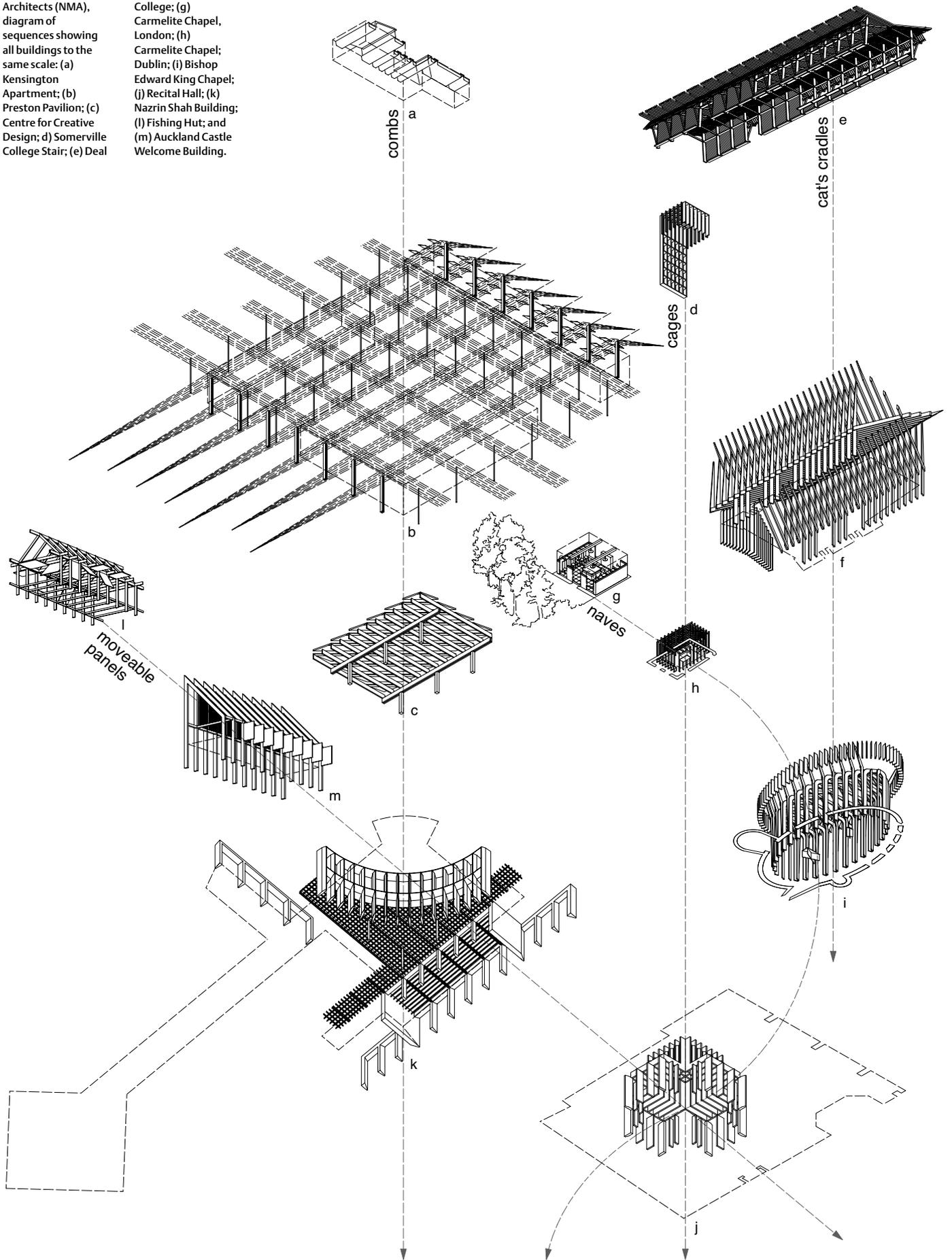


- 1 Niall McLaughlin Architects (NMA), diagram of sequences showing all buildings to the same scale: (a) Kensington Apartment; (b) Preston Pavilion; (c) Centre for Creative Design; (d) Somerville College Stair; (e) Deal Pier Café; (f) Jesus College; (g) Carmelite Chapel, London; (h) Carmelite Chapel; Dublin; (i) Bishop Edward King Chapel; (j) Recital Hall; (k) Nazrin Shah Building; (l) Fishing Hut; and (m) Auckland Castle Welcome Building.



An ‘architecture of line’ manifest as arrays and lattices in the work of Níall McLaughlin Architects is examined within the context of related work by other historical and contemporary designers.

Combs, cages, and thickets: Níall McLaughlin and an architecture of line

Andrew Carr

Repeating linear elements organised into arrays and lattices are commonly manifest in the work of Níall McLaughlin Architects. This article describes a series of projects that explore the use of this ‘architecture of line’ in the work of the practice. Organised by formal development, rather than chronology, it identifies sequences that evolve from a two-dimensional handling of line, as combs, to a thickened three-dimensional handling that produces cat’s cradles, cages, naves, thickets, and forests. The work of other architects and their handling of line is placed within and alongside these sequences, informing our understanding of McLaughlin’s work, particularly his spatial and temporal handling of the relationship between inside and outside.

Lines of inquiry

The individual buildings of Níall McLaughlin Architects have been widely published in the architectural press, often by prominent critics including Joseph Rykwert and William Curtis,¹ yet little exists that provides a wider critical overview of his output and direction across multiple projects. Among the many interviews and descriptions of his work a special issue of *The Architects’ Journal* in 2018 included a part-biographical interview and editorial followed by reviews of three projects.² While noting the ‘distinctive quality of his architecture’ the conversational format did not attempt to define it. Two separate publications by Mary Ann Steane develop a deeper critical exploration of McLaughlin’s use of light in relation to liturgy and setting, firstly in an intervention in a Carmelite Monastery, Kensington, and in the Bishop Edward King Chapel, Cuddesdon, noting how ‘McLaughlin builds light’.³ This much published project has been considered by others including Ellis Woodman, who also links the chapel with the Carmelite Monastery, McLaughlin’s only other religious commission at the time.⁴ By contrast, Peter Salter’s review, despite having the title ‘Ark of Light’, emphasises the spatial and constructional aspects of the building.⁵ Many reviews of McLaughlin’s buildings tend to be primed by his own descriptions of his work,

which contain diverse points of reference, including poems, literature, paintings, archaeology, history, scientific ideas, theory, and the work of other architects.

This study considers multiple projects by McLaughlin and focuses on an examination of their use of linear elements, attempting to make connections between each project and placing them in the wider context of the work of other architects using similar architectural means. McLaughlin’s writing and references are used selectively to inform the exploration. Gottfried Semper is a recurring presence in his thinking, informing his attitude to construction, representation, and spatial formation, and is discussed in relation to the works being considered. T. S. Eliot’s essay ‘Tradition and the Individual Talent’ (1919) is cited by McLaughlin as a way of situating his output in relation to the body of work produced by others.⁶ The much quoted essay considers strands of thought and enquiry as remaining perpetually unfinished, being developed by individuals acting over time. McLaughlin goes so far as to embed a ‘trail of crumbs’ in one project that link his work with related buildings by other architects.

These living lines of thinking, or ‘traditions’, are referred to by George Kubler in his *The Shape of Time* (1962), in which he sought to reconsider art historical development and classification beyond biography and a lineage of styles, towards a consideration of sequences addressing a problem. Such sequences might develop at different rates revealing invention, replication, and mutation creating ‘linked solutions’ that:

*occupy time in a great variety of ways [...]. They disclose a finite yet uncharted domain of mental forms. Most of these are still open to further elaboration by new solutions. Some are closed, completed series belonging to the past.*⁷

This non-linear historical sense, which emphasises the evolution of living sequences of ideas and forms, is here used to examine McLaughlin’s ‘search’ for ‘an architecture of line’ alongside the searches of near and more distant contemporaries adopting similar approaches. The comparison functions in two

reciprocal directions, both aiding an understanding of the nuances of McLaughlin's approach and helping examine the work of others. While this study focuses on line it is not intended to suggest that this is the sole preoccupation of McLaughlin's practice, but one area of exploration among others.

Several sequences are considered: the first looks at a two-dimensional handling of line to produce combs and weaves in a single plane. The second expands into a more three-dimensional handling of line to create cages and cat's cradle-like forms from intersecting planes of comb-like surfaces. Their expanded role as an environmental filter and spatial, metaphorical, and intellectual enclosure is developed before concluding with an examination of thickets, naves, and forests. The sequences are intended as a temporary scaffold to help understand McLaughlin's work. Some works coexist in different series and the lines of connection and exploration will change as new works appear and older ones are reconsidered [1].

The study has been developed, simultaneously, through writing and drawing. The process of drawing has been used to isolate elements of line within each architectural work through editing and iteration. Eventually an axonometric drawing convention, rendered in a single line weight, was adopted throughout. This reductive means of depiction isolates linear elements and allows a focused comparison between a range of different projects. The drawings are considered as 'critical architectural texts', to borrow from Peter Eisenman's description of his analytical drawings of buildings by Terragni and others.⁸ Both the process of developing each drawing and their final form assist in understanding and interpreting the role of line in McLaughlin's work and the wider critical framework of other architect's work employing line in a comparable way.

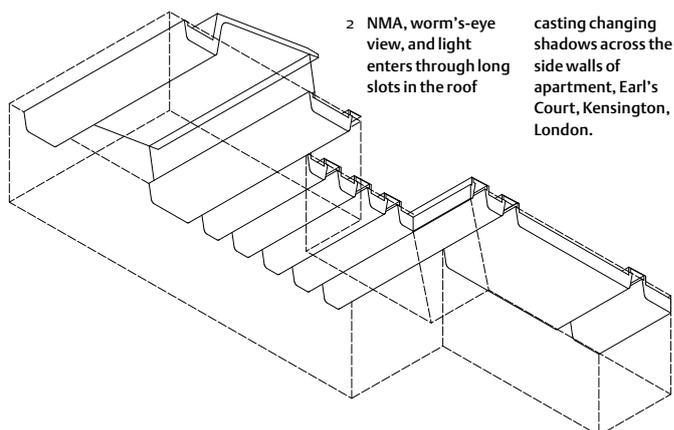
Typically, a worm's-eye viewpoint has been adopted allowing ceiling and wall planes to be understood together. The resultant images recall the analysis of space and construction in the drawings of Auguste Choisy, drawn as a retrospective analysis of an existing building, or the projective design drawings of James Stirling interrogating route, form, and facade. In some cases the process of editing and establishing a viewpoint or

convention to depict the work, via a drawing, have informed the analysis. Where aerial viewpoints have been adopted it has been in response to a perceived relevance of the floor plane and its interaction with linear elements. In some studies, such as Kengo Kuma's Hiroshige Museum, the intensity of line creates dense visual effects approaching the illegible. Here physical linear elements, represented with width, depth, and length in other studies, have been reduced to a single two-dimensional line. The graphical qualities of the drawing echo the implied mass evoked by the dense line, informing the written analysis and aiding an understanding of the formal qualities of the architectural work.

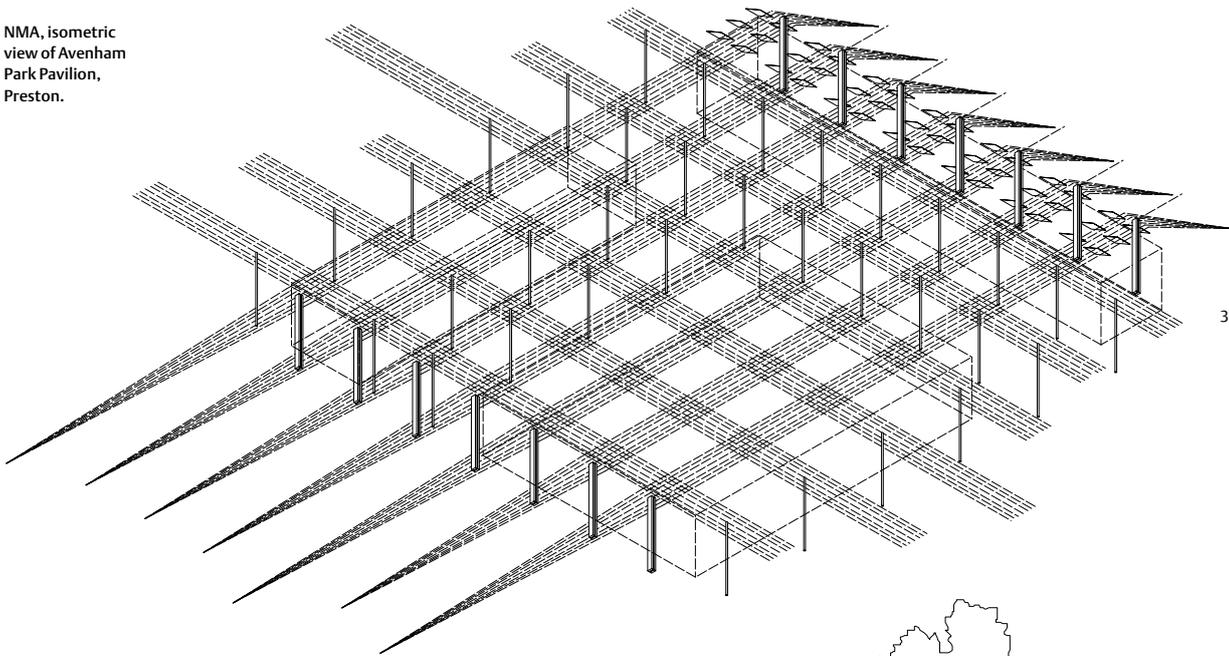
Like Choisy, the drawings are based on buildings that already exist, so differ from the type of drawings McLaughlin might have used to conceive each work. His visible output of design drawings typically combines hand drawn sketches, using line, with further computer-generated images. It appears that earlier collaborative design stage sketches are destroyed and only considered a means to an end rather than an entity in their own right. One drawing McLaughlin has produced retrospectively revisits an Alzheimer's Centre designed and built by the practice in Dublin. Entitled 'Losing Myself', the drawing consists of projections of multiple hand drawn images tracing the speculative inhabitation of the space throughout a day and seasons. Drawn by McLaughlin, collaborator Yeoryia Manolopoulou, and others, this contrasts the transient wandering lines of inhabitation of many authors, with the firmer lines of walls and boundaries. This dialogue between the fixed and fleeting echoes many of the themes discussed in this study.⁹

An architecture of line

McLaughlin uses the term 'architecture of line' in a lecture given in 2004 and documented in 'A Royal Gittern at the British Museum' (2007),¹⁰ describing the early work of his practice and teaching with Unit 17 at the Bartlett, University College London. This work 'searched' for spaces where 'boundaries are no longer described by enclosing surfaces' but by 'thickets' where 'the spatial property they have is that of immersion; the sense that the space we inhabit is a continuous dense weave without edges'.¹¹ Various reference points are cited to



3 NMA, isometric view of Avenham Park Pavilion, Preston.



illustrate this sense, including; a medieval gittern, a guitar-like stringed instrument whose surface is decorated with dense foliage and people, the pattern-dense environments of Irish sitting rooms, an Andreas Gursky photograph of a workshop with a 'rainshower' of tools and cables hanging from the ceiling, a painting of a wood by Albrecht Aldorfer and a Bridget Riley painting with a layered, musical structure. The essay is also illustrated with various projects where McLaughlin describes how:

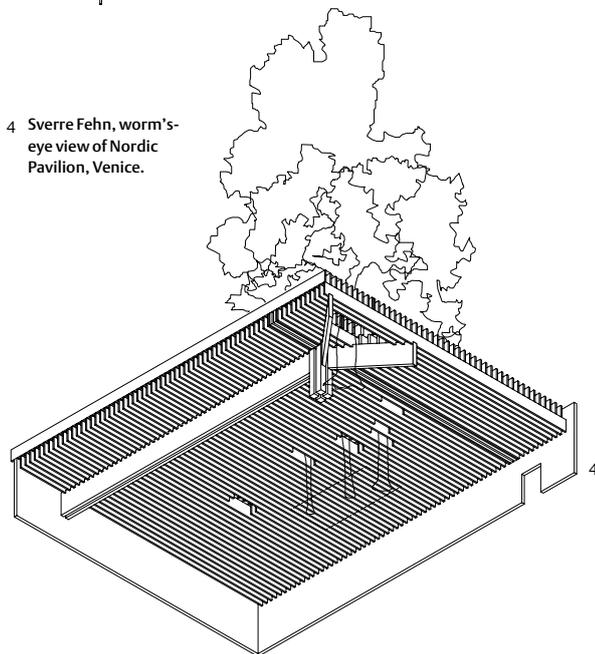
*The screen has become a favourite device in our search. It is both surface and space. There is pattern, repetition and variation. Screens hold light within themselves, and this can manifest the passage of time across the day. Sometimes they seem like clocks.*¹²

As the work of the practice has evolved the deployment of linear elements, organised into arrays and lattices, permeates many projects. A repetitive combination of the presence and absence of a linear form, usually a fin, allows or denies the passage of light, air, or movement and implies a perforate spatial enclosure.

Combs and weaves

An apartment renovation by McLaughlin for the top floor of an existing building in Earl's Court, Kensington, London, provides an early built example of an architecture of line used to form the roof plane of a living space. Completed in 2006, the upper floor of the apartment is a large living, dining, and kitchen space lit predominantly from above. Light enters the space through long slots in the roof plan formed by deep curved reveals, glazed with a hidden roof light above, which repeat at regular intervals across the space. A larger, taller slot defines a sitting area. The array of slots admit light into the space, the deep reveals creating bars of light and soffits strips of shadow, which begin to diffuse and intermingle as they reach the floor. This interaction is revealed on the side walls where shadow and light rotate, fade and intensify

4 Sverre Fehn, worm's-eye view of Nordic Pavilion, Venice.



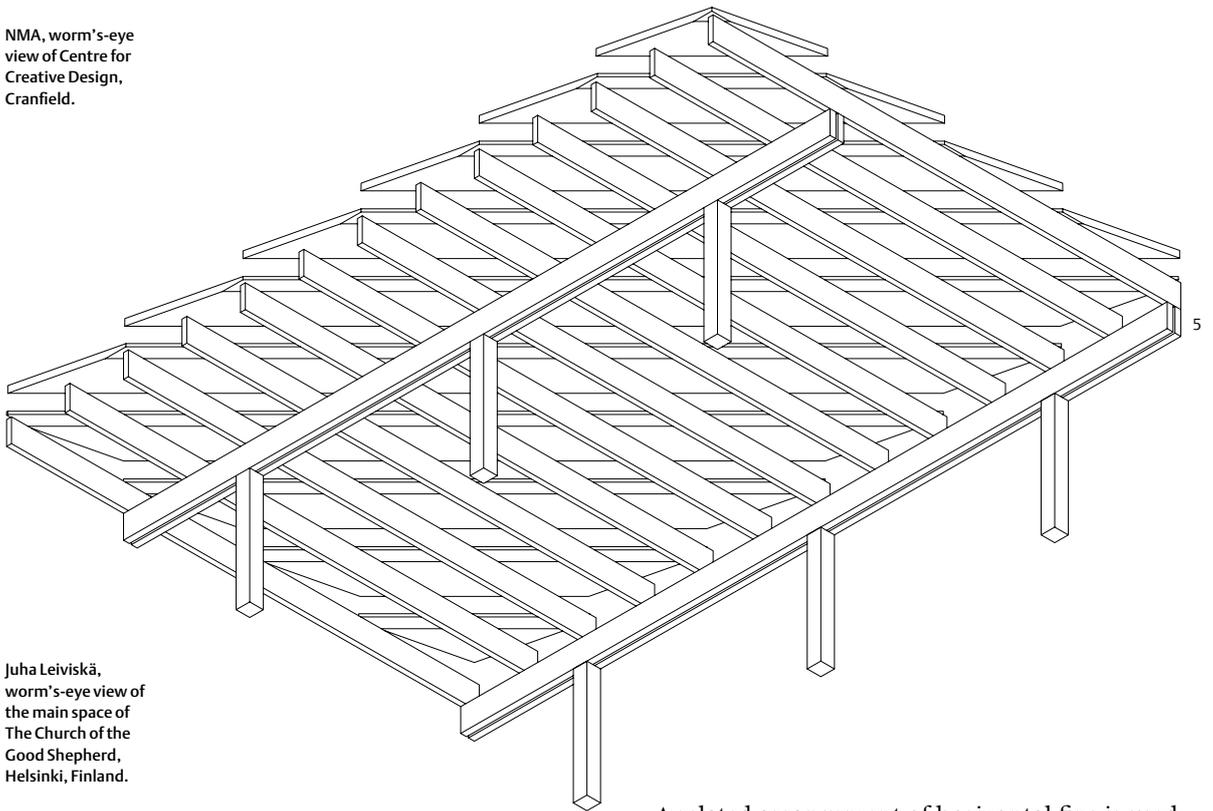
throughout the day and year as the sun moves and weather changes [2]. McLaughlin describes the apartment thus:

*The apartment is designed around light. The space is intended to change as the sun wheels overhead; sometimes beams of light are cast down the walls, sometimes light is blurring the soft shades of blue and grey. The luminosity of the room shifts continuously through the day and through the seasons.*¹³

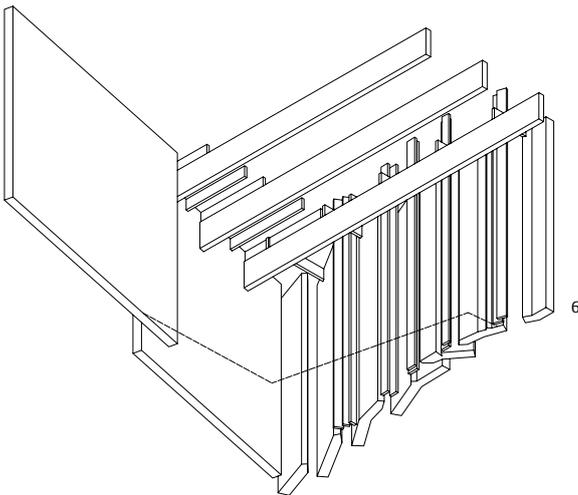
The use of the ceiling plane as an environmental filter to form spaces below is further explored in unbuilt competition proposals for a new cafe and community space in Avenham Park, Preston, an area with a history strongly connected with the textile industry and a high annual rainfall. Designed in 2005, around the same time as the apartment, McLaughlin defines new spaces with a 'loom' roof that might 'delay' the passage of rainwater, filter sunlight and provide shelter:

The fine-cable structure would nest arrays of weather catching devices: basins, gutters, gargoyles, downpipes, sluices, solar panels and wind turbines.

5 NMA, worm's-eye view of Centre for Creative Design, Cranfield.



6 Juha Leiviskä, worm's-eye view of the main space of The Church of the Good Shepherd, Helsinki, Finland.



*The cyclical and flickering activity of these elements would interact with seasonal changes in the foliage to create a changeable shade beneath the canopy. We hoped that people would come to experience the rain.*¹⁴ The resultant weave of lines, propped on timber trusses, creates an environmental filter that interacts with the rain, while defining a spatial enclosure with its woven structure [3].

In both the Kensington apartment and the Avenham Park Pavilion the handling of the ceiling plane as a comb fuses the presence of solar and meteorological rhythms of the outside world with the interior worlds they create. This creates a very particular relationship between inside and outside. The inner world is linked to the rhythms of the outer world but protected from it. When brought inside, the outer world has been transformed and represented using architectural combs and weaves. This approach is not unique to McLaughlin.

A related arrangement of horizontal fins is used by Sverre Fehn in the Nordic Pavilion in Venice but to a different end. Here the brief was for a large exhibition space, which Fehn defines with a roof formed of two layers of repeating beams laid perpendicular to one another. The second layer of beams avoids the direct penetration of sunlight below, transforming the strong Venetian light into something softer and more diffuse, arguably having more in common with a Scandinavian quality of light, as it is a Nordic pavilion, than one of the Mediterranean. Where the trees interrupt the beams, gaps allow narrow shafts of sunlight into the space [4].¹⁵

The pavilion has similar spatial properties to the Kensington apartment: top lit via a repeating slot or beam, and punctuated with a focal point of a higher slot in the apartment and penetrating trees in the pavilion. As at the Avenham Park Pavilion and in the Kensington apartment, the light and meteorological conditions of the outside world are transformed, using devices of combs and weaves, to create an inner world that is spatially separate but temporally intertwined, accelerated, and represented. In contrast to McLaughlin's work, the Nordic Pavilion creates an inner world that distances itself from its geographical location, intent on making connections with another latitude. The temporal qualities of the two approaches are very different: Fehn's approach, though using similar means, seeks a slower, softer, diffuse quality of light, arguably more appropriate for the changing display of cultural objects and in making symbolic geographical connections. A related, double-layered approach is used by McLaughlin in the roof of the Centre for Creative Design for Cranfield University to create an even light to the teaching and research spaces below [5].

At the Avenham Park Pavilion and in the Kensington apartment the changeable qualities of light are sought and enhanced. Compared to an open ceiling plane, which would allow light to fall without shadow, making it difficult to perceive change and the passage of time, these roofs comb the light, casting multiple shadows, thus ‘changing its speed’ as McLaughlin intended.¹⁶ Juha Leiviskä achieves something similar with vertical fins and planes. At the Church of the Good Shepherd, Helsinki, a focal wall behind the altar of the main sanctuary in the church is a complex arrangement of fins of different widths, angles, and spacings that is sensitive to even small changes in the quality and quantity of external light as it reflects off multiple surfaces [6].

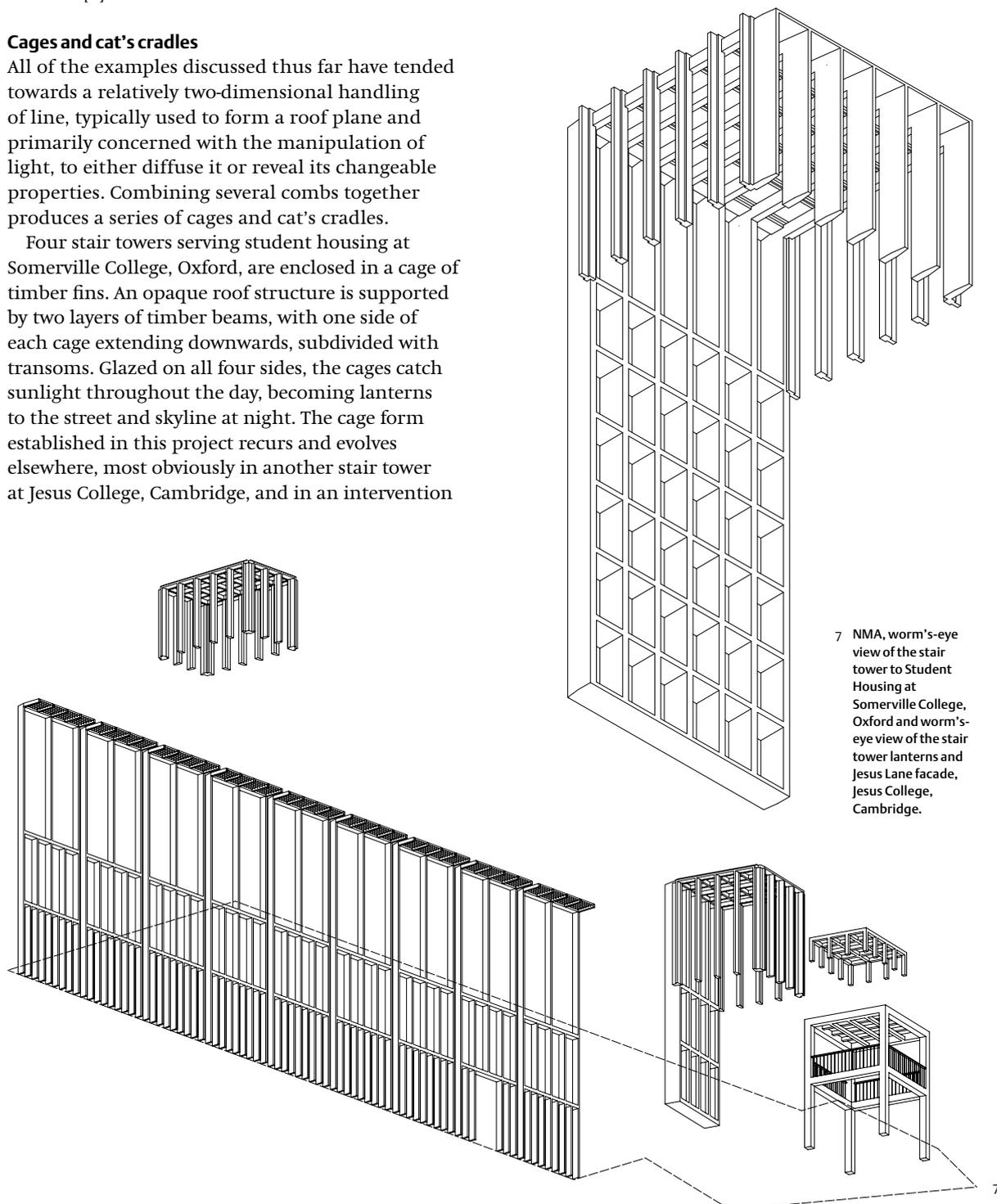
Cages and cat’s cradles

All of the examples discussed thus far have tended towards a relatively two-dimensional handling of line, typically used to form a roof plane and primarily concerned with the manipulation of light, to either diffuse it or reveal its changeable properties. Combining several combs together produces a series of cages and cat’s cradles.

Four stair towers serving student housing at Somerville College, Oxford, are enclosed in a cage of timber fins. An opaque roof structure is supported by two layers of timber beams, with one side of each cage extending downwards, subdivided with transoms. Glazed on all four sides, the cages catch sunlight throughout the day, becoming lanterns to the street and skyline at night. The cage form established in this project recurs and evolves elsewhere, most obviously in another stair tower at Jesus College, Cambridge, and in an intervention

in an existing building to create a Carmelite Prayer Room in Dublin, which will be discussed later as part of another connected sequence. As a formal motif the cage is also present in the handling of several facades created by the practice such as at the LAMDA Drama School in Baron’s Court, London and student accommodation at Jesus College, Cambridge [7].

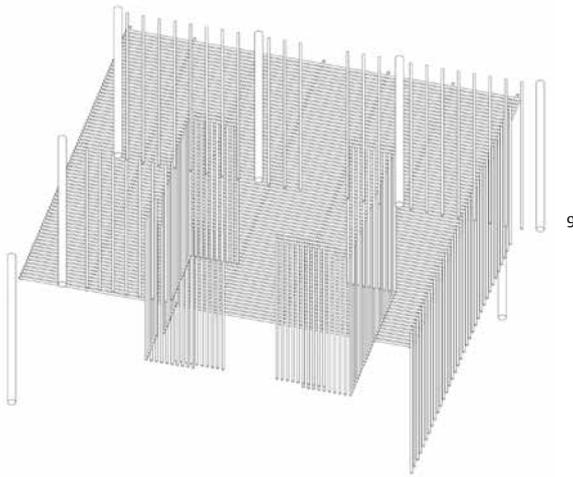
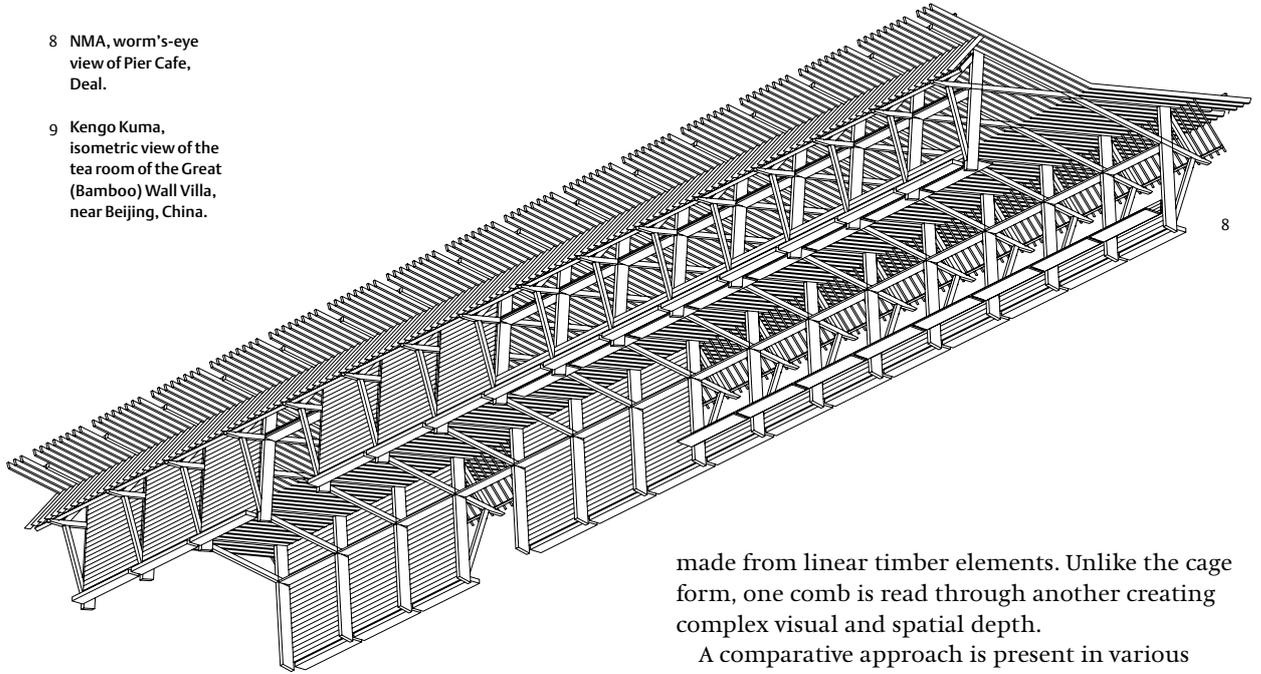
The term ‘cat’s cradle’ comes from McLaughlin, although it is also shared with his tutors at University College Dublin, Sheila O’Donnell and John Tuomey, who use it in two different senses; to describe their non-rectilinear projects and with reference to poet W. H. Auden’s warning against the artist becoming lost and isolated within their own



7 NMA, worm’s-eye view of the stair tower to Student Housing at Somerville College, Oxford and worm’s-eye view of the stair tower lanterns and Jesus Lane facade, Jesus College, Cambridge.

8 NMA, worm's-eye view of Pier Cafe, Deal.

9 Kengo Kuma, isometric view of the tea room of the Great (Bamboo) Wall Villa, near Beijing, China.



personal structures and vision.¹⁷ Here the term is used to describe the interlocking of multiple combs at angles to enclose spaces and derive more complex form. At the Deal Pier Cafe arrays of linear elements enclose a space on an existing pier projecting into the North Sea. A repeating primary iroko frame, which includes angled internal tie beams, sets out an upper butterfly of spaced rafters that project into the sky following the lines of the ties. A smaller comb of angled timbers below connects to the opposite end of the tie. The resultant 'cat's cradle' of timber combs is fully enclosed at its northern end to create privacy to the toilet area, has panels of glazing in its middle, and at the southern end opens fully to the wind and rain of its very exposed setting [8].

The structure itself eschews a clear distinction between inside and outside, projecting and forming intermediate spaces that comb and entrap open space. At the base of the structure external benches further blur this relationship, creating a space to sit under the partial shelter of the timber combs above. The handling of the lattice seeks to intertwine with the space, weather, and use within which it is immersed. Spaces are implied by combs

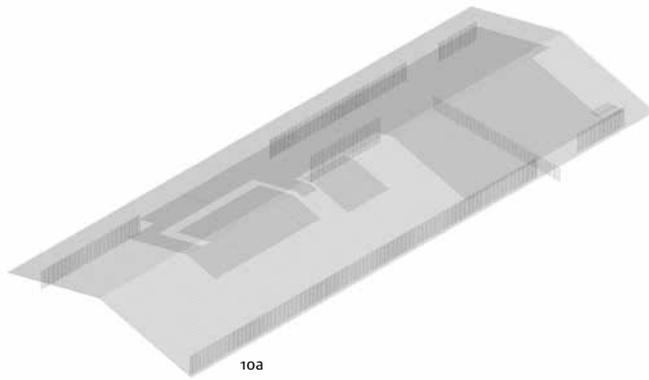
made from linear timber elements. Unlike the cage form, one comb is read through another creating complex visual and spatial depth.

A comparative approach is present in various works by Kengo Kuma, who characteristically defines the spatial enclosure of a building using alternating solids and voids. While he has experimented with a wide range of materials to achieve this, his earlier works commonly use arrays of slim timbers to form screens. At the Great Bamboo Wall Villa, near Beijing, China, nested cage forms define a tearoom with views out to the Great Wall. Outside the thermal envelope of the building, the vertical and horizontal bamboo screens create an enjoyably ambiguous space somewhere between interior and exterior [9].

This ambiguity continues at the Hiroshige Museum in Nasu, Japan, which combines solid and void in both the spatial planning of the building and the handling of its enclosure. The route to the museum creates an axis between the town and a nearby hill, which is registered in an open entrance space under the pitched roof form of the building. This creates an outdoor space, within the shelter of the roof of the building, that is both inside and out. The walls and roof are formed from combs of closely spaced cedar timbers hiding a primary steel structure and layered with areas of glazing and translucent materials, suggesting that the museum is permeated with its environment [10]. Similar devices are present in much of Kuma's work and demonstrate a wider preoccupation, linked by Kuma in this instance to the works of Japanese Ukiyo-e artist Utagawa Hiroshige, which the museum was built to house:

This idea that nature and objects are not contrasting elements, but rather parts of a continuous environment, is implicit in Hiroshige's two-dimensional technique. His straight-lined rain seemed to me to symbolise this very Japanese concept, and I translated that rain into cedar louvers.¹⁸

Kuma reads Hiroshige's visual handling of rain as a means of immersing those depicted in nature. His wider writings describe his interest in dissolving architecture in an attempt to connect architecture and people with nature. 'My ultimate aim is to "erase" architecture, because I believe



10 a, b, c Kengo Kuma, worm's-eye view of Hiroshige Museum, Nasu, Tochigi, Japan; wall and roof planes are formed from 30 x 60 mm cedar sections; evening

Squall at Shono (Shono hakuu); Utagawa Hiroshige, no. 46 from the series Fifty-Three Stations of the Tokaido (Tokaido gosantsugi no uchi), 1832–3.



10b

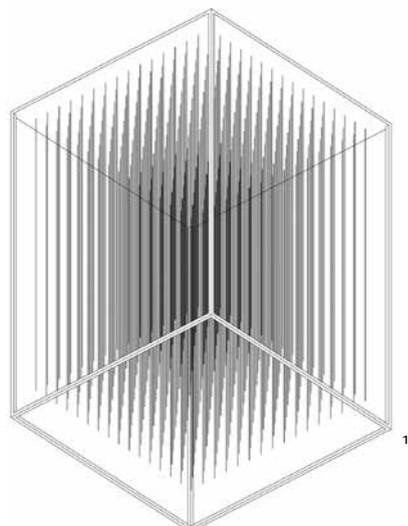


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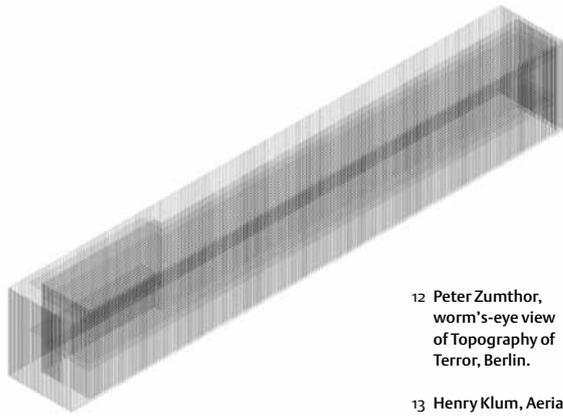
that a building should become one with its surroundings.¹⁹ At the Hiroshige Museum, Kuma uses comparatively slim 30 x 60 mm cedar sections, spaced at close 120 mm centres to form the primary spatial enclosure. This pushes the spatial envelope towards a combination of voids and the thinnest, most insubstantial linear of elements.

A similar concern with fragility, delicacy, and disappearance is shared with other Japanese architects and artists such as Sou Fujimoto, Junya Ishigami, and Ryuji Nakamura, who McLaughlin referred to in his delicate proposals for a canopy in King's Cross, London.²⁰ The repetition of similar elements, often of a delicate scale, also cause optical effects which further reinforce the sense of dematerialisation. McLaughlin has explored such effects using coloured lines and weaves set within separating glass screens in an office fit out for YSC in London. Here the lines of one screen overlay and optically 'flicker' with the lines of another and recall the investigations of artists such as Jesús Soto, who have created both two-dimensional and immersive 'penetrable' works – consisting of multiple linear elements where 'dematerialisation was expressed through the effects of optional vibration created by the serial repetition of superimposed geometric elements'.²¹ Multiple, thin elements combine at scale, in three dimensions, to create a dense mesh that suggests volume. A similar effect occurs with Kuma's timber and void linings that oscillate between presence and absence such that they are literally only half there. Ironically, this delicacy when viewed closely contrasts with an almost monolithic appearance when viewed from a distance [11].

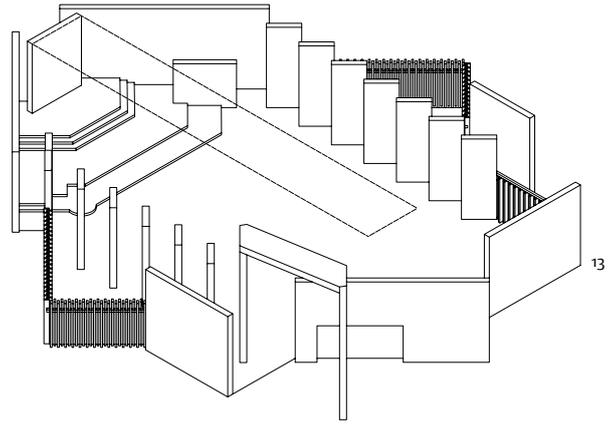
Using more substantial elements, a related strategy was adopted by Peter Zumthor in his proposal for the Topography of Terror in Berlin. Here 300 mm wide concrete columns placed at 520 mm centres are used to define a long, rectangular volume. The resulting 'fences' define a perforate spatial enclosure, partially solid but open to admit light and allow a view when looking perpendicular to the plane of the array. When looking along each array views through the fins are blocked, their side faces presenting an opaque rhythm of lines that reflect light and register shadow. This theatrical potential of line is exploited by Henry Klumb at San Martin de Porres Church, Puerto Rico, where angled fins are arranged along the sides of the church to



11 Jesús Soto, worm's-eye view of Penetrable Sonoro (1971) metal, fiberboard, paint, 98.4 x 70.9 x 70.9 inches.

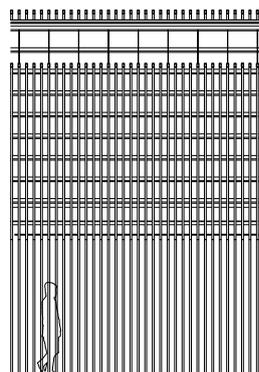
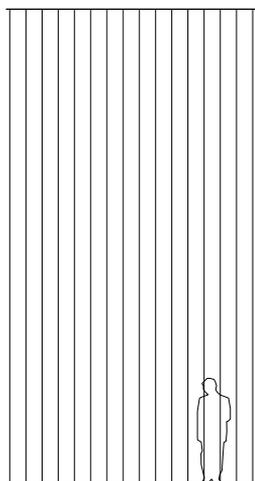
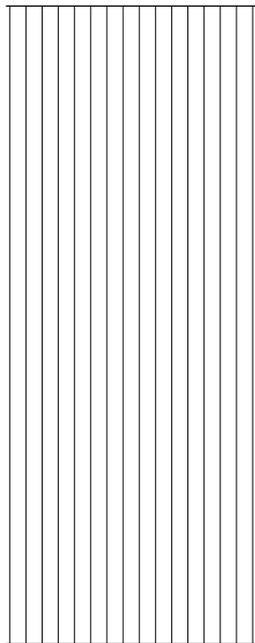
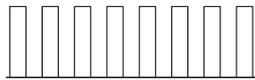


12 Peter Zumthor, worm's-eye view of Topography of Terror, Berlin.



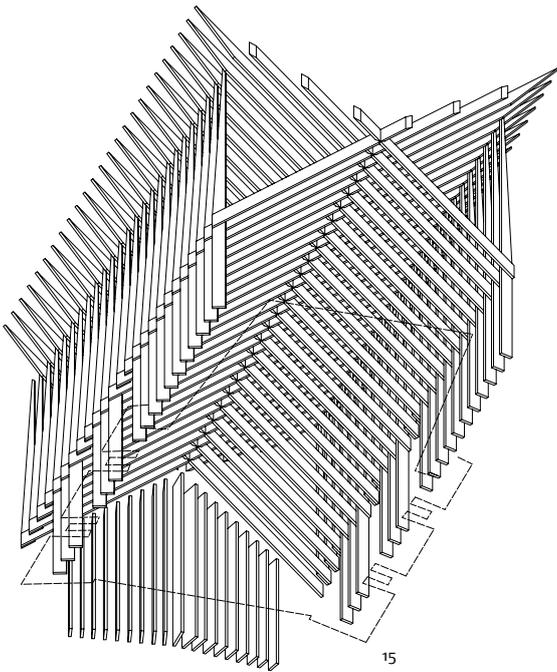
13 Henry Klum, Aerial view of San Martin de Porres Church, Puerto Rico.

14 Comparison of two facades drawn to the same scale, showing the Topography of Terror on the left and the Hiroshige Museum on the right.

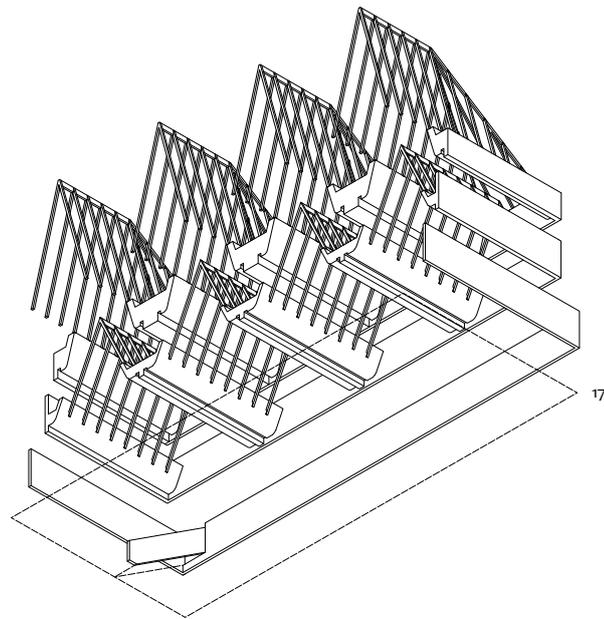


focus the views of the congregation on the altar during worship. At the end of the service the congregation turn to leave, their viewpoint reversed such that they can now see the world they are returning to between the fins. A similar device was proposed on a larger scale by Colin St John Wilson in his scheme for Coventry Cathedral [12, 13].²²

Each of these examples handle spacing and structure in a different way: a wider spacing creates colonnades and isolates individual elements such that they read as columns, rather than collectively as screens. A tighter spacing produces screens commonly manifest as vertical blinds, brise soleil, louvre banks, venetian blinds, and pergolas. Kuma tends to hide structure within his perforate envelopes, as at the Hiroshige Museum where a steel frame is lost behind layers of timber screens, reinforcing a sense of weightlessness and fragility, whereas Zumthor uses line structurally. McLaughlin tends to adopt a structural approach at an intermediate spacing, as in a development of the cat's cradle section proposed for Jesus College, Cambridge to create an auditorium. Two crossed combs of timber rafters repeat at the same frequency as two combs of vertical fins. The resultant lattice defines an acoustically useful large volume that is subdivided into a lower inner space and a trapped triangular space above. Glazed side walls allow light to filter through two combs before reaching the auditorium below. McLaughlin describes these trapped volumes as 'beyond-spaces' being inside but inaccessible, thickening an ambiguous zone between inside and out.²³ A similar quality is imbued in the work of Fay Jones and Maurice Jennings at Thorncrowne Chapel, Eureka Springs, Arkansas, where the difficulty in accessing a remote location for construction dictated the use of multiple smaller elements. The resultant timber lattice filters light and echoes the linear rhythms of tree branches and trunks. The approach also recalls devices used by Alvar Aalto in projects such as the National Pensions Institute, Helsinki, where roof lights to the main hall use double layers of line to trap an inaccessible, intermediate space, creating a thermal buffer to the Scandinavian climate. This dialogue with Aalto will be further developed after considering a third cat's cradle project that is based on a centralised rather than linear geometry [14-17].



15

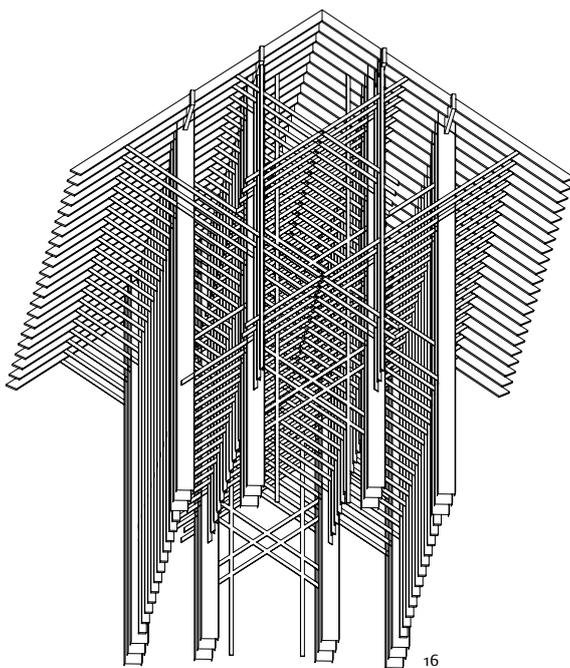


17

15 NMA, worm's-eye view of Jesus College auditorium, Cambridge.

16 Fay Jones and Maurice Jennings, worm's-eye view of Thorncrown Chapel, Eureka Springs, Arkansas.

17 Alvar Aalto, worm's-eye view of National Pensions Institute Hall, Helsinki.



16

Thickets, naves, and forests

A distinct spatial type based on a centred, inner world forms an interconnecting series that uses both cages and cat's cradles. Beginning with projects for religious communities each frames a prayer room or place of worship, in a rich, intertwined combination of the physical, environmental, and metaphorical.

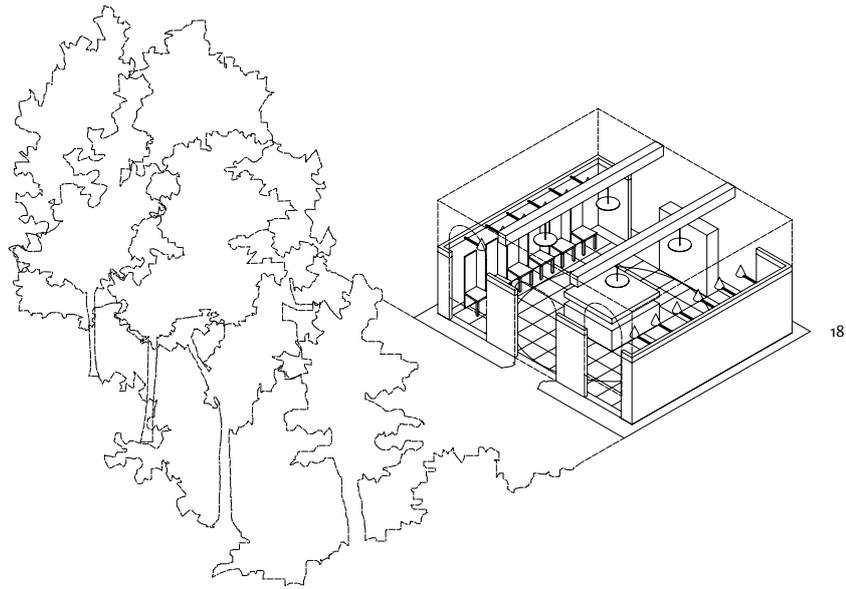
A new chapel space for a Carmelite order in Kensington, London, is set within an existing building. A central axis, flanked by chairs on both sides, runs through the square plan, linking a door to the garden with the square altar and the tabernacle. Relationships are thus established around the altar; between the garden, suggesting

nature and Eden, the tabernacle, representing the divine, and those assembled. The central position of the altar is further emphasised by a circle that almost touches the chairs and door to the garden. An inner lining creates a horizon above eye height but below the existing ceiling. The project relies upon careful placement and platonic geometries, rather than an architecture of line, but establishes a dialogue between the inner world of the chapel and the outer world of the garden that informs the sequence [18].

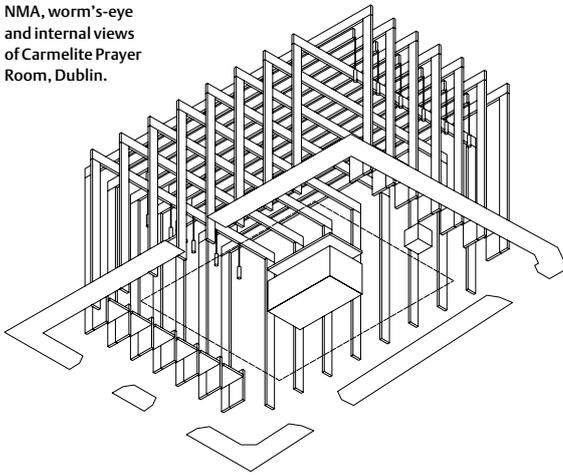
The visible and implied platonic geometries of the Kensington chapel are replaced with a rectangular timber cage within an existing building in another small chapel for the Carmelites, in Dublin. The insertion of a precise timber lattice structure within the more irregular existing walls creates a contrast between a perfect, ordered inner world and the more contingent, incidental world beyond. The cage is made from repeating timber columns and beams to create a rhythm that incorporates seating, light fittings, and the tabernacle. Light from two existing windows is allowed to creep through the cage, while two doorways provide access. The floor finish creates a perimeter relating to the seats and inner area for the altar and lectern [19].

Bishop Edward King Chapel, at Ripon Theological College in Cuddesdon, Oxfordshire is a much larger space, based on an elliptical geometry with seating arranged antiphonally within a laminated timber structure of columns that rise, fork, spread, and connect with neighbours to support the roof. The altar and lectern are placed at the gravitational centres of the orbit of the timber structure, which defines the inner space of the chapel. Surrounding and set back from the columns, to create a

18 NMA, isometric view of Carmelite Chapel, London.



19 NMA, worm's-eye and internal views of Carmelite Prayer Room, Dublin.



perimeter aisle, is a solid wall that is penetrated at various points to create side chapels, entry points, and recesses, arranged centripetally and episodically beyond the calm of the sanctuary. The wall stops short of the roof creating a clerestory of vertical stone fins, allowing light to find its way through the inner frame, bringing the luminous animation of the sun, weather, and surrounding tree branches into the sanctuary [20].

McLaughlin cites various sources and influences in the evolution of the design of the chapel including Rudolf Schwarz's St Michael's Church in Frankfurt, Germany.²⁴ Here, as with Schwarz's St Theresia Church in Linz, Austria, elliptical forms are used that include perimeter incidents to create side chapels and entrances. While having similarities



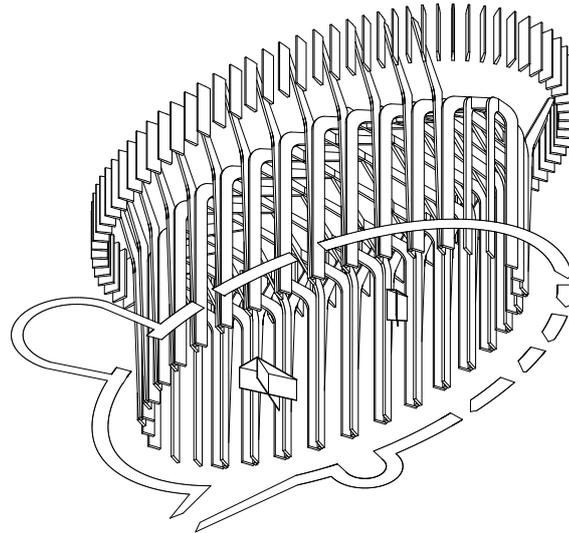
with Bishop Edward the relationship of structure, enclosure, and the effect of light is different. The structure of each of the Schwarz churches, though visible, is embedded within the enclosing perimeter surface, which defines the interior space. Gaps between this surface and the cage structure allow light directly into the interior, typically at high level in a clerestory-like arrangement [21].

The 'halo' of light from the clerestory of another chapel, Zumthor's Saint Benedict Chapel, Sumtvig, Switzerland was witnessed by McLaughlin and has reappeared at Cuddesdon. Zumthor's teardrop-shaped space has a timber structure, which is offset from a gently reflective enclosing wall surface, stopped short of the roof to create the clerestory. The floor of the chapel extends to touch the edge of these columns, which disappear below to create a sense of separation between each element of the spatial enclosure. Zumthor refers to the structure as a 'Baldachin', reinforcing, in his conception, this sense of separation [22].²⁵

Bishop Edward is a conscious development of this sequence of chapels, the line of structure moving further inwards with each iteration, until the columns escape the wall to create an ambulatory around the sanctuary. McLaughlin even leaves a 'trail of crumbs' within the plan of the building that make reference to the entrance porch of St Benedict and the side chapel of St Michael's to acknowledge their influence. This is just one of many ideas that have been layered on

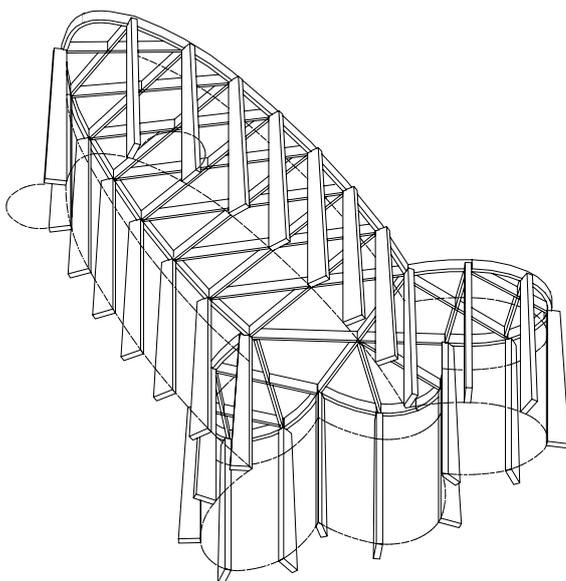
the conception of the building. Gottfried Semper's 'Four Elements of Architecture', each associated with a different way of making, is also used by McLaughlin to conceptualise parts of the building: the floor gently stepping downwards is considered earthwork, the timber columns designated structure, the altar and lectern holding the Word assigned the role of hearth and, significantly, the elliptical outer wall of the chapel is considered its woven spatial enclosure.²⁶

The experiential qualities of the building present a more complex and ambiguous relationship



20 NMA, worm's-eye view of Bishop Edward King Chapel, Cuddesdon, Oxfordshire; interior view showing light broken by the clerestory and cat's cradle reflecting off the timber fins and ambulatory wall.

20



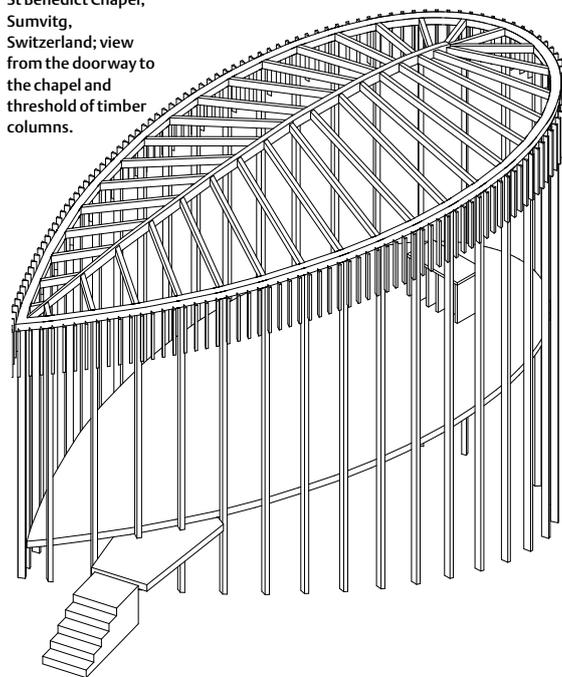
21 Rudolf Schwarz,
worm's-eye views of
St Michael's Church,
Frankfurt, Germany
and of St Theresia
Church, Linz, Austria.

between three of these elements. The floor and wall blur and read as a single monolithic, stereotomic mass within which the timber structure has been placed. This is further reinforced by the sculpting of the ground plane, which raises the ambulatory above the nave and creates a broken elliptical plinth as a base for the timber columns. Arguably, the 'earthwork' is both the floor and elliptical walls, while the timber columns and clerestory combine the elements of structure and spatial enclosure. In one sense such categorisation is purely semantic and diverting from this study of line, but it does help reveal what might be at work in McLaughlin's architecture. While it is perhaps problematic to apply the four elements too dogmatically – as Semper guarded against a too literal interpretation of the primacy he gives to the woven screen as a spatial enclosure – here screen and structure have combined as an architecture of line to create a cage that defines an interior space. McLaughlin himself has even described allowing 'the wooden structure to weave together seamlessly',²⁷ verbally assigning the properties of Semper's woven enclosure to the frame. In contrast to typical basilica sections, which bring light directly into the nave, here clerestory light, already filtered by the surrounding trees,

crosses the ambulatory and is combed through the timber structure before entering the sanctuary. The interior becomes a complex instrument, sensitive to small changes in solar angle and luminous intensity. Lacking the distraction of expressed fixings the plain, wide surfaces of the chapel columns foreground patches of broken sunlight. Tonally similar, the whitened columns and wall become a relief upon which light can reflect and shadow be cast.

This reading moves beyond a principally tectonic understanding of the Four Elements to emphasise the phenomenological qualities of the thicket, recalling Semper's 'Hedge-fence – the crudest wicker work [...] spatial enclosure made from tree branches [where] only the friendly daylight had free entry through the holes left in the wall.'²⁸ Such an approach to enclosure and light also echoes Kuma's

22 Peter Zumthor,
isometric view of
St Benedict Chapel,
Sumvitg,
Switzerland; view
from the doorway to
the chapel and
threshold of timber
columns.



intentions for his perforate envelopes where:

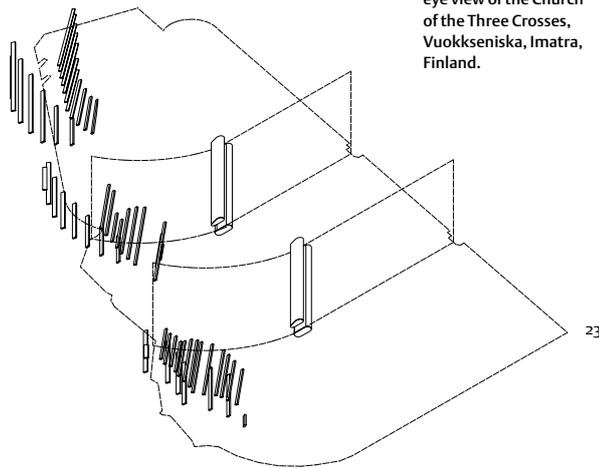
Filtered light, dispersed in particles shines through these apertures. In Japan we call this play of light shining through trees' leafage komorebi, 'the interplay of sunlight and trees'.²⁹

The metaphor of the forest seems particularly relevant, recalling both McLaughlin's interest in thickets and Aalto's double layered 'beyond-spaces', such as at the Church of the Three Crosses, Vuokkseniska, which is composed of 'irregularly spaced mullions, vertical outside and sloping inside, capturing a luminous volume of space and creating, through parallel effects as you move past, one of his most alluring evocations of the light and space of the forest'.³⁰ This is developed more extensively at Villa Mairea, Noormarku, Finland, where line is used to create differentiated, flowing spaces, punctuated with 'broken light', which work hard to avoid 'artificial architectural rhythm' by undermining regular structural grids with double, triple, and sloping columns combined with a palette of varied bindings and materials. Such spaces have variously been described as episodic and painterly. Line often appears in collaged surfaces too, as profiled glazed tiles that catch and reflect light or in poles fixed to buildings to encourage foliage to grow and engulf architectural forms [23, 24].³¹

A polemical development of the conception of architecture as forest is present in the work of others, like Junya Ishigami, who propose large, irregular fields of line to produce literal, rather than metaphorical, forests – where movement, use, and inhabitation are suggested by wider or narrower gaps and more or less dense areas of column. Extended vertically the approach creates dense three-dimensional lattices, such as Kuma's GC Protho Museum, Kagugai, Japan, combining wooden sticks into a cubic grid, or Sou Fujimoto's cloud of slender steel sections for the 2013 Serpentine Pavilion in Hyde Park, London [25].

Compared to the varied, flowing spatial rhythm of the forest McLaughlin tends to conceive of discrete, centred spaces defined with a regular discipline and order. He consciously draws upon the broader etymological roots of the term 'nave'

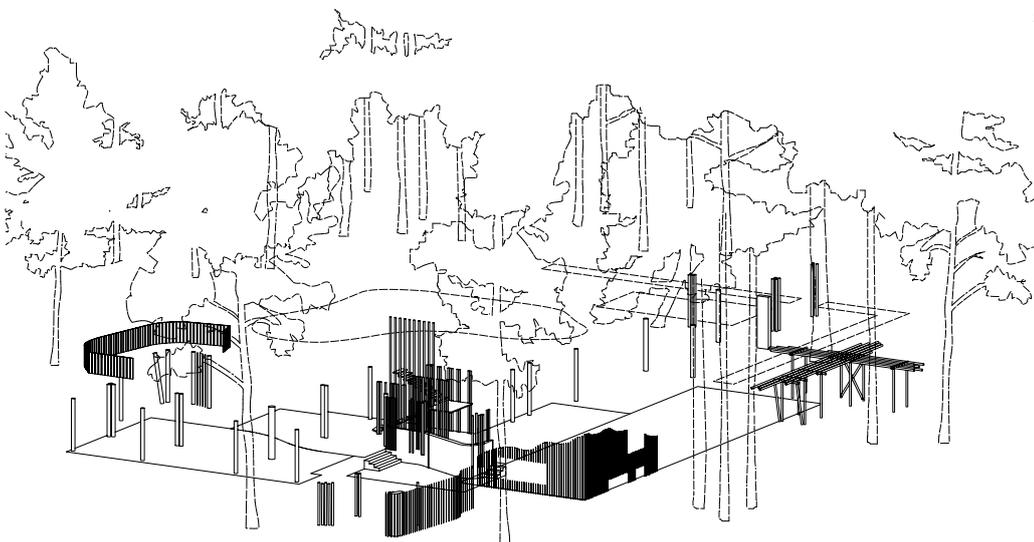
in his descriptions of Bishop Edward as referring to the body of a church in ecclesiastical architecture, the structure of a ship, and as the 'still centre of a turning wheel'. This sense of difference between a still centre and turning outer world is established by a cage of lines with a centralised spatial geometry, disciplined by the gravitational orbits around the altar and lectern, pushing movement and informal geometry beyond its perimeter. Whereas for the Carmelite projects this irregular geometry was found in the existing building, at Bishop Edward it is created as new; the form of the building dissolving into a looser arrangement of



23 Alvar Aalto, worm's-eye view of the Church of the Three Crosses, Vuokkseniska, Imatra, Finland.



24 Alvar Aalto, view of Villa Mairea, Noormarku, Finland; vertical elements create a thicket of line as you move through the living spaces of the Villa.



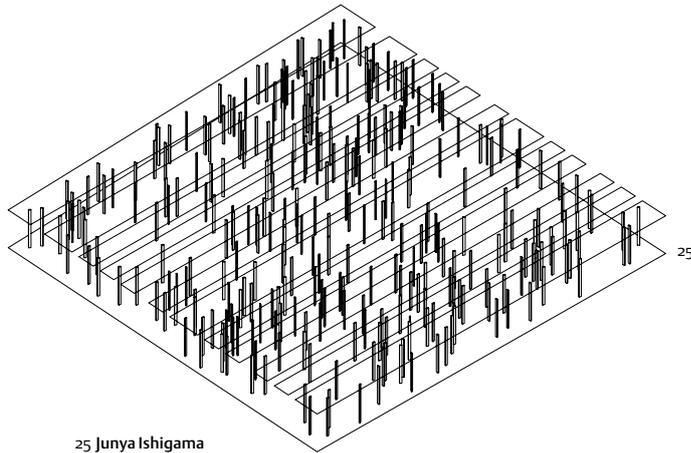
individual elements and episodes the further out one moves. Before reaching the ‘still’ centre, light and bodies must pass through several layers of line, thickening the spatial depth between inside and outside and creating a rich interplay of light and trapped ‘beyond’ spaces. Such a handling of space, line, light, and movement has strong parallels with evocations of the forest in the work of others but relegates it to a perimeter role as a thickened enclosure.

The still centre is also associated with the eternal, the curved white inner surface of the chapel considered as a ‘boundless’ representation of the infinite, borrowed from Schwarz’s *The Church Incarnate* (1958), which explores the relationship between liturgy and sacred Christian architecture. This spatial inversion turns the contained vessel of the chapel into a portal to an expansive inner world where the congregation reside within the timber structure. This reading, while potent, is somewhat at odds with McLaughlin’s assignment of Semper’s perforate woven screen to the same element, and

tends to reinforce the argument made earlier that the wall is an extension of the earthwork. However, references and semantics aside, the resultant theological thicket establishes a stable inner realm, both a vantage point and a retreat to the fleeting world and eternal beyond.³²

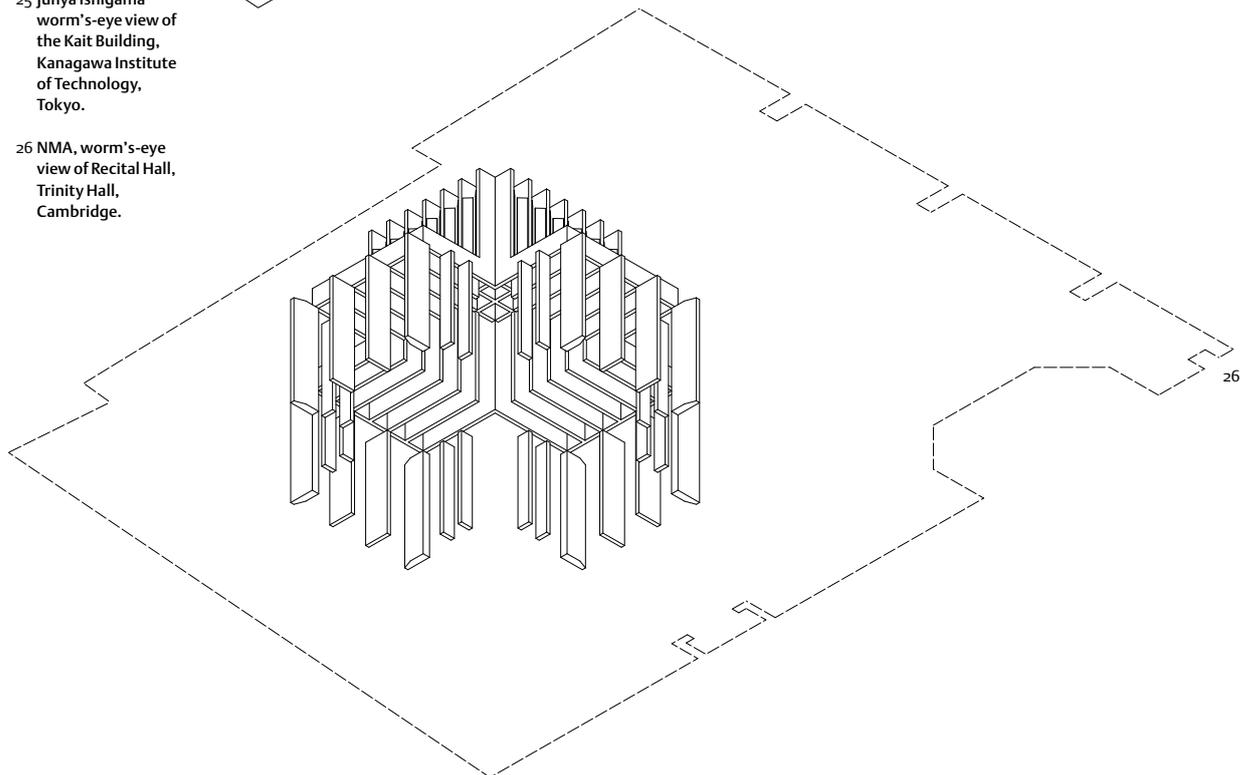
In a secular context, the centred spatial handling that has evolved recurs in proposals for a recital space at Trinity Hall, Cambridge. Based on a disciplined cross-plan form, the hall combines four cages as bays below a caged lantern above. A singular, centralised geometric object of tall stone fins, forming trabeated facades, creates a precise, stable inner world within the varied facades of the existing courtyard [26].

This geometric discipline loosens at the Nazrin Shah Building, Oxford, where comb-like elements address edges and approaches. A double colonnade forms a stepped loggia to an open space and a second colonnade addresses a route from the nearby Worcester College. Recalling the weave of the Avenham Park Pavilion, the roof plane of the lobby is composed of layers of timber beams and battens, but here they remain in shadow, with light only being permitted to penetrate in a few discrete locations. Both colonnades are gathered by the curved, double-height comb of the auditorium which, visible externally, creates a clerestory to the auditorium. McLaughlin acknowledges the compositional influence of Aalto’s Cultural Centre at Wolfsburg, juxtaposing a fan shaped auditorium against orthogonal spaces used as meetings rooms, events and support facilities. Also noted is Karl Friedrich Schinkel’s Gardener’s House in Charlottenhof, Germany, where the external spaces of the house are structured with pergolas, colonnades, and changes in level [27, 28].³³



25 Junya Ishigama
worm's-eye view of
the Kait Building,
Kanagawa Institute
of Technology,
Tokyo.

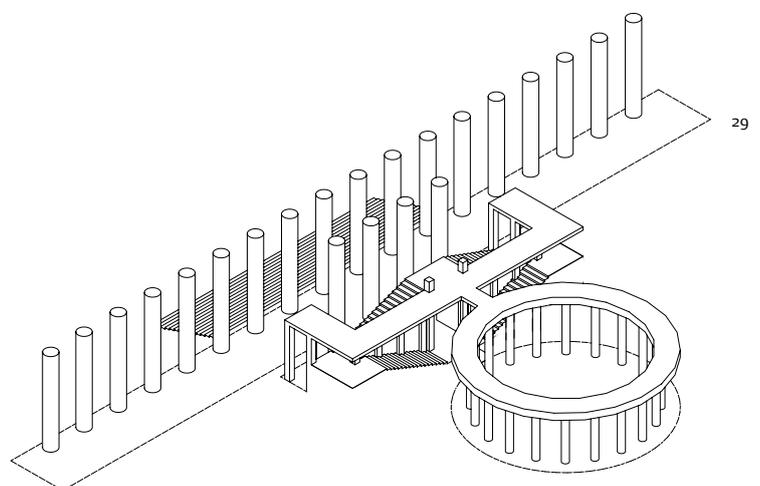
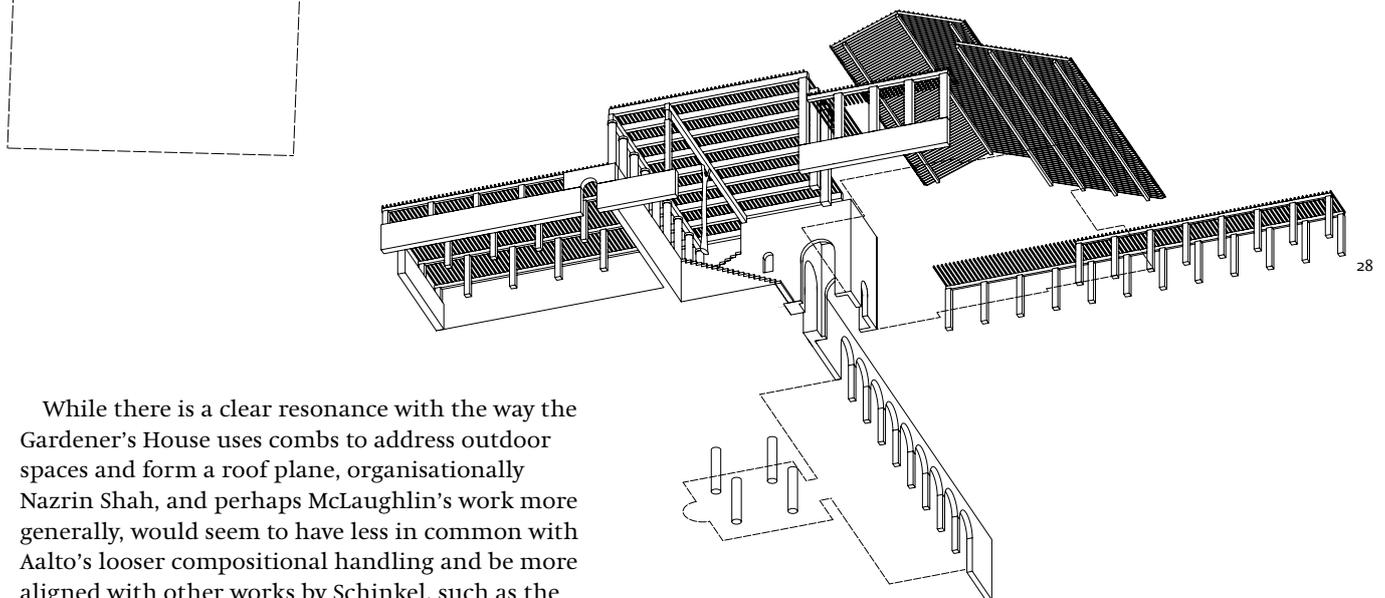
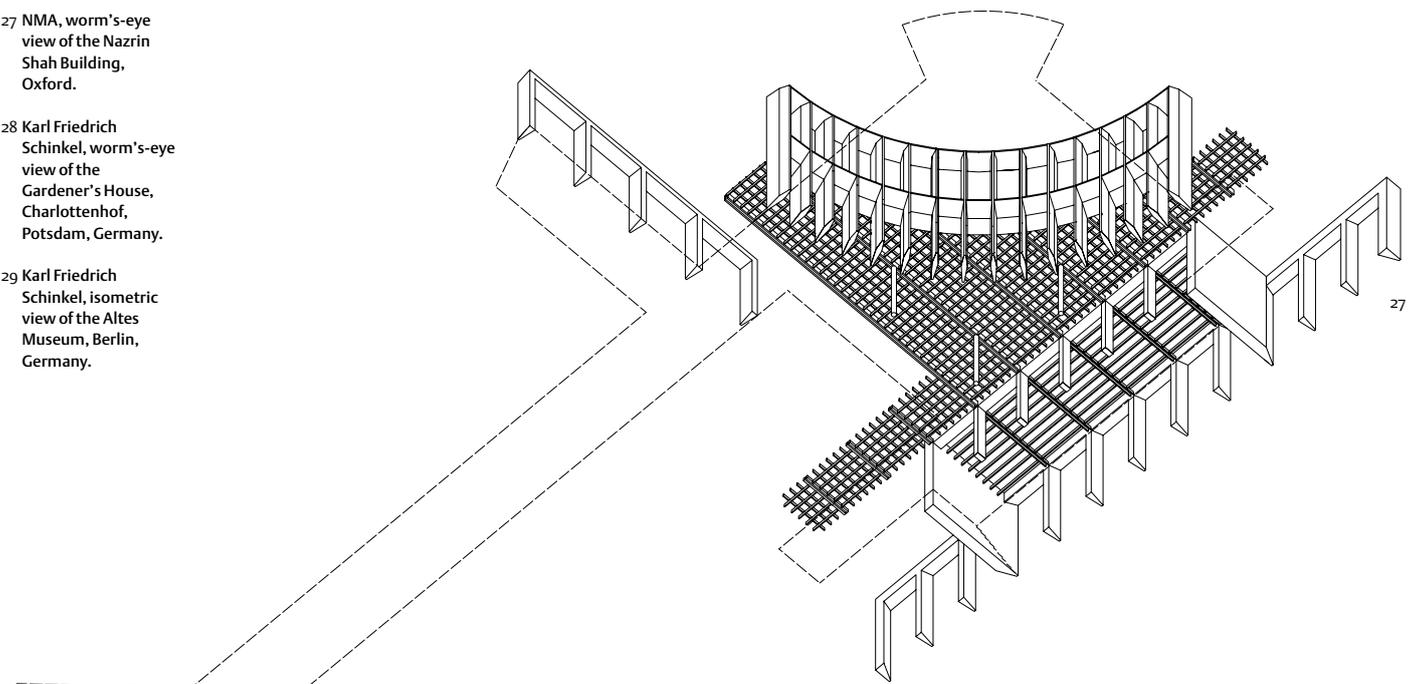
26 NMA, worm's-eye
view of Recital Hall,
Trinity Hall,
Cambridge.



27 NMA, worm's-eye view of the Nazrin Shah Building, Oxford.

28 Karl Friedrich Schinkel, worm's-eye view of the Gardener's House, Charlottenhof, Potsdam, Germany.

29 Karl Friedrich Schinkel, isometric view of the Altes Museum, Berlin, Germany.



While there is a clear resonance with the way the Gardener's House uses combs to address outdoor spaces and form a roof plane, organisationally Nazrin Shah, and perhaps McLaughlin's work more generally, would seem to have less in common with Aalto's looser compositional handling and be more aligned with other works by Schinkel, such as the Altes Museum in Berlin. Here a frontage, addressing a public garden, is formed from a long colonnade, which doubles at its centre to create an interstitial porch leading to a circular space that is the focus of the museum. Just as at Nazrin Shah, linear and curved figures, composed with line, are juxtaposed against each other in a disciplined, formal relationship. Arrays of line define clear thresholds to carefully order the transition between inside and out [29].

Kenneth Frampton describes Schinkel and Semper as conceiving of 'form as a phenomenally transparent grid, structured about a hierarchical articulation of discrete parts'.³⁴ Evolving beyond the purely tectonic this resonates too with McLaughlin and the deeper presence Semper has in his thinking, arguing that he 'edged away from the conception of the screen as representing physical support towards an elucidation of the spatial field'.³⁵

Weaving space and time

The emphasis Semper placed on the woven spatial enclosure is echoed by both Kuma and McLaughlin when they discuss his writings. Kuma links it with his own handling of a facade and traditional Japanese Sudare screens; horizontal slats of wood that protect from sunlight, rain, and insects but allow cooling breezes to pass through them in the summer.³⁶ Such devices assist Kuma's aims of 'erasing' architecture by blurring distinctions between inside and out through perforate, delicate structures.

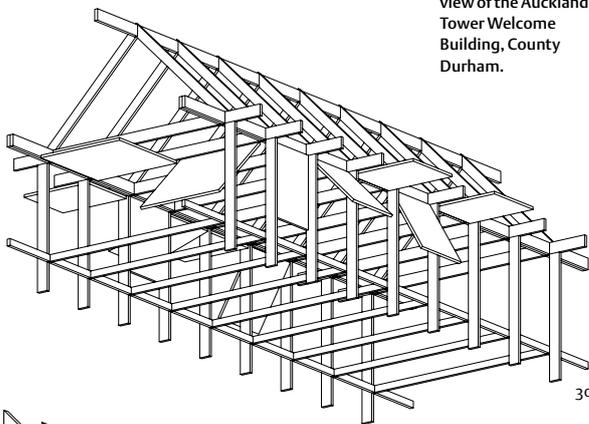
While McLaughlin has explicitly used woven forms as architectural elements, as at Avenham Park, he situates his work in a broader reading of Semper based on the ritual act, as it emanates from activities of dance and music, to making and construction, becoming the basis of art and architecture:

*The underlying harmony of the world is enacted in rhythmic activity, which, in turn, is fixed into things through repetitive knotting, weaving and binding; these basic forms of human manufacture, which are mimetic of human ritual and activity, are the origin of architecture [...] Semper says, 'Weaving is always associated with the separation of the inner world from the outer world, and that's the origin of architecture.'*³⁷

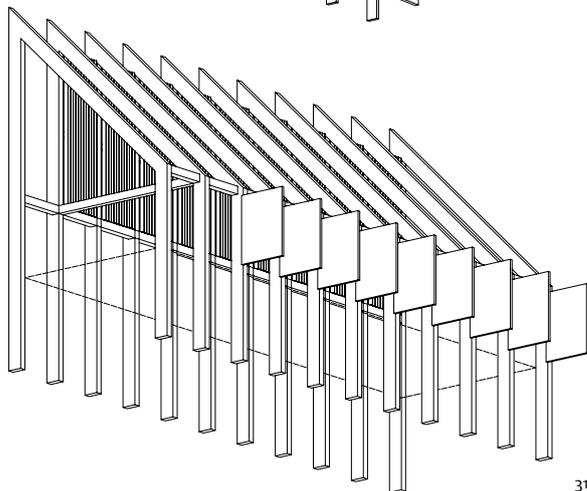
The ritual act initiates the process of construction and eventual solidification as a building, such

30 NMA, worm's-eye view of the Fishing Hut, Hampshire.

31 NMA, worm's-eye view of the Auckland Tower Welcome Building, County Durham.



30



31

that the 'origins of monumental architecture lie in the ritual bedecking of festival structures'. The constructive act is therefore framed in the context of having multiple authors contributing to it over time, rather than being conceived by a lone individual in a single moment. For McLaughlin these authors relate not just to the craft trades of Semper's Four Elements of hearth, earthwork, structure, and enclosure, but to a wider authorship involving people, time, weather, and use. Buildings become present as they are woven from the community and situation in which they originate, such that the 'dance and dancer' of form and use have a reciprocal relationship.³⁸

Since the 'Royal Gittern' lecture of 2004 McLaughlin's work has evolved from a lighter, tighter, and often looser grain of line, to later works that employ more substantial elements in often axial, trabeated arrangements that verge on the classical. In this period the work has also grown in scale and prestige. *Twelve Halls* was self-published in 2018 and conceives of buildings as an 'open latticework' that 'stands in counterpoint to the continuous cycles of light, season, use and regeneration' enduring the 'endless procession of fugitive elements'.³⁹ The chronotope described contrasts the circular time of light, seasons, and calendars of use with the architecture of a static frame, persisting in linear time. This was illustrated by his 'Presences'⁴⁰ installation at the Venice Biennale in 2018 where a rotating circular table displayed partial scale models of six projects reduced down to their enclosing frames or 'halls'. Laid out on an astronomical map, with an inscription of days, months, moon phases, seasons, and events around its perimeter, the models were lit from a tower of spotlights each triggered by the rotation of the table to simulate solar angles. Hinting at a conceptual shift from 'line' to 'frame', or 'thicket' to 'hall', this moves beyond latticeworks that modulate and transform light and use, to more inert 'counterpoint' frames; present but inactive witnesses, complete in themselves and closely choreographed to an intended use, but hosts rather than active participants.

The works of Kuma and Aalto that have been discussed point to different positions, which submit to time and authorship in other ways: for Kuma it is futile to resist linear time and entropy so, rather than attempting to be a defiant counterpoint, his work uses line to build lightly and with fragility, accepting impermanence. Aalto's painterly handling produces eroded, collaged forms, evoking ruins and overlaid with arrays of line that invite nature to grow, intertwine, and consume. By avoiding a single unifying structure or idea, episodic spaces invite use and embrace incompleteness. Curiously, McLaughlin has remarked that Aalto's house in Munkkiniemi, Helsinki, is appealing to him as a dwelling for just this reason.⁴¹

Attempting to define McLaughlin's chronotope too tightly risks losing the richness of his evolving position, which employs a range of temporal ideas

to describe projects and considers that ‘time is the most fundamental thing in architecture’.⁴² Briefs for his teaching unit often have a temporal bias and references are commonly made to other buildings as precedents, at Bishop Edward even leaving a ‘trail of crumbs’ connecting his work to the chapels of Zumthor and Schwarz. This sensitivity to absorbing and translating influences echoes remarks made by one of his tutors, John Tuomey, who declared that, as architects, ‘We are agents in the continuum of architectural culture’ and connects us back to sequence, to Eliot, and to Kubler.⁴³

The sequences of work described in this study are neither an exhaustive survey of McLaughlin’s output or closed as series. Other series are present in his work and each will extend and reconfigure as newer works are produced: a related sequence incorporating hinged panels within fixed frames is evident in projects such as the Fishing Hut, Auckland Tower Welcome Building in County Durham, the auditorium in the Nazrin Shah

Building, and the Recital Building for Trinity Hall. Belvedere forms, related to the cages discussed here, have appeared in competition proposals for the London School of Economics, London and International Rugby Experience in Limerick, Ireland. Broader preoccupations interrogate the use of surface, stone, timber, structure, and the articulation of corner windows [30, 31].

As a series of ‘linked solutions’, sometimes cross-linked, they show different manifestations of an architecture of line, from relatively two-dimensional combs, to more immersive three-dimensional cages, naves, forests, and thickets. The juxtaposition of the work of other architects has revealed common approaches and individual differences. In McLaughlin’s work, line is apparent as a meteorological, environmental and poetic mediator between inner and outer worlds. While the thickened relation created by this use of line creates spatial separation, it quickens and accentuates temporal relations, becoming an instrument to reveal the fleeting.

Notes

- Joseph Rykwert, ‘Stirling Prize 2013: Bishop Edward Chapel’, *The Architects’ Journal*, 10 (20 September 2013), 86–96; William J. R. Curtis, ‘Building for a Longer Lifetime’, *The Architects’ Journal*, 5 (10 February 2011), 20–7.
- Rob Wilson, ‘In Practice: Níall McLaughlin’, *The Architects’ Journal*, 1 (11 January 2018), 20–73 (20–4).
- Mary Ann Steane, *The Architecture of Light* (London: Routledge, 2011); Mary Ann Steane, ‘Lightenings’, *Architecture Today*, AT237 (April 2013), 20–31 (31).
- Ellis Woodman, ‘Sacred Spaces’, *Building Design* (26 April 2013), 10–15.
- Peter Salter, ‘Ark of Light’, *Architectural Review* (April 2013), 32–5.
- Charles Jencks, ‘An Evolving Sum of the Parts’, *RIBA Journal* (October 2016), 59–60. Eliot’s widely cited essay has been referred to within architectural circles by many, including Colin St John Wilson and Juhanni Pallasmaa. The Yale University journal *Perspecta* reprinted the entire essay in 1982 together with related essays by others, such as George Kubler. T. S. Eliot, ‘Tradition and the Individual Talent’ and George Kubler, ‘The Shape of Time Reconsidered’, *Perspecta*, 19 (1982), 36–42, 112–21.
- George Kubler, *The Shape of Time: Remarks on the History of Things* (New Haven: Yale University Press, 1962), pp. 33, 35.
- Peter Eisenman, *Feints* (Milan: Skira, 2006), p. 74.
- Níall McLaughlin, in *IV Sketchbooks – A Parallel Life, Níall McLaughlin*, ed. by Tina di Carlo (Somerset: Drawing Matter, 2018), p. 45.
- Níall McLaughlin, ‘A Royal Gittern at the British Museum’, in *Material Matters: Architecture and Material Practice*, ed. by Katie Lloyd-Thomas (London: Routledge, 2007).
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- Níall McLaughlin, *Twelve Halls* (London: Níall McLaughlin Architects, 2018), pp. 56–7.
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- Kengo Kuma, in Kenneth Frampton, *Kengo Kuma Complete Works* (London: Thames and Hudson, 2012), p. 117.
- Kengo Kuma, in Botond Bogner, *Kengo Kuma: Selected Works* (New York: Princeton Architectural Press, 2004), p. 14.
- Níall McLaughlin Architects, ‘King’s Cross Canopy, London’ <<http://www.niallmclaughlin.com/projects/kings-cross-canopy/>> [accessed 7 February 2020].
- Gabriel Pérez-Barreiro, *Radical Geometry: Modern Art of South America from the Patricia Phelps de Cisneros Collection* (London: Royal Academy of Arts, 2014), pp. 29, 30.
- Zumthor refers to these arrays as ‘fences’ in Steven Spier, ‘Place, Authorship and the Concrete: Three Conversations with Peter Zumthor’, *arq: Architectural Research Quarterly*, 5 (2000), 15–36 (32). A close study of the San Martín de Porres Church is included in ‘Breathing Walls’, in David Leatherbarrow, *Architecture Oriented Otherwise* (New York: Princeton Architectural Press, 2009), pp. 21–42; Sarah Menin and Stephen Kite, *An Architecture of Invitation* (London: Lund Humphries, 2005), p. 44.
- McLaughlin, *Twelve Halls*, p. 95.
- These sources are noted in various contexts and lectures. McLaughlin, *Twelve Halls*, p. 24.
- McLaughlin, in *IV Sketchbooks – A Parallel Life, Níall McLaughlin*, p. 12; Peter Zumthor, *Works* (Zurich: Lars Müller Publishers, 1999), p. 56.
- The term ‘a trail of crumbs’ was used by McLaughlin during an interview with Andrew Carr at the offices of Níall McLaughlin Architects, on 13 February 2019. The sequence is referred to by McLaughlin in Nina Rappaport, ‘Níall McLaughlin’, *Constructs – Yale Architecture* (spring 2015), 2–3 (2). Gottfried Semper, *The Four*

- Elements of Architecture and Other Writings*, trans. by Henry Francis Mallgrave and Wolfgang Hermann (Cambridge: Cambridge University Press, 1989), p. 102; Níall McLaughlin, in 'Bishop Edward King Chapel, Bartlett Design Research Folios', ed. by Yeoryia Manolopoulou, pp. 24–9 <https://issuu.com/bartlettarchucl/docs/mclaughlin_03_chapel_s05_update> [accessed 13 March 2018].
27. Níall McLaughlin, 'Incarnations: Bishop Edward King Chapel, Cuddesdon', in *Modern Religious Architecture in Germany, Ireland and Beyond*, ed. by Lisa Godson and Kathleen James-Chakraborty (London: Bloomsbury, 2019), p. 133. The wall was originally conceived as a woven timber basketwork screen correlating more literally with Semper's link between spatial enclosure and woven textiles. During the design and planning process the basketwork was changed to a cut stone laid in alternating courses that spiral around the elliptical form. This same stone is used to the lower part of the wall with a smoother, dressed finish until it eventually meets the ground where it merges with the 'earthwork'.
 28. Semper, *The Four Elements of Architecture and Other Writings*, pp. 103, 111.
 29. Kengo Kuma, in *Architecture et temps [Architecture and Time]*, ed. by Sylvie Zavatta (Besançon: frac franche-comté, 2012), p. 286.
 30. Richard Weston, *Alvar Aalto* (London: Phaidon, 1995), p. 206.
 31. Juhanni Pallasmaa, 'Architecture of the Forest', in *The Language of Wood* (Helsinki: Museum of Finnish Architecture), pp. 16–22; Weston, *Alvar Aalto*, pp. 83–91, 124, 206; Richard Weston, *Alvar Aalto: Villa Mairea Noormarku, Finland 1937–9* (London: Phaidon 1999), pp. 5–8; Aino and Alvar Aalto, 'Villa Mairea: Project Description, 1939', in *Alvar Aalto: Villa Mairea 1938–39*, ed. by Juhanni Pallasmaa (Helsinki: Alvar Aalto Foundation and Mairea Foundation, 1998), p. 31; Juhanni Pallasmaa, 'Surface, Touch and Time', in *The Brick*, ed. by Hanni Sipponen (Helsinki: Alvar Aalto Foundation, 2001), pp. 13–27.
 32. Níall McLaughlin, in 'Bishop Edward King Chapel, Bartlett Design Research Folios', p. 11; Rudolf Schwarz, *The Church Incarnate: The Sacred Function of Christian Architecture* (Chicago: Henry Regnery Company, 1958).
 33. Níall McLaughlin, 'How We Built It', *The Architects' Journal*, 245:18 (27 September 2018), 114. This contrast was used by Aalto on multiple projects, including the university complex at Otaniemi, which is perhaps closer to Nazrin Shah in that the curve of the auditorium faces into, rather than away from, the rectilinear forms.
 34. Kenneth Frampton, *Studies in Tectonic Culture* (Massachusetts: MIT Press, 2001), p. 85.
 35. Níall McLaughlin, 'Screens, The Haze of Candles', unpublished essay (2008) <<http://www.niallmclaughlin.com/presentations/haze-of-candles/4396/>> [accessed 28 April 2019].
 36. Dana Buntrock, *Materials and Meaning in Traditional Japanese Architecture: Tradition and Today* (London: Routledge, 2010), p. 80.
 37. Rappaport, 'Níall McLaughlin', p. 2; McLaughlin, 'Incarnations: Bishop Edward King Chapel, Cuddesdon', p. 133.
 38. McLaughlin, *Twelve Halls*, p. 57. This approach to multiple authorship, over time, draws not just on Semper but also on Marvin Trachtenberg's thesis concerning cumulative authorship throughout the long duration of building construction prior to the Renaissance and Alberti. McLaughlin is aware that the implications of adopting this approach within contemporary architectural practice are problematic and discussed this with the author in an interview at his offices on 13 February 2019. While appearing as a sole named author McLaughlin attempts to address this through collaboration with others and by thinking of buildings as time-bound, so being moulded by a wider definition of authorship. Marvin Trachtenberg, *Building in Time* (New York: Yale University Press, 2010).
 39. McLaughlin, *Twelve Halls*, p. 7.
 40. Níall McLaughlin, 'Presences', Venice Biennale Architettura 2018 (2018) <<http://www.niallmclaughlin.com/projects/presences-venice-biennale-architettura-2016/>> [accessed 18 June 2018].
 41. Níall McLaughlin, 'Architect's Homes', unpublished essay (2005) <<http://www.niallmclaughlin.com/presentations/architects-homes/4337/>> [accessed 28 April 2019].
 42. Níall McLaughlin, 'Six Pockets of Time', International Lecture Series, Bartlett School of Architecture (20 March 2019) <<https://vimeo.com/339062024>> [accessed 30 October 2019].
 43. Tuomey, *Architecture, Craft and Culture*, p. 66.

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