

Mediating the Qualitative and Quantitative

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Over the last two decades, the term ‘sustainability’ has become almost ubiquitous in its application in both urban and rural contexts. The role of environment in the design process was once conveniently compartmentalised into fields such as low energy design and intermediate technology. Universal narratives are often laced with a taste for the apocalyptic in relation to climate change, population growth, resource scarcity and threats to biodiversity. The breadth of such anxieties articulate themselves in how the term sustainability might be defined. It is normally expressed as protecting the interests of future generations by levers of social and economic change as well as through environmental means. It is a concept that draws both strength and reveals weakness through an essential vagueness. Far from being a cohesive ideology, sustainability as a term is conflicted and often counter-intuitive. It does however embody a sense of shared sentiment in that it is often defined by a perception of threat, but that its agency is essentially redemptive. It offers an effective foil for architecture’s sometimes expressed preference to celebrate the dystopian.

This edition of EAR is compelling not only in the inherent value of its reflective enquiry. It also holds a revealing mirror to our design and research practices in the environment. We find here a field of work that not only illuminates diverse sustainable paradigms but also reflects how design, landscape and the built environment inhabits both quantitative and qualitative worlds. When seen as a set of demarcated relationships, set within discipline tradition and an academic tribalism, architecture and landscape architecture might be perceived as inherently problematic. Instead, when looked at, as a whole, the papers actually point to a more productive and rich discourse where disciplinary difference is celebrated.

ENVIRONMENTAL HOLISM OR ECOLOGY À LA CARTE

In sustainable pedagogies, a sensibility towards the connectedness of ecological systems is often pre-eminent. The importance of addressing design issues in a holistic way is seen as virtuous. In ‘Lessons from the Lafitte Greenway Project’, a landscape corridor is carefully described and the work identifies the importance of evidence based design in concert with measurable environmental and ecological value. The work of Ian McHarg is quoted, who in *Design with Nature* advocates a multidisciplinary analysis of site often using overlay technique to show the integrative nature of landscape design. In contrast the paper ‘From

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Fragment to Eco-Island: an Archipelago à la Carte' forms a proposition taken from Alvin Boyarski's Chicago à la carte whereby designers and users choose their own singular and often speculative paths, both literally and metaphorically within an urban environment. In many ways, this reflects a question as to whether sustainable design practice should be essentially holistic or selective? Holistic approaches, especially when deployed through established quantitative assessment systems, often value projects that not only perform adequately but across a wide spectrum of metrics. But, designing à la carte might negate or ignore the vital physical and intellectual connective tissue that comes from a sensibility for the integrative nature of ecologies. However, both papers are sophisticated in their weaving of the qualitative and quantitative. In 'Lafitte Greenway', a mediating dialogue exists in that the project is conceived not just as a means of meeting measurable yardsticks but also 'draws upon principles of historic ecology and is built upon a palimpsest which honors the rich layers of the site's history'. Both projects also have a shared preoccupation with site in both cultural and ecological terms, with the archipelago's à la carte seeking inspiration through the reconnection of 'as-found fragmented territories'

MEDIATING THE QUANTITATIVE

The relationship between building science and architectural design has always been fractious. A territorial retrenchment often follows poorly structured collaborations with a consequent retreat behind disciplinary boundaries. Critiques of technology and scientific absolutism are well versed, but at the same time a certain semantic sleight of hand often undermines the significance to many societies of resource depletion and climate change. At its worst, fundamental questions of energy generation and distribution are sidelined as valid preoccupations for design practice. In contrast, 'Thermodynamic Optimism: Three Energy / Material Dialogues', Lisa Moffitt 'explores a softer more qualitative framework' for drawing out visual interpretation. It is as a means to articulate thermodynamic phenomena as generative rather than reductionist in relation to design. Using student work from her drawing energy Kerrera Studio, it demonstrates a characteristic of energy to flow in a literal as well as metaphoric sense, and allows a crossing of quantitative and qualitative boundaries. Suzanne Ewing in 'Collecting Light' also acknowledges a new interest in reframing environmental conditions as a creative means to design. In this case, measurement of quantitative conditions in spaces throughout the city enable data to be used in a way complementary to an engineering analysis of illumination but with a far greater facility to stimulate design discourse.

In 'Environmental Attitude, Values on Urban Wildlife; A Case Study of Kuala Lumpur Urban Parks', the authors are faced with the difficult task of assessing societal attitudes towards urban wildlife. Here quantitative and qualitative methodologies are incorporated using Kellert values on human attitudes towards animals, to include 'naturalistic', 'aesthetic' and 'dominionistic' classifications. What the resultant statistical analysis

demonstrates is a fundamental, and qualitative complexity in many of our relationships with the natural world. The possibilities of designers to harness and use quantitative environmental simulation tools is outlined by Uduku and Treacy in 'Environmental Design Analysis Models in Technology and Environment Teaching in Architecture Schools; Reflections on the Past and Speculating on the Future'. Such simulation software is normally perceived as a privileged instrument in the hands of the engineering professions and therefore out of reach of experimental design practice. The authors instead suggest a framework for a democratisation of the software in an educational context for design students to allow creative environmental speculation rather than a verification tool only to be used at the end of the design process.

MATERIAL IMPERATIVES

A sense of materiality is becoming an important place for debate when defining what might constitute a sustainable sensibility towards building. The role of geological time in the process of material extraction, construction and a return to earth were articulated clearly some fifteen years previously in publications such as Berge's *Ecology of Building Materials*. At the same time, a preoccupation continues in the deployment of new technologies as found in 'Growing Sustainability; Integrating Algae Cultivation into the Built Environment'. In this, Gundula Proksch sets out potential uses for cultivation and use of Algae in the built environment. Like Berge, Proksch refers to the importance of forming cyclical consumption loops in contrast to linear systems more often encountered in design practice. In 'Bamboo Symphony', Apurva Bose Dutta re-examines bamboo, long identified as an integral part of intermediate technology practice but in this case, deployed in a sophisticated manner in producing efficient and expressive structure and architectural form.

Eva Sopeoglou in 'Weaving Shadows; Dressing the Body and Landscape', explains the how fabric, especially in relation to its modes of production, can suggest how form and enclosure is informed not just through the inherent quantitative parameters of the material but also a qualitative appreciation and communication of its very making. Here, the design of a house is inspired by a close study of looms 'that weaves shadow'. In all these instances, an understanding of the fundamentals of the material allow for design transformations that have qualitative significance in the making of form and enclosure.

INFRASTRUCTURE'S HIGH NOON

Graham and Marvin in 'Splintering Infrastructure' look at the present as experiencing the high tide of centralised, publicly-delivered utility service. Energy and water networks are now being designed and delivered at a neighbourhood level, both as a positive choice in the making of sustainable settlements as well as a response to economic

and political necessity. The move towards a more dispersed and granular pattern of energy networks comes at a time of increasing anxiety about resilience in supply. Therefore, new energy generation typologies will not only meet a series of technically informed demand targets, but qualitatively act almost as didactic objects in the community. In 'REI's; Renewable Energy Infrastructures', Chris Ford situates designers as placed to deploy both creative and analytic skills. From this, he posits renewable energy generation as an architectural typology through case study and design speculation.

The rich diversity of articles in this edition of EAR is representative of where the key debates lie in defining sustainable environments. There is a superficial paradox in the existence of quantitative cultures and traditions that are identified in environmentalism. Here the significance of often straightforward mathematical relationships become almost talismanic. Well-established concepts such as 'carrying capacity' and 'ecological footprint' now have value well beyond the algorithms that underpin them, not unlike the growth of parametrics as a generator for design. Whether the quantitative and qualitative dimensions of sustainable environments can ever function as a true dialectic depends as much on the intellectual suppleness of design practitioners and their collaborating professions. However, some of the issues uncovered and explained in this publication give cause for optimism about a complex but ultimately more rewarding environment in which to situate design.