Environmental anticipation

From template to temple

The house of exact breathing

I find it astonishing that it was as long ago as 1969 that Reyner Banham's seminal book, *The Architecture of the Well-tempered Environment,* set in train a line of environmental history that has now grown to maturity. In the intervening years much has been added by many other authors. In his paper (**arq** 9/1, pp. 69–79), Pedro Guedes refers to the work of Butti and Perlin (1980) and to Colin Porteous' *The New Eco-Architecture* (2002) as further contributions to the environmental lineage. To these I would add distinguished studies at the building scale by Robert Bruegmann, John Olley and Todd Willmert, and also John Farmer's *Green Shift* (1996, rev. 1999) and Susannah Hagan's *Taking Shape* (2001), both of which take the discourse into wider territories of scale and concept. But Guedes' discovery of the remarkable house built in Yokohama by Willem van der Heyden in 1891 is an important addition to the field.

Beyond the obvious inherent interest of van der Heyden's design, two specific points come immediately to mind. First is the anticipation in van der Heyden's project of Le Corbusier's vision, offered in his 1929 Buenos Aires lectures of, 'only one house in all countries, the house of *exact breathing*' (see *Précisions,* 1930). Compare this with van der Heyden's ambition to achieve, in Guedes' words, '... nothing less than that of making the whole world, from the Equator to the poles, habitable for European settlers'. The similarities between the two projects extend beyond primary intention. They both propose the creation of a hermetic environment that not only provides thermal comfort in any climate, but also scrupulously filters the air.

Van der Heyden writes, 'The air of the house being filtered before entering the house will contain no dust, nor any bacteria ... in fact it will be possible to make the air as innocuous to health as can be made the drinking water'.

For Le Corbusier, 'The house is sealed fast! No dust can enter it. Neither flies nor mosquitos. No noise!' Le Corbusier claimed his *respiration exacte* and *mur neutralisant* to be *notre invention*, but how similar they are to van der Heyden's system of circulation and double skin walls, although Le Corbusier didn't venture so far as to incorporate phase change material.

'van der Heyden began from first principles, beginning his investigation of the processes of solar design by purchasing Teach Yourself Thermodynamics!'

The other comparison is with St. George's School at Wallasey (1957-1961), which was one of Banham's major environmental discoveries and now stands as an icon of passive solar – sustainable in current parlance – architecture. I am particularly struck by the methodological similarity between van der Heyden and Emslie A. Morgan, the architect of St. George's. Guedes describes van der Heyden's recourse to scientific first principles as the basis of his design. A number of years ago, when I researched Morgan's papers for an essay about St. George's,[1] I discovered that this scientifically untutored architect also began from first principles, beginning his investigation of the processes of solar design by purchasing *Teach Yourself Thermodynamics*!

In the introduction to *The Architecture of the Well-tempered Environment*, which he titled 'Unwarranted apology', Banham wrote, 'This present book represents a tiny fraction of what Giedion left unsaid (in *Mechanization Takes Command* [1948]). This too is a tentative beginning, whose shortcomings, I have no doubt, will become manifest as research proceeds ...' In this context I am particularly grateful to Pedro Guedes for this paper and look forward to more from him and others as this branch of scholarship continues to mature.

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Note

1. Dean Hawkes, 'Wallasey School: pioneer of solar design', in *Architects' Journal* 185, Pt. 18, (6 May 1987), pp. 55–59, reprinted in Dean Hawkes, *The Environmental Tradition: studies in the architecture of environment* (London: E. & F.N. Spon, 1996).

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Making templates, building temples

Bob Sheil's article entitled 'Transgression from Drawing to Making' (**arq** 9/1, pp. 20-32) discusses the transformation of the practice of architecture by the fast-growing advances in information technology.

Sheil is right that the historical position of drawing as the product of the architect requires rethinking. Addressing the interdependency of design and making, Sheil has paid attention to the elusive history of translation of ideas into matter in architectural creation. In providing this history, the author's ambition is to show how the connection between design and making became critical and inseparable in the current practice of architecture. The focus of the connection between design and making is 'design information' which becomes a means of control in contemporary manufacturing processes. Who is responsible for making information: the architect; manufacturing experts; or the maker of the drawing? Sheil's reply to this question is the maker of the drawing, who has new responsibilities in the current practice of architecture (pp. 23-24). With the integration of digital fabrication technologies (CAD/CAM) into the process of exchanging building information, the maker of the drawing is operative in the making of the product. A computer drawing, in which electronic data is encoded, is no longer just a document dependent on the translation of others' ideas but an electronic code transferred to the fabrication process. Sheil calls the maker of this drawing a 'neo-jack of all trades' who has to have hybrid skills and knowledge in today's work environment (p. 24). At this moment I want to recall a tool that was used by a 'pre-jack of all trades'.

A template as a physical model – acting both as a construction and a communication tool – allowed pre-Renaissance architects to bypass the fabrication of construction drawings. Through templates made out of timber boards or thin sheets of lead or zinc, the shape and dimensions of the imagined form were accurately imposed onto the actual material: stone in most cases. In the absence of a standardised measurement system, the template provided the easiest means of transmitting information for master builders (the equivalent of present-day architects), stone contractors, building contractors and construction supervisors. The mobile nature of these templates allowed for easy transfer of the embodied knowledge that they held. The power of the template maker is evident because, by nature, the physical form of a template held the coded information necessary for its construction.

'A template as a physical model – acting both as a construction and a communication tool – allowed pre-Renaissance architects to bypass the fabrication of construction drawings … The template, in many respects, resembles the drawings of the digital era'

The template, in many respects, resembles the drawings of the digital era. Consequently, the template makers share similar roles with the makers of the drawings of the past decade, although their knowledge in products, techniques and environments is understandably different. A three-dimensional digital model of a project is now the basis on which parts of building are fabricated through CAD/CAM machine mills. This digital model – providing all the coded information – serves both as a communication and a construction tool for component suppliers, fabricators and contractors around the world, all of whom have access to one central online source which, I believe, serves as a *template* as in the tradition of pre-Renaissance construction techniques. The templates of 'pre-jack of all trades' are very similar to the digitally-driven processes of production, design and construction of 'neo-jack of all trades' in terms of their link with making. Hence, it is often said that the role of the pre-Renaissance architect is reinvented through the integration of separate disciplines of architecture, engineering, and construction, closing what Mitchell and McCullough call 'the gap between designing and producing that opened up when designers began to make drawings'.[1]

After contemplating the interdependency between design and making in the current practice of architecture, Sheil discusses an ongoing project developed through a residency at the Art and Architecture partnership at Kielder in Northumbria. Instead of using available instruments, it is admirable that the research group *sixteen* decides to design and fabricate new instruments, or 'probes' as they like to call them. It is interesting to note that the words 'instrument' and 'instruction' both come from the same Latin root, *instruere*. These probes are not only supposed to monitor change but also respond to change in the environment. Sheil's ambition is to provide 'metadata of the probes' behaviour and experience of the site' so that they can learn 'how to design a more site-specific and fitter architecture' (p. 30). At this moment, the question is left unanswered about how this survey informs us about how to design a more site-specific and fitter architecture. That is why, on the one hand, Sheil can be congratulated for his analyses of the many changes in the building industry; on the other hand, one wonders if the probes acquired information that could not be gathered in another way. Since this is an ongoing project, I am looking forward to seeing the results.

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Note

1. Mitchell, W. and McCullough, M., *Prototyping in Digital Design Media*, 2nd ed. (New York: Van Nostrand Reinhold, 1995).

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