

# Topology in the Architecture of Alvar Aalto

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## Abstract

Having roots in geometry and mathematics, the term topology attained a topical dimension in Reyner Banham's definition of New Brutalism. What concerns topology is not the form, shape or the brutal texture of a building, but the way architecture relates to both its site and its own structure. In reference to Alvar Aalto's architecture and its rapport with the Finnish landscape, topology provides an alternative interpretation of the classical notion of order and geometry which has implications on the way Aalto's architecture is theorised.

Starting with this definition of topology, the essay will make an attempt to evoke a constructed landscape wherein Aalto's architecture is discussed in reference to the vertical posture permeating his work. Most research on Aalto's architecture highlights the architectonic and formal consequences of the horizontality associated with the Finnish landscape. Whereas such reflections on the place of landscape in Aalto's work are confined to naturalism tout court, this essay will discuss certain topological aspects of two of his major projects, the Seinäjoki Town Hall (1958-87) and the Auditorium at the Helsinki University of Technology in Otaniemi (1953-66).

The vertical posture informing the design of these two buildings is suggestive of the ways that Aalto would transform the image of the landscape-forest into tectonic forms, one major consequence of which was to surpass the structural rationalist discourse on the subject. It will be argued that the alleged vertical posture, itself emerging out of the design's tectonic articulation of Semperian earth-work and frame-work, reveals topology in reference to landscape in the case of the Auditorium and landform at the Town Hall. The aim is to discuss the significance of landscape in Aalto's architecture in light of contemporary interpretations of topology.

## Essay

The genesis of this essay occurred during a ferry trip to Alvar Aalto's Experimental House (1952-53) at Muuratsalo. Upon inspection, the distant shoreline revealed not only the obvious vastness that informs the heightened sense of horizontality associated with the Finnish landscape, but also the vertical posture of the trees gathered densely within forests clustered along the coast. This essay seeks to explore the ways that Aalto transformed this image of the mythical Finnish landscape-forest into tectonic forms by first establishing Aalto's approach to nature and how that has influenced his architecture. The relationship between Aalto's architecture and nature is inextricably linked with the notion of the organic. For different reasons it is also discussed in reference to the Enlightenment tradition of the Picturesque. According to Richard Weston the picturesque ideology acted as the mediator between two older aesthetic categories, namely, the 'beautiful' and the 'sublime'<sup>1</sup> – another expansion of the aesthetic field. In reference to Aalto, Demetri Porphyrios observed in *Sources of Modern Eclecticism* that his work displays an aesthetic tendency towards the variability of nature and picturesque composition. He went further, drawing numerous parallels between the picturesque tradition and Aalto's alleged ordering sensibility of heterotopia.<sup>2</sup> Porphyrios believed that well before the advent of modernity architecture had always kept the notions of geometry and order in alliance and that in Aalto's work there is 'another' sense of order which is not as easily discernable, and at a glance could be taken for disorder. There are indeed similarities between the notions of heterotopia and topology. However, these issues are beyond the scope of this essay. For Porphyrios and in reference to Aalto's work, the term picturesque composition assumes both an aesthetic and a pragmatic dimension. Since essentially, "In nature Aalto found both the origins of a wisdom that standardizes and the solace of a picturesque variability."<sup>3</sup> Whereas Porphyrios claimed that in nature Aalto found the means to try and reconcile picturesque longing with the demands of industrialised production, Weston focused more on the centrality of the human body in relation to Aalto's concept of nature and in turn landscape.<sup>4</sup> Both views agree that Aalto sought inspiration from the wealthy variety of forms found in nature. Weston however, further argues that such forms are always subject to abstractions made possible by the human mind, concluding that Aalto's approach is classical inasmuch as it is based on mimetic rather than literal representation of natural phenomena. In addition, he compares Aalto's approach to nature to what is today called ecological architecture.<sup>5</sup>

What is constant in these two discussions is the dialectic between human being and nature in Aalto's architecture which manifests in an incredible affinity between landscape and built-form. Aalto's admiration for the Italian hill town is well known because of the very fact that Aalto saw in it a perfect model for the integration of architecture and landscape whereby one complements the other into a state which Weston described as "a cultural symbiosis."<sup>6</sup> It is this acknowledgement of the presence of the body in nature and the human ability to improve the landscape which is crucial to the discussion of Aalto's approach. Within this theoretical framework architecture and landscape cannot be analysed independently since in Aalto's architecture they are so intertwined that to discuss one without consideration for the other would be moot. In this respect the term landscape may refer to both 'urban' and 'rural' settings, the boundaries of which for Aalto would in time eventually be dissolved. At both the Town Hall and Auditorium the relationship between the architecture and its particular setting, be it 'city' or 'country,' create an experience that reveals the topology of the place. It is an experience enabled by Aalto's mastery in articulating the earth-work and frame-work relative to a specific context. Here topology is understood in terms of its etymological roots – *geometria situs* (geometry of place).

According to Porphyrios what is central to the notion of picturesque aesthetics, which indeed forms part of Aalto's oeuvre, is the secularisation of nature; whereby "...nature assumes the status of a setting, a backdrop, a spatial and physical mise-en-scène. The image of the landscape as 'setting' delegates to architecture a romantic dimension of rootedness, while, inversely, architecture lends to nature its premeditated status."<sup>7</sup> In addition, noting that in general the contrast between the horizontality of Aalto's architecture and the surrounding verticality of the forest recalls Uvedale Price's writings on the picturesque. Price himself regarded the opposite qualities of roughness and variation in combination with that of irregularity as "...the most efficient causes of the picturesque."<sup>8</sup> The sectional syntax of the Auditorium and Town Hall reveals the constant presence of the vertical element, be it in the form of the sharp triangular brick side-walls of the Auditorium or the elevated roofline of the Town Hall, which counterbalances its otherwise horizontal composition. These sections not only allude to Aalto's tendency toward picturesque composition but also expose the vertical posture of the framework which is exaggerated by the horizontality of the stereotomic earth-work. The picturesque favoured the possible symbiotic rapport between architecture and landscape that results in the sensuous amplification of both the former and the latter. It is a theoretical concept wherein architecture cannot be divorced from landscape and vice versa whilst at the same time acknowledging the inevitable contrast between the two, whether it be in the form of a 'horizontal building in a vertical landscape' or a 'vertical building in a horizontal landscape.' What is essential to the transformation of the image of the landscape-forest into architectonic form in Aalto's architecture is the opposition or contrast itself; thus, the verticality or horizontality of either the architecture or landscape is interchangeable. It is interesting to examine the vertical posture of the Auditorium and its connection to the surrounding landscape; likewise the manipulation of landform at the Town Hall from a topological lens since it reveals an intense connectivity between architecture and landscape which, to an extent, is achievable through the use of imaginative geometry on Aalto's part. Not geometry in a rigid sense but instead one that is closer to, as Juhani Pallasmaa described after speculating on the Finnish use of space, "a forest geometry."<sup>9</sup>

Historically architecture has made manifest geometries found in nature – indeed a term that varies in meaning between different cultures and locales – these geometries are mostly Platonic and Euclidean in that they are primarily concerned with the attributes of length, area, volume and ultimately form which if articulated correctly have the power to create and/or reveal a supposed mathematical harmony.<sup>10</sup> Regarded as the subordinate or perhaps 'other' geometry, topology was championed by Reyner Banham in the 1950s as a new strategy to theorise architecture. The mathematical foundation of topology ascribed to by Banham in effect charged his argument with a *quasi* scientific basis.<sup>11</sup> This helped him promote a new ethic influencing the work of a selected group of young post-war British architects which he would later label under the neologism 'New Brutalism.' Banham pushed the New Brutalist agenda to counter at the time dominant Picturesque and Neo-Palladian values extolled by Nikolaus Pevsner and Rudolf Wittkower respectively. His intention was to foster-father a new movement in architecture which he himself would later declare dead in its seminal thesis *The New Brutalism: Ethic or Aesthetic?*<sup>12</sup> By considering architecture from a topological point of view Banham was able to theorise architecture beyond its usual formal capacities. He proposed that certain ensembles or campuses of buildings, arguably such as those found at Seinäjoki and Otaniemi, can be considered whole in their image at a topological level. Reflecting on a competition entry for the Sheffield University extension completed by Alison and Peter Smithson, Banham noted a positive aformalism in its composition comparable to that of a painting by Jackson Pollock or Alberto Burri.

Further elaborating,

*Composition* might seem pretty strong language for so apparently casual a layout... and on examination it can be shown to have a composition, but based not on the elementary rule-and-compass geometry which underlies most architectural composition, so much as an intuitive sense of topology.<sup>13</sup>

In considering the aforementioned 'forest geometry' permeating Aalto's work, which by its very nature is organic and variable – a heterotropic sense of order,<sup>14</sup> it is perhaps apt to consider such geometry not in a rigid Euclidean or Platonic sense but instead from a more malleable topological point of view – the most abstract geometry we have to date.<sup>15</sup>

Topology is the branch of geometry which studies spaces that can be in continuous variation, insofar as it is primarily concerned with the connection between two points, not its physical shape or form, but the connection itself. Fundamental to the concept of topology is the denial of two vital operations, namely 'cutting' and 'gluing', opting instead for the possibilities of 'bending', 'stretching', 'squashing' and 'folding'. As such a brick is identical to a billiard ball in topology – an unpenetrated mass – since one can be transformed into the other without any cutting or gluing. It is important to note at this point that *'in any geometry two objects are the same if one can transform into the other using the operations that that geometry uses.'*<sup>16</sup> Topology thus affords an alternative reading of the relationship between architecture and landscape, or more specifically building and site in Aalto's work.

The relationship to and articulation of the landscape and landform at the Auditorium and Town Hall reveals a topological deformation between landscape and architecture that does not perform, or at least blurs, the 'cut and glue' operations demanded by the realities of building. In effect, maintaining a greater sense of connectivity and continuity between architecture and landscape through the careful treatment of particular thresholds between the two. The way in which the architectonic elements and the ground plane are articulated in these two projects are suggestive of a topological process wherein the architect is able to deform the image of the landscape-forest and its associated verticality into both designs. Perhaps overall it transforms into an image that presents the building-form and its context as a whole at a topological level? This alleged vertical posture is particularly apparent when viewed from eye-height at ground level. Aalto had once wrote about his experience of the town on the hill explaining that *"Above all, it has a natural beauty in that it reaches full stature when seen from the level of the human eye, that is, from ground level."*<sup>17</sup> What is suggested in this passage is the dynamic experience of the human body in reference to architecture. Surely Aalto had kept this in mind in conceiving the designs of the Auditorium and the Town Hall. The abstract arrangement of volumes in relation to the virtually flat site, particularly at Seinäjoki, alludes to the fact that the architect was well aware of the viewpoints from which the building and its surrounding context was to be seen and ultimately perceived, that is to say the building's, so to speak, aspect. The early perspective sketches of the Auditorium submitted for the competition stage of the project illustrates this idea. The articulation of the earth-work further emphasises this point, because these artificial terraces (mound) not only mediate between building and site proper, but also dictate the circulation of an observer thus predetermining how the building is viewed and experienced. Furthermore, the Auditorium and the Town Hall are oriented in such a way that the observer is more prone to an oblique view of the building. It is a view that presents the strong verticality of the corner or edge. It is as if the volumes are responding to or anticipating the dynamic circulation of the viewer. Together the orientation and the aspect of both projects evoke a strong vertical posture. In this way they are akin to a sculptural object in a landscape. At this point a parallel can be drawn between the architectural experience of the Auditorium and the Town Hall, and Hal Foster's account of the sculptural experience in regards to Richard Serra's work which he describes as a parallax operation whereby the work, or in Aalto's case

the building, frames and reframes the subject and site in tandem and in effect revealing the landscape's topology.<sup>18</sup>

The tectonic articulation of the Semperian earth-work and frame-work is integral to the concept of topology in Aalto's work, since the former is fundamental to the site specificity of both projects.<sup>19</sup> It is possible to shed further light on this subject via another excursion into the realm of sculpture. Rosalind Krauss has noted that the logic of the monument, which faded in the late nineteenth century, relied on two elements: the base and the marker. Within this logic, a figurative sculpture stands vertical as a marker in any given context on a base which mediates between site and representational sign. She opined that without the base or pedestal the work becomes homeless, nomadic in nature, in that it does not belong to any particular place.<sup>20</sup> Similar to sculpture in this sense, the rise of modernism in architecture brought with it the absorption of the podium into a more homogenous architectural form. This was not the case for Aalto, especially in his civic projects. For Aalto the podium remained a critical element since the omission of the base would render the architecture placeless and thus not able to reveal the geometry of the site – topology. Both projects suggest the Semperian idea of terrace-making by which architecture creates its own ground: transforming the landscape of a given site into earth-work. Here lies a paradox in Aalto's architecture. The earth-work at the Auditorium and Town Hall is neither here nor there. Albeit essential to both; it neither exclusively belongs to the building nor the site. Nevertheless, the articulation of the base at both projects amplifies the buildings' verticality especially when viewed in locomotion from eye height at ground level – a parallax experience enabled by the *"dialectic of walking and looking."*<sup>21</sup> The horizontal base elevates the topological arrangement of volumes into a vertical posture, together framing and reframing the surrounding landscape without submitting to the lures of scenography, in effect amplifying the topology of both the landscape and the building – the topology of the place. In this sense, the Auditorium and Town Hall create a picturesque experience wherein architecture and landscape appear to be at once in contrast and in equilibrium.

Aalto had displayed a classical tendency toward vertical contrasts in the landscape early in his career. In describing a vision he had of a white campanile placed not on the apex but near the summit of Ronninmäki Hill at Jyväskylä, he noted that *"A real tower would make the landscape Classical."*<sup>22</sup> Despite never realising such an audacious idea, Aalto in his mature post-war period applied the same concept to his larger civic buildings, including the Auditorium and Town Hall, even when the site was virtually flat and the topography alluded to no specific architectural response. This use of architecture to intensify the landform and compliment the landscape is truly one of Aalto's signatures.<sup>23</sup> It is this transformation of the ground plane and its relationship to the buildings' tectonic qualities that elevates the architectural form to its vertical stature – as a marker of place on the horizon. The topological reading of Aalto's architecture presented in this essay in essence reveals particular sculptural aspects of his work which indeed recall Le Corbusier's verdict that architecture is primarily experienced in circulation from eye height. In this respect, it is possible to associate Aalto's work with the contemporary interpretation of topology as discussed by Foster in *The Art-Architecture Complex*. Whereas Brutalism moved architecture away from the realm of painting into that of sculpture through its attitude towards materiality and construction,<sup>24</sup> Aalto's architecture evokes a sculptural experience by way of its topological connection to its site and the greater Finnish landscape.

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- <sup>1</sup> Richard Weston, *100 Ideas that Changed Architecture*, London: Laurence King Publishing Ltd, 2011, p. 83.
- <sup>2</sup> Michel Foucault, *Les mots et les choses*, transl. *The Order of Things*, New York: Vintage Books, 1973. Demetri Porphyrios refers to this source in reference to the concept of Heterotopia. See also Michel Foucault's article *Des Espace Autres*, transl. *Of other Spaces*, 1967
- <sup>3</sup> Demetri Porphyrios, *Sources of Modern Eclecticism: Studies on Alvar Aalto*, London: Academy Editions, 1982, p. 65.
- <sup>4</sup> Richard Weston, *Alvar Aalto*, London: Phaidon Press Limited, 1995, pp. 100–4.
- <sup>5</sup> Ibid. See also Kenneth Frampton, 'The Legacy of Alvar Aalto: Evolution and Influence', in Peter Reed, ed. *Alvar Aalto: Between Humanism and Materialism*, New York: The Museum of Modern Art, 1998, pp. 119–39
- <sup>6</sup> Ibid., p. 102.
- <sup>7</sup> Porphyrios, op. cit., p. 62.
- <sup>8</sup> Ibid.
- <sup>9</sup> Marc Treib, 'Aalto's Nature', in Peter Reed, ed. *Alvar Aalto: Between Humanism and Materialism*, New York: The Museum of Modern Art, 1998, p. 63.
- <sup>10</sup> Manuel De Landa, 'Immanent Patterns of Becoming', <http://www.youtube.com/watch?v=jKqOic0kx4U> (Feb. 01, 2012)
- <sup>11</sup> Laurent Stalder, 'New Brutalism', 'Topology' and 'Image': some remarks on the architectural debates in England around 1950', *The Journal of Architecture* 13, July 2008, 268. Stalder claims that this detour via the exact sciences was no coincidence, and that it had always been meant to ascribe to architecture an allegedly objective and contemporary foundation.
- <sup>12</sup> Reyner Banham, *New Brutalism: Ethic or Aesthetic*, London: Architectural Press, 1966, p. 134. In the final chapter Banham laments how the initial ethic or attitude transformed into an aesthetic.
- <sup>13</sup> Reyner Banham, 'The New Brutalism', *The Architectural Review* 118, December 1955, 361.
- <sup>14</sup> Treib, op. cit., p. 63.
- <sup>15</sup> De Landa, op. cit.
- <sup>16</sup> Ibid.
- <sup>17</sup> Alvar Aalto, as quoted in Treib, op. cit., p. 57.
- <sup>18</sup> Hal Foster, *The Art-Architecture Complex*, London: Verso, 2011, p. 140.
- <sup>19</sup> Kenneth Frampton, 'The Legacy of Alvar Aalto: Evolution and Influence', in Peter Reed, ed. *Alvar Aalto: Between Humanism and Materialism*, New York: The Museum of Modern Art, 1998, pp. 119–39
- <sup>20</sup> Rosalind Krauss, 'Sculpture in the Expanded Field', *October* 8, Spring 1979, p. 33–4.
- <sup>21</sup> Richard Serra, as quoted in Foster, op. cit., p. 140.
- <sup>22</sup> Alvar Aalto, as quoted in Treib, op. cit., p. 61.
- <sup>23</sup> Treib, *ibid.*
- <sup>24</sup> Gevork Hartoonian, 'Theatrical Tectonics: The Mediating Agent for a Contesting Practice', *Footprint* 4, Spring 2009, 77– 96