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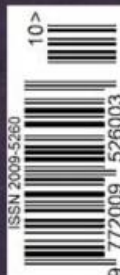
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The international style: performance vs pattern

In his latest column on the evolution of sustainable building design in the 20th century, Dr Marc Ó Riain looks at some early modernists who wanted their buildings to respond to local climate — and some who didn't.

It is easy to allege that the international style had a negative impact on the environment, and that its protagonists were exclusively concerned with form over such utilitarian concerns as climate. With some of its buildings over 100 years old, North America suffers from the world's largest CO2 footprint and its modernist architectural heritage is in the dock for disconnecting form from function.

The interwar period (1919-1939) saw the migration of the European international style to the UK, then onto North America, where it was criticised by such luminaries as Frank Lloyd Wright in 1930, who accused this "superficial, new 'surface and mass' aesthetic" of creating "badly built"... "cardboard houses"... "folded and bent in rectangles... glued together in boxlike forms..." unresponsive to their local contexts (Wright 1945).

Yet concurrently some of Wright's peers in Europe were either evolving the international style to respond to climate or indeed uncoupling the form from its interior climate.

Raoul Decourt's "maison isotherme" (isothermal house, 1925) was based on a machine for living, mechanically separating indoor and exterior climates. Such types of active air conditioning systems would later be introduced into cinemas (1920s), offices (1930s) and homes (1950s).

Radiant heating systems were integrated into floors, walls and ceilings by pioneering modernist architects such as Corbusier, Aalto and Duiker, whilst Frank Lloyd Wright was using underfloor heating, all before 1939. The technology of indoor climate control could free an architect to concentrate on form, whilst others sought to regionalise their buildings in the context of their climate.

Some modernists believed that climate was a logical evolution of the functionalist tradition, and that regional modernism could be a bioclimatic expression of a buildings' context. Mirroring the Keck brothers in the US, the Hungarian Olgay twins took this bioclimatic approach to their architecture in the early 1940s with regionally responsive buildings. The Olgays scientifically studied solar orientation, radiant heat transfer, time lag, micro-climatic effects, wind, exposure, and shading, whilst adopting heliothermic planning.

Exemplar projects such as their Budapest Tschögl apartment scheme (1940) and Stuhmer chocolate factory (1941)



The Tschögl apartment scheme, Budapest.
Photo: Adrian Tschögl

demonstrated that the modernist tradition and bioclimatic design were not mutually incongruent. Victor Olgay had a significant impact on US architecture, becoming dean of architecture at Princeton in the 1950s and publishing 'Design with Climate: Bioclimatic Approach to Architectural Regionalism' in 1963.

Perhaps surprisingly to some, Corbusier appeared quite concerned with solar gain in 1933, when he redesigned a skyscraper for his proposed Cite Radieuse, by adopting fixed 'brise soleil' in a new section "dictated by sunlight" (Corbusier).

Corbusier also experimented with active

brises-soleils are not entirely appropriate" (Corbusier 1960). Such examples challenge the notion that all the protagonists of the international style were exclusively focused on form over function.

The European modernists brought both a new formal language and the beginnings of bioclimatic design to North America after WW2 to blend with indigenous practice. With the Olgay brothers at Princeton, Mies at IIT Chicago, and Gropius at Harvard, European architects would establish different paradigms for modernism in the US.

'Regional modernism' (Gropius, Olgay, Wright) and the purist International style (Mies) fought for dominance. The international style adopted active technologies to free its architecture from the concerns and limitations of climate, thus allowing for transparency and the dogmatic articulation of structure and grid. This found favour with companies who wished to express their industrial egos through puritanical and inefficient glass and steel buildings, which would go on to define the US skyline for the next century.

In the next article we will look at how a group of indigenous architects responded to the need for post war housing in the UK and US. ■

“ The international style adopted active technologies to free its architecture from the concerns and limitations of climate.

systems on the City of Refuge (1933), using mechanically operated active double skin facades (murs neutralisants), mechanical ventilation with heat recovery (respiration exacte), and an air tightness that would be almost 60 years before passive house. Budget restrictions and mechanical failures caused summer overheating from solar gain, with intolerable living conditions for its homeless occupants, leading to performance failure.

In 1933 Corbusier also designed a block of flats in Algiers with sheer glass walls on the north and east sides, and brise soleil on the south and west elevations (Mackenzie 2011) ... "the sun must never touch a pane of glass during the summer period, between the two equinoxes... the sun may be desirable at the winter solstice but be intolerable at the summer solstice. Therefore, fixed

Dr Marc Ó Riain is the president emeritus of the Institute of Designers in Ireland, a founding editor of Iterations design research journal and practice review, a former director of Irish Design 2015, a board member of the new Design Enterprise Skillsnet and has completed a PhD in low energy building retrofit, realising Ireland's first commercial NZEB retrofit in 2013.