The Two Paths

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I have stolen the title from Ruskin. The intoxicating flow of words in the Foreword to The
Two Paths of 1859 seems to say that those who themselves sculpt or paint natural forms
are on the path to the Olive mountains, but those who stand back are on the path to the vale
of the Salt Sea. Choose carefully at the division of the paths, Ruskin advises: ‘There are few
cross roads, that I know of, from one to the other.’1

The precedence between those that do and those that tag along behind has plausibility. In
Anthony Powell’s Dance to the Music of Time the grovelling music critic Maclintick says to
the composer Moreland, ‘I obey you with the proper respect of the poor interpretative hack
for the true creative artist.’2 But the role of the critic or commentator or historian can be
respectable. In literature there is a balance between those who produce literary work and
those who study and write about what other people have produced. The Department of
English at Cambridge University, for example, is devoted to studying literature, not
producing it. In architecture there is an equivalent distinction between designing buildings
and studying what other people have designed, although students in the Department of
Architecture find they have to follow both paths. Can architectural research be divided in the
same way: between research seeking knowledge for the design of new buildings, and
research seeking knowledge about buildings that have already been designed?

Sir Leslie Martin, Professor of Architecture in Cambridge from 1956 to 1972, gave research
an important place in his elegant conspectus of the discipline of architecture, which was
founded on the shared body of architectural knowledge. Architects in practice apply this
knowledge when they produce designs for buildings; teachers of architecture convey it to
students; and researchers add to the body of architectural knowledge. Writing in the late
1950s, Martin was also rationalising the end of the old apprenticeship system of
architectural education: ‘The universities will require something more than a study of
techniques and parcels of this or that form of knowledge. They will expect and have a right
to expect that knowledge will be guided and developed by principle: that is, by theory. …
Research is the tool by which theory is advanced.’3 He continued: ‘… postgraduate work in
architecture [is] a suitable subject for development universities where, so far, the main
developments of postgraduate study have concentrated on historical research which,
indeed, they have carried out with distinction.’4 But he envisaged something different: ‘By
the development of postgraduate study, the profession can provide itself with the higher
technical ability and knowledge that it requires. What Martin meant is shown by the research centre that he established in Cambridge in 1968, the Centre for Land Use and Built Form Studies, with the architect-mathematician Lionel March as its first director. Its key idea was the use of mathematical modelling to reveal the underlying properties of buildings in a systematic way – their geometrical form, environmental performance, functionality, and so on.5

In Martin’s world view, architectural teaching and research are justified because they are on the path that leads to the production of new (and better) designs. Although the quantity of architectural research has grown vastly over the last forty or fifty years ago, hasn’t some of it headed down the other path – with a weak or non-existent connection to practice? The academic study of architecture has taken on a life of its own and could happily continue if no new designs were produced at all. This is getting perilously close to the history of art.

There’s nothing wrong with enthusiasm for architecture, within universities and more widely. The paraphernalia of books about architecture, exhibitions, courses, tourism, and architectural appreciation in general, all reflect the discipline’s diversity and richness. But the contribution to the production of designs is indirect at best. The flow is mostly the other way. One generation’s concern with production turns into the next’s – or the next-but-one’s – quarry for history and criticism. Issues of the Architectural Review (AR) of the 1960s that originally provided practicing architects with exemplars for imitation are now source material for researchers in architectural history. Not that current architects mightn’t pick up a few tips from browsing the old issues; for example, the weak massing of the new Hepworth gallery in Wakefield could have benefited from an injection of the drama displayed by Stout & Litchfield in the February 1965 issue of AR (fig.1).

The two paths converge in architectural conservation. Take Sir Owen Williams as an example. He was an engineer with no architectural training, but a well-qualified judge – Andrew Saint, our own former professor – believes that his are the outstanding British modern buildings of the inter-war years.6 But Williams’ greatest strength was not originality. For example, the striking gable end of his Empire Pool (now Wembley Arena) of 1933 is prefigured – at a much smaller scale – in a factory in Germany illustrated in Architectural Design in Concrete of 1927,7 a book that Williams must have known (fig.2). Williams’ masterpiece was the Boots ‘Wets’ Factory, built in 1930-32, but by then the multi-storey factory was obsolescent and almost every feature of the design was anticipated in Moritz Kahn’s book The Design and Construction of Industrial Buildings of 19178 (fig.3). Moritz was a younger brother of Albert Kahn,9 the greatest American factory architect, and ran the London branch of Truscon, the family business, where Williams worked from 1912-16. What made Williams outstanding was his extremism. In his hands the conventions of design became bigger, bolder and more ruthless. There is much to discover about Williams’ work by looking into the knowledge-base of the period in which he worked. Research into a dead designer’s sources and the knowledge at his (mostly his) disposal is valuable when buildings are being conserved – or even assessing whether they are worth conserving.

Research into the accumulated heritage of architectural production is a perfectly legitimate branch of the humanities, and can have relevance for current architectural practice in the field of conservation and no doubt elsewhere as well, but I believe that research in a university department of architecture should attach special importance to new knowledge for the design of new buildings.
The implications can be explored in a small but important facet of the architectural knowledge base – the topic of adaptability or flexibility. It is a highly desirable attribute for buildings that are expensive to construct and risk premature obsolescence if they cannot accommodate change over time. The desire for flexibility is not new and is already a research topic in the history of ideas, as in Adrian Forty's *Words and Buildings*.\(^\text{10}\) His discussion of the word ‘flexibility’ starts in the 1950s, although it was used by Owen Williams in the 1920s: ‘The object of the factory builder should therefore be fitness for purpose at minimum cost in combination with complete flexibility for replanning and alteration.’\(^\text{11}\) Forty classified the remarkably diverse ways in which the word has been used. He focused on what people said about flexibility over the last couple of generations, and Daniel M Abramson, an art historian, is writing a book to be called *Obsolescence: an architectural history* about architects’ attempts to design flexible buildings.\(^\text{12}\) Because the architectural knowledge base lacks an effective theory of flexibility the attempts have often failed; however, they make perfectly good source material for the historian. It is fascinating stuff, but meanwhile the challenge of designing flexible buildings remains unsolved.

One of the most important and influential practitioners of flexible design was John Weeks. His attractive ‘duffle coat’ theory of the 1960s was based on a plausible analogy: ‘In order to get maximum flexibility within a [hospital] department it is necessary to provide rooms which fit around the activities which are to be carried out in them like a duffle coat. The duffle coat, provided by the Navy for its officers, was not a tailor-made garment. A few sizes were made and these were related to the known sizes of sailors so that it was usually possible to find one that would fit reasonably, and keep the sailor quite snug.’\(^\text{13}\) Weeks believed that hospitals would be more flexible if they were built with a small number of distinct room sizes.

The argument rests on two key concepts, activity-space tolerance and looseness of fit. Activity-space tolerance allows activities to take place in spaces that are not precisely the ‘right’ size. Looseness of fit is what you get with activity-space tolerance – it allows a set of activities to be allocated to a set of spaces in many different ways; Weeks equated looseness of fit with flexibility.

The following rationale for the duffle coat theory can be inferred from Weeks’s writing:

1. **Proposition 1:** Activity-space tolerance increases looseness of fit
2. **Proposition 2:** Activity-space tolerance allows for designs with a smaller number of distinct room sizes [i.e. a duffle coat design strategy]
3. **Conclusion:** Therefore, a smaller number of distinct room sizes increases looseness of fit.

The two propositions are valid but the reasoning is unsound and Weeks’s conclusion is unconvincing logically – but how do duffle coat designs work in practice? I recently investigated this question with the help of Martin Centre PhD student Danny Rigby.\(^\text{14}\) We used mathematical simulations to compare the flexibility of a range of designs in which the duffle coat theory was applied with increasingly severity, by progressively reducing the number of distinct room sizes. Far from performing better, the duffle coat designs proved less flexible. It was evident that the key to loose-fit flexibility is activity-space tolerance, not the number of distinct room sizes. However, despite its logical and pragmatic weakness, the duffle coat theory of flexibility is alive and well in the knowledge base of hospital design practice. Hospitals are large and complex buildings and there may be very good reasons for designing with a limited range of standard room sizes, but the idea that it will increase flexibility is erroneous.
Identifying errors of this kind in the knowledge-base of current practice is surely a valid role for academic research, although Ruskin warns, ‘We are all of us willing enough to accept dead truths or blunt ones; which can be fitted harmlessly into spares niches …’¹⁵ (abbreviation is a necessity in quoting Ruskin). Finding errors is important, but it would be even more useful to add new ideas to the knowledge-base, including a better theory of flexibility. Ruskin again, pessimistically: ‘But a sapling truth, with earth at its root and blossom on its branches; … most men, it seems to me, dislike the sight or entertainment of, if by any means such a guest or vision may be avoided.’¹⁶

A better theory of flexibility has already been formulated, at Cambridge Architectural Research Ltd (CAR), a spin-off consultancy from the Martin Centre. The theory is based on the concept of lifecycle options.¹⁷,¹⁸ It argues that the essence of a flexible building is that the initial designer’s decisions are overlaid by new decisions made by other people in the future – changing the building’s use, spatial subdivision, size, materials, mechanical systems, etc, etc. The initial designer cannot make these decisions or predict how they will be made, but a designer who aims for flexibility should deliberately provide many opportunities for a wide range of future decisions, only some of which will ever be used. For example, when a building is designed the architect makes many decisions between alternative components (figure reference). It is unrealistic to assume that this initial decision will be repeated every time a component is replaced during the building’s service life (model I). In a more realistic world view a new decision is made at each replacement (model II). In fact new components are sure to appear (and old ones disappear), so future decision makers will choose between new alternatives (model III). These future decision opportunities are lifecycle options. They provide flexibility for future decision makers to respond to unfolding events, and therefore enhance the building’s long-term performance.

A crucial advantage of the lifecycle options approach compared to other theories of flexibility is that the value of lifecycle options can be quantified by simulation, and compared to the cost of providing them. Only if the value is greater than the cost should flexible strategies be pursued. This test would minimise the risk of over-investing in expensive flexibility that could never realistically be used, as in, for example, the Free University of Berlin (Candilis Josic Woods, 1963-73)¹⁹ or the Lloyds Building in London (Richard Rogers Partnership, 1978-84), now Grade I listed. CAR is working with European partners on developing a software tool based on the lifecycle options theory, through the European Commission-funded CILECCTA project.²⁰ This will make the new theory of flexibility available to practitioners.

It seems to me that this example lies on the path of real architectural research, in the rational and mathematical tradition of Sir Leslie Martin and Lionel March, which should be cherished at the Martin Centre.

References


4. Leslie Martin’s own PhD of 1936 was on Spanish Baroque architecture.


15. Ruskin, op cit, p.v.


20. See: www.cilecta.eu

**Note**

The Conservation Management Plan for the Boots 'Wets' Factory was prepared by Cambridge Architectural Research Ltd and completed in 2010.

**Author note**

William Fawcett is an architect. His Martin Centre PhD on adaptability was supervised by Lionel March. After teaching at the University of Hong Kong he was a co-founder of Cambridge Architectural Research Ltd in 1987. In 2005 he became the Chadwick Fellow in Architecture at Pembroke College, pursuing Activity-Space Research at the Martin Centre.
Figure 1. Compositions of fragmented masses. (top) Weakly articulated in the Hepworth gallery at Wakefield by Sir David Chipperfield, completed 2011 (author's photo). (above) Boldly articulated in a house at Shipton-under-Wychwood by Stout & Litchfield (R Einzig photo from *Architectural Review*, February 1965, reproduced by permission of ARCAID).
Figure 2. Gable ends of reinforced concrete portal frames. (top) Empire Pool (now Wembley Arena) by Sir Owen Williams, 1933 (photo reproduced by permission of English Heritage). (above) Factory at Cassel by Curt von Brocke (from Architectural Design in Concrete, 1927, plate XLIX).
Figure 3. Industrial atria. (top) Current view of the packing hall in the Boots 'Wets' Factory by Sir Owen Williams, of 1930-32 (author’s photo). (above) The atrium in one of Albert Kahn’s Ford factories in Detroit (from Moritz Kahn's The Design and Construction of Industrial Buildings, 1917, plate XLVIII).
Figure 4. In designing a building the architect decides between alternative components. During the service life new decisions are made – they may repeat the initial decision (model I), but not necessarily (model II). In reality, new components appear and old ones disappear (model III). The future decision opportunities are lifecycle options. (author’s diagram).