



# Thoughts from the Dome: On a century of the environmental tradition

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On New Year's Day 1965 I began work as a research assistant in the Department of Architecture on a project funded by the Building Research Station (as BRE was then known). The project was to study the significance of daylighting in the design of housing layouts using physical models in the then new artificial sky – the 'Dome'. This structure/machine was the work of David Croghan, one of the pioneering research students in the department, and for a number of years played an important part in the research and teaching in the department. In those early years the dome was also used to study the daylighting design of a number of important buildings designed by architects teaching in the department and others. These included Leslie Martin's and Sandy Wilson's Manor Road Library at Oxford, Martin's Oxford Zoology Laboratories, Sandy Wilson's Cornford House, his laboratories at Babraham, where I worked with another young chap called Peter Carolin, and work on the Hayward Gallery and the Pimlico School. My lifelong engagement with the environmental dimensions of architecture began with those

days in the dome and in this short essay I will try to review the place of environmental studies in the history of the department.

### THE ENVIRONMENTAL TRADITION – AGAIN

32 At the conference held in 1992 to mark the 25th anniversary of the Martin Centre, I gave a paper called 'The Cambridge School and the Environmental Tradition'. There I proposed a lineage of environmental concern from the arts and crafts houses of Edward Prior, Slade professor and founder of the school, through the Cambridge modernist houses of George Checkley, who came to teach in the department in 1928, and on to the buildings of Leslie Martin and Sandy Wilson referred to above. I also enlisted the Cambridge related practices of Edward Cullinan, Richard MacCormac, David Lea and, as they then were, Feilden Clegg (now Feilden Clegg Bradley Studios) as exemplars of environmental synthesis. This theme was further developed in my contribution to *Compendium*; the publication related to the exhibition of the department's work held at the RIBA in 2006. There I offered a review of works by a younger generation of architects associated with the school who, I suggested, in diverse ways achieve a synthesis of the environmental and the architectural. These included, the global practice of Ken Yeang, who I remember as an invigorating PhD student between 1971 and 1975, Brenda and Robert Vale, who were already environmentalists in their second year at Cambridge and have pursued a deep line of environmentalism in their teaching, research and practice in both the UK and now New Zealand, Alan Short, who has gone from undergraduate to professor, and whose buildings have given unique form to the processes of air movement and ventilation. Also included was Sarah Wigglesworth, with a lyrical image of her and Jeremy Till's house at Stock Orchard Street in north London. Six years on one could add yet others to the litany, such as Meadowcroft Griffin's Lauriston School in Hackney that demonstrates 'sustainability' in its widest definition, and, with different environmental pre-occupations, Eric Parry's lyrical Holburne Museum in Bath.

## ENVIRONMENTAL RESEARCH

From its beginnings with the dome and the work associated with that, environmental research in the department quickly evolved and expanded. In 1967 the centre for Land Use and Built Form Studies (LUBFS) was founded and my own work moved on from the relatively primitive physical modelling under the artificial sky to exploring the new possibilities in the late 1960's of computer modelling of environmental factors in building. My PhD project centred on the construction of a computer model that calculated and inter-connected quantities of heat, light and sound in buildings. This consisted of over 3500 lines of 'Fortran 4' computer code, written by me, with the considerable help of Richard Stibbs, a computer scientist, who was a key member of the group. Susannah Hagan recently reviewed this work in her book *Digitalia*. The work was applied to study aspects of the environmental performance of office buildings and then hospitals.

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The 1970's saw the environmental work expand on many fronts. The Autonomous (later Autarkic) House project under Alex Pike brought a specifically energy conscious focus to environmental research and, although the much desired prototype building was never built, it produced much fundamental research in the field. The research associates Randall Thomas and John Littler later had distinguished careers in environmental design and research. Another development around this time was the introduction of research on the acoustics of auditoria. This came from the Building Research Establishment and brought 1:8 scale models of the Olivier Theatre at the National Theatre and the concert hall at the Barbican, both then under construction. The work, which made numerous important contributions to the field, was led by Mike Barron and Raf Orłowski, who have become major figures in architectural acoustics.

Following on from the computer modelling, I became interested in the development of a more 'conceptual' model of the environmental processes in buildings and particularly in the place of occupants in responding to and managing their environments.

Observational studies in a group of schools in Essex, in which Diane Haigh was the research associate, led to a follow up project in collaboration with Hampshire County Council in which principles from the research were applied to the design of a primary school at Locksheath, which was completed in 1984 and was the first occasion that funding from the Science and Engineering Research Council directly contributed to the design of a building. In this project we were joined by Nick Baker, who brought scientific rigour and much else to the work. He went on to make a major contribution to both research and teaching in the department and to acquire an international reputation.

At this point the environmental work had, it may be suggested, reached maturity. Research grants and contracts came in; there was a stream of publications and a growing community of PhD students. In 1987 Nick Baker and I began the MPhil in Environmental Design in Architecture, which continues to the present in two modes as the MPhil (B) is the basis of the department's revived RIBA Part 2 course. Koen Steemers was in the first group of students to join the course.

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## TECHNICS AND POETICS

More recently my work has moved away from the predominantly technical concerns of the early years. As I view the field of environmental architecture in its many manifestations it is in capable hands. In 1995 I moved to the Welsh School of Architecture at Cardiff and, the following year, I published an essay that explored the relationship between 'technique' and 'design' in architecture in *The Journal of Architecture* (Vol. 1, Winter 1996). This theme was further developed in the book, *The Environmental Tradition* (1996), and then, in the years since my 'retirement' in 2002, in *The Environmental Imagination* (2008) and in *Architecture and Climate* (2012).

My aim in these projects has been to try and bridge the gap that all too often exists between the territories of technology and design in architecture. By bringing together

‘theory’ and ‘design’, and ‘technics’ and ‘poetics’ in exploring the environmental characteristics and qualities of buildings from the 16th century masterpieces of Robert Smythson to works of the present day by architects of the substance of Moneo, Siza and Zumthor, I am trying to show that ‘environment’, in an all-embracing definition, lies at the heart of the architectural project.

Those days in the dome occurred almost at the mid-point of this century of Cambridge architecture. At that moment the whole basis of architecture as an academic discipline was changing under the influence of the RIBA Oxford Conference in 1958, and the department was at the forefront of this. The environmental strand was, perhaps, symbolised by the dome and I think it important that its first use was in connection with the practices of Leslie Martin, Sandy Wilson and others, even before the ‘theoretical’ studies began. Looking further back those buildings may be placed in a lineage that connects with the implicit environmentalism of the arts and crafts in general and, in the context of Cambridge, to the designs of Edward Prior and, later, the English modernism of Checkley. Looking forward there is ample evidence that an environmental sensibility informs the work of many architects who have had direct or, equally importantly, indirect associations with this line of research and that, reciprocally, the research informed by the perceptions of practice.

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I should like to end by paraphrasing the conclusion of my contribution to *Compendium*. There I suggested that throughout its history the Cambridge school has avoided the singular and the specific as the basis of architecture. It promotes diversity of thought and a spirit of enquiry and it is in this context that what I have labelled ‘the environmental tradition’ has evolved. The concern is with the qualities of the environment, not just with the mechanics of technical performance – the unity of technics and poetics, that is its true value.