9 Representation and symbolism

Introduction

This chapter explores how exposed structure enriches architecture when structural forms and details contribute meaning by virtue of their representational and symbolic qualities. Structural representation is understood as structure typifying a physical object, like a tree or a crane, while symbolic structure recalls an idea, a quality or a condition. Like beauty, representation and symbolism lie in the eye of the beholder.

Both representational and symbolic structure encompass different degrees of explicitness. While some examples of representation are almost universally recognized, others are not. The situation is even more pronounced in the case of symbolism. When discerning symbolic meaning in architecture, as in any object, one brings his or her whole life to bear upon it. One's imagination, upbringing, education, life experiences, sense of well-being and professional expertise all influence how meaning in architecture in general, and in exposed structure in particular, is perceived. It is little wonder then that many symbolic readings are completely unimagined by designers.

Architect Sverre Fehn illustrates the deeply personal nature of human response to structural representation and symbolism. He sensitively imagines an individual's response to an exposed structural member, a column:

> *In the church the fisherman enters his pew. From his seat he recognizes that the column has the same dimensions as his mast. Through this recognition he feels secure. He sits by his column, a form also acknowledged by the gentle touch of his fingers. On the open sea, the tree was a symbol he trusted, as it brought him safely home. The same representation assists him now in turning his thoughts towards prayer. Within his spirit the sea is calm. In his search for the stars, the column offers him a personal dialogue.*[1]

This passage exemplifies structure, in this case a column, playing both representational and symbolic roles. Although both roles may be being

played simultaneously when a structure is read, the following sections discuss each role separately.

Representation

Examples of structural representation can be divided into two unevenly sized groups. In the far larger group, sources of representation include objects and processes found in the natural world. Artifacts, that comprise the smaller group, also become sources of design inspiration and invite attempts at representation.

The limited number of examples that this chapter describes is but a fraction of all possible structural representations. Plant forms that recall the shapes of well-developed trees are by far the most common. Only in the Eden Project (see Fig. 3.5), whose hexagonal structured biomes are scaled-up versions of bumblebee eye structures, is structure based on natural microscopic or molecular forms. This is not to deny the potential for other sources of inspiration from the natural world. Forms from plants, the worlds of animals, birds, insects and marine life, and forms from naturally occurring solids like metals and crystals are all latent sources of representation.[2]

Natural world

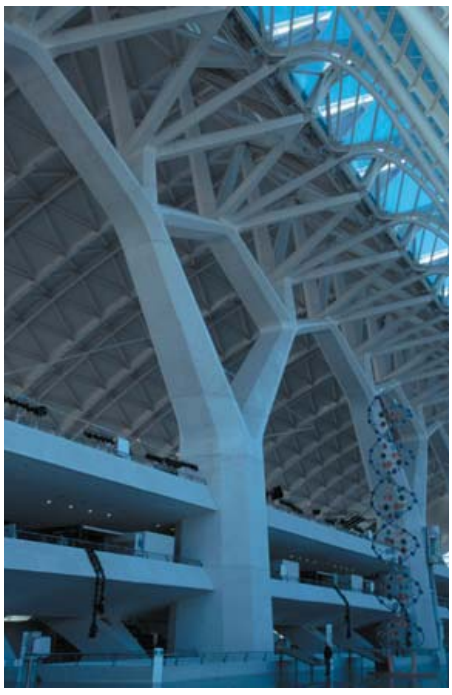
In the context of discussing the designs of young Finnish architects, Antoniades suggests that 'one may classify as a uniquely Finnish obsession, the introduction of tree-form elements into architecture'.[3] He illustrates numerous examples where tree and forest have inspired and generated structural form in recent architecture, and he includes some conceptual explorations of trees as generators of high-rise building structures. However, while many examples of arboreal columns are to be found in Finland, articulation of column as tree occurs in many, if not most countries.[4]

Of all natural forms, trees and forests are by far the most likely to be represented structurally, and their popularity among architects is reflected in the case-studies that follow. After exploring a number of different structures that manifest tree forms, several buildings are considered where the structure is more likely to be read as forest, and then the chapter moves on to examples that exhibit the geological process of erosion and various anthropomorphic and zoomorphic features.

Structural trees dominate the main façade at the Palais de Justice, Melun (Fig. 9.1). An entrance canopy that extends across the building frontage rests upon six tree-like columns. Apart from the small fins radiating from the perimeter of the trunk bases to deter intending graffiti artists, these columns are literal steel replicas of trees. Like real trees, they

▲ **9.1** Palais de Justice, Melun, France, Jourda & Perraudin architectes, 1998. A tree-supported canopy on the main façade.

possess trunks and forked branches. Even twigs exist, located immediately underneath the canopy. Only the leaves are missing! Such explicit representation raises the question how do the trees relate to the building's interior? Once inside does one promenade along a tree-lined avenue? Unfortunately, in this building no connection exists between its exterior and interior architecture – the trees are little more than an architectural gesture, albeit one that is rather grand.



▲ **9.2** Science Museum, Valencia, Spain, Santiago Calatrava, 1998. Two of the giant structural trees with galleries behind.

In an equally literal example of representation, steel tree-columns transform the interior of the Stuttgart Airport Terminal (see Fig. 3.43). Structural twigs penetrate the wall glazing at first floor level to support an entrance canopy. Linking interior and exterior architecture they hint at the interior grove of trees within. Again stick-like and leafless, the branches indicate either an endless winter or death, but their complexity and intricacy more than compensate for their starkness, and they arouse interest and admiration.

'Trees' also become the primary interior elements of the Science Museum, Valencia. They visually separate the huge entry and exhibit hall from the three levels of galleries behind (Fig. 9.2). Although the main branches spread out in just two dimensions, the form of the five white concrete elements is quite unambiguous.

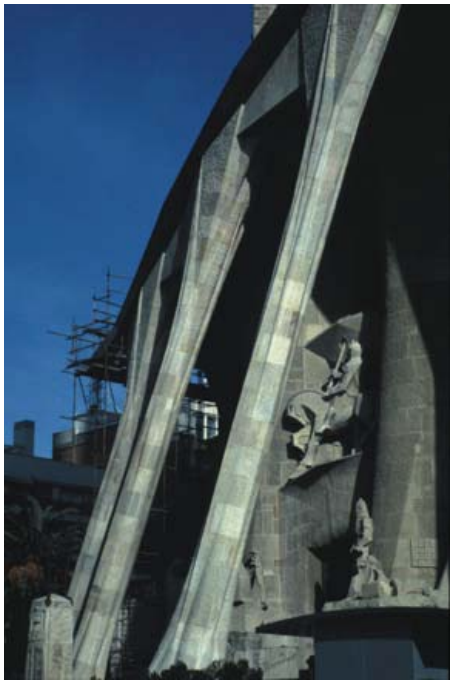
Whereas in the previous two examples the trunks and branches are formed by linear members, the branches of the structural trees at the

Oriente Station, Lisbon, are elegantly curved. Their arboreal representation is equally explicit. The Station platform canopy appears light-weight and very delicate by comparison to its heavy concrete-arched structure housing the main concourse and other facilities upon which it rests (Fig. 9.3). Recalling the pointed Gothic arches of Oxford University Museum's courtyard structure (see Fig. 6.39), the steel ribbed canopy bears a strong resemblance to a grove of palm trees – an association reinforced by its detailing. Apart from its square fabricated-steel column-bases, other members of the roof canopy comprise I-sections. The main arch members not only curve, but also taper. The haunched and rounded rib-to-arch connections and the use of sharp-edged and thin sections recall similar properties of palm thongs and strengthen the botanical analogy (Figs 9.4 and 9.5).

▲ **9.3** Oriente Station, Lisbon, Portugal, Santiago Calatrava, 1996. A light-weight platform canopy atop a heavy base.

▲ **9.4** A view along the canopy structure.

▲ **9.5** Palm tree thong-like ribs connect to a primary arch.



▲ **9.6** Sagrada Familia, Barcelona, Spain, Antonio Gaudí (under construction). Ribs of sloping columns on the Passion façade recall those of cypress trees.

Variously shaped tree-like columns are found in the Sagrada Familia cathedral, Barcelona. Splaying canopy columns on the Passion façade display very complex geometrical shapes (Fig. 9.6). The attached ribs that buttress their trunks are similar to those that protrude from the bases of cypress trees. Inside the cathedral a forest of columns with forked branches support the roof over the nave and aisles (Fig. 9.7). Ornamentation just below the lowest level of forks bares a strong resemblance to the healed surfaces that form after branches have been pruned close to a trunk. Although the columns are essentially cylindrical their surface indentations transform with height and reduce the literal nature of the analogy slightly.[5]

By comparison to the previous examples, the level of literal representation at the Stansted Airport terminal, Essex is somewhat muted. As discussed in Chapter 4, the structural trees link the exterior and interior architecture of the building. Their trunks consist of four steel tubes on a square grid joined together with beams above head-height to form two-way moment-resisting frames. Well-integrated services and information pods are located within the trunks. Tubular struts branch diagonally in both section and plan from each corner of a trunk to support lattice-dome roofs (Fig. 9.8). The wide 36 m spacing between the trees means that they are perceived more as individual elements than as members of a forest.

▲ **9.7** Nave and aisle columns.

▲ **9.8** Stansted Airport terminal, Essex, England, Foster Associates, 1991. A typical interior structural tree.

In the final three examples where the structural representation of the tree is less explicit, large numbers of columns evoke the notion of the forest or the plantation. For instance, one identifies more with the concept of the forest than with the tree where: 'Rows of rough hewn columns of ancient pine march through the cavernous space in regimented, arboreal splendor', at the Mont-Cenis Academy, Herne (see Fig. 3.27).[6] While each column is little more than a de-barked log, one faces only numerous tree-trunks, and a canopy without branches. The forest, rather than the tree, is again communicated in the Baumschulenweg Crematorium, Berlin (see Fig. 2.13). Its plain cylindrical columns are devoid of branches. Although such regular columns on their own could hardly be considered to represent trees, their sheer numbers and their collective 'random' placement evokes a forest. In another variation on the forest theme, one is reminded of the multitudinous leaning canopy posts under the Melbourne Exhibition Centre verandah (see Fig. 4.13). They can be read alternatively as river-bank reeds or plantation wind-blown saplings.

Whereas the previous buildings in this section exemplify structure representing either trees or forest, the structure at the rear of the Outdoor Activities Centre, Portsmouth, suggests a natural process – erosion. Although the Centre's exposed timber construction and metal fasteners deny the hostility of its coastal location only several metres from the sea shore, the western side of the building, facing inland yet subject to prevailing winds, incorporates masonry and concrete construction (Fig. 9.9). When approaching the building from the car park, one passes two bays of externally buttressed masonry walls that 'break down' and eventually become a colonnade of free-standing buttresses closer to the main entrance of the Centre. Given the disappearance of sections of the wall and of the full wall panels along most of the length of the building, a geological process like erosion springs to mind, even without overt signs such as crumbling bricks and jagged or worn surfaces. This example of representation is certainly not explicit, and in fact nothing in the architect's account of the building supports this reading.

Anthropomorphic and zoomorphic sources are also represented by structural form and detailing. Chapter 7 comments upon the elegantly detailed metal castings at the Lyons School of Architecture (see Fig. 7.30). Their ribs not only express the flow of internal forces but are also expressive of the visual characteristics of human fingers. Also, consider the pier-plinth 'feet' in the Stadelhofen Railway Station underground mall, Zürich (see Fig. 7.52), and the similarly shaped base-plates under the entrance canopy to Wohlen High School (Figs 9.10 and 9.11). In another design by Santiago Calatrava, his fascination with bones and

▲ **9.9** Outdoor Activities Centre, Portsmouth, England, Hampshire County Architects, 1995. Where the building is approached from the car park in the background, the partial or full disappearance of the wall panels suggests a process like erosion.

▲ **9.10** Wohlen High School entry canopy, Switzerland, Santiago Calatrava, 1988. Ribs cantilever from the main arch.

▲ **9.11** Feet-like base-plates to the window mullions behind the canopy.

▲ **9.12** Terminal building, Railway Station at Satolas Airport, Lyons, France, Santiago Calatrava, 1994. The central arched-spine and its supporting buttresses (during construction).

skeletons finds expression in the arched spine-like truss of steel vertebrae that spans the length of the main terminal building at Satolas Airport, Lyons. Thrusts from the arch are transferred into the foundations by zoomorphic shaped external buttresses (Fig. 9.12). Around the

▲ **9.13** Armenian School Library, Los Angeles, USA, StudioWorks Architects, 2003. The 'ark' is elevated above the school playground.

perimeter of the Palazetto dello Sport, Rome, inclined exterior struts that resist compression loads from its ribbed-shell roof resemble athletes with arms extended, stretching their calf muscles by pushing against a wall (see Fig. 3.3).

▲ **9.14** The main columns align with the keel and are flanked by stabilizing posts.

Artifacts

Architectural books and journals contain many examples of structural representation originating other than from the natural world – areas such as aeronautical, nautical and automotive engineering, and industrial and historic structures, are but a few sources.

Several buildings where structure represents different types of artifacts have already been encountered. Drawing upon nautical imagery, ribbed timber construction defines the curved surfaces at the European Institute of Health and Medical Sciences, Guilford (see Fig. 3.28), and under the Némausus Apartments, Nîmes, uniformly-distributed slender columns create the impression of the building floating. Shear walls that read as rudders, given their location at the rear of the 'ship' and their rudder-like elevational profile, provide longitudinal stability for the ground floor (see Fig. 5.13).

The nautical theme surfaces again at the Armenian School Library, Los Angeles, a new addition to an already cramped site. Raised one storey above the ground, four large red elliptically clad columns and some slender steel tubes are the library's only footprint (Figs 9.13 and 9.14). The ark, as it is known, is intended to recall the account of the biblical Noah's

ark which is important in Armenian culture, as well as to symbolize aspects of Armenian immigration to countries like the USA. Its clear ark-like form, with walls elliptically shaped in plan, a rounded hull and an expressed keel, is held aloft by two different structural elements. The large columns placed under the centrally located keel are assisted by secondary props whose main task is to ensure transverse stability. Even then, the ark appears quite precariously balanced. Although the props are symmetrically and regularly placed, because the outer props support the intersections of the faceted planes that form the ellipse, and due to their inclination to the vertical, they read as randomly placed. This strengthens the idea of make-shift propping stabilizing a grounded craft. In spite of the absence of interior transverse ribs and the deployment of internal pairs of columns on the same centres as the large columns beneath, the shape of the interior space and its entirely unfinished plywood wall linings more than adequately continue the narrative begun outside.

The roof structure of the Atlântico Pavilion, Lisbon, similarly responds to a maritime theme. Glue-laminated arched and trussed frames span up to 115 m to enclose the arena and its concrete seating structure (Figs 9.15 and 9.16):

> *Built for Expo '98, a world's fair that commemorated the 500th anniversary of explorer Vasco da Gama's voyage from Portugal to India . . . the shape of the roof resembles the inverted hull of the carabelas, the type of ship used by de Gama; the arena's wood ceiling and heavy wood support ribs pay homage to the construction of the carabelas.*[7]

The youth club in Möglingen, Stuttgart, exemplifies more literal structural representation. After consulting with the teenage user-group, the

▲ **9.15** Atlântico Pavilion, Lisbon, Portugal, Skidmore Owings & Merrill PLC, 1998. The sleek pavilion roof is in the background.

▲ **9.16** Timber trussed-arches over-sail the seating.

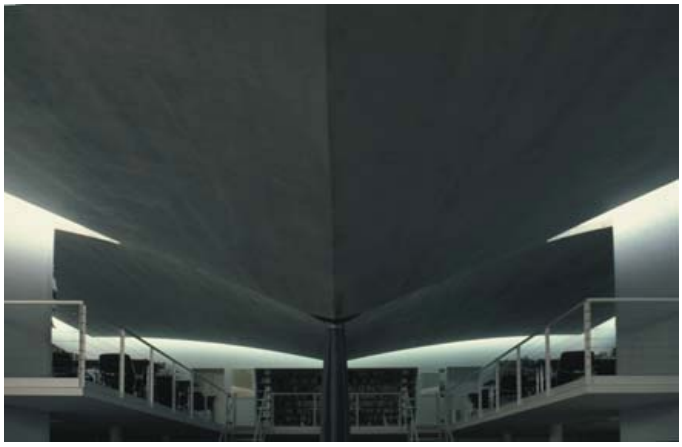
▲ **9.17** Youth Club, Möglingen, Stuttgart, Germany, Peter Hübner, 1996. Building exterior.

architect has created a work of narrative architecture that incorporates two seemingly disparate elements – a space-craft and mud. The overall form, and especially the exterior structure, bears strong resemblance to a space-craft, while the theme of mud is realized by the non-structural earthen walls (Figs 9.17 and 9.18). Although the steel ribbed-dome roof and its perimeter open-truss utilize a High-Tech vocabulary, the realistically detailed 'retractable legs' speak loudly of space-age technology. The source of inspiration behind their detailing, especially their struts and rods that articulate the compression and tension connections to the perimeter truss, and the circular landing pads at their bases, is unmistakable.

▲ **9.18** A primary structural roof support displaying space-age detailing.

Wohlen High School is revisited again to discuss the fourth and final set-piece in the school designed by Santiago Calatrava – the library roof. From his preliminary sketches it is clear that the structural form of the roof draws upon the shape of an open soft-covered book or the out-stretched wings of a bird flying (Fig. 9.19).[8] It consists of a folded and curved concrete shell whose weight is supported by a tubular steel column reinforced by ribs whose curved shapes give rise to its spindle-shaped profile. Horizontal stainless-steel rods located around the perimeter of the roof in several locations stabilize it by tying it back to structural walls. Daylight washes down the walls through gaps between them and the roof.

Although the roof form resembles the pages of an open book or the wings of a bird, the enfolding presence of its curved concrete surfaces immediately above the mezzanine reading galleries provides a strong sense of enclosure and protection. These emotions, evoked by the combination of the structural form and the perimeter lighting, reinforce



▲ **9.19** Wohlen High School library roof, Switzerland, Santiago Calatrava, 1988. A central column supports the roof shell which 'shelters' the mezzanine galleries to the rear.

▲ **9.20** Church of the Autostrada, Florence, Italy, Giovanni Michelucci, 1968. The church as seen from the motorway.

▲ **9.21** Dramatic interior structure with the main altar to the left facing the rows of seats. (Courtesy F. Amadei.)

▲ **9.22** Details of the concrete structure.

a reading derived from the natural world – that of the wings of a bird sheltering her offspring.

The Church of the Autostrada, Florence, contains the final example of structure representing an object from the human world. Situated on the outskirts of Florence adjacent to the motorway, the church commemorates those workers who lost their lives building Italy's modern motorway system. Both architect and reviewers agree that the church's tent-like form simultaneously acknowledges the nomadic life of the ancient Israelites and the travelling public driving past the church (Fig. 9.20). However, opinions pertaining to the interpretation of its dramatic interior structure remain divided.

I refer to the amazing array of irregular struts that support the roof and also differentiate the sanctuary from the nave, frame the main altar, and screen off a passage-way (Figs 9.21 and 9.22). One reviewer suggests that the structural forms allude to: 'the calcified bones of a skeleton, and to desiccated stems'.[9] While a preliminary cross-sectional sketch by the architect suggests tree-like supports, the architect, Giovanni Michelucci, denied any intention of naturalistic representation. Instead, he referred to his desire to introduce fantasy, variety and surprise into his architecture, and acknowledged how forms inspired by trees contribute to that process.[10] He insists that no particular representation or symbolism was intended, other than allowing 'fantastic' structural shapes to invite a variety of readings. Perhaps the church's programme as a monument to the human cost of civil engineering construction suggests another reading? To me, this unconventional and intriguing structure, both in terms of its form and its exquisite irregularly modelled surfaces, reads as an abstraction of construction scaffolding, props and temporary bracing, and other construction equipment like derricks or cranes.

With this building fresh in our minds, a building whose structure defies categorization, that can be interpreted in many ways, and possesses a palpable and tantalizing sense of both representation and symbolism, examples where structures play more obvious symbolic roles are now considered.

Symbolism

The practice of people imbuing structure with meaning is commonplace both outside and inside the architectural community. Several examples that are drawn from quite different sources, including two from the world of vernacular architecture, illustrate this activity.

Kenneth Frampton includes an analysis of an Algerian Berber house by the sociologist Pierre Bourdieu:

> *In addition to all this, at the center of the dividing wall, between 'the house of human beings' stands the main pillar, supporting the governing beam and all the framework of the house. Now this governing beam which connects the gables and spreads the protection of the male part of the house to the female part . . . is identified explicitly with the master of the house, whilst the main pillar on which it rests, which is the trunk of a forked tree . . . is identified with the wife . . . and their interlocking represents the act of physical union.*[11]

A very different and religious symbolic meaning is attached to the exposed interior structure of the Rangiatea Church, Otaki, which was, until recently, New Zealand's oldest church: 'The ridge-pole, fashioned from a single tree, symbolizes the new faith and a belief in only one god. The ridge-pole is supported by three pillars symbolizing the Christian Trinity.'[12]

Exposed interior roof structure seems particularly amenable to symbolic interpretation. Lance LaVine writes of house ridge beams:

> *As a cultural artifact, the ridge beam is the center of the roof that covers human habitation. It is this center that preserves the human mind and spirit, as well as the needs of the human body, and thus this unique building element has gained a special place in the collective human memory of place or, perhaps more importantly, of being in places. The ridge of a house not only centers its roof structure but in so doing becomes a symbol for a centered existence within that form. It is a unique place in a dwelling that has come to secure the human psyche as it gathers the live and dead loads of the roof rafters that it helps to support.*[13]

While still on the subject of roof structure, and considering the meaning embodied in a vaulted roof, LaVine continues: 'A flat surface may extend indefinitely without ever protecting an inhabitant at its edges. To be covered is to have something that wraps around human beings . . . The vault of the house covers inhabitants as blankets cover their bed as the sky covers the earth.'[14]

Angus Macdonald also acknowledges the symbolic role of structure in architecture. In his categorization of possible relationships between structure and architecture he includes a category, 'structure symbolized'. Here 'structure is emphasized visually and constitutes an essential element of the architectural vocabulary . . . the "structure symbolized" approach has been employed almost exclusively as a means of expressing the idea of technical progress . . .'.[15] He explains that symbolic intent can encompass issues other than celebrating technology and explores the implications of structure symbolizing an ideal – like sustainability.

An implicit assumption that structure plays symbolic roles in architecture underlies this book. For example, Chapter 2 discusses how the unique detailing of the BRIT School columns symbolizes notions of innovation and creativity, and how the sombre and giant columns of the Baumschulenweg Crematorium are likely to be a source of strength for those who mourn (see Figs 2.1 and 2.13). At the Kunsthal, Rotterdam, exposed structural detailing that questions conventional attitudes to aesthetics, expresses the ethos of a museum of modern art (see Figs 7.10 and 7.11), while the elegance of detailing at Bracken House, London, conveys a sense of quality and prestige (see Fig. 7.39).

As already seen, structure plays a wide range of symbolic roles. While some symbolic readings are unintended by architects, in other cases architecture is enriched quite explicitly by exploiting the symbolic potential of structure, as exemplified in three buildings designed by Daniel Libeskind.

▲ **9.23** Jewish Museum, Berlin, Germany, Daniel Libeskind, 1998. Structural members pass chaotically above the main stairs.

▲ **9.24** Felix Nussbaum Museum, Osnabrück, Germany, Daniel Libeskind, 1998. Dysfunctional concrete beams in the Nussbaum Corridor.

In the Jewish Museum, Berlin, structural members play important symbolic roles. They reinforce the symbolism inherent in the whole project, but that is especially evident in the plans and elevations of the fractured building. Concrete struts-cum-beams pass chaotically across the main stairwell leading to the exhibition galleries (Fig. 9.23). Orientated at different angles with varied cross-sectional shapes and dimensions, these members symbolize the historical dislocations and horrors experienced by the German Jews. The convincing materiality and scale of the struts suggest structurally important roles, even though their chaotic configuration contradicts such a possibility. Although the struts prop the external wall to some degree, their primary role is symbolic. They enhance the architectural concept. This ominous and unexpected structure is laden with meaning.

Structure also contributes to the narrative architecture of the Felix Nussbaum Museum, Osnabrück. It helps recount the tragic story of the Jewish painter after whom the museum is named.[16] Structure, together with the building plan, building exterior, and the architectural details, speaks of violence, isolation and disorientation. For example, structural walls and a ceiling slab enclose the high and dimly lit Nussbaum Corridor that leads visitors to the main galleries. The harshness of the grey concrete, the lack of any detailing to relieve the plainness of the elongated space, and the dysfunctional concrete beams passing over it intensify the sense of loneliness and horror faced by Nussbaum as he entered a period of exile (Fig. 9.24). Elsewhere, structure evokes equally poignant emotions. Some structural walls possess sharp and angled edges, and structural members passing through windows and across overhead light-slots read unmistakably as bars of prison cells (Fig. 9.25). Together with other architectural elements, as well as the museum collection itself, structure recounts Nussbaum's life in a chilling and jarring manner.

Fragmentation as a design concept is also incorporated into the Imperial War Museum-North, Manchester. Its architectural form reflects a view of the world shattered into three fragments, depicting the devastating effect of war. These fragments, or 'shards', brought together to form the main museum volumes, represent conflict on land, water and in the air. The main museum space is accommodated in the Earth Shard while the Water Shard contains a restaurant and café. The Air Shard takes the form of an irregularly shaped and slightly canted tower which houses a viewing platform at roof level.

Open to the elements, the Air Shard is essentially a soaring 30 m high void – except for its interior structure (Fig. 9.26). All museum visitors

▲ **9.25** Beams passing across the light-slot read as the bars of prison cells.

▲ **9.26** Imperial War Museum-North, Manchester, England, Studio Daniel Libeskind, 2002. Structural members dominate the Air Shard volume.

enter the tower at ground level and pass through it towards the museum proper. While rain and wind pass through the generous gaps between its aluminum cladding battens and accentuate the bleakness of the space, the greater assault upon the senses arises from the structure that fills the volume. Steel tubes fly through the space, seemingly at all angles. They form a multi-member spatial framework that appears chaotic. The structural members appear to be mapping the three-dimensional trajectories of war planes through the sky.

Libeskind's works have influenced the design of Federation Square, Melbourne. The fragmentation of its façade surfaces and their supporting structures is recognized as symbolizing a number of aspects of Australia's culture – the individuality of Australia's eight states and territories, its ethnic diversity and its relationship with the indigenous people. Behind the fractural patterned glazing mullions and cladding panels, structural form intensifies the idea of fracture through its 'random' three-dimensional frameworks that support some roofs and exterior walls.

From within and outside two of the main public spaces, the Atrium and the interior BMW Edge amphitheatre, structural forms appear totally chaotic, verging on possible spatial versions of Pick-up Sticks (Figs 9.27 and 9.28). Load paths are impossible to trace. There are no recognizable structural systems or patterns, such as frames, arches or trusses, and no geometrical predictability. Most structural rules and traditions are broken as horizontal and vertical members are avoided and eccentric connections between members become commonplace. This is an example of structural anarchy. When lit at night the structure appears as a tangled thicket of bare tree branches.

As well as symbolizing some of the realities of Australia's national life, most of which are in fact universally applicable, other fundamental issues as well are raised by the welded and rigidly connected steel hollow-section frameworks. Given one's inability to categorize them and understand their workings, one is forced to accept that their structural performance is beyond understanding and trust in the expertise of those few structural engineers responsible for their digital structural analyses and designs. This structure forces its viewers to accept the unknown and live beyond their prior experiences. It also acknowledges the reality of the irrational and the unpredictable, that is, the environment much of life is lived in.

By comparison with the explicit structural symbolism in the previous four projects, any intended meaning in the exposed structure of the Industrial Park Office Building, Völkermarkt, is far less obvious. Even though the nature of its exposed structure is far more flamboyant than

▲ **9.27** Federation Square, Melbourne, Australia, Lab Architectural Studio and Bate Smart Partners, 2002. The tangled structure of the Atrium roof.

that of previous examples, it solicits different interpretations and creates a refreshing degree of mystery in the same manner as the Church of the Autostrada, Florence, discussed in the previous section.

▲ **9.28** A perimeter walkway though the wall structure of the BMW Edge ampitheatre.

Providing office accommodation, the building is a gateway for a light industrial park dedicated to start-up or emerging business enterprises. It consists of three elements; a narrow concrete walled-structure housing stairs and a lift that connects to the main concrete frame rising five storeys above a ground level podium. The frame supports the third and the most interesting element, a curved cantilevered steel structure (Figs 9.29 and 9.30).

After commenting on a previous design by the same architect that was interpreted as a criticism of the capitalist system, Peter Davey writes:

> *It is difficult to see how this building is a criticism of the system . . . perhaps it is a claw against the sky, or possibly a tattered crow's feather with its filaments flying. But the main impression is of welcome and thrust, the swirling curve of a powerful living, glossy bird's wing: a signal of strength, virility, generosity and hope.*[17]

Another interpretation might focus on the different characteristics of the frame and the cantilever. Perhaps the heavy, orthogonal and certainly conventional frame epitomizes the capitalistic system, while the light and flexible cantilevered area represents the new enterprises that

▲ **9.29** Industrial Park Office Building, Völkermarkt, Carinthia, Austria, Günther Domenig, 1996. The framed block supporting the cantilever and the lift and stair tower behind.

are twisting, turning and climbing in an effort to break free from it and its constraining rigidity? Then again, perhaps the curvature of the cantilever in plan is merely responding to the geometry of the road which bends around the base of the building?

▲ **9.30** Steelwork of the braced cantilever structure.

Summary

After acknowledging how representation and symbolism ranges from the literal to the ambiguous, this chapter illustrates the individualistic and personal nature of how meaning in structure is discerned. It then continues with examples of representation that draw upon the natural world for their inspiration. Trees, followed by forest are the most common sources, but anthropomorphic and zoomorphic forms are also included. Representation based upon human artifacts is less common but ship, boat, space-craft and book forms are also represented by structure. The section concludes with the representational and symbolic ambiguity of Michelucci's remarkable Church of the Autostrada.

Structural symbolism, inherent in the concept of reading structure, is implicit throughout this book. Before recalling numerous examples from previous chapters, several other authors demonstrate just how widespread is the practice of imbuing structure with meaning. Three buildings by Daniel Libeskind illustrate structure playing explicit symbolic roles, and the chapter concludes by considering a final building where any definitive meaning remains delightfully elusive.

REFERENCES AND NOTES

1 Fehn, S. (1983). *The Thought of Construction*. Per Olaf Fjeld and Rizzoli International Publications, p. 46.

2 Pearce, P. (1978). *Structure in Nature is a Strategy for Design*. The MIT Press, ch. 2.

3 Antoniades, A. C. (1992). *Epic Space: Towards the Roots of Western Architecture*. Van Nostrand Reinhold, p. 256.

4 See, for example, Cook, J. (1996). *Seeking Structure from Nature*. Birkhäuser.

5 For an explanation of the geometric complexity of the construction refer to Burry, M. (1992). Gaudí: the making of the Sagrada Familia. *Architects' Journal*, 195 (13), pp. 22–51.

6 Kugel, C. (1999). Green academy. *Architectural Review*, 206 (1232), pp. 51–5.

7 Bussel, A. (2000). *SOM Evolutions: Recent Work of Skidmore, Owings & Merrill*. Birkhäuser, pp. 60–5.

8 Blaser, W. (ed.) (1989). *Santiago Calatrava: Engineering Architecture*. Birkhäuser, p. 35.

9 Dal Co, F. (1992). Giovanni Michelucchi: a life one century long. *Perspecta 27, The Yale Architectural Journal*. Rizzoli International Publications, pp. 99–115.

10 de Alba, R. H. and Organschi, A. W. (1992). A conversation with Giovanni Michelucci. *Perspecta 27, The Yale Architectural Journal*. Rizzoli International Publications, pp. 116–39.

11 Quoted in Frampton, K. (1995). *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*. Massachusetts Institute of Technology, p. 14.

12 Tumatatoa, P. (1990). Churches illustrate impact of new faith. *New Zealand Historic Places*, 29, 40–4. Unfortunately the original church was destroyed by fire several years ago. A replica was opened in 2003.

13 LaVine, L. (2001). *Mechanics and Meaning in Architecture*. University of Minnesota Press, p. 125.

14 LaVine (2001), p. 151.

15 Macdonald, A. J. (1997). *Structural Design for Architecture*. Architectural Press, p. 30.

16 After going into exile and evading capture for many years, the young Nussbaum and his partner were killed in a Nazi concentration camp in 1944.

17 Davey, P. (1996). Spirit of Ecstasy. *Architectural Review*, 199, pp. 54–9.