard Weston as his 'most personal and private meditation on nature and culture'.²⁶ Landscape has been argued as having an important role in a contemporary understanding of this singular work of architecture.²⁷

Pallasmaa has written generally about the architecture of Alvar Aalto, using experience as the basis of his reflection that,

Aalto's buildings reveal their full complexity and charm only when encountered in reality. [...] Alvar Aalto was a critical realist and his architecture engaged directly with

the senses and emotions, not with ideas or idealized abstraction.²⁸

This emotional accessibility has led Pallasmaa to conclude that Aalto's work 'belongs to the few popular successes of contemporary aesthetics', pleasing both critics and public.²⁹ Pallasmaa attributes this general appeal to the sensual dimension of the built work. Pallasmaa draws together biological, sensual, and bodily reactions to architectural experience reminiscent of landscape experience:

The calm organic or biological sensation in Aalto's architecture seems to result from a simultaneous stimulation of all the senses [...] the experience of Aalto's architecture also reminds one of walking in a forest.³⁰

EXPERIENCE, RECEPTION, AESTHETICS

Appleton linked the aesthetic appeal of landscape to biological necessity, arguing that humans respond positively to landscapes which seem likely to aid survival:

the satisfaction which we derive from the contemplation of this environment, and which we call 'aesthetic', arises from a spontaneous reaction to that environment as a habitat, that is to say, as a place which affords the opportunity for achieving our simple biological needs.³¹

Architectural aesthetics may be similarly linked to a spontaneous sense that an artificial habitat may support 'simple biological needs' such as shelter, outlook, and raising offspring. E.O. Wilson is interested in environmental aesthetics; he also advocates a fusion or 'consilience'³² of the arts and the sciences, wherein biology is,

the key to human nature, and social scientists cannot afford to ignore its rapidly tightening principles. But the social sciences are potentially far richer in content. Eventually they will absorb the relevant ideas of biology and go on to beggar them.³³

A biologically informed lens of landscape may inform the study of human nature, as well as architecture. The multidisciplinary fields of landscape, architecture, and garden history already exhibit considerable theoretical and practical 'consilience' between the sciences and the arts, and would seem well positioned for such a study.

Using the lens of landscape

Writers such as John Dixon Hunt, Elizabeth Meyer, and Yve-Alain Bois have variously used landscape knowledge as part of their critical discourse. Landscape historian John Dixon Hunt has adopted literary reception theory, which centralizes the importance of the reader in a mode of 'reader-responsive' criticism,³⁴ to propose a 'reception theory' of garden and landscape history.³⁵ Hunt maintains that the designed landscape,

needs an addressee, as it were, a spectator, visitor, or inhabitant, somebody to feel, to receive, to sense its existence and its qualities. To use or inhabit a landscape

should be regarded as a response to its design, and to study such responses or "conscious engagement" will bring us to a better understanding of design history.³⁶

Experience and emotional appreciation of landscape produce a valid historical story, to complement interpretive criticism and to cast new light on existing knowledge. A reception study of architectural experience might similarly form a basis for a better understanding of aspects of architectural history and theory.

In his influential 1984 essay, 'A Picturesque Stroll Around Clara-Clara', art critic Yve-Alain Bois reflected on vision and movement in the perception of landscape and of the large steel sculptures of Richard Serra. Serra has asserted that 'the dialectic of walking and looking into the landscape establishes the sculptural experience.'³⁷ He proposes that the sculpture redefines the site, which is discovered by the viewer walking through the elements of the sculpture:

the placement of all structural elements in the open field draws the viewer's attention to the topography of the landscape as the landscape is walked.³⁸

According to Bois, this notion is based on theory of the picturesque garden: 'not to force nature, but to reveal the "capacities" of the site.'³⁹ Bois describes a 'rupture' between visual and bodily perception of landscape:

despite the 'pictorial' bias, it is necessary to break the assurance of the organ of vision, [...] and recall to the spectator's body, its indolence and weight, its material existence.⁴⁰

However, Bois does not connect the sculptural experience of Serra's work to experience of natural landscape, but rather to Baroque architecture. Despite his interest in movement and landscape experience, Bois appears to consider natural landscape as a mere backdrop for theoretical reflection, rather than a source of architectural or sculptural experience.

American landscape architect Elizabeth Meyer is one of a number of landscape historians and theorists currently aiming to restore the authority of what they see as 'suppressed' discourses of nature, landscape, and the architectural site.⁴¹ Meyer is concerned with the historical suppression and marginalization of landscape by the discourses of modern art and architecture. She considers landscape to be a matter of the senses and experience, of situational contingencies, and of unique sites; she asserts that landscape design and theory, are based on observation, on that which is known through experience, on the immediate and the sensory - that which is known by all the senses, not only the visual.⁴²

It may be presumptuous to cite Meyer to comment on the dominant discourse of architecture, but this is an indication of the (literally) 'contested terrain' of landscape, both as a topic and a field, in the

context of architecture. Pallasmaa has written of landscape that,

the tradition of landscape and garden architecture can provide inspiration for an architecture liberated from the constraints of geometric and strong image.⁴³

Pallasmaa has written similarly about Aalto, noting that his 1937 Villa Mairea has an ambient and emotional quality which, 'obscures the categories of foreground and background, object and context.'⁴⁴ Malcolm Quantrill has described the landscape qualities of the courtyard of Aalto's Säynät-salo Town Hall,

between the formality of the entry stairs and the surrounding forest; its garden character is decidedly domestic, offering a bridge between architecture and nature.⁴⁵

Kenneth Frampton concluded in a 1998 essay that Aalto's 'achievements as an architect cannot be separated at any stage of his career from his capacity as a designer of landscapes.'⁴⁶ It would appear that considerable new insight into Aalto's architecture can be gained from reflection on aspects of both experience and landscape in his architecture.

Landscape and Architectural Aesthetics: Williams Tsien and La Jolla; Aalto and Muuratsalo

In Leatherbarrow's 'Earthwork as Framework' essay, he reflects on architectural beginnings, differentiating the elements of architecture such that 'earthwork' comprises Gottfried Semper's elements of platform and hearth, while 'framework' includes roof and enclosure.⁴⁷ He notes that architectural origins,

coincide with the beginnings of society, the gathering of people for religious or social practices. The communal situation (around a fire) was so significant to ancient peoples, Semper argued, that earthwork and framework were always subordinate to this initial and fundamental situation.⁴⁸

In this social and spatial archetype, relating land and building, mound and frame combine to enclose and support the fire. Leatherbarrow draws attention to Tod Williams and Billie Tsien's 1995 Neurosciences Institute at La Jolla, California, which investigates similar mutual interconnections between building and site. The site is seen to structure the overall project, of which the buildings are a component of an architecture which is 'not substantial on its own terms, nor self-sufficient, but contingent, dependent, or adjective to its milieu.'⁴⁹ Leatherbarrow refers to Billie Tsien's response to her own built work:

When asked by Peter Zumthor to identify a beautiful place, Billie Tsien recalled a setting within the Neurosciences Institute, "the circular, outdoor space where you can sit and look at the fountain, which gives you a long view." It was one, she said, that made her completely happy.⁵⁰

This description of an outdoor room, enclosed in a hollowed-out space, with a long view over water, may be self-promoting, or its language may indicate the emotional depth of architecture which substantially acknowledges its landscape context. Leatherbarrow observes paired phenomena of excavation (refuge) and extension (prospect), analogous even to dark and light, in an outdoor room partly cut into the land; this landscape-related pairing,

exists in many analogous forms in this project. Each was built out of the folds of the terrain as a site of contrast and complementarity between darkness (of the land) and clarity (of the prospect).⁵¹

Buttressed prospect

Leatherbarrow refers to several 'sites of hollowing into the slope' in the Neurosciences Institute as 'buttressed prospect'.⁵² Buttressed prospect, comprising a very thick, possibly habitable, wall behind and/or beside a protected open space, appears to be pleasurable, safe, and intuitively survival-enhancing, offering a balance of refuge and prospect.⁵³ Zumthor also describes a domestic room as his favourite space, the Swiss German *Stube*, a traditional confined central living room where essential opposites interplay: security and freedom, light and dark. The space is simultaneously protective and liberating, a balance which ultimately provides relaxation and comfort:

I'm looking for a kind of protection, as in this space here where I have a long wall at my back. I feel that this is my space and it gives me the freedom to relax and let go. [...] This is exactly the space where I feel most comfortable.⁵⁴

Architect Will Bruder has written that, 'architectural experience [of] the entire built portfolio of Aalto in Finland resonates' in the work of Williams Tsien.⁵⁵ This resonance might well be traced to Aalto's 1953 Muuratsalo house, where the domestic program forms a habitable 'buttressed prospect' of rooms to north and east, perceived from the courtyard as the famously patterned brick walls. This substantial refuge is complemented by prospects of falling ground, trees, water and distant space, seen to south and west over the central outdoor fire. Aalto himself delighted in the reflected glow of the fire and its 'pleasant, almost mystical feeling of warmth',⁵⁶ and found archaic pleasure at the heart of his personal retreat. In the Williams Tsien courtyard, the architect similarly feels 'completely happy', in a setting which balances real and apparent protection with a long view. Bruder describes, at the Neurosciences Institute,

physically embedded into the site's topography around a skycourt [...] a composition of positive and negative spatial sequences that elevate every work day to the highest level of aesthetic experience.⁵⁷

This almost transcendent placement of the sky into the earth is for daily users, not merely for the architect's enjoyment. The combination of topography and prospect-refuge symbolism appears to con-

tribute to landscape-related architecture capable of exerting a powerful aesthetic effect on a visitor.

Transcendence and the site: inscribing distance

Peter Zumthor: Transcendence... going beyond the limits, is that what the word means? You cross a border and there is something beautiful there.

Billie Tsien: Yes.⁵⁸

In his pursuit of high level architectural aesthetics, Leatherbarrow notes Williams and Tsien's comment that a work of architecture,

is of use but also transcends use. It must take care of its business in a forthright, clear way, but it must also transcend the problem-solving situation so that it is suggesting something beyond.⁵⁹

Leatherbarrow argues that this transcendence is achieved through a strategy of 'inscribing distance into the midst of carefully constructed conditions of everyday praxis'.⁶⁰ This could mean the open, levelled space of a courtyard or garden, cut emphatically into the building composition, offering distant views and suggesting release from the se-

curity (and confinement) of interior rooms.⁶¹ A visitor experiencing the architecture of highly contrived prospect-refuge situations, such as Muurat-salo or La Jolla, appears to feel high levels of emotional satisfaction. This kind and degree of aesthetic experience appears to be effected by buildings and artificial landscape elements, experienced as if they were natural landscape. Appleton was interested in links between landscape and aesthetic pleasure: the lens of landscape, through a discourse such as his prospect-refuge theory, helps us identify landscape phenomena underlying architectural spatial experience. Through reflection on the significance of such experiences, landscape can connect us with human nature and our more archaic selves, in a manner intense in its historical and theoretical potential, and disarming in its everyday emotional accessibility. The lens of landscape offers a consilience between both art and science, and nature and culture; landscape can reveal further dimensions of our own human nature and of our relationship to both the natural and the artificial worlds.

¹ David Leatherbarrow, 'Earthwork as Framework', in *Topographical Stories: Studies in Landscape and Architecture*, Philadelphia: University of Pennsylvania Press, 2004: 'happiness', p. 23; 'transcendence', p. 58.

² See 'The Tension of Not Being Specific: Billie Tsien and Tod Williams in conversation with Peter Zumthor', in *2G International Architecture Review No.9: Williams Tsien: Works*, Barcelona: Editorial Gustavo Gili, 1999, pp. 8-23 *passim*.

³ Anne Whiston Spirn, *The Language of Landscape*, New Haven: Yale University Press, 1998, p. 15.

⁴ See Valerius Geist, *Life Strategies, Human Evolution, Environmental Design: Toward a Biological Theory of Health*, New York: Springer-Verlag, 1978, p. ix.

⁵ Geist, *Life Strategies*.

⁶ See Geist, 'From Periglacial to Artificial Environments', *Life Strategies*, pp. 354-61. Geist also notes, 'The idea that *Homo* arose from *Australopithecus* by adapting from the savannah to the steppe is thus a prerequisite for the evolution and development of: tool use; vocal mimicry; visual mimicry; systematic hunting; human legs, feet, hands, arms, and dentition; and the typical human social system.' See Geist, *Life Strategies*, p. 268.

⁷ Jay Appleton, *The Experience of Landscape* (revised edition), Chichester, UK: John Wiley & Sons, 1996 (1975), pp. 52-61.

⁸ Jay Appleton, 'Landscape and architecture', in Ben Farmer and Hentie Louw (eds), *Companion to Contemporary Architectural Thought*, London & New York: Routledge, 1993, p. 74.

⁹ See José Ortega y Gasset, *Meditations on Hunting* (translated by Howard B. Wescott), New York: Charles Scribner's Sons, 1972, p. 136.

¹⁰ Grant Hildebrand, *The Origins of Architectural Pleasure*, Berkeley: University of California Press, 1999.

¹¹ Judith H. Heerwagen and Gordon H. Orians, 'Humans, Habitats, and Aesthetics', in Stephen R. Skellert and Edward O. Wilson (eds), *The Biophilia Hypothesis*, Washington, D.C.: Island Press / Shearwater Books, 1993.

¹² Edward O. Wilson, *Sociobiology: The New Synthesis*, Harvard, MA: Belknap Press, 1975, p. 4.

¹³ Edward O. Wilson, *Consilience: The Unity of Knowledge*, London: Little, Brown, 1998, p. 250.

¹⁴ Edward O. Wilson, *The Future of Life*, London: Abacus, 2003, p. 137.

¹⁵ Donald E. Brown, *Human Universals*, New York: McGraw-Hill, 1991, p. 116.

¹⁶ Heerwagen and Orians, 'Humans, Habitats, and Aesthetics', p. 139.

¹⁷ Biologists Tooby and Cosmides acknowledge this difficulty; see John Tooby and Lida Cosmides, 'Think Again', in Robert W. Sussman, *The Biological Basis of Human Behaviour: a critical review* (2nd ed.), New Jersey: Prentice-Hall, 1999, p. 359.

¹⁸ Steven Pinker: *How the Mind Works*, London: Penguin, 1997.

¹⁹ Pinker, *Mind*, pp. 374-5.

²⁰ Pinker, *Mind*, p. 376.

²¹ Grant Hildebrand, *The Origins of Architectural Pleasure*, Berkeley: University of California Press, 1999.

²² Juhani Pallasmaa, 'The mind of the environment', in Birgit Cold (ed.), *Aesthetics, Well-being and Health: Essays within Architecture and environmental aesthetics*, Aldershot, UK: Ashgate, 2001, pp. 211-213.

²³ Pallasmaa, 'The mind of the environment', pp. 211-213.

²⁴ Pallasmaa, 'The mind of the environment', pp. 211-213.

- ²⁵ See for example Marc Treib, 'Aalto's Nature', in Peter Reed (ed.), *Alvar Aalto: between humanism and materialism*, New York: The Museum of Modern Art, 1998.
- ²⁶ Richard Weston, *Alvar Aalto*, London: Phaidon, 1996, p.114.
- ²⁷ See John Roberts, 'Prospect-Refuge Theory and Alvar Aalto's "Experimental House" at Muuratsalo: "What is it that we like about Aalto's site-related architecture, and why?"', in *PROGRESS: The Proceedings of the Twentieth Annual Conference of the Society of Architectural Historians, Australia and New Zealand*, Sydney: SAHANZ, 2003, pp. 263-268.
- ²⁸ Juhani Pallasmaa, 'An architecture of imagery: conception and experience in Alvar Aalto's architecture', in Ben Farmer and Hentie Louw (eds), *Companion to Contemporary Architectural Thought*, London & New York: Routledge, 1993, pp. 414-15.
- ²⁹ Pallasmaa, 'Architecture of imagery', p. 415.
- ³⁰ Pallasmaa, 'Architecture of imagery', p. 414.
- ³¹ Appleton, *Experience*, p. 63.
- ³² Wilson, *Consilience*.
- ³³ Edward O. Wilson, *On Human Nature*, Cambridge, MA: Harvard University Press, 1978 [Penguin edition, 1995, consulted, p. 13].
- ³⁴ Elizabeth Freund, *The Return of the Reader: Reader-response criticism*, London and New York: Methuen, 1987.
- ³⁵ John Dixon Hunt, *The Afterlife of Gardens*, London: Reaktion Books, 2004.
- ³⁶ John Dixon Hunt, *Greater Perfections: The Practice of Garden Theory* (Penn Studies in Landscape Architecture), Philadelphia: University of Pennsylvania Press, 2000, p. 218.
- ³⁷ Yve-Alain Bois, 'A Picturesque Stroll around Clara-clara', *October* no. 29 (1984), p. 34. This is a quotation from Richard Serra and Peter Eisenman, 'Interview', *Skyline*, April 1983, p. 16.
- ³⁸ Bois, 'A Picturesque Stroll', p. 34.
- ³⁹ Bois, 'A Picturesque Stroll', p. 34.
- ⁴⁰ Bois, 'A Picturesque Stroll', p. 43.
- ⁴¹ See for example Carol J. Burns and Andrea Kahn, 'Why Site Matters', in Carol J. Burns and Andrea Kahn (eds), *Site Matters: Design Concepts, Histories, and Strategies*, New York and London: Routledge, 2005.
- ⁴² Elizabeth K. Meyer, 'Landscape Architecture as Modern Other and Post Modern Ground', in Harriet Edquist & Vanessa Bird (eds), *The Culture of Landscape Architecture*, Melbourne: Edge Publishing, 1994, pp. 30-31.
- ⁴³ Juhani Pallasmaa, 'Hapticity and Time: Notes on fragile architecture', in *Encounters: Architectural Essays* (ed. Peter MacKeith), Helsinki: Rakennustieto, 2005, p. 330. (Originally in *The Architectural Review*, May 2000, Vol. 207, pp. 78-84.)
- ⁴⁴ Pallasmaa, 'Hapticity and Time', pp. 330-31.
- ⁴⁵ Malcolm Quantrill, *Finnish Architecture and the Modernist Tradition*, London: Spon, 1995, p.109.
- ⁴⁶ Kenneth Frampton, 'The Legacy of Alvar Aalto' (1998), in *Labour Work and Architecture: Collected Essays on Architecture and Design*, London: Phaidon, 2002, p. 238.
- ⁴⁷ Gottfried Semper, *The Four Elements of Architecture and other Writings* (translated by Harry Francis Mallgrave and Wolfgang Herrmann), Cambridge UK: Cambridge University Press, 1989.
- ⁴⁸ David Leatherbarrow, 'Earthwork as Framework', in *Topographical Stories: Studies in Landscape and Architecture*, Philadelphia: University of Pennsylvania Press, 2004, p. 20.
- ⁴⁹ Leatherbarrow, 'Earthwork as Framework', p. 20.
- ⁵⁰ Leatherbarrow, 'Earthwork as Framework', p. 21.
- ⁵¹ Leatherbarrow, 'Earthwork as Framework', p. 24.
- ⁵² Leatherbarrow, 'Earthwork as Framework', p. 57.
- ⁵³ A diagram of buttressed prospect is drawn by Herman Hertzberger in a comparative description of notions of architectural 'space' and 'place'. See Herman Hertzberger, *Space and the Architect: Lessons in Architecture 2*, Rotterdam: O10 Publishers, 2000, p. 24.
- ⁵⁴ Tsien, Williams, Zumthor, 'Tension', p. 11.
- ⁵⁵ Will Bruder, 'Personal reflections on an architecture of quiet inspiration and substance – the work of Tod Williams and Billie Tsien', in *2G International Architecture Review No.9: Williams Tsien: Works*, Barcelona, 1999, pp. 24-29.
- ⁵⁶ Goran Schildt (ed.), *Alvar Aalto Sketches*, trans. Stuart Wrede, The MIT Press, Cambridge, Mass., and London, 1978, p. 116.
- ⁵⁷ Bruder, 'Personal reflections', pp. 24-29.
- ⁵⁸ 'Tsien, Williams, Zumthor, 'Tension', p. 11, p. 23.
- ⁵⁹ Leatherbarrow, 'Earthwork as Framework', p. 58.
- ⁶⁰ Leatherbarrow, 'Earthwork as Framework', p. 58.
- ⁶¹ For further comments on cultural history of the flattened platform, or chora, see David Leatherbarrow, 'Leveling the Land', in James Corner (ed.), *Recovering Landscape: Essays in Contemporary Landscape Architecture*, New York: Princeton Architectural Press, 1999.