The ‘curves of nature’ – the organic inflections of modern regionalism and ecological architecture in an urbanising context

P. S. Jahnkassim
School of Architecture and Design, Faculty of Arts and Architecture, University of Brighton, United Kingdom

Abstract

The position of ‘nature’ in architectural design represents two facets – ‘nature’ as embellishment to an established type-form and secondly, as formal gestures arising from ‘avant-garde’ themes in times of rapid change. This paper presents an analysis of the latter - within the struggle to reconcile the tensions of conflicting forces of localisation and globalisation in developing countries had produce ‘hybrid’ architectural works representative of ‘modern regionalism’. Several architects sought to counterbalance the linearity of the modernism with a curvilinearity of forms based on an abstraction of culture and nature. The term ‘organic inflection’ is used to denote such compositions arising from tensions between the normative orthogonal themes of Modernism and a curvilinearity based on nature and culture. Three architects are discussed Oscar Niemeyer, (Brazil), Ken Yeang (Malaysia) and Edward Suzuki (Japan. While Niemeyer works were inspired by the ‘curves’ of the Brazilian natural landscape, Yeang’s Malaysian works celebrates an intertwining of nature/ecology and cultural icons gleaned from the vernacular. In Suzuki’s work, ecological themes are fused with an abstraction of form based on culture and nature. The contextual background, the inspiration and ideas related to ‘nature’ such as landscape (earth) and lifeforms (organism) - and ideas based on ecological themes are discussed.
In his treatise on principles of architecture and nature in the 'Stones of Venice', Ruskin (1960) outlines several sources of nature of architectural design. These were discussed as 'the treatment of ornament' i.e. embellishments on archetypical forms or elements - the wall base, the wall, the arch, the column and the buttress of traditional building types. Ruskin (1960) summarises a comprehensive list of 'sources of nature' – which he calls the 'proper material of ornament' as: 1. Abstract lines, 2. Forms of Earth; 3. Forms of Water; 4. Forms of fire (Flames and Rays); 5. Forms of Air (Clouds); 6. Shells (Organic Forms); 7. fish; 8. Reptiles and insects; 9. Vegetation; 10. animals and man.

This list remain significant in the present analysis of current trends of modern architecture – particularly the interaction between 'nature' and modern building forms. The rise of the 'avant-garde' – since in the beginning of the 20th century – had challenged the established architectural canons and typeforms in the pursuit of novel forms representative of an industrial era. Architects sought embrace the 'original' and 'uncanny'; where formal gestures arising from 'avant-garde' themes became characteristic of times of rapid change. The phenomenon of modern regionalism was similarly spurred by the spirit of the avant-garde- representing a kind of rebellion, newness and most importantly, a heroic concept within an urbanizing context.
2 The phenomenon of modern regionalism

'Regionalism' in architecture has been described as 'a commitment to finding unique responses to particular places, culture and climates' (Curtis, 1986). During the post-colonial era in developing countries, regionalism presented a common reaction against the universality and uniformity of modern architecture. A re-assertion of the past, in the name of a nation's identity basically represented a critique of the universalising tendencies of rapid modernisation through an understanding towards the cultural and physical conditions of place.

In their 'taxonomy' of regionalism, Powell and Ozkan (1985 had identified two broad strands - 'neo-vernacularism' and 'transformative regionalism'. 'Neo-vernacularism' embraces the application of indigenous techniques rooted in tradition including the integration of landscape, indigenous labour and craftsmanship. 'Transformative' or 'modern regionalism' enables a more critical approach by abstracting principles from the past and re-interpreting them in new forms - particularly for modern, large-scale building programmes e.g. universities, hospitals, government buildings, offices and hotels - which have become part of the growing complexity of the social order in this context.

In resolving the tension between modernity and tradition - how to be at once 'regional' and 'modern', the position of modern regionalism is opposed to 'pastiche' regionalism - a cut-and-paste method of transplanting vernacular elements within modern building programmes. Such kitsch is the consequence of a certain immaturity in coping with rapid socio-economic change and an insufficient depth in resolving the paradoxical synthesis of modernity and tradition.

3 Ken Yeang - Malaysia

Widely known as a 'bioclimatic' proponent, the architecture of Malaysian architect Kenneth Yeang can be characterised as the 'conflation' of Eastern and Western influences during a particular place and time where 'East' and 'West' collide and collude - within the rapidly developing context of tropical Malaysia. Yeang's early ideas have stemmed from his PhD thesis - which had aimed at defining and developing a theoretical framework to unify areas of design based on the term 'ecological' i.e. to see 'design' from an ecologist's point of view and forward a theory based on ecological models.

3.1 Theories of 'Design with nature'

Yeang (1982) defines the 'ecosystem' as consisting of the 'biological' and the 'physical' - the 'biological' being concerned with 'plants and animals' and the 'physical' with 'the physical environment or site of a given community including its climate'. Yeang's later usage of the term 'bio-climatic' can be related to the integration of 'biology' and 'climate' - 'bio-' relates to the
organic/biological constituents of place such as plants and microbes and 'climatic' refers to a significant 'physical characteristics of place'.

The term is hence based on 'an acceptance of the ecologists concept of the built environment' and an ecologist's outlook where the site is seen as 'a living and functioning system'. Yeang's theoretical framework and its methodology in his PhD was greatly influenced by the theories of Ian McHarg - who similarly developed a unified conceptual methodology for environmental planning through a basic methodological technique derived from overlays of categories of environmental and ecological characteristics of a given environment. This would then suggest a particular ecological design configuration for a particular environment.

Figure 2 The breakdown of the eco-system and biological constituents and its physical constituents (Yeang, 1982)

3.2 The Malaysian context

In Malaysia, the 1960's and 70s signaled the beginning of a turbulent period of national growth and change. The expansion of commerce and implementation of national development plans brought a rapid increase in building activity. This adoption of Western/Modernist models however became the basis of public, commercial and institutional buildings in various urban centers.

The issue of climate presented a potentially powerful idea as a generator of architectural form and a major factor that shaped the culture and lifestyle of Malaysia. Yeang's focus on climatic issues can be seen as the outcome of the collusion of two forces - his ecological science background and Yeang's aversion to both the direct adoption of Western forms and to the
proliferation of kitsch. Yeang’s intention was to ‘move’ away from ‘simplistically’ transferring traditional culture-specific models to a modern building type, to a more universally accepted basis for design.

The 24 storey Plaza IBM (1984) was designed as a ‘tropical highrise archetype’- encapsulating Yeang’s earlier ‘environmental filter’ ideas - which intended to ‘sieve’ the external climate and control the interactions between the internal and external environment. Elements of cultural iconism - gleaned from the ‘traditional’ Malay house and the Chinese shophouse - were then ‘adapted’ and modified to the highrise - where climatic the principles based on Malaysia were fused with abstract references of the vernacular. Organic inflections can be discerned in the curving arches of the roof-top and the curvilinear bridge connects the main tower block to the lower podium building. This pedestrian bridge weaves like a snake over the pedestrianised ground floor(Figure 3). This ‘organic’ element inflects and breaks the crispness and balanced the hard-edged regularity of the tower.

Due to the conceptual nature of his 80-storey Tokyo-Nara tower (1995) proposal prepared for the 1995 World Architecture Exposition in Japan, Yeang was able to forward his ‘bioclimatic’ ideals which epitomize the fusion of
technologies involving the sun, wind and landscaping. The spiralling form of the tower was inspired by the spiralling biological forms of the human genetic fingerprint – the DNA – the primary building blocks of mankind. The envelope design of the tower represents Yeang’s vision of a ‘reactive’ bioclimatic system that can rotate and react to the surrounding climatic environment.

The floorplates were configured as rotating planes in which the floors ‘above’ serve as sun-shading to the floor ‘below’. The sun-shading devices can thus be rotated to shade the building at particular times of the day or seasons of the year. Wind flues direct the wind for air movement at various angles towards the center of the building and dampers are used as regulators to control air movement into the building. Landscaping is profuse and is situated in vertical spirals around the building. Specialized mechanized devices like ‘robot-arms’ travel along an external track that spirals around the tower and service the plants.

Fig 5. The Tokyo Nara Tower
Fig 6. The spiralling track and vegetation of the Tokyo Nara tower
Fig 7. The rotating floor plates of the Tokyo Nara tower showing integration of landscaping.

4 Oscar Niemeyer – Brazil

The architecture of Oscar Niemeyer was a product of tension between International Modernism and the Brazilian context and landscape during a time rapid transition towards the industrial era of the 1960s and 70s. In his crusade to
establish a unique Brazilian identity during this era, Niemeyer embraced an approach based on abstract sculptural expressionism. Although he initially drew his inspiration from the ideas of Le Corbusier, Niemeyer later sought to steer away from Modernist restraints towards a kind of ‘free-form’ Modernism made possible by advances in modern structural technology. Asserts Segawa(1997) Niemeyer argued for the autonomy of artistic creation, the singularity of individual creation, against a puritan and normative rationalism.

The focus here however is on the tension between the orthogonal and hard-edged themes the curvilinearity of particular forms inspired by the natural elements of Brazilian landscape – characteristic of Niemeyer’s earlier works. As Greenwood(1994) has observed of Niemeyer’s dialectics and sources of inspiration:

Niemeyer’s synthesis of modernist oppositions has been fundamentally conditioned by the historical circumstances and physical and economic contrasts of Brazil. Extremes appear in the country’s topography and climate, from the intense tropical heat of the Amazon to the temperate climes of the south; from the dramatic mountains, luxuriant vegetation, and the picturesque curving shorelines of Rio’s Atlantic coast to the vast, scruffy flatlands of the Brazilian frontier.

The Brazilian Pavilion at the New York World’s Fair (1939-1940) was an early attempt to fuse orthogonal forms of International Modernism with regional abstractions - through the contours of the site and view of landscape. A curved entrance ramp meets the hard-edge brise-soleil wall in the building’s promenade – while the piloti or vertical columns lift the overall box-like composition up in space freeing the ground underneath, creating an internal garden that curves and balances the overall design. As Greenwood(1994) observes

The Brazilian Pavilion controlled spatial progression of the Corbusian manner with the curvilinear jeito of Brazil.

The Casa do Baile (popular dance hall and restaurant)(1942) is a similar composition based on free-form elements to counter-balance the linearity of the main complex. The basis of the composition is a meandering canopy of reinforced concrete that connects the two small buildings, a free form that follows the contours of the small island on which it is placed. (Greenwood, 1994:p55). The design reflects Niemeyer’s early affinity for Corbusian devices while responding sensitively to the specifics of context and programme.

Niemeyer’s own house in Canoas Road near the Sao Conrado district of Rio Janeirol(1953) epitomises of his ideals and ethos – crystallising the tenuous relationship between architecture, technology and nature. Borrowing from the idea of the ‘canopy’, Niemeyer’s house reflect his ‘free-form’ position – the curving walls are capped by a thin, horizontal slab roof echoes the flowing curves of the perimeter walls. The resulting wide overhanging eaves create a shaded perimeter terrace supported by thin steel columns – which enables the walls to be entirely glazed –creating a constant visual continuity with the surrounding natural elements of landscape.
Fig. 8. The Brazilian pavilion (1940) – the ground floor plan (grey areas) as an integration of landscape

Fig. 9. The meandering canopy of the Casa do Baile (1942)

Fig. 10. Plan of the Canoas House (1953) (lighter grey areas are shaded 'buffer' terraces, darker grey areas – indicating boulder)

Fig. 11. Canoas House (1953) – External View from the pool showing the boulder and external landscape
He inverts the modernist convention of elevating the building on pilotis, bringing the house back down to earth in closer communion with the natural nature of the mountain, from which it seems to grow, as does the huge boulder of carioca granite that is its centerpiece. (Greenwood, 1994; p79)

Jutting towards the center of the composition, is a huge boulder – which inherently connects the house, the water of the pool, the inside-outside space of the exterior terrace and the surrounding nature. The major formal elements of the Canoas House are the forms of nature – the sand and water of the concrete slab, the water of the pool, the boulder, and the vegetation. ..... At Canoas, Niemeyer lets nature be his decorator (Greenwood, 1994; p83)

5 Edward Suzuki - Japan

Japanese architect Edward Suzuki represents an ecological strand within modern regionalism whose works reflects an emerging ‘eco-aesthetic’ – the use of bioclimatic ‘elements’ such as the use of landscaping, vegetation, sunshades, balconies integrated within the high-technology vocabulary of aluminium, steel frame and glass façades. Inspired by clouds during a visit to Lake Yamenaks, Suzuki’s translated the Japanese bamboo screen or sudare, usually used during the summer to allow breeze to blow through whilst maintaining privacy – into a facade composed of square grids of I-beams in-filled with perforated aluminium panels. In between the window sash and the metal screen in a protected bamboo garden. The traditional Japanese vocabulary coupled with vegetation such as bamboos is transformed to provide a cushion or a buffer zone between the outside and the inside worlds. (Fig 13)

Some of his works reflect an organic tendency with curvilinear forms reflects an intention for a differentiated regionalist identity within a modern, urban context of Japan (Fig. 12). Regional identity becomes a ‘poetic realm’ expressed through the means spatial fluidity. The capacity to evoke regionalist identity stems directly from the means of curvilinear forms – and at time, they serve both as a metaphor of, and as a foil to, the naturally organic.

6 Conclusion

The position of nature and architectural design has again come to the fore due to the ascendancy of sustainable ethos and developments in environmentalism in architecture. Rather than adopting a functionalist, even deterministic paradigm based on the exact/ scientific/ methodological correspondence of architectural form with external data or an extreme ‘formalised’ position of emulating natural forms through sculptural virtuosity, this paper posits a more balanced idea of synthesising opposing tendencies in a creative tension. The examples involve the role of nature within a holistic philosophy in an urbanizing context – particularly in the East – with an emphasis on a dualistic sensibility reflecting equipoise and tension, where rational considerations are balanced by romantic
expressive tendencies. This dialectical process integrates mutually contradictory concepts into a comprehensive synthesis and achieves a balance between a functionalist tendency and a highly personal means of self expression. The three architects were spurred a heightened interest by the loss of regional identity – where all works include a recollection of traditional devices which defined each region at its core. The overall compositions then become ‘landscapes of nature’ which embrace abstracted elements from cultural traditions – resulting in an architecture that celebrates a humanist and creative interpretation based on natural phenomena and regional tendencies.

Fig. 12 (above). The Supervilla11 - Suzuki regionally ‘inflects’ with curved lines;

Fig. 13 (right). The Arterior Design Studio – view of northern exterior – perforated aluminium with bamboos trees simulating clouds.

References